City of Newberg
Community Development Department
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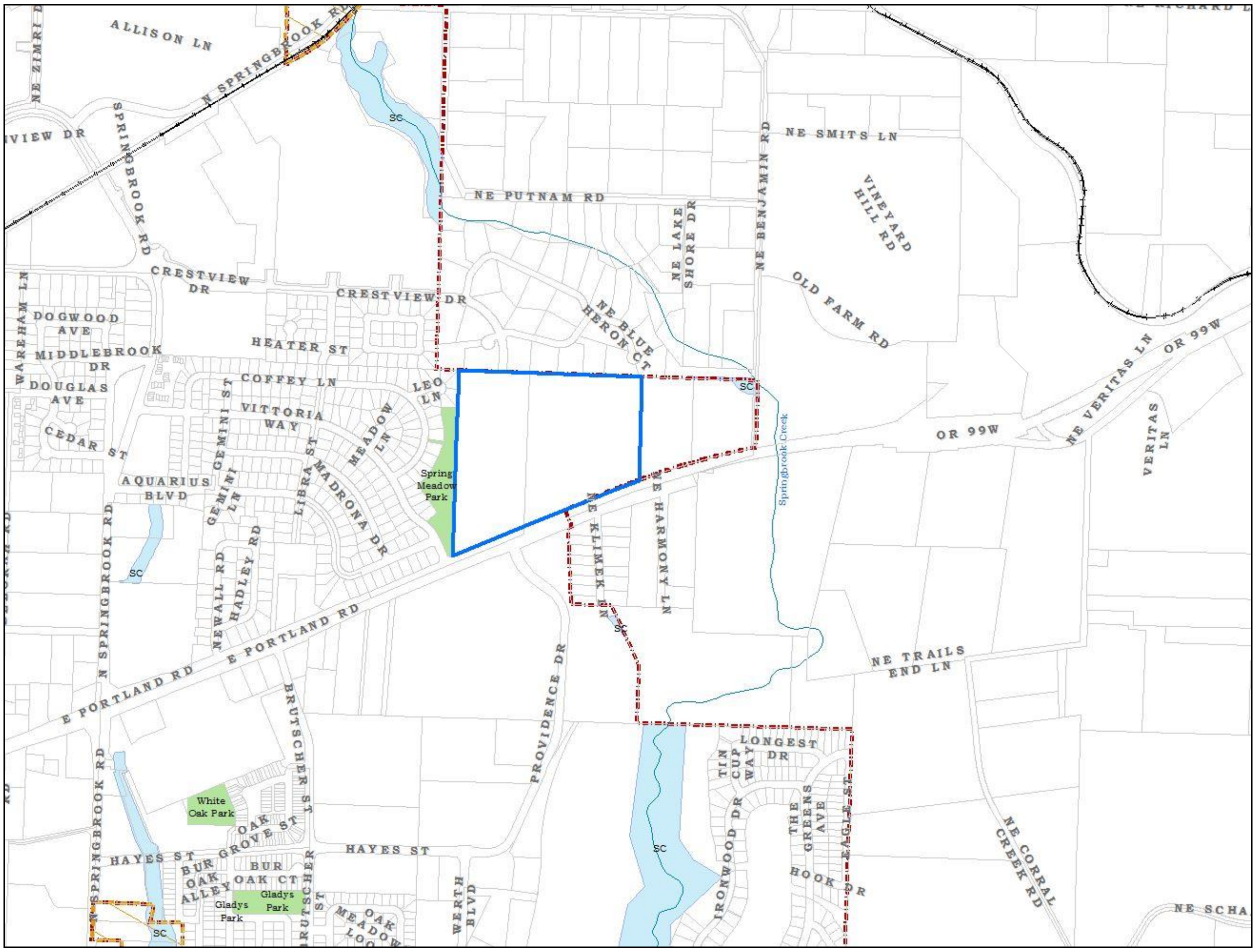
PLANNING COMMISSION STAFF REPORT
CRESTVIEW CROSSING PLANNED UNIT DEVELOPMENT AND CONDITIONAL USE PERMIT

HEARING DATE:	August 09, 2018
FILE NO:	PUD18-0001/CUP18-0004
REQUEST:	The application proposes a mixture of commercial use, single-family homes, cottage style homes, affordable housing and multi-family homes. The proposed development on 33.13 acres of land includes 18 single-family homes, 230 cottage homes and 51 multi-family homes with modifications to the base zone's dimensional requirements as permitted through the PUD process. The conditional use permit request is for allowing residential use on C-2 Community Commercial zoned property.
LOCATION:	4505 E Portland Road and abutting property without a street address
TAX LOTS:	Yamhill County tax lots 3216-01100 and 3216AC-13800
PROPERTY SIZE:	33.13 acres
APPLICANT:	Andrew Tull of 3J Consulting, Inc.
OWNER:	CG Commercial, LLC and VPCF Crestview, LLC
ZONE:	C-2 Community Commercial, R-1 Low Density Residential and R-2 Medium Density Residential districts
PLAN DISTRICT:	COM (commercial), LDR (low density residential), MDR (medium density residential)
OVERLAYS:	Airport Conical Surface

Attachments:
Order 2018-10 with
Exhibit "A": Findings
Exhibit "B": Conditions
Attachments
1. Application Material
2. Agency Comments
3. Public Comments
4. Joint Permit Application
5. Submittals by Applicant after July 25, 2018 (Density, Private vs. Publuc WalkwaysPreliminary Plat, Phasing Plan)
6. 5 Party Agreement



Location Map

A. DESCRIPTION OF APPLICATION:

The applicant is proposing a mixture of commercial development, single-family homes, cottage style single-family homes, affordable housing and multi-family homes. Residential use will include 18 single-family homes on large lots, 230 cottage homes, and 51multi-family homes with modifications to the dimensional requirements of the base zones dimensional requirements. One 4.4-acre lot will be created to allow for future commercial development (Attachment 1).

The applicant is proposing both active and passive opens space areas. There will be a network of open spaces, wetlands and a network of linked pedestrian paths. The paths will provide connections for the residents to open spaces, a neighborhood park and wetlands.

Both public and private streets will be utilized through the PUD process. Several off-street parking areas are proposed and on-street parking will also be provided on the public streets.

The applicant has reviewed the City of Newberg Affordable Housing Action Plan and is proposing an affordable housing component that would provide twelve single family detached homes at reduced prices and deed restrictions designed to create perpetual affordability. The twelve homes will be marketed at rates affordable to those home buyers earning less than the median family income as described within the City's Housing Action Plan's definition of affordable housing. The City's Affordable Housing Action Plan defines affordable housing as when a family spends no more than 30% of their income for housing. The applicant has stated that "at closing, buyers will be required to sign covenants agreeing to limit the price of any future sale to a rate of appreciation which is tied to either the Area Median Family Income rate or another acceptable index of income." Further, the applicant has stated that they "plan on working with the Housing Authority of Yamhill County and the City's Affordable Housing Ad Hoc Committee to refine the covenants which will be recorded with the sale of these units and to eventually find parties which may qualify for the purchase of affordable houses. The proposed affordable homes will require owner occupation and will be constructed at various locations throughout the development."

B. SITE INFORMATION:

1. Location: 4505 E. Portland Road and abutting tax lot 3216AC-13800

2. Size: 33.13 Acres

3. Topography: Sloping topography, generally slopes downward from the northwest to the southeast.

4. Current Land Uses: vacant, single family house, a barn and several small structures (animal coops/pens or storage sheds) buildings and unmaintained orchards

5. Natural Features: wetlands

6. Adjacent Land Uses:

   a. North: Unincorporated Yamhill County, Oxberg Lake Estates with lots 1 acre and larger

   b. East: Single family house, vacant

   c. South: E Portland Road, Klimek Homes subdivision, Providence Newberg Medical Center

   d. West: Spring Meadow Park, Spring Meadow Subdivision

7. Access and Transportation: Access will be provided from the south by E Portland Road and E Crestview Drive from the north.

8. Utilities:

   a. Sanitary Sewer: The City's GIS shows there is a 24-inch public sewer line which is available for extension to the north to serve the Crestview Crossing PUD. The line is located approximately 700-feet south of E Portland Road at the south end of NE Klimek Lane.

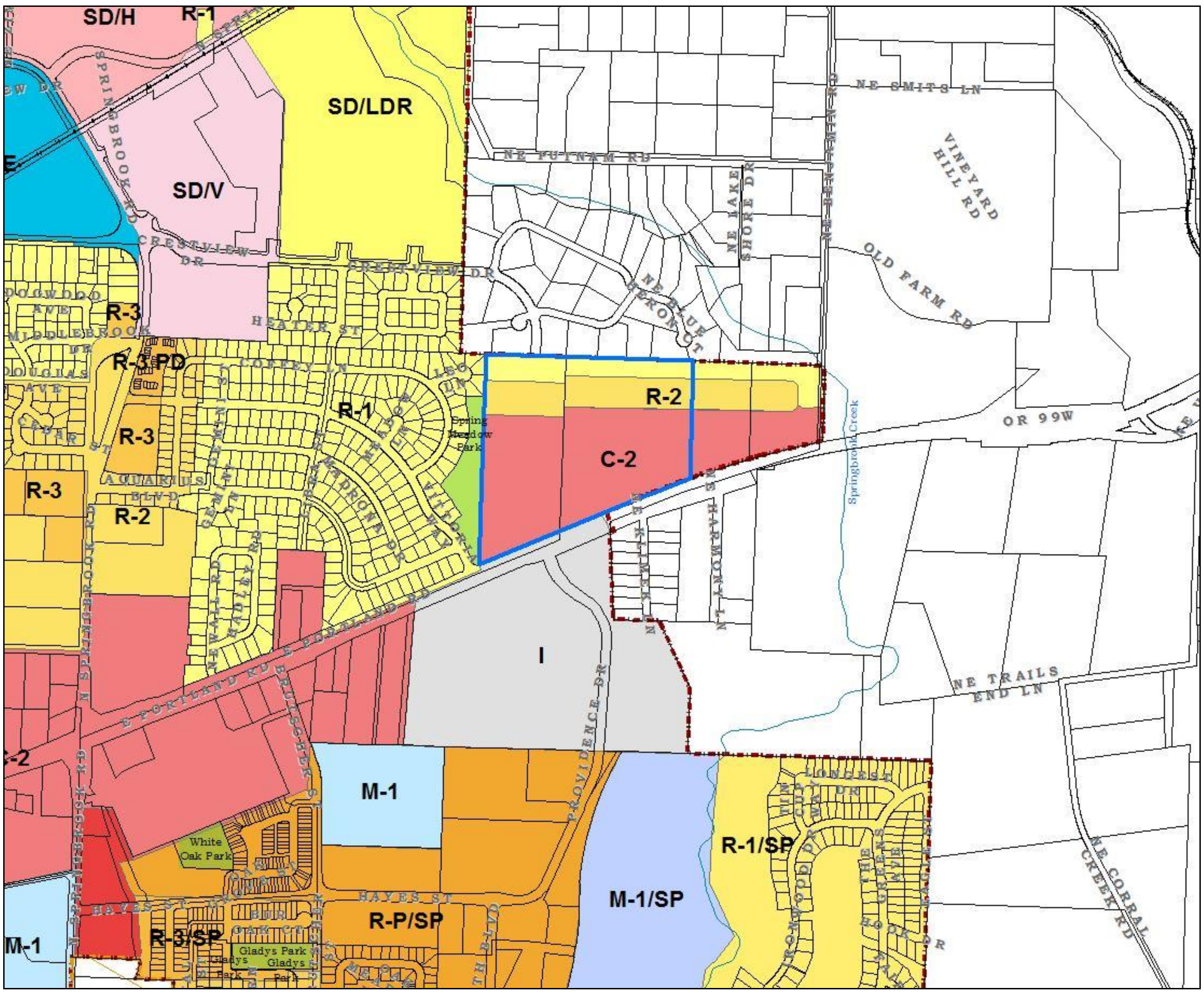
   b. Water: The City's GIS shows there is a 10-inch public water line in E Portland Road which is available for extension to the north, and an 8-inch public water line in E Crestview Drive which is available for extension to the south.

The City's GIS also shows an 10-inch non-potable water line along E Portland Road that terminates just east of the property near NE Harmony Lane.

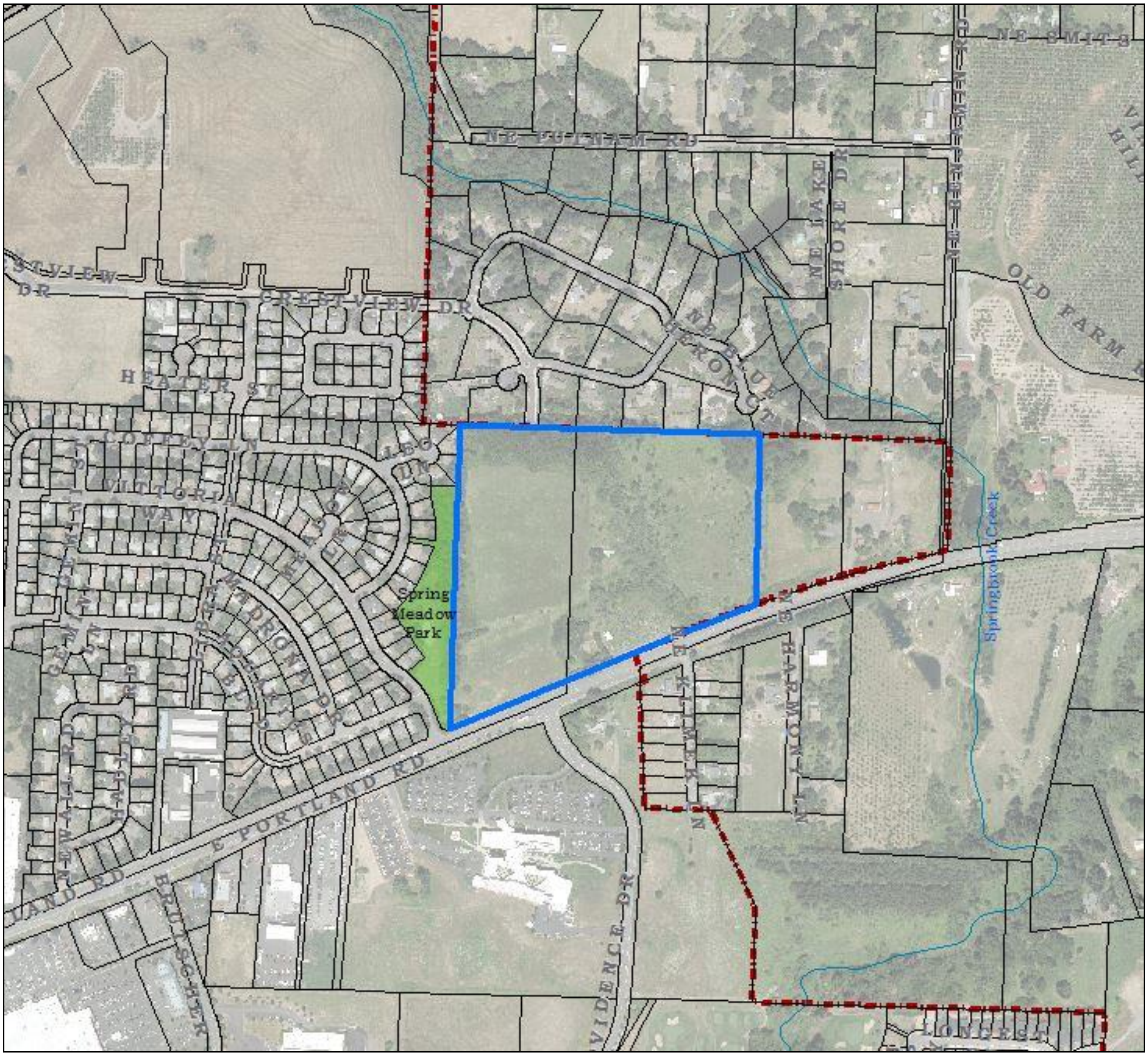
c. Storm: The City's GIS shows there is a 15-inch public stormwater line available for connection to the northern terminus of E Crestview Drive, and a 24-inch public stormwater line culvert under E Portland Road.

d. Overhead lines: There are no existing overhead lines. All new service lines are required to be undergrounded.

e. Wetlands: There are existing wetlands within the boundary of the Crestview Crossing PUD. The applicant will be required to follow state/federal processes to delineate wetlands and apply for a joint permit application (JPA).



Zoning Map



Aerial Photo

C. **PROCESS:** The planned unit development request is a Type III application and follows the procedures in Newberg Development Code 15.100.050. The Planning Commission will hold a quasi-judicial hearing on the application. The Commission is to make a decision on the application based on the criteria listed in the attached findings. The Planning Commission's decision is final unless appealed. Important dates related to this application are as follows:

1. 07/05/18: The Community Development Director deemed the application complete.

2. 07/12/18: The applicant mailed notice to the property owners within 500 feet of the site.

3. 07/12/18: The applicant posted notice on the site.

4. 07/18/18: The *Oregonian* newspaper published notice of the Planning Commission hearing.

5. 07/16/18 City staff posted notice of the Planning Commission hearing in 4 public places.

6. 08/09/18: The Planning Commission will hold a quasi-judicial hearing to consider the application.

D. AGENCY COMMENTS: The application was routed to several public agencies for review and comment. Comments and recommendations from city departments have been incorporated into the findings and conditions. As of the writing of this report, the city received the following external agency comments (Attachment 2):

1. PGE
2. Oregon Department of State Lands (email)
3. ODOT

E. PUBLIC COMMENTS: As of the writing of this report, the city has received ten public comments. Two of the comments expressed concern for the number of trees proposed for removal. The other eight generally expressed concern regarding degradation of livability due to noise, not wanting a Lake Oswego based Developer building the development, trespassing, traffic, movement of the planned roundabout further south, violation of the 5 party agreement with Oxberg Lake Estates, need for a barrier between Oxberg Lake Estates and the large lots proposed by the Crestview Crossing PUD, wanting to utilize all the wetlands as a park, filling of wetlands and maintaining the water quality of the Oxberg Lake Estates aquifer which the Oxberg Lake Estates draws potable water from for their homes. All public comments received in time are included in Attachment 3.

F. ANALYSIS:

Issues

Wetlands: There are five wetlands located within the confines of the subject property. Subject property means both Yamhill County tax lot 01100 and 13800. The applicant did not provide detailed information pertaining to the wetlands. This information was obtained from the Oregon Department of State Lands website. In an email dated July 26, 2018, Ms. Jevra Brown, Aquatic Resource Planner for Oregon Department of State Lands (Attachment 4) notified City staff that two wetland delineation applications had expired and one application, Joint Permit Application (JPA) No.WD2013-0148, administratively closed application 57027-RF, 58464-RF application on extension through August 31, 2018. The aforementioned application was for a different layout that had a larger commercial component proposed as part of the development. On July 30, 2018, an email was received from Mr. Dan Cary, Aquatic Resource Coordinator Columbia and Clatsop Counties for the Oregon Department of State Lands which stated "I am told by the applicant that there is a new revised application coming but I have not seen it. I am not reviewing any application at this time. They are in an extension of my permit decision deadline until August 31, 2018. They will likely need to request another extension to maintain this file number since I still haven't received a new application. From the informal plans I have seen the project has changed significantly and it will go back out for public review and restart the clock for the whole process when I get a complete application. That is all I have."

The following is a description of the existing wetlands taken directly from the Joint Permit Application NO. WD2013-0148 (Attachment 2).

- Wetland A (A1, A2) (288,785sf) was primarily a PEM/slope wetland with areas of PSS and PFO. A 1, 4471f perennial drainage was located within and directly adjacent to the wetland with an area of 6, 589sf. combined wetland/ water area was 6. 7 acres (295,374sf).
- Wetland B, at 189sf (0. 004 acre) was a PFO/depressional wetland located in the northwest corner of the site.
- The other two wetlands are isolated and located in the eastern portion of the property which is planted to small trees for a tree farm. These wetlands were delineated in 2007 and although no hydrology was indicated in 2013 their presence was based on vegetation and soils criteria. Wetland C is 13, 147sf (0. 3 acres) and classified as palustrine emergent slope wetland. The dominant vegetation in the emergent portion is meadow foxtail (Alopecurus pratensis) and bentgrass (Agrostis stolonifera). Wetland D is another isolated wetland (469sf) immediately below the first.

Drawings: The Land Use plan set, dated June 6, 2018, were not printed to scale so no precise measurements could be made of such dimensional requirements as driving lanes within proposed parking lots. Due to time constraints these additional submittals are included as attachments but have not been thoroughly reviewed (Attachment 6). The City conducts a completeness review that is not detailed to find issues such as drawings not being to scale. A completeness check is done to determine if an applicant has submitted the required materials but not the quality of those materials.

Late Submittals: The applicant has made several late submittals that there is not enough time to send out for review by all internal and external review agencies.

- Public vs Private Sidewalks and Pathways (requested by staff due to not being clearly delineated within the narrative or drawings dated June 6, 2018).
- Letter dated June 24, 2018 describing phasing (submitted by applicant, received July 26, 2018 via email attachment)
- Phasing Plan (submitted by applicant)
- Tentative Plat that removes attached product from the plan in favor of all detached homes. (submitted by applicant)

In terms of phasing the applicant is requesting that "the City grant the developer a ten (10) year window for the construction of the infrastructure shown within the plan's phases with opportunities for up to five (5) one (1) year extensions following the approval of the preliminary plat. While the Applicant does not intend to wait for ten (10) years to allow for the construction of the proposed improvements, the flexibility afforded by the ten (10) year schedule with the requested extensions will allow for the project's various components to be sensitive to changing market conditions."

Public Utility Easements (PUEs): The applicant is proposing 8 foot wide PUEs along the private street frontages. PGE has stated that they will not accept the use of PUEs under 10 feet wide.

G. **PRELIMINARY STAFF RECOMMENDATION:** The preliminary staff recommendation is made in the absence of public hearing testimony, and may be modified subsequent to the close of the public hearing. At this writing, staff recommends the following motion:

Planning Commission open the public hearing, take public testimony,keep the record open and continue the hearing until September 13, 2018 in order for and supplental material to be routed for review and for the applicant to submit additional information.

PLANNING COMMISSION ORDER 2018-10

AN ORDER APPROVING PUD18-0001/CUP18-0004 FOR THE CRESTVIEW CROSSING PUD AND CONDITIONAL USE PERMIT TO ALLOW RESIDENTIAL USE IN THE C-2 COMMERCIAL ZONING DISTRICT AND CREATE 250 LOTS FOR SINGLE FAMILY, MULTI-FAMILY AND COMMERCIAL USE AT 4505 E PORTLAND ROAD (YAMHILL COUNTY TAX LOT 3216-01100) AND ON YAMHILL COUNTY TAX LOT 3216AC-13800.

RECITALS

1. CG Commercial LLC and VPCF Crestview LLC submitted an application for preliminary plan approval of a planned unit development for 250 lots and conditional use permit to allow residential use on C-2 commercially zoned property at 4505 E Portland Road (Yamhill County Tax Lot 3216-01100) and Yamhill County Tax Lot 3216AC-13800.

2. After proper notice, the Newberg Planning Commission held a hearing on August 9, 2018 to consider the application. The Commission considered public testimony, kept the hearing open and continued the hearing to September 13, 2018 based on a lack of information needed to assess the proposed PUD and conditional use permit.

3. The Newberg Planning Commission finds that the application meets the applicable criteria as shown in the findings shown in Exhibit “A”.

The Newberg Planning Commission orders as follows:

1. Conditional Use Permit Application CUP18-0004 is hereby approved, subject to the conditions contained in Exhibit “B”. Exhibit "B" is hereby adopted and by this reference incorporated.

2. The planned unit development preliminary plan application PUD18-0001 is hereby approved, subject to the conditions contained in Exhibit “B”. Exhibit "B" is hereby adopted and by this reference incorporated.

3. The findings shown in Exhibit “A” are hereby adopted. Exhibit "A" is hereby adopted and by this reference incorporated.

4. This order shall be effective August 24, 2018 unless appealed prior to that date.

5. This order shall expire one year after the effective date above if the applicant does not apply for final plan approval by that time, unless an extension is granted per Newberg Development Code 15.240.020.

6. The conditional permit shall expire one years after the effective date above if the applicant does not apply for final plan approval by the time, unless an extension as granted per Newberg

Development Code 15.225.100.

7. The phasing plan shall expire ten years after the effective date above with the possibility of five one year extensions as granted per 15.240.020(C).

Adopted by the Newberg Planning Commission this 13th day of September, 2018.

ATTEST:

Planning Commission Chair

Planning Commission Secretary

List of Exhibits:
Exhibit “A”: Findings
Exhibit “B”: Conditions

Exhibit "A" to Planning Commission Order 2018-10
Findings –File PUD18-0001/CUP18-0004
Crestview Crossing PUD

I. Applicable Planned Unit Development Criteria: Newberg Development Code 15.240

Requested Conditional Use Permit: The applicant is requesting that C-2 zoned property be used for single family and multifamily residential uses.

> ***15.225.060 General conditional use permit criteria – Type III.***
> ***A conditional use permit may be granted through a Type III procedure only if the proposal conforms to all the following criteria:***

A. The location, size, design and operating characteristics of the proposed development are such that it can be made reasonably compatible with and have minimal impact on the livability or appropriate development of abutting properties and the surrounding neighborhood, with consideration to be given to harmony in scale, bulk, coverage and density; to the availability of public facilities and utilities; to the generation of traffic and the capacity of surrounding streets, and to any other relevant impact of the development.

Finding: The proposal is within the Newberg Urban Growth Boundary where urban density is encouraged. Oxberg Lake Estates subdivision is located to the north and is located in unincorporated Yamhill County with lot sizes of 1 acre and larger. Along the northern property line the applicant has proposed 18 larger lots ranging from 8,105 square feet to 10,492 square feet as a buffer to the Oxberg Lake Estates subdivision. To the west is Spring Meadow Park and Spring Meadow subdivision with lots approximating 8,000 square feet. The applicant has proposed smaller lots ranging from 1,508 square feet to 2,307 square feet along the western property line. Two larger lots in the Spring Meadow subdivision will directly abut smaller lots 245 through 248 in the proposed development. The bulk of the smaller lots 215 through 244 will abut Spring Meadow Park, which will provide a natural buffer for the larger lots to the west located in Spring Meadow subdivision to the west of the Park. Two other lots in Spring Meadow subdivision will abut proposed larger lot 1 and public Street "C". To the south is E Portland Road, smaller lots 203 through 214, commercial lot 250 and multiple family lot 249. To the west there is one existing single family home that is located approximately 263 feet from the east property line of the proposed development. The site plan shows one large lot (lot 18), smaller lots 19 through 30, proposed Public Streets "B" and "C" and two multfamily buildings located in the southeastern portion of the site.

The height of the proposed buildings meets the requirements of the NDC and should relate well to human scale. The bulk of the proposed development is somewhat out of character with the surrounding area due to the reduced size of the proposed lots and reduced setbacks. Lot and parking coverage cannot be accessed with respect to the surrounding subdivisions and lots due a lack of data provided by the applicant. The landscaping and screening is adequate for most of the surrounding lots with the exception of 1812 Leo Lane, tax lot 12100, located in Spring Meadow subdivision. The property in Spring Meadow subdivision will abut proposed lots 245 through 248. It should be pointed out that the surrounding subdivisions were developed before the adoption of the current development code, when larger lots and lower density was common. Due to a lack of supporting information provided by the applicant, this criterion cannot be adequately evaluated.

Adequate public facilities and utilities are available to serve the development. The applicant has provided a Transportation Impact Analysis (TIA) dated June 2018. The TIA makes several recommendations pertaining to Providence Drive/E Crestview Drive/E Portland Road intersection and site circulation/site access operations that have been incorporated into the findings in Exhibit "A" and conditions of approval in Exhibit "B".

City staff engineers have reviewed the proposed development for the availability of sanitary sewer, water and stormwater facilities and services. Sanitary sewer, water and stormwater services are available to serve the development. Conditions of approval have been drafted by City staff, which ensure that if any upgrades or additional services are needed then the applicant will construct them per City requirements. Sanitary sewer, water and stormwater requirements are discussed in other sections of this report to further support the availability of facilities, services and any needed upgrades as stated in the conditions of approval.

In 2006, the City of Newberg, Yamhill County, Oxberg Lake Homeowners Association, JT Smith Companies, Ken and Joan Austin and Meadowood Development, LLC. entered into an agreement commonly known as the "Five Party Agreement". This agreement pertains to transportation issues within and surrounding area of the Crestview Crossing project area and needed improvements agreed upon by those signatories of the agreement. (Attachment XX)

Because detailed information pertaining to lot and parking was not provided by the applicant, this section of the NDC cannot be fully assessed.

B. The location, design, and site planning of the proposed development will provide a convenient and functional living, working, shopping or civic environment, and will be as attractive as the nature of the use and its location and setting warrants.

Finding: The proposed development will be accessed via E Portland Road from the south and E Crestview Drive from the north. With direct access to E Portland Road, the proposed development will have easy access to the Portland Metro area, Downtown Newberg, grocery stores, recreational uses, medical facilities, offices and industrial uses. When the proposed commercial lot is developed there will be direct access for residents within the development and for those within the surrounding area. The possible additional population will potentially spend additional dollars within the community and have the opportunity to work and live within the City of Newberg. The property owner is utilizing planners, engineers, architects and landscape architects to design the project. These professionals have produced designs and site planning for the subject property. Because of the access from the proposed development to potential employers, shopping, downtown and other community amenities and the property owner using professionals to design and provide site planning for the subject property, this criterion is met.

C. The proposed development will be consistent with this code. [Ord. 2451, 12-2-96. Code 2001 § 151.210.]

Finding: The applicant has provided responses to Newberg Development Code sections, a set of land use plans, various technical reports and public notification of the public hearing. The land use plans were not to scale so assessing dimensional measurements such as parking lot driving lane width could not be accomplished. City planning staff cannot determine compliance with this criteria because not all required material has been submitted.

Recommendation: *City staff recommends approval of the Conditional Use Permit to allow residential use on C-2 zoned property because the NDC criteria listed in Section 15.225.060 have been met.*

II. Chapter 15.240 PD PLANNED UNIT DEVELOPMENT REGULATIONS

15.240.020 General provisions.
A. Ownership. Except as provided herein, the area included in a proposed planned unit development must be in single ownership or under the development control of a joint application of owners or option holders of the property involved.

Finding: Yamhill County tax lot 13800 is owned by GC Commercial, LLC. and tax lot 01100 is owned by VPCF Crestview, LLC. The person signing the City's Application for the two LLCs is Jeff Smith. This criterion is met.

B. Processing Steps – Type III. Prior to issuance of a building permit, planned unit development applications must be approved through a Type III procedure and using the following steps:

1. Step One – Preliminary Plans. Consideration of applications in terms of on-site and off-site factors to assure the flexibility afforded by planned unit development regulations is used to preserve natural amenities; create an attractive, safe, efficient, and stable environment; and assure reasonable compatibility with the surrounding area. Preliminary review necessarily involves consideration of the off-site impact of the proposed design, including building height and location.

Finding: On July 5, 2018, the applicants' submittal was deemed complete by City staff. The applicant has provided technical reports evaluating the on-site and off-site impacts of the proposed development. The proposed development would remove 923 of 1,045 total trees within the site. The City of Newberg does not have an urban forestry program and the development code only provides for tree preservation within Stream Corridor overlay areas. There are no noted Stream Corridor areas within the confines of the subject property. The applicant has provided elevation drawings illustrating the proposed façades of buildings, which appear to be aesthetically pleasing. The applicant submitted a TIA to assess impacts and proposed recommendations to mitigate the additional number of automobile trips projected to be generated by the development of the subject property. A landscaping plan has been submitted that meets the requirements of the NDC. The applicant has made an effort to locate larger lots on the northern border of the subject property where they will abut larger lots of the Oxberg Lake Estates subdivision that is located in unincorporated Yamhill County. Most of the smaller lot higher density area along the western boundary of the subject property will abut Spring Meadow Park. The multifamily buildings will be located north of E Portland Road and approximately 263 feet from the closest house to the east. A network of paths and sidewalks provide pedestrians safe access throughout the development and the proposed park and preserved wetland area.

This criterion is met.

> ***2. Step Two – Final Plans. Consideration of detailed plans to assure substantial conformance with preliminary plans as approved or conditionally approved. Final plans need not include detailed construction drawings as subsequently required for a building permit.***

Finding: Not applicable for the first step in the PUD review process.

C. Phasing. If approved at the time of preliminary plan consideration, final plan applications may be submitted in phases. If preliminary plans encompassing only a portion of a site under single ownership are submitted, they must be accompanied by a statement and be sufficiently detailed to prove that the entire area can be developed and used in accordance with city standards, policies, plans and ordinances.

Finding: On Thursday July 26, 2018, the City received a phasing plan (Attachment 7). City staff urged the applicant to submit the phasing plan and any other materials to the City as soon as possible. Due to the late submittal the phasing plan has not had adequate time to be reviewed by internal departments or external agencies.

The applicant is proposing the following phasing:

- Phase 1: This phase will include improvements to the site's frontage along E Portland Road and the installation of underground utility connections necessary to provide service to the site.

- Phase 1a: This phase will include the extension of E Crestview Drive through the site and the construction of roadways and lots located east of the E Crestview Drive extension to public road D. This phase will also include the stormwater facility located south of public road B.

- Phase 2: This phase will include the installation of the roadways, infrastructure and lots which are to be located west of the E Crestview extension. Crestview Crossing – Alternate Plat and Phasing July 24, 2018

- Phase 3: This phase will include the lots located east of public road D to the property's eastern property boundary.

- Phases B and C will be constructed after the construction of Phases 1 and 1A and may be constructed independently of the subdivision lots and by other entities or assigns.

Due to the size of the plan and the complexity of the various components within the development, the Applicant ha requested that the City grant the developer a ten (10) year window for the construction of the infrastructure shown within the plan's phases with opportunities for up to five (5) one (1) year extensions following the approval of the preliminary plat. While the Applicant does not intend to wait for ten (10) years to allow for the construction of the proposed improvements, the flexibility afforded by the ten (10) year schedule with the requested extensions will allow for the project's various components to be sensitive to changing market conditions."

Because this phasing plan was submitted late, both internal city departments and external review agencies have not had time to review the proposed phasing plan. City staff cannot state definitively if this criterion is met due to a lack of time to review the phasing plan.

F. Density. Except as provided in NMC 15.302.040 relating to subdistricts, dwelling unit density provisions for residential planned unit developments shall be as follows:

1. Maximum Density.

a. Except as provided in adopted refinement plans, the maximum allowable density for any project shall be as follows:

District	***Density Points***
R-1	***175 density points per gross acre, as calculated in subsection (F)(1)(b) of this section***
R-2	***310 density points per gross acre, as calculated in subsection (F)(1)(b) of this section***
R-3	***640 density points per gross acre, as calculated in subsection (F)(1)(b) of this section***
RP	***310 density points per gross acre, as calculated in subsection (F)(1)(b) of this section***
C-1	***As per required findings***
C-2	***As per required findings***

District	Density Points
C-3	As per required findings

b. Density point calculations in the following table are correlated to dwellings based on the number of bedrooms, which for these purposes is defined as an enclosed room which is commonly used or capable of conversion to use as sleeping quarters. Accordingly, family rooms, dens, libraries, studies, studios, and other similar rooms shall be considered bedrooms if they meet the above definitions, are separated by walls or doors from other areas of the dwelling and are accessible to a bathroom without passing through another bedroom. Density points may be reduced at the applicant's discretion by 25 percent for deed-restricted affordable dwelling units as follows:

Density Point Table		
Dwelling Type	Density Points: Standard Dwelling	
Studio and efficiency	12	9
One-bedroom	14	11
Two-bedroom	21	16
Three-bedroom	28	21
Four or more bedrooms	35	26

The density points in the right-hand column are applicable to income-restricted affordable dwelling units, provided the dwelling units meet the affordability criteria under NMC 15.242.030 regarding affordable housing requirements for developments using the flexible development standards.

2. Approved Density. The number of dwelling units allowable shall be determined by the hearing authority in accordance with the standards set forth in these regulations. The hearing authority may change density subsequent to preliminary plan approval only if the reduction is necessary to comply with required findings for preliminary plan approval or if conditions of preliminary plan approval cannot otherwise be satisfied.

3. Easement Calculations. Density calculations may include areas in easements if the applicant clearly demonstrates that such areas will benefit residents of the proposed planned unit development.
4. Dedications. Density calculations may include areas dedicated to the public for recreation or open space.
5. Cumulative Density. When approved in phases, cumulative density shall not exceed the overall density per acre established at the time of preliminary plan approval.

Finding: The applicant has provided density calculations based on zoning and land area within a zone district to calculate the maximum allowable density. The R-1 total acreage of 4.31 acres yields 754.25 density points at 175 points per acres. The R-2 total acreage of 6.58 acres yields 4,211.2 density points at 640 points per acres. The C-2 total acreage of 22.24 acres yields 6,894.4 density points at 310 points per acres. The total maximum density points earned based on zoning and land area is 11,859.85 points.

Although the applicant is proposing an affordable housing component for the development, they did not provide data for the number of bedrooms for each unit so these calculations cannot be accurately determined. City staff multiplied 12 (income restricted units) by 26 points for the “four or more income-restricted affordable dwelling unit” for a total of 312 points. The data table provided by the applicant totaled the point column in the NDC instead of producing a point total based on total number of proposed bedrooms (Attachment 7). The applicant has stated in an email dated Friday July 27, 2018 the number of bedrooms being proposed for the development, which were then used for the density calculations (Attachment 7). There will be 27 one bedroom units, multiplied by 14 density points, which yields 378 points. There will be 24 two bedroom units, multiplied by 21 density points, which yields 504 points. There will be 80 three bedroom units, multiplied by 28 density points, which yields 2,240 points. There will be 168 four or more bedroom units, multiplied by 35 density points, which yields 5,880 points. Adding the total number of points produced by the number of bedrooms yields 9,314 points.

The applicants’ narrative or other submitted material did not provide data for assessing the applicability of NMC 15.242.030 so the flexible development standards are not part of these findings.

Compliance with these criteria cannot be clearly assessed due to not knowing how many bedrooms are proposed for the affordable housing units.

G. Buildings and Uses Permitted. Buildings and uses in planned unit developments are permitted as follows:
1. R-1, R-2, R-3 and RP Zones.
a. Buildings and uses permitted outright or conditionally in the use district in which the proposed planned unit development is located.
b. Accessory buildings and uses.
c. Duplexes.

d. Dwellings, single, manufactured, and multifamily.
e. Convenience commercial services which the applicant proves will be patronized mainly by the residents of the proposed planned unit development.

Finding: The applicant is proposing single family detached residential uses within the R-1 and R-2 portions of the subject property. This criterion is met because single-family and multifamily uses are permitted within the R-1 and R-2 zone districts.

2. C-1, C-2 and C-3 Zones.
a. When proposed as a combination residential-commercial planned unit development, uses and buildings as listed in subsection (G)(1) of this section and those listed as permitted outright or conditionally in the use district wherein the development will be located.

Finding: The applicant is proposing a combination residential-commercial planned unit development. All uses within the C-2 zoned property are permitted either conditionally for residential or as a permitted use for future commercial use. This criterion is met because all proposed uses are permitted either conditionally or by right as a permitted uses.

H. Professional Coordinator and Design Team. Professional coordinators and design teams shall comply with the following:
1. Services. A professional coordinator, licensed in the State of Oregon to practice architecture, landscape architecture or engineering, shall ensure that the required plans are prepared. Plans and services provided for the city and between the applicant and the coordinator shall include:
a. Preliminary design;
b. Design development;
c. Construction documents, except for single-family detached dwellings and duplexes in subdivisions; and
d. Administration of the construction contract, including, but not limited to, inspection and verification of compliance with approved plans.
2. Address and Attendance. The coordinator or the coordinator's professional representative shall maintain an Oregon address, unless this requirement is waived by the director. The coordinator or other member of the design team shall attend all public meetings at which the proposed planned unit development is discussed.
3. Design Team Designation. Except as provided herein, a design team, which includes an architect, a landscape architect, engineer, and land surveyor, shall be designated by the professional coordinator to prepare appropriate plans. Each team member must be licensed to practice the team member's profession in the State of Oregon.
4. Design Team Participation and Waiver. Unless waived by the director upon proof by the coordinator that the scope of the proposal does not require the services of all members at one

or more steps, the full design team shall participate in the preparation of plans at all three steps.
5. Design Team Change. Written notice of any change in design team personnel must be submitted to the director within three working days of the change.
6. Plan Certification. Certification of the services of the professionals responsible for particular drawings shall appear on drawings submitted for consideration and shall be signed and stamped with the registration seal issued by the State of Oregon for each professional so involved. To assure comprehensive review by the design team of all plans for compliance with these regulations, the dated cover sheet shall contain a statement of review endorsed with the signatures of all designated members of the design team.

Finding: The applicant narrative states that a professional engineer licensed by the State of Oregon has produced all required plans. Additionally, the land use plan sheets list a landscape architecture firm. A completeness check was conducted to verify that all required documents and plans were submitted. These criteria have been met.

I. Modification of Certain Regulations. Except as otherwise stated in these regulations, fence and wall provisions, general provisions pertaining to height, yards, area, lot width, frontage, depth and coverage, number of off-street parking spaces required, and regulations pertaining to setbacks specified in this code may be modified by the hearing authority, provided the proposed development will be in accordance with the purposes of this code and those regulations. Departures from the hearing authority upon a finding by the engineering director that the departures will not create hazardous conditions for vehicular or pedestrian traffic. Nothing contained in this subsection shall be interpreted as providing flexibility to regulations other than those specifically encompassed in this code.

Finding: The applicants' narrative requests modification for lot sizes, minimum lot dimensions, minimum lot frontages, maximum lot and parking area coverage and minimum setback standards for the R-1, R-2 and C-2 zoning districts. Lot coverage is discussed below under "J". The following table details the requirements listed in the NDC and the dimensional modifications that the applicant is requesting.

	Min. front yard setback per NDC to house not garage	**Proposed front yard setback by applicant**	**Minimum interior setback per NDC**	**Proposed minimum interior setback proposed by applicant**	**Minimum lot size per NDC**	**Proposed minimum lot size**	**Minimum lot width per the NDC**	**Proposed minimum lot width**
R-1	15 feet	10 feet	5 feet	5 feet	5,000 sq.ft.	5,000 sq.ft.	35 feet	35 feet

R-2	15 feet	10 feet	5 feet	2.5 feet	3,000 sq.ft.	1,440 sq.ft.	25 feet	21.5 feet
C-2	10 feet	10 feet	10 feet	2.5 feet	5,000 sq.ft.	1,440 sq.ft.	n/a	21.5 feet

City of Newberg Staff Engineers have reviewed the development proposal and have not found hazardous conditions created for vehicular or pedestrian traffic if all conditions of approval are adhered to. This criterion is met because the proposed modifications to the Newberg Development Code do not create hazardous conditions for vehicular or pedestrian traffic.

J. Lot Coverage. Maximum permitted lot and parking area coverage as provided in this code shall not be exceeded unless specifically permitted by the hearing authority in accordance with these regulations.

Finding: The applicant has proposed an increase of lot and parking coverage up to 60 percent. The applicant initially submitted their application, June 6, 2018, when maximum lot coverage in the R-1 was 30 percent or 40 percent if all structures on the lot are one-story. Maximum lot coverage in the R-2 is 50 percent for this application. The maximum combined parking and lot coverage is 60 percent lot for this application. The C-2 zoning district is not limited by a maximum parking or lot coverage. The applicant did not provide supporting data for their request so compliance with this criterion cannot be accessed.

K. Height. Unless determined by the hearing authority that intrusion of structures into the sun exposure plane will not adversely affect the occupants or potential occupants of adjacent properties, all buildings and structures shall be constructed within the area contained between lines illustrating the sun exposure plane (see Appendix A, Figure 8 and the definition of "sun exposure plane" in NMC 15.05.030). The hearing authority may further modify heights to:

- ***1. Protect lines of sight and scenic vistas from greater encroachment than would occur as a result of conventional development.***
- ***2. Protect lines of sight and scenic vistas.***
- ***3. Enable the project to satisfy required findings for approval.***

Finding: The applicant did not provide a sun exposure analysis or diagram. The applicant stated "Communities of this nature exist in several areas and sun exposure is not known to be a significant issue in other communities. Each unit will have access to the sun from the southern sky and will have opportunities to enjoy the benefit of the sun's light and warmth". However, without having an analysis and diagram as shown in Appendix A, Figure 8 of the NDC, verification of this criterion being met cannot be made. The applicant shall provide a sun exposure plan diagram meeting the requirements of NDC 15.240.020(K) and 15.05.030. If sun exposure is does meet the requirements of the NDC then the applicant must adjust their plans in order to meet this condition of approval. Because the applicant did not submit the supporting information required by the NDC, compliance with this criterion cannot be accessed.

L. Dedication, Improvement and Maintenance of Public Thoroughfares. Public thoroughfares shall be dedicated, improved and maintained as follows:

1. Streets and Walkways. Including, but not limited to, those necessary for proper development of adjacent properties. Construction standards that minimize maintenance and protect the public health and safety, and setbacks as specified in NMC 15.410.050, pertaining to special setback requirements to planned rights-of-way, shall be required.

2. Notwithstanding subsection (L)(1) of this section, a private street may be approved if the following standards are satisfied.

a. An application for approval of a PUD with at least 50 dwelling units may include a private street and the request for a private street shall be supported by the evidence required by this section. The planning commission may approve a private street if it finds the applicant has demonstrated that the purpose statements in NMC 15.240.010(A) through (D) are satisfied by the evidence in subsections (L)(2)(a)(i) through (v) of this section.

i. A plan for managing on-street parking, maintenance and financing of maintenance of the private street, including a draft reserve study showing that the future homeowners association can financially maintain the private street;

ii. A plan demonstrating that on- and off-street parking shall be sufficient for the expected parking needs and applicable codes;

iii. Proposed conditions, covenants and restrictions that include a requirement that the homeowners association shall be established in perpetuity and shall continually employ a community management association whose duties shall include assisting the homeowners association with the private street parking management and maintenance, including the enforcement of parking restrictions;

iv. Evidence that the private street is of sufficient width and construction to satisfy requirements of the fire marshal and city engineer; and

v. The PUD shall be a Class I planned community as defined in ORS Chapter 94.

Finding: The applicant is proposing a mixture of private and public streets. The NDC states that "at least 50 dwelling units may include a private street and the request for a private street shall be supported by the evidence required by this section". The applicant has stated they have met the requirements listed in NDC Section 15.240.020(L)(2)(a)(i, ii, iii, iv and v) as well as Section 15.240.010(A, B, C and D). The applicant has provided documentation that the development proposal meets the requirements listed in Section 15.240.020(L)(a)(i, ii, iii, iv and v) including:

- "a PUD proposes at least 50 dwelling units,
- has provided a plan for on-street parking, maintenance and financing of maintenance of the private street,
- demonstrates sufficient parking,
- includes CCRs addressing the private street,
- is constructed to proper standards, and

- the PUD is a Class I planned community as defined in ORS Ch. 94."

After a review of the applicants' submittal a plan for maintenance and financing of maintenance for the private streets and CCRs were not located. The applicant shall provide documentation for maintenance and financing of maintenance for the private streets.

The applicant further states their application meets the following purpose statements in NMC 15.240.010(A) through (D), which include:

- "encourage comprehensive planning in areas of sufficient size…
- provide flexibility in architectural design, placement and clustering of buildings, use of open space and outdoor living areas, and provision of circulation facilities, parking, storage and related site and design considerations
- promote an attractive, safe, efficient and stable environment…and
- provide for economy of shared services and facilities."

The city engineer is requiring sidewalks along private streets to be a minimum of five feet wide. The applicant is proposing a PUD which includes both public and private streets. The applicant is proposing private streets A-L with the following cross-section:

- 5-foot sidewalk*
- 0.5-foot rolled curb
- 24-26-foot travel lanes
- 0.5-foot curb
- 5-foot sidewalk*

* Per private road cross-section shown on sheet C300.

The applicant has indicated in parts of the narrative that private walkways are to be 4-feet wide, but the cross-section of C300 show sidewalks along private streets as 5-feet wide, Information regarding travel lane widths for private streets was updated by the applicant per an email sent on Friday July 27, 2018 by Andrew Tull. The email indicates that all private streets will have at least 26-feet of access. In some cases, access drives will be 24-feet in width with mountable curbs and sidewalks built to withstand wheel-loads. Private streets without walkways will have 26-feet of pavement.

Because the applicant has been unclear on the intended width of walkways along private streets, the applicant shall follow the city engineer requirement for sidewalks along private streets to be 5-foot wide matching the applicant's cross-section detail on sheet C300.

Because the applicant has been unclear about their intended parking locations on private streets, the applicant shall follow requirements outlined in a letter TVF&R provided on June 5, 2018 which indicated the following:

- 20-26 feet road width – no parking on either side of roadway

Through their submitted materials, the applicant has demonstrated compliance with Section 15.240.010 (A) through (D) of the NDC.

Because the applicant did not provide a copy of the CC&Rs compliance with these criteria cannot be accessed.

Additional requirements for public improvements are addressed later in this report.

> ***b. If the PUD is established, the homeowners association shall provide an annual written report on the anniversary date of the final approval of the PUD approval to the community development director that includes the following:***
> ***i. The most recent reserve study.***
> ***ii. The name and contact information for the retained community management association.***
> ***iii. A report on the condition of the private street and any plans for maintenance of the private street.***

Finding: As of the time this report was drafted, the applicant has not provided information detailing a home owners association or CC&Rs for City staff to review. Compliance with this criterion cannot be assessed because we did not receive a copy of the CC&Rs or information pertaining to a Home Owners Association.

3. Easements. As are necessary for the orderly extension of public utilities and bicycle and pedestrian access.

Finding: Easements are needed for the extension of public utilities and bicycle and pedestrian access. The applicant is showing 8-foot public utility easements along private street frontages. Comments received from utilities state that 10-foot public utility easements are required along all street frontages. Because the applicant's plans do not show an adequate public utility easement on private street frontages, the applicant is required to provide a 10-foot public utility easement along street frontages.

M. Underground Utilities. Unless waived by the hearing authority, the developer shall locate all on-site utilities serving the proposed planned unit development underground in accordance with the policies, practices and rules of the serving utilities and the Public Utilities Commission.

Finding: On page 20 of the narrative the applicant has stated that all utilities will be placed underground. This criterion is met.

N. Usable Outdoor Living Area. All dwelling units shall be served by outdoor living areas as defined in this code. Unless waived by the hearing authority, the outdoor living area must equal at least 10 percent of the gross floor area of each unit. So long as outdoor living area is available to each dwelling unit, other outdoor living space may be offered for dedication to the city, in fee or easement, to be incorporated in a city-approved recreational facility. A portion or all of a dedicated area may be included in calculating density if permitted under these regulations.

Finding: On page 20 of the applicants' narrative states "all dwelling units are served by outdoor living areas equal to at least 10 percent of the gross floor area of each unit. The multifamily will utilize a combination of balconies and porches as well as common outdoor living areas located throughout the overall planned unit development." Floor plans for the multi-family units were not submitted so verification of this requirement cannot be made. Compliance with this criterion cannot be accessed because the applicant did not provide the data for staff to evaluate. The applicant shall submit drawings and data that clearly illustrate that each unit is served by outdoor living areas equal to at least 10 percent of the gross floor area for each residential unit. If any unit falls below the 10 percent outdoor living requirement then the applicant must revise their plans to provide the required outdoor living requirement. ***O. Site Modification. Unless otherwise provided in preliminary plan approval, vegetation, topography and other natural features of parcels proposed for development shall remain substantially unaltered pending final plan approval.***

Finding: The applicant has submitted grading plans that have been reviewed by City staff engineers. The applicant is proposing to remove 923 of 1,042 trees, which is allowed under the current Newberg Development Code due to there not being an Urban Forestry Program in the City. The applicant is proposing significant modifications to wetlands including preservation, removal and mitigation. In an email dated July 26, 2018 (Attachment2) and received after 6:30 pm, Ms. Jevra Brown, Aquatic Resource Planner for Department of State Lands stated the following:

"Expired delineation WD2000-0260 for tax lot 1100
Expired delineation WD2006-0698 associated with administratively closed permits 40337-RF and 48735-RF for Crestview Crossing – Part I.
Crestview Crossing – Part 2 WD2013-0148, administratively closed application 57027-RF, 58464-RF application on extension."

The applicant was informed of the expired wetlands permit issue on July 27, 2018. Because the applicant has several wetland within the confines of tax lot 1100 and delineations have been allowed to expire this criterion is not met.

P. Completion of Required Landscaping. If required landscaping cannot be completed prior to occupancy, or as otherwise required by a condition of approval, the director may require the applicant to post a performance bond of a sufficient amount and time to assure timely completion.

Finding: On page 21 of the applicants' narrative it states that "the applicant acknowledges the possibility of a performance bond being required to assure timely completion of any delayed landscaping." Because the applicant has acknowledged this section of the NDC this criterion is met.

Q. Design Standards. The proposed development shall meet the design requirements for multifamily residential projects identified in NMC 15.220.060. A minimum of 40 percent of the required points shall be obtained in each of the design categories. [Ord. 2822 § 1 (Exh. A), 2-5-18; Ord. 2763 § 1 (Exh. A §§ 9, 10), 9-16-13; Ord. 2730 § 1 (Exh. A § 9), 10-18-10; Ord. 2720 § 1(4), 11-2-09; Ord. 2505, 2-1-99; Ord. 2451, 12-2-96. Code 2001 § 151.226.]

Finding: This section of the NDC is discussed later in this staff report under Section 15.220.060.

15.240.030 Preliminary plan consideration – Step one.
B. Application. An application, with the required fee, for preliminary plan approval shall be made by the owner of the affected property, or the owner's authorized agent, on a form prescribed by and submitted to the director. Applications, accompanied by such additional copies as requested by the director for purposes of referral, shall contain or have attached sufficient information as prescribed by the director to allow processing and review in accordance with these regulations. As part of the application, the property owner requesting the planned development shall file a waiver stating that the owner will not file any demand against the city under Ballot Measure 49, approved November 6, 2007, that amended ORS Chapters 195 and 197 based on the city's decision on the planned development.

Finding: All required fees for the preliminary plan approval have been paid. Additionally, the applicant has provided a Measure 49 waiver. This criterion is met because required fees have been paid and a Measure 49 waiver has been submitted.

C. Type III Review and Decision Criteria. Preliminary plan consideration shall be reviewed through the Type III procedure. Decisions shall include review and recognition of the potential impact of the entire development, and preliminary approval shall include written affirmative findings that:

1. The proposed development is consistent with standards, plans, policies and ordinances adopted by the city; and

Finding: This application is being reviewed under a Type III process and the findings review and recognize potential impacts of the entire development. The proposed development has gone through a full review of City standards, plans, policies and ordinances to determine compliance. Conditions of approval (Exhibit "B") are provided later in this report and require the developer to address any issues that the preliminary PUD has that cause a shortfall in meeting City requirements. This criterion will be met with the adherence to all conditions of approval.

2. The proposed development's general design and character, including but not limited to anticipated building locations, bulk and height, location and distribution of recreation space,

parking, roads, access and other uses, will be reasonably compatible with appropriate development of abutting properties and the surrounding neighborhood; and

Finding: The applicant is proposing larger lot single-family detached homes along the northern property line, providing a buffer from the smaller lots proposed as part of the development from the larger lots located in the Oxberg Lake Estates subdivision. To the east is Spring Meadow Subdivision and Spring Meadow Park, where smaller lot higher density single family development is proposed. The higher density single family area near the east property line is buffered from Spring Meadow subdivision by Spring Meadow Park. The multifamily and smaller lots bordering the eastern property line of the subject property are approximately 263 feet from the single family home on the abutting lot to the east. Along the southern property line smaller single family lots and multifamily buildings abut E Portland Road. The proposed development provides a network of pathways and a centrally located park. Parking is provided on the single family lots, a parking lot for the multifamily buildings, on street parking on the public streets and visitor parking lots are located throughout the higher density single family areas. Both public and private streets are being proposed as part of the development.

The height of the proposed buildings meets the requirements of the NDC and should relate well to human scale. The bulk of the proposed development is somewhat out of character with the surrounding area due to the reduced size of the proposed lots and reduced setbacks. Lot and parking coverage cannot be accessed with respect to the surrounding subdivisions and lots due a lack of data provided by the applicant. The landscaping and screening is adequate for most of the surrounding lots with the exception of 1812 Leo Lane, tax lot 12100, located in Spring Meadow subdivision. The property in Spring Meadow subdivision will abut proposed lots 245 through 248. It should be pointed out that the surrounding subdivisions were developed before the adoption of the current development code, when larger lots and lower density was common. Due to a lack of supporting information provided by the applicant, this criterion cannot be adequately evaluated.

This criterion cannot be assessed due to the applicant not providing all information required for analysis such as lot and parking coverage.

3. Public services and facilities are available to serve the proposed development. If such public services and facilities are not at present available, an affirmative finding may be made under this criterion if the evidence indicates that the public services and facilities will be available prior to need by reason of:

a. Public facility planning by the appropriate agencies; or
b. A commitment by the applicant to provide private services and facilities adequate to accommodate the projected demands of the project; or
c. Commitment by the applicant to provide for offsetting all added public costs or early commitment of public funds made necessary by the development; and

4. The provisions and conditions of this code have been met; and

Finding: City staff engineers have evaluated the available pubic services and facilities available to the subject property, have found that adequate public services and facilities exists or upgrades can be made in order to meet this section of the NDC. The conditions of approval cover any needed upgrades to public services and facilities. The applicant has made several late submittals that have not been reviewed by internal City of Newberg departments or outside agencies due to a lack of time. However, because all required materials needed to evaluate compliance with the NDC have not been submitted by the applicant compliance cannot be assessed.

> ***5. Proposed buildings, roads, and other uses are designed and sited to ensure preservation of features, and other unique or worthwhile natural features and to prevent soil erosion or flood hazard; and***

Finding: The design and location of the buildings, roads and other uses has been done in a way to preserve a portion of one of the wetlands located on the property. The applicant has provided a grading plan showing soil erosion mitigation measures that will be taken. According to the City's GIS, there are no flood hazards within the confines of the subject property. This criterion is met.

> ***6. There will be adequate on-site provisions for utility services, emergency vehicular access, and, where appropriate, public transportation facilities; and***

Finding: City Staff Engineers have evaluated the application for adequate utility services and have found existing services to be adequate. PGE stated that they will not accept an 8 foot wide Public Utility Easements (PUEs) for placing their equipment and lines. PGE requires 10 foot wide PUEs. The applicant has indicated they've worked with Tualatin Valley Fire & Rescue (TVF&R) and a letter was submitted as part of their application. TVF&R stated that no on-street parking is permitted on the private streets, it doesn't appear that the applicant is proposing parallel parking on the private streets but they are illustrating several parking lots showing 90 degree parking. Sheet C230 of the plan set illustrates a fire access plan. No transportation facilities are located onsite or planned per the applicants' submittal. The applicant stated that "if the opportunity arises in the future, public transportation facilities" could be provided. Because PGE has required 10 foot wide PUEs, this criterion is not met.

> ***7. Sufficient usable recreation facilities, outdoor living area, open space, and parking areas will be conveniently and safely accessible for use by residents of the proposed development; and***

Finding: The applicant is proposing both active and passive open space recreational areas for use by the residents. The applicant has stated in their findings that "the proposed design includes a civic use park which has been envisioned to provide space for community events as well as a space for featured local vendors. A smaller neighborhood park is connected to the proposed development through a network of multi-use pathways which provide pedestrian circulation and recreation throughout the site. The proposal includes multiple open spaces, most of which include a trail system. The multi-family housing has common outdoor living areas, as well as balconies and patios for some individual units. The single-family housing has outdoor living areas adjacent to the homes." The single family homes will have onsite parking, the multifamily buildings have direct access to a parking lot, on-street parking is provided on the public streets and visitor parking lots are provided in several areas throughout the development. This criterion is met.

> ***8. Proposed buildings, structures, and uses will be arranged, designed, and constructed so as to take into consideration the surrounding area in terms of access, building scale, bulk, design, setbacks, heights, coverage, landscaping and screening, and to assure reasonable privacy for residents of the development and surrounding properties.***

Finding: The applicant has stated that the "…site has been designed reflect the surrounding area and to provide a reasonable level of privacy for residents of the development and surrounding properties. Large lot single-family detached dwellings are proposed along the northern property line, separating this development from another large lot residential development, easing the transition from lower density to higher. The site is buffered from the residential developments to the west by the park that is adjacent to the site. The site as a whole is designed to provide safe and convenient access." There is sufficient buffering for the surrounding neighborhoods either through like sized lots or separation by distance from the smaller lots and multifamily lots. The access to the site will be from E Crestview Drive from the north and E Portland Road from the south. Building scale refers to building elements and details as they proportionally relate to each other and to humans. The height of the proposed buildings meets the requirements of the NDC and should relate well to human scale. The bulk of the proposed development is somewhat out of character with the surrounding area due to the reduced size of the proposed lots and reduced setbacks. Lot and parking coverage cannot be accessed with respect to the surrounding subdivisions and lots due a lack of data provided by the applicant. The landscaping and screening is adequate for most of the surrounding lots with the exception of 1812 Leo Lane, tax lot 12100, located in Spring Meadow subdivision. The property in Spring Meadow subdivision will abut proposed lots 245 through 248. It should be pointed out that the surrounding subdivisions were developed before the adoption of the current development code, when larger lots and lower density was common. Due to a lack of supporting information provided by the applicant, this criterion cannot be adequately evaluated.

D. Conditions. Applications may be approved subject to conditions necessary to fulfill the purpose and provisions of these regulations. [Ord. 2822 § 1 (Exh. A), 2-5-18; Ord. 2693 § 1 (Exh. A(6)), 3-3-08; Ord. 2612, 12-6-04; Ord. 2451, 12-2-96. Code 2001 § 151.227.]

Finding: Exhibit "B" lists conditions of approval that are necessary in order fulfill the purpose and provisions of these regulations within the NDC. If the applicant adheres to all conditions of approval this criterion will be met.

III. 15.220.060 Additional requirements for multifamily residential projects.

The purpose of this section is to ensure that residential projects containing three or more units meet minimum standards for good design, provide a healthy and attractive environment for those

who live there, and are compatible with surrounding development. As part of the site design review process, an applicant for a new multifamily residential project must demonstrate that some of the following site and building design elements, each of which has a point value, have been incorporated into the design of the project. At least 14 points are required for attached single-family projects of any size and smaller multifamily projects with six or fewer units and at least 20 points are required for multifamily projects with seven or more units. For more information and illustrations of each element, refer to the Newberg Residential Development Design Guidelines (July 1997).

A. Site Design Elements.

1. Consolidate green space to increase visual impact and functional utility. This applies to larger projects which collectively have a significant amount of open space areas which can be consolidated into children's play areas, gardens, and/or dog-walking areas (three points).
2. Preserve existing natural features, including topography, water features, and/or native vegetation (three points).
3. Use the front setback to build a street edge by orienting building(s) toward the street with a relatively shallow front yard (12 to 15 feet for two-story buildings) to create a more "pedestrian-friendly" environment (three points).
4. Place parking lots to the sides and/or back of projects so that front yard areas can be used for landscaping and other "pedestrian-friendly" amenities (three points).
5. Create "outdoor" rooms in larger projects by grouping buildings to create well-defined outdoor spaces (two points).
6. Provide good-quality landscaping. Provide coordinated site landscaping sufficient to give the site its own distinctive character, including the preservation of existing landscaping and use of native species (two points).
7. Landscape at the edges of parking lots to minimize visual impacts upon the street and surrounding properties (two points).
8. Use street trees and vegetative screens at the front property line to soften visual impacts from the street and provide shade (one point).
9. Use site furnishings to enhance open space. Provide communal amenities such as benches, playground equipment, and fountains to enhance the outdoor environment (one point).
10. Keep fences neighborly by keeping them low, placing them back from the sidewalk, and using compatible building materials (one point).
11. Use entry accents such as distinctive building or paving materials to mark major entries to multifamily buildings or to individual units (one point).
12. Use appropriate outdoor lighting which enhances the nighttime safety and security of pedestrians without causing glare in nearby buildings (one point).

B. Building Design Elements.

1. Orient buildings toward the street. For attached single-family and smaller multifamily projects, this means orienting individual entries and porches to the street. In larger projects with internal circulation and grounds, this means that at least 10 percent of the units should have main entries which face the street rather than be oriented toward the interior (three points).
2. Respect the scale and patterns of nearby buildings by reflecting the architectural styles, building details, materials, and scale of existing buildings (three points).
3. Break up large buildings into bays by varying planes at least every 50 feet (three points).
4. Provide variation in repeated units in both single-family attached and large multifamily projects so that these projects have recognizable identities. Elements such as color; porches, balconies, and windows; railings; and building materials and form, either alone or in combination, can be used to create this variety (three points).
5. Building Materials. Use some or all of the following materials in new buildings: wood or wood-like siding applied horizontally or vertically as board and batten; shingles, as roofing, or on upper portions of exterior walls and gable ends; brick at the base of walls and chimneys; wood or wood-like sash windows; and wood or wood-like trim (one point for each material described above).
6. Incorporate architectural elements of one of the city's historical styles (Queen Anne, Dutch colonial revival, colonial revival, or bungalow style) into the design to reinforce the city's cultural identity. Typical design elements which should be considered include, but are not limited to, "crippled hip" roofs, Palladian-style windows, roof eave brackets, dormer windows, and decorative trim boards (two points).
7. Keep car shelters secondary to the building by placing them to the side or back of units and/or using architectural designs, materials, and landscaping to buffer visual impacts from the street (two points).
8. Provide a front porch at every main entry as this is both compatible with the city's historic building pattern and helps to create an attractive, "pedestrian-friendly" streetscape (two points).
9. Use sloped roofs at a pitch of 3:12 or steeper. Gable and hip roof forms are preferable (two points). [Ord. 2763 § 1 (Exh. A § 8), 9-16-13; Ord. 2505, 2-1-99. Code 2001 § 151.195.]

Finding: The table below illustrates the possible points and points earned for site design and building design elements. This section of the NDC states that at least 14 points are required for attached single-family projects of any size and smaller multifamily projects with six or fewer units and at least 20 points are required for multifamily projects with seven or more units. This multifamily design criteria listed in the NDC is met because the applicant has demonstrated they have obtained at least 28 combined points for site design and building design.

Design Review	Possible Points	Points Earned
Site Design Elements		
Consolidate green space	**3**	**3**
Preserve existing natural features	**3**	**0**
Use front setback to build a street edge	**3**	**0**
Place parking lots on sides or back of projects	**3**	**3**
Create "outdoor rooms"	**2**	**0**
Provide good quality landscaping	**2**	**2**
Landscape at edges of parking lots	**2**	**2**
Use street trees and vegetative screens	**1**	**1**
Use site furnishings to enhance open space	**1**	**0**
Keep fences "neighborly"	**1**	**0**
Use entry accents	**1**	**1**
Use appropriate outdoor lighting	**1**	**1**
Building Design Elements		
Orient buildings toward the street	**3**	**0**
Respect the scale and patterns of nearby buildings	**3**	**3**
Break up large building planes into bays	**3**	**3**
Provide variation in repeated units	**3**	**3**
Building materials: **a) wood or wood-like siding** **b) shingles on roof or upper portions** **c) brick at base of walls or chimneys** **d) wood or wood-like sash windows** **e) wood or wood-like trim**	**1 each**	**4 (a, b, d and e)**
Incorporate historical architectural elements	**2**	**0**
Keep car shelters accessory to building	**2**	**0**
Provide a front porch at every main entry	**2**	**2**
Use slope roofs at a pitch of 3:12 or steeper	**2**	**0**
Total		**28**

15.220.030 Site design review requirements.

14. Traffic Study. A traffic study shall be submitted for any project that generates in excess of 40 trips per p.m. peak hour. This requirement may be waived by the director when a determination is made that a previous traffic study adequately addresses the proposal and/or when off-site and frontage improvements have already been completed which adequately mitigate any traffic impacts and/or the proposed use is not in a location which is adjacent to an intersection which is functioning at a poor level of service. A traffic study may be required by the director for projects below 40 trips per p.m. peak hour where the use is located immediately adjacent to an intersection functioning at a poor level of service. The traffic study shall be conducted according to the City of Newberg design standards. [Ord. 2619, 5-16-05; Ord. 2451, 12-2-96. Code 2001 § 151.192.]

Finding: A traffic study was submitted with the land use application for the Crestview Crossing PUD dated June 2018. Based on the analysis, the 260 single-family homes and 48 apartment units within the Crestview Crossing PUD were evaluated and it was estimated to create 4,126 additional trips each day; 213 will occur in the AM peak hour (7am-9am) and 285 trips will occur in the PM peak hour (4pm-6pm). It should be noted that the applicant's narrative uses a different number of homes, as it states 18 single-family homes, 230 cottage homes, and 51 multi-family homes. This means that the traffic analysis over stated the number of single family homes (260 homes in TIA vs. 248 homes in the applicant's narrative) and understated the number of apartments (48 apartments in the TIA vs. 51 apartments in the applicant's narrative). Eight study intersections were evaluated to determine the impact on the adjacent transportation system.

The study identified the following recommendations to mitigate traffic impacts at the Providence Drive/E Crestview Drive/E Portland Road intersection from the development. No other traffic impacts were identified.

- The new north leg of the Providence Drive/E Crestview Drive/E Portland Road intersection should be configured as a four-lane section with one northbound lane and three southbound lanes (left turn lane, through movement, and right turn lane). At least 250-feet of southbound left-turn lane storage and 150-feet of southbound right-turn lane storage should be provided to accommodate the 95th percentile queue lengths.
- The existing south leg of the Providence Drive/E Crestview Drive/E Portland Road intersection should be restriped to a four-lane section with one southbound lane, and three northbound lanes (left turn lane, through movement, and right turn lane).
- Based on the 95th percentile queuing analysis:
    - A westbound right turn lane should be constructed with at least 300-feet of storage
    - A eastbound left turn lane should be striped to provide at least 150-feet of storage
- The signal phasing of the Providence Drive/E Crestview Drive/E Portland Road intersection should be operated with permissive left turn movements on the north and south approaches with fully protected left turn movements on the east and west approaches.

Because the applicant has submitted a TIA that meets City requirements this criterion is met.

15.440.010 Required off-street parking.
A. Off-street parking shall be provided on the development site for all R-1, C-1, M-1, M-2 and M-3 zones. In all other zones, the required parking shall be on the development site or within 400 feet of the development site which the parking is required to serve. All required parking must be under the same ownership as the development site served except through special covenant agreements as approved by the city attorney, which bind the parking to the development site.
B. Off-street parking is not required in the C-3 district, except for:
1. Dwelling units meeting the requirements noted in NMC 15.305.020.

2. New development which is either immediately adjacent to a residential district or separated by nothing but an alley.

C. Within the C-4 district, the minimum number of required off-street parking spaces shall be 50 percent of the number required by NMC 15.440.030, except that no reduction is permitted for residential uses.

D. All commercial, office, or industrial developments that have more than 20 off-street parking spaces and that have designated employee parking must provide at least one preferential carpool/vanpool parking space. The preferential carpool/vanpool parking space(s) must be located close to a building entrance. [Ord. 2810 § 2 (Exhs. B, C), 12-19-16; Ord. 2763 § 1 (Exh. A § 15), 9-16-13; Ord. 2564, 4-15-02; Ord. 2561, 4-1-02; Ord. 2451, 12-2-96. Code 2001 § 151.610.]

Penalty: See NMC 15.05.120.

15.440.020 Parking area and service drive design.

A. All public or private parking areas, parking spaces, or garages shall be designed, laid out and constructed in accordance with the minimum standards as set forth in NMC 15.440.070.

B. Groups of three or more parking spaces, except those in conjunction with single-family or two-family dwellings on a single lot, shall be served by a service drive so that no backward movement or other maneuvering of a vehicle within a street, other than an alley, will be required. Service drives shall be designed and constructed to facilitate the flow of traffic, provide maximum safety in traffic access and egress and maximum safety of pedestrian and vehicular traffic on the site, but in no case shall two-way and one-way service drives be less than 20 feet and 12 feet, respectively. Service drives shall be improved in accordance with the minimum standards as set forth in NMC 15.440.060.

C. Gates. A private drive or private street serving as primary access to more than one dwelling unit shall not be gated to limit access, except as approved by variance.

D. In the AI airport industrial district and AR airport residential district, taxiways may be used as part of the service drive design where an overall site plan is submitted that shows how the circulation of aircraft and vehicles are safely accommodated, where security fences are located, if required, and is approved by the fire marshal, planning director, and public works director. The following submittal must be made:

1. A drawing of the area to be developed, including the probable location, height, and description of structures to be constructed; the location and description of a security fence or gate to secure the aircraft operations areas of off-airport property from the other nonsecured pedestrian/auto/truck areas of on-airport property; the proposed location of the proposed taxiway access in accordance with FAA specifications (refer to Federal Aviation Administration Advisory Circular No. 150/5300-13 regarding airport design, and AC/5370-10B regarding construction standards for specifications that should be used as a guideline); and the identification of the vehicular traffic pattern area clearly separated from aircraft traffic. Once specific buildings have been designed, FAA Form 7460-1, Notice of Proposed Construction or Alteration, must be submitted to the City of Newberg, the private airport owner, and the FAA for airspace review. [Ord. 2670, 5-7-07; Ord. 2647, 6-5-06; Ord. 2451, 12-2-96. Code 2001 § 151.611.]

Penalty: See NMC 15.05.120.

15.440.030 Parking spaces required.

A. Use	**B.** Minimum Parking Spaces Required
1. Residential Types	
2. Dwelling, multifamily and multiple single-family dwellings on a single lot	3.
4. Studio or one-bedroom unit 5. Two-bedroom unit 6. Three- and four-bedroom unit 7. Five- or more bedroom unit	8. 1 per dwelling unit 9. 1.5 per dwelling unit 10. 2 per dwelling unit 11. 0.75 spaces per bedroom
12. • Unassigned spaces	13. If a development is required to have more than 10 spaces on a lot, then it must provide some unassigned spaces. At least 15 percent of the total required parking spaces must be unassigned and be located for convenient use by all occupants of the development. The location shall be approved by the director.
14. • Visitor spaces	15. If a development is required to have more than 10 spaces on a lot, then it must provide at least 0.2 visitor spaces per dwelling unit.
16. • On-street parking credit	17. On-street parking spaces may be counted toward the minimum number of required spaces for developments required to have more than 10 spaces on a lot. The on-street spaces must be directly adjoining and on the same side of the street as the subject property, must be legal spaces that meet all city standards, and cannot be counted if they could be removed by planned future street widening or a bike lane on the street.
18. • Available transit service	19. At the review body's discretion, affordable housing projects may reduce the required off-street parking by 10 percent if there is an adequate continuous pedestrian route no more than 1,500 feet in length from the development to transit service with an average of less than one hour regular service intervals

A.	Use	**B.**	Minimum Parking Spaces Required
			during commuting periods or where the development provides its own transit. A developer may qualify for this parking reduction if improvements on a proposed pedestrian route are made by the developer, thereby rendering it an adequate continuous route.
20.	Commercial neighborhood district (C-1)	21.	1 for each dwelling
22.	Dwelling, single-family or two-family	23.	2 for each dwelling unit on a single lot
24.	Fraternities, sororities, cooperatives and dormitories	25.	1 for each three occupants for which sleeping facilities are provided
26.	Hotels, motels, motor hotels, etc.	27.	1 for each guest room
28.	Rooming or boarding houses	29.	1 for each guest room
30.	Special needs housing	31.	1 space per 3 beds or actual parking needs as demonstrated through a parking analysis.
32.	Institutional Types		
33.	Churches, clubs, lodges	34.	1 for every 4 fixed seats or every 8 feet of bench length or every 28 sq. ft. where no permanent seats or benches are maintained – in main auditorium (sanctuary or place of worship)
35.	Continuing care retirement community not including nursing care	36.	1 space per living unit
37.	Day care facility	38.	5 spaces per each 1,000 gross sq. ft.
39.	Hospitals (including accessory retail wholly contained within a hospital building)	40.	2 spaces for each 1,000 gross sq. ft.
41.	Libraries, museums, art galleries	42.	1 for each 250 sq. ft. of gross floor area
43.	Medical/dental offices and laboratories	44.	3.5 spaces for each 1,000 gross sq. ft.
45.	Nursing homes, homes for the aged, group care homes, asylums, etc.	46.	1 for each 3 beds
47.	Schools	48.	Colleges – "commuter" type, 1 for every full-

A.	Use	**B.**	Minimum Parking Spaces Required
			time equivalent student (plus 1/2 of the requirements for accessory buildings, i.e., 1.-E* and 3.-G(1))**
49.	Schools	50.	Colleges – "resident" type, 1 for every 3 full-time equivalent students (plus 1/2 of the requirements for accessory buildings, i.e., 1.-E* and 3.-G(1))**
51.	Schools	52.	Elementary or junior high, 1-1/2 for each teaching station plus 4 for every classroom, or 1 for every 42 sq. ft. of seating area where there are no fixed seats in an auditorium or assembly area
53.	Schools	54.	High schools, 1-1/2 for each teaching station, plus 8 for every classroom, or 1 for every 28 sq. ft. of seating area where there are no fixed seats in an auditorium or assembly area
55.	Schools	56.	Colleges – commercial or business, 1 for every 3 classroom seats (plus 1/2 of the requirements for accessory buildings, i.e., 1.-E* and 3.-G(1))**
57.	Welfare or correctional institutions	58.	1 for each 5 beds
59.	Commercial Types		
60.	Barber and beauty shops	61.	1 for each 75 sq. ft. of gross floor area
62.	Bowling alleys	63.	6 for each bowling lane
64.	Establishments or enterprises of a recreational or an entertainment nature:		
65.	Establishments for the sale and consumption on the premises of food and beverages with a drive-up window	66.	1 for each 75 sq. ft. of gross floor area
67.	Establishments for the sale and consumption on the premises of food and beverages without a drive-up window	68.	1 for each 100 sq. ft. of gross floor area
69.	Participating type, e.g., skating rinks, dance halls	70.	1 for each 75 sq. ft. of gross floor area

A.	Use	B.	Minimum Parking Spaces Required
71.	Spectator type, e.g., auditoriums, assembly halls, theaters, stadiums, places of public assembly	72.	1 parking space for each 4 seats
73.	Office buildings, business and professional offices	74.	1 for every 400 sq. ft. of gross floor area
75.	Pharmacies	76.	1 for each 150 sq. ft. of gross floor area
77.	Retail establishments, except as otherwise specified herein	78.	1 for each 300 sq. ft. of gross floor area
79.	Retail stores handling bulky merchandise, household furniture, or appliance repair	80.	1 for each 600 sq. ft. of gross floor area
81.	Industrial Types		
82.	Except as specifically mentioned herein, industrial uses listed as permitted in the M districts: M-1, M-2, M-3, and M-4	83.	1 for each 500 sq. ft. of gross floor area
84.	Aircraft storage hangars up to 3,600 sq. ft. each enclosed hangar area	85.	None (parking occurs in hangar)
86.	Aircraft storage hangars over 3,600 sq. ft. each enclosed hangar area	87.	1 for every 700 sq. ft. of hangar area over 3,600 sq. ft.
88.	Aircraft hangars intended for repair and maintenance operations	89.	1 for each 5,000 sq. ft. of hangar, plus 1 for each 500 sq. ft. of shop area, plus 1 for each 400 sq. ft. of office area
90.	Laboratories and research facilities	91.	1 for each 300 sq. ft. of gross floor area
92.	Machinery or equipment	93.	1 for each 400 sq. ft. of gross sales floor area
94.	Wholesale and storage operations	95.	1 for each 700 sq. ft. of gross floor area

Notes:

****   "1-E" refers to fraternities, sororities, cooperatives and dormitories that require one parking space for each three occupants for whom sleeping facilities are provided.***

*****   "3.-G(1)" refers to establishments or enterprises of a recreational or an entertainment nature (spectator type, e.g., auditoriums, assembly halls, theaters, stadiums, places of public assembly) that require one parking space for each four seats.***

1. [Ord. 2763 § 1 (Exh. A § 16), 9-16-13; Ord. 2730[1] § 1 (Exh. A (13)), 10-18-10; Ord. 2720 § 1(19), 11-2-09; Ord. 2710 § 1, 3-2-09; Ord. 2647, 6-5-06; Ord. 2550, 5-21-01; Ord. 2451, 12-2-96. Code 2001 § 151.612.]
Penalty: See NMC 15.05.120.

5.440.040 Parking requirements for uses not specified.
The parking space requirements for buildings and uses not set forth herein shall be determined by the director through a Type I procedure. Such determination shall be based upon the requirements for the most comparable building or use specified herein. [Ord. 2451, 12-2-96. Code 2001 § 151.613.]

15.440.050 Common facilities for mixed uses.
A. In the case of mixed uses, the total requirements for off-street parking spaces shall be the sum of the requirements for the various uses. Off-street parking facilities for one use shall not be considered as providing parking facilities for any other use except as provided below.

B. Joint Uses of Parking Facilities. The director may, upon application, authorize the joint use of parking facilities required by said uses and any other parking facility; provided, that:

> ***1. The applicant shows that there is no substantial conflict in the principal operating hours of the building or use for which the joint use of parking facilities is proposed.***
>
> ***2. The parking facility for which joint use is proposed is no further than 400 feet from the building or use required to have provided parking.***
>
> ***3. The parties concerned in the joint use of off-street parking facilities shall evidence agreement for such joint use by a legal instrument approved by the city attorney as to form and content. Such instrument, when approved as conforming to the provisions of the ordinance, shall be recorded in the office of the county recorder and copies of the instrument filed with the director.***

C. Commercial establishments within 200 feet of a commercial public parking lot may reduce the required number of parking spaces by 50 percent. [Ord. 2451, 12-2-96. Code 2001 § 151.614.]

15.440.060 Parking area and service drive improvements.
All public or private parking areas, outdoor vehicle sales areas, and service drives shall be improved according to the following:

A. All parking areas and service drives shall have surfacing of asphaltic concrete or Portland cement concrete or other hard surfacing such as brick or concrete pavers. Other durable and dust-free surfacing materials may be approved by the directorfor infrequently used parking areas.

All parking areas and service drives shall be graded so as not to drain stormwater over the public sidewalk or onto any abutting public or private property.

B. All parking areas shall be designed not to encroach on public streets, alleys, and other rights-of-way. Parking areas shall not be placed in the area between the curb and sidewalk or, if there is no sidewalk, in the public right-of-way between the curb and the property line. The director may issue a permit for exceptions for unusual circumstances where the design maintains safety and aesthetics.

C. All parking areas, except those required in conjunction with a single-family or two-family dwelling, shall provide a substantial bumper which will prevent cars from encroachment on abutting private and public property.

D. All parking areas, including service drives, except those required in conjunction with single-family or two-family dwellings, shall be screened in accordance with NMC 15.420.010(B).

E. Any lights provided to illuminate any public or private parking area or vehicle sales area shall be so arranged as to reflect the light away from any abutting or adjacent residential district.

F. All service drives and parking spaces shall be substantially marked and comply with NMC 15.440.070.

G. Parking areas for residential uses shall not be located in a required front yard, except as follows:

> ***1. Attached or detached single-family or two-family: parking is authorized in a front yard on a service drive which provides access to an improved parking area outside the front yard.***
>
> ***2. Three- or four-family: parking is authorized in a front yard on a service drive which is adjacent to a door at least seven feet wide intended and used for entrance of a vehicle (see Appendix A, Figure 12).***

H. A reduction in size of the parking stall may be allowed for up to a maximum of 30 percent of the total number of spaces to allow for compact cars. For high turnover uses, such as convenience stores or fast-food restaurants, at the discretion of the director, all stalls will be required to be full-sized.

I. Affordable housing projects may use a tandem parking design, subject to approval of the community development director.

J. Portions of off-street parking areas may be developed or redeveloped for transit-related facilities and uses such as transit shelters or park-and-ride lots, subject to meeting all other applicable standards, including retaining the required minimum number of parking spaces. [Ord. 2810 § 2

(Exhs. B, C), 12-19-16; Ord. 2730 § 1 (Exh. A (14)), 10-18-10; Ord. 2628, 1-3-06; Ord. 2505, 2-1-99; Ord. 2451, 12-2-96. Code 2001 § 151.615.]

15.440.090 Purpose.

Cycling is a healthy activity for travel and recreation. In addition, by maximizing bicycle travel, the community can reduce negative effects of automobile travel, such as congestion and pollution. To maximize bicycle travel, developments must provide effective support facilities. At a minimum, developments need to provide a secure place for employees, customers, and residents to park their bicycles. [Ord. 2564, 4-15-02; Ord. 2518, 9-21-99. Code 2001 § 151.625.1.]

15.440.100 Facility requirements.

Bicycle parking facilities shall be provided for the uses shown in the following table. Fractional space requirements shall be rounded up to the next whole number.

Use	Minimum Number of Bicycle Parking Spaces Required
New multiple dwellings, including additions creating additional dwelling units	One bicycle parking space for every four dwelling units
New commercial, industrial, office, and institutional developments, including additions that total 4,000 square feet or more	One bicycle parking space for every 10,000 square feet of gross floor area. In C-4 districts, two bicycle parking spaces, or one per 5,000 square feet of building area, must be provided, whichever is greater
Transit transfer stations and park and ride lots	One bicycle parking space for every 20 vehicle parking spaces
Parks	Two bicycle parking

Use	*Minimum Number of Bicycle Parking Spaces Required*
	spaces within 50 feet of each developed play-ground, ball field, or shelter

[Ord. 2564, 4-15-02; Ord. 2518, 9-21-99. Code 2001 § 151.625.2.]

15.440.110 Design.
A. Bicycle parking facilities shall consist of one or more of the following:

A. 1. A firmly secured loop, bar, rack, or similar facility that accommodates locking the bicycle frame and both wheels using a cable or U-shaped lock.

B. 2. An enclosed locker.

C. 3. A designated area within the ground floor of a building, garage, or storage area. Such area shall be clearly designated for bicycle parking.

D. 4. Other facility designs approved by the director.

B. All bicycle parking spaces shall be at least six feet long and two and one-half feet wide. Spaces shall not obstruct pedestrian travel.

C. All spaces shall be located within 50 feet of a building entrance of the development.

D. Required bicycle parking facilities may be located in the public right-of-way adjacent to a development subject to approval of the authority responsible for maintenance of that right-of-way. [Ord. 2518, 9-21-99. Code 2001 § 151.625.3.]

15.440.080 Off-street loading.
A. Buildings to be built or substantially altered which receive and distribute materials and merchandise by trucks shall provide and maintain off-street loading berths in sufficient number and size to adequately handle the needs of the particular use.

1. The following standards shall be used in establishing the minimum number of berths required:

Gross Floor Area of the Building in Square Feet	No. of Berths
Up to 10,000	C. 1
10,000 and over	D. 2

2. A loading berth shall contain a space 10 feet wide and 35 feet long and have a vertical clearance of 14 feet. Where the vehicles generally used for loading and unloading exceed these dimensions, the required length of these berths shall be increased.

3. Additional off-street loading requirements within the C-4 district are described in NMC 15.352.040(H)(7).

4. Where a facility includes an aircraft hangar, the off-street loading requirement is not required since loading may occur through the hangar doors.

B. The following provisions shall apply to off-street loading facilities:

1. The provision and maintenance of off-street loading space is a continuing obligation of the property owner. No building permit shall be issued until plans are presented that show property that is and will remain available for exclusive use as off-street loading space. The subsequent use of property for which the building permit is issued shall be conditional upon the unqualified continuance and availability of the amount of loading space required by this code. Should the owner or occupant of any building change the use to which the building is put, thereby increasing off-street loading requirements, it shall be unlawful and a violation of this code to begin or maintain such altered use until such time as the increased off-street loading requirements are met.

2. Owners of two or more buildings may agree to utilize jointly the same loading spaces when the hours of operation do not overlap; provided, that satisfactory legal evidence is presented to the city attorney in the form of deeds, leases or contracts to establish the joint use.

3. A plan drawn to scale, indicating how the off-street loading requirements are to be fulfilled, shall accompany an application for a building permit.

4. Design Requirements for Loading Areas.

96. a. Areas used for standing and maneuvering of vehicles shall have durable and dustless surfaces of asphaltic concrete or portland cement concrete, maintained adequately for all-weather use and so drained as to avoid flow of water across the sidewalks.

97. b. Loading areas adjacent to residential zones designed to minimize disturbance of residents.

98. c. Artificial lighting which may be provided shall be so deflected as not to shine or create glare in any residential zone or on any adjacent dwelling.

99. d. Access aisles shall be of sufficient width for all vehicular turning and maneuvering.

100. e. Vision clearance standards as identified in NMC 15.410.060 shall apply. [Ord. 2647, 6-5-06; Ord. 2564, 4-15-02; Ord. 2451, 12-2-96. Code 2001 § 151.617.]

Penalty: See NMC 15.05.120.

Article II. Bicycle Parking

15.440.090 Purpose.

Cycling is a healthy activity for travel and recreation. In addition, by maximizing bicycle travel, the community can reduce negative effects of automobile travel, such as congestion and pollution. To maximize bicycle travel, developments must provide effective support facilities. At a minimum, developments need to provide a secure place for employees, customers, and residents to park their bicycles. [Ord. 2564, 4-15-02; Ord. 2518, 9-21-99. Code 2001 § 151.625.1.]

15.440.100 Facility requirements.

Bicycle parking facilities shall be provided for the uses shown in the following table. Fractional space requirements shall be rounded up to the next whole number.

Use	*Minimum Number of Bicycle Parking Spaces Required*
New multiple dwellings, including additions creating additional dwelling units	*One bicycle parking space for every four dwelling units*
New commercial, industrial, office, and institutional developments,	*One bicycle parking space for every 10,000 square feet of gross floor area.*

Use	*Minimum Number of Bicycle Parking Spaces Required*
including additions that total 4,000 square feet or more	*In C-4 districts, two bicycle parking spaces, or one per 5,000 square feet of building area, must be provided, whichever is greater*
Transit transfer stations and park and ride lots	*One bicycle parking space for every 20 vehicle parking spaces*
Parks	*Two bicycle parking spaces within 50 feet of each developed play-ground, ball field, or shelter*

[Ord. 2564, 4-15-02; Ord. 2518, 9-21-99. Code 2001 § 151.625.2.]

15.440.110 Design.
A. Bicycle parking facilities shall consist of one or more of the following:

1. A firmly secured loop, bar, rack, or similar facility that accommodates locking the bicycle frame and both wheels using a cable or U-shaped lock.

2. An enclosed locker.

3. A designated area within the ground floor of a building, garage, or storage area. Such area shall be clearly designated for bicycle parking.

4. Other facility designs approved by the director.

B. All bicycle parking spaces shall be at least six feet long and two and one-half feet wide. Spaces shall not obstruct pedestrian travel.

C. All spaces shall be located within 50 feet of a building entrance of the development.

D. Required bicycle parking facilities may be located in the public right-of-way adjacent to a development subject to approval of the authority responsible for maintenance of that right-of-way. [Ord. 2518, 9-21-99. Code 2001 § 151.625.3.]

Finding: The applicants' submittal has not been evaluated for conformance with Section 15.440.010 through 15.440.110 because of not having scaled drawings and other missing information.

15.440.140 Private walkway design.

A. All required private walkways shall meet the applicable building code and Americans with Disabilities Act requirements.
B. Required private walkways shall be a minimum of four feet wide.
C. Required private walkways shall be constructed of portland cement concrete or brick.
D. Crosswalks crossing service drives shall, at a minimum, be painted on the asphalt or clearly marked with contrasting paving materials or humps/raised crossings. If painted striping is used, it should consist of thermoplastic striping or similar type of durable application.
E. At a minimum, required private walkways shall connect each main pedestrian building entrance to each abutting public street and to each other.
F. The review body may require on-site walks to connect to development on adjoining sites.
G. The review body may modify these requirements where, in its opinion, the development provides adequate on-site pedestrian circulation, or where lot dimensions, existing building layout, or topography preclude compliance with these standards. [Ord. 2619, 5-16-05; Ord. 2513, 8-2-99. Code 2001 § 151.620.3.]

Finding: The applicant is proposing private walkways throughout the PUD, which connect multi-family residential units to E Portland Road, are located throughout the wetland/natural areas, and connect to Spring Meadow Park to the west. The applicant has indicated that "walkways will be a minimum of 4-feet in width and will be constructed of Portland cement concrete. Crosswalks will be provided on the site to delineate the shift from public streets to private streets. Crosswalks will be painted/clearly striped in conformance with these requirements." The applicant did not indicate in the narrative that private walkways will meet the applicable building code and Americans with Disabilities Act requirements, or that private walkways are connecting each main pedestrian building entrance to each abutting public street and to each other. Because the applicant is not addressing all private walkway design requirements, <u>the applicant will be required to meet the applicable building code and Americans with Disabilities Act requirements for private walkways, and develop a plan where private walkways are connecting each main pedestrian building entrance to each abutting public street and to each other.</u>

These criteria will be met if the aforementioned conditions of approval are met.

IV. Chapter 15.505 PUBLIC IMPROVEMENTS STANDARDS

5.505.010 Purpose.
This chapter provides standards for public infrastructure and utilities installed with new development, consistent with the policies of the City of Newberg comprehensive plan and adopted city master plans. The standards are intended to minimize disturbance to natural features, promote energy conservation and efficiency, minimize and maintain development impacts on surrounding properties and neighborhoods, and ensure timely completion of adequate public facilities to serve new development. [Ord. 2810 § 2 (Exhs. B, C), 12-19-16.]

15.505.020 Applicability.
The provision and utilization of public facilities and services within the City of Newberg shall apply to all land developments in accordance with this chapter. No development shall be approved unless the following improvements are provided for prior to occupancy or operation, unless future provision is assured in accordance with NMC 15.505.030(E).

A. Public Works Design and Construction Standards. The design and construction of all improvements within existing and proposed rights-of-way and easements, all improvements to be maintained by the city, and all improvements for which cityapproval is required shall comply with the requirements of the most recently adopted Newberg public works design and construction standards.

Finding: The preliminary plans show an extension of E Crestview Drive (Major Collector) to the south connecting to E Portland Road (Major Arterial). Frontage improvements along E Portland Road are also shown. Internal to the PUD, Public Street B is designated as a minor collector, and Public Street C and Public Street D are designated as local streets. Additionally, Private Streets A-L provide circulation and property access throughout the PUD. Other public improvements not limited to water, wastewater and stormwater infrastructure are also included in the applicant's plans. Because these improvements require City approval they shall comply with the City of Newberg Public Works Design and Construction Standards. A number of these improvements also require approval from other agencies. <u>Public utility infrastructure improvements not limited to street improvements, public walkways, water, non-potable water, wastewater, and stormwater will require completed permits from partner agencies to authorize different work tasks. Issuance of required permits for wetland delineation/mitigation, construction, etc. not limited to the agencies of Yamhill County, the State of Oregon, and the Federal Government will be required prior to the City of Newberg issuing a Public Improvement Permit.</u>

This criterion will be met if the conditions of approval are adhered to.

B. Street Improvements. All projects subject to a Type II design review, partition, or subdivision approval must construct street improvements necessary to serve the development.

Finding: The preliminary plans show an extension of E Crestview Drive to the south connecting to E Portland Road. Frontage improvements along E Portland Road are also shown. Internal to the PUD, Public Street B is designated as a minor collector, and Public Street C and Public Street D are designated as local streets. Additionally, Private Streets A-L provide circulation and property access throughout the PUD.

This criterion will be met if all street improvements necessary to serve the development are constructed.

C. Water. All developments, lots, and parcels within the City of Newberg shall be served by the municipal water system as specified in Chapter 13.15 NMC.

Finding: There is an existing 10-inch public water line on E Portland Road, which is available for extension to the north to serve the development. There is an existing 8-inch public water line on E Crestview Drive which is available for extension to the south to serve the development.

There is an existing 10-inch non-potable water line on E Portland Road east of the development near N Harmony Lane that is available for extension to the north to serve the development.

Preliminary plans show both public and private streets having water lines, and public streets having non-potable water lines. This criterion is met.

D. Wastewater. All developments, lots, and parcels within the City of Newberg shall be served by the municipal wastewater system as specified in Chapter 13.10 NMC.

Finding: There is an existing 24-inch public wastewater line approximately 700-feet south of E Portland Road, which is available for extension to the north to serve the E Crestview Crossing PUD. Preliminary plans show both public and private streets having wastewater lines. This criterion is met.

E. Stormwater. All developments, lots, and parcels within the City of Newberg shall manage stormwater runoff as specified in Chapters 13.20 and 13.25 NMC.

Finding: Preliminary plans show stormwater drainage for the development connecting to proposed Tract B, Tract C, and Tract E stormwater facilities. Additionally plans show connection to the existing 15-inch stormwater pipe to the north and the 24-inch public stormwater line that connections under E Portland Road. This requirement is met.

This criterion will be met if the aforementioned condition of approval is adhered to.

F. Utility Easements. Utility easements shall be provided as necessary and required by the review body to provide needed facilities for present or future development of the area.

Finding: The applicant has submitted preliminary plans that indicate some utility easements. All public utilities shall be located within a public utility easement or right-of-way. The applicant has not submitted construction plans so it cannot be determined if this requirement has been met.

G. City Approval of Public Improvements Required. No building permit may be issued until all required public facility improvements are in place and approved by the director, or are otherwise bonded for in a manner approved by the review authority, in conformance with the provisions of this code and the Newberg Public Works Design and Construction Standards. [Ord. 2810 § 2 (Exhs. B, C), 12-19-16.]

15.505.030 Street standards.

A. Purpose. The purpose of this section is to:

1. Provide for safe, efficient, and convenient multi-modal transportation within the City of Newberg.

2. Provide adequate access to all proposed and anticipated developments in the City of Newberg. For purposes of this section, "adequate access" means direct routes of travel between destinations; such destinations may include residential neighborhoods, parks, schools, shopping areas, and employment centers.

3. Provide adequate area in all public rights-of-way for sidewalks, wastewater and water lines, stormwater facilities, natural gas lines, power lines, and other utilities commonly and appropriately placed in such rights-of-way. For purposes of this section, "adequate area" means space sufficient to provide all required public services to standards defined in this code and in the Newberg public works design and construction standards.

B. Applicability. The provisions of this section apply to:

1. The creation, dedication, and/or construction of all public streets, bike facilities, or pedestrian facilities in all subdivisions, partitions, or other developments in the City of Newberg.

2. The extension or widening of existing public street rights-of-way, easements, or street improvements including those which may be proposed by an individual or the city, or which may be required by the city in association with other development approvals.

3. The construction or modification of any utilities, pedestrian facilities, or bike facilities in public rights-of-way or easements.

4. The designation of planter strips. Street trees are required subject to Chapter 15.420 NMC.

5. Developments outside the city that tie into or take access from city streets.

C. Layout of Streets, Alleys, Bikeways, and Walkways. Streets, alleys, bikeways, and walkways shall be laid out and constructed as shown in the Newberg transportation system plan. In areas where the transportation system plan or future street plans do not show specific transportation improvements, roads and streets shall be laid out so as to conform to previously approved subdivisions, partitions, and other developments for adjoining properties, unless it is found in the public interest to modify these patterns. Transportation improvements shall conform to the

standards within the Newberg Municipal Code, the Newberg public works design and construction standards, the Newberg transportation system plan, and other adopted city plans.

D. Construction of New Streets. Where new streets are necessary to serve a new development, subdivision, or partition, right-of-way dedication and full street improvements shall be required. Three-quarter streets may be approved in lieu of full street improvements when the city finds it to be practical to require the completion of the other one-quarter street improvement when the adjoining property is developed; in such cases, three-quarter street improvements may be allowed by the city only where all of the following criteria are met:

> ***1. The land abutting the opposite side of the new street is undeveloped and not part of the new development; and***
>
> ***2. The adjoining land abutting the opposite side of the street is within the city limits and the urban growth boundary.***

Finding: The applicant is proposing to extend E Crestview Drive, a major collector, from its northern terminus to E Portland Road. The applicant has proposed a cross-section on sheet C200 that varies and does not match the City's cross-section for a major collector roadway which requires a minimum of 60-feet of right of way:

- 1-foot from back of walk to right-of-way
- 5-foot sidewalk
- 5.5-foot planter
- 0.5-foot curb
- 6-foot bike lane
- 12-foot travel lane
- 12-foot travel lane
- 6-foot bike lane
- 0.5-foot curb
- 5.5-foot planter
- 5-foot sidewalk
- 1-foot from back of walk to right-of-way

Because the applicant has not shown E Crestview Drive matching a major collector standard, <u>the roadway is to consist of the following: 1-foot from back of walk to right-of-way, 5-foot sidewalk, 5.5-foot planter, 0.5-foot curb, 6-foot bike lane, 12-foot travel lane, 12-foot travel lane, 6-foot bike lane, 0.5-foot curb, 5.5-foot planter, 5-foot sidewalk, 1-foot from back of walk to right-of-way. The applicant is required to dedicate sufficient right-of-way (minimum of 60-feet) to construct E Crestview Drive, to construct a roundabout meeting FHWA Standards at the E Crestview Drive/Public Street B intersection, and to construct improvements related to modifying the traffic signal at the E Crestview Drive/Providence Drive/E Portland Road intersection meeting City of Newberg, Yamhill County, and Oregon Department of Transportation requirements.</u>

The applicant is showing Public Street B designated as a minor collector running east-west through the PUD. The applicant has proposed a cross-section on sheet C200 that does not clearly articulate the dedication of roadway space. The following cross-section meets the City's standard for a minor collector and requires 64-feet of right of way:

- 1-foot from back of walk to right-of-way
- 5-foot sidewalk
- 5.5-foot planter
- 0.5-foot curb
- 8-foot parking lane
- 12-foot travel lane with sharrow
- 12-foot travel lane with sharrow
- 8-foot parking lane
- 0.5-foot curb
- 5.5-foot planter
- 5-foot sidewalk
- 1-foot from back of walk to right-of-way

Because the applicant has not clearly indicated that allocation of space in the public right-of-way for Public Street B, <u>the street is to consist of the following: 1-foot from back of walk to right-of-way, 5-foot sidewalk, 5.5-foot planter, 0.5-foot curb, 8-foot parking lane, 12-foot travel lane with sharrow, 12-foot travel lane with sharrow, 8-foot parking lane, 0.5-foot curb, 5.5-foot planter, 5-foot sidewalk, 1-foot from back of walk to right-of-way. The applicant is required to dedicate sufficient right-of-way (minimum of 64-feet) to construct Public Street B.</u>

The applicant is showing Public Street C and Public Street D designated as local residential streets. The applicant has proposed a cross-section on sheet C200 that does not match the City's Transportation System Plan based on a local road functional classification. The following cross-section meets the City's standard for a local residential street and requires 56-feet of right of way:

- 1-foot from back of walk to right-of-way
- 5-foot sidewalk
- 5.5-foot planter
- 0.5-foot curb
- 7-foot parking lane
- 9-foot travel lane
- 9-foot travel lane
- 7-foot parking lane
- 0.5-foot curb
- 5.5-foot planter
- 5-foot sidewalk
- 1-foot from back of walk to right-of-way

Because that applicant has proposed a roadway cross-section that does not match the City's Transportation System Plan for a local road, the applicant must revise plans to show Public Street C and Public Street D consisting of the following: 1-foot from back of walk to right-of-way, 5-foot sidewalk, 5.5-foot planter, 0.5-foot curb, 7-foot parking lane, 9-foot travel lane, 9-foot travel lane, 7-foot parking lane, 0.5-foot curb, 5.5-foot planter, 5-foot sidewalk, 1-foot from back of walk to right-of-way. The applicant is required to dedicate sufficient right-of-way (minimum of 56-feet) to construct the listed streets.

These criteria cannot be accurately assessed until the City receives plans that meet the aforementioned conditions of approval.

E. Improvements to Existing Streets.

1. All projects subject to partition, subdivision, or Type II design review approval shall dedicate right-of-way sufficient to improve the street to the width specified in subsection (G) of this section.

Finding: E Portland Road is designated as a major arterial and is an ODOT owned facility that boarders the southern edge of the property. The applicant is proposing to construct frontage improvements along their property frontage and is showing a dedication 4.5-feet of right-of-way just east of the E Crestview Drive/E Portland Road intersection in order to construct a right-turn lane. The following cross-section meets the City's standard for a major arterial street and requires 98-feet of right of way:

- 1-foot from back of walk to right-of-way
- 5-foot sidewalk
- 5.5-foot planter
- 0.5-foot curb
- 6-foot bike lane
- 12-foot travel lane
- 12-foot travel lane
- 14-foot TWLTL travel lane
- 12-foot travel lane
- 12-foot travel lane
- 6-foot bike lane
- 0.5-foot curb
- 5.5-foot planter
- 5-foot sidewalk
- 1-foot from back of walk to right-of-way

As noted in the applicants traffic study a westbound right-turn lane is needed at the E Crestview Drive/E Portland Road intersection. Based on the submitted plans, it is unclear if 4.5-feet is all of the right-of-way that will be required by the Oregon Department of Transportation for the right turn lane construction. Because right-of-way dedication will need to be verified through the detailed design process which is unknown at this time, the applicant will be required to dedicated additional right-of-way necessary to meet requirements set forth by the Oregon Department of Transportation to meet Highway Design Manual standards to construct the westbound right-turn lane.

This criterion will be met with the adherence to the aforementioned condition of approval.

2. All projects subject to partition, subdivision, or Type II design review approval must construct a minimum of a three-quarter street improvement to all existing streets adjacent to, within, or necessary to serve the development. The director may waive or modify this requirement where the applicant demonstrates that the condition of existing streets to serve the development meets city standards and is in satisfactory condition to handle the projected traffic loads from the development. Where a development has frontage on both sides of an existing street, full street improvements are required.

3. In lieu of the street improvement requirements outlined in NMC 15.505.040(B), the review authority may elect to accept from the applicant monies to be placed in a fund dedicated to the future reconstruction of the subject street(s). The amount of money deposited with the city shall be 100 percent of the estimated cost of the required street improvements (including any associated utility improvements), and 10 percent of the estimated cost for inflation. Cost estimates used for this purpose shall be based on preliminary design of the constructed street provided by the applicant's engineer and shall be approved by the director.

F. Improvements Relating to Impacts. Improvements required as a condition of development approval shall be roughly proportional to the impact of the development on public facilities and services. The review body must make findings in the development approval that indicate how the required improvements are roughly proportional to the impact. Development may not occur until required transportation facilities are in place or guaranteed, in conformance with the provisions of this code. If required transportation facilities cannot be put in place or be guaranteed, then the review body shall deny the requested land use application.

Finding: A traffic study was submitted with the land use application for the Crestview Crossing PUD dated June 2018. Based on the analysis, the 260 single-family homes and 48 apartment units within the Crestview Crossing PUD were evaluated and it was estimated to create 4,126 additional trips each day; 213 will occur in the AM peak hour (7am-9am) and 285 trips will occur in the PM peak hour (4pm-6pm). This means that the traffic analysis over stated the number of single family homes (260 homes in TIA vs. 248 homes in the applicant's narrative) and understated the number of apartments (48 apartments in the TIA vs. 51 apartments in the applicant's narrative). Eight study intersections were evaluated to determine the impact on the adjacent transportation system. Because the TIA identified mitigation measures the following shall occur:

The traffic study identified the following recommendations to mitigate traffic impacts of the proposed development at the Providence Drive/E Crestview Drive/E Portland Road intersection, and the applicant shall construct and be fiscally responsible for these roadway improvements:

- The new north leg of the intersection should be configured as a four-lane section with one northbound lane and three southbound lanes (left turn lane, through movement, and right turn lane). At lease 250-feet of southbound left-turn lane storage and 150-feet of southbound right-turn lane storage should be provided to accommodate the 95th percentile queue lengths.
- The existing south leg of the intersection should be restriped to a four-lane section with one southbound lane, and three northbound lanes (left turn lane, through movement, and right turn lane).
- Based on the 95th percentile queuing analysis:
  - A westbound right turn lane should be constructed with at least 300-feet of storage
  - A eastbound left turn lane should be striped to provide at least 150-feet of storage
- The signal phasing of the intersection should be operated with permissive left turn movements on the north and south approaches with fully protected left turn movements on the east and west approaches.

The Oregon Department of Transportation (ODOT) has reviewed the traffic study and provided comments. Because the applicant has not addressed all of ODOT's traffic study requirements, the comments on the traffic study identified by ODOT shall be adequately addressed and approved by ODOT as noted in the memo dated July 19, 2018 signed by Dan Fricke, Region 2 Senior Planner.

ODOT has identified the following Roadway Improvements and Signal Modifications at the Providence Drive/E Crestview Drive/E Portland Road intersection:

Roadway Improvements:

The following roadway improvements have been identified

- Installation of a westbound right-turn deceleration lane on E Portland Road approaching E Crestview Drive
- At the northeast corner of the E Portland Road/E Crestview Drive intersection, the sidewalk will need to connect to the highway shoulder with an "End of Walk" ADA compliant connection (ODOT Standard Drawing RD 754).

- The crosswalk on the east leg of the intersection (across E Portland Road) must be reinstalled along with appropriate modifications to the traffic signal (signal modifications are addressed in more detail below)
- The required roadway and signal improvements will trigger the need to assess all curb ramps and push buttons at E Portland Road/E Crestview Drive. Any non-compliant curb ramps shall be remediated to meet State ADA standards.

Prior to the issuance of the first grading or building permit, the applicant shall submit plans and specifications for all improvements/construction within ODOT right-of-way for review and approval by ODOT District 3 and issuance of a permit to construct within ODOT right-of-way. ODOT shall certify that all construction activities have been completed pursuant to the approved plans and specifications prior to the issuance of the first certificate of use and occupancy, or the city's equivalent.

Signal Modifications:

It is likely that the entire signal installation will need to be replaced to accommodate the E Crestview Drive leg being added to the existing intersection. The following is a list of the minimum modifications that are anticipated to be necessary:

- The existing signal poles on the north side of the intersection will need to be replaced to accommodate the new E Crestview Drive
- A new mast arm will be needed in the southwest quadrant of the intersection to signalize the new E Crestview Drive leg.
- New pedestrian signal and push-button pedestal for the pedestrian crossing on the east leg of the intersection.
- New detection will be needed depending on how new ADA ramps affect crosswalk locations (note that Region 2 is using radar detection)

Prior to issuance of the first grading or building permit, the applicant shall submit signal modification plans for the review of the ODOT Region 2 Traffic Engineer and the review and approval of the State Traffic Engineer. ODOT shall certify that all required signal modifications have been completed and the signal operational prior to the issuance of the first certificate of use and occupancy, or the city's equivalent.

This criterion will be met if the conditions of approval are adhered to.

G. Street Width and Design Standards.

1. Design Standards. All streets shall conform with the standards contained in Table 15.505.030(G). Where a range of values is listed, the director shall determine the width based on a consideration of the total street section width needed, existing street widths, and existing development patterns. Preference shall be given to the higher value. Where values may be

modified by the director, the overall width shall be determined using the standards under subsections (G)(2) through (10) of this section.

Table 15.505.030(G) Street Design Standards

Type of Street	*Right-of-Way Width*	*Curb-to-Curb Pavement Width*	*Motor Vehicle Travel Lanes*	*Median Type*	*Striped Bike Lane (Both Sides)*	*On-Street Parking*
Arterial Streets						
*Expressway***	*ODOT*	*ODOT*	*ODOT*	*ODOT*	*ODOT*	*ODOT*
Major arterial	*95 – 100 feet*	*74 feet*	*4 lanes*	*TWLTL or median**	*Yes*	*No**
Minor arterial	*69 – 80 feet*	*48 feet*	*2 lanes*	*TWLTL or median**	*Yes*	*No**
Collectors						
Major	*57 – 80 feet*	*36 feet*	*2 lanes*	*None**	*Yes*	*No**
Minor	*61 – 65 feet*	*40 feet*	*2 lanes*	*None**	*Yes**	*Yes**
Local Streets						
Local residential	*54 – 60 feet*	*32 feet*	*2 lanes*	*None*	*No*	*Yes*
Limited residential, parking both sides	*44 – 50 feet*	*28 feet*	*2 lanes*	*None*	*No*	*Yes*
Limited residential, parking one side	*40 – 46 feet*	*26 feet*	*2 lanes*	*None*	*No*	*One side*
Local commercial/ industrial	*55 – 65 feet*	*34 feet*	*2 lanes*	*None**	*No**	*Yes**

**   May be modified with approval of the director. Modification will change overall curb-to-curb and right-of-way width. Where a center turn lane is not required, a landscaped median shall be provided instead, with turning pockets as necessary to preserve roadway functions.*

***   All standards shall be per ODOT expressway standards.*

2. Motor Vehicle Travel Lanes. Collector and arterial streets shall have a minimum width of 12 feet.

Finding: The submitted plans show 12-foot travel lanes on E Portland Road (major arterial), E Crestview Drive (major collector), and Public Street B (minor collector). This criterion is met.

3. Bike Lanes. Striped bike lanes shall be a minimum of six feet wide. Bike lanes shall be provided where shown in the Newberg transportation system plan.

Finding: The submitted plans show space available for a 6-foot bike lane on E Crestview Drive, and Public Street B. The applicant is showing the westbound bike lane on E Portland Road as 5-feet wide, this does not meet the City's standard. Because the applicant's proposal does not meet the City's standard, the applicant is required to install a 6-foot bike lane along E Portland Road to match the City's Transportation System Plan cross-section. This criterion will be met with the adherence to the aforementioned condition of approval.

4. Parking Lanes. Where on-street parking is allowed on collector and arterial streets, the parking lane shall be a minimum of eight feet wide.

Finding: The submitted show space for an 8-foot on-street parking lane on Public Street B, which is classified as a minor collector. The applicant is not proposing on-street parking along E Crestview Drive. This criterion is met.

5. Center Turn Lanes. Where a center turn lane is provided, it shall be a minimum of 12 feet wide.

Finding: The applicant's preliminary plans show a southbound and northbound left turn lane at the E Crestview Drive/E Portland Road intersection. Because the applicant's submitted plans are not to scale and do not indicate the width of center turn lanes, the City will require the southbound and northbound center turn lanes at the E Crestview Drive/E Portland Drive intersection to be a minimum of 12-feet wide.

This criterion will be verified to have been met with the submittal of scaled plans.

7. Sidewalks. Sidewalks shall be provided on both sides of all public streets. Minimum width is five feet.

Finding: The submitted plans show 5-foot sidewalks along both sides of E Crestview Drive, Public Street B, Public Street C, and Public Street D. The City requires 5-foot sidewalks along all public streets where a planter strip is utilized, and 6-foot sidewalks in areas utilizing a curb-tight sidewalk. ODOT has different sidewalk width requirements and the applicant is showing a 6-foot sidewalk along E Portland Road. Because the applicant's plans do not clearly show directional ADA curb ramps which are integral to the sidewalk, the applicant will be required to install directional ADA curb ramps at the corners of all public street/public street intersection locations, and at public street/private street intersection locations. The final design of all roads within the PUD will be reviewed and approved as part of the Public Improvement Permit. This criterion will be met with the adherence to the aforementioned condition of approval.

8. Planter Strips. Except where infeasible, a planter strip shall be provided between the sidewalk and the curb line, with a minimum width of five feet. This strip shall be landscaped in accordance with the standards in NMC 15.420.020. Curb-side sidewalks may be allowed on limited residential streets. Where curb-side sidewalks are allowed, the following shall be provided:

a. Additional reinforcement is done to the sidewalk section at corners.

b. Sidewalk width is six feet.

Finding: The submitted plans show planter strips on E Portland Road, E Crestview Drive, Public Street B, Public Street C, and Public Street D. Planter strips are not provided on private streets. The planter strips on public streets are required to be 5.5-feet wide. Where a planter strip is not provided, the public sidewalk is required to be 6-feet wide. These criteria will be met if the conditions of approval are adhered to.

10. Intersections and Street Design. The street design standards in the Newberg public works design and construction standards shall apply to all public streets, alleys, bike facilities, and sidewalks in the city.

Finding: Preliminary plans indicate that the applicant will be able to meet requirements of the Public Works Design and Construction Standards. Because final plans have not been developed to review if all the City's Public Works Design and Construction Standards have been met, the final design of E Portland Road, E Crestview Drive, Public Street B, Public Street C, and Public Street D will need to comply with City's Public Works Design and Construction Standards and applicable ODOT standards. The applicant will be required to obtain a Public Improvement Permit and meet the City's Transportation System Plan and Public Works Design and Construction Standards for the proposed roadway improvements. This condition of approval will be verified to have been met with the adherence to the aforementioned condition of approval.

K. Future Extension of Streets. All new streets required for a subdivision, partition, or a project requiring site design review shall be constructed to be "to and through": through the development and to the edges of the project site to serve adjacent properties for future development.

Finding: Preliminary plans show Public Street B and Public Street C with east-west alignments with the potential to extend further to the east. This criterion is met.

M. Street Names and Street Signs. Streets that are in alignment with existing named streets shall bear the names of such existing streets. Names for new streets not in alignment with existing streets are subject to approval by the director and the fire chief and shall not

unnecessarily duplicate or resemble the name of any existing or platted street in the city. It shall be the responsibility of the land divider to provide street signs.

Finding: The applicant's plans do not show details for street name signs. Because the applicant has not shown street names and street name signs in the plans or indicated that they will be installed, the applicant is required to install street name signs at all intersections within the development including those intersections with private streets. This criterion will be met with the adherence to the aforementioned condition of approval.

N. Platting Standards for Alleys.

1. An alley may be required to be dedicated and constructed to provide adequate access for a development, as deemed necessary by the director.

2. The right-of-way width and paving design for alleys shall be not less than 20 feet wide. Slope easements shall be dedicated in accordance with specifications adopted by the city council under NMC 15.505.010 et seq.

3. Where two alleys intersect, 10-foot corner cut-offs shall be provided.

4. Unless otherwise approved by the city engineer where topographical conditions will not reasonably permit, grades shall not exceed 12 percent on alleys, and centerline radii on curves shall be not less than 100 feet.

5. All provisions and requirements with respect to streets identified in this code shall apply to alleys the same in all respects as if the word "street" or "streets" therein appeared as the word "alley" or "alleys" respectively.

O. Platting Standards for Blocks.

1. Purpose. Streets and walkways can provide convenient travel within a neighborhood and can serve to connect people and land uses. Large, uninterrupted blocks can serve as a barrier to travel, especially walking and biking. Large blocks also can divide rather than unite neighborhoods. To promote connected neighborhoods and to shorten travel distances, the following minimum standards for block lengths are established.

2. Maximum Block Length and Perimeter. The maximum length and perimeters of blocks in the zones listed below shall be according to the following table. The review body for a subdivision, partition, conditional use permit, or a Type II design review may require installation of streets or walkways as necessary to meet the standards below.

Zone(s)	***Maximum Block Length***	***Maximum Block Perimeter***
R-1	***800 feet***	***2,000 feet***
R-2, R-3, RP, I	***1,200 feet***	***3,000 feet***

3. Exceptions.

a. If a public walkway is installed mid-block, the maximum block length and perimeter may be increased by 25 percent.
b. Where a proposed street divides a block, one of the resulting blocks may exceed the maximum block length and perimeter standards provided the average block length and perimeter of the two resulting blocks do not exceed these standards.
c. Blocks in excess of the above standards are allowed where access controlled streets, street access spacing standards, railroads, steep slopes, wetlands, water bodies, preexisting development, ownership patterns or similar circumstances restrict street and walkway location and design. In these cases, block length and perimeter shall be as small as practical. Where a street cannot be provided because of these circumstances but a public walkway is still feasible, a public walkway shall be provided.
d. Institutional campuses located in an R-1 zone may apply the standards for the institutional zone.
e. Where a block is in more than one zone, the standards of the majority of land in the proposed block shall apply.
f. Where a local street plan, concept master site development plan, or specific plan has been approved for an area, the block standards shall follow those approved in the plan. In approving such a plan, the review body shall follow the block standards listed above to the extent appropriate for the plan area.

Finding: Due to the applicants' plan sheets not being printed to scale, a precise measurement of block length and perimeter cannot be made. It appears that the block lengths and perimeters <u>may</u> meet this requirement but a definitive determination would be difficult. <u>The applicant must meet all requirements listed in Section15.505.030 (N)(O) of the NDC.</u> These criteria will be met with the aforementioned condition of approval being adhered to.

P. Private Streets. New private streets, as defined in NMC 15.05.030, shall not be created, except as allowed by NMC 15.240.020(L)(2).

Finding: Preliminary plans show public and private streets as part of a Planned Unit Development. See finding under NMC 15.240 (L)(2) for additional findings and conditions. Preliminary plans show concrete aprons/driveways providing a visual separation of private streets from public streets. This requirement is met.

R. Vehicular Access Standards.
1. Purpose. The purpose of these standards is to manage vehicle access to maintain traffic flow, safety, roadway capacity, and efficiency. They help to maintain an adequate level of service consistent with the functional classification of the street. Major roadways, including arterials and collectors, serve as the primary system for moving people and goods

within and through the city. Access is limited and managed on these roads to promote efficient through movement. Local streets and alleys provide access to individual properties. Access is managed on these roads to maintain safe maneuvering of vehicles in and out of properties and to allow safe through movements. If vehicular access and circulation are not properly designed, these roadways will be unable to accommodate the needs of development and serve their transportation function.

2. Access Spacing Standards. Public street intersection and driveway spacing shall follow the standards in Table 15.505.R below. The Oregon Department of Transportation (ODOT) has jurisdiction of some roadways within the Newberg city limits, and ODOT access standards will apply on those roadways.

Table 15.505.R. Access Spacing Standards

Roadway Functional Classification	***Area[1]***	***Minimum Public Street Intersection Spacing (Feet)[2]***	***Driveway Setback from Intersecting Street[3]***
Expressway	***All***	***Refer to ODOT Access Spacing Standards***	***NA***
Major arterial	***Urban CBD***	***Refer to ODOT Access Spacing Standards***	
Minor arterial	***Urban CBD***	***500 200***	***150 100***
Major collector	***All***	***400***	***150***
Minor collector	***All***	***300***	***100***

[1] "Urban" refers to intersections inside the city urban growth boundary outside the central business district (C-3 zone).

"CBD" refers to intersections within the central business district (C-3 zone).

"All" refers to all intersections within the Newberg urban growth boundary.

[2] Measured centerline to centerline.

[3] The setback is based on the higher classification of the intersecting streets. Measured from the curb line of the intersecting street to the beginning of the driveway, excluding flares. If the driveway setback listed above would preclude a lot from having at least one driveway, including shared driveways or driveways on adjoining streets, one driveway is allowed as far from the intersection as possible.

Finding: The applicant's plans show the driveways for Private Street G and Private Street H to the east of E Crestview Drive (major collector). The plans provided are not scalable and it appears that Private Street G and Private Street H do not meet spacing requirements from a Public Street intersection. Because the applicant is not meeting street spacing standards, <u>Private Street G and Private Street H driveway setbacks need to be a minimum of 150-feet from E Crestview Drive per</u>

Table 15.505.R. Access Spacing Standards

Roadway Functional Classification	***Area[1]***	***Minimum Public Street Intersection Spacing (Feet)[2]***	***Driveway Setback from Intersecting Street[3]***

Table 15.505.R Access Spacing Standards. This criteria will be met with the adherence to the aforementioned condition of approval.

3. Properties with Multiple Frontages. Where a property has frontage on more than one street, access shall be limited to the street with the lesser classification.

Finding: Several lots within the applicant's Planned Unit Development have frontages along more than one public/private street. Access shall be taken from the street with the lesser functional classification, and private streets are designated as having the lowest functional classification. This criterion will be met with the adherence to the aforementioned condition of approval.

4. Driveways. More than one driveway is permitted on a lot accessed from either a minor collector or local street as long as there is at least 40 feet of lot frontage separating each driveway approach. More than one driveway is permitted on a lot accessed from a major collector as long as there is at least 100 feet of lot frontage separating each driveway approach.

Finding: The applicant's plans show that Lot 249 has just over 400-feet of frontage along Public Street B (minor collector). Lot 249 has two driveways shown and the distance between the driveways is at least 100-feet. This criterion is met.

5. Alley Access. Where a property has frontage on an alley and the only other frontages are on collector or arterial streets, access shall be taken from the alley only. The review body may allow creation of an alley for access to lots that do not otherwise have frontage on a public street provided all of the following are met:

a. The review body finds that creating a public street frontage is not feasible.
b. The alley access is for no more than six dwellings and no more than six lots.
c. The alley has through access to streets on both ends.
d. One additional parking space over those otherwise required is provided for each dwelling. Where feasible, this shall be provided as a public use parking space adjacent to the alley.

Finding: The applicant is proposing private streets and has not identified private access locations. Because access locations have not been identified, if a property has frontage on a private street and other frontages are on collector or arterial streets, access shall be taken from the private street only. This criterion will be met with the adherence to the aforementioned condition of approval.

6. Closure of Existing Accesses. Existing accesses that are not used as part of development or redevelopment of a property shall be closed and replaced with curbing, sidewalks, and landscaping, as appropriate.

7. Shared Driveways.

a. The number of driveways onto arterial streets shall be minimized by the use of shared driveways with adjoining lots where feasible. The city shall require shared driveways as a condition of land division or site design review, as applicable, for traffic safety and access management purposes. Where there is an abutting developable property, a shared driveway shall be provided as appropriate. When shared driveways are required, they shall be stubbed to adjacent developable parcels to indicate future extension. "Stub" means that a driveway temporarily ends at the property line, but may be accessed or extended in the future as the adjacent parcel develops. "Developable" means that a parcel is either vacant or it is likely to receive additional development (i.e., due to infill or redevelopment potential).

b. Access easements (i.e., for the benefit of affected properties) and maintenance agreements shall be recorded for all shared driveways, including pathways, at the time of final plat approval or as a condition of site development approval.

c. No more than four lots may access one shared driveway.

d. Shared driveways shall be posted as no parking fire lanes where required by the fire marshal.

e. Where three lots or three dwellings share one driveway, one additional parking space over those otherwise required shall be provided for each dwelling. Where feasible, this shall be provided as a common use parking space adjacent to the driveway.

Finding: The applicant is not proposing shared driveways as part of this development. This requirement is not applicable.

9. ODOT or Yamhill County Right-of-Way. Where a property abuts an ODOT or Yamhill County right-of-way, the applicant for any development project shall obtain an access permit from ODOT or Yamhill County.

T. Street Trees. Street trees shall be provided for all projects subject to Type II design review, partition, or subdivision. Street trees shall be installed in accordance with the provisions of NMC 15.420.010(B)(4).

Finding: Preliminary plans show street trees along public streets within the development. E Crestview Drive is classified a major collector, Public Street B is a minor collector, and Public Street C and Public Street D are local streets. It is unclear from the applicant's submittal if they are meeting the street tree requirement. Because it's unclear that the applicant is meeting the street tree requirement, <u>the applicant will be required to provide street trees along all public streets that are</u>

compliant with 15.420.010(B)(4)(a). This criterion will be verified to have been met when the applicant submits plans with sufficient detail to assess compliance.

U. Street Lights. All developments shall include underground electric service, light standards, wiring and lamps for street lights according to the specifications and standards of the Newberg public works design and construction standards. The developer shall install all such facilities and make the necessary arrangements with the serving electric utility as approved by the city. Upon the city's acceptance of the public improvements associated with the development, the street lighting system, exclusive of utility-owned service lines, shall be and become property of the city unless otherwise designated by the city through agreement with a private utility.

Finding: Preliminary plans show street lighting on both public and private streets. Because it's unclear if the applicant is meeting street lighting standards, the applicant will be required to submit construction plans that include street lighting needed to meet the specifications and standards of the City's Public Works Design and Construction Standards. This condition of approval will be met with the adherence to the aforementioned condition of approval.

15.505.040 Public utility standards.

C. General Standards.

1. The design and construction of all improvements within existing and proposed rights-of-way and easements, all improvements to be maintained by the city, and all improvements for which city approval is required shall conform to the Newberg public works design and construction standards and require a public improvements permit.

2. The location, design, installation and maintenance of all utility lines and facilities shall be carried out with minimum feasible disturbances of soil and site. Installation of all proposed public and private utilities shall be coordinated by the developer and be approved by the city to ensure the orderly extension of such utilities within public right-of-way and easements.

Finding: The applicant's narrative indicates that they plan to follow the City of Newberg Design and Construction Standards and ODOT construction standards for all public improvements depending on jurisdiction and will acquire the necessary permits to build those improvements. Because the applicant has not obtained all necessary permits for construction, the issuance of required permits not limited to the agencies of Yamhill County, the State of Oregon, and the Federal Government will be required prior to the City of Newberg issuing a Public Improvement Permit. These criteria will be met with the adherence to the aforementioned condition of approval.

D. Standards for Water Improvements. All development that has a need for water service shall install the facilities pursuant to the requirements of the city and all of the following standards. Installation of such facilities shall be coordinated with the extension or improvement of necessary wastewater and stormwater facilities, as applicable.

1. All developments shall be required to be linked to existing water facilities adequately sized to serve their intended area by the construction of water distribution lines, reservoirs and pumping stations which connect to such water service facilities. All necessary easements required for the construction of these facilities shall be obtained by the developer and granted to the city pursuant to the requirements of the city.
2. Specific location, size and capacity of such facilities will be subject to the approval of the director with reference to the applicable water master plan. All water facilities shall conform with city pressure zones and shall be looped where necessary to provide adequate pressure and fire flows during peak demand at every point within the system in the development to which the water facilities will be connected. Installation costs shall remain entirely the developer's responsibility.

Finding: The applicant will be utilizing the existing water lines in E Crestview Drive and E Portland Road to provide public water lines through the PUD. The applicant will be utilizing the existing non-potable water line in E Portland Road to provide non-potable water lines through the PUD. The applicant has not submitted fire flow calculations. <u>Because the applicant has not submitted fire flow calculations, they will be required to submit fire flow calculations to show that the existing and proposed service is adequate prior to the issuance of the Public Improvement Permit.</u> This criterion will be verified to have met with the adherence to the conditions of approval.

3. The design of the water facilities shall take into account provisions for the future extension beyond the development to serve adjacent properties, which, in the judgment of the city, cannot be feasibly served otherwise.

Finding: Preliminary plans indicate that Public Street B and Public Street C will continue east beyond the proposed development in the future. The applicant's plans do not take into account future extension beyond the development to serve adjacent properties. Because the applicant's plans do not take into account future street extensions beyond the development, <u>a blow off assembly on the water lines at the eastern end of Street B and Street C will be required which allows for future extension beyond the development site.</u> This criterion will be met with the adherence to the aforementioned condition of approval.

4. Design, construction and material standards shall be as specified by the director for the construction of such public water facilities in the city.

Finding: Preliminary plans indicate that the applicant will be able to meet requirements of the Public Works Design and Construction Standards. Submitted plans show water mains in both public and private streets, but do not show a water main size, the City's standard is an 8-inch minimum water main. The applicant is also showing non-potable water lines in public streets. Fire hydrants will need to be located to meet the Fire Code requirements.

Because construction plans have not yet been submitted and reviewed to determine if this requirement is met, the applicant will need to submit construction plans and obtain a Public Improvement Permit to install the water system and non-potable water system pursuant to the requirements of the City's Public Works Design and Construction Standards. Utility designs and alignments will be reviewed as part of the Public Improvement Permit. Non-potable water lines are required in public streets and may be required in private streets to provide non-potable water to any landscaping area maintained by the PUD. This criterion will be met with the adherence to the aforementioned condition of approval.

E. Standards for Wastewater Improvements. All development that has a need for wastewater services shall install the facilities pursuant to the requirements of the city and all of the following standards. Installation of such facilities shall be coordinated with the extension or improvement of necessary water services and stormwater facilities, as applicable.

> ***1. All septic tank systems and on-site sewage systems are prohibited. Existing septic systems must be abandoned or removed in accordance with Yamhill County standards.***

Finding: Preliminary plans show an existing home located on the property and the applicant did not address if a septic system exists. Because it's possible that a septic system is present on the property and the applicant has not addressed this issue, the applicant is required to abandon or remove the septic system in accordance with Yamhill County Standards. The applicant will need to provide a certification from Yamhill County of the septic system abandonment/removal. This criterion will be met with the adherence to the aforementioned condition of approval.

> ***2. All properties shall be provided with gravity service to the city wastewater system, except for lots that have unique topographic or other natural features that make gravity wastewater extension impractical as determined by the director. Where gravity service is impractical, the developer shall provide all necessary pumps/lift stations and other improvements, as determined by the director.***
> ***3. All developments shall be required to be linked to existing wastewater collection facilities adequately sized to serve their intended area by the construction of wastewater lines which connect to existing adequately sized wastewater facilities. All necessary easements required for the construction of these facilities shall be obtained by the developer and granted to the city pursuant to the requirements of the city.***

> ***4. Specific location, size and capacity of wastewater facilities will be subject to the approval of the director with reference to the applicable wastewater master plan. All wastewater facilities shall be sized to provide adequate capacity during peak flows from the entire area potentially served by such facilities. Installation costs shall remain entirely the developer's responsibility.***

Finding: Preliminary plans indicate that the applicant will be able to meet requirements of the Public Works Design and Construction Standards. Submitted plans show sewer mains in both public and private streets, but do not show a sewer main size, the City's standard is a minimum 8-inch sewer main. Service laterals for waste water service is to be provided to each lot; single residential service laterals require a 4-inch pipe with cleanout, and split residential service laterals require a 6-inch pipe with cleanout. Plans also show a connection to the existing sewer main approximately 700-feet south of E Portland Road. The applicant has not adequately addressed capacity of the proposed wastewater line extension for the purpose of the development.

Because the applicant has not adequately addressed capacity needs of the proposed wastewater line extension, <u>the applicant will be required to evaluate downstream impacts, including impacts to the Fernwood lift station, submit construction plans, and obtain a Public Improvement Permit to install the wastewater system pursuant to the requirements of the City's Design and Construction Standards. Utility designs and alignments will be reviewed as part of the Public Improvement Permit.</u> These criteria will be met with the adherence to the aforementioned condition of approval.

> ***6. The design of the wastewater facilities shall take into account provisions for the future extension beyond the development to serve upstream properties, which, in the judgment of the city, cannot be feasibly served otherwise.***

Finding: Preliminary plans indicate Public Street B and Public Street C will continue east beyond the proposed development in the future. The applicant's plans do not address future street extensions. Because the applicant's plans do not take into account future street extensions beyond the development, <u>a manhole will be required at the eastern end of the wastewater lines in both street B and street C which will allow for future extension beyond the development site.</u> This criterion will be met with the adherence to the aforementioned condition of approval.

> ***7. Design, construction and material standards shall be as specified by the director for the construction of such wastewater facilities in the city.***

Finding: Preliminary plans indicate that the applicant will be able to meet requirements of the Public Works Design and Standards. Submitted plans show new sewer mains in both public and private streets throughout the PUD, minimum sewer mains are required to be 8-inches. Service laterals for waste water service is to be provided to each lot; single residential service laterals require a 4-inch pipe with cleanout, and split residential service laterals require a 6-inch pipe with cleanout. Because construction plans have not yet been submitted and reviewed to determine if this requirement is met, <u>the applicant will be required to submit construction plans and obtain a Public Improvement Permit to install the wastewater system pursuant to the requirements of the City's Public Works Design and Construction Standards. Utility designs and alignments will be reviewed as part of the Public Improvement Permit.</u> This criterion will be met with the adherence to the aforementioned condition of approval.

F. Easements. Easements for public and private utilities shall be provided as deemed necessary by the city, special districts, and utility companies. Easements for special purpose uses shall be of a

width deemed appropriate by the responsible agency. Such easements shall be recorded on easement forms approved by the city and designated on the final plat of all subdivisions and partitions. Minimum required easement width and locations are as provided in the Newberg public works design and construction standards. [Ord. 2810 § 2 (Exhs. B, C), 12-19-16.]

Finding: The applicant has submitted preliminary plans that indicate some utility easements, however not all easements have been identified. Because the applicant has not indicated all utility easements, <u>the applicant will be required to submit construction plans that include necessary utility easements meeting the specifications and standards of the City's Public Works Design and Construction Standards, but not necessarily limited to:</u>

1) <u>10-foot utility easements along all street frontages, unless determined by the City Engineer as part of the Public Improvement Permit plan review to be not needed or not feasible due to site conditions.</u>
2) <u>15-foot utility easements along all public stormwater, sewer, water, and non-potable water lines where not located within the existing roadway right-of-way.</u>
3) <u>Public access easements for any private streets that are required to be used to access public infrastructure.</u>
4) <u>Public access easements for all private walkways within the PUD.</u>

This criterion will be met with the adherence to all the conditions of approval.

15.505.050 Stormwater system standards.
C. General Requirement. All stormwater runoff shall be conveyed to a public storm wastewater or natural drainage channel having adequate capacity to carry the flow without overflowing or otherwise causing damage to public and/or private property. The developer shall pay all costs associated with designing and constructing the facilities necessary to meet this requirement.

Finding: Preliminary plans show that all on-site stormwater is collected into a storm main and conveyed into stormwater facilities located in Tract B, Tract C, and Tract E. The applicant's materials indicate that stormwater tracts/facilities will be privately maintained, but is it unclear if the facilities can be adequately accessed. Stormwater tracts located in areas of wetlands are to be mitigated, and the City will not accept wetlands in stormwater tracts. Construction plans have not yet been submitted and reviewed to determine if the requirement is met.

Because the applicant has not submitted constriction plans, <u>the applicant will be required to submit construction plans and obtain a Public Improvement Permit to install the stormwater system improvements pursuant to the requirements of the City's Public Works Design and Construction Standards which should include the following:</u>

- <u>Turn templates for maintenance vehicles accessing stormwater facilities shall be provided to verify that adequate site access exists.</u>

- Permanent maintenance access via a paved road within 10-feet of stormwater facility structures within the stormwater tracts is required.

- Any stormwater tract/facility treating private stormwater shall be owned and maintained by the PUD. Any stormwater tract/facility treating both public and private stormwater shall be owned and maintained by the PUD. Any stormwater tract/facility treating only public stormwater shall be owned and maintained by the City of Newberg.

- Preliminary plans show wetlands inside of stormwater tracts, because the City does not accept wetlands in stormwater tracks, the applicant will be required to remove any wetlands from stormwater tracts dedicated to the City.

- Public/private walkways when located adjacent to stormwater facilities must be located outside of the fenced stormwater facility and outside of maintenance access drives.

- A downstream analysis shall be completed, where the design Engineer visually investigates the downstream system for at least on-quarter mile downstream and reports any observed deficiencies per Public Works Design and Construction Standards.

- All stormwater mains are required to cross streets at right angles perpendicular to the street**.**

This criterion will be met with the adherence to the aforementioned conditions of approval.

D. Plan for Stormwater and Erosion Control. No construction of any facilities in a development included in subsection (B) of this section shall be permitted until an engineer registered in the State of Oregon prepares a stormwater report and erosion control plan for the project. This plan shall contain at a minimum:

1. The methods to be used to minimize the amount of runoff, sedimentation, and pollution created from the development both during and after construction.

2. Plans for the construction of stormwater facilities and any other facilities that depict line sizes, profiles, construction specifications, and other such information as is necessary for the city to review the adequacy of the stormwater plans.

3. Design calculations shall be submitted for all drainage facilities. These drainage calculations shall be included in the stormwater report and shall be stamped by a licensed professional engineer in the State of Oregon. Peak design discharges shall be computed based upon the design criteria outlined in the public works design and construction standards for the city.

Finding: Preliminary plans and a preliminary stormwater report for the proposed development have been submitted. This site is not currently paved. New impervious surfaces will be created and stormwater quality and quantity facilities will be required and the applicant has not obtained appropriate erosion control permitting. Because this project will disturb more than one acre and permitting has not been obtain, a 1200-C permit from DEQ will be required. The applicant will be required to submit a copy of the 1200-C permit from DEQ. This criterion will be met with the adherence to the aforementioned condition of approval.

E. Development Standards. Development subject to this section shall be planned, designed, constructed, and maintained in compliance with the Newberg public works design and construction standards. [Ord. 2810 § 2 (Exhs. B, C), 12-19-16.]

Finding: Preliminary plans show that all on-site stormwater is collected and conveyed to on-site stormwater facilities. Construction plans for this stormwater systems have not yet been submitted. A stormwater final report will need to be submitted with the Public Improvement Permit and will be completely reviewed at that time. Because construction plans have not yet been submitted and reviewed to determine if this requirement has been met, the applicant will need to submit a stormwater report and construction plans meeting the City's Public Works Design and Construction Standards and obtain a Public Improvement Permit to install the stormwater system improvements. Utility designs and alignments will be reviewed as part of the Public Improvement Permit. This criterion will be verified to have been met with the adherence to the aforementioned condition of approval.

Conclusion: City of Newberg staff cannot definitively state that the requirements listed in the Newberg Development Code have been met due to not receiving enough detailed information and reasons stated throughout Exhibit "A" findings.

Exhibit “B” to Planning Commission Order 2018-10

Conditions –File PUD18-0001/CUP18-0004
Crestview Crossing PUD

A. The applicant must provide the following information for review and approval <u>prior</u> to construction of any improvements:

Streets, Sidewalks, Walkways and Street Trees

1. The applicant shall provide documentation for maintenance and financing of maintenance for the private streets.

2. The applicant shall follow the city engineer requirement for sidewalks along private streets to be 5-foot wide matching the applicant’s cross-section detail on sheet C300.

3. The applicant shall follow requirements outlined in a letter TVF&R provided on June 5, 2018 which indicated the following:

    - 20-26 feet road width – no parking on either side of roadway

4. The applicant will be required to meet the applicable building code and Americans with Disabilities Act requirements for private walkways, and develop a plan where private walkways are connecting each main pedestrian building entrance to each abutting public street and to each other.

5. The roadway is to consist of the following: 1-foot from back of walk to right-of-way, 5-foot sidewalk, 5.5-foot planter, 0.5-foot curb, 6-foot bike lane, 12-foot travel lane, 12-foot travel lane, 6-foot bike lane, 0.5-foot curb, 5.5-foot planter, 5-foot sidewalk, 1-foot from back of walk to right-of-way. The applicant is required to dedicate sufficient right-of-way (minimum of 60-feet) to construct E Crestview Drive, to construct a roundabout meeting FHWA Standards at the E Crestview Drive/Public Street B intersection, and to construct improvements related to modifying the traffic signal at the E Crestview Drive/Providence Drive/E Portland Road intersection meeting City of Newberg, Yamhill County, and Oregon Department of Transportation requirements.

6. The applicant must revise plans to show Public Street C and Public Street D consisting of the following: 1-foot from back of walk to right-of-way, 5-foot sidewalk, 5.5-foot planter, 0.5-foot curb, 7-foot parking lane, 9-foot travel lane, 9-foot travel lane, 7-foot parking lane, 0.5-foot curb, 5.5-foot planter, 5-foot sidewalk, 1-foot from back of walk to right-of-way. The applicant is required to dedicate sufficient right-of-way (minimum of 56-feet) to construct the listed streets.

7. The street is to consist of the following: 1-foot from back of walk to right-of-way, 5-foot sidewalk, 5.5-foot planter, 0.5-foot curb, 8-foot parking lane, 12-foot travel lane with sharrow, 12-foot travel lane with sharrow, 8-foot parking lane, 0.5-foot curb, 5.5-foot planter,

5-foot sidewalk, 1-foot from back of walk to right-of-way. The applicant is required to dedicate sufficient right-of-way (minimum of 64-feet) to construct Public Street B.

8. The applicant will be required to dedicated additional right-of-way necessary to meet requirements set forth by the Oregon Department of Transportation to meet Highway Design Manual standards to construct the westbound right-turn lane.

9. The traffic study identified the following recommendations to mitigate traffic impacts of the proposed development at the Providence Drive/E Crestview Drive/E Portland Road intersection, and the applicant shall construct and be fiscally responsible for these roadway improvements:

    a. The new north leg of the intersection should be configured as a four-lane section with one northbound lane and three southbound lanes (left turn lane, through movement, and right turn lane). At lease 250-feet of southbound left-turn lane storage and 150-feet of southbound right-turn lane storage should be provided to accommodate the 95th percentile queue lengths.

    b. The existing south leg of the intersection should be restriped to a four-lane section with one southbound lane, and three northbound lanes (left turn lane, through movement, and right turn lane).

    c. Based on the 95th percentile queuing analysis:

        i. A westbound right turn lane should be constructed with at least 300-feet of storage

        ii. A eastbound left turn lane should be striped to provide at least 150-feet of storage

    d. The signal phasing of the intersection should be operated with permissive left turn movements on the north and south approaches with fully protected left turn movements on the east and west approaches.

10. The comments on the traffic study identified by ODOT shall be adequately addressed and approved by ODOT as noted in the memo dated July 19, 2018 signed by Dan Fricke, Region 2 Senior Planner.

11. Prior to the issuance of the first grading or building permit, the applicant shall submit plans and specifications for all improvements/construction within ODOT right-of-way for review and approval by ODOT District 3 and issuance of a permit to construct within ODOT right-of-way. ODOT shall certify that all construction activities have been completed pursuant to the approved plans and specifications prior to the issuance of the first certificate of use and occupancy, or the city's equivalent.

12. Prior to issuance of the first grading or building permit, the applicant shall submit signal modification plans for the review of the ODOT Region 2 Traffic Engineer and the review and approval of the State Traffic Engineer. ODOT shall certify that all required signal

modifications have been completed and the signal operational prior to the issuance of the first certificate of use and occupancy, or the city's equivalent.

13. The applicant is required to install a 6-foot bike lane along E Portland Road to match the City's Transportation System Plan cross-section.

14. The City will require the southbound and northbound center turn lanes at the E Crestview Drive/E Portland Drive intersection to be a minimum of 12-feet wide.

15. The applicant will be required to install directional ADA curb ramps at the corners of all public street/public street intersection locations, and at public street/private street intersection locations. The final design of all roads within the PUD will be reviewed and approved as part of the Public Improvement Permit.

16. The planter strips on public streets are required to be 5.5-feet wide. Where a planter strip is not provided, the public sidewalk is required to be 6-feet wide.

17. The final design of E Portland Road, E Crestview Drive, Public Street B, Public Street C, and Public Street D will need to comply with City's Public Works Design and Construction Standards and applicable ODOT standards. The applicant will be required to obtain a Public Improvement Permit and meet the City's Transportation System Plan and Public Works Design and Construction Standards for the proposed roadway improvements.

18. The applicant is required to install street name signs at all intersections within the development including those intersections with private streets.

19. The applicant must meet all requirements listed in Section 15.505.020 (N)(O) of the NDC.

20. Private Street G and Private Street H driveway setbacks need to be a minimum of 150-feet from E Crestview Drive per Table 15.505.R Access Spacing Standards.

21. Access shall be taken from the street with the lesser functional classification, and private streets are designated as having the lowest functional classification.

22. If a property has frontage on a private street and other frontages are on collector or arterial streets, access shall be taken from the private street only.

23. The applicant will be required to provide street trees along all public streets that are compliant with 15.420.010(B)(4)(a).

24. The applicant will be required to submit construction plans that include street lighting needed to meet the specifications and standards of the City's Public Works Design and Construction Standards.

Water

25. A blow off assembly on the water lines at the eastern end of Street B and Street C will be required which allows for future extension beyond the development site.

26. The applicant will need to submit construction plans and obtain a Public Improvement Permit to install the water system and non-potable water system pursuant to the requirements of the City's Public Works Design and Construction Standards. Utility designs and alignments will be reviewed as part of the Public Improvement Permit. Non-potable water lines are required in public streets and may be required in private streets to provide non-potable water to any landscaping area maintained by the PUD.

Wastewater

27. The applicant is required to abandon or remove the septic system in accordance with Yamhill County Standards. The applicant will need to provide a certification from Yamhill County of the septic system abandonment/removal.

28. The applicant will be required to evaluate downstream impacts, including impacts to the Fernwood lift station, submit construction plans, and obtain a Public Improvement Permit to install the wastewater system pursuant to the requirements of the City's Design and Construction Standards. Utility designs and alignments will be reviewed as part of the Public Improvement Permit.

29. A manhole will be required at the eastern end of the wastewater lines in both street B and street C which will allow for future extension beyond the development site.

30. The applicant will be required to submit construction plans and obtain a Public Improvement Permit to install the wastewater system pursuant to the requirements of the City's Public Works Design and Construction Standards. Utility designs and alignments will be reviewed as part of the Public Improvement Permit.

Stormwater

31. The applicant will be required to submit construction plans and obtain a Public Improvement Permit to install the stormwater system improvements pursuant to the requirements of the City's Public Works Design and Construction Standards which should include the following:

32. Turn templates for maintenance vehicles accessing stormwater facilities shall be provided to verify that adequate site access exists.

33. Permanent maintenance access via a paved road within 10-feet of stormwater facility structures within the stormwater tracts is required.

34. Any stormwater tract/facility treating private stormwater shall be owned and maintained by the PUD. Any stormwater tract/facility treating both public and private stormwater shall be owned and maintained by the PUD. Any stormwater tract/facility treating only public stormwater shall be owned and maintained by the City of Newberg.

35. Preliminary plans show wetlands inside of stormwater tracts, because the City does not accept wetlands in stormwater tracks, the applicant will be required to remove any wetlands from stormwater tracts dedicated to the City.

36. Public/private walkways when located adjacent to stormwater facilities must be located outside of the fenced stormwater facility and outside of maintenance access drives.

37. A downstream analysis shall be completed, where the design Engineer visually investigates the downstream system for at least on-quarter mile downstream and reports any observed deficiencies per Public Works Design and Construction Standards.

38. All stormwater mains are required to cross streets at right angles perpendicular to the street.

39. The applicant will need to submit a stormwater report and construction plans meeting the City's Public Works Design and Construction Standards and obtain a Public Improvement Permit to install the stormwater system improvements. Utility designs and alignments will be reviewed as part of the Public Improvement Permit.

Permits

40. The applicant has not submitted fire flow calculations, they will be required to submit fire flow calculations to show that the existing and proposed service is adequate prior to the issuance of the Public Improvement Permit.

41. Public utility infrastructure improvements not limited to street improvements, public walkways, water, non-potable water, wastewater, and stormwater will require completed permits from partner agencies to authorize different work tasks. Issuance of required permits for wetland delineation/mitigation, construction, etc. not limited to the agencies of Yamhill County, the State of Oregon, and the Federal Government will be required prior to the City of Newberg issuing a Public Improvement Permit.

42. The issuance of required permits not limited to the agencies of Yamhill County, the State of Oregon, and the Federal Government will be required prior to the City of Newberg issuing a Public Improvement Permit.

43. A 1200-C permit from DEQ will be required. The applicant will be required to submit a copy of the 1200-C permit from DEQ.

Building Designs

44. The applicant shall provide a sun exposure plan diagram meeting the requirements of NDC 15.240.020(K) and 15.05.030 during Step 2 Final Plans phase of the PUD review. If sun exposure is does meet the requirements of the NDC then the applicant must adjust their plans in order to meet this condition of approval.

45. The applicant shall submit drawings and data that clearly illustrate that each unit is served by outdoor living areas equal to at least 10 percent of the gross floor area for each residential unit. If any unit falls below the 10 percent outdoor living requirement then the applicant must revise their plans to provide the required outdoor living requirement.

Easements

46. The applicant is required to provide a 10-foot public utility easement along all street frontages.

47. <u>The applicant will be required to submit construction plans that include necessary utility easements meeting the specifications and standards of the City's Public Works Design and Construction Standards, but not necessarily limited to:</u>

    a. <u>10-foot utility easements along all street frontages, unless determined by the City Engineer as part of the Public Improvement Permit plan review to be not needed or not feasible due to site conditions.</u>
    b. <u>15-foot utility easements along all public stormwater, sewer, water, and non-potable water lines where not located within the existing roadway right-of-way.</u>
    c. <u>Public access easements for any private streets that are required to be used to access public infrastructure.</u>
    d. <u>Public access easements for all private walkways within the PUD.</u>

Home Owners Association

48. The applicant must provide an annual written report meeting the requirements of Section 15.240.020(L)(2)(b) of the Newberg Development code.

Construction Plans:

49. Submit engineered construction plans for review and approval of all utilities and public street improvements. The plans must note the following:

    a. **Grading:** Obtain a city grading permit prior to grading.

B. The applicant must complete the following <u>prior</u> to final plat approval.

50. **Substantially Complete the Construction Improvements:** Prior to final plat approval, the applicant must substantially complete the construction improvements and secure for them in accordance with city policy. Complete construction and call for a walk-through inspection with the Engineering Division (503-537-1273).

C. Final Plat Application: In accordance with NDC 15.240.040, submit the following for City review of the final plan application. Construction improvements should be substantially complete at this point.

1. **Lapse of Approval**. If the applicant fails to submit material required for consideration at the next step in accordance with the schedule approved at the previous step or, in the absence of a specified schedule, **within one year** of such approval, the application as approved at the previous step expires. If the applicant fails to obtain a building permit for construction in accordance with the schedule as previously approved, or in the absence of a specified schedule, within three years of a preliminary plan approval, preliminary and final plan approvals expire. Prior to

expiration of plan approval at any step, the hearing authority responsible for approval may, if requested, extend or modify the schedule, providing it is not detrimental to the public interest or contrary to the findings and provisions specified herein for planned unit developments. Unless the preliminary plan hearing authority provides to the contrary, expiration of final plan approval of any phase automatically renders all phases void that are not yet finally approved or upon which construction has not begun.

2. **Application Materials:**

   a. Type I application form (found either at City Hall or on the website – www.newbergoregon.gov in the Planning Forms section) with the appropriate fees.

   b. A current title report (within 6 months old) for the property. Include copies of all existing easements and CC&Rs that pertain to the property.

   c. A written response to these Conditions of Approval that specifies how each condition has been met.

   d. Two blue-line copies of the final partition plats for preliminary review by the City Engineering Division. Engineering will make red-line comments on these sheets for your surveyor/engineer to correct prior to printing final Mylar copies.

   e. Any other documents required for review.

3. **Documents Required:** Provide the following documents for review and approval:

   a. A bond for street tree planting in an amount to be approved by the Planning Division.

4. **Final Mylar Copies of the Partition Plats:** Submit final mylar copies of the corrected final partition plats (after red-line corrections have been made).

   a. Three sets (one original and two copies), 18 inches by 24 inches in size, of the final partition plans drawn in black India ink in clear and legible form. Original plats shall be in substantial conformity to the approved tentative plan and shall conform to the Yamhill County Surveyor's specifications and requirements.

5. **Required Signatures:** According to NDC 15.235.180, approval of a final partition plat must be acknowledged and signed by the following:

   a. Planning and Building Director
   b. The County Assessor
   c. The County Surveyor
   d. The City Recorder

6. **Recording:** Deliver the approved plat to the office of the County Clerk for recording. The County Clerk's office is located at 414 NE Evans St, McMinnville, OR 97128.

7. **Copy returned to the City:** Return an exact mylar copy of the recorded plat to the Director to complete the plat process. The land division will not be considered final until the copy is returned to the Director. No permits will be issued for any development on the property after the plat is signed until the copy is returned.

D. Development Notes:

1. **Postal Service:** The applicant shall submit plans to the Newberg Postmaster for approval of proposed mailbox delivery locations. Contact the Newberg Post Office for assistance at 503-554-8014.

2. **PGE:** PGE can provide electrical service to this project under terms of the current tariff which will involve developer expense and easements. Contact the Service & Design Supervisor, PGE, at 503-463-4348.

3. **Frontier:** The developer must coordinate trench/conduit requirements with Frontier. Contact the Engineering Division, Frontier, at 541-269-3375.

4. **Addresses:** The Planning Division will assign addresses for the new lots. Planning Division staff will send out notice of the new addresses after they receive a mylar copy of the recorded final plat.

Attachment 1: Application Material

City of Newberg

TYPE III APPLICATION - 2018
(QUASI-JUDICIAL REVIEW)

File #: CUP18-0004

TYPES – PLEASE CHECK ONE:

___ **Annexation**
___ **Comprehensive Plan Amendment (site specific)**
___ **Zoning Amendment (site specific)**
___ **Historic Landmark Modification/alteration**
___ **Conditional Use Permit**
___ **Type III Major Modification**
X **Planned Unit Development**
___ **Other: (Explain)**

APPLICANT INFORMATION:

APPLICANT: Andrew Tull, 3J Consulting, Inc.
ADDRESS: 5075 SW Griffith Drive, Suite 150 Beaverton, Or 97005
EMAIL ADDRESS: Andrew.tull@3j-consulting.com
PHONE: 503-545-1907 MOBILE: FAX:
OWNER (if different from above): CG Commercial LLC & VPCF Crestview LLC PHONE: 503-730-8620
ADDRESS: 5285 Meadows Drive, Suite 171 Lake Oswego, Oregon 97035
ENGINEER/SURVEYOR: Aaron Murphy, PE, 3J Consulting, Inc. PHONE: 720-220-3915
ADDRESS: 5075 SW Griffith Drive, Suite 150 Beaverton, Or 97005

GENERAL INFORMATION:

PROJECT NAME: Crestview Crossing PROJECT LOCATION: 4505 E Portland Road
PROJECT DESCRIPTION/USE: Planned Unit Development and Conditional Use Permit
MAP/TAX LOT NO. (i.e.3200AB-400): 250 Lots 3s2w16 ~~lots~~ 13800 & 1100 ZONE: R1,R2,C2 SITE SIZE: 33.13 SQ. FT. ☐ ACRE ☐
COMP PLAN DESIGNATION: COM, MDR, LDR TOPOGRAPHY: Gentle
CURRENT USE: Vacant
SURROUNDING USES:
NORTH: Residential County Subdivision SOUTH: Providence Hospital
EAST: Undeveloped Land WEST: Residential Subdivision

SPECIFIC PROJECT CRITERIA AND REQUIREMENTS ARE ATTACHED

General Checklist: ☐ Fees ☐ Public Notice Information ☐ Current Title Report ☐ Written Criteria Response ☐ Owner Signature

RECEIVED JUN 06 2018 Initial:

For detailed checklists, applicable criteria for the written criteria response, and number of copies per application type, turn to:

Annexation .... **p. 15**
Comprehensive Plan / Zoning Map Amendment (site specific) .... **p. 19**
Conditional Use Permit .... **p. 21**
Historic Landmark Modification/Alteration .... **p. 23**
Planned Unit Development **p.26**

The above statements and information herein contained are in all respects true, complete, and correct to the best of my knowledge and belief. Tentative plans must substantially conform to all standards, regulations, and procedures officially adopted by the City of Newberg. All owners must sign the application or submit letters of consent. Incomplete or missing information may delay the approval process.

Applicant Signature — Date: 6/6/18
Print Name: Andrew Tull

Owner Signature — Date: 5/29/2018
Print Name: Jeff Smith

Attachments: General Information, Fee Schedule, Noticing Procedures, Planning Commission Schedule, Criteria, Checklists

Z:\FORMS\PLANNING APPLICATIONS\Type III Application

City of Newberg

TYPE III APPLICATION - 2018
(QUASI-JUDICIAL REVIEW)

File #: PUD18-0001

TYPES – PLEASE CHECK ONE:

___ **Annexation**
___ **Comprehensive Plan Amendment (site specific)**
___ **Zoning Amendment (site specific)**
___ **Historic Landmark Modification/alteration**
___ **Conditional Use Permit**
___ **Type III Major Modification**
X **Planned Unit Development**
___ **Other: (Explain)**___

APPLICANT INFORMATION:

APPLICANT: Andrew Tull, 3J Consulting, Inc.
ADDRESS: 5075 SW Griffith Drive, Suite 150 Beaverton, Or 97005
EMAIL ADDRESS: Andrew.tull@3j-consulting.com
PHONE: 503-545-1907 MOBILE: ___ FAX: ___
OWNER (if different from above): CG Commercial LLC & VPCF Crestview LLC PHONE: 503-730-8620
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General Checklist: ☐ Fees ☐ Public Notice Information ☐ Current Title Report ☐ Written Criteria Response ☐ Owner Signature

RECEIVED
JUN 06 2018
Initial:

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Applicant Signature 6/6/18 Date

Owner Signature 5/29/2018 Date

Andrew Tull
Print Name

Jeff Smith
Print Name

Attachments: General Information, Fee Schedule, Noticing Procedures, Planning Commission Schedule, Criteria, Checklists

Z:\FORMS\PLANNING APPLICATIONS\Type III Application

Table of Contents

Attachments

Appendix A – Land Use Application
Appendix B – Pre-Application Notes
Appendix C – Notification Materials
Appendix D – Technical Reports
Appendix E – Land Use Plans

GENERAL INFORMATION

Property Owner and Applicant:	CG Commercial, LLC & VPCF Crestview, LLC 5285 Meadows Road, Suite 171 Lake Oswego, OR 97035 Contact: Jesse Nemec Phone: (503)-730-8620 Email: jnemec@jtsmithco.com
Applicant's Representative:	3J Consulting, Inc. 5075 SW Griffith Drive, Suite 150 Beaverton, OR 97005 Contact: Andrew Tull Phone: (503)-545-1907 Email: andrew.tull@3j-consulting.com
Legal Representative:	Schwabe Williamson & Wyatt PacWest Center 1211 SW Fifth Avenue, Suite 1900 Portland, OR 97204 Contact: Michael C. Robinson Phone: (503)-796-3756 Email: mrobinson@schwabe.com

SITE INFORMATION

Parcel Number:	3216AC 13800 &1100
Address:	OR 99W and Crestview Drive
Size:	33.13 acres
Zoning Designations:	R-1, R-2, C-2
Existing Use:	Vacant
Street Functional Classification:	OR-99W is classified as a Major Arterial and is an ODOT facility. Crestview Drive is classified as a Minor Arterial and is within the City's jurisdiction.
Surrounding Zoning:	The properties to the west are located within the City of Newberg and are zoned Low Density Residential (R-1). The properties to the south are zoned City Institutional (I) and County VLDR-2.5. The properties to the north are located within Yamhill county and are zoned VLDR-1. The properties to the east are located within Yamhill County and are zoned EF-20.

INTRODUCTION

APPLICANT'S REQUEST

The Applicant seeks approval of an application for a Type III Planned Unit Development (PUD) and Conditional Use Permit (CUP). This narrative has been prepared to describe the proposed development and to document compliance with the relevant sections of Newberg's Development Code.

SITE DESCRIPTION/SURROUNDING LAND USE

The subject site is 33.13 acres in size and is located north of OR-99W, south of Crestview Drive. The property is located within the City and is Zoned C-2, R-2, and R-1. The site has sloping topography which generally slopes towards the southeastern end of the property. The site currently contains numerous wetlands that will be preserved or mitigated, in compliance with Department of State Lands and Army Corps of Engineers standards.

PROPOSAL

The proposed Planned Community will create a mixture of commercial development, single-family homes, cottage style single-family homes, affordable housing and multi-family homes. The proposed development includes 18 single-family homes on large lots, 230 cottage homes, and 51 multi-family homes with modifications to the base zone's dimensions as permitted through the PUD process. The project will include a 4.4-acre parcel which has been created to allow for future commercial development.

The proposed neighborhood will feature active and passive open space areas for use by the residents. The proposed design includes a network of open spaces and wetlands, a thoughtfully linked pedestrian circulation system, and several pedestrian amenities. A neighborhood park is connected to the proposed development through a network of multi-use pathways which provide pedestrian circulation and recreation throughout the site. The development will utilize a network of public and private streets, as well as alleyways which will provide for additional on-street parking. Additional parking for residents has been provided in several off-street parking areas.

The project will include an affordable housing component. While affordable housing is not a required component of a submission for a Planned Unit Development or a Conditional Use Permit, the City does have an Affordable Housing Action Plan which identifies a significant shortage of affordably priced homes within the City and the Applicant said it would include this element. In recognition of the City's needs for affordable housing options, the Applicant proposes to create five percent of the single family detached homes with price reductions and deed restrictions designed to create perpetual affordability.

Affordable Housing is defined within the City's Affordable Housing Action Plan as when a family spends no more than 30% of its income for housing. The twelve single family homes created as part of this program will initially be marketed at rates which make them eligible for families earning less than the median family incomes as described within the Housing Action Plan's definitions of affordable housing. At closing, buyers will be required to sign covenants agreeing to limit the price of any future sale to a rate of appreciation which is tied to either the Area Median Family Income rate or another acceptable index of income. The Applicant plans to work with the Housing Authority of Yamhill County and the City's Affordable Housing

Ad Hoc Committee to refine the covenants which will be recorded with the sale of these units and to eventually find parties which may qualify for the purchase of affordable houses. The proposed affordable homes will require owner occupation and will be constructed at various locations throughout the development.

APPLICABLE CRITERIA

The following sections of Newberg's and Development Code have been extracted as they have been deemed to be applicable to the proposal. Following each bold applicable criteria or design standard, the Applicant has provided a series of draft findings. The intent of providing code and detailed responses and findings is to document, with absolute certainty, that the proposed development has satisfied the approval criteria for a Planned Unit Development and a Conditional Use Permit.

TITLE 15 DEVELOPMENT CODE

Division 15.200 Land Use Applications

15.225 Conditional Use Procedures
15.225.010 Description and purpose.
A. It is recognized that certain types of uses require special consideration prior to their being permitted in a particular district. The reasons for requiring such special consideration involves, among other things, the size of the area required for the full development of such uses, the nature of the traffic problems incidental to operation of the use, the effect such uses have on any adjoining land uses and on the growth and development of the community as a whole.

Applicant's Facts and Findings:	The proposal includes residential development in a commercial zoning district, requiring a conditional use permit. The applicable conditional use permit standards are addressed below. This standard is met.

B. All uses permitted conditionally are declared to be possessing such unique and special characteristics as to make impractical their being included as outright uses in any of the various districts herein defined. The authority for the location and operation of the uses shall be subject to review and the issuance of a conditional use permit. The purpose of review shall be to determine that the characteristics of any such use shall be reasonably compatible with the type of uses permitted in surrounding areas, and for the further purpose of stipulating such conditions as may be reasonable so that the basic purposes of this code shall be served. Nothing construed herein shall be deemed to require the hearing body to grant a conditional use permit.

Applicant's Facts and Findings:	The development of residential housing in the C-2 (Commercial) zoning district requires a conditional use permit. The Conditional Use Permit is used in this scenario to ensure that density, lot coverage, parking, vehicular access, pedestrian and bicycle connectivity, and other residential characteristics are developed to be compatible with surrounding land uses. This standard is met.

1**5.225.020 Conditional use permit prerequisite to building.**

No building permit shall be issued when a conditional use permit is required by the terms of this code unless a permit has been granted by the hearing body and then only in accordance with the terms and conditions of the conditional use permit. Conditional use permits may be temporary or permanent for any use or purpose for which such permits are required or permitted by provisions of this code.

Applicant's Facts and Findings:	This land use application proposes a permanent conditional use permit for residential development in the C-2 zoning district. Building permits have not been issued for this development. This standard is met.

15.225.030 Application.

Application for a conditional use permit shall be accompanied by such information including, but not limited to, site and building plans, drawings and elevations, and operational data, as may be required by the director to allow proper evaluation of the proposal. The plan submittal requirements identified in NMC 15.220.030 and 15.445.190 shall be used as a guide. All proposals for conditional use permit shall be accompanied by a detailed project description which includes information such as the use, information relating to utilities, the number of employees, the hours of operation, traffic information, odor impacts, and other information needed to adequately describe the project.

Applicant's Facts and Findings:	The proposed Conditional Use Permit includes all information necessary for a complete and thorough review. This standard is met.

15.225.040 Concurrent design review.

If new buildings or structures are to be included as part of the application, the planning commission shall concurrently review the application for site design review in order to streamline the review process.

Applicant's Facts and Findings:	The proposed Conditional Use Permit includes a proposed Planned Unit Development on the site with both single-family detached and multi-family housing. The review of the CUP is proposed concurrent with the PUD. This standard is met.

15.225.050 Additional information.

In order to fully evaluate the proposal, additional information may be required. This includes but is not limited to traffic studies, noise studies, visual analysis, and other site impact studies as determined by the director or planning commission.

Applicant's Facts and Findings:	The proposal includes a traffic study and materials display boards. Noise studies are not necessary based on the residential proposal.

This standard is met.

15.225.060 General conditional use permit criteria – Type III.
A conditional use permit may be granted through a Type III procedure only if the proposal conforms to all the following criteria:
A. The location, size, design and operating characteristics of the proposed development are such that it can be made reasonably compatible with and have minimal impact on the livability or appropriate development of abutting properties and the surrounding neighborhood, with consideration to be given to harmony in scale, bulk, coverage and density; to the availability of public facilities and utilities; to the generation of traffic and the capacity of surrounding streets, and to any other relevant impact of the development.
B. The location, design, and site planning of the proposed development will provide a convenient and functional living, working, shopping or civic environment, and will be as attractive as the nature of the use and its location and setting warrants.
C. The proposed development will be consistent with this code.

Applicant's Facts and Findings:

The proposed residential development on this site will allow a gradual transition from the residentially-developed properties to the north and west toward the 4.4-acre retail commercial designated pad adjacent to Highway 99W. The large-lot single-family detached properties immediately adjacent to the site will be buffered by large-lot single-family detached homes. Higher-density single-family detached housing will be located central to the site and adjacent to the park on the western property boundary. The two proposed multi-family buildings are in the southeast corner of the site, adjacent to Highway 99W and near the proposed retail commercial area to be developed at a later date.

This "stair step" approach to lot size and density will serve to ensure harmony in scale, bulk, coverage and density while the multi-family near commercial will provide a convenient and functional living, working and shopping environment. All homes in the site have access via sidewalk to Spring Meadow Park and further into the City of Newberg, satisfying the requirement that the conditional use permit provide a convenient and functional civic environment.

As shown on the included design and materials boards, the proposed development includes a high level of residential design to reflect the location of the development at the eastern entry to the City of Newberg. Materials such as wood, stone, brick and northwest-style siding are all utilized to blend the site to both the natural and built surrounding areas.

Findings are made regarding all applicable sections of the Newberg Development Code throughout this narrative. As identified the findings of each individual code section, the proposed Planned Unit Development and Conditional Use Permit meet all applicable sections of the Newberg Development Code.

This standard has been met.

15.225.080 Conditions.

The hearing body shall designate conditions in connection with the conditional use permit deemed necessary to secure the purpose of this chapter and the general conditional use permit criteria and require the guarantees and evidence that such conditions will be complied with. Such conditions may include:

A. Regulation of uses.

B. Special yards, spaces

C. Fences and walls.

D. Surfacing of parking areas to city specifications.

E. Street dedications and improvements (or bonds).

F. Regulation of points of vehicular ingress and egress.

G. Regulation of signs.

H. Landscaping and maintenance of landscaping.

I. Maintenance of the grounds.

J. Regulation of noise, vibration, odors or other similar nuisances.

K. Regulation of time for certain activities.

L. Time period within which the proposed use shall be developed.

M. Duration of use.

N. Such other conditions as will make possible the development of the city in an orderly and efficient manner in conformity with the Newberg comprehensive plan and the Newberg development code.

Applicant's Facts and Findings:	The Conditional Use Permit is required for residential development within the C-2 (Commercial) zoned portion of this site. The proposed residential development includes appropriate yards and spaces, parking areas, ingress and egress, landscaping, vehicular, pedestrian and bicycle connectivity and maintenance plans to ensure compliance with this Section of the Code. Additional conditions are not warranted to secure the purpose of the Conditional Use Permit chapter. This standard is met.

15.225.090 Development in accord with plans.

Construction, site development, and landscaping shall be carried out in substantial accord with the plans, drawings, conditions, sketches, and other documents approved as part of a final decision on a conditional use permit.

Applicant's Facts and Findings:	It is feasible for the Applicant to carry out development of the site in substantial accord with the plans, drawings, sketches and other documents approved as part of this final decision on the Conditional Use Permit. This standard is met.

15.225.100 Conditional use permit must be exercised to be effective.

A. A conditional use permit granted under this code shall be effective only when the exercise of the right granted thereunder shall be commenced within one year from the effective date of the decision. The director under a Type I procedure may grant an extension for up to six months if the applicant files a request in writing prior to the expiration of the approval and demonstrates compliance with the following:

1. **The land use designation of the property has not been changed since the initial use permit approval; and**
2. **The applicable standards in this code which applied to the project have not changed.**

B. In case such right is not exercised, or extension obtained, the conditional use permit decision shall be void. Any conditional use permit granted pursuant to this code is transferable to subsequent owners or contract purchasers of the property unless otherwise provided at the time of granting such permit.

Applicant's Facts and Findings:	The Applicant acknowledges that the Conditional Use Permit approval is valid for one year if an extension is not requested. The Applicant intends to begin construction of the residential development on this site within one year of the approval date. If unforeseen delay is encountered, an extension request will be filed in writing prior to the expiration date. This standard is met.

15.225.110 Preexisting uses now listed as a conditional use.

Where a use is legally established and continuing, but that use currently would require a conditional use permit, the use shall be considered as having a conditional use permit under the terms of the prior permit approval. Any nonconforming site development shall be subject to the provisions of Chapter 15.205 NMC.

Applicant's Facts and Findings:	This proposal does not include a preexisting use now listed as a conditional use and, as such, this standard is not applicable.

15.240 PD Planned Unit Development Regulations

15.240.010 Purpose.

The city's planned unit development regulations are intended to:

A. Encourage comprehensive planning in areas of sufficient size to provide developments at least equal in the quality of their environment to traditional lot-by-lot development and that are reasonably compatible with the surrounding area; and

B. Provide flexibility in architectural design, placement and clustering of buildings, use of open space and outdoor living areas, and provision of circulation facilities, parking, storage and related site and design considerations; and

C. Promote an attractive, safe, efficient and stable environment which incorporates a compatible variety and mix of uses and dwelling types; and

D. Provide for economy of shared services and facilities; and

E. Implement the density requirements of the comprehensive plan and zoning districts through the allocation of the number of permitted dwelling units based on the number of bedrooms provided.

Applicant's Facts and Findings:	The Applicant proposes a residential Planned Unit Development (PUD) meeting the stated purposes of the PUD regulations. This site is of sufficient size as to warrant comprehensive planning rather than traditional lot-by-lot development. The Applicant proposes flexibility in placement and clustering of buildings, use of open space, circulation, parking and density to promote a safe, attractive, efficient and stable residential environment adjacent to a highway facility and a future commercial development. This standard is met.

15.240.020 General provisions.

A. Ownership. Except as provided herein, the area included in a proposed planned unit development must be in single ownership or under the development control of a joint application of owners or option holders of the property involved.

Applicant's Facts and Findings:	The area included in the planned unit development is in single ownership. This standard is met.

B. Processing Steps – Type III. Prior to issuance of a building permit, planned unit development applications must be approved through a Type III procedure and using the following steps:

1. **Step One – Preliminary Plans. Consideration of applications in terms of on-site and off-site factors to assure the flexibility afforded by planned unit development regulations is used to preserve natural amenities; create an attractive, safe, efficient, and stable environment; and assure reasonable compatibility with the surrounding area. Preliminary review necessarily involves consideration of the off-site impact of the proposed design, including building height and location.**
2. **Step Two – Final Plans. Consideration of detailed plans to assure substantial conformance with preliminary plans as approved or conditionally approved. Final plans need not include detailed construction drawings as subsequently required for a building permit.**

Applicant's Facts and Findings:	The Applicant acknowledges the two-step process to PUD approval and submits materials in support of Step One- Preliminary Plans. This standard is met.

C. Phasing. If approved at the time of preliminary plan consideration, final plan applications may be submitted in phases. If preliminary plans encompassing only a portion of a site under single ownership are submitted, they must be accompanied by a statement and be sufficiently detailed to prove that the entire area can be developed and used in accordance with city standards, policies, plans and ordinances.

Applicant's Facts and Findings:	The Applicant acknowledges the process for phasing of final plan applications. This standard is met.

D. Lapse of Approval. If the applicant fails to submit material required for consideration at the next step in accordance with the schedule approved at the previous step or, in the absence of a specified schedule, within one year of such approval, the application as approved at the previous step expires. If the applicant fails to obtain a building permit for construction in accordance with the schedule as previously approved, or in the absence of a specified schedule, within three years of a preliminary plan approval, preliminary and final plan approvals expire. Prior to expiration of plan approval at any step, the hearing authority responsible for approval may, if requested, extend or modify the schedule, providing it is not detrimental to the public interest or contrary to the findings and provisions specified herein for planned unit developments. Unless the preliminary plan hearing authority provides to the contrary, expiration of final plan approval of any phase automatically renders all phases void that are not yet finally approved or upon which construction has not begun.

Applicant's Facts and Findings:	The Applicant acknowledges the process for lapse of PUD approval and intends to follow through with development of the site based on the original approval timeline. This standard is met.

E. Resubmittal Following Expiration. Upon expiration of preliminary or final plan approval, a new application and fee must be submitted prior to reconsideration. Reconsideration shall be subject to the same procedures as an original application.

Applicant's Facts and Findings:	The Applicant acknowledges the process for resubmittal following expiration. This standard is met.

F. Density. Except as provided in NMC 15.302.040 relating to subdistricts, dwelling unit density provisions for residential planned unit developments shall be as follows:

1. **Maximum Density.**
    a. **Except as provided in adopted refinement plans, the maximum allowable density for any project shall be as follows:**

District	**Density Points**
R-1	**175 density points per <u>gross acre</u>, as calculated in subsection (F)(1)(b) of this section**
R-2	**310 density points per <u>gross acre</u>, as calculated in subsection (F)(1)(b) of this section**

R-3	**640 density points per gross acre, as calculated in subsection (F)(1)(b) of this section**
RP	**310 density points per gross acre, as calculated in subsection (F)(1)(b) of this section**
C-1	**As per required findings**
C-2	**As per required findings**
C-3	**As per required findings**

b. **Density point calculations in the following table are correlated to dwellings based on the number of bedrooms, which for these purposes is defined as an enclosed room which is commonly used or capable of conversion to use as sleeping quarters. Accordingly, family rooms, dens, libraries, studies, studios, and other similar rooms shall be considered bedrooms if they meet the above definitions, are separated by walls or doors from other areas of the dwelling and are accessible to a bathroom without passing through another bedroom. Density points may be reduced at the applicant's discretion by 25 percent for deed-restricted affordable dwelling units as follows:**

Density Point Table

Dwelling Type	Density Points: Standard Dwelling	Density Points: Income-Restricted Affordable Dwelling Units
Studio and Efficiency	12	9
One-bedroom	14	11
Two-bedroom	21	16
Three-bedroom	28	21
Four or more bedroom	35	26

The density points in the right-hand column are applicable to income-restricted affordable dwelling units, provided the dwelling units meet the affordability criteria under NMC 15.242.030 regarding affordable housing requirements for developments using the flexible development standards.

2. **Approved Density. The number of dwelling units allowable shall be determined by the hearing authority in accordance with the standards set forth in these regulations. The hearing authority may change density subsequent to preliminary plan approval only if the reduction is necessary to comply with required findings for preliminary plan approval or if conditions of preliminary plan approval cannot otherwise be satisfied.**
3. **Easement Calculations. Density calculations may include areas in easements if the applicant clearly demonstrates that such areas will benefit residents of the proposed planned unit development.**
4. **Dedications. Density calculations may include areas dedicated to the public for recreation or open space.**
5. **Cumulative Density. When approved in phases, cumulative density shall not exceed the overall density per acre established at the time of preliminary plan approval.**

Applicant's Facts and Findings: This narrative includes a Density Matrix, identifying the total number of density points available to this site vs. the total number of density points necessary to develop the site as proposed. The C-2 zoning district is proposed at the same maximum allowable density as the R-3 zoning district, or 640 points per acre. The total number of density points available to this site, as detailed on the Density Matrix, is 11,859.85. The total number and type of residential dwelling units proposed requires 9,085 density points, which is less than the number of points available to this site.

This standard is met.

G. Buildings and Uses Permitted. Buildings and uses in planned unit developments are permitted as follows:

1. **R-1, R-2, R-3 and RP Zones.**
    a. **Buildings and uses permitted outright or conditionally in the use district in which the proposed planned unit development is located.**
    b. **Accessory buildings and uses.**
    c. **Duplexes.**
    d. **Dwellings, single, manufactured, and multifamily.**
    e. **Convenience commercial services which the applicant proves will be patronized mainly by the residents of the proposed planned unit development.**

Applicant's Facts and Findings: The proposal includes single-family detached and multi-family residential uses within the R-1 and R-2 portions of this site, both of which are permitted by subsection d. above.

This standard is met.

2. **C-1, C-2 and C-3 Zones.**
    a. **When proposed as a combination residential-commercial planned unit development, uses and buildings as listed in subsection (G)(1) of this section and those listed as permitted outright or conditionally in the use district wherein the development will be located.**
    b. **When proposed as a residential or commercial planned unit development, uses and buildings as permitted outright or conditionally in the use district wherein the development will be located.**

Applicant's Facts and Findings: The proposed Planned Community will create a mixture of commercial development, single-family homes, cottage style single-family homes, affordable housing and multi-family homes. All uses proposed are permitted either outright or conditionally for the C-2 portion of this property, in compliance with subsections a. and b. above.

This standard is met.

3. **M-1, M-2 and M-3 Zones. Uses and buildings as permitted outright or conditionally in the use district wherein the development will be located.**

4. **M-4 Zone. Uses and buildings as permitted outright or conditionally in the use district wherein the development will be located. Proposed sites, structures and uses must work together to support a common theme, product or industry. Applicants for an industrial planned development in M-4 must demonstrate conformance with any adopted master plan for the subject area and provide a plan describing how the proposed structures and uses will work together to support a common theme, product or industry. Prior to subdivision, covenants must limit occupancy to the types of industrial and related uses identified in the development plan.**

Applicant's Facts and Findings:	No part of this site is located within the M-1, M-2, M-3 or M-4 zoning district and, as such, this standard is not applicable.

H. Professional Coordinator and Design Team. Professional coordinators and design teams shall comply with the following:

1. **Services. A professional coordinator, licensed in the State of Oregon to practice architecture, landscape architecture or engineering, shall ensure that the required plans are prepared. Plans and services provided for the city and between the applicant and the coordinator shall include:**
    a. **Preliminary design;**
    b. **Design development;**
    c. **Construction documents, except for single-family detached dwellings and duplexes in subdivisions; and**
    d. **Administration of the construction contract, including, but not limited to, inspection and verification of compliance with approved plans.**
2. **Address and Attendance. The coordinator or the coordinator's professional representative shall maintain an Oregon address, unless this requirement is waived by the director. The coordinator or other member of the design team shall attend all public meetings at which the proposed planned unit development is discussed.**
3. **Design Team Designation. Except as provided herein, a design team, which includes an architect, a landscape architect, engineer, and land surveyor, shall be designated by the professional coordinator to prepare appropriate plans. Each team member must be licensed to practice the team member's profession in the State of Oregon.**
4. **Design Team Participation and Waiver. Unless waived by the director upon proof by the coordinator that the scope of the proposal does not require the services of all members at one or more steps, the full design team shall participate in the preparation of plans at all three steps.**
5. **Design Team Change. Written notice of any change in design team personnel must be submitted to the director within three working days of the change.**

6. **Plan Certification. Certification of the services of the professionals responsible for particular drawings shall appear on drawings submitted for consideration and shall be signed and stamped with the registration seal issued by the State of Oregon for each professional so involved. To assure comprehensive review by the design team of all plans for compliance with these regulations, the dated cover sheet shall contain a statement of review endorsed with the signatures of all designated members of the design team.**

Applicant's Facts and Findings: This Planned Unit Development application includes all of the required plans and documents. A professional engineer in the State of Oregon has ensured that all required plans are prepared, certified as necessary and submitted. The Applicant acknowledges the process for a design team change.

This standard is met.

I. Modification of Certain Regulations. Except as otherwise stated in these regulations, fence and wall provisions, general provisions pertaining to height, yards, area, lot width, frontage, depth and coverage, number of off-street parking spaces required, and regulations pertaining to setbacks specified in this code may be modified by the hearing authority, provided the proposed development will be in accordance with the purposes of this code and those regulations. Departures from the hearing authority upon a finding by the engineering director that the departures will not create hazardous conditions for vehicular or pedestrian traffic. Nothing contained in this subsection shall be interpreted as providing flexibility to regulations other than those specifically encompassed in this code.

Applicant's Facts and Findings: This Planned Unit Development proposal seeks to modify the lot size standards of the R-1, R-2 and C-2 zoning districts. The PUD further seeks to modify the minimum lot sizes, minimum lot dimensions, minimum lot frontages, maximum lot and parking area coverage and minimum setback standards. The proposed modifications are shown on the attached preliminary site plan and plat and are intended to allow for the development of smaller residential lots, allowing a lower price-point than homes built in similar zoning districts. The creativity in site design also allows for the provision of parks and open space facilities exceeding those of a typical subdivision. And finally, varying the standards allows for the construction of a street network exceeding that of a typical residential subdivision.

The proposed modifications are in accordance with the purposes of this code as they support the efficient development of land within the City Limits, provide functional, attractive housing for the residents of the City and include safe, convenient, efficient transportation design.

This standard is met.

J. Lot Coverage. Maximum permitted lot and parking area coverage as provided in this code shall not be exceeded unless specifically permitted by the hearing authority in accordance with these regulations.

Applicant's Facts and Findings: The maximum permitted lot coverage is requested to be exceeded in conjunction with the Planned Unit Development request. The Applicant proposes a coverage of up to 60% throughout the plan area. The smaller lot sizes allow for the provision of a more affordable housing stock and the increased parking ensures an adequate supply for residents and visitors. The Applicant requests these exceptions be specifically permitted by the Planning Commission in reviewing the Planned Unit Development and Conditional Use Permit request.

This standard is met.

K. Height. Unless determined by the hearing authority that intrusion of structures into the sun exposure plane will not adversely affect the occupants or potential occupants of adjacent properties, all buildings and structures shall be constructed within the area contained between lines illustrating the sun exposure plane (see Appendix A, Figure 8 and the definition of "sun exposure plane" in NMC 15.05.030). The hearing authority may further modify heights to:

1. **Protect lines of sight and scenic vistas from greater encroachment than would occur as a result of conventional development.**
2. **Protect lines of sight and scenic vistas.**
3. **Enable the project to satisfy required findings for approval.**

Applicant's Facts and Findings: This proposed residential Planned Unit Development includes three story single-family residential structures with reduced setbacks. This development type allows the developer to provide the housing at an approachable price point, complete the much-needed transportation system for the area and provide parks and open spaces for the residents of this and neighboring developments. Communities of this nature exist in several areas and sun exposure is not known to be a significant issue in other communities. Each unit will have access to the sun from the southern sky and will have opportunities to enjoy the benefit of the sun's light and warmth.

No modifications to the heights within the proposed development is necessary, nor are any protected lines of site to preserve scenic vistas.

This standard is met.

L. Dedication, Improvement and Maintenance of Public Thoroughfares. Public thoroughfares shall be dedicated, improved and maintained as follows:

1. **Streets and Walkways. Including, but not limited to, those necessary for proper development of adjacent properties. Construction standards that minimize maintenance and protect the public health and safety, and setbacks as specified in NMC 15.410.050, pertaining to special setback requirements to planned rights-of-way, shall be required.**
2. **Notwithstanding subsection (L)(1) of this section, a private street may be approved if the following standards are satisfied.**

a. An application for approval of a PUD with at least 50 dwelling units may include a private street and the request for a private street shall be supported by the evidence required by this section. The planning commission may approve a private street if it finds the applicant has demonstrated that the purpose statements in NMC 15.240.010(A) through (D) are satisfied by the evidence in subsections (L)(2)(a)(i) through (v) of this section.

i. A plan for managing on-street parking, maintenance and financing of maintenance of the private street, including a draft reserve study showing that the future homeowners association can financially maintain the private street;

ii. A plan demonstrating that on- and off-street parking shall be sufficient for the expected parking needs and applicable codes;

iii. Proposed conditions, covenants and restrictions that include a requirement that the homeowners association shall be established in perpetuity and shall continually employ a community management association whose duties shall include assisting the homeowners association with the private street parking management and maintenance, including the enforcement of parking restrictions;

iv. Evidence that the private street is of sufficient width and construction to satisfy requirements of the fire marshal and cityengineer; and

v. The PUD shall be a Class I planned community as defined in ORS Chapter 94.

b. If the PUD is established, the homeowners association shall provide an annual written report on the anniversary date of the final approval of the PUD approval to the community development director that includes the following:

i. The most recent reserve study.

ii. The name and contact information for the retained community management association.

iii. A report on the condition of the private street and any plans for maintenance of the private street.

3. **Easements. As are necessary for the orderly extension of public utilities and bicycle and pedestrian access.**

Applicant's Facts and Findings:

This proposed PUD includes a mixture of public and private streets. As identified in subsection L.2 above, private streets may be approved if:

- a PUD proposes at least 50 dwelling units,
- has provided a plan for on-street parking, maintenance and financing of maintenance of the private street,
- demonstrates sufficient parking,
- includes CCRs addressing the private street,
- is constructed to proper standards, and
- the PUD is a Class I planned community as defined in ORS Ch. 94.

The proposal meets all of the criteria for private streets identified above. The purpose statements in NMC 15.240.010(A) through (D) include:

- encourage comprehensive planning in areas of sufficient size…
- provide flexibility in architectural design, placement and clustering of buildings, use of open space and outdoor living areas, and provision of

circulation facilities, parking, storage and related site and design considerations
- promote an attractive, safe, efficient and stable environment…and
- provide for economy of shared services and facilities.

The proposed PUD is of a sufficient size to warrant comprehensive planning that is similar to traditional lot-by-lot developments in the same zoning and compatible with the surrounding environment. The inclusion of private streets makes it feasible to preserve more of the natural areas on the site. The housing design and placement, open space and outdoor living areas, circulation, parking and storage on this site are all designed to work together to form a cohesive neighborhood feel. The shared services and facilities within the development include the private streets, parking areas and open spaces. The adjacent commercial development that will be added in the future will allow for shared services as well.

All public streets are designed to City standards and proposed to be dedicated to the City.

The proposal includes all of the necessary materials to approve both the public and private streets.

This standard is met.

M. Underground Utilities. Unless waived by the hearing authority, the developer shall locate all on-site utilities serving the proposed planned unit development underground in accordance with the policies, practices and rules of the serving utilities and the Public Utilities Commission.

Applicant's Facts and Findings: The proposal includes all on-site utilities located underground.

This standard is met.

N. Usable Outdoor Living Area. All dwelling units shall be served by outdoor living areas as defined in this code. Unless waived by the hearing authority, the outdoor living area must equal at least 10 percent of the gross floor area of each unit. So long as outdoor living area is available to each dwelling unit, other outdoor living space may be offered for dedication to the city, in fee or easement, to be incorporated in a city-approved recreational facility. A portion or all of a dedicated area may be included in calculating density if permitted under these regulations.

Applicant's Facts and Findings: All dwelling units are served by outdoor living areas equal to at least 10 percent of the gross floor area of each unit. The single-family units will have outdoor living on individual lots. The multi-family will utilize a combination of balconies and porches as well as common outdoor living areas located throughout the overall planned unit development.

This standard is met.

O. Site Modification. Unless otherwise provided in preliminary plan approval, vegetation, topography and other natural features of parcels proposed for development shall remain substantially unaltered pending final plan approval.

Applicant's Facts and Findings:	This site contains several wetlands which will be a combination of preserved on site and mitigated off-site. The permitting for this is occurring separate from the land use review. This is the only substantial change to the natural features of the site. This standard is met.

P. Completion of Required Landscaping. If required landscaping cannot be completed prior to occupancy, or as otherwise required by a condition of approval, the director may require the applicant to post a performance bond of a sufficient amount and time to assure timely completion.

Applicant's Facts and Findings:	The Applicant acknowledges the possibility of a performance bond being required to assure timely completion of any delayed landscaping. This standard is met.

Q. Design Standards. The proposed development shall meet the design requirements for multifamily residential projects identified in NMC 15.220.060. A minimum of 40 percent of the required points shall be obtained in each of the design categories.

Applicant's Facts and Findings:	There are 23 possible site design points and 23 possible building design points, therefore, this project must obtain 9 each site design and building design points (40% of each). <u>Site Design:</u> Consolidated green space: 3 points Parking lot to the back of project when viewed from 99W: 3 points Good-quality coordinated site landscaping: 2 points Landscaped Edges of Parking Lots: 2 points Street trees: 1 point Entry Accents to mark major entries to multi-family buildings: 1 point Appropriate Outdoor Lighting: 1 point Total Site Design Points: 13 <u>Building Design:</u> Respect scale and patterns of nearby buildings by reflecting architectural styles, building details, materials and scale of existing buildings: 3 points Break up large buildings into bays/vary planes at least every 50 feet: 3 points Provide variation in repeated units using color, porches, balconies, windows, railings, building materials and form, alone or in combination: 3 points

Building materials: Wood or wood-like siding applied horizontally or vertically as board and batten at entry ways; shingles, as roofing; wood or wood-like sash windows; and wood or wood-like trim: 4 points
A porch at every main entry: 2 points
Total Building Design Points: 15

This standard is met as described above.

15.240.030 Preliminary plan consideration – Step one.
A. Preapplication Conference. Prior to filing an application for preliminary plan consideration, the applicant or coordinator may request through the director a preapplication conference to discuss the feasibility of the proposed planned unit development and determine the processing requirements.

Applicant's Facts and Findings:	The Applicant attended a pre-application conference with the City on March 14, 2018. This standard is met.

B. Application. An application, with the required fee, for preliminary plan approval shall be made by the owner of the affected property, or the owner's authorized agent, on a form prescribed by and submitted to the director. Applications, accompanied by such additional copies as requested by the director for purposes of referral, shall contain or have attached sufficient information as prescribed by the director to allow processing and review in accordance with these regulations. As part of the application, the property owner requesting the planned development shall file a waiver stating that the owner will not file any demand against the city under Ballot Measure 49, approved November 6, 2007, that amended ORS Chapters 195 and 197 based on the city's decision on the planned development.

Applicant's Facts and Findings:	This land use application includes all required fees, forms and documentation for review of the Planned Unit Development and Conditional Use requests. This standard is met.

C. Type III Review and Decision Criteria. Preliminary plan consideration shall be reviewed through the Type III procedure. Decisions shall include review and recognition of the potential impact of the entire development, and preliminary approval shall include written affirmative findings that:

1. **The proposed development is consistent with standards, plans, policies and ordinances adopted by the city; and**

Applicant's Facts and Findings:	As described in this narrative, the proposed development is consistent with standards, plans, policies and ordinances adopted by the City.

This standard is met.

2. **The proposed development's general design and character, including but not limited to anticipated building locations, bulk and height, location and distribution of recreation space, parking, roads, access and other uses, will be reasonably compatible with appropriate development of abutting properties and the surrounding neighborhood; and**

Applicant's Facts and Findings: As discussed previously, the proposed PUD includes larger lot single-family detached homes along the northern property line, separating this development from a single-family detached development. Lot sizes will then decrease as one heads south into the site, with two multi-family residential buildings constructed in the southeast corner of the site. The homes on the site will all be designed and constructed so as to provide a cohesive design and character to the entire development. The distribution of recreation space, parking, roads, access and other uses is reasonably compatible with the appropriate development of abutting properties and the surrounding neighborhood.

This standard is met.

3. **Public services and facilities are available to serve the proposed development. If such public services and facilities are not at present available, an affirmative finding may be made under this criterion if the evidence indicates that the public services and facilities will be available prior to need by reason of:**
   a. **Public facility planning by the appropriate agencies; or**
   b. **A commitment by the applicant to provide private services and facilities adequate to accommodate the projected demands of the project; or**
   c. **Commitment by the applicant to provide for offsetting all added public costs or early commitment of public funds made necessary by the development; and**

Applicant's Facts and Findings: Public services and facilities are either available to serve the proposed development or can be reasonably conditioned to be installed and provided. The public improvement plans included with the land use submittal demonstrate full public facilities will be provided, including water, sanitary sewer, storm sewer, electricity and natural gas. Public services are currently available to serve this site, including police, fire, garbage/recycling and US Mail.

This standard is met.

4. **The provisions and conditions of this code have been met; and**

Applicant's Facts and Findings: As discussed in detail in this narrative, the provisions and conditions of this code have been met.

This standard is met.

5. **Proposed buildings, roads, and other uses are designed and sited to ensure preservation of features, and other unique or worthwhile natural features and to prevent soil erosion or flood hazard; and**

Applicant's Facts and Findings: The buildings, roads and other site features are located so as to preserve several wetlands and natural features and to prevent soil erosion or flood hazard.

This standard is met.

6. **There will be adequate on-site provisions for utility services, emergency vehicular access, and, where appropriate, public transportation facilities; and**

Applicant's Facts and Findings: The site is well provisioned for utility services, emergency vehicular access and, if the opportunity arises in the future, public transportation facilities. The public roadways are designed to public street standards and the private streets are designed to provide vehicular access. The application includes a letter from Tualatin Valley Fire & Rescue indicating that the private streets are adequate for emergency vehicle access.

This standard is met.

7. **Sufficient usable recreation facilities, outdoor living area, open space, and parking areas will be conveniently and safely accessible for use by residents of the proposed development; and**

Applicant's Facts and Findings: The proposed neighborhood will feature active and passive open space areas for use by the residents. The proposed design includes a civic use park which has been envisioned to provide space for community events as well as a space for featured local vendors. A smaller neighborhood park is connected to the proposed development through a network of multi-use pathways which provide pedestrian circulation and recreation throughout the site. The proposal includes multiple open spaces, most of which include a trail system within. The multi-family housing has common outdoor living areas, as well as balconies and patios for some individual units. The single-family housing has outdoor living areas adjacent to the homes.

This standard is met.

8. **Proposed buildings, structures, and uses will be arranged, designed, and constructed so as to take into consideration the surrounding area in terms of access, building scale, bulk, design, setbacks, heights, coverage, landscaping and screening, and to assure reasonable privacy for residents of the development and surrounding properties.**

Applicant's Facts and Findings: This site has been designed reflect the surrounding area and to provide a reasonable level of privacy for residents of the development and surrounding properties. Large lot single-family detached dwellings are proposed along the northern property line, separating this development from another large lot residential development, easing the transition from lower density to higher. The site is buffered from the residential developments to the west by the park that is adjacent to the site. The site as a whole is designed to provide safe and convenient access. The building scale, bulk, design, setbacks, heights, coverage, landscaping and screening are designed to provide harmony within the site while respecting and reflecting design patterns utilized in other nearby developments.

This standard is met.

D. Conditions. Applications may be approved subject to conditions necessary to fulfill the purpose and provisions of these regulations.

Applicant's Facts and Findings: The Applicant acknowledges the possibility of conditions imposed to fulfill the purpose and provisions of the PUD regulations. However, based on the findings identified in this narrative, the Applicant finds the proposal in full compliance with the PUD standards.

This standard is met.

15.240.040 Final plan consideration – Step two.
A. Application. An application, with the required fee, for final plan approval shall be submitted in accordance with the provisions of this code, and must be in compliance with all conditions imposed and schedules previously prescribed.

B. Referral. Referral of final plans and supportive material shall be provided to appropriate agencies and departments.

C. Decision Type I Procedure. The final plan consideration shall be reviewed through the Type I procedure. Upon receipt of the application and fee, final plans and required supportive material, the director shall approve, conditionally approve or deny the application for final plan approval. The decision of the director to approve or deny the application shall be based on written findings of compliance or noncompliance with approved preliminary plans and city standards, plans, policies and ordinances. Minor variations from approved preliminary plans may be permitted if consistent with the general character of the approved preliminary plans.

D. Conditions. Applications may be approved subject to such conditions as are necessary to fulfill the purpose and provisions of this code.

1. **Preparation and Signatures. A duly notarized performance agreement binding the applicant, and the applicant's successors in interest, assuring construction and performance in accordance with the approved final plans shall be prepared by the city and executed by the applicant and city prior to issuance of a building permit.**

2. **Return. Unless an executed copy of the agreement is returned to the director within 60 days of its delivery to the applicant, final plan approval shall expire, necessitating the reapplication for final plan reapproval.**
3. **Filing. The director shall file a memorandum of the performance agreement with the Yamhill County recorder.**
4. **Improvement Petitions and Dedications. Improvement petitions and all documents required with respect to dedications and easements shall be submitted prior to completion of the agreement.**
5. **Project Changes. The director may permit project changes subsequent to execution of the agreement upon finding the changes substantially conform to final approved plans and comply with city standards, plans, policies and ordinances. Other modifications are subject to reapplication at the appropriate step.**
6. **Compliance. Compliance with this section is a prerequisite to the issuance of a building permit.**

Applicant's Facts and Findings: The Applicant acknowledges the process for Step Two of a PUD review.

This standard is met.

Division 15.300 Zoning Districts

15.305 Zoning Use Table

Use	R-1	R-2	C-2
Residential Uses			
Dwelling, single-family detached	P(2)	P	C(4)
Dwelling, multifamily	C	P	C(4)
Parks and Open Spaces			
Open Space	P	P	P
Park	P	P	P

Notes.

(2) Limited to one per lot as a permitted use. More than one per lot allowed only through a conditional use permit or planned unit development, subject to density limits of NMC 15.405.010(B).

(4) The permitted density shall be stated on the conditional use permit.

Applicant's Facts and Findings: The proposed residential development requires a conditional use permit because a part of the site, including the area proposed for multi-family residential, is within the C-2 zoning district. Single-family residential development is permitted in the R-1 and R-2 zones. The Planned Unit Development proposes residential development, both single-family and multi-family, on all areas of the site (zoned R-1, R-2 and C-2).

As this application includes a conditional use permit application, this standard is met.

15.356 Bypass Interchange (BI) Overlay

Applicant's Facts and Findings: The frontage of this site is adjacent to the Bypass Interchange (BI) Overlay. While the provisions of the BI Overlay may apply to this site, the provisions only speak to permitted, conditional and prohibited uses. Residential development is a permitted use in the R-1 and R-2 zoning districts and a conditional use in the C-2 zoning district. Residential development is not prohibited in the BI Overlay.

This standard is met.

Division 15.400 Development Standards

15.405 Lot Requirements

15.405.010 Lot area – Lot areas per dwelling unit.

A. In the following districts, each lot or development site shall have an area as shown below except as otherwise permitted by this code:

1. **In the R-1 district, each lot or development site shall have a minimum area of 5,000 square feet or as may be established by a subdistrict. The average size of lots in a subdivision intended for single-family development shall not exceed 10,000 square feet.**
2. **In the R-2, R-3, and RP districts, each lot or development site shall have a minimum area of 3,000 square feet or as may be established by a subdistrict. In the R-2 and R-P districts, the average size of lots in a subdivision intended for single-family development shall not exceed 5,000 square feet.**
3. **In the AI, AR, C-1, C-2, and C-3 districts, each lot or development site shall have a minimum area of 5,000 square feet or as may be established by a subdistrict.**
4. **In the M-1, M-2 and M-3 districts, each lot or development site shall have a minimum area of 20,000 square feet.**
5. **Institutional districts shall have a minimum size of five contiguous acres in order to create a large enough campus to support institutional uses; however, additions to the district may be made in increments of any size.**
6. **Within the commercial zoning district(s) of the riverfront overlay subdistrict, there is no minimum lot size required, provided the other standards of this code can be met.**

Applicant's Facts and Findings: This application includes a Planned Unit Development (PUD) that proposes reduced lot sizes. The standards for a PUD are discussed previously in this narrative.

This standard is met.

B. Lot or Development Site Area per Dwelling Unit.

1. **In the R-1 district, there shall be a minimum of 5,000 square feet per dwelling unit.**
2. **In the R-2, AR, and R-P districts, there shall be a minimum of 3,000 square feet of lot or development site area per dwelling unit. In the R-2 and R-P districts, lots or development sites in excess of 15,000 square feet used for multiple single-family, duplex or multifamily dwellings shall be developed at a minimum of one dwelling per 5,000 square feet lot area.**
3. **In the R-3 district, there shall be a minimum of 1,500 square feet of lot or development site area per dwelling unit. Lots or development sites in excess of 15,000 square feet used for multiple single-family, duplex or multifamily dwellings shall be developed at a minimum of one dwelling per 2,500 square feet lot area.**

C. In calculating lot area for this section, lot area does not include land within public or private streets. In calculating lot area for maximum lot area/minimum density requirements, lot area does not include land within stream corridors, land reserved for public parks or open spaces, commons buildings, land for preservation of natural, scenic, or historic resources, land on slopes exceeding 15 percent or for avoidance of identified natural hazards, land in shared access easements, public walkways, or entirely used for utilities, land held in reserve in accordance with a future development plan, or land for uses not appurtenant to the residence.

D. Lot size averaging is allowed for any subdivision. Some lots may be under the minimum lot size required in the zone where the subdivision is located, as long as the average size of all lots is at least the minimum lot size.

Applicant's Facts and Findings:	This application includes a Planned Unit Development (PUD) that proposes reduced lots (development site areas). The standards for a PUD are discussed previously in this narrative. This standard is met.

15.405.020 Lot area exceptions.

The following shall be exceptions to the required lot areas:

A. Lots of record with less than the area required by this code.

B. Lots or development sites which, as a process of their creation, were approved in accordance with this code.

C. Planned unit developments, provided they conform to requirements for planned unit development approval.

Applicant's Facts and Findings:	This proposal complies with subsection C. of this criterion as a Planned Unit Development is proposed with conformity to all PUD requirements. This standard is met.

15.405.030 Lot dimensions and frontage.

A. Width. Widths of lots shall conform to the standards of this code.

B. Depth to Width Ratio. Each lot and parcel shall have an average depth between the front and rear lines of not more than two and one-half times the average width between the side lines. Depths of lots shall conform to the standards of this code. Development of lots under 15,000 square feet are exempt from the lot depth to width ratio requirement.

C. Area. Lot sizes shall conform to standards set forth in this code. Lot area calculations shall not include area contained in public or private streets as defined by this code.

D. Frontage.

1. **No lot or development site shall have less than the following lot frontage standards:**
    a. **Each lot or development site shall have either frontage on a public street for a distance of at least 25 feet or have access to a public street through an easement that is at least 25 feet wide. No new private streets, as defined in NMC 15.05.030, shall be created to provide frontage or access.**
    b. **Each lot in an R-2 and R-3 zone shall have a minimum width of 30 feet at the front building line.**
    c. **Each lot in an R-1, AI, or RP zone shall have a minimum width of 50 feet at the front building line.**
    d. **Each lot in an AR zone shall have a minimum width of 45 feet at the front building line.**
2. **The above standards apply with the following exceptions:**
    a. **Legally created lots of record in existence prior to the effective date of the ordinance codified in this code.**
    b. **Lots or development sites which, as a process of their creation, were approved with sub-standard widths in accordance with provisions of this code.**
    c. **Existing private streets may not be used for new dwelling units, except private streets that were created prior to March 1, 1999, including paving to fire access roads standards and installation of necessary utilities, and private streets allowed in the airport residential and airport industrial districts.**

Applicant's Facts and Findings:	This application includes a Planned Unit Development (PUD) that proposes reduced lot dimensions and frontage. Private streets are proposed to provide access to many of the lots in this development. Private streets are permitted as discussed previously in this narrative. The standards for a PUD are discussed previously in this narrative. This standard is met.

15.405.040 Lot coverage and parking coverage requirements.

A. Purpose. The lot coverage and parking coverage requirements below are intended to:

1. **Limit the amount of impervious surface and storm drain runoff on residential lots.**
2. **Provide open space and recreational space on the same lot for occupants of that lot.**
3. **Limit the bulk of residential development to that appropriate in the applicable zone.**

B. Residential uses in residential zones shall meet the following maximum lot coverage and parking coverage standards. See the definitions in NMC 15.05.030 and Appendix A, Figure 4.

1. **Maximum Lot Coverage.**
    a. **R-1: 30 percent, or 40 percent if all structures on the lot are one-story.**
    b. **R-2 and RP: 50 percent.**
    c. **AR and R-3: 50 percent.**
2. **Maximum Parking Coverage. R-1, R-2, R-3, and RP: 30 percent.**
3. **Combined Maximum Lot and Parking Coverage.**
    a. **R-1, R-2 and RP: 60 percent.**
    b. **R-3: 70 percent.**

C. All other districts and uses not listed in subsection (B) of this section shall not be limited as to lot coverage and parking coverage except as otherwise required by this code.

Applicant's Facts and Findings: This application includes a Planned Unit Development (PUD) that proposes an increase to the maximum lot coverage standards. This increase to the maximum is proposed to provide more housing options at an approachable price point, including some affordable housing. The standards for a PUD are discussed previously in this narrative.

This standard is met.

15.410 Yard Setback Requirements

15.410.010 General yard regulations.

A. No yard or open space provided around any building for the purpose of complying with the provisions of this code shall be considered as providing a yard or open space for any other building.

B. No yard or open space on adjoining property shall be considered as providing required yard or open space for another lot or development site under the provisions of this code.

C. No front yards provided around any building for the purpose of complying with the regulations of this code shall be used for public or private parking areas or garages, or other accessory buildings, except as specifically provided elsewhere in this code.

D. When the common property line separating two or more contiguous lots is covered by a building or a permitted group of buildings with respect to such common property line or lines does not fully conform to the required yard spaces on each side of such common property line or lines, such lots shall constitute a single development site and the yards as required by this code shall then not apply to such common property lines.

E. Dwellings Where Permitted above Nonresidential Buildings. The front and interior yard requirements for residential uses shall not be applicable; provided, that all yard requirements for the district in which such building is located are complied with.

F. In the AI airport industrial district, clear areas, safety areas, object-free areas, taxiways, parking aprons, and runways may be counted as required yards for a building, even if located upon an adjacent parcel.

G. In the AR airport residential district, clear areas, safety areas, object-free areas, taxiways, parking aprons, and runways may be counted as required yards for a building, if located upon an adjacent parcel.

15.410.020 Front yard setback.
A. Residential (see Appendix A, Figure 10).

1. **AR, R-1 and R-2 districts shall have a front yard of not less than 15 feet. Said yard shall be landscaped and maintained.**
2. **R-3 and RP districts shall have a front yard of not less than 12 feet. Said yard shall be landscaped and maintained.**
3. **The entrance to a garage or carport, whether or not attached to a dwelling, shall be set back at least 20 feet from the nearest property line of the street to which access will be provided. However, the foregoing setback requirement shall not apply where the garage or carport will be provided with access to an alley only.**

B. Commercial.

1. **All lots or development sites in the C-1 district shall have a front yard of not less than 10 feet. Said yard shall be landscaped and maintained.**
2. **All lots or development sites in the C-2 district shall have a front yard of not less than 10 feet. No parking shall be allowed in said yard. Said yard shall be landscaped and maintained.**
3. **All lots or development sites in the C-3 district shall have no minimum front yard requirements. The maximum allowable front yard shall be 20 feet. In the case of a through lot with two front yards, at least one front yard must meet the maximum setback requirement. In the case of three or more front yards, at least two front yards must meet the maximum setback requirements. No parking shall be allowed in said yard. Said yard shall be landscaped and maintained.**
4. **All lots or development sites in the C-4 district will comply with the front yard requirements described in NMC 15.352.040(E).**

15.410.030 Interior yard setback.
A. Residential.

1. **All lots or development sites in the AR, R‐1, R-2 and R-3 districts shall have interior yards of not less than five feet, except that where a utility easement is recorded adjacent to a side lot line, there shall be a side yard no less than the width of the easement.**
2. **All lots or development sites in the RP district shall have interior yards of not less than eight feet.**

B. Commercial.

1. **All lots or development sites in the C-1 and C-2 districts have no interior yards required where said lots or development sites abut property lines of commercially or industrially zoned property. When interior lot lines of said districts are common with property zoned**

residentially, interior yards of not less than 10 feet shall be required opposite the residential districts.

2. **All lots or development sites in the C-3 district shall have no interior yard requirements.**
3. **All lots or development sites in the C-4 district will comply with the interior yard requirements described in NMC 15.352.040(E).**

Applicant's Facts and Findings:	This application includes a Planned Unit Development (PUD) that proposes reduced yard setbacks. The reduced yard setbacks allow innovation in design and density of this site that promotes the purpose of the PUD to provide an approachable price point for housing, including some affordable housing. The standards for a PUD are discussed previously in this narrative. This standard is met.

15.410.060 Vision clearance setback.

The following vision clearance standards shall apply in all zones (see Appendix A, Figure 9).

A. At the intersection of two streets, including private streets, a triangle formed by the intersection of the curb lines, each leg of the vision clearance triangle shall be a minimum of 50 feet in length.

B. At the intersection of a private drive and a street, a triangle formed by the intersection of the curb lines, each leg of the vision clearance triangle shall be a minimum of 25 feet in length.

C. Vision clearance triangles shall be kept free of all visual obstructions from two and one-half feet to nine feet above the curb line. Where curbs are absent, the edge of the asphalt or future curb location shall be used as a guide, whichever provides the greatest amount of vision clearance.

D. There is no vision clearance requirement within the commercial zoning district(s) located within the riverfront (RF) overlay subdistrict.

Applicant's Facts and Findings:	The proposed development maintains all required vision clearance setbacks, as demonstrated on the submitted plans. This standard is met.

15.410.070 Yard exceptions and permitted intrusions into required yard setbacks.

The following intrusions may project into required yards to the extent and under the conditions and limitations indicated:

A. Depressed Areas. In any district, open work fences, hedges, guard railings or other landscaping or architectural devices for safety protection around depressed ramps, stairs or retaining walls may be located in required yards; provided, that such devices are not more than three and one-half feet in height.

B. Accessory Buildings. In front yards on through lots, where a through lot has a depth of not more than 140 feet, accessory buildings may be located in one of the required front yards; provided, that every portion of such accessory building is not less than 10 feet from the nearest street line.

C. Projecting Building Features. The following building features may project into the required front yard no more than five feet and into the required interior yards no more than two feet; provided, that such projections are no closer than three feet to any interior lot line:

1. **Eaves, cornices, belt courses, sills, awnings, buttresses or other similar features.**
2. **Chimneys and fireplaces, provided they do not exceed eight feet in width.**
3. **Porches, platforms or landings which do not extend above the level of the first floor of the building.**
4. **Mechanical structures (heat pumps, air conditioners, emergency generators and pumps).**

D. Fences and Walls.

1. **In the residential district, a fence or wall shall be permitted to be placed at the property line or within a yard setback as follows:**
    a. **Not to exceed six feet in height. Located or maintained within the required interior yards. For purposes of fencing only, lots that are corner lots or through lots may select one of the street frontages as a front yard and all other yards shall be considered as interior yards, allowing the placement of a six-foot fence on the property line. In no case may a fence extend into the clear vision zone as defined in NMC 15.410.060.**
    b. **Not to exceed four feet in height. Located or maintained within all other front yards.**
2. **In any commercial or industrial district, a fence or wall shall be permitted to be placed at the property line or within a yard setback as follows:**
    a. **Not to exceed eight feet in height. Located or maintained in any interior yard except where the requirements of vision clearance apply. For purposes of fencing only, lots that are corner lots or through lots may select one of the street frontages as a front yard and all other yards shall be considered as interior yards, allowing the placement of an eight-foot fence on the property line.**
    b. **Not to exceed four feet in height. Located or maintained within all other front yards.**
3. **If chain link (wire-woven) fences are used, they are manufactured of corrosion-proof materials of at least 11-1/2 gauge.**
4. **The requirements of vision clearance shall apply to the placement of fences.**

Applicant's Facts and Findings:	The Applicant acknowledges permitted intrusions into required yard setbacks. The fences surrounding the single-family residential in the R-1 and R-2 zoning areas will not exceed 6-feet in height. The fencing in the C-2 zoning areas will not exceed 8-feet in height. No fence exceeding 4-feet in height will be placed in a front yard setback. This standard is met.

E. Parking and Service Drives (Also Refer to NMC 15.440.010 through 15.440.080).

1. **In any district, service drives or accessways providing ingress and egress shall be permitted, together with any appropriate traffic control devices in any required yard.**
2. **In any residential district, public or private parking areas and parking spaces shall not be permitted in any required yard except as provided herein:**

a. **Required parking spaces shall be permitted on service drives in the required front yard in conjunction with any single-family or two-family dwelling on a single lot.**

b. **Recreational vehicles, boat trailers, camperettes and all other vehicles not in daily use are restricted to parking in the front yard setback for not more than 48 hours; and recreational vehicles, boat trailers, camperettes and all other vehicles not in daily use are permitted to be located in the required interior yards.**

c. **Public or private parking areas, parking spaces or any building or portion of any building intended for parking which have been identified as a use permitted in any residential district shall be permitted in any interior yard that abuts an alley, provided said parking areas, structures or spaces shall comply with NMC 15.440.070, Parking tables and diagrams (Diagrams 1 through 3).**

d. **Public or private parking areas, service drives or parking spaces which have been identified as a use permitted in any residential district shall be permitted in interior yards; provided, that said parking areas, service drives or parking spaces shall comply with other requirements of this code.**

3. **In any commercial or industrial district, except C-1, C-4 and M-1, public or private parking areas or parking spaces shall be permitted in any required yard (see NMC 15.410.030). Parking requirements in the C-4 district are described in NMC 15.352.040(H).**

4. **In the I district, public or private parking areas or parking spaces may be no closer to a front property line than 20 feet, and no closer to an interior property line than five feet.**

F. Public Telephone Booths and Public Transit Shelters. Public telephone booths and public transit shelters shall be permitted; provided, that vision clearance is maintained for vehicle requirements for vision clearance.

G. Hangars within the AR airport residential district may be constructed with no yard setbacks to property lines adjacent to other properties within the airport residential or airport industrial districts

Applicant's Facts and Findings: Parking is proposed on private lots in driveways, on-street parallel, on-street in perpendicular "bays", and in designated parking lots. There are a total of 246 parking spaces proposed to serve the residential development plus either one or two parking spaces per unit within the garages of the single family homes. The location of the proposed parking areas meets the requirements of this standard.

This standard is met.

15.415 Building and Site Design Standards

15.415.010 Main buildings and uses as accessory buildings.

A. Hereinafter, any building which is the only building on a lot is a main building.

B. In any residential district except RP, there shall be only one main use per lot or development site; provided, that home occupations shall be allowed where permitted.

C. In any residential district, there shall be no more than two accessory buildings on any lot or development site.

Applicant's Facts and Findings: The proposed residential development includes only main residential-use buildings at this time. The Applicant acknowledges that no more than two accessory buildings will be permitted on any lot in the R-zoned portions of the development.

This standard is met.

15.415.020 Building height limitation.

A. Residential.

1. **In the R-1, R-2, AR, and RP districts, no main building shall exceed 30 feet in height. Accessory buildings in the R-1, R-2, R-3, AR, and RP districts are limited to 16 feet in height, except as follows:**
   a. **Up to 800 square feet of an accessory building may have a height of up to 24 feet.**
   b. **Aircraft hangars in the AR district may be the same height as the main building.**
2. **In the R-3 district, no main building shall exceed 45 feet in height, except, where an R-3 district abuts upon an R-1 district, the maximum permitted building height shall be limited to 30 feet for a distance of 50 feet from the abutting boundary of the aforementioned district.**
3. **Single-family dwellings permitted in commercial or industrial districts shall not exceed 30 feet in height.**

Applicant's Facts and Findings: The proposed single-family three story attached and detached structures proposed will exceed the 30 foot height limits. The proposed buildings will be approximately 35 feet in height. The applicant has proposed a height allowance which exceeds the limitations of this section as part of an overall plan to create a planned unit development.

This standard is met.

B. Commercial and Industrial.

1. **In the C-1 district no main building or accessory building shall exceed 30 feet in height.**
2. **In the AI, C-2, C-3, M-1, M-2, and M-3 districts there is no building height limitation, except, where said districts abut upon a residential district, the maximum permitted building height shall not exceed the maximum building height permitted in the abutting residential district for a distance of 50 feet from the abutting boundary.**
3. **In the C-4 district, building height limitation is described in NMC 15.352.040(J)(1).**

Applicant's Facts and Findings: The multi-family buildings proposed in the C-2 zoned portion of this site require a conditional use permit. As such, the maximum height of buildings in the C-2 zoning district will be stated in the Conditional Use Permit, as required by subsection C., below.

This standard is not applicable as a Conditional Use Permit is requested and will state the maximum height of buildings.

C. The maximum height of buildings and uses permitted conditionally shall be stated in the conditional use permits.

Applicant's Facts and Findings:	The Applicant proposes a maximum building height of 48 feet for the multi-family residential structures. This maximum height shall be stated on the Conditional Use Permit. This standard is met.

15.415.040 Public access required.

No building or structure shall be erected or altered except on a lot fronting or abutting on a public street or having access to a public street over a private street or easement of record approved in accordance with provisions contained in this code. New private streets may not be created to provide access except as allowed under NMC 15.332.020(B)(24), 15.336.020(B)(8), and in the M-4 zone. Existing private streets may not be used for access for new dwelling units, except as allowed under NMC 15.405.030. No building or structure shall be erected or altered without provisions for access roadways as required in the Oregon Fire Code, as adopted by the city.

Applicant's Facts and Findings:	All proposed residential structures will have access to a public street either directly or via a connection from a private street, as permitted by the Planned Unit Development (PUD) criteria and as previously discussed in this narrative. This standard is met.

15.420 Landscaping and Outdoor Areas

15.420.010 Required minimum standards.

A. Private and Shared Outdoor Recreation Areas in Residential Developments.

1. **Private Areas. Each ground-level living unit in a residential development subject to a design review plan approval shall have an accessible outdoor private space of not less than 48 square feet in area. The area shall be enclosed, screened or otherwise designed to provide increased privacy for unit residents, their guests and neighbors.**
2. **Individual and Shared Areas. Usable outdoor recreation space shall be provided for the individual and/or shared use of residents and their guests in any duplex or multifamily residential development, as follows:**
    a. **One- or two-bedroom units: 200 square feet per unit.**
    b. **Three- or more bedroom units: 300 square feet per unit.**
    c. **Storage areas are required in residential developments. Convenient areas shall be provided in residential developments for the storage of articles such as bicycles, barbecues, luggage, outdoor furniture, and the like. These shall be entirely enclosed.**
3. **In the AR airport residential district a five percent landscaping standard is required with the goal of "softening" the buildings and making the development "green" with plants, where**

possible. The existence of the runway, taxiway, and approach open areas already provide generally for the 15 percent requirement.

Applicant's Facts and Findings: Each ground-level home within the community will have a minimum of 48 square feet of private outdoor open space. The multi-family housing area provides the required shared usable outdoor recreation space. Enclosed storage areas are provided attached to the outdoor private areas in the multi-family residential and in the garages of the single-family residential.

This standard is met.

B. Required Landscaped Area. The following landscape requirements are established for all developments except single-family dwellings:

1. **A minimum of 15 percent of the lot area shall be landscaped; provided, however, that computation of this minimum may include areas landscaped under subsection (B)(3) of this section. Development in the C-3 (central business district) zoning district and M-4 (large lot industrial) zoning district is exempt from the 15 percent landscape area requirement of this section. Additional landscaping requirements in the C-4 district are described in NMC 15.352.040(K). In the AI airport industrial district, only a five percent landscaping standard is required with the goal of "softening" the buildings and making the development "green" with plants, where possible. The existence of the runway, taxiway, and approach open areas already provide generally for the 15 percent requirement. Developments in the AI airport industrial district with a public street frontage shall have said minimum landscaping between the front property line and the front of the building.**

Applicant's Facts and Findings: A minimum of fifteen percent (15%) of the area surrounding the multi-family development will be landscaped.

This standard is met.

2. **All areas subject to the final design review plan and not otherwise improved shall be landscaped.**

Applicant's Facts and Findings: All areas included with the final design review plan and not otherwise improved will be landscaped.

This standard is met.

3. **The following landscape requirements shall apply to the parking and loading areas:**
   a. **A parking or loading area providing 10 or more spaces shall be improved with defined landscaped areas totaling no less than 25 square feet per parking space.**
   b. **A parking, loading area, or drive aisle which runs adjacent to a property line shall be separate from any lot line adjacent to a street by a landscaped strip at least 10 feet in interior width or the width of the required yard, whichever is greater, and any other**

lot line by a landscaped strip of at least five feet in interior width. See subsections (B)(3)(c) and (d) of this section for material to plant within landscape strips.

c. **A landscaped strip separating a parking area, loading area, or drive aisle from a street shall contain street trees spaced as appropriate to the species, not to exceed 50 feet apart on average, and a combination of shrubs and ground cover, or lawn. This landscaping shall provide partial screening of these areas from the street.**
d. **A landscaped strip separating a parking area, loading area, or drive aisle from an interior lot line shall contain any combination of trees, shrubs, ground cover or lawn. Plant material shall be selected from at least two different plant material groups (example: trees and shrubs, or lawn and shrubs, or lawn and trees and shrubs).**
e. **Landscaping in a parking or loading area shall be located in defined landscaped areas which are uniformly distributed throughout the parking or loading area.**
f. **Landscaping areas in a parking lot, service drive or loading area shall have an interior width of not less than five feet.**
g. **All multifamily, institutional, commercial, or industrial parking areas, service drives, or loading zones which abut a residential district shall be enclosed with a 75 percent opaque, site-obscuring fence, wall or evergreen hedge along and immediately adjacent to any interior property line which abuts the residential district. Landscape plantings must be large enough to provide the required minimum screening requirement within 12 months after initial installation. Adequate provisions shall be maintained to protect walls, fences or plant materials from being damaged by vehicles using said parking areas.**
h. **An island of landscaped area shall be located to separate blocks of parking spaces. At a minimum, one deciduous shade tree per seven parking spaces shall be planted to create a partial tree canopy over and around the parking area. No more than seven parking spaces may be grouped together without an island separation unless otherwise approved by the director based on the following alternative standards:**
    i. **Provision of a continuous landscaped strip, with a five-foot minimum width, which runs perpendicular to the row of parking spaces (see Appendix A, Figure 13).**
    ii. **Provision of tree planting landscape islands, each of which is at least 16 square feet in size, and spaced no more than 50 feet apart on average, within areas proposed for back-to-back parking (see Appendix A, Figure 14).**

Applicant's Facts and Findings:

As identified on the included site plan, the parking areas providing 10 or more spaces all meet the minimum landscaping requirements. All landscaped areas in parking areas provide a minimum of two different plant material groups, including trees, shrubs, ground cover or lawn. Fencing will be provided in compliance with this Section.

This standard is met.

4. **Trees, Shrubs and Ground Covers. The species of street trees required under this section shall conform to those authorized by the city council through resolution. The director shall have the responsibility for preparing and updating the street tree species list which shall be adopted in resolution form by the city council.**
    a. **Arterial and minor arterial street trees shall have spacing of approximately 50 feet on center. These trees shall have a minimum two-inch caliper tree trunk or stalk at a measurement of two feet up from the base and shall be balled and burlapped or boxed.**
    b. **Collector and local street trees shall be spaced approximately 35 to 40 feet on center. These trees shall have a minimum of a one and one-half or one and three-fourths inch tree trunk or stalk and shall be balled and burlapped or boxed.**
    c. **Accent Trees. Accent trees are trees such as flowering cherry, flowering plum, crab-apple, Hawthorne and the like. These trees shall have a minimum one and one-half inch caliper tree trunk or stalk and shall be at least eight to 10 feet in height. These trees may be planted bare root or balled and burlapped. The spacing of these trees should be approximately 25 to 30 feet on center.**
    d. **All broad-leafed evergreen shrubs and deciduous shrubs shall have a minimum height of 12 to 15 inches and shall be balled and burlapped or come from a two-gallon can. Gallon-can size shrubs will not be allowed except in ground covers. Larger sizes of shrubs may be required in special areas and locations as specified by the design review board. Spacing of these shrubs shall be typical for the variety, three to eight feet, and shall be identified on the landscape planting plan.**
    e. **Ground Cover Plant Material. Ground cover plant material such as greening juniper, cotoneaster, minor Bowles, English ivy, hypericum and the like shall be one of the following sizes in specified spacing for that size:**

Gallon cans	**3 feet on center**
4'' containers	**2 feet on center**
2-1/4'' containers	**18'' on center**
Rooted cuttings	**12'' on center**

Applicant's Facts and Findings: As identified on the submitted landscaping plan, all street trees and ground cover provided in this development will meet city standards.

This standard is met.

5. **Automatic, underground irrigation systems shall be provided for all areas required to be planted by this section. The director shall retain the flexibility to allow a combination of irrigated and nonirrigated areas. Landscaping material used within nonirrigated areas must consist of drought- resistant varieties. Provision must be made for alternative irrigation**

during the first year after initial installation to provide sufficient moisture for plant establishment.

6. **Required landscaping shall be continuously maintained.**
7. **Maximum height of tree species shall be considered when planting under overhead utility lines.**
8. **Landscaping requirements and standards for parking and loading areas (subsection (B)(3) of this section) will apply to development proposals unless the institution has addressed the requirements and standards by an approved site development master plan. With an approved site development master plan, the landscape requirements will be reviewed through an administrative Type I review process.**
9. **In the M-4 zone, landscaping requirements and standards for parking and loading areas (subsection (B)(3) of this section) do not apply unless within 50 feet of a residential district.**

Applicant's Facts and Findings: Automatic, underground irrigation systems will be provided for all landscaped areas. Landscaping will be continuously maintained and is included as a provision of the dues collection of the included CC&Rs. As identified in the included landscaping plan, the trees and shrubs have been chosen for their appropriateness for the location in which they are to be planted.

This standard is met.

C. Installation of Landscaping. All landscaping required by these provisions shall be installed prior to the issuance of occupancy permits, unless security equal to 110 percent of the cost of the landscaping as determined by the director is filed with the city, insuring such installation within six months of occupancy. A security – cash, certified check, time certificates of deposit, assignment of a savings account, bond or such other assurance of completion as shall meet with the approval of the city attorney – shall satisfy the security requirements. If the installation of the landscaping is not completed within the six-month period, or within an extension of time authorized by the director, the security may be used by the city to complete the installation. Upon completion of the installation, any portion of the remaining security deposited with the city shall be returned to the applicant.

Applicant's Facts and Findings: Landscaping will be installed or assured according to City requirements prior to the issuance of occupancy permits.

This standard is met.

15.420.020 Landscaping and amenities in public rights-of-way.

The following standards are intended to create attractive streetscapes and inviting pedestrian spaces. A review body may require any of the following landscaping and amenities to be placed in abutting public rights-of-way as part of multifamily, commercial, industrial, or institutional design reviews, or for subdivisions and planned unit developments. In addition, any entity improving existing rights-of-way should consider including these elements in the project. A decision to include any amenity

shall be based on comprehensive plan guidelines, pedestrian volumes in the area, and the nature of surrounding development.

A. Pedestrian Space Landscaping. Pedestrian spaces shall include all sidewalks and medians used for pedestrian refuge. Spaces near sidewalks shall provide plant material for cooling and dust control, and street furniture for comfort and safety, such as benches, waste receptacles and pedestrian-scale lighting. These spaces should be designed for short-term as well as long-term use. Elements of pedestrian spaces shall not obstruct sightlines and shall adhere to any other required city safety measures. Medians used for pedestrian refuge shall be designed for short-term use only with plant material for cooling and dust control, and pedestrian-scale lighting. The design of these spaces shall facilitate safe pedestrian crossing with lighting and accent paving to delineate a safe crossing zone visually clear to motorists and pedestrians alike.

1. **Street trees planted in pedestrian spaces shall be planted according to NMC 15.420.010(B)(4).**
2. **Pedestrian spaces shall have low (two and one-half feet) shrubs and ground covers for safety purposes, enhancing visibility and discouraging criminal activity.**
    a. **Plantings shall be 90 percent evergreen year-round, provide seasonal interest with fall color or blooms, and at maturity maintain growth within the planting area (refer to plant material matrix below).**
    b. **Plant placement shall also adhere to clear sight line requirements as well as any other relevant city safety measures**
3. **Pedestrian-scale lighting shall be installed along sidewalks and in medians used for pedestrian refuge.**
    a. **Pole lights as well as bollard lighting may be specified; however, the amount and type of pedestrian activity during evening hours, e.g., transit stops, nighttime service districts, shall ultimately determine the type of fixture chosen.**
    b. **Luminaire styles shall match the area/district theme of existing luminaires and shall not conflict with existing building or roadway lights causing glare.**
    c. **Lighting heights and styles shall be chosen to prevent glare and to designate a clear and safe path and limit opportunities for vandalism (see Appendix A, Figure 17, Typical Pedestrian Space Layouts).**
    d. **Lighting shall be placed near the curb to provide maximum illumination for spaces furthest from building illumination. Spacing shall correspond to that of the street trees to prevent tree foliage from blocking light.**
4. **Street furniture such as benches and waste receptacles shall be provided for spaces near sidewalks only.**
    a. **Furniture should be sited in areas with the heaviest pedestrian activity, such as downtown, shopping districts, and shopping centers.**
    b. **Benches should be arranged to facilitate conversation between individuals with L-shaped arrangements and should face the area focal point, such as shops, fountains, plazas, and should divert attention away from nearby traffic.**
5. **Paving and curb cuts shall facilitate safe pedestrian crossing and meet all ADA requirements for accessibility.**

Applicant's Facts and Findings: The submitted landscaping plan identifies landscaping and amenities proposed for the public right-of-way. Due to the residential nature of the site and the amenities to be provided within the project's open spaces, the public rights-of-way have been provided with mainly plantings. Once the commercial component of this site develops, we would anticipate the need for more benches, trash receptacles and other pedestrian amenities, potentially within the rights-of-way.

This standard is met.

B. Planting Strip Landscaping. All planting strips shall be landscaped. Planting strips provide a physical and psychological buffer for pedestrians from traffic with plant material that reduces heat and dust, creating a more comfortable pedestrian environment. Planting strips shall have different arrangements and combinations of plant materials according to the frequency of on-street parking (see Appendix A, Figures 18 and 19).

1. **Planting strips which do not have adjacent parking shall have a combination of ground covers, low (two and one-half feet) shrubs and trees. Planting strips adjacent to frequently used on-street parking, as defined by city staff, shall only have trees protected by tree grates, and planting strips adjacent to infrequently used on-street parking shall be planted with ground cover as well as trees (see Appendix A, Figures 18 and 19, Typical Planting Strip Layouts). District themes or corridor themes linking individual districts should be followed utilizing a unifying plant characteristic, e.g., bloom color, habit, or fall color. When specifying thematic plant material, monocultures should be avoided, particularly those species susceptible to disease.**
2. **Street trees shall be provided in all planting strips as provided in NMC 15.420.010(B)(4).**
   a. **Planting strips without adjacent parking or with infrequent adjacent parking shall have street trees in conjunction with ground covers and/or shrubs.**
   b. **Planting strips with adjacent parking used frequently shall have only street trees protected by tree grates.**
3. **Shrubs and ground covers shall be provided in planting strips without adjacent parking with low (two and one-half feet) planting masses to enhance visibility, discourage criminal activity, and provide a physical as well as psychological buffer from passing traffic.**
   a. **Plantings shall be 90 percent evergreen year-round, provide seasonal interest with fall color or blooms and at maturity maintain growth within the planting area.**
   b. **Ground cover able to endure infrequent foot traffic shall be used in combination with street trees for planting strips with adjacent occasional parking (refer to plant material matrix below).**
   c. **All plant placement shall adhere to clear sight line requirements as well as any other relevant city safety measures.**

C. Maintenance. All landscapes shall be maintained for the duration of the planting to encourage health of plant material as well as public health and safety. All street trees and shrubs shall be pruned to maintain health and structure of the plant material for public safety purposes.

Applicant's Facts and Findings:	As identified in the included landscaping plan, all planting strips will be landscaped with a combination of ground covers, shrubs and trees. All landscaping will be maintained for the duration of the planting and all street trees and shrubs will be pruned to maintain the health and structure of the plants. This standard is met.

D. Exception. In the AI airport industrial district and AR airport residential district, no landscape or amenities except for grass are required for any area within 50 feet of aircraft operation areas including aircraft parking areas, taxiways, clear areas, safety areas, object-free areas, and the runway.

Applicant's Facts and Findings:	This standard is not in the AI or AR zone and, as such, this standard is not applicable.

15.425 Exterior Lighting

15.425.010 Purpose.

The purpose of this chapter is to regulate the placement, orientation, distribution patterns, and fixture types of on-site outdoor lighting. The intent of this section is to provide minimum lighting standards that promote safety, utility, and security, prevent glare on public roadways, and protect the privacy of residents.

15.425.020 Applicability and exemptions.

A. Applicability. Outdoor lighting shall be required for safety and personal security in areas of assembly, parking, and traverse, as part of multifamily residential, commercial, industrial, public, recreational and institutional uses. The applicant for any Type I or Type II development permit shall submit, as part of the site plan, evidence that the proposed outdoor lighting plan will comply with this section. This information shall contain but not be limited to the following:

1. **The location, height, make, model, lamp type, wattage, and proposed cutoff angle of each outdoor lighting fixture.**
2. **Additional information the director may determine is necessary, including but not limited to illuminance level profiles, hours of business operation, and percentage of site dedicated to parking and access.**
3. **If any portion of the site is used after dark for outdoor parking, assembly or traverse, an illumination plan for these areas is required. The plan must address safety and personal security.**

B. Exemptions. The following uses shall be exempt from the provisions of this section:

1. **Public street and airport lighting.**
2. **Circus, fair, carnival, or outdoor governmentally sponsored event or festival lighting.**
3. **Construction or emergency lighting, provided such lighting is discontinued immediately upon completion of the construction work or abatement of the emergency necessitating said lighting.**

4. **Temporary Lighting. In addition to the lighting otherwise permitted in this code, a lot may contain temporary lighting during events as listed below:**
    a. **Grand Opening Event. A grand opening is an event of up to 30 days in duration within 30 days of issuance of a certificate of occupancy for a new or remodeled structure, or within 30 days of change of business or ownership. No lot may have more than one grand opening event per calendar year. The applicant shall notify the city in writing of the beginning and ending dates prior to the grand opening event.**
    b. **Other Events. A lot may have two other events per calendar year. The events may not be more than eight consecutive days in duration, nor less than 30 days apart.**
5. **Lighting activated by motion sensor devices.**
6. **Nonconforming lighting in place as of September 5, 2000. Replacement of nonconforming lighting is subject to the requirements of NMC 15.205.010 through 15.205.100.**
7. **Light Trespass onto Industrial Properties. The lighting trespass standards of NMC 15.425.040 do not apply where the light trespass would be onto an industrially zoned property.**

Applicant's Facts and Findings: The land use submittal includes a lighting plan identifying the location, height, make, model, lamp type, wattage, and proposed cutoff angle of each outdoor lighting fixture. Lighting is provided in the parking areas and the multi-family residential buildings.

This standard is met.

15.425.030 Alternative materials and methods of construction, installation, or operation.
The provisions of this section are not intended to prevent the use of any design, material, or methods of installation or operation not specifically prescribed by this section, provided any such alternate has been approved by the director. Alternatives must be an approximate equivalent to the applicable specific requirement of this section and must comply with all other applicable standards in this section.

Applicant's Facts and Findings: This land use submittal does not include a request for alternative materials and methods of construction, installation or operation.

This standard is met.

15.425.040 Requirements.
A. General Requirements – All Zoning Districts.
1. **Low-level light fixtures include exterior lights which are installed between ground level and six feet tall. Low-level light fixtures are considered nonintrusive and are unrestricted by this code.**
2. **Medium-level light fixtures include exterior lights which are installed between six feet and 15 feet above ground level. Medium-level light fixtures must either comply with the shielding requirements of subsection (B) of this section, or the applicant shall show that light trespass from a property has been designed not to exceed one-half foot-candle at the property line.**

3. **High-level light fixtures include exterior lights which are installed 15 feet or more above ground level. High-level light fixtures must comply with the shielding requirements of subsection (B) of this section, and light trespass from a property may not exceed one-half foot-candle at the property line.**

B. Table of Shielding Requirements.

Fixture Lamp Type	**Shielded**
Low/high pressure sodium, mercury vapor, metal halide and fluorescent over 50 watts	**Fully**
Incandescent over 160 watts	**Fully**
Incandescent 160 watts or less	**None**
Fossil fuel	**None**
Any light source of 50 watts or less	**None**
Other sources	**As approved by NMC 15.425.030**

Applicant's Facts and Findings: The land use submittal includes a lighting plan identifying the location, height, make, model, lamp type, wattage, and proposed cutoff angle of each outdoor lighting fixture. Lighting is provided in the parking areas and the multi-family residential buildings. All medium- and high-level lighting is designed to meet this section.

This standard is met.

15.430 Underground Utility Installation

15.430.010 Underground utility installation.

A. All new utility lines, including but not limited to electric, communication, natural gas, and cable television transmission lines, shall be placed underground. This does not include surface-mounted transformers, connections boxes, meter cabinets, service cabinets, temporary facilities during construction, and high-capacity electric lines operating at 50,000 volts or above.

B. Existing utility lines shall be placed underground when they are relocated, or when an addition or remodel requiring a Type II design review is proposed, or when a developed area is annexed to the city.

C. The director may make exceptions to the requirement to underground utilities based on one or more of the following criteria:

1. **The cost of undergrounding the utility is extraordinarily expensive.**
2. **There are physical factors that make undergrounding extraordinarily difficult.**
3. **Existing utility facilities in the area are primarily overhead and are unlikely to be changed.**

Applicant's Facts and Findings: All new utility lines will be located underground.

This standard is met.

15.440 Off-Street Parking, Bicycle Parking, and Private Walkways

Article I. Off-Street Parking Requirements

15.440.010 Required off-street parking.

A. Off-street parking shall be provided on the development site for all R-1, C-1, M-1, M-2 and M-3 zones. In all other zones, the required parking shall be on the development site or within 400 feet of the development site which the parking is required to serve. All required parking must be under the same ownership as the development site served except through special covenant agreements as approved by the city attorney, which bind the parking to the development site.

B. Off-street parking is not required in the C-3 district, except for:

1. **Dwelling units meeting the requirements noted in NMC 15.305.020.**
2. **New development which is either immediately adjacent to a residential district or separated by nothing but an alley.**

C. Within the C-4 district, the minimum number of required off-street parking spaces shall be 50 percent of the number required by NMC 15.440.030, except that no reduction is permitted for residential uses.

D. All commercial, office, or industrial developments that have more than 20 off-street parking spaces and that have designated employee parking must provide at least one preferential carpool/vanpool parking space. The preferential carpool/vanpool parking space(s) must be located close to a building entrance.

Applicant's Facts and Findings: The proposed parking for the single-family homes will be on the same lot as the use. Additional on-street parking and "guest parking" areas are proposed and will be owned and maintained according to the CC&Rs for the Homeowner's Association. The proposed parking for the multi-family buildings will also be on the same development site as the buildings, in a parking lot adjacent to the buildings. There are no commercial, office or industrial developments proposed at this time and, as such, no carpool/vanpool parking spaces are required.

This standard is met.

15.440.020 Parking area and service drive design.

A. All public or private parking areas, parking spaces, or garages shall be designed, laid out and constructed in accordance with the minimum standards as set forth in NMC 15.440.070.

B. Groups of three or more parking spaces, except those in conjunction with single-family or two-family dwellings on a single lot, shall be served by a service drive so that no backward movement or other maneuvering of a vehicle within a street, other than an alley, will be required. Service drives shall be designed and constructed to facilitate the flow of traffic, provide maximum safety in traffic access and egress and maximum safety of pedestrian and vehicular traffic on the site, but in no case shall two-way and one-way service drives be less than 20 feet and 12 feet, respectively. Service drives shall be improved in accordance with the minimum standards as set forth in NMC 15.440.060.

C. Gates. A private drive or private street serving as primary access to more than one dwelling unit shall not be gated to limit access, except as approved by variance.

D. In the AI airport industrial district and AR airport residential district, taxiways may be used as part of the service drive design where an overall site plan is submitted that shows how the circulation of aircraft and vehicles are safely accommodated, where security fences are located, if required, and is approved by the fire marshal, planning director, and public works director. The following submittal must be made:

1. **A drawing of the area to be developed, including the probable location, height, and description of structures to be constructed; the location and description of a security fence or gate to secure the aircraft operations areas of off-airport property from the other nonsecured pedestrian/auto/truck areas of on-airport property; the proposed location of the proposed taxiway access in accordance with FAA specifications (refer to Federal Aviation Administration Advisory Circular No. 150/5300-13 regarding airport design, and AC/5370-10B regarding construction standards for specifications that should be used as a guideline); and the identification of the vehicular traffic pattern area clearly separated from aircraft traffic. Once specific buildings have been designed, FAA Form 7460-1, Notice of Proposed Construction or Alteration, must be submitted to the City of Newberg, the private airport owner, and the FAA for airspace review.**

15.440.030 Parking spaces required.

Use	**Minimum Parking Spaces Required**
Residential Types	
Dwelling, multifamily and multiple single-family dwellings on a single lot **Studio or one-bedroom unit** **Two-bedroom unit** **Three- and four-bedroom unit** **Five- or more bedroom unit**	**1 per dwelling unit** **1.5 per dwelling unit** **2 per dwelling unit** **0.75 spaces per bedroom**
• Unassigned spaces	**If a development is required to have more than 10 spaces on a lot, then it must provide some unassigned spaces. At least 15 percent of the total required parking spaces must be unassigned and be located for convenient use by all occupants of the development. The location shall be approved by the director.**
• Visitor spaces	**If a development is required to have more than 10 spaces on a lot, then it must provide at least 0.2 visitor spaces per dwelling unit.**
• On-street parking credit	**On-street parking spaces may be counted toward the minimum number of required spaces for developments required to have more than 10 spaces on a lot. The on-street spaces must be directly adjoining and on the same side of the street as the subject property, must be legal spaces that meet all city standards, and cannot be counted if they could be**

• Available transit service	**removed by planned future street widening or a bike lane on the street.** **At the review body's discretion, affordable housing projects may reduce the required off-street parking by 10 percent if there is an adequate continuous pedestrian route no more than 1,500 feet in length from the development to transit service with an average of less than one hour regular service intervals during commuting periods or where the development provides its own transit. A developer may qualify for this parking reduction if improvements on a proposed pedestrian route are made by the developer, thereby rendering it an adequate continuous route.**
Dwelling, single-family or two-family	**2 for each dwelling unit on a single lot**

Applicant's Facts and Findings: All single-family development will have parking on the individual lots. The multi-family development proposes to create 51 units with 27 one bedroom homes and 24 two bedroom homes. The required parking for the one bedroom units is 27 spaces, the two bedroom units require 36 parking spaces and a total of 10 visitor parking spaces are required for a total of 74 parking spaces. As proposed, 92 spaces are provided which are on the same site as the multi-family buildings. An additional 7 on-street parking spaces are provided adjacent to the multi-family lot.

This standard is met.

15.440.060 Parking area and service drive improvements.

All public or private parking areas, outdoor vehicle sales areas, and service drives shall be improved according to the following:

A. All parking areas and service drives shall have surfacing of asphaltic concrete or Portland cement concrete or other hard surfacing such as brick or concrete pavers. Other durable and dust-free surfacing materials may be approved by the director for infrequently used parking areas. All parking areas and service drives shall be graded so as not to drain stormwater over the public sidewalk or onto any abutting public or private property.

B. All parking areas shall be designed not to encroach on public streets, alleys, and other rights-of-way. Parking areas shall not be placed in the area between the curb and sidewalk or, if there is no sidewalk, in the public right-of-way between the curb and the property line. The director may issue a permit for exceptions for unusual circumstances where the design maintains safety and aesthetics.

C. All parking areas, except those required in conjunction with a single-family or two-family dwelling, shall provide a substantial bumper which will prevent cars from encroachment on abutting private and public property.

D. All parking areas, including service drives, except those required in conjunction with single-family or two-family dwellings, shall be screened in accordance with NMC 15.420.010(B).

E. Any lights provided to illuminate any public or private parking area or vehicle sales area shall be so arranged as to reflect the light away from any abutting or adjacent residential district.

F. All service drives and parking spaces shall be substantially marked and comply with NMC 15.440.070.

G. Parking areas for residential uses shall not be located in a required front yard, except as follows:

1. **Attached or detached single-family or two-family: parking is authorized in a front yard on a service drive which provides access to an improved parking area outside the front yard.**
2. **Three- or four-family: parking is authorized in a front yard on a service drive which is adjacent to a door at least seven feet wide intended and used for entrance of a vehicle (see Appendix A, Figure 12).**

H. A reduction in size of the parking stall may be allowed for up to a maximum of 30 percent of the total number of spaces to allow for compact cars. For high turnover uses, such as convenience stores or fast-food restaurants, at the discretion of the director, all stalls will be required to be full-sized.

I. Affordable housing projects may use a tandem parking design, subject to approval of the community development director.

J. Portions of off-street parking areas may be developed or redeveloped for transit-related facilities and uses such as transit shelters or park-and-ride lots, subject to meeting all other applicable standards, including retaining the required minimum number of parking spaces.

Applicant's Facts and Findings:	As identified on the submitted site plan and utility plans, all parking areas and service drives will be constructed to City standards. Parking areas do not encroach on public streets. Substantial parking bumpers are provided for the multi-family parking area. All parking area lighting will be designed to reduce light spill and glare away from any proposed or existing neighboring developments. This standard is met.

Article II. Bicycle Parking

15.440.090 Purpose.

Cycling is a healthy activity for travel and recreation. In addition, by maximizing bicycle travel, the community can reduce negative effects of automobile travel, such as congestion and pollution. To maximize bicycle travel, developments must provide effective support facilities. At a minimum, developments need to provide a secure place for employees, customers, and residents to park their bicycles. [Ord. 2564, 4-15-02; Ord. 2518, 9-21-99. Code 2001 § 151.625.1.]

15.440.100 Facility requirements.

Bicycle parking facilities shall be provided for the uses shown in the following table. Fractional space requirements shall be rounded up to the next whole number.

Use	Minimum Number of Bicycle Parking Spaces Required

New multiple dwellings, including additions creating additional dwelling units	One bicycle parking space for every four dwelling units

Applicant's Facts and Findings:	The proposed 51 multi-family dwelling units requires 13 bicycle parking spaces. This proposal includes the provision of 13 bicycle parking spaces. This standard is met.

15.440.110 Design.

A. Bicycle parking facilities shall consist of one or more of the following:

1. **A firmly secured loop, bar, rack, or similar facility that accommodates locking the bicycle frame and both wheels using a cable or U-shaped lock.**
2. **An enclosed locker.**
3. **A designated area within the ground floor of a building, garage, or storage area. Such area shall be clearly designated for bicycle parking.**
4. **Other facility designs approved by the director.**

B. All bicycle parking spaces shall be at least six feet long and two and one-half feet wide. Spaces shall not obstruct pedestrian travel.

C. All spaces shall be located within 50 feet of a building entrance of the development.

D. Required bicycle parking facilities may be located in the public right-of-way adjacent to a development subject to approval of the authority resp

Applicant's Facts and Findings:	As shown on the included site development plans, the bicycle parking facility is designed to meet these requirements. This standard is met.

Article III. Private Walkways

15.440.120 Purpose.

Sidewalks and private walkways are part of the city's transportation system. Requiring their construction is part of the city's plan to encourage multimodal travel and to reduce reliance on the automobile. Considerable funds have and will be expended to install sidewalks along the streets in the city. Yet there is little point to this expense if it is not possible for people to walk from the sidewalk to the developments along each side. The following requirements are intended to provide safe and convenient paths for employees, customers, and residents to walk from public sidewalks to development entrances, and to walk between buildings on larger sites.

15.440.130 Where required.

Private walkways shall be constructed as part of any development requiring Type II design review, including mobile home parks. In addition, they may be required as part of conditional use permits or planned unit developments. In the airport industrial (AI) district and residential (AR) district, on-

site walks are not required in aircraft operations areas, such as parking aprons, taxiways, and runways.

Applicant's Facts and Findings:	As this application includes a Planned Unit Development and Conditional Use Permit, walkways and sidewalks are required. This standard is met.

15.440.140 Private walkway design.

A. All required private walkways shall meet the applicable building code and Americans with Disabilities Act requirements.

B. Required private walkways shall be a minimum of four feet wide.

C. Required private walkways shall be constructed of portland cement concrete or brick.

D. Crosswalks crossing service drives shall, at a minimum, be painted on the asphalt or clearly marked with contrasting paving materials or humps/raised crossings. If painted striping is used, it should consist of thermoplastic striping or similar type of durable application.

E. At a minimum, required private walkways shall connect each main pedestrian building entrance to each abutting public street and to each other.

F. The review body may require on-site walks to connect to development on adjoining sites.

G. The review body may modify these requirements where, in its opinion, the development provides adequate on-site pedestrian circulation, or where lot dimensions, existing building layout, or topography preclude compliance with these standards.

Applicant's Facts and Findings:	The proposal includes private walkways connecting the multi-family units to Highway 99W and connecting the western portion of the site to Spring Meadow Park. These walkways will be a minimum of 4-feet in width and will be constructed of Portland cement concrete. Crosswalks will be provided on the site to delineate the shift from public streets to private streets. Crosswalks will be painted/clearly striped in conformance with these requirements. This standard is met.

Division 15.500 Public Improvement Standards

15.505 Public Improvements Standards

15.505.010 Purpose.

This chapter provides standards for public infrastructure and utilities installed with new development, consistent with the policies of the City of Newberg comprehensive plan and adopted city master plans. The standards are intended to minimize disturbance to natural features, promote energy conservation and efficiency, minimize and maintain development impacts on surrounding properties and neighborhoods, and ensure timely completion of adequate public facilities to serve new development.

15.505.020 Applicability.

The provision and utilization of public facilities and services within the City of Newberg shall apply to all land developments in accordance with this chapter. No development shall be approved unless the following improvements are provided for prior to occupancy or operation, unless future provision is assured in accordance with NMC 15.505.030(E).

A. Public Works Design and Construction Standards. The design and construction of all improvements within existing and proposed rights-of-way and easements, all improvements to be maintained by the city, and all improvements for which city approval is required shall comply with the requirements of the most recently adopted Newberg public works design and construction standards.

B. Street Improvements. All projects subject to a Type II design review, partition, or subdivision approval must construct street improvements necessary to serve the development.

C. Water. All developments, lots, and parcels within the City of Newberg shall be served by the municipal water system as specified in Chapter 13.15 NMC.

D. Wastewater. All developments, lots, and parcels within the City of Newberg shall be served by the municipal wastewater system as specified in Chapter 13.10 NMC.

E. Stormwater. All developments, lots, and parcels within the City of Newberg shall manage stormwater runoff as specified in Chapters 13.20 and 13.25 NMC.

F. Utility Easements. Utility easements shall be provided as necessary and required by the review body to provide needed facilities for present or future development of the area.

G. City Approval of Public Improvements Required. No building permit may be issued until all required public facility improvements are in place and approved by the director, or are otherwise bonded for in a manner approved by the review authority, in conformance with the provisions of this code and the Newberg Public Works Design and Construction Standards.

Applicant's Facts and Findings:

As identified on the included public improvement plans, the design and construction of all improvements within existing and proposed public rights-of-way and easements and all improvements to be maintained by the city are designed to comply with the requirements of the most recently adopted Newberg public works design and construction standards. All improvements for which city approval is required are proposed to the most recently adopted Newberg public works design and construction standards or, in the case of private streets, as reviewed and approved by the Newberg Engineering Department. The site development plan includes private and public streets, utility easements where necessary, connection to public water and sanitary sewer services and management of stormwater runoff.

This standard is met.

15.505.030 Street standards.

A. Purpose. The purpose of this section is to:

1. **Provide for safe, efficient, and convenient multi-modal transportation within the City of Newberg.**

2. **Provide adequate access to all proposed and anticipated developments in the City of Newberg. For purposes of this section, "adequate access" means direct routes of travel between destinations; such destinations may include residential neighborhoods, parks, schools, shopping areas, and employment centers.**
3. **Provide adequate area in all public rights-of-way for sidewalks, wastewater and water lines, stormwater facilities, natural gas lines, power lines, and other utilities commonly and appropriately placed in such rights-of-way. For purposes of this section, "adequate area" means space sufficient to provide all required public services to standards defined in this code and in the Newberg public works design and construction standards.**

B. Applicability. The provisions of this section apply to:

1. **The creation, dedication, and/or construction of all public streets, bike facilities, or pedestrian facilities in all subdivisions, partitions, or other developments in the City of Newberg.**
2. **The extension or widening of existing public street rights-of-way, easements, or street improvements including those which may be proposed by an individual or the city, or which may be required by the city in association with other development approvals.**
3. **The construction or modification of any utilities, pedestrian facilities, or bike facilities in public rights-of-way or easements.**
4. **The designation of planter strips. Street trees are required subject to Chapter 15.420 NMC.**
5. **Developments outside the city that tie into or take access from city streets.**

Applicant's Facts and Findings: As demonstrated in the public improvement plans, this development includes public and private streets designed to provide safe and convenient vehicular and pedestrian access. Proposed improvements include paved streets, curbs (rolled curb on private streets), sidewalks, crosswalks, planter strips with street trees and appropriate groundcover, and utility easements where necessary.

This standard is met.

C. Layout of Streets, Alleys, Bikeways, and Walkways. Streets, alleys, bikeways, and walkways shall be laid out and constructed as shown in the Newberg transportation system plan. In areas where the transportation system plan or future street plans do not show specific transportation improvements, roads and streets shall be laid out so as to conform to previously approved subdivisions, partitions, and other developments for adjoining properties, unless it is found in the public interest to modify these patterns. Transportation improvements shall conform to the standards within the Newberg Municipal Code, the Newberg public works design and construction standards, the Newberg transportation system plan, and other adopted city plans.

Applicant's Facts and Findings: While no bikeways are proposed, the streets, alleys and walkways are designed to comply with the Newberg Transportation System Plan. Streets are planned to meet with adjoining roadways and to provide for future connectivity to the east.

This standard is met.

D. Construction of New Streets. Where new streets are necessary to serve a new development, subdivision, or partition, right-of-way dedication and full street improvements shall be required. Three-quarter streets may be approved in lieu of full street improvements when the city finds it to be practical to require the completion of the other one-quarter street improvement when the adjoining property is developed; in such cases, three-quarter street improvements may be allowed by the city only where all of the following criteria are met:

1. **The land abutting the opposite side of the new street is undeveloped and not part of the new development; and**
2. **The adjoining land abutting the opposite side of the street is within the city limits and the urban growth boundary.**

Applicant's Facts and Findings: Full street improvements are proposed throughout the site.

This standard is met.

E. Improvements to Existing Streets.

1. **All projects subject to partition, subdivision, or Type II design review approval shall dedicate right-of-way sufficient to improve the street to the width specified in subsection (G) of this section.**
2. **All projects subject to partition, subdivision, or Type II design review approval must construct a minimum of a three-quarter street improvement to all existing streets adjacent to, within, or necessary to serve the development. The director may waive or modify this requirement where the applicant demonstrates that the condition of existing streets to serve the development meets city standards and is in satisfactory condition to handle the projected traffic loads from the development. Where a development has frontage on both sides of an existing street, full street improvements are required.**
3. **In lieu of the street improvement requirements outlined in NMC 15.505.040(B), the review authority may elect to accept from the applicant monies to be placed in a fund dedicated to the future reconstruction of the subject street(s). The amount of money deposited with the city shall be 100 percent of the estimated cost of the required street improvements (including any associated utility improvements), and 10 percent of the estimated cost for inflation. Cost estimates used for this purpose shall be based on preliminary design of the constructed street provided by the applicant's engineer and shall be approved by the director.**

Applicant's Facts and Findings: The proposal includes development of full street improvements throughout the site. The public streets will be constructed to public street standards and dedicated to the City of Newberg. The private streets will be full street improvements and will be owned and maintained by the future Homeowner's Association subject to the CC&Rs (a draft of which is submitted with this proposal).

This standard is met.

F. Improvements Relating to Impacts. Improvements required as a condition of development approval shall be roughly proportional to the impact of the development on public facilities and services. The review body must make findings in the development approval that indicate how the required improvements are roughly proportional to the impact. Development may not occur until required transportation facilities are in place or guaranteed, in conformance with the provisions of this code. If required transportation facilities cannot be put in place or be guaranteed, then the review body shall deny the requested land use application.

Applicant's Facts and Findings: Development of the proposed street network and utilities within the development and connecting to the neighboring properties is roughly proportional to the transportation and development impacts from the development. Transportation facilities will be in place or guaranteed prior to development of the site.

This standard is met.

G. Street Width and Design Standards.

1. **Design Standards. All streets shall conform with the standards contained in Table 15.505.030(G). Where a range of values is listed, the director shall determine the width based on a consideration of the total street section width needed, existing street widths, and existing development patterns. Preference shall be given to the higher value. Where values may be modified by the director, the overall width shall be determined using the standards under subsections (G)(2) through (10) of this section.**

Table 15.505.030(G) Street Design Standards

Type of Street	Right-of-Way Width	Curb-to-Curb Pavement Width	Motor Vehicle Travel Lanes	Median Type	Striped Bike Lane (Both Sides)	On-Street Parking
Arterial Streets						
Expressway**	ODOT	ODOT	ODOT	ODOT	ODOT	ODOT
Minor arterial	69 – 80 feet	48 feet	2 lanes	TWLTL or median*	Yes	No*
Collectors						
Minor	61 – 65 feet	40 feet	2 lanes	None*	Yes*	Yes*
Local Streets						
Local residential	54-60 feet	32 feet	2 lanes	None	No	Yes

2. **Motor Vehicle Travel Lanes. Collector and arterial streets shall have a minimum width of 12 feet.**
3. **Bike Lanes. Striped bike lanes shall be a minimum of six feet wide. Bike lanes shall be provided where shown in the Newberg transportation system plan.**

4. **Parking Lanes. Where on-street parking is allowed on collector and arterial streets, the parking lane shall be a minimum of eight feet wide.**
5. **Center Turn Lanes. Where a center turn lane is provided, it shall be a minimum of 12 feet wide.**
6. **Limited Residential Streets. Limited residential streets shall be allowed only at the discretion of the review authority, and only in consideration of the following factors:**
   a. **The requirements of the fire chief shall be followed.**
   b. **The estimated traffic volume on the street is low, and in no case more than 600 average daily trips.**
   c. **Use for through streets or looped streets is preferred over cul-de-sac streets.**
   d. **Use for short blocks (under 400 feet) is preferred over longer blocks.**
   e. **The total number of residences or other uses accessing the street in that block is small, and in no case more than 30 residences.**
   f. **On-street parking usage is limited, such as by providing ample off-street parking, or by staggering driveways so there are few areas where parking is allowable on both sides.**
7. **Sidewalks. Sidewalks shall be provided on both sides of all public streets. Minimum width is five feet.**
8. **Planter Strips. Except where infeasible, a planter strip shall be provided between the sidewalk and the curb line, with a minimum width of five feet. This strip shall be landscaped in accordance with the standards in NMC 15.420.020. Curb-side sidewalks may be allowed on limited residential streets. Where curb-side sidewalks are allowed, the following shall be provided:**
   a. **Additional reinforcement is done to the sidewalk section at corners.**
   b. **Sidewalk width is six feet.**
9. **Slope Easements. Slope easements shall be provided adjacent to the street where required to maintain the stability of the street.**
10. **Intersections and Street Design. The street design standards in the Newberg public works design and construction standards shall apply to all public streets, alleys, bike facilities, and sidewalks in the city.**
11. **The planning commission may approve modifications to street standards for the purpose of ingress or egress to a minimum of three and a maximum of six lots through a conditional use permit.**

Applicant's Facts and Findings: Streets, sidewalks and planter strips, as identified on the proposed public improvement plans, are designed to meet the standards of the Newberg Transportation System Plan and this section.

This standard is met.

H. Modification of Street Right-of-Way and Improvement Width. The director, pursuant to the Type II review procedures of Chapter 15.220 NMC, may allow modification to the public street standards

of subsection (G) of this section, when the criteria in both subsections (H)(1) and (2) of this section are satisfied:

1. **The modification is necessary to provide design flexibility in instances where:**
   a. **Unusual topographic conditions require a reduced width or grade separation of improved surfaces; or**
   b. **Lot shape or configuration precludes accessing a proposed development with a street which meets the full standards of this section; or**
   c. **A modification is necessary to preserve trees or other natural features determined by the city to be significant to the aesthetic character of the area; or**
   d. **A planned unit development is proposed and the modification of street standards is necessary to provide greater privacy or aesthetic quality to the development.**
2. **Modification of the standards of this section shall only be approved if the director finds that the specific design proposed provides adequate vehicular access based on anticipated traffic volumes.**

Applicant's Facts and Findings:	Street modifications are not proposed as part of this development and, as such, this standard is not applicable.

I. Temporary Turnarounds. Where a street will be extended as part of a future phase of a development, or as part of development of an abutting property, the street may be terminated with a temporary turnaround in lieu of a standard street connection or circular cul-de-sac bulb. The director and fire chief shall approve the temporary turnaround. It shall have an all-weather surface, and may include a hammerhead-type turnaround meeting fire apparatus access road standards, a paved or graveled circular turnaround, or a paved or graveled temporary access road. For streets extending less than 150 feet and/or with no significant access, the director may approve the street without a temporary turnaround. Easements or right-of-way may be required as necessary to preserve access to the turnaround.

Applicant's Facts and Findings:	The east-west minor collector dead-ends at the eastern property line for connection to future development. The easternmost north-south private street creates a hammerhead-type turnaround with the minor collector. This standard is met.

J. Topography. The layout of streets shall give suitable recognition to surrounding topographical conditions in accordance with the purpose of this code.

Applicant's Facts and Findings:	The layout of the streets takes into consideration the surrounding topography. This standard is met.

K. Future Extension of Streets. All new streets required for a subdivision, partition, or a project requiring site design review shall be constructed to be "to and through": through the development and to the edges of the project site to serve adjacent properties for future development.

Applicant's Facts and Findings:	The street network connects to the existing street to the north and future street development to the east. Connection to the west is not possible because the entire property line is adjacent to Spring Meadow Park. The connection to the south is the access from Highway 99W. This standard is met.

L. Cul-de-Sacs.

1. **Cul-de-sacs shall only be permitted when one or more of the circumstances listed in this section exist. When cul-de-sacs are justified, public walkway connections shall be provided wherever practical to connect with another street, walkway, school, or similar destination.**
   a. **Physical or topographic conditions make a street connection impracticable. These conditions include but are not limited to controlled access streets, railroads, steep slopes, wetlands, or water bodies where a connection could not be reasonably made.**
   b. **Buildings or other existing development on adjacent lands physically preclude a connection now or in the future, considering the potential for redevelopment.**
   c. **Where streets or accessways would violate provisions of leases, easements, or similar restrictions.**
   d. **Where the streets or accessways abut the urban growth boundary and rural resource land in farm or forest use, except where the adjoining land is designated as an urban reserve area.**
2. **Cul-de-sacs shall be no more than 400 feet long (measured from the centerline of the intersection to the radius point of the bulb).**
3. **Cul-de-sacs shall not serve more than 18 single-family dwellings.**
   Each cul-de-sac shall have a circular end with a minimum diameter of 96 feet, curb-to-curb, within a 109-foot minimum diameter right-of-way. For residential uses, a 35-foot radius may be allowed if the street has no parking, a mountable curb, curbside sidewalks, and sprinkler systems in every building along the street.

Applicant's Facts and Findings:	No cul-de-sacs are proposed as part of this development and, as such, this standard is not applicable.

M. Street Names and Street Signs. Streets that are in alignment with existing named streets shall bear the names of such existing streets. Names for new streets not in alignment with existing streets are subject to approval by the director and the fire chief and shall not unnecessarily duplicate or resemble the name of any existing or platted street in the city. It shall be the responsibility of the land divider to provide street signs.

Applicant's Facts and Findings:	The north-south major collector will be named Crestview Street as that is the name of the connection to the north. Other streets in the development are new and will be established with this development. This standard is met.

N. Platting Standards for Alleys.

1. **An alley may be required to be dedicated and constructed to provide adequate access for a development, as deemed necessary by the director.**
2. **The right-of-way width and paving design for alleys shall be not less than 20 feet wide. Slope easements shall be dedicated in accordance with specifications adopted by the city council under NMC 15.505.010 et seq.**
3. **Where two alleys intersect, 10-foot corner cut-offs shall be provided.**
4. **Unless otherwise approved by the city engineer where topographical conditions will not reasonably permit, grades shall not exceed 12 percent on alleys, and centerline radii on curves shall be not less than 100 feet.**
5. **All provisions and requirements with respect to streets identified in this code shall apply to alleys the same in all respects as if the word "street" or "streets" therein appeared as the word "alley" or "alleys" respectively.**

Applicant's Facts and Findings:	The alleys included with this proposal are all proposed as private streets owned and maintained by the Homeowner's Association. This standard is met.

O. Platting Standards for Blocks.

1. **Purpose. Streets and walkways can provide convenient travel within a neighborhood and can serve to connect people and land uses. Large, uninterrupted blocks can serve as a barrier to travel, especially walking and biking. Large blocks also can divide rather than unite neighborhoods. To promote connected neighborhoods and to shorten travel distances, the following minimum standards for block lengths are established.**
2. **Maximum Block Length and Perimeter. The maximum length and perimeters of blocks in the zones listed below shall be according to the following table. The review body for a subdivision, partition, conditional use permit, or a Type II design review may require installation of streets or walkways as necessary to meet the standards below.**

Zones(s)	**Maximum Block Length**	**Maximum Block Perimeter**
R-1	**800 feet**	**2,000 feet**
R-2, R-3, RP, I	**1,200 feet**	**3,000 feet**

3. **Exceptions.**

a. **If a public walkway is installed mid-block, the maximum block length and perimeter may be increased by 25 percent.**
b. **Where a proposed street divides a block, one of the resulting blocks may exceed the maximum block length and perimeter standards provided the average block length and perimeter of the two resulting blocks do not exceed these standards.**
c. **Blocks in excess of the above standards are allowed where access controlled streets, street access spacing standards, railroads, steep slopes, wetlands, water bodies, preexisting development, ownership patterns or similar circumstances restrict street and walkway location and design. In these cases, block length and perimeter shall be as small as practical. Where a street cannot be provided because of these circumstances but a public walkway is still feasible, a public walkway shall be provided.**
d. **Institutional campuses located in an R‑1 zone may apply the standards for the institutional zone.**
e. **Where a block is in more than one zone, the standards of the majority of land in the proposed block shall apply.**
f. **Where a local street plan, concept master site development plan, or specific plan has been approved for an area, the block standards shall follow those approved in the plan. In approving such a plan, the review body shall follow the block standards listed above to the extent appropriate for the plan area.**

Applicant's Facts and Findings:	The proposed development would create several blocks and new blocks however the patterns of natural resources present on the site and the existing development surrounding the property make a traditional subdivision with blocks meeting the standards listed above impractical. Instead of a traditional block layout, the applicant has proposed a series of blocks which are porous and interconnected with private streets, walkways, and alleys. This standard is met.

P. Private Streets. New private streets, as defined in NMC 15.05.030, shall not be created, except as allowed by NMC 15.240.020(L)(2).

Applicant's Facts and Findings:	Private streets are proposed in compliance with NMC 15.240.020(L)(2), as addressed previously in this narrative. This standard is met.

Q. Traffic Calming.

1. **The following roadway design features may be required in new street construction where traffic calming needs are anticipated:**
   a. **Serpentine alignment.**
   b. **Curb extensions.**
   c. **Traffic diverters/circles.**

d. **Raised medians and landscaping.**
e. **Other methods shown effective through engineering studies.**

2. **Traffic-calming measures such as speed humps should be applied to mitigate traffic operations and/or safety problems on existing streets. They should not be applied with new street constructions.**

Applicant's Facts and Findings: Traffic calming measures are not proposed as the submitted Transportation Impact Analysis demonstrates that the proposed street network is safe and effective.

This standard is met.

R. Vehicular Access Standards.

1. **Purpose. The purpose of these standards is to manage vehicle access to maintain traffic flow, safety, roadway capacity, and efficiency. They help to maintain an adequate level of service consistent with the functional classification of the street. Major roadways, including arterials and collectors, serve as the primary system for moving people and goods within and through the city. Access is limited and managed on these roads to promote efficient through movement. Local streets and alleys provide access to individual properties. Access is managed on these roads to maintain safe maneuvering of vehicles in and out of properties and to allow safe through movements. If vehicular access and circulation are not properly designed, these roadways will be unable to accommodate the needs of development and serve their transportation function.**
2. **Access Spacing Standards. Public street intersection and driveway spacing shall follow the standards in Table 15.505.R below. The Oregon Department of Transportation (ODOT) has jurisdiction of some roadways within the Newberg city limits, and ODOT access standards will apply on those roadways.**

Table 15.505.R. Access Spacing Standards

Roadway Functional Classification	Area[1]	Minimum Public Street Intersection Spacing (Feet)[2]	Driveway Setback from Intersecting Street[3]
Expressway	All	Refer to ODOT Access Spacing Standards	NA
Major Arterial	Urban CBD	Refer to ODOT Access Spacing Standards	
Minor Arterial	Urban CBD	500 200	150 100
Major Collector	All	400	150
Minor Collector	All	300	100

3. **Properties with Multiple Frontages. Where a property has frontage on more than one street, access shall be limited to the street with the lesser classification.**

4. **Driveways. More than one driveway is permitted on a lot accessed from either a minor collector or local street as long as there is at least 40 feet of lot frontage separating each driveway approach. More than one driveway is permitted on a lot accessed from a major collector as long as there is at least 100 feet of lot frontage separating each driveway approach.**
5. **Alley Access. Where a property has frontage on an alley and the only other frontages are on collector or arterial streets, access shall be taken from the alley only. The review body may allow creation of an alley for access to lots that do not otherwise have frontage on a public street provided all of the following are met:**
   a. **The review body finds that creating a public street frontage is not feasible.**
   b. **The alley access is for no more than six dwellings and no more than six lots.**
   c. **The alley has through access to streets on both ends.**
   d. **One additional parking space over those otherwise required is provided for each dwelling. Where feasible, this shall be provided as a public use parking space adjacent to the alley.**
6. **Closure of Existing Accesses. Existing accesses that are not used as part of development or redevelopment of a property shall be closed and replaced with curbing, sidewalks, and landscaping, as appropriate.**
7. **Shared Driveways.**
   a. **The number of driveways onto arterial streets shall be minimized by the use of shared driveways with adjoining lots where feasible. The city shall require shared driveways as a condition of land division or site design review, as applicable, for traffic safety and access management purposes. Where there is an abutting developable property, a shared driveway shall be provided as appropriate. When shared driveways are required, they shall be stubbed to adjacent developable parcels to indicate future extension. "Stub" means that a driveway temporarily ends at the property line, but may be accessed or extended in the future as the adjacent parcel develops. "Developable" means that a parcel is either vacant or it is likely to receive additional development (i.e., due to infill or redevelopment potential).**
   b. **Access easements (i.e., for the benefit of affected properties) and maintenance agreements shall be recorded for all shared driveways, including pathways, at the time of final plat approval or as a condition of site development approval.**
   c. **No more than four lots may access one shared driveway.**
   d. **Shared driveways shall be posted as no parking fire lanes where required by the fire marshal.**
   e. **Where three lots or three dwellings share one driveway, one additional parking space over those otherwise required shall be provided for each dwelling. Where feasible, this shall be provided as a common use parking space adjacent to the driveway.**
8. **Frontage Streets and Alleys. The review body for a partition, subdivision, or design review may require construction of a frontage street to provide access to properties fronting an arterial or collector street.**

9. **ODOT or Yamhill County Right-of-Way. Where a property abuts an ODOT or Yamhill County right-of-way, the applicant for any development project shall obtain an access permit from ODOT or Yamhill County.**
10. **Exceptions. The director may allow exceptions to the access standards above in any of the following circumstances:**
    a. **Where existing and planned future development patterns or physical constraints, such as topography, parcel configuration, and similar conditions, prevent access in accordance with the above standards.**
    b. **Where the proposal is to relocate an existing access for existing development, where the relocated access is closer to conformance with the standards above and does not increase the type or volume of access.**
    c. **Where the proposed access results in safer access, less congestion, a better level of service, and more functional circulation, both on street and on site, than access otherwise allowed under these standards.**
11. **Where an exception is approved, the access shall be as safe and functional as practical in the particular circumstance. The director may require that the applicant submit a traffic study by a registered engineer to show the proposed access meets these criteria.**

Applicant's Facts and Findings: This application proposes one access on Highway 99W. All other driveway and intersection spacing standards are met, as demonstrated on the submitted public improvement plans.

This standard is met.

S. Public Walkways.

1. **Projects subject to Type II design review, partition, or subdivision approval may be required to provide public walkways where necessary for public safety and convenience, or where necessary to meet the standards of this code. Public walkways are meant to connect cul-de-sacs to adjacent areas, to pass through oddly shaped or unusually long blocks, to provide for networks of public paths according to adopted plans, or to provide access to schools, parks or other community destinations or public areas. Where practical, public walkway easements and locations may also be used to accommodate public utilities.**
2. **Public walkways shall be located within a public access easement that is a minimum of 15 feet in width.**
3. **A walk strip, not less than 10 feet in width, shall be paved in the center of all public walkway easements. Such paving shall conform to specifications in the Newberg public works design and construction standards.**
4. **Public walkways shall be designed to meet the Americans with Disabilities Act requirements.**
5. **Public walkways connecting one right-of-way to another shall be designed to provide as short and straight of a route as practical.**
6. **The developer of the public walkway may be required to provide a homeowners' association or similar entity to maintain the public walkway and associated improvements.**

7. **Lighting may be required for public walkways in excess of 250 feet in length.**
8. **The review body may modify these requirements where it finds that topographic, preexisting development, or similar constraints exist.**

Applicant's Facts and Findings:	Public walkways are proposed to connect the multi-family resident to Highway 99W, throughout the wetland/natural areas, and connecting from the development to Spring Meadow Park to the west. This standard is met.

T. Street Trees. Street trees shall be provided for all projects subject to Type II design review, partition, or subdivision. Street trees shall be installed in accordance with the provisions of NMC 15.420.010(B)(4).

Applicant's Facts and Findings:	As indicated on the submitted landscaping plans, street trees are proposed on all streets. This standard is met.

U. Street Lights. All developments shall include underground electric service, light standards, wiring and lamps for street lights according to the specifications and standards of the Newberg public works design and construction standards. The developer shall install all such facilities and make the necessary arrangements with the serving electric utility as approved by the city. Upon the city's acceptance of the public improvements associated with the development, the street lighting system, exclusive of utility-owned service lines, shall be and become property of the city unless otherwise designated by the city through agreement with a private utility.

Applicant's Facts and Findings:	This proposal includes developer-installed underground electric service, light standards, wiring and lamps for street lights according to the specifications and standards of the Newberg public works design and construction standards. This standard is met.

V. Transit Improvements. Development proposals for sites that include or are adjacent to existing or planned transit facilities, as shown in the Newberg transportation system plan or adopted local or regional transit plan, shall be required to provide any of the following, as applicable and required by the review authority:

1. **Reasonably direct pedestrian connections between the transit facility and building entrances of the site. For the purpose of this section, "reasonably direct" means a route that does not deviate unnecessarily from a straight line or a route that does not involve a significant amount of out-of-direction travel for users.**
2. **A transit passenger landing pad accessible to disabled persons.**

3. **An easement of dedication for a passenger shelter or bench if such facility is in an adopted plan.**
4. **Lighting at the transit facility.**

Applicant's Facts and Findings:	There are no transit facilities within or adjacent to this site and, as such, this standard is not applicable.

15.505.040 Public utility standards.

A. Purpose. The purpose of this section is to provide adequate services and facilities appropriate to the scale and type of development.

B. Applicability. This section applies to all development where installation, extension or improvement of water, wastewater, or private utilities is required to serve the development or use of the subject property.

C. General Standards.

1. **The design and construction of all improvements within existing and proposed rights-of-way and easements, all improvements to be maintained by the city, and all improvements for which city approval is required shall conform to the Newberg public works design and construction standards and require a public improvements permit.**
2. **The location, design, installation and maintenance of all utility lines and facilities shall be carried out with minimum feasible disturbances of soil and site. Installation of all proposed public and private utilities shall be coordinated by the developer and be approved by the city to ensure the orderly extension of such utilities within public right-of-way and easements.**

D. Standards for Water Improvements. All development that has a need for water service shall install the facilities pursuant to the requirements of the city and all of the following standards. Installation of such facilities shall be coordinated with the extension or improvement of necessary wastewater and stormwater facilities, as applicable.

1. **All developments shall be required to be linked to existing water facilities adequately sized to serve their intended area by the construction of water distribution lines, reservoirs and pumping stations which connect to such water service facilities. All necessary easements required for the construction of these facilities shall be obtained by the developer and granted to the city pursuant to the requirements of the city.**
2. **Specific location, size and capacity of such facilities will be subject to the approval of the director with reference to the applicable water master plan. All water facilities shall conform with city pressure zones and shall be looped where necessary to provide adequate pressure and fire flows during peak demand at every point within the system in the development to which the water facilities will be connected. Installation costs shall remain entirely the developer's responsibility.**
3. **The design of the water facilities shall take into account provisions for the future extension beyond the development to serve adjacent properties, which, in the judgment of the city, cannot be feasibly served otherwise.**
4. **Design, construction and material standards shall be as specified by the director for the construction of such public water facilities in the city.**

E. Standards for Wastewater Improvements. All development that has a need for wastewater services shall install the facilities pursuant to the requirements of the city and all of the following standards. Installation of such facilities shall be coordinated with the extension or improvement of necessary water services and stormwater facilities, as applicable.

1. **All septic tank systems and on-site sewage systems are prohibited. Existing septic systems must be abandoned or removed in accordance with Yamhill County standards.**
2. **All properties shall be provided with gravity service to the city wastewater system, except for lots that have unique topographic or other natural features that make gravity wastewater extension impractical as determined by the director. Where gravity service is impractical, the developer shall provide all necessary pumps/lift stations and other improvements, as determined by the director.**
3. **All developments shall be required to be linked to existing wastewater collection facilities adequately sized to serve their intended area by the construction of wastewater lines which connect to existing adequately sized wastewater facilities. All necessary easements required for the construction of these facilities shall be obtained by the developer and granted to the city pursuant to the requirements of the city.**
4. **Specific location, size and capacity of wastewater facilities will be subject to the approval of the director with reference to the applicable wastewater master plan. All wastewater facilities shall be sized to provide adequate capacity during peak flows from the entire area potentially served by such facilities. Installation costs shall remain entirely the developer's responsibility.**
5. **Temporary wastewater service facilities, including pumping stations, will be permitted only if the director approves the temporary facilities, and the developer provides for all facilities that are necessary for transition to permanent facilities.**
6. **The design of the wastewater facilities shall take into account provisions for the future extension beyond the development to serve upstream properties, which, in the judgment of the city, cannot be feasibly served otherwise.**
7. **Design, construction and material standards shall be as specified by the director for the construction of such wastewater facilities in the city.**

F. Easements. Easements for public and private utilities shall be provided as deemed necessary by the city, special districts, and utility companies. Easements for special purpose uses shall be of a width deemed appropriate by the responsible agency. Such easements shall be recorded on easement forms approved by the city and designated on the final plat of all subdivisions and partitions. Minimum required easement width and locations are as provided in the Newberg public works design and construction standards.

Applicant's Facts and Findings:	The development will connect to public utilities, including water and sanitary sewer. As demonstrated on the submitted public improvement plans, all public utilities are designed to be constructed to City standards. This standard is met.

15.505.050 Stormwater system standards.

A. Purpose. The purpose of this section is to provide for the drainage of surface water from all development; to minimize erosion; and to reduce degradation of water quality due to sediments and pollutants in stormwater runoff.

B. Applicability. The provisions of this section apply to all developments subject to site development review or land division review and to the reconstruction or expansion of such developments that increases the flow or changes the point of discharge to the city stormwater system. Additionally, the provisions of this section shall apply to all drainage facilities that impact any public storm drain system, public right-of-way or public easement, including but not limited to off-street parking and loading areas.

C. General Requirement. All stormwater runoff shall be conveyed to a public storm wastewater or natural drainage channel having adequate capacity to carry the flow without overflowing or otherwise causing damage to public and/or private property. The developer shall pay all costs associated with designing and constructing the facilities necessary to meet this requirement.

D. Plan for Stormwater and Erosion Control. No construction of any facilities in a development included in subsection (B) of this section shall be permitted until an engineer registered in the State of Oregon prepares a stormwater report and erosion control plan for the project. This plan shall contain at a minimum:

1. **The methods to be used to minimize the amount of runoff, sedimentation, and pollution created from the development both during and after construction.**
2. **Plans for the construction of stormwater facilities and any other facilities that depict line sizes, profiles, construction specifications, and other such information as is necessary for the city to review the adequacy of the stormwater plans.**
3. **Design calculations shall be submitted for all drainage facilities. These drainage calculations shall be included in the stormwater report and shall be stamped by a licensed professional engineer in the State of Oregon. Peak design discharges shall be computed based upon the design criteria outlined in the public works design and construction standards for the city.**

E. Development Standards. Development subject to this section shall be planned, designed, constructed, and maintained in compliance with the Newberg public works design and construction standards.

Applicant's Facts and Findings:	The submitted public improvement plans include details of the proposed stormwater detention and treatment plan. The stormwater detention and treatment plan is designed to meet City standards and to preclude stormwater drainage on surrounding properties. This standard is met.

SUMMARY AND CONCLUSION

Based upon the materials submitted herein, the Applicant respectfully requests approval from the City's Planning Commission of this application for a Planned Unit Development and a Conditional Use Permit.

Pre-application meeting notes: Crestview Crossing – 3/14/18

Planning comments:

Zoning and allowed uses: The site is in the C-2, R-2 and R-1 zones.

Corps of Engineers/Department of State Lands:
Discussions with the Corps and DSL continue on the wetland mitigation program. The stream channel is proposed to be retained across the site.

Process:
Application type: Type III Preliminary PUD and a CUP for housing in the C-2 zone.
Timing: Typically 4-6 weeks after the application is deemed complete for a Planning Commission hearing. Two week appeal period following Planning Commission decision. If appealed then it would go to the City Council.
Public notice requirements: Mailed notice to properties within 500 feet, sign posted on frontage.

1. **Please describe the city's plans and funding opportunities for the construction of the new connection between Highway 99 and existing section of Crestview.**

   Regional Solutions Grant: The City received a $740,000 grant for Crestview Drive improvements that will cover the roadway from the County line west towards Springbrook Road. JT Smith Companies will be responsible to construct Crestview Drive from Highway 99W north to the County line where Crestview Drive is located. The City will go from the County Line west as far as it can go with the $740,000 grant and #1.1M in SDC funds. Springbrook Properties will construct from the location the City stops out to Springbrook Road. The roadway is a Major Collector with a travel lane in each direction, center turn lane, bike lanes, planer strip and sidewalks. The City will not be contributing grant funds to the portion of Crestview Drive that is the responsibility of JT Smith Companies to construct. If the City loses the grant funds then JT Smith Companies may have to pave at minimum a two lane asphalt surface in Crestview Drive that cover the gravel road portion based on trip distribution from the traffic analysis.

2. **Please confirm the extent to which any frontage improvements will be required along Highway 99.**

   ODOT:
   Frontage improvements along OR99W will need to be coordinated with the Oregon Department of Transportation (ODOT) in coordination with the City of Newberg. A separate meeting will need to be scheduled with ODOT on any requirements for Highway 99W improvements. Diego Arguea will contact Jerry Juster at ODOT to set up a meeting that City staff will attend.

Access Permit: An access permit from ODOT is required for connection o Crestview Drive to Highway 99W. JT Smith Companies will prepare the required permit application and the City will submit the permit application to ODOT. JT Smith Companies will be responsible for any ODOT fees for the permit application.

Commercial Access to Highway 99W: That will need to be discussed with ODOT. Prior meetings with ODOT indicated that Highway 99W would function as an on/off ramp to the Bypass and access from an on/off ramp is not permitted. The on/off ramp terminates at the Providence Drive/Crestview Drive intersection with Highway 99W.

3. **Please comment upon whether the city has any interest in taking ownership of any open spaces within the plan.**

   The City is not interested in owning any park or open space in the development. The City suggested JT Smith Companies contact the Chehalem Park and Recreation District to see if they would be interested. City to provide contacts for Don Clements and Jim McMaster to JT Smith Companies representatives. Don Clements, Superintendent, dclements@cprdnewberg.org; Jim McMaster, Parks & Facilities Supervisor, jmcmaster@cprdnewberg.org

4. **Please confirm the applicable approval criteria for the PD and CUP applications.**

   Staff distributed the PUD and Conditional Use requirements.

5. **Please provide comments on the site's layout, density, and overall road configuration.**

   The site layout was discussed and appears appropriate based on prior versions of the conceptual site layout. The proposal identifies some apartment uses that respond to prior comments to include some multi-family housing to address local housing advocate concerns and issues.

   A distinction needs to be made between public and private streets, perhaps some type of gateway treatment.

   The west leg of the roundabout including the splitter island needs to be part of the public street system, and then transition to a private street west of the roundabout.

   There will be concern from planning commission about parking, be prepared to discuss parking needs/capacity.

   For the road configuration it was suggested to talk with property owners to the east to make sure they are aware of the roadway layout and to determine if they have any concerns on the location of the stub streets.

The traffic circle on the west side will need a demarcation of surface type between a public street and private street. A driveway apron should be considered at the connection point with the north/south private street. JT Smith Companies will propose a round-a-bout design and the City will review TVF&R wants to be able to see through the round-a-bout, us low landscaping.

A driveway apron will necessary to make the transition from the public street to private street for the east/west transportation system at the northwest corner of the site.

6. **Please provide the City's right-of-way sections for all proposed roads.**

   See attached.

7. **Are there addition plans required for land use approval that are not listed on the provided check list for a planned unit development? Will any architectural plans be required?**

   A PUD and CUP are required for development. Architectural plan are a requirement as part of the PUD. City is receptive to have as part of the submittal a pallet of building material to be used that can be mixed and matched on the proposed residential buildings, identify the scale and massing of the building will be important.

   The commercial lot will be viewed as a vacant lot in the PUD. City is receptive to doing a separate Design Review on the commercial area at a later date when development is proposed.

8. **The City currently requires a 10' PUE along the front of each lot within a subdivision. Can the 10' PUE requirement be reduced? What would be the City's preference for PUE placement for lots without frontage on a public street?**

   The City requires a 10' PUE. The City would be open to consider the applicant's proposal for PUE placement for lots without frontage on public streets. However the PUE alignment needs to be kept separate from the water, sewer, storm, and non-potable water alignments i.e. no overlapping of public vs. private utilities. The street alignment of public utilities needs to follow Standard Detail 103. Private utilities would also need to be included in the discussion (and consent to the PUE location) if the proposal includes placing private utilities in paved areas.

9. **Does the City have preferred dimensions for the proposed roundabout?**

   Follow FHWA guidance for roundabout layout and design.

10. **Can PUE's be located within alleyways?**

    The City is open to a proposal from the applicant, however public vs. private utilities must be kept in separate alignments.

11. **Please provide a copy of the City's current Sewer Master Plan.**

    The City's current Sewer Master Plan is in the process of being updated. The March 2018 draft document can be found here: https://www.newbergoregon.gov/engineering/page/wastewater-master-plan-ad-hoc-advisory-committee-1

12. **The storm system design currently requires CG-48 structures with a maximum depth of 72-inches. Please confirm the City's preferred design for the storm system in areas that reach depths greater than 72-inches.**

    The standard detail for this design is currently being revised.

13. **Please confirm where the proposed development will be required to connect to the Recycled Water Use system. If so, please provide guidance on the design, location, depth and sizing for the proposed utility.**

    The development will be required to connect to non-potable water. Additional information about sizing for the non-potable water line can be found in the Water Master Plan. Further review and discussion will be needed to confirm design guidance for the non-potable system.

14. **Does the city allow AWWA C900/C905 PVC to be used for water mains?**

    The City only allows ductile iron for public water mains, see Public Works Design and Construction Standards (PWDCS), Section 3.2 Pipe Materials and Size.

15. **What values with the City of Newberg like to use for Occupants/Dwellings, Gallons/Occupant Contingency Factor, and Peaking Factor when calculation the Peak Design flow for the site?**

    See Sewer Master Plan.

16. **Will the City allow mechanical stormwater treatment and what systems are currently approved for use?**

    Mechanical stormwater treatment is allowed for private facilities only. See the Public Works Design and Construction Standards for hierarchy of treatment solutions. Provide justification as to why mechanical treatment is used over preferred treatment solutions in the hierarchy.

June 5, 2018

Aaron Murphy
Senior Project Manager
3J Consulting, Inc.
5075 SW Griffith Dr. Suite 150
Beaverton, OR 97005

Re: Crestview Crossing
Tax Lot I.D: 3216AC 13800 & 13216 1100

Aaron,

Thank you for the opportunity to review the proposed application surrounding the Crestview Crossing Subdivision. These notes are provided in regards to our meeting held on **May 17, 2018** and the site plan published **May 14, 2018**. There may be more or less requirements needed based upon the final project design, however, Tualatin Valley Fire & Rescue will endorse this proposal predicated on the following criteria and conditions of approval.

FIRE APPARATUS ACCESS:

1. **FIRE APPARATUS ACCESS ROAD DISTANCE FROM BUILDINGS AND FACILITIES:** Access roads shall be within 150 feet of all portions of the exterior wall of the first story of the building as measured by an approved route around the exterior of the building or facility. An approved turnaround is required if the remaining distance to an approved intersecting roadway, as measured along the fire apparatus access road, is greater than 150 feet. (OFC 503.1.1)

2. **DEAD END ROADS AND TURNAROUNDS:** Dead end fire apparatus access roads in excess of 150 feet in length shall be provided with an approved turnaround. Diagrams can be found in the corresponding guide that is located at http://www.tvfr.com/DocumentCenter/View/1296. (OFC 503.2.5 & D103.1)

3. **FIRE APPARATUS ACCESS ROAD WIDTH AND VERTICAL CLEARANCE:** Fire apparatus access roads shall have an unobstructed driving surface width of not less than 20 feet (**26 feet adjacent to fire hydrants** (OFC D103.1)) and an unobstructed vertical clearance of not less than 13 feet 6 inches. (OFC 503.2.1 & D103.1)

4. **FIRE APPARATUS ACCESS ROADS WITH FIRE HYDRANTS:** Where a fire hydrant is located on a fire apparatus access road, the minimum road width shall be 26 feet and shall extend 20 feet before and after the point of the hydrant. (OFC D103.1)

5. **NO PARKING SIGNS:** Where fire apparatus roadways are not of sufficient width to accommodate parked vehicles and 20 feet of unobstructed driving surface, "No Parking" signs shall be installed on one or both sides of the roadway and in turnarounds as needed. Signs shall read "NO PARKING - FIRE LANE" and shall be installed with a clear space above grade level of 7 feet. Signs shall be 12 inches wide by 18 inches high and shall have red letters on a white reflective background. (OFC D103.6)

6. **NO PARKING:** Parking on emergency access roads shall be as follows (OFC D103.6.1-2):

1. 20-26 feet road width – no parking on either side of roadway
2. 26-32 feet road width – parking is allowed on one side
3. Greater than 32 feet road width – parking is not restricted

Note: For specific widths and parking allowances, contact the local municipality.

7. **SURFACE AND LOAD CAPACITIES:** Fire apparatus access roads shall be of an all-weather surface that is easily distinguishable from the surrounding area and is capable of supporting not less than 12,500 pounds point load (wheel load) and 75,000 pounds live load (gross vehicle weight). Documentation from a registered engineer that the final construction is in accordance with approved plans or the requirements of the Fire Code may be requested. (OFC 503.2.3)

8. **TURNING RADIUS:** The inside turning radius and outside turning radius shall not be less than 28 feet and 48 feet respectively, measured from the same center point. (OFC 503.2.4 & D103.3)

9. **ANGLE OF APPROACH/GRADE FOR TURNAROUNDS:** Turnarounds shall be as flat as possible and have a maximum of 5% grade with the exception of crowning for water run-off. (OFC 503.2.7 & D103.2)

10. **ANGLE OF APPROACH/GRADE FOR INTERSECTIONS:** Intersections shall be level (maximum 5%) with the exception of crowning for water run-off. (OFC 503.2.7 & D103.2)

11. **ACCESS DURING CONSTRUCTION:** Approved fire apparatus access roadways shall be installed and operational prior to any combustible construction or storage of combustible materials on the site. Temporary address signage shall also be provided during construction. (OFC 3309 and 3310.1)

12. **TRAFFIC CALMING DEVICES:** Shall be prohibited on fire access routes unless approved by the Fire Marshal. (OFC 503.4.1). Traffic calming measures linked here: http://www.tvfr.com/DocumentCenter/View/1578

FIREFIGHTING WATER SUPPLIES:

13. **FIREFIGHTING WATER SUPPLY FOR INDIVIDUAL ONE- AND TWO-FAMILY DWELLINGS:** The minimum available fire flow for one and two-family dwellings served by a municipal water supply shall be 1,000 gallons per minute. If the structure(s) is (are) 3,600 square feet or larger, the required fire flow shall be determined according to OFC Appendix B. (OFC B105.2)

14. **FIRE FLOW WATER AVAILABILITY:** Applicants shall provide documentation of a fire hydrant flow test or flow test modeling of water availability from the local water purveyor if the project includes a new structure or increase in the floor area of an existing structure. Tests shall be conducted from a fire hydrant within 400 feet for commercial projects, or 600 feet for residential development. Flow tests will be accepted if they were performed within 5 years as long as no adverse modifications have been made to the supply system. Water availability information may not be required to be submitted for every project. (OFC Appendix

15. **FIRE HYDRANT DISTANCE FROM AN ACCESS ROAD:** Fire hydrants shall be located not more than 15 feet from an approved fire apparatus access roadway unless approved by the Fire Marshal. (OFC C102.1)

16. **PREMISES IDENTIFICATION:** New and existing buildings shall have approved address numbers; building numbers or approved building identification placed in a position that is plainly legible and visible from the street or road fronting the property, including monument signs. These numbers shall contrast with their background. Numbers shall be a minimum of 4 inches high with a minimum stroke width of 1/2 inch. (OFC 505.1)

If you have questions or need further clarification, please feel free to contact me at **503-259-1510.**

Sincerely,

Jason Arn

Jason Arn
Deputy Fire Marshal II

Email Jason.arn@tvfr.com

Cc: File

A full copy of the New Construction Fire Code Applications Guide for Residential Development is available at http://www.tvfr.com/DocumentCenter/View/1438

17. **Will the City allow underground stormwater detention and what systems are currently approved for use?**

    Private underground stormwater detention facilities are allowed, the City does not have a pre-qualified list of approved materials.

3J CONSULTING

5075 SW GRIFFITH DRIVE, SUITE 150
BEAVERTON, OREGON 97005
PH: (503) 946.9365
WWW.3J-CONSULTING.COM

April 25, 2018

CRESTVIEW CROSSING
NOTICE OF NEIGHBORHOOD MEETING

Dear Resident or Property Owner:

3J Consulting, Inc. acts on behalf of JT Smith Companies regarding a new planned residential and commercial community located at the intersection of Highway 99 and Crestview Drive – 4505 Portland Road. This property can be legally identified as taxlots 3216ac lot 13800 and 3216 lot 1100.

JT Smith Companies is proposing to bring forward a new design for a residential subdivision, small apartment complex, and a small commercial pad for future commercial and retail development. JT Smith is also proposing to extend Crestview Drive through the site to the Highway. Before submitting applications to the Newberg Planning Department, we would like to take the opportunity to discuss the proposal in more detail with our neighbors.

A meeting to discuss this project has been scheduled for:

Monday, May 14, 2018
6:00PM-7:00PM
Tualatin Valley Fire Station 21
3100 Middlebrook Drive
Newberg, Oregon

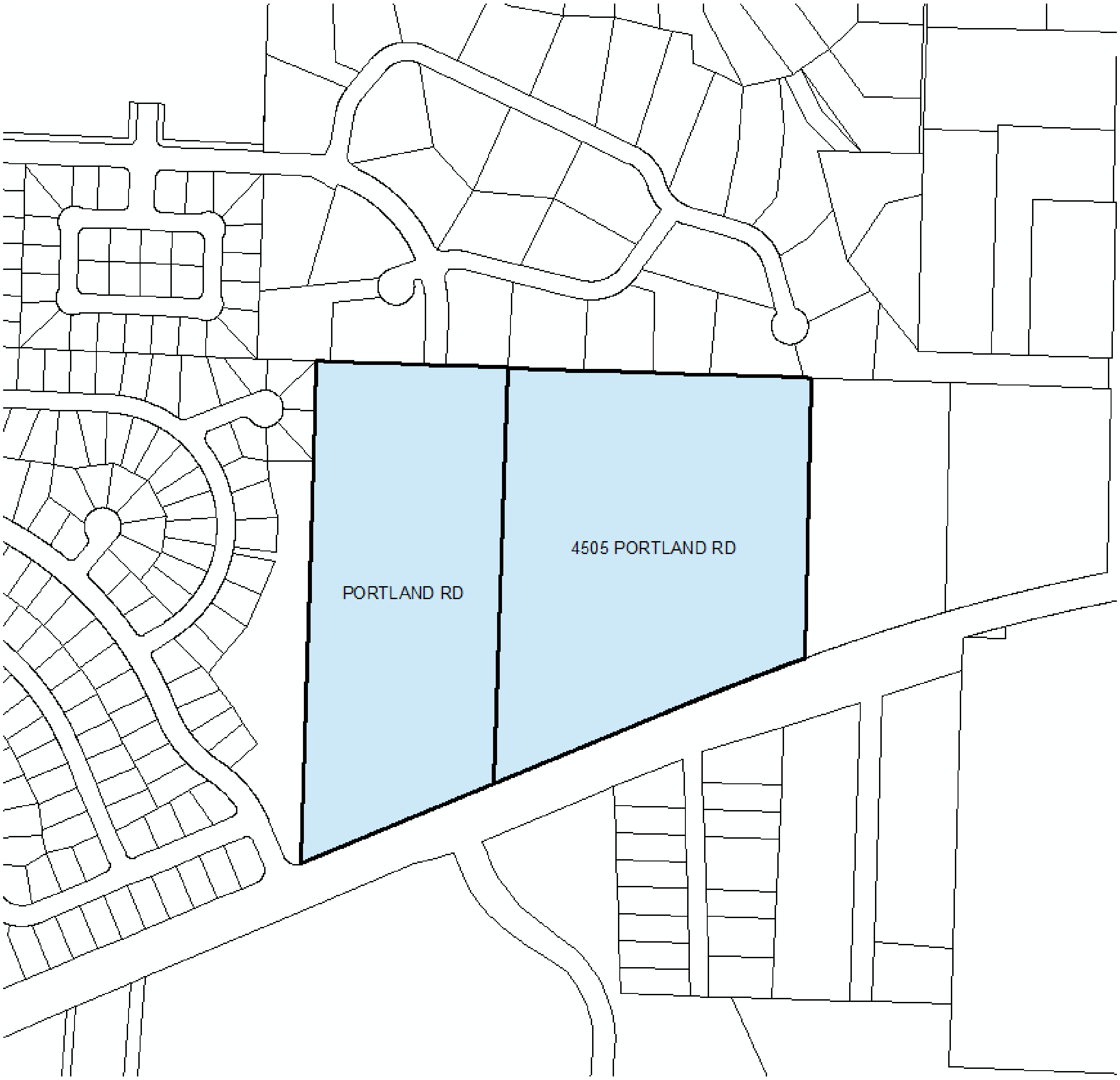
The purpose of this meeting is to provide a forum for surrounding property owners/residents to review the proposal and to identify issues so they can be considered before the formal application is submitted. This meeting gives you the opportunity to share with me any special information you know about the property involved. We will try to answer questions related to how the project meeting relevant development standards consistent with Newberg's land use regulations.

Please note that this will be an informational meeting on preliminary development plans. These plans may change slightly before the application is submitted to the City. Depending upon the type of application, you may receive an official notice from the City of Newberg of your opportunity to participate either by submitted written comments, and/or by attending a public hearing.

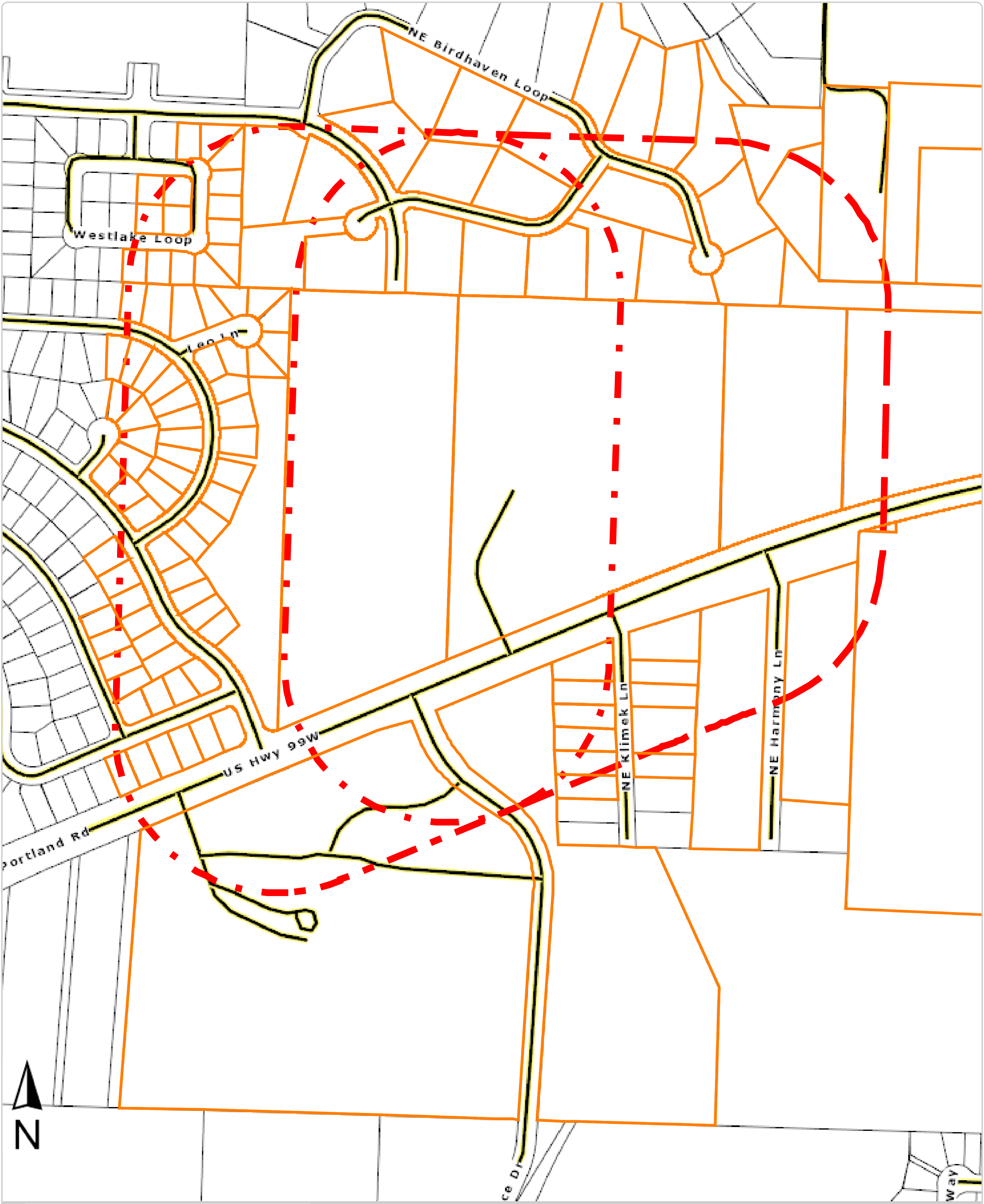
We look forward to discussing this proposal with you. Please feel free to contact us at (503) 946-9365 or andrew.tull@3j-consulting.com if you have questions.

Sincerely,

Andrew Tull
Principal Planner
3J Consulting, Inc.



VICINITY MAP



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NEIGHBORHOOD MEETING
CRESTVIEW CROSSING
LAND DIVISION
MAY 14, 2018

NAME	ADDRESS	EMAIL
Beth Bernier	1811 Leo Ln Newberg 97132	bethbgoose@yahoo.com
Jay Gilbertson	1907 WestLake Lp., Newberg	~~jay-8588~~
Samantha Gilbertson	" " " "	jay-8588@yahoo.com
Nathan Roedel	4209 NE Birdhaven	nate.roedel@gmail.com
Sally Simmons	4301 NE Birdhaven Loop	simmsal@yahoo.com
Mark Simmons	✓	mark.simmons@
David Farrar · Tonna Farrar	4509 NE Blue Heron Ct	tonnafarrar@yahoo.com / @yahoo.com
Marilyn Godfrey	3714 Coffey Ln Newberg	godfreykittyz@gmail.com
Carla Anderson	4601 NE Blue Heron Ct. Newberg	anderson.cjc@gmail.com
Ann DAVIS	4405 NE Birdhaven Loop Newberg	rickannd@yahoo.com

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NEIGHBORHOOD MEETING
CRESTVIEW CROSSING
LAND DIVISION
MAY 14, 2018

NAME	ADDRESS	EMAIL
Geneva (JoAn) Hoy	1958 Westlake Loop	Hoyjoan475@gmail.com
LINDA + DAVID CAMPBELL	1951 WESTLAKE LOOP	tangocamp02@frontier.com
TRACY Smits	1921 westlake loop	TCJ9995@yahoo.com
LARRY + Polly S.W	1931 westLAKE Loop	larryS[illegible]@gmail.com
Joyce Plamman	30160 N.E. Benjamin Rd.	N/A
Doreen + Bill Light	1926 WESTLAKE LOOP	billmyrtle@yahoo.com
Denise Burt	1955 Westlake Loop	denise.burt@gmail.com
DANIEL PEEK	4402 NE BIRDHAVEN LOOP	dcpeek55@gmail.com
Bill & Ingrid Olsen	4501 Blue Heron Ct.	owilliamolsen@gmail.com
DAVE SIMMONS	4407 BIRDHAVEN LOOP	djjsimmons@comcast.net
Sherrie Mathison	3813 Coffey Lane	ssmathison@aol.com

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NEIGHBORHOOD MEETING
CRESTVIEW CROSSING
LAND DIVISION
MAY 14, 2018

NAME	ADDRESS	EMAIL
Ronny Bernier	1811 Leo Ln. Newberg 97132	RB44CHINOOK@Yahoo.com
LINDA WRIGHT	1925 WESTLAKE Lp 97132	——
DAVID HANSEN	1807 LEO LN 97132	dhansen1977@gmail.com
MARK WAGNER	4403 NE BIRDHAVEN LOOP 97132	OXBERGHOA@GMAIL.COM
Russ Thomas	1808 Leo LN Newberg Or 97132	Russ-Thomas@comcast.net

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NEIGHBORHOOD MEETING
CRESTVIEW CROSSING
LAND DIVISION
MAY 14, 2018

NAME	ADDRESS	EMAIL
Trudel, John & Pat	4303 N.E. Birdhaven Loop	JTRUDEL@TRUDELGROUP.COM
Petrone	4321 NE Crestview Dr	shami6@frontier.com
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David & Susanne Wall	P.O. Box 756 Newberg 97132	—
Victoria Streit	1917 Westlake Loop Newberg	ourthreebs@comcast.net
[illegible]	1915 Westlake Loop	
Keith & Darlene Wingfield	4204 Birdhaven	darlenewingfield@aol.com
Stephan Bernier	1811 Leo Lane	bengalsguy1988@gmail.co.
Bruce & Bobbie Barnett	4600 NE Blue Heron Ct	bruce@barnettins.com
Kathie Ayers	1900 Westlake Loop	seaayer9@gmail.com
Mike White	3612 Crestview Dr	MJBWHITE@COMCAST.NET
Howard [illegible]	1942 Westlake Loop	Tribbett14@hotmail.com
Jackie [illegible]	" " "	
Doris Palmer	4408 Birdhaven Loop	—
Vicki Shepherd	30230 NE Benjamin Rd.	dvshepherd2@gmail.com
Kyle Kern	1941 Westlake Lp Newberg	KyleKern05@gmail.com

3J CONSULTING

CIVIL ENGINEERING | WATER RESOURCES | LAND USE PLANNING

PRELIMINARY STORMWATER MANAGEMENT PLAN

CRESTVIEW CROSSING
NEWBERG, OR

June 6, 2018

Prepared For:

JT Smith Companies
5285 Meadows Road
Lake Oswego, OR 97035

REGISTERED PROFESSIONAL ENGINEER
74498PE
Kathleen Freeman
OREGON
Jan. 8, 2009
KATHLEEN E. FREEMAN
6/6/18
EXPIRES 12/31/2019

Prepared By:
3J Consulting, Inc.
5075 Griffith Drive, Suite 150
Beaverton, Oregon 97005
Project No: 17393
KEF

SLOPES V: Stormwater, Transportation and Utilities

(NMFS# NWR-2013-10411)

Stormwater Information Form

If you are submitting a project that includes a stormwater plan for review under SLOPES: Stormwater, Transportation and Utilities please fill out the following cover sheet to be included with stormwater management plan, and any other supporting materials.

Also include a drawing of the stormwater treatment area including drainage areas, direction of flow, BMP locations/types, contributing areas, other drainage features, receiving water/location, etc.

	Project Information	
	Corps of Engineers permit #	2008-192
	Name of Project:	Crestview Crossing
	Type of project (i.e., residential, commercial, industrial, or combination)	Residential and Commercial
	Nearest receiving water occupied by ESA-listed species or designated critical habitat	Spring Brook
	Have you contacted anyone at NMFS regarding this project?	No
1.	Stormwater Designer and/or Engineer Contact Information	
	Name:	Kathleen Freeman, PE
	Phone:	503-946-9365 Ext. 204
	Email:	Kathleen.freeman@3j-consulting.com
	Summary of Design Elements	
2.	**Total** contributing impervious area including all contiguous surface (e.g. roads, driveways, parking lots, sidewalks, roofs, and similar surfaces)	0 **Acres**
	Proposed new	17.076 Acres
	Existing	0 Acres
	Acres of total impervious area x design storm = 158,068 ft^3 to be treated	
3.	Peak discharge of design storm:	4.57 cfs
4.	Total stormwater to be treated:	158,068 ft^3 4.57 cfs
5.	24-hour design storm: 1.25 Inches	50%* or 67% of 2-yr, 24-hr storm fully treated: Yes No If no, project may not meet the SLOPES programmatic criteria *See PDC 36.e. for geographically based percentage
6.	Lat/Long (DDD.dddd) of Project Location: 45.311844/-122.934544	
7.	2 year, 24 hour storm from NOAA Precipitation Atlas: 2.14 Inches http://www.nws.noaa.gov/ohd/hdsc/noaaatlas2.htm **2.50 Inches was used to comply with City of Newberg**	
8.	Stormwater Design Manual Used and Year/Version: (example: City of Portland, Clean Water Services, King County, Western Washington) 2014 City of Newberg Design Standards Manual, Clean Water Services Design and Construction Standards (April 2017) and LIDA Handbook (June 2016), Oregon Department of Transportation Hydraulics Manual (April 2014) Describe which elements of your stormwater plan came from this manual: Water quality and detention requirements. Treatment and detention Low Impact Approach BMPs.	

9.	Have you treated all stormwater to the design storm within the contributing impervious area? Yes No If no, why not and how will you offset the effects from remaining stormwater?
	Water Quality
10.	Low Impact Development methods incorporated? Yes No (e.g. site layout, vegetation and soil protection, reforestation, integrated management practices such as amended soils, bioretention, permeable pavement, rainwater collection, tree retention) Please describe: Impervious areas from the entire development (except the multi-family residential) including, sidewalks and roads will be treated in vegetated facilities. Impervious area from the multi-family residential area will not be treated with vegetated facilities due to grading constraints. This area will be treated with an underground mechanical facility. How much of total stormwater is treated using LID: 94%
11.	Treatment train, including pretreatment and bioretention methods used to treat water quality: All runoff will be conveyed to trapped catch basins followed by sumped water quality manholes to remove coarse sediment. The manholes will convey the pretreated stormwater to vegetated swales which will provide filtration through the length of each swale. Why this treatment train was chosen for the project site: The treatment train was incorporated into the project site to work with the existing topography and drainage channel within the property. Page in stormwater plan where more details can be found: Beginning on Page 10 of 25
	Water Quantity
12.	Does the project discharge directly into a major water body (see PDC 36.c.iii)? Yes No
13.	Pre-development runoff rate (i.e., before human-induced changes to the unimproved property) 2-yr, 24-hour storm: 1.72 cfs 10-yr storm: 5.27 cfs Post-development runoff rate (i.e., after proposed developments) 2-yr, 24-hour storm: 0.86 cfs 10-yr storm: 5.27 cfs
	Post-development runoff rate must be less than or equal to pre-development runoff rate
14.	Methods used to treat water quantity: Detention ponds and underground detention facilities will be constructed to detain post-developed runoff. Baseflows from the upstream area will continue to flow through the drainage channel. Page in stormwater plan where more details can be found: Beginning on Page 12 of 25
	Maintenance and Inspection Plan
15.	Have you included a stormwater maintenance plan with a description of the onsite stormwater system, inspection schedule and process, maintenance activities, legal and financial responsibility, and inspection and maintenance logs? Yes No* *Projects cannot be submitted for review under SLOPES without a maintenance and inspection plan. Page in stormwater plan where plan can be found: Page 15 of 25 and the Preliminary O&M Plan

16.	Contact information for the party/parties that will be legally responsible for performing the inspections and maintenance or the stormwater facilities: Name: Jesse Nemec Phone number: 503-730-8620 Email: jnemec@jtsmithco.com Name: ____ Phone number: ______________________________________ Email: ____ Name: ____ Phone number: ______________________________________ Email: ____ Name: ____ Phone number: ______________________________________ Email: ____ Page in stormwater plan where more details can be found: Page 15 of 25 and the Preliminary O&M Plan

TABLE OF CONTENTS

LIST OF FIGURES

LIST OF TABLES

I hereby certify that this Preliminary Stormwater Management Plan for Crestview Crossing has been prepared by me or under my supervision and meets minimum standards of the City of Newberg, Oregon Department of Transportation, SLOPES V and normal standards of engineering practice. I hereby acknowledge and agree that the jurisdiction does not and will not assume liability for the sufficiency, suitability, or performance of drainage facilities designed by me.

EXECUTIVE SUMMARY

The proposed project is located along OR 99W between Vittoria Way and NE Benjamin Rd in the City of Newberg, OR. The property consists of two tax lots (3216AC 13800 & 1100). The total area of the two tax lots is 33.11 acres containing a private residence and several outbuildings. The rest of the property is used for farming and is undeveloped. All existing structures and the driveway will be demolished for the proposed development. A commercial development consisting of 4.40 acres will be developed by others and is not included in this project.

The proposed project will consist of subdividing the property into 248 single-family residential lots, a two-building apartment complex with clubhouse and new roads and sidewalks. A commercial development will be constructed by others and will not contribute stormwater to any of the proposed stormwater facilities discussed in this report. The existing intermittent stream running through the site will remain in place providing conveyance for upstream flows, as well as onsite stormwater discharge points.

Due to the need of filling wetland on the site, stormwater facilities have been designed to comply with the Standard Local Operating Procedures for Endangered Species (SLOPES V) by the U.S. Army Corps of Engineers (ACOE 2014). The treatment and detention requirements are as follows:

- Treat the volume of water equal to 50% of the cumulative rainfall from the 2-year, 24-hour storm event using a continuous rainfall/runoff (flow duration) model, equating to 1.25 inches of precipitation over 24 hours. Flow duration matching requires a continuous simulation hydrologic model; this has not been adopted by the City of Newberg or Yamhill County. Therefore, the stormwater modeling will use an event based peak flow matching method (Santa Barbara Urban Hydrograph).
- Capture and detain the 2-year, 24-hour post developed runoff rate to ½ of the 2-year, 24-hour predeveloped discharge rate.
- Capture and detain the 10-year, 24-hour post developed runoff to the 10-year, 24-hour predeveloped discharge rate.

In addition to the SLOPES V requirements, the City of Newberg requires the 25-year post-developed runoff rate to match the 25-year predeveloped runoff rate. Also, since runoff enters a culvert crossing Highway 99W (Oregon Department of Transportation jurisdiction), the 50-year post-developed runoff rate is required to match the 50-year predeveloped runoff rate.

The project will discharge to the existing intermittent stream which is a tributary to Spring Brook and the Willamette River (Middle Willamette Basin). Spring Brook and the Willamette River are listed as a water quality limited streams for E. Coli. Typical pollutants from single-family residential projects include: nutrients, pesticides, metals, oil, grease, and other petroleum products, and sediment. Dissolved copper, dissolved zinc, and PAHs are typically the primary constituents of concern for stormwater in Oregon streams for their impact on ESA listed species.

Water quality treatment will occur through trapped catch basins, sedimentation water quality manholes, stormwater vegetated swales and rain gardens and an underground mechanical treatment facility.

Lots 8-248 will be treated in vegetated swales. The vegetated swales will be located in the bottom of each detention pond. Swales provide treatment through vegetation. Clean Water Services Design and Construction Standards will be utilized to design vegetated swales.

Water quality treatment and detention for lots 1-7 in the northern portion of the site will be provided on each lot. Treatment will be designed following Clean Water Services Low Impact Design Approach (LIDA) handbook and will consist of rain gardens or LIDA swales; treatment facilities will release to an underground detention system located on each lot designed to detain all storm events previously discussed.

Water quality treatment for the proposed multi-family apartment complex will be treated using an underground BaySaver BayFilter vault, which is an approved mechanical treatment approach approved by Clean Water Services.

The project site has been delineated into five sub-basins (sub-basin 5 consists off lots 1-7). The calculated peak water quality flow from the disturbed portion of the site, including ODOT Highway 99W of impervious area is 4.57 cfs with approximately 158,068 ft^3 runoff volume. Water quantity control will occur with detention ponds and underground detention.

Stormwater conveyance will be designed in the final design phase of the development.

The proposed development will meet the requirements of the City of Newberg and ODOT as well as conform to Standard Local Operating Procedures for Endangered Species (SLOPES V) as part of the wetland fill permit with the Army Corp of Engineers.

PROJECT DESCRIPTION

The proposed project will consist of subdividing the property into 248 single-family residential lots, a two-building apartment complex with clubhouse and new roads and sidewalks. A commercial development will be constructed by others and will not contribute stormwater to any of the proposed stormwater facilities discussed in this report. The existing intermittent stream running through the site will remain in place providing conveyance for upstream flows, as well as onsite stormwater discharge points.

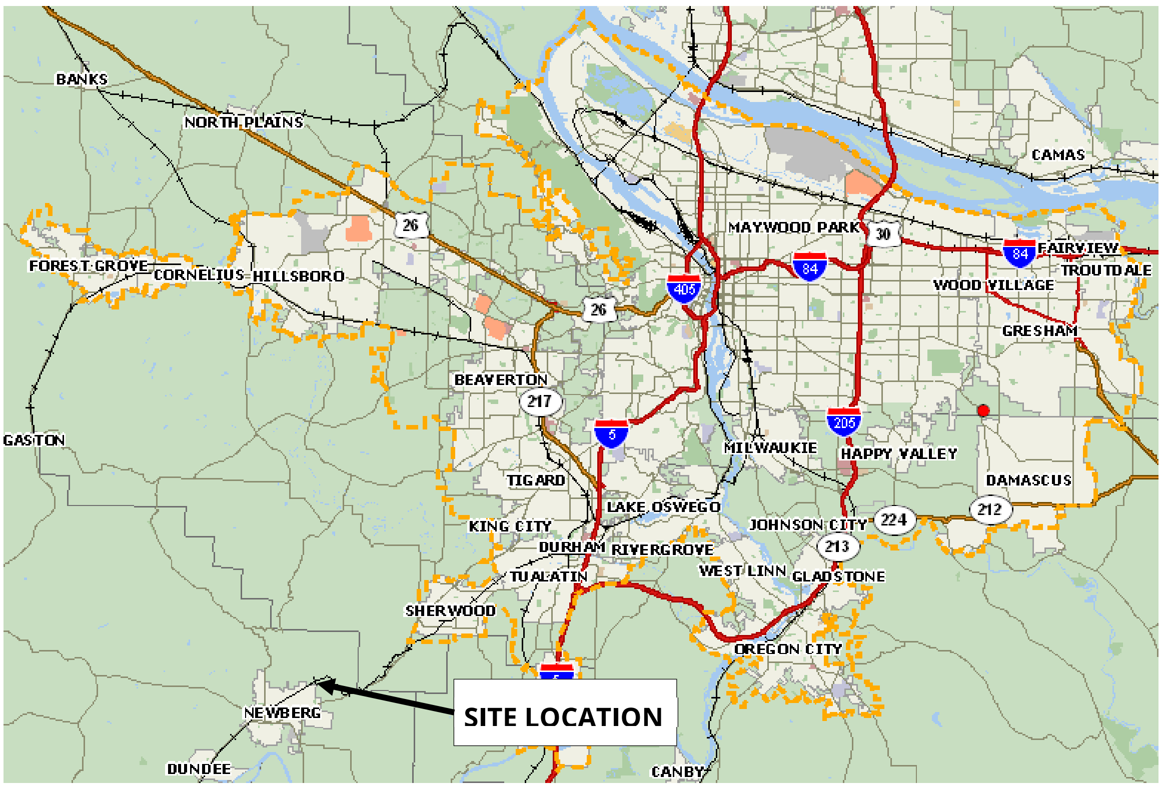


Figure 1 - Vicinity Map

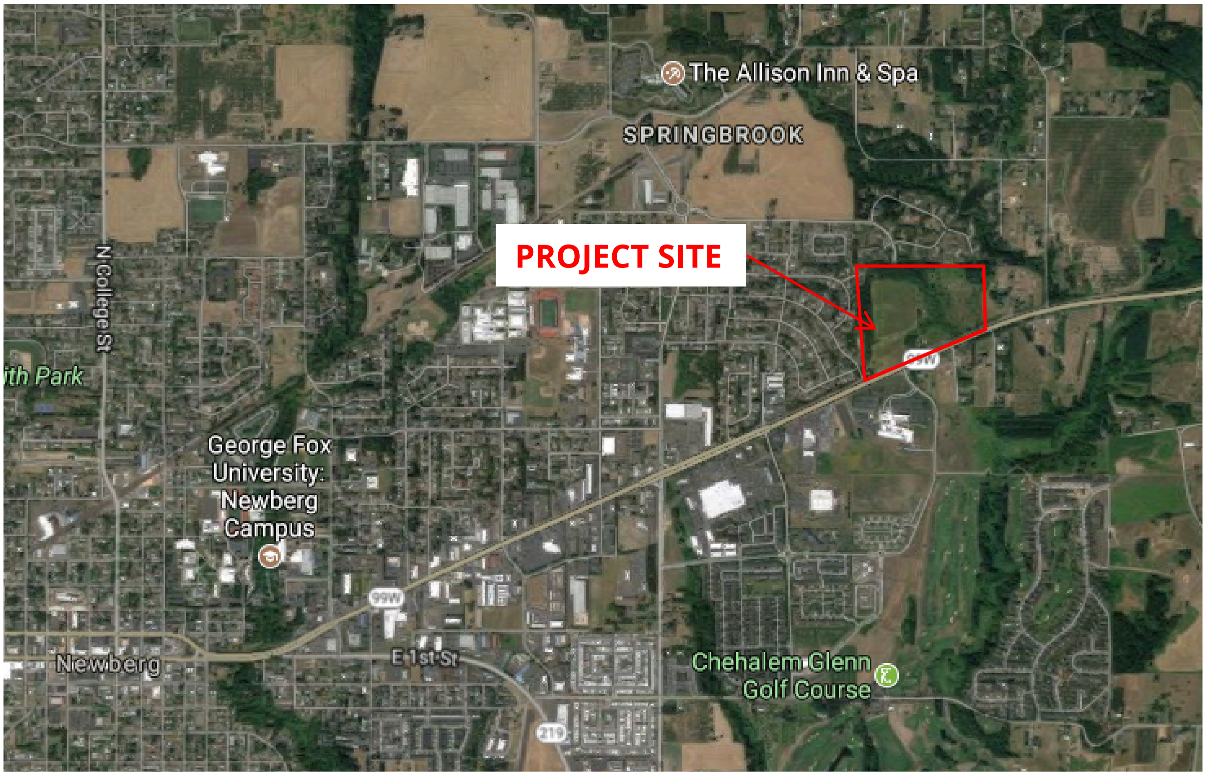


Figure 2 - Site Location

EXISTING CONDITIONS

Site

The existing site contains a private residence, driveway and outbuildings. All existing structures will be demolished for the proposed development.

Flood Map

The site is located within Zone X (un-shaded) per flood insurance rate map (FIRM) community-panel number 41071C 0241D (See Technical Appendix: Exhibits – FIRM: 41071C 0241D). FEMA's definition of Zone X (un-shaded) is an area of minimal flood risk outside the 0.2% annual chance floodplain.

Site Geology

The soil types as classified by the United States Department of Agriculture Soil Survey of Washington County are identified in Table 1 (See Technical Appendix: Exhibits – Hydrologic Soil Group-Yamhill County, Oregon). Soils hydrologically categorized as C/D have been classified as D soils for this analysis.

Soil Type	Hydrologic Group	Percent of Site
Amity Silt Loam	C/D	51.4%
Woodburn Silt Loam	C	48.6%

Table 1 - Soil Characteristics

Geotechnical Report

A geotechnical investigation by GeoEngineers has been included in the Technical Appendix. Infiltration testing was conducted in two locations at depths 2 and 3 feet below ground surface. The field infiltration rates were 0.1 and 0.0 in/hr, respectively. Therefore, GeoEngineers do not recommend stormwater infiltrating facilities.

Existing Site Storm

Runoff from the site generally sheet flows to the intermittent stream that flows from the northwest corner of the site to the south. A 24-inch culvert carries the runoff underneath OR 99W to a ditch that discharges to Spring Brook.

Existing Offsite Storm

Offsite basins discharge into the intermittent stream at three locations (See Technical Appendix: Exhibits – City of Newberg Public Utility Map).

Offsite Basin West drains towards the onsite property from the west (See Technical Appendix: Exhibits – Predeveloped Basin Delineation). The basin includes fourteen lots, roadway and sidewalks and Spring Meadow Park. Stormwater is discharged into an existing wetland onto the onsite property via an 8-inch clay pipe. The wetland eventually drains to the intermittent stream.

Offsite Basin North conveys stormwater via a 15-inch pipe and discharges directly into the intermittent stream (See Technical Appendix: Exhibits – Offsite Basin North).

Offsite Basin Northwest on the northwest side of the property conveys stormwater via a 36-inch pipe and discharges directly into the intermittent stream (See Technical Appendix: Exhibits – Offsite Basin Northwest).

Predeveloped Basin Areas

Table 2 shows the basin areas for the property (See Technical Appendix: Exhibits – Predeveloped Basin Delineation). Predeveloped conditions have been used for analysis to determine runoff rates, therefore, it is assumed the property and area captured from ODOT Highway 99W is 100 percent pervious.

Basin	C Soils (CN=70), Acres	D Soils (CN=77), Acres
Basin 1	6.081	2.077
Basin 2	3.867	7.028
Basin 3	[1]4.324	3.460
Basin 4	1.227	0.567
Basin 5	0.314	1.053
Total Predeveloped Area	15.813	14.184

[1]Includes 2.988 acres from ODOT Right-of-Way

Table 2 – Predeveloped Onsite Basin Areas

Approximately 1.701 acres will remain unchanged and consists of the intermittent stream, adjacent wetlands and construction buffer areas. Additionally, 4.40 acres will be developed by others and is not part of this development.

POST-DEVELOPED CONDITIONS

Site

The existing intermittent stream with adjacent wetlands running through the site will remain in place and undisturbed to convey upstream flows and provide discharge points for the proposed stormwater management systems.

Water quality treatment will occur through trapped catch basins, sedimentation water quality manholes, stormwater vegetated swales and rain gardens and an underground mechanical treatment facility.

The vegetated swales will be located in the bottom of each detention pond. Swales provide treatment through vegetation. Clean Water Services Design and Construction Standards will be utilized to design vegetated swales.

Water quality treatment and detention for lots 1-7 in the northern portion of the site will be provided on each lot. Treatment will be designed following Clean Water Services Low Impact Design Approach (LIDA) handbook and will consist of rain gardens or LIDA swales; treatment facilities will release to an underground detention system located on each lot designed to detain all storm events previously discussed.

The existing 8-inch clay pipe in Offsite Basin West will be connected to the proposed onsite storm system conveying it to the Basin 2 pond. The flow control structure will sized to release the to the required predeveloped flows plus the runoff from Offsite Basin West.

Final conveyance sizing of the pipes will be provided in the final stormwater management plan.

Post-Developed Basin Areas

Table 3 shows the proposed impervious and pervious areas for each sub-basin (See Technical Appendix: Exhibits – Post-Developed Area Delineation). Per City of Newberg Design Standards, when the average lot size is less than 3,000 ft^2, the actual impervious area can be used. The average lot size for lots 19-248 is 1,618 ft^2. Lots 1-18, the average lot size exceeds 3,000 ft^2; therefore, the actual impervious area for lots 19-248 was used and 2,877 ft^2 was used for lots 1-18.

Post-Developed Basin	C Soils (CN=74), Acres	D Soils (CN=80), Acres	Impervious Area (CN=98), Acres
1	3.090	0.919	4.149
2	1.789	3.330	5.777
3	1.062	1.231	5.489
4	0.387	0.209	1.199
5	0.189	0.715	0.462
Total Post-Developed Area	6.517	6.405	17.076

Table 3 – Post-Developed Onsite Basin Area

Of the disturbed portions of the property, including the ODOT Highway 99W, the proposed impervious area will be 56% of the total disturbed area. According to Figure 2-5 Future Conditions Land Use of the City's Stormwater Master Plan Update, dated June 2014, the property is zoned Commercial (85% impervious) and Medium Density (60%) impervious (See Technical Appendix: Exhibits – Figure 2-5 Future Conditions Land Use).

Offsite Basin West Area

Offsite Basin West has a total area of approximately 7.156 acres. Fourteen single family residences contribute runoff to the 8-inch clay pipe with an average lot size greater than 3,000 ft^2; therefore, it was assumed that each lot has an impervious area of 2,877 ft^2. The total impervious and pervious area for the basin is approximately 1.761 acres 5.395 acres, respectively. Runoff rates were calculated for this basin since stormwater will be conveyed through the onsite system and drain to pond 2.

Offsite Basins North and Northwest

Runoff from these two basins will be conveyed directly to the intermittent stream in one storm line. The storm line will enter the stream on the north end of site and will not enter any of the stormwater detention facilities.

HYDROLOGIC ANALYSIS DESIGN GUIDELINES

Design Guidelines

The site is located within the jurisdiction of the City of Newberg. The hydrology and hydraulics modeling will follow the requirements of the City of Newberg's Design Standards, SLOPES V and ODOT.

Hydrograph Method

The Santa Barbara Urban Hydrograph (SBUH) method was used to develop runoff rates since the City and County do not have a continuous simulation model. The computer software XPSTORM was used in modeling the hydrology during the predeveloped and post-developed storm events to determine the required water quality treatment flows and detention volumes.

Design Storm

The rainfall distribution to be used for this area is the design storm of 24-hour duration based on the standard Type 1A rainfall distribution. Table 4 shows total precipitation depths for the storm events used in the analysis, which were used as multipliers for the Type 1A 24-hour rainfall distribution.

Recurrence Interval (Years)	Total Precipitation Depth (inches)
WQ	1.25
2	2.50
10	3.50
25	4.00
50	4.20

Table 4 - Design Storms

RUNOFF PARAMETERS

Curve Number

The major factors for determining the CN values are hydrologic soil group, cover type, treatment, hydrologic condition, and antecedent runoff condition. The curve number represents runoff potential from the ground. Table 2-2a and 2-2c from the TR55 Urban Hydrology for Small Watersheds were used to determine the appropriate curve numbers (See Technical Appendix: Exhibits – Table 2-2a and 2-2c Runoff Curve Numbers).

The predeveloped site was given a curve number of 70 for C soils and 77 for D soils, which corresponds to woods in good condition. The post-developed site and Offsite Basin West was given a curve number of 74 for C soils and 80 for D soils, which corresponds to open space in good condition. All impervious surface was given a curve number of 98.

Time of Concentration

The time of concentration for each sub-basin was calculated using the TR-55 Method and the existing contours. See Table 5 for the time of concentration calculated for each sub-basin (See Technical Appendix: Calculations – Time of Concentration). A time of concentration for lots 1-18 (predeveloped and post), ODOT Highway 99W predeveloped and the post-developed conditions were assumed to be 5 minutes.

Post-Developed Onsite Basin Area	Time of Concentration (minutes)
1	22
2	24
3	24
4	25

Table 5 – Existing Time of Concentration

Basin Runoff

The predeveloped runoff rates for each basin are shown in Table 6 (See Technical Appendix: Hydrographs).

Basin	2-YR Runoff Rate (cfs)	10-YR Runoff Rate (cfs)	25-YR Runoff Rate (cfs)	50-YR Runoff Rate (cfs)
1	0.34	1.20	1.75	1.98
2	0.71	2.00	2.78	3.11
3	0.44	1.43	2.02	2.27
4	0.08	0.26	0.38	0.43
5	0.15	0.38	0.51	0.56
Total Predeveloped Runoff	**1.72**	**5.27**	**7.44**	**8.35**

Table 6 – Predeveloped Basin Runoff Rates

Table 7 below shows the post-developed peak runoff rates (without flow control mitigation).

Basin	2-YR Runoff Rate (cfs)	10-YR Runoff Rate (cfs)	25-YR Runoff Rate (cfs)	50-YR Runoff Rate (cfs)
1	2.78	4.46	5.35	5.71
2	4.03	6.37	7.59	8.09
3	3.45	5.19	6.09	6.45
4	0.76	1.15	1.35	1.44
5	0.40	0.68	0.84	0.90
Total Post-Developed Runoff	**11.42**	**17.85**	**21.22**	**22.59**

Table 7 – Post-Developed Basin Runoff Rates

Table 8 below shows the runoff rates for Offsite Basin West and will not be detained.

Recurrence Interval (Years)	Peak Runoff Rate
2	1.46
10	2.73
25	3.43
50	3.72

Table 8 – Offsite Basin West Runoff Rates

HYDRAULIC ANALYSIS AND DESIGN CHARACTERISTICS

System Characteristics

The stormwater conveyance system will be sized in the final design phase of the project to convey all storm events up to and including the 100-year storm event without any out of system flooding.

Conveyance pipe sizing for Offsite Basins North and Northwest will be determined based on the capacity of the existing pipes, as well as assuming undetained flow from Lots 1-7. Conveyance for this system will be determined in the final design phase of the project.

WATER QUALITY

Water Quality Guidelines

The site is required to follow City of Newberg, SLOPES V, and ODOT Water Quality Standards. See below for each Jurisdictions standard.

- City of Newberg
  - The stormwater quality only facilities shall be designed for a dry weather storm event totaling 1.0 inches of precipitation falling in 24 hours with an average storm return period of 96 hours.
- SLOPES V
  - All stormwater quality treatment practices and facilities will be designed to accept and fully treat the volume of water equal to 50% of the cumulative rainfall from the 2-year, 24-hour storm for that site.
- ODOT
  - Stormwater quality treatment facilities shall be designed to treat the water quality design flow rate or water quality design volume. The water quality storm is designated as a percentage of the 2-year, 24-hour design storm, depending on the location of the site. For the proposed site the water quality design storm is 50% of the 2-year, 24-hour design storm.

SLOPES V and ODOT have the same water quality design storm and the most stringent. The water quality facilities will be sized to treat 50% of the 2-year, 24-hour design storm.

The project will discharge to an existing intermittent stream which is a tributary to Spring Brook and the Willamette River (Middle Willamette Basin). Spring Brook and the Willamette River are listed as a water quality limited streams for E. Coli. Typical pollutants from single-family residential projects include: nutrients, pesticides, metals, oil, grease, and other petroleum products, and sediment. Dissolved copper, dissolved zinc, and PAHs are typically the primary constituents of concern for stormwater in Oregon streams for their impact on ESA listed species.

Water Quality Facilities

Lots 8-248 and All Roads and Sidewalks (Basins 1, 2 and 3)

Water quality treatment will occur through trapped catch basins, sedimentation water quality manholes and stormwater vegetated swales. The vegetated swales will be located in the bottom of each detention pond. Swales provide treatment through vegetation and will provide flow attenuation to reduce hydraulic impacts from urban developments on the downstream surface water systems. Clean Water Services Design and Construction Standards will be utilized to design vegetated swales.

Table 9 below shows the water quality flow rate as modeled in XPSTORM (See Technical Appendix: Hydrographs).

Basin	WQ Treatment Runoff Rate (cfs)
1	1.11
2	1.55
3	1.47

Table 9 – Basins 1-3 Water Quality Runoff Rates

Table 10 below shows the minimum dimensions for each swale (See Technical Appendix: Calculations – Swale Calculations). Each swale will have a minimum hydraulic residence time of 9 minutes and maximum depth of 0.50 feet during the water quality event.

Basin	Minimum Length (ft)	Minimum Bottom Width (ft)	Side Slopes (H:V)	Maximum Swale Slope (ft/ft)
1	126.6	7.2	4:1	0.005
2	184.2	7	4:1	0.010
3	133.4	10	4:1	0.005

Table 10 – Proposed Water Quality Swales

Basin 4

Water quality treatment flow rate for Basin 4 is 0.32 cfs. The proposed basin will utilize BayFilter by BaySaver Technologies, Inc to treat runoff (or equivalent). BayFilter is listed as an approved stormwater treatment technology for Clean Water Services. All runoff from the basin will be conveyed to a single BayFilter vault upstream of the underground detention facility where it will be treated using 4 (four) BayFilter Enhanced Media Cartridges. One cartridge is capable of treating up to 45 gpm of flow, which is equal to 0.10 cfs. Table 11 below shows the required number of cartridges needed to treat Water Quality flow of 0.32 cfs.

Facility	Water Quality Flow (cfs)	Quantity of Cartridges	Treatment Capacity of Facilities	Excess Treatment Capacity (cfs)
BayFilter Manhole	0.32	4	0.40 cfs	0.08

Table 11 – BayFilter Cartridge Calculation

Basin 5 (Lots 1-7)

Water Quality treatment on lots 1-7 will be achieved by implementing Low Impact Development Approaches (LIDA) following Clean Water Services LIDA Handbook. The LIDA Handbook utilizes a sizing ratio of 6% per 1 ft^2 of impervious area. Assuming 2,877 ft^2 of impervious area per lot, 173 ft^2 LIDA facility will be required. The water quality treatment flow rate using the SBUH method is 0.12 cfs.

Water Quality Treatment Volume

Table 12 shows the water quality volume for the post-developed site. Volume is based on the following calculation:

$$\text{WQ Volume} = \frac{1.25\text{ in}}{12\text{in}} \times 1\text{ft} \times \text{Imp Area (ft}^2\text{)}$$

Basin	WQ Treatment Volume (cf)
1	18,826
2	47,184
3	64,756
4	18,498
5	8,805
Total Volume	158,068

Table 12 – Water Quality Volume

WATER QUANTITY

Water Quantity Guidelines

The site is required to meet the City of Newberg, SLOPES V and ODOT flow control requirements. See below for each Jurisdictions standard.

- City of Newberg
  - Stormwater quantity on-site detention facilities shall be designed to capture runoff so the post-development runoff rates from the site do not exceed the pre-developed runoff rates from the site, based on 24-hour storm events ranging from ½ the 2-year return storm to the 25-year return storm. Specifically, the ½ of the 2, 2, 10, and 25-year post-development runoff rates will not exceed their respective ½ of the 2, 2, 10, and 25-year pre-development runoff rates.

- SLOPES V
    - The post-developed runoff rate for the 2-year design storm shall not exceed ½ of the 2-year pre-development runoff rate. Additionally, the post-developed runoff rate for the 10-year design storm shall not exceed the 10-year pre-developed runoff rate.
- ODOT
    - The post-developed runoff rate for the 2, 10, and 50-year design storm shall not exceed their respective pre-developed 2, 10, and 50-year runoff rates.

The calculated water quantity volume for the northern portion of the site is approximately 72,885 ft^3 and the southern portion is approximately 36,945 ft^3. Flow control areas and structures will be fully designed at the final design phase.

Water Quantity Facilities

Lots 8-248 and All Roads and Sidewalks (Basins 1, 2 and 3)

Three detention ponds will be constructed to detain all required storm events. Each will have a flow control manhole which will control the release rate so that the following is met:

- The post-developed runoff rate for the 2-year design storm shall not exceed ½ of the 2-year pre-development runoff rate.
- The post-developed runoff rate for the 10-year design storm shall not exceed the 10-year pre-developed runoff rate.
- The post-developed runoff rate for the 25-year design storm shall not exceed the 25-year pre-developed runoff rate.
- The post-developed runoff rate for the 50-year design storm shall not exceed the 50-year pre-developed runoff rate.

The design of flow control structures and outfall protection will be provided in the final design phase.

Basins 4

Underground detention in the form of StormTech Chambers (or equivalent) will be provided under the proposed parking lot of the multi-family residential basin. Detention will be provided downstream of the water quality treatment and will release detained stormwater to the intermittent stream. The design of flow control structures will be provided in the final design phase.

Basin 5

Lots 1-7 will contain underground detention in the form of StormTech Chambers (or equivalent) under each LIDA facility. The detention facilities will release stormwater to the bypass storm line provided to convey offsite flows to the intermittent stream. The design of flow control structures will be provided in the final design phase.

Table 13 shows the allowable release rates from the site after development. The allowable release rate for basin 2 (pond 2) will be the combined allowable release rate from the predeveloped flows plus the runoff rates shown in Table 8.

Basin	2-YR Allowable Release Rate (cfs)	10-YR Allowable Release Rate (cfs)	25-YR Allowable Release Rate (cfs)	50-YR Allowable Release Rate (cfs)
1	0.17	1.20	1.75	1.98
2	0.36+*1.46*	2.00+*2.73*	2.78+*3.43*	3.11+*3.72*
3	0.22	1.43	2.02	2.27
4	0.04	0.26	0.38	0.43
5	0.08	0.38	0.51	0.56
Allowable Release Rates from Site	**2.33**	**8.00**	**10.87**	**12.07**

Runoff from Offsite Basin West

Table 13 –Allowable Release Rates

DOWNSTREAM ANALYSIS

According to the City's Design Manual, a certificate of investigation stating that the engineer has taken downstream impacts into consideration is required for each development constructing, collecting or discharging more than 500 ft^2 of new impervious area.

The City's Stormwater Master Plan (SWMP), dated June 2014, was used to investigate the downstream system to determine if there are currently any known downstream deficiencies in the system. According to the SWMP, the Spring Brook Subcatchment was delineated and analyzed for existing and future capacity issues (See Technical Appendix: Downstream Analysis – Figure 2-6 Drainage System and Study Area). The analysis utilized two methods to identify flooding problems. The first method modeled the existing storm systems using PC SWMM 2012. In addition to the existing flow modeling, the study utilized future conditions based on the zoning showing in Figure 2-5. The second method evaluated the storm systems through discussions with City staff and reviewing existing reports that documented potential problems.

Per Figure 3-1 Predicted Flooding: Existing Land Use, 10-YR Design Storm, the existing storm system does not experience any flooding during the 10-year storm event (See Technical Appendix: Downstream Analysis – Figure 3-1 Predicted Flooding: Existing Land Use, 10-YR Design Storm). Figure 3-1 depicts areas that have both major and minor flooding. Minor flooding was defined in the SWMP "as flooding that occurs for less than 2-hours during the peak 24-hour design storm", while major flooding occurs longer than 2-hours during the peak design storm. Additionally, Figure 3-2 Predicted Flooding: Future Land Use, 10-YR Design Storm shows there are no predicted flooding in the downstream system for Spring Brook.

In discussions with the City, it was noted that flooding occurred at the Chehalem Glenn Golf Course during a January 2012 storm event.

The proposed stormwater management system for Crestview Crossing will detain all storm events to the required predeveloped release rates up to and including the 50-year storm events. Based on the City's SWMP, the proposed developed should not impact the downstream system.

OPERATIONS & MAINTENANCE

The performance of the water quality treatment and detention facilities is very important to ensure prolonged use and functionality. Stormwater facilities will be operated and maintained privately by the homeowners and the apartment complex. Until an HOA can be created, please contact Jesse Nemec at 503-730-8620 or jnemec@jtsmithco.com about inspection and maintenance of the proposed stormwater facilities.

It's vital that the owners of the stormwater management systems insure proper maintenance and operation to ensure water quality facilities function to remove petroleum hydrocarbons, sediments, metals, bacteria and nutrients from stormwater runoff. Additionally, owners must ensure that detention facilities are regulating the release and volume of stormwater prior to leaving the property. See the Technical Appendix for the Operation and Maintenance Plan.

SUMMARY

The proposed stormwater management system design for the Crestview Crossing development followed the City of Newberg's Design Standards dated 2014. Additionally, the project will comply with the National Marine Fisheries Service criteria as part of the March 2014 Programmatic Biological Opinion and Essential Fish Habitat Consultation for the Standard Local Operating Procedures for Endangered Species (SLOPES V) as part of the Wetland Fill Permit with the Army Corp of Engineers.

TECHNICAL APPENDIX

Exhibits
- Oregon's 2012 Integrated Report
- FIRM: 41071C0241D
- Hydrologic Soil Group-Yamhill County
- Tables 2-2a Runoff Curve Numbers
- City of Newberg Public Utility Map
- Offsite Basin North
- Offsite Basin Northwest
- Figure 2-5 Future Conditions Land Use
- Existing Basin Delineation
- Proposed Conditions

Drawings
- Sheet C210 – Overall Site Plan
- Sheet C215 – Multi-Family Site Plan
- Sheet C300 – Composite Utility Plan
- Sheet C303 – Multi-Family Composite Utility Plan

Calculations
- Time of Concentration
- Swale Calculation (Swale 1, 2, & 3)

Hydrographs
- Existing Hydrographs
    - Node – E-Basin 1, 2, 3, 4 & 5
- Post-Developed Hydrographs
    - Node – P-Basin 1, 2, 3, 4 & 5
- Offsite Basin West

Downstream Analysis
- Figure 2-6 Drainage System and Study Area
- Figure 3-1 Predicted Flooding: Existing Land Use, 10-YR Design Storm
- Figure 3-1 Predicted Flooding: Future Land Use, 10-YR Design Storm

Operations & Maintenance Plan
- Preliminary Operations & Maintenance Plan

Geotechnical Report
- Geotechnical Engineering Report, GeoEngineers, March 12, 2018

REFERENCES

1. City of Newberg Design Standards Manual, 2014
2. City of Newberg Stormwater Master Plan, June 2014
3. Clean Water Services Design and Construction Standards, April 2017

4. Clean Water Services LIDA Handbook, 2016
5. Oregon Department of Transportation Hydraulics Manual, 2014

EXHIBITS

Oregon's 2012 Integrated Report

To select new search criteria click here - **DO NOT USE THE BACK ARROW**

Refresh Report | Show All Records | Records per page: 100

Lookup LASARStation data | Link to LASAR Web

Basin Name Subbasin 4th Field HUC Record ID	Water Body LLID River Miles Segment Miles Beach Name Beach ID	Pollutant	Season	Criteria	Beneficial Uses	Status	2012 Assessment Action	[Data Source] Supporting Data
Willamette Middle Willamette 17090007 24852	Spring Brook 1229212452679 0 to 7.3 7.3	E. Coli	Summer	30-day log mean of 126 E. coli organisms per 100 ml; no single sample > 406 organisms per 100 ml	Water contact recreation	Cat 4A: Water quality limited, TMDL approved	New Cat 4A: Water quality limited, TMDL approved	TMDL Approved: 07/31/2001 Tillamook Bay Watershed TMDL Tillamook Bay Watershed TMDL Based on EPA analysis of available data for 303(d) additions proposed in March 2012: Six exceedences of the 406 maximum criteria out of 9 days of sampling at LASAR station 28468, Springbrook Creek upstream of Wilsonville Road, between 8/26/02 and 9/15/03.

To select new search criteria click here - **DO NOT USE THE BACK ARROW.**

NOTES TO USERS

This map is for use in administering the National Flood Insurance Program. It does not necessarily identify all areas subject to flooding, particularly from local drainage sources of small size. **The community map repository** should be consulted for possible updated or additional flood hazard information.

To obtain more detailed information in areas where **Base Flood Elevations** (BFEs) and/or **floodways** have been determined, users are encouraged to consult the Flood Profiles and Floodway Data and/or Summary of Stillwater Elevations tables contained within the Flood Insurance Study (FIS) Report that accompanies this FIRM. Users should be aware that BFEs shown on the FIRM represent rounded whole-foot elevations. These BFEs are intended for flood insurance rating purposes only and should not be used as the sole source of flood elevation information. Accordingly, flood elevation data presented in the FIS Report should be utilized in conjunction with the FIRM for purposes of construction and/or floodplain management.

Boundaries of the **floodways** were computed at cross sections and interpolated between cross sections. The floodways were based on hydraulic considerations with regard to requirements of the National Flood Insurance Program. Floodway widths and other pertinent floodway data are provided in the Flood Insurance Study Report for this jurisdiction.

Certain areas not in Special Flood Hazard Areas may be protected by **flood control structures**. Refer to Section 2.4 "Flood Protection Measures" of the Flood Insurance Study Report for information on flood control structures for this jurisdiction.

The **projection** used in the preparation of this map was Universal Transverse Mercator (UTM) zone 10. The **horizontal datum** was NAD 83, GRS 1980 spheroid. Differences in datum, spheroid, projection or UTM zones used in the production of FIRMs for adjacent jurisdictions may result in slight positional differences in map features across jurisdiction boundaries. These differences do not affect the accuracy of this FIRM.

Flood elevations on this map are referenced to the North American Vertical Datum of 1988. These flood elevations must be compared to structure and ground elevations referenced to the same **vertical datum**. For information regarding conversion between the National Geodetic Vertical Datum of 1929 and the North American Vertical Datum of 1988, visit the National Geodetic Survey website at http://www.ngs.noaa.gov or contact the National Geodetic Survey at the following address:

NGS Information Services
NOAA, N/NGS12
National Geodetic Survey
SSMC-3, #9202
1315 East-West Highway
Silver Spring, Maryland 20910-3282
(301) 713-3242

To obtain current elevation, description, and/or location information for **bench marks** shown on this map, please contact the Information Services Branch of the National Geodetic Survey at **(301) 713-3242**, or visit its website at http://www.ngs.noaa.gov.

Base map information shown on this FIRM was derived from multiple sources. Base map files were provided in digital format by the State of Oregon. This information was compiled from the U.S. Geological Survey (2007), Oregon Department of Transportation (2007), OR/WA Bureau of Land Management (2005), Oregon Department of Forestry (2003), NGS (2007), and USDA-FSA (2006) at a scale of 1:24,000.

The profile **baselines** depicted on this map represent the hydraulic modeling baselines that match the flood profiles in the FIS report. As a result of improved topographic data, the **profile baseline**, in some cases, may deviate significantly from the channel centerline or appear outside the SFHA.

Corporate limits shown on this map are based on the best data available at the time of publication. Because changes due to annexations or de-annexations may have occurred after this map was published, map users should contact appropriate community officials to verify current corporate limit locations.

Please refer to the separately printed **Map Index** for an overview map of the county showing the layout of map panels; community map repository addresses; and a **Listing of Communities** table containing National Flood Insurance Program dates for each community as well as a listing of the panels on which each community is located.

Contact the **FEMA Map Service Center** at 1-800-358-9616 for information on available products associated with this FIRM. Available products may include previously issued Letters of Map Change, a Flood Insurance Study Report, and/or digital versions of this map. The FEMA Map Service Center may also be reached by Fax at 1-800-358-9620 and its website at http://msc.fema.gov.

If you have **questions about this map** or questions concerning the National Flood Insurance Program in general, please call 1-877-FEMA MAP (1-877-336-2627) or visit the FEMA website at http://www.fema.gov/business/nfip/.

LEGEND

SPECIAL FLOOD HAZARD AREAS (SFHAs) SUBJECT TO INUNDATION BY THE 1% ANNUAL CHANCE FLOOD

The 1% annual chance flood (100-year flood), also known as the base flood, is the flood that has a 1% chance of being equaled or exceeded in any given year. The Special Flood Hazard Area is the area subject to flooding by the 1% annual chance flood. Areas of Special Flood Hazard include Zones A, AE, AH, AO, AR, A99, V, and VE. The Base Flood Elevation is the water-surface elevation of the 1% annual chance flood.

ZONE A	No Base Flood Elevations determined.
ZONE AE	Base Flood Elevations determined.
ZONE AH	Flood depths of 1 to 3 feet (usually areas of ponding); Base Flood Elevations determined.
ZONE AO	Flood depths of 1 to 3 feet (usually sheet flow on sloping terrain); average depths determined. For areas of alluvial fan flooding, velocities also determined.
ZONE AR	Special Flood Hazard Areas formerly protected from the 1% annual chance flood by a flood control system that was subsequently decertified. Zone AR indicates that the former flood control system is being restored to provide protection from the 1% annual chance or greater flood.
ZONE A99	Area to be protected from 1% annual chance flood by a Federal flood protection system under construction; no Base Flood Elevations determined.
ZONE V	Coastal flood zone with velocity hazard (wave action); no Base Flood Elevations determined.
ZONE VE	Coastal flood zone with velocity hazard (wave action); Base Flood Elevations determined.

FLOODWAY AREAS IN ZONE AE

The floodway is the channel of a stream plus any adjacent floodplain areas that must be kept free of encroachment so that the 1% annual chance flood can be carried without substantial increases in flood heights.

OTHER FLOOD AREAS

ZONE X — Areas of 0.2% annual chance flood; areas of 1% annual chance flood with average depths of less than 1 foot or with drainage areas less than 1 square mile; and areas protected by levees from 1% annual chance flood.

OTHER AREAS

ZONE X — Areas determined to be outside the 0.2% annual chance floodplain.

ZONE D — Areas in which flood hazards are undetermined, but possible.

COASTAL BARRIER RESOURCES SYSTEM (CBRS) AREAS

OTHERWISE PROTECTED AREAS (OPAs)

CBRS areas and OPAs are normally located within or adjacent to Special Flood Hazard Areas.

1% Annual Chance Floodplain Boundary

0.2% Annual Chance Floodplain Boundary

Floodway boundary

Zone D boundary

CBRS and OPA boundary

Boundary dividing Special Flood Hazard Areas of different Base Flood Elevations, flood depths or flood velocities.

~~ 513 ~~~	Base Flood Elevation line and value; elevation in feet*
(EL 987)	Base Flood Elevation value where uniform within zone; elevation in feet*

*Referenced to the North American Vertical Datum of 1988

(A)———(A)	Cross section line
(23) - - - - (23)	Transect line
45° 02' 08", 93° 02' 12"	Geographic coordinates referenced to the North American Datum of 1983 (NAD 83) Western Hemisphere
3100000 FT	5000-foot ticks: Oregon State Plane North Zone (FIPS Zone 3601), Lambert Conformal Conic projection
4989000m N	1000-meter Universal Transverse Mercator grid values, zone 10N
DX5510 ×	Bench mark (see explanation in Notes to Users section of this FIRM panel)
• M1.5	River Mile

MAP REPOSITORIES
Refer to Map Repositories list on Map Index

EFFECTIVE DATE OF COUNTYWIDE
FLOOD INSURANCE RATE MAP
March 2, 2010
EFFECTIVE DATE(S) OF REVISION(S) TO THIS PANEL

For community map revision history prior to countywide mapping, refer to the Community Map History table located in the Flood Insurance Study report for this jurisdiction.

To determine if flood insurance is available in this community, contact your insurance agent or call the National Flood Insurance Program at 1-800-638-6620.

MAP SCALE 1" = 500'

250 0 500 1000 FEET
150 0 150 300 METERS

NFIP

NATIONAL FLOOD INSURANCE PROGRAM

PANEL 0241D

FIRM
FLOOD INSURANCE RATE MAP
YAMHILL COUNTY, OREGON
AND INCORPORATED AREAS

PANEL 241 OF 675
(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
NEWBERG, CITY OF	410256	0241	D
YAMHILL COUNTY	410249	0241	D

Notice to User: The **Map Number** shown below should be used when placing map orders; the **Community Number** shown above should be used on insurance applications for the subject community.

MAP NUMBER
41071C0241D

EFFECTIVE DATE
MARCH 2, 2010

Federal Emergency Management Agency

Map Scale: 1:3,540 if printed on A landscape (11" x 8.5") sheet.

N

Meters: 0, 50, 100, 200, 300

Feet: 0, 150, 300, 600, 900

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 10N WGS84

MAP LEGEND

Area of Interest (AOI)

- Area of Interest (AOI)

Soils

Soil Rating Polygons

- A
- A/D
- B
- B/D
- C
- C/D
- D
- Not rated or not available

Soil Rating Lines

- A
- A/D
- B
- B/D
- C
- C/D
- D
- Not rated or not available

Soil Rating Points

- A
- A/D
- B
- B/D
- C
- C/D
- D
- Not rated or not available

Water Features

- Streams and Canals

Transportation

- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background

- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Yamhill County, Oregon
Survey Area Data: Version 4, Sep 16, 2016

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Aug 19, 2015—Sep 13, 2016

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Hydrologic Soil Group

Hydrologic Soil Group— Summary by Map Unit — Yamhill County, Oregon (OR071)				
Map unit symbol	**Map unit name**	**Rating**	**Acres in AOI**	**Percent of AOI**
2301A	Amity silt loam, 0 to 3 percent slopes	C/D	17.0	51.4%
2310A	Woodburn silt loam, 0 to 3 percent slopes	C	7.3	21.9%
2310C	Woodburn silt loam, 3 to 12 percent slopes	C	8.7	26.3%
2310D	Woodburn silt loam, 12 to 20 percent slopes	C	0.2	0.5%
Totals for Area of Interest			**33.2**	**100.0%**

Description

Hydrologic soil groups are based on estimates of runoff potential. Soils are assigned to one of four groups according to the rate of water infiltration when the soils are not protected by vegetation, are thoroughly wet, and receive precipitation from long-duration storms.

The soils in the United States are assigned to four groups (A, B, C, and D) and three dual classes (A/D, B/D, and C/D). The groups are defined as follows:

Group A. Soils having a high infiltration rate (low runoff potential) when thoroughly wet. These consist mainly of deep, well drained to excessively drained sands or gravelly sands. These soils have a high rate of water transmission.

Group B. Soils having a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep or deep, moderately well drained or well drained soils that have moderately fine texture to moderately coarse texture. These soils have a moderate rate of water transmission.

Group C. Soils having a slow infiltration rate when thoroughly wet. These consist chiefly of soils having a layer that impedes the downward movement of water or soils of moderately fine texture or fine texture. These soils have a slow rate of water transmission.

Group D. Soils having a very slow infiltration rate (high runoff potential) when thoroughly wet. These consist chiefly of clays that have a high shrink-swell potential, soils that have a high water table, soils that have a claypan or clay layer at or near the surface, and soils that are shallow over nearly impervious material. These soils have a very slow rate of water transmission.

If a soil is assigned to a dual hydrologic group (A/D, B/D, or C/D), the first letter is for drained areas and the second is for undrained areas. Only the soils that in their natural condition are in group D are assigned to dual classes.

Rating Options

Aggregation Method: Dominant Condition

Component Percent Cutoff: None Specified

Tie-break Rule: Higher

Table 2-2a Runoff curve numbers for urban areas [1]

Cover description: Cover type and hydrologic condition	Average percent impervious area [2]	Curve numbers for hydrologic soil group: A	B	C	D
Fully developed urban areas (vegetation established)					
Open space (lawns, parks, golf courses, cemeteries, etc.) [3]:					
Poor condition (grass cover < 50%)		68	79	86	89
Fair condition (grass cover 50% to 75%)		49	69	79	84
Good condition (grass cover > 75%)		39	61	74	80
Impervious areas:					
Paved parking lots, roofs, driveways, etc. (excluding right-of-way)		98	98	98	98
Streets and roads:					
Paved; curbs and storm sewers (excluding right-of-way)		98	98	98	98
Paved; open ditches (including right-of-way)		83	89	92	93
Gravel (including right-of-way)		76	85	89	91
Dirt (including right-of-way)		72	82	87	89
Western desert urban areas:					
Natural desert landscaping (pervious areas only) [4]		63	77	85	88
Artificial desert landscaping (impervious weed barrier, desert shrub with 1- to 2-inch sand or gravel mulch and basin borders)		96	96	96	96
Urban districts:					
Commercial and business	85	89	92	94	95
Industrial	72	81	88	91	93
Residential districts by average lot size:					
1/8 acre or less (town houses)	65	77	85	90	92
1/4 acre	38	61	75	83	87
1/3 acre	30	57	72	81	86
1/2 acre	25	54	70	80	85
1 acre	20	51	68	79	84
2 acres	12	46	65	77	82
Developing urban areas					
Newly graded areas (pervious areas only, no vegetation) [5]		77	86	91	94
Idle lands (CN's are determined using cover types similar to those in table 2-2c).					

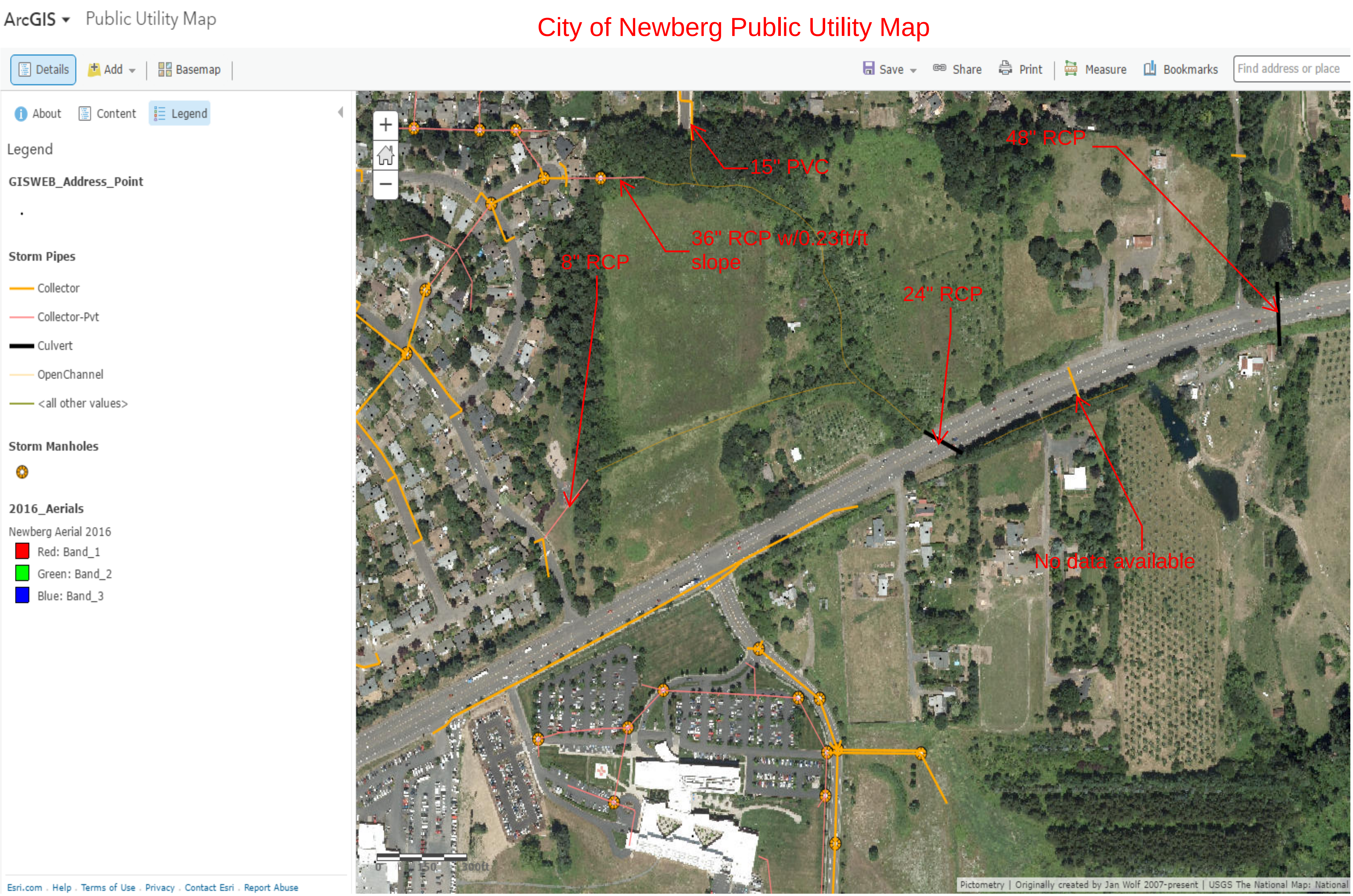
1 Average runoff condition, and $I_a = 0.2S$.
2 The average percent impervious area shown was used to develop the composite CN's. Other assumptions are as follows: impervious areas are directly connected to the drainage system, impervious areas have a CN of 98, and pervious areas are considered equivalent to open space in good hydrologic condition. CN's for other combinations of conditions may be computed using figure 2-3 or 2-4.
3 CN's shown are equivalent to those of pasture. Composite CN's may be computed for other combinations of open space cover type.
4 Composite CN's for natural desert landscaping should be computed using figures 2-3 or 2-4 based on the impervious area percentage (CN = 98) and the pervious area CN. The pervious area CN's are assumed equivalent to desert shrub in poor hydrologic condition.
5 Composite CN's to use for the design of temporary measures during grading and construction should be computed using figure 2-3 or 2-4 based on the degree of development (impervious area percentage) and the CN's for the newly graded pervious areas.

Table 2-2c Runoff curve numbers for other agricultural lands [1/]

Cover description		Curve numbers for hydrologic soil group			
Cover type	Hydrologic condition	A	B	C	D
Pasture, grassland, or range—continuous forage for grazing. [2/]	Poor	68	79	86	89
	Fair	49	69	79	84
	Good	39	61	74	80
Meadow—continuous grass, protected from grazing and generally mowed for hay.	—	30	58	71	78
Brush—brush-weed-grass mixture with brush the major element. [3/]	Poor	48	67	77	83
	Fair	35	56	70	77
	Good	30 [4/]	48	65	73
Woods—grass combination (orchard or tree farm). [5/]	Poor	57	73	82	86
	Fair	43	65	76	82
	Good	32	58	72	79
Woods. [6/]	Poor	45	66	77	83
	Fair	36	60	73	79
	Good	30 [4/]	55	$\boxed{70}$	$\boxed{77}$
Farmsteads—buildings, lanes, driveways, and surrounding lots.	—	59	74	82	86

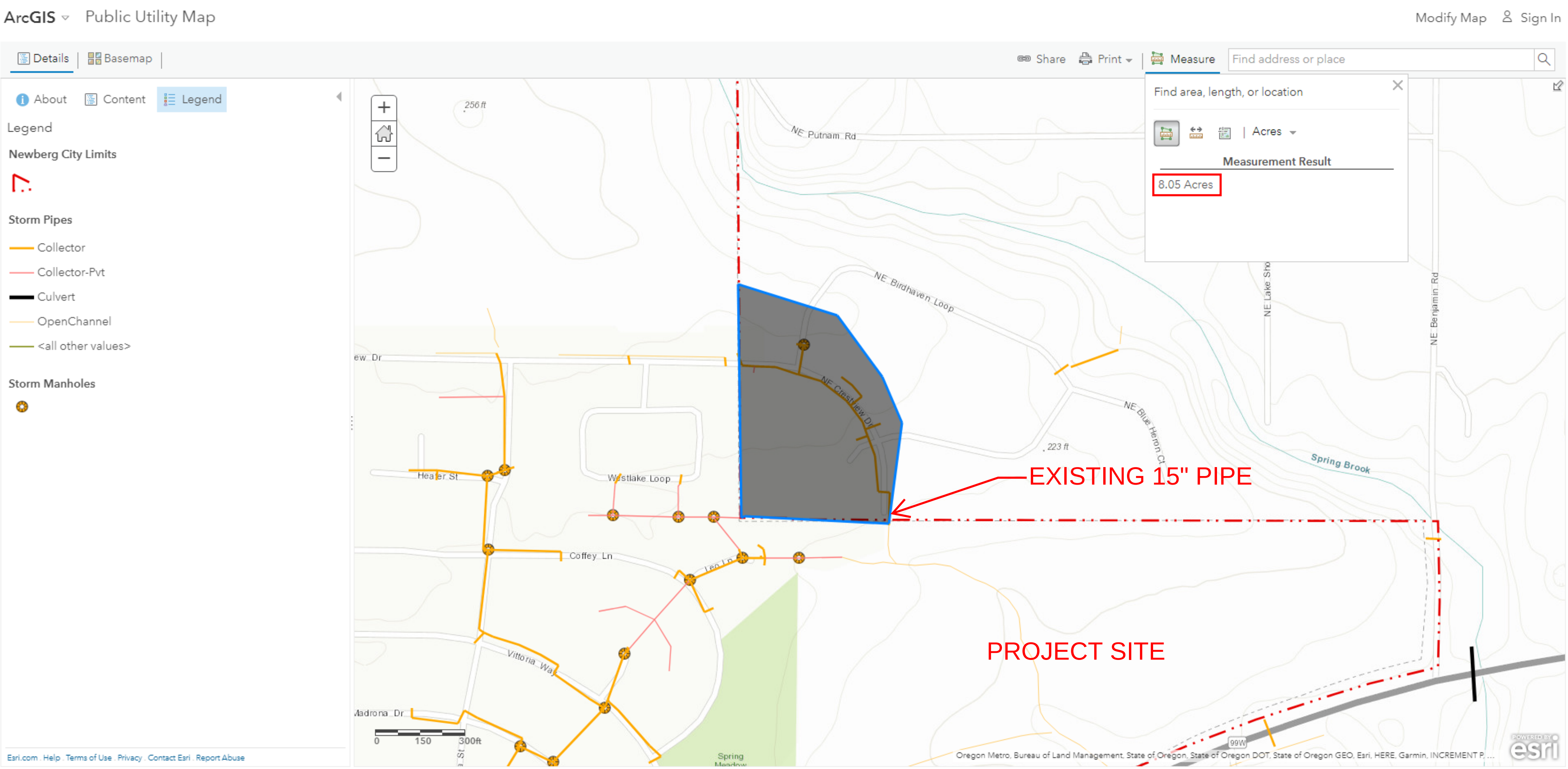
1 Average runoff condition, and $I_a = 0.2S$.
2 *Poor:* <50%) ground cover or heavily grazed with no mulch.
Fair: 50 to 75% ground cover and not heavily grazed.
Good: > 75% ground cover and lightly or only occasionally grazed.
3 *Poor:* <50% ground cover.
Fair: 50 to 75% ground cover.
Good: >75% ground cover.
4 Actual curve number is less than 30; use CN = 30 for runoff computations.
5 CN's shown were computed for areas with 50% woods and 50% grass (pasture) cover. Other combinations of conditions may be computed from the CN's for woods and pasture.
6 *Poor:* Forest litter, small trees, and brush are destroyed by heavy grazing or regular burning.
Fair: Woods are grazed but not burned, and some forest litter covers the soil.
Good: Woods are protected from grazing, and litter and brush adequately cover the soil.

City of Newberg Public Utility Map

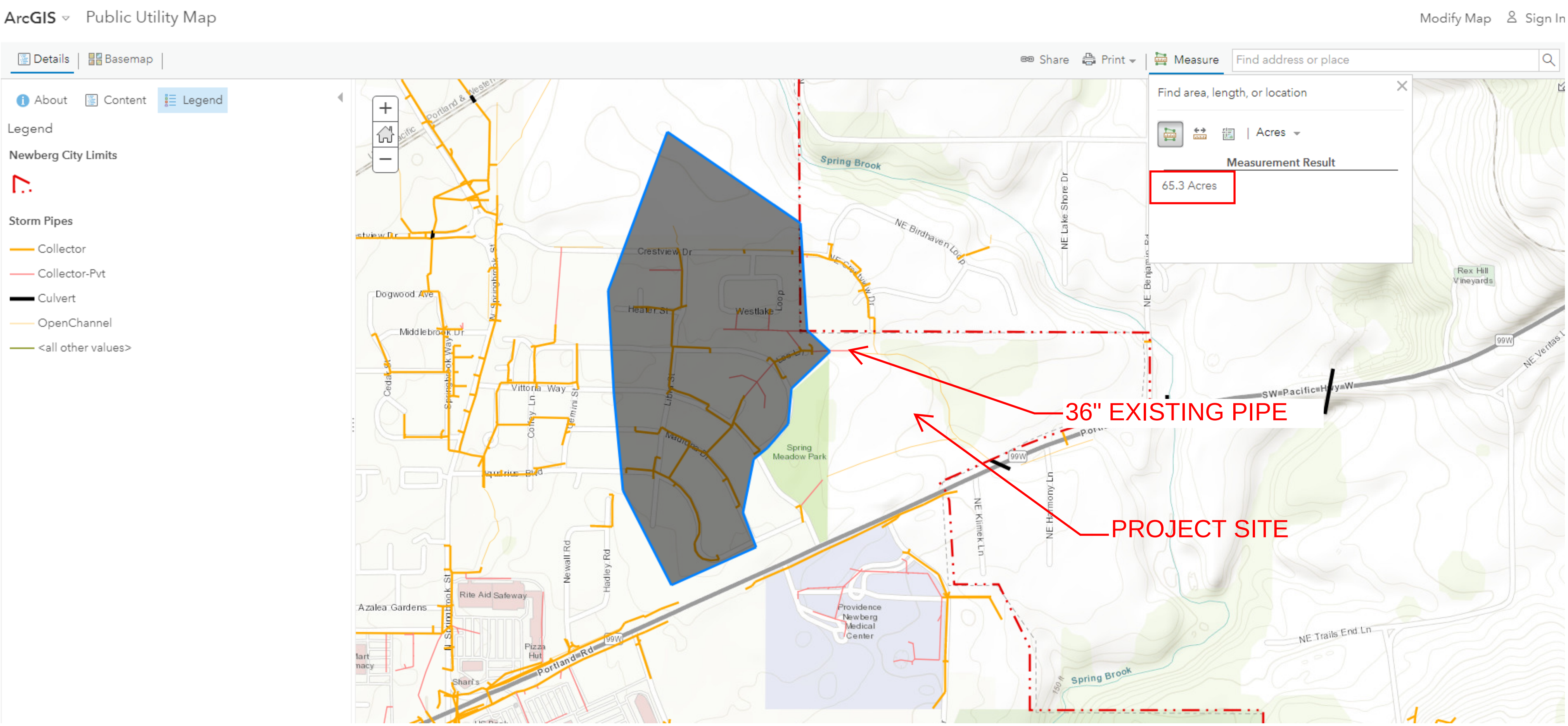


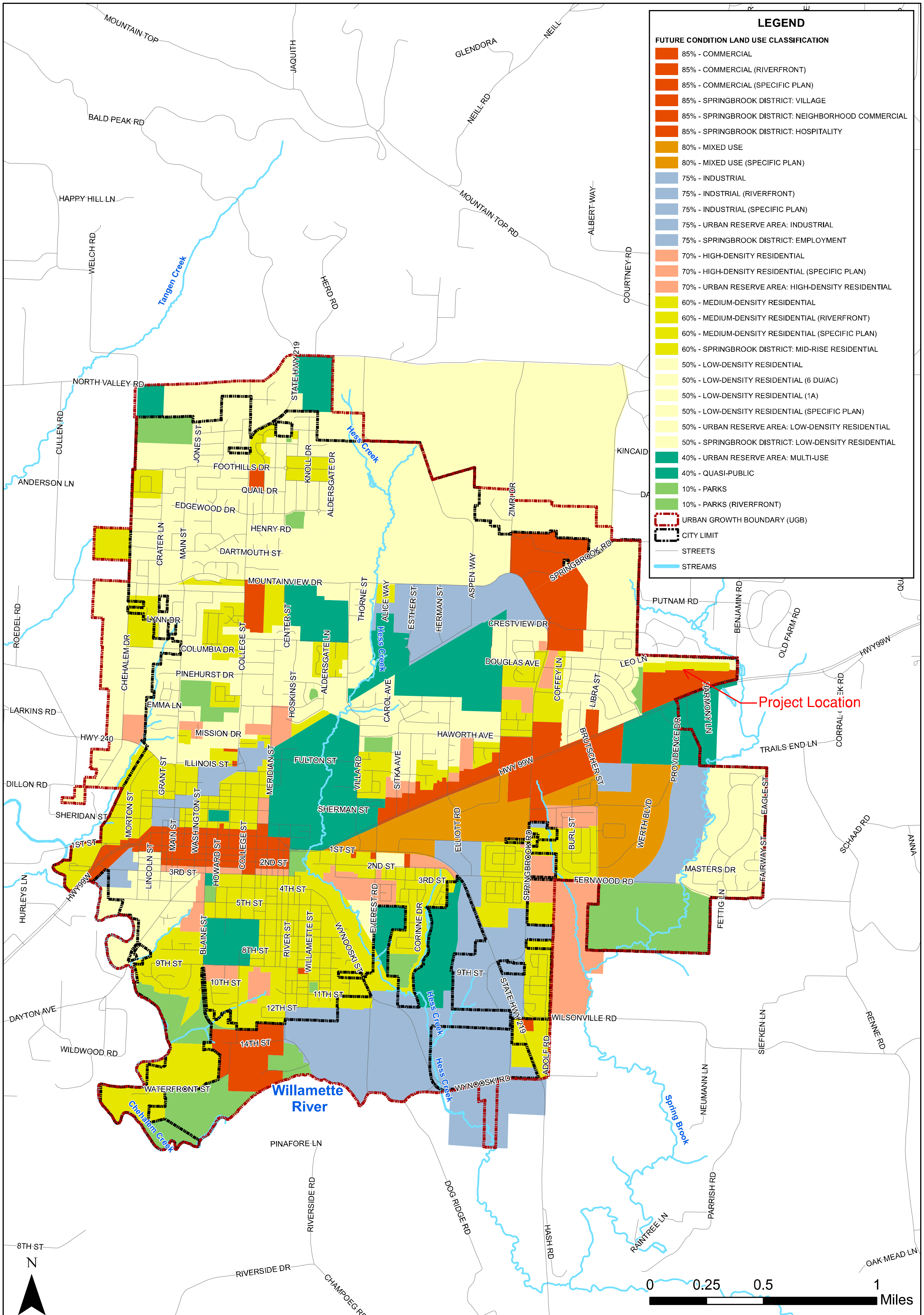
Pipes may or may not be RCP.

OFFSITE BASIN NORTH



OFFSITE BASIN NORTHWEST



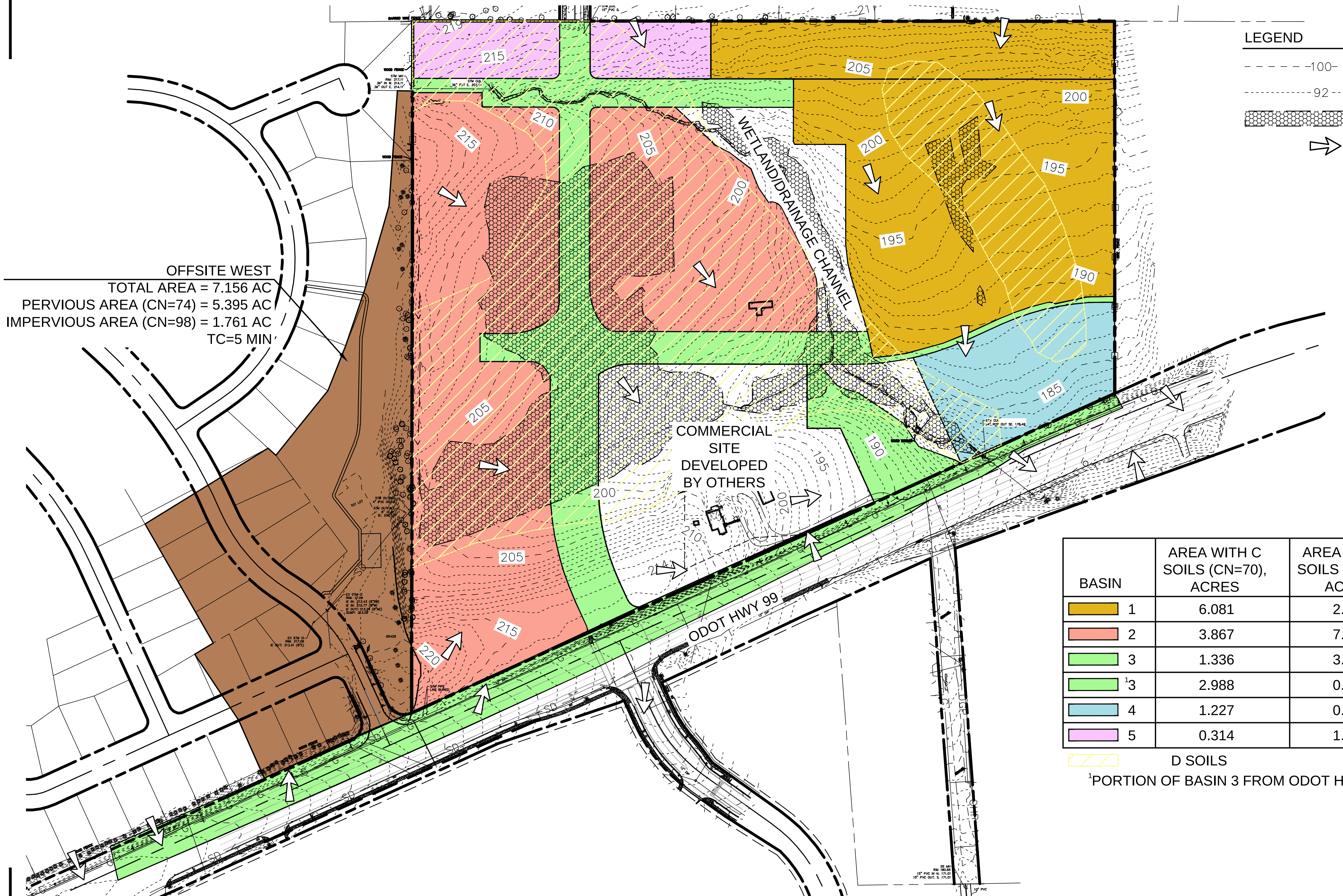


STORMWATER MASTER PLAN UPDATE

FIGURE 2-5. FUTURE CONDITIONS LAND USE

NEWBERG, OREGON

JUNE 2014



LEGEND

- EXISTING MAJOR CONTOUR (100)
- EXISTING MINOR CONTOUR (92)
- EXISTING WETLAND
- SURFACE RUN-OFF FLOW ARROW

BASIN	AREA WITH C SOILS (CN=70), ACRES	AREA WITH D SOILS (CN=77), ACRES	TIME OF CONCENTRATION, MINUTES
1	6.081	2.077	22
2	3.867	7.028	24
3	1.336	3.460	24
[1]3	2.988	0.000	5
4	1.227	0.567	25
5	0.314	1.053	5

D SOILS

[1]PORTION OF BASIN 3 FROM ODOT HWY 99

N W E S

SCALE: 1" = 200'

0 200

CRESTVIEW CROSSING

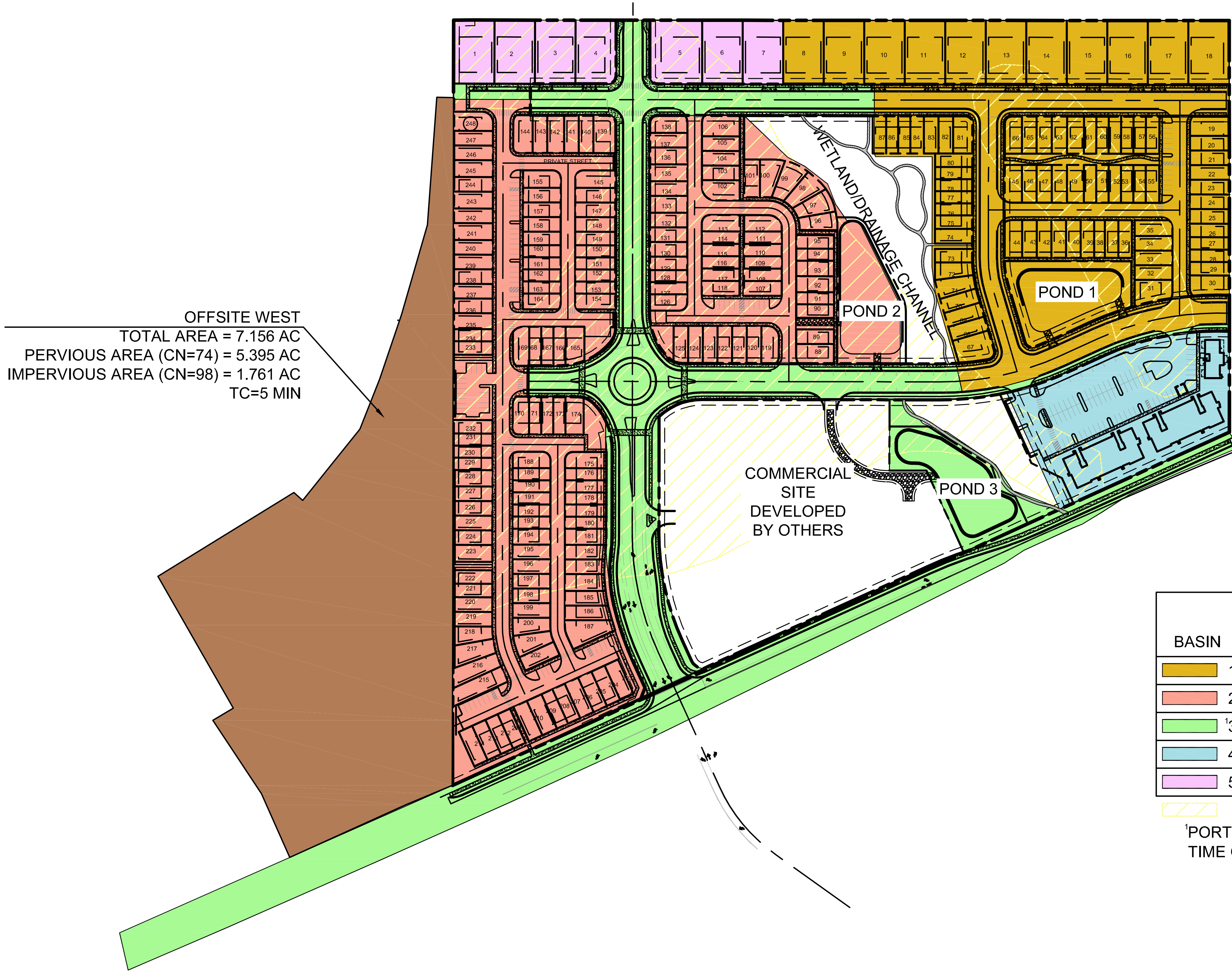
06/06/18

JT SMITH COMPANIES

EXHIBIT 1 - PREDEVELOPED CONDITIONS

3J CONSULTING

CIVIL ENGINEERING | WATER RESOURCES | LAND USE PLANNING



BASIN	AREA WITH C SOILS (CN=70), ACRES	AREA WITH D SOILS (CN=77), ACRES	IMPERVIOUS AREA (CN=98), ACRES
1	3.090	0.919	4.149
2	1.789	3.330	5.777
[1]3	1.062	1.231	5.489
4	0.387	0.209	1.199
5	0.189	0.715	0.462

D SOILS

[1]PORTION OF BASIN 3 FROM ODOT HWY 99

TIME OF CONCENTRATION = 5 MINUTES FOR ALL BASINS

N
W
E
S

SCALE: 1" = 200'

0 200

CRESTVIEW CROSSING

06/06/2018

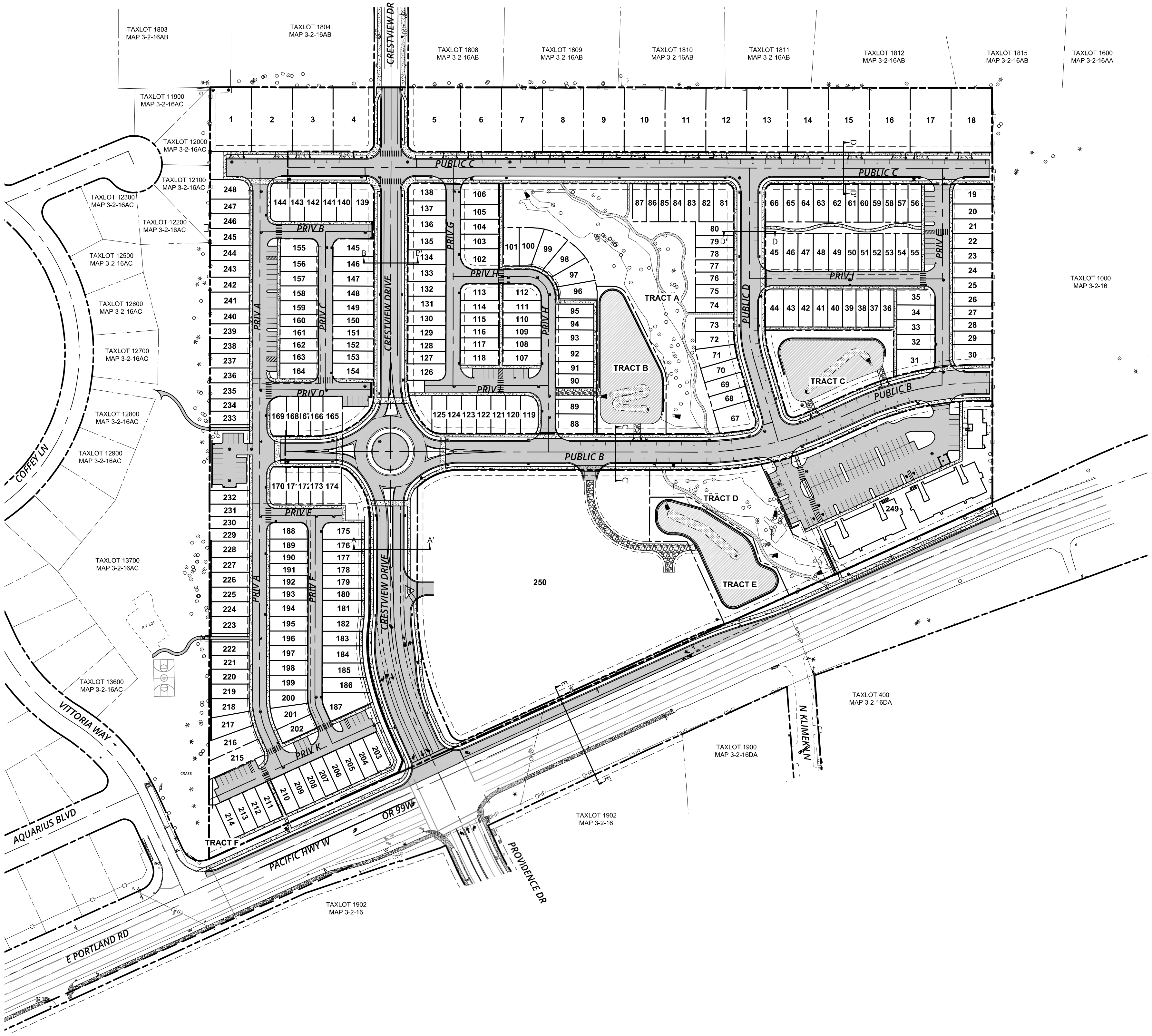
JT SMITH COMPANIES

EXHIBIT 2 - PROPOSED CONDITIONS

3J CONSULTING

CIVIL ENGINEERING | WATER RESOURCES | LAND USE PLANNING

DRAWINGS



LEGEND

	PROJECT BOUNDARY
	EXISTING RIGHT-OF-WAY LINE
	EXISTING RIGHT-OF-WAY CENTERLINE
	EXISTING ADJACENT PROPERTY LINE
	PROPOSED RIGHT-OF-WAY LINE
	PROPOSED RIGHT-OF-WAY CENTERLINE
	PROPOSED LOT LINE
	PROPOSED SETBACK LINE
	PROPOSED EASEMENT
	PROPOSED CURB FACE
	PROPOSED CURB BACK
	PROPOSED LIP OF GUTTER
	PROPOSED WHITE STRIPING
	PROPOSED CONCRETE
	PROPOSED ASPHALT
	PROPOSED STORM FACILITY
	PROPOSED SWALE
	PROPOSED GRAVEL
	PROPOSED WOODCHIP PATH
	PROPOSED RETAINING WALL
	PROPOSED DRIVEWAY
	PROPOSED PEDESTRIAN CROSSWALK STRIPING
A — A'	PROPOSED TYPICAL STREET SECTION SEE SHEETS C200 & C201

811 Know what's below. Call before you dig.

N W E S

SCALE: 1" = 100'
0 100' 200'

PUBLISH DATE
06.06.2018
ISSUED FOR
LAND USE DOCUMENTS

OVERALL SITE PLAN
CRESTVIEW CROSSING PLANNED UNIT DEVELOPMENT
JT SMITH COMPANIES
NEWBERG, OR

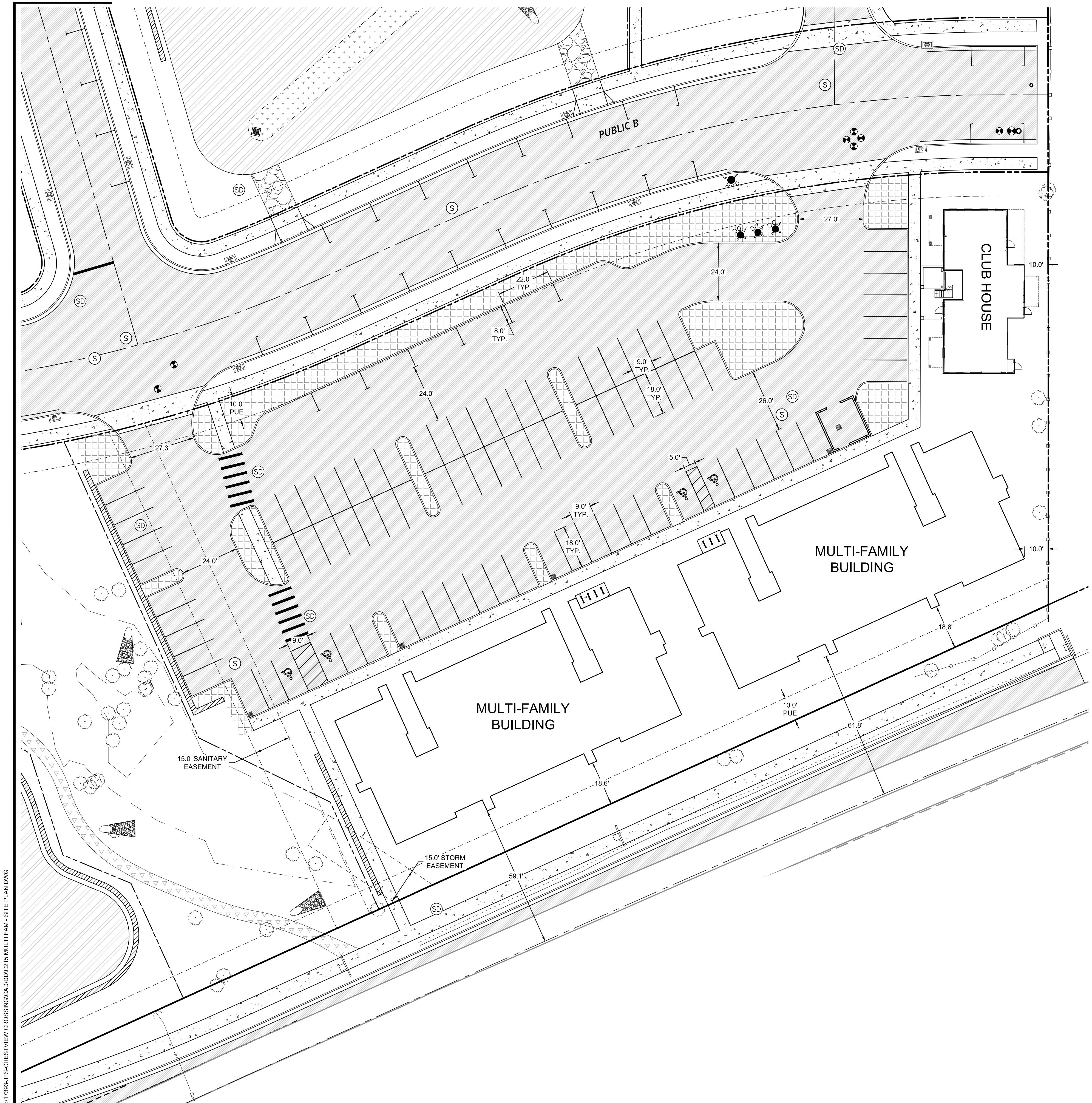
3J CONSULTING
CIVIL ENGINEERING
WATER RESOURCES
LAND USE PLANNING
5075 SW GRIFFITH DRIVE, SUITE 150, BEAVERTON, OR 97005

PROJECT INFORMATION

3J PROJECT #	17393
TAX LOT(S)	3S2W16 13800, 1100
LAND USE #	N/A
DESIGNED BY	ARS, JEJ, BMO
CHECKED BY	AJM, RGW

SHEET NUMBER
C210

P:\17393-JTS-CRESTVIEW CROSSING\CAD\DD\C210 SITE PLAN.DWG



LEGEND

- PROJECT BOUNDARY
- EXISTING RIGHT-OF-WAY LINE
- EXISTING RIGHT-OF-WAY CENTERLINE
- EXISTING ADJACENT PROPERTY LINE
- PROPOSED RIGHT-OF-WAY LINE
- PROPOSED RIGHT-OF-WAY CENTERLINE
- PROPOSED LOT LINE
- PROPOSED SETBACK LINE
- PROPOSED EASEMENT
- PROPOSED CURB FACE
- PROPOSED CURB BACK
- PROPOSED LIP OF GUTTER
- PROPOSED WHITE STRIPING
- PROPOSED CONCRETE
- PROPOSED ASPHALT
- PROPOSED LANDSCAPING
- PROPOSED GRAVEL
- PROPOSED WOODCHIP PATH
- PROPOSED RETAINING WALL
- PROPOSED DRIVEWAY
- PROPOSED PEDESTRIAN CROSSWALK STRIPING
- PROPOSED BIKE PARKING
- PROPOSED ACCESSIBLE PARKING STALL
- PROPOSED HYDRANT
- PROPOSED VALVE
- PROPOSED BLOW-OFF / AIR RELEASE ASSY.
- PROPOSED FIRE DPT. CONNECTION
- PROPOSED SEWER MANHOLE
- PROPOSED STORM MANHOLE
- PROPOSED CATCH BASIN
- EXISTING DECIDUOUS TREE

PARKING STATISTICS - MULITFAMILY LOT

PROPOSED STALL COUNT & SUMMARY

TYPE = (WIDTH x DEPTH)	STANDARD 9' x 18'	PARALLEL 8' x 22'	ADA 9' x 18'	ADA - VAN 9' x 18'	TOTAL
MULTIPLE FAMILY APARTMENTS =	80	7	3	1	91
TOTAL =	80	7	3	1	91

VEHICLES
DEVELOPMENT CODE CHAPTER 15.440.30

MAXIMUM PARKING - MULTI-FAMILY	NONE
MINIMUM PARKING - MULTI-FAMILY	74
PROPOSED	91

BICYCLES
DEVELOPMENT CODE CHAPTER 15.440.90

	MINIMUM	PROPOSED
MINIMUM BICYCLE PARKING - MULTI-FAMILY	13	14

ACCESSIBLE
OSSC SECTION 1106.1

MULTI-FAMILY PARKING LOT (76 TO 100)	MINIMUM	PROPOSED
ACCESSIBLE SPACES	4	4
VAN ACCESSIBLE SPACES	1	1

LANDSCAPING
DEVELOPMENT CODE CHAPTER 15.420.010

	REQUIRED	PROPOSED
MULTI-FAMILY PARKING LOT (25 SF PER STALL)	2,275 SF	6,357 SF

SETBACKS

ZONE C3 - MULTI-FAMILY LOT

FRONT	10 FT
INTERIOR	0 FT/10 FT
STREET - EXPRESSWAY CENTERLINE	50 Ft

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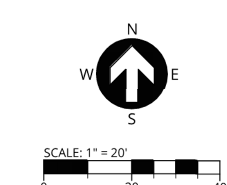

PUBLISH DATE
06.06.2018

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LAND USE DOCUMENTS

MULTI-FAMILY SITE PLAN

CRESTVIEW CROSSING PLANNED UNIT DEVELOPMENT

JT SMITH COMPANIES
NEWBERG, OR

3J CONSULTING
CIVIL ENGINEERING
WATER RESOURCES
LAND USE PLANNING
5075 SW GRIFFITH DRIVE, SUITE 150; BEAVERTON, OR 97005

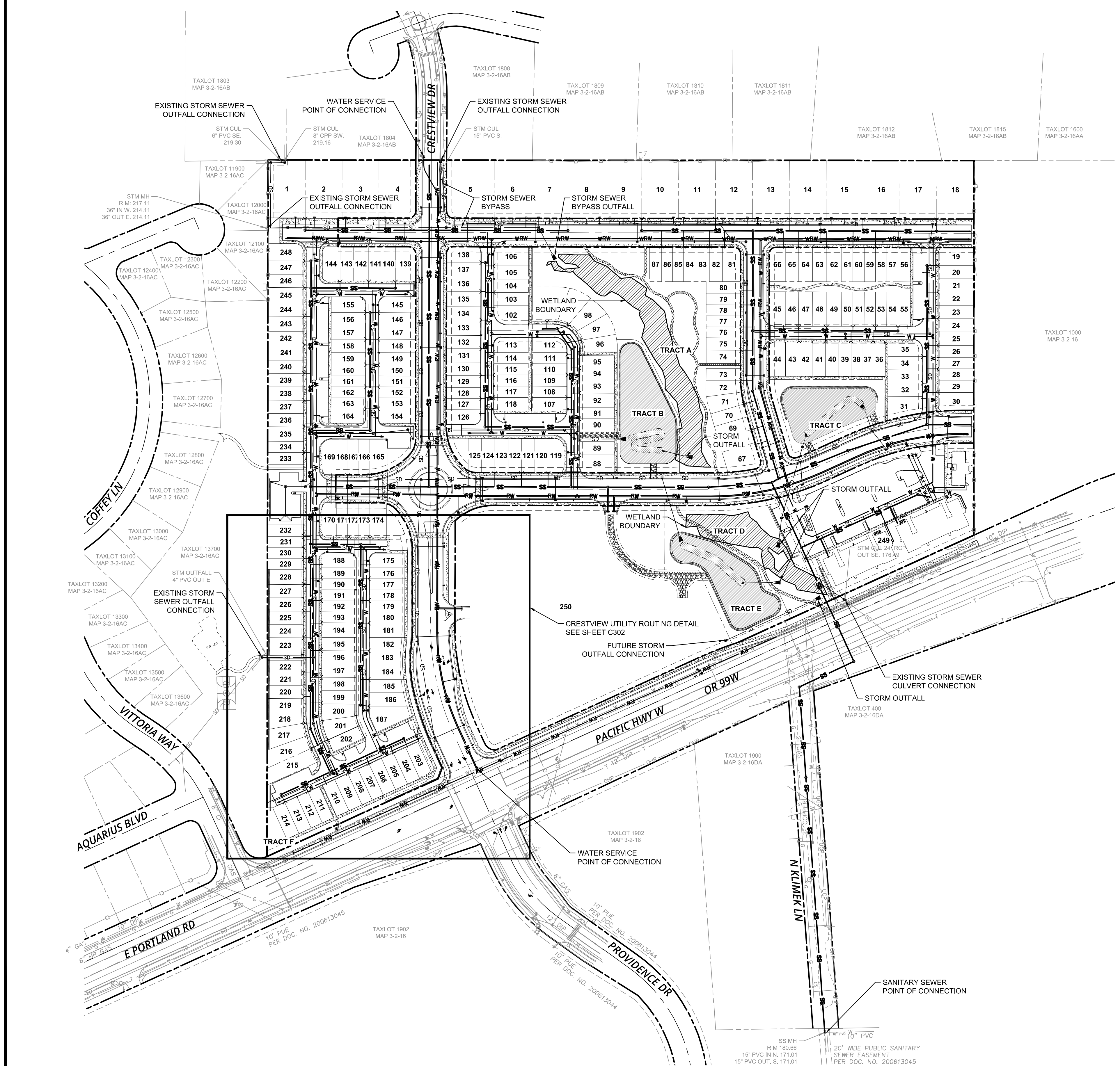
PROJECT INFORMATION

3J PROJECT #	17393
TAX LOT(S)	3S2W16 13800, 1100
LAND USE #	N/A
DESIGNED BY	ARS, JEJ, BMO
CHECKED BY	AJM, RGW

SHEET NUMBER
C215

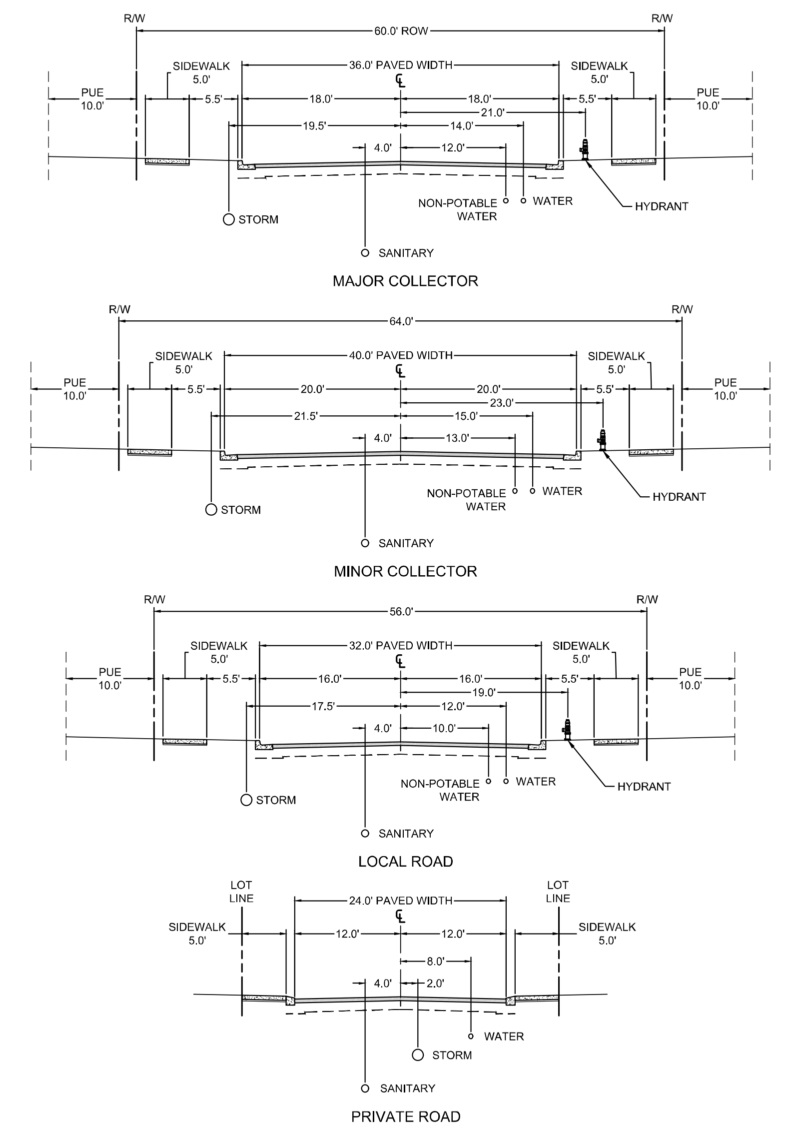
GENERAL NOTES

1. LOTS 1 THROUGH 7 SHALL HAVE STORMWATER QUALITY TREATMENT LOCATED WITHIN LOT BOUNDARIES. STORMWATER DISCHARGE FROM THESE LOTS SHALL CONNECT TO PROPOSED STORM SEWER BYPASS AND OUTFALL TO THE WETLAND.



LEGEND

PROPOSED STORM PIPE	EXISTING TELECOM. LINE
PROPOSED SANITARY MAIN	EXISTING GAS LINE
PROPOSED WATER MAIN	EXISTING UNDERGROUND POWER
PROPOSED NON-POTABLE WATER MAIN	EXISTING OVERHEAD POWER
PROPOSED WATER FIRE SERVICE	EXISTING SANITARY SEWER
PROPOSED DETENTION POND	EXISTING STORM DRAIN
PROPOSED WATER QUALITY SWALE	EXISTING WATER MAIN
PIPE CAP / STUB	EXISTING HYDRANT
PROPOSED HYDRANT	EXISTING WATER VALVE
PROPOSED WATER VALVE	EXISTING SANITARY MANHOLE
PROPOSED WATER PIPE BLOWOFF/ PROPOSED AIR RELEASE ASSEMBLY	EXISTING STORM MANHOLE
PROPOSED FIRE DPT. CONNECTION	EXISTING STORM INLET
PROPOSED SANITARY MANHOLE	EXISTING POWER METER
PROPOSED SANITARY SERVICE LATERAL WITH CLEANOUT	EXISTING GAS METER
PROPOSED STORM MANHOLE	EXISTING TELEPHONE PEDESTAL
PROPOSED STORM OUTFALL PROTECTION	EXISTING GUY ANCHOR
PROPOSED STANDARD INLET MANHOLE	EXISTING LIGHT POLE
PROPOSED SUPERSIZED INLET MANHOLE	EXISTING UTILITY POLE
PROPOSED CATCH BASIN	EXISTING INTERSECTION SIGNAL
PROPOSED DITCH INLET	EXISTING ELECTRICAL BOX
PROPOSED STREET LIGHTING	



STREET UTILITIES TYPICAL SECTIONS

SCALE: NTS

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SCALE: 1" = 100'

PUBLISH DATE 06.06.2018

ISSUED FOR LAND USE DOCUMENTS

COMPOSITE UTILITY PLAN

CRESTVIEW CROSSING PLANNED UNIT DEVELOPMENT

JT SMITH COMPANIES
NEWBERG, OR

3J CONSULTING
CIVIL ENGINEERING
WATER RESOURCES
LAND USE PLANNING
5075 SW GRIFFITH DRIVE, SUITE 150, BEAVERTON, OR 97005

PROJECT INFORMATION

3J PROJECT #	17393
TAX LOT(S)	3S2W16 13800, 1100
LAND USE #	N/A
DESIGNED BY	ARS, JEJ, BMO
CHECKED BY	AJM, RGW

SHEET NUMBER C300

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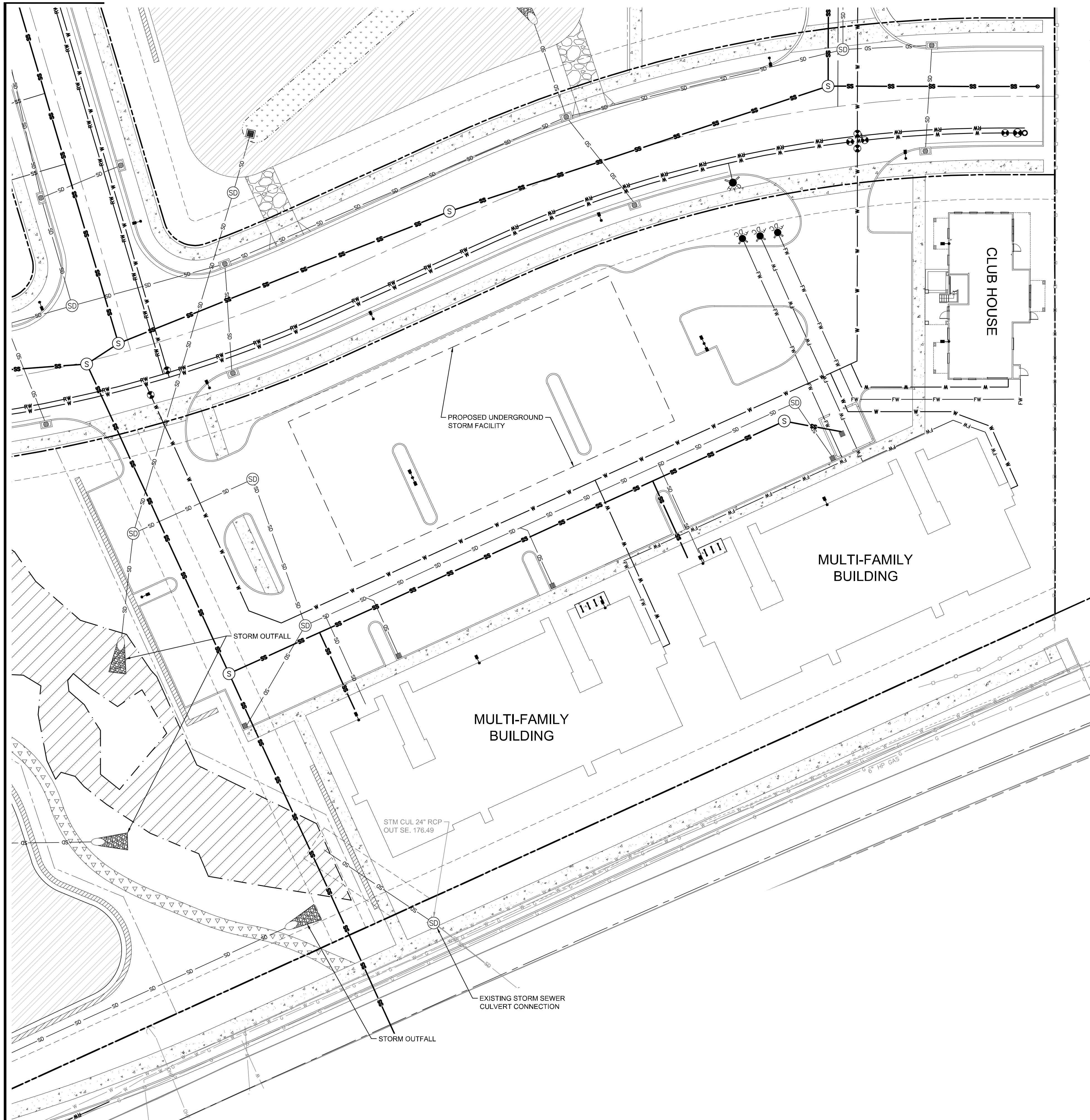

LEGEND

- PROPOSED STORM PIPE
- PROPOSED SANITARY MAIN
- PROPOSED WATER MAIN
- PROPOSED NON-POTABLE WATER MAIN
- PROPOSED WATER FIRE SERVICE
- PROPOSED DETENTION POND
- PROPOSED WATER QUALITY SWALE
- PIPE CAP / STUB
- PROPOSED HYDRANT
- PROPOSED FIRE DEPARTMENT CONNECTION
- PROPOSED WATER VALVE
- PROPOSED WATER PIPE BLOWOFF/ AIR RELEASE ASSEMBLY
- PROPOSED SANITARY MANHOLE
- PROPOSED SANITARY SERVICE LATERAL WITH CLEANOUT
- PROPOSED STORM MANHOLE
- PROPOSED STORM OUTFALL PROTECTION
- PROPOSED STANDARD INLET MANHOLE
- PROPOSED SUPERSIZED INLET MANHOLE
- PROPOSED CATCH BASIN
- PROPOSED DITCH INLET
- PROPOSED STREET LIGHTING
- EXISTING TELECOM. LINE
- EXISTING GAS LINE
- EXISTING UNDERGROUND POWER
- EXISTING OVERHEAD POWER
- EXISTING SANITARY SEWER
- EXISTING STORM DRAIN
- EXISTING WATER MAIN
- EXISTING HYDRANT
- EXISTING WATER VALVE
- EXISTING SANITARY MANHOLE
- EXISTING STORM MANHOLE
- EXISTING STORM INLET
- EXISTING POWER METER
- EXISTING GAS METER
- EXISTING TELEPHONE PEDESTAL
- EXISTING GUY ANCHOR
- EXISTING LIGHT POLE
- EXISTING UTILITY POLE
- EXISTING INTERSECTION SIGNAL
- EXISTING ELECTRICAL BOX

Know what's below. Call before you dig.

N S E W

SCALE: 1" = 100'
0 100' 200'

PUBLISH DATE
06.06.2018
ISSUED FOR
LAND USE DOCUMENTS

MULTI-FAMILY COMPOSITE UTILITY PLAN
CRESTVIEW CROSSING PLANNED UNIT DEVELOPMENT
JT SMITH COMPANIES
NEWBERG, OR

3J CONSULTING
CIVIL ENGINEERING
WATER RESOURCES
LAND USE PLANNING
5075 SW GRIFFITH DRIVE, SUITE 150, BEAVERTON, OR 97005

PROJECT INFORMATION
3J PROJECT # | 17393
TAX LOT(S) | 3S2W16 13800, 1100
LAND USE # | N/A
DESIGNED BY | ARS, JEJ, BMO
CHECKED BY | AJM, RGW

SHEET NUMBER
C303

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CALCULATIONS

TIME OF CONCENTRATION

PROJECT NO. 17393	BY KEF	DATE 4/30/2018

SHEET FLOW			
INPUT	**BASIN 1**	**BASIN 2 & 3**	**BASIN 4**
Surface Description	**Type 7** **Grass (Bermudagrass)**	**Type 7** **Grass (Bermudagrass)**	**Type 7** **Grass (Bermudagrass)**
Manning's "n"	**0.41**	**0.41**	**0.41**
Flow Length, L	**100** ft	**100** ft	**100** ft
2-Yr 24 Hour Rainfall, P_2	**2.5** in	**2.5** in	**2.5** in
Land Slope, s	**0.038** ft/ft	**0.032** ft/ft	**0.021** ft/ft
OUTPUT			
Travel Time	0.32 hr	0.34 hr	0.40 hr
SHALLOW CONCENTRATED FLOW			
INPUT	**VALUE**	**VALUE**	**VALUE**
Surface Description	**Unpaved**	**Unpaved**	**Unpaved**
Flow Length, L	**397** ft	**562** ft	**82** ft
Watercourse Slope*, s	**0.024371** ft/ft	**0.028** ft/ft	**0.065** ft/ft
OUTPUT			
Average Velocity, V	2.52 ft/s	2.71 ft/s	4.11 ft/s
Travel Time	0.044 hr	0.058 hr	0.006 hr
CHANNEL FLOW			
INPUT	**VALUE**	**VALUE**	**VALUE**
Cross Sectional Flow Area, a	**0** ft^2	**0** ft^2	**0** ft^2
Wetted Perimeter, P_w	**0** ft	**0** ft	**0** ft
Channel Slope, s	**0** ft/ft	**0** ft/ft	**0** ft/ft
Manning's "n"	**0.24**	**0.24**	**0.24**
Flow Length, L	**0** ft	**0** ft	**0** ft
OUTPUT			
Average Velocity	0.00 ft/s	0.00 ft/s	0.00 ft/s
Hydraulic Radius, $r = a / P_w$	1.00 ft	1.00 ft	1.00 ft
Travel Time	0.00 hr	0.00 hr	0.00 hr
Watershed or Subarea T_c =	**0.36 hr**	**0.40 hr**	**0.41 hr**
Watershed or Subarea T_c =	**22 minutes**	**24 minutes**	**25 minutes**

SWALE CALCULATION: SWALE I

PROJECT NO. 17393	BY KEF	DATE 5/17/2018

Swale Characteristics		
Input		**Value**
Q	Peak design storm discharge	**1.11** cfs
n	Roughness factor	**0.24**
B	Swale width at base (Min Width = 2')	**7.207558** ft
Z	Side Slopes X:1 (4:1 for WQ Flow)	**4** H:1V
s	Slope of channel (ft/ft, 0.005 minimum)	**0.005** ft/ft
t	Minimum hydraulic residence time (Min HRT = 9 min)	**9** min
Flow Results (Q)		
Input		**Value**
Y	Normal depth (Max Depth @ WQ Event = 0.50')	**0.50** ft
P	Wetted perimeter	**11.33** ft
A	Cross section flow area	**4.61** ft^2
R	Hydraulic radius	**0.41** ft
W	Width of water surface in Swale	**11.21** ft
V	Velocity	**0.24** ft/s
L	Length (Min Length = 100')	**130.09** ft

SWALE CALCULATION: SWALE 2

PROJECT NO. 17393	BY KEF	DATE 5/17/2018

Swale Characteristics		
Input		**Value**
Q	Peak design storm discharge	**1.55** cfs
n	Roughness factor	**0.24**
B	Swale width at base (Min Width = 2')	**7** ft
Z	Side Slopes X:1 (4:1 for WQ Flow)	**4** H:1V
s	Slope of channel (ft/ft, 0.005 minimum)	**0.01** ft/ft
t	Minimum hydraulic residence time (Min HRT = 9 min)	**9** min
Flow Results (Q)		
Input		**Value**
Y	Normal depth (Max Depth @ WQ Event = 0.50')	**0.50** ft
P	Wetted perimeter	**11.16** ft
A	Cross section flow area	**4.54** ft^2
R	Hydraulic radius	**0.41** ft
W	Width of water surface in Swale	**11.03** ft
V	Velocity	**0.34** ft/s
L	Length (Min Length = 100')	**184.21** ft

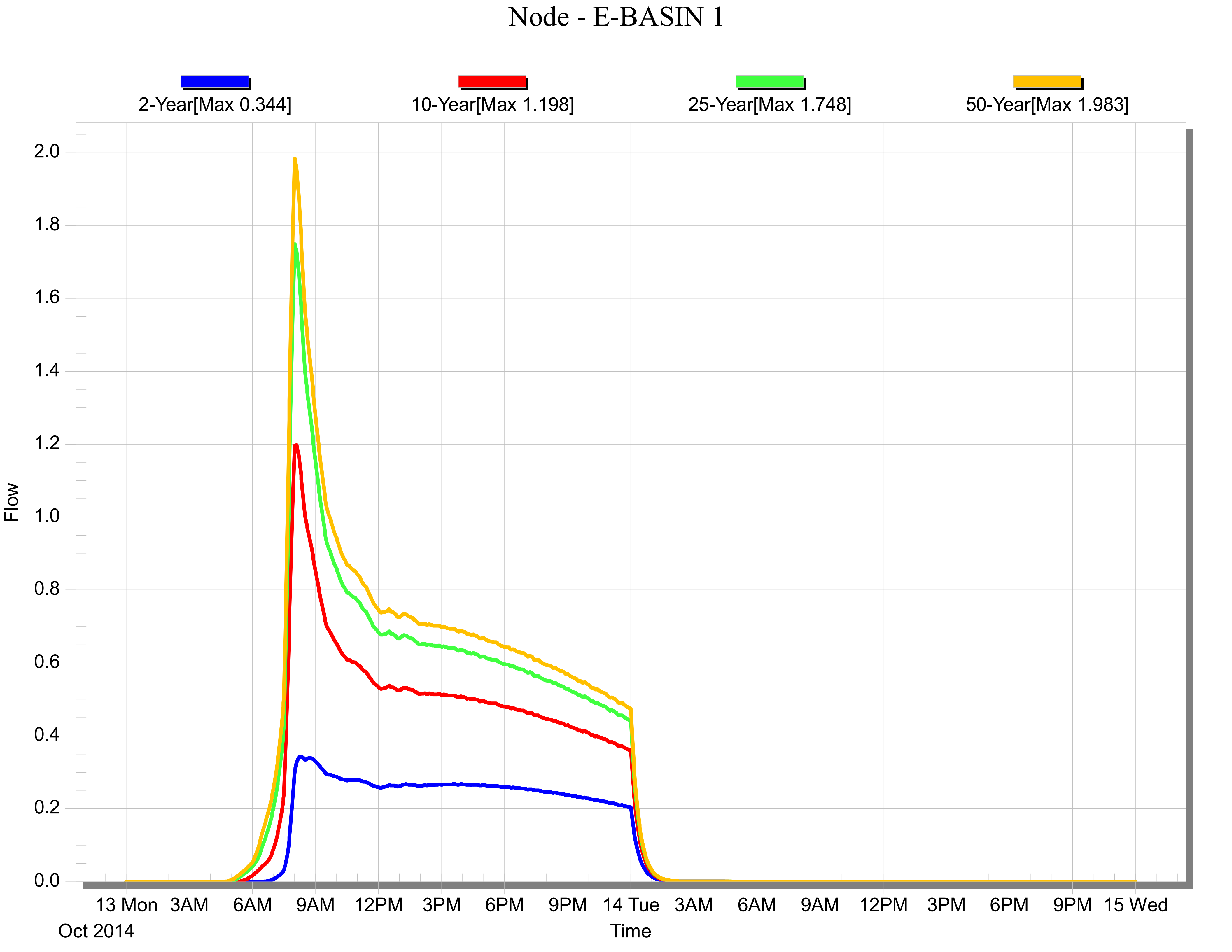
SWALE CALCULATION: SWALE 3

PROJECT NO. 17393	BY KEF	DATE 5/17/2018

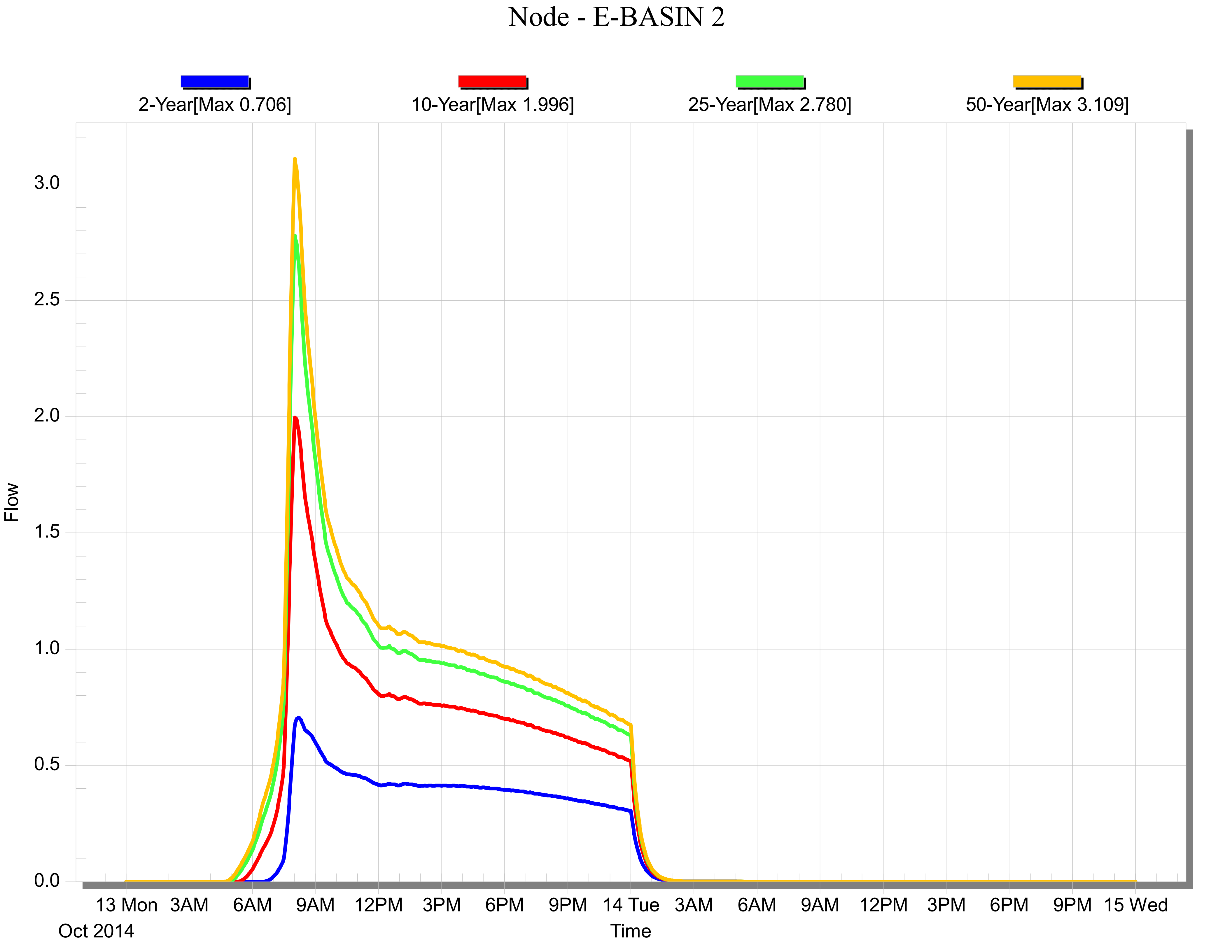
Swale Characteristics		
Input		**Value**
Q	Peak design storm discharge	**1.47** cfs
n	Roughness factor	**0.24**
B	Swale width at base (Min Width = 2')	**10** ft
Z	Side Slopes X:1 (4:1 for WQ Flow)	**4** H:1V
s	Slope of channel (ft/ft, 0.005 minimum)	**0.005** ft/ft
t	Minimum hydraulic residence time (Min HRT = 9 min)	**9** min
Flow Results (Q)		
Input		**Value**
Y	Normal depth (Max Depth @ WQ Event = 0.50')	**0.50** ft
P	Wetted perimeter	**14.09** ft
A	Cross section flow area	**5.95** ft^2
R	Hydraulic radius	**0.42** ft
W	Width of water surface in Swale	**13.97** ft
V	Velocity	**0.25** ft/s
L	Length (Min Length = 100')	**133.41** ft

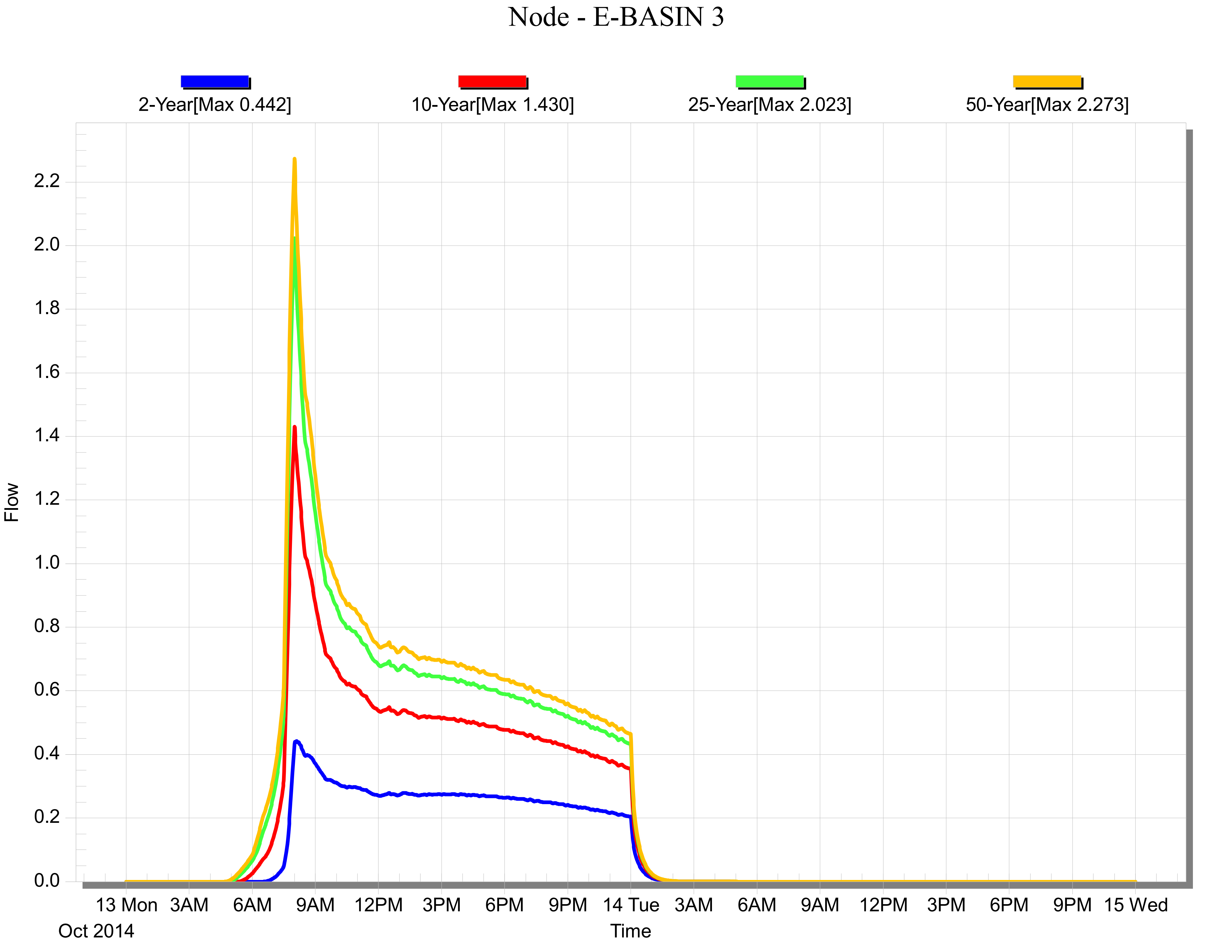
HYDROGRAPHS

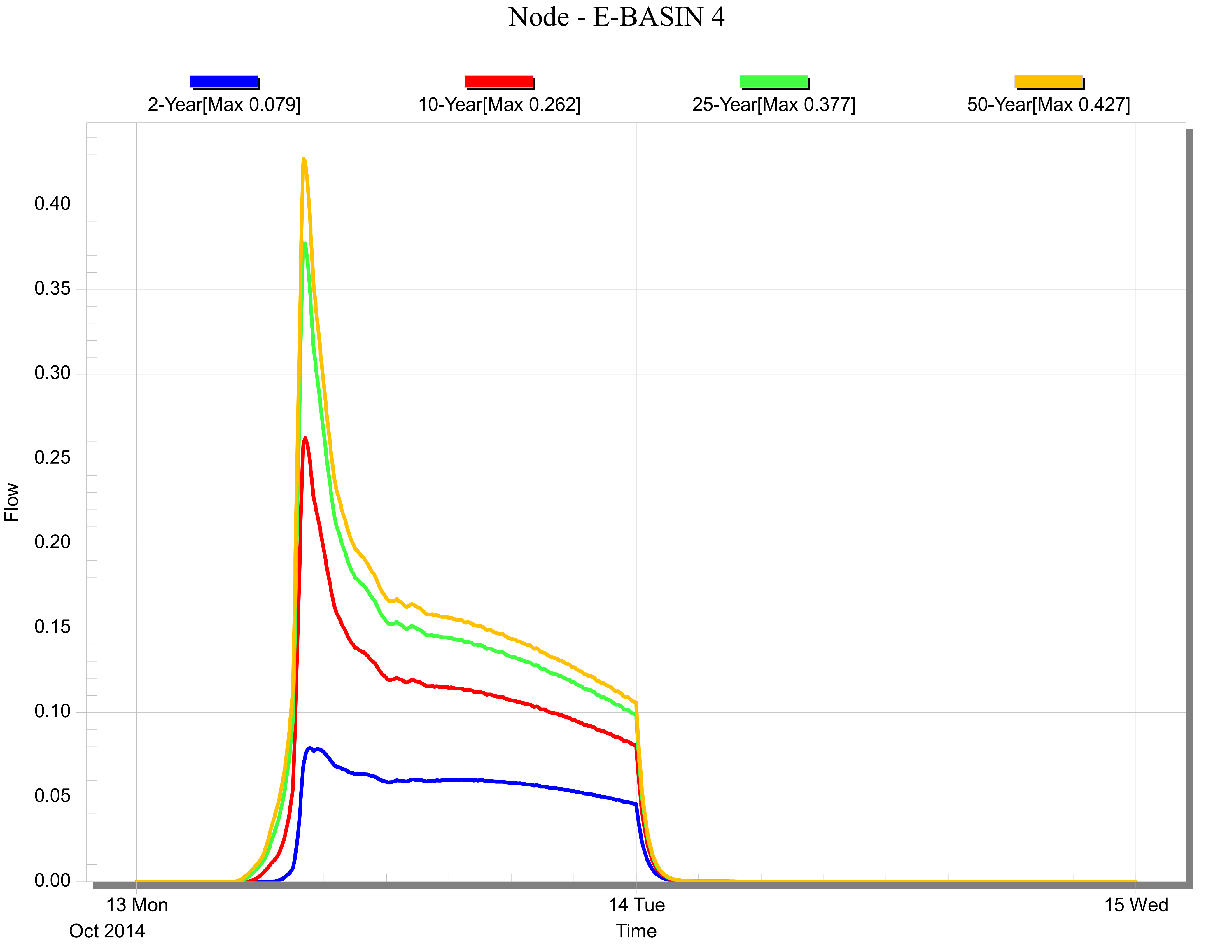
EXISTING HYDROGRAPHS



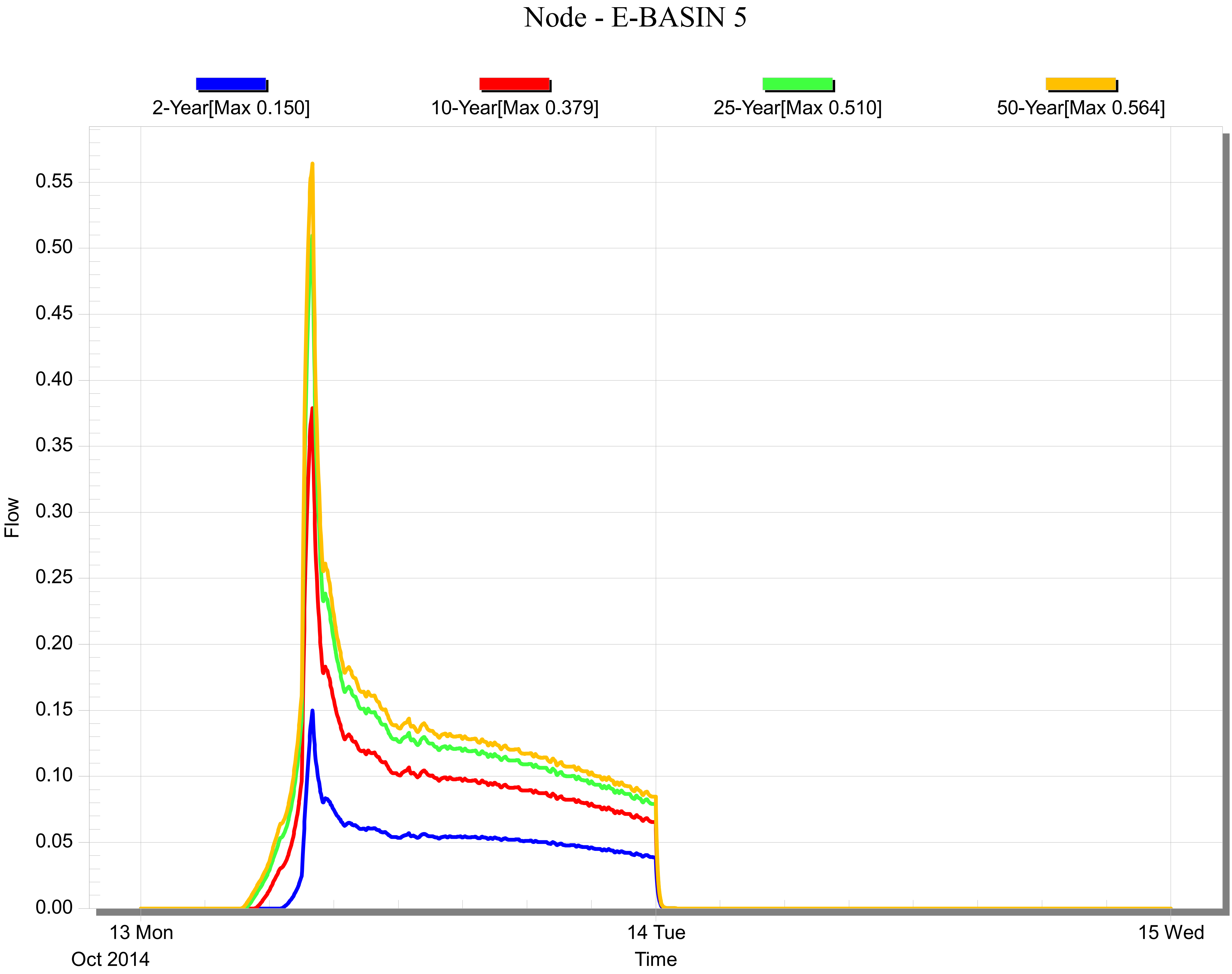
Node - E-BASIN 1
2-Year[Max 0.344]
10-Year[Max 1.198]
25-Year[Max 1.748]
50-Year[Max 1.983]
Flow
2.0
1.8
1.6
1.4
1.2
1.0
0.8
0.6
0.4
0.2
0.0
13 Mon
3AM
6AM
9AM
12PM
3PM
6PM
9PM
14 Tue
3AM
6AM
9AM
12PM
3PM
6PM
9PM
15 Wed
Oct 2014
Time


Node - E-BASIN 2
2-Year[Max 0.706]
10-Year[Max 1.996]
25-Year[Max 2.780]
50-Year[Max 3.109]
Flow
3.0
2.5
2.0
1.5
1.0
0.5
0.0
13 Mon
3AM
6AM
9AM
12PM
3PM
6PM
9PM
14 Tue
3AM
6AM
9AM
12PM
3PM
6PM
9PM
15 Wed
Oct 2014
Time


Node - E-BASIN 3
2-Year[Max 0.442]
10-Year[Max 1.430]
25-Year[Max 2.023]
50-Year[Max 2.273]
Flow
0.0
0.2
0.4
0.6
0.8
1.0
1.2
1.4
1.6
1.8
2.0
2.2
13 Mon
3AM
6AM
9AM
12PM
3PM
6PM
9PM
14 Tue
3AM
6AM
9AM
12PM
3PM
6PM
9PM
15 Wed
Oct 2014
Time

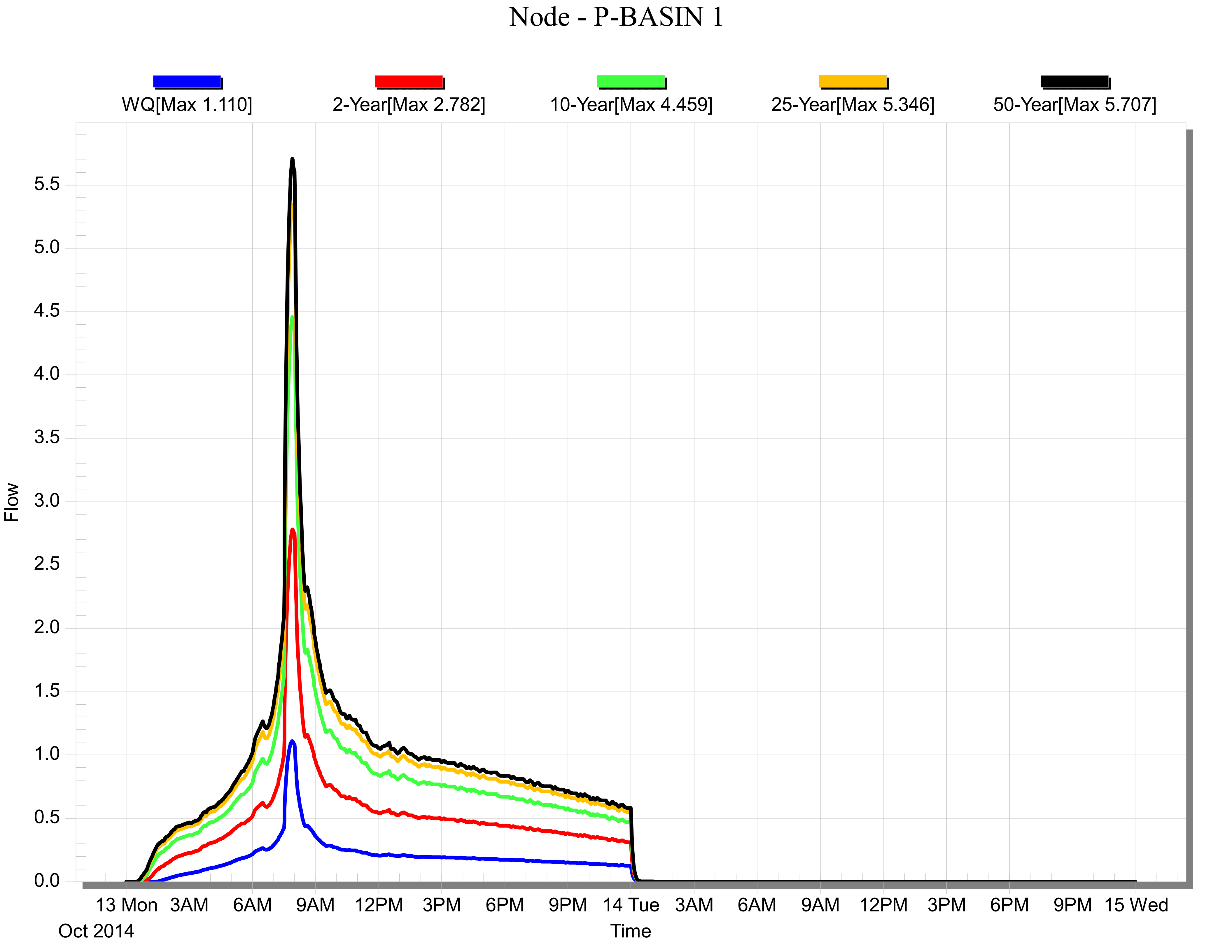


Node - E-BASIN 4
2-Year[Max 0.079]
10-Year[Max 0.262]
25-Year[Max 0.377]
50-Year[Max 0.427]
Flow
0.40
0.35
0.30
0.25
0.20
0.15
0.10
0.05
0.00
13 Mon
Oct 2014
14 Tue
Time
15 Wed

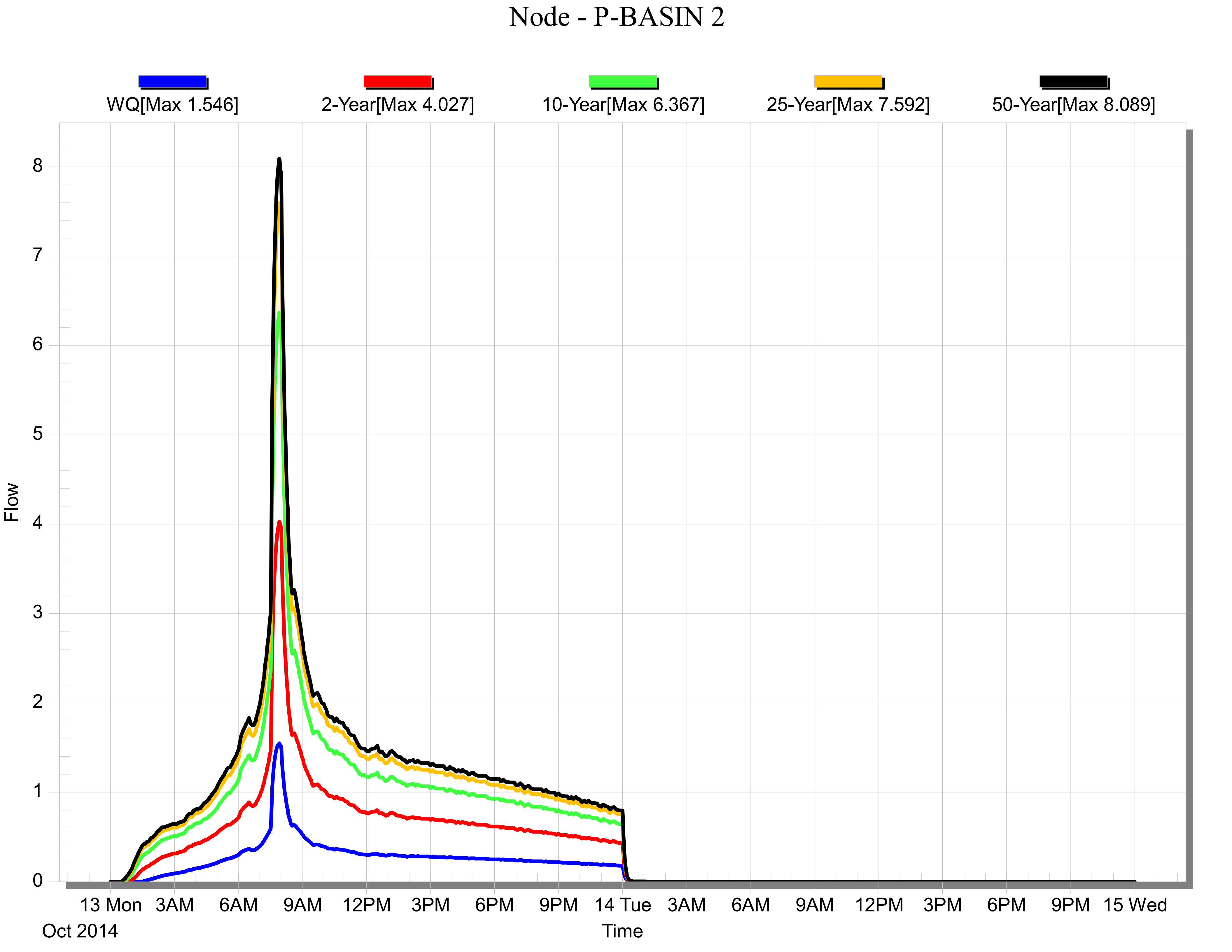


Node - E-BASIN 5
2-Year[Max 0.150]
10-Year[Max 0.379]
25-Year[Max 0.510]
50-Year[Max 0.564]
Flow
0.55
0.50
0.45
0.40
0.35
0.30
0.25
0.20
0.15
0.10
0.05
0.00
13 Mon
Oct 2014
14 Tue
Time
15 Wed

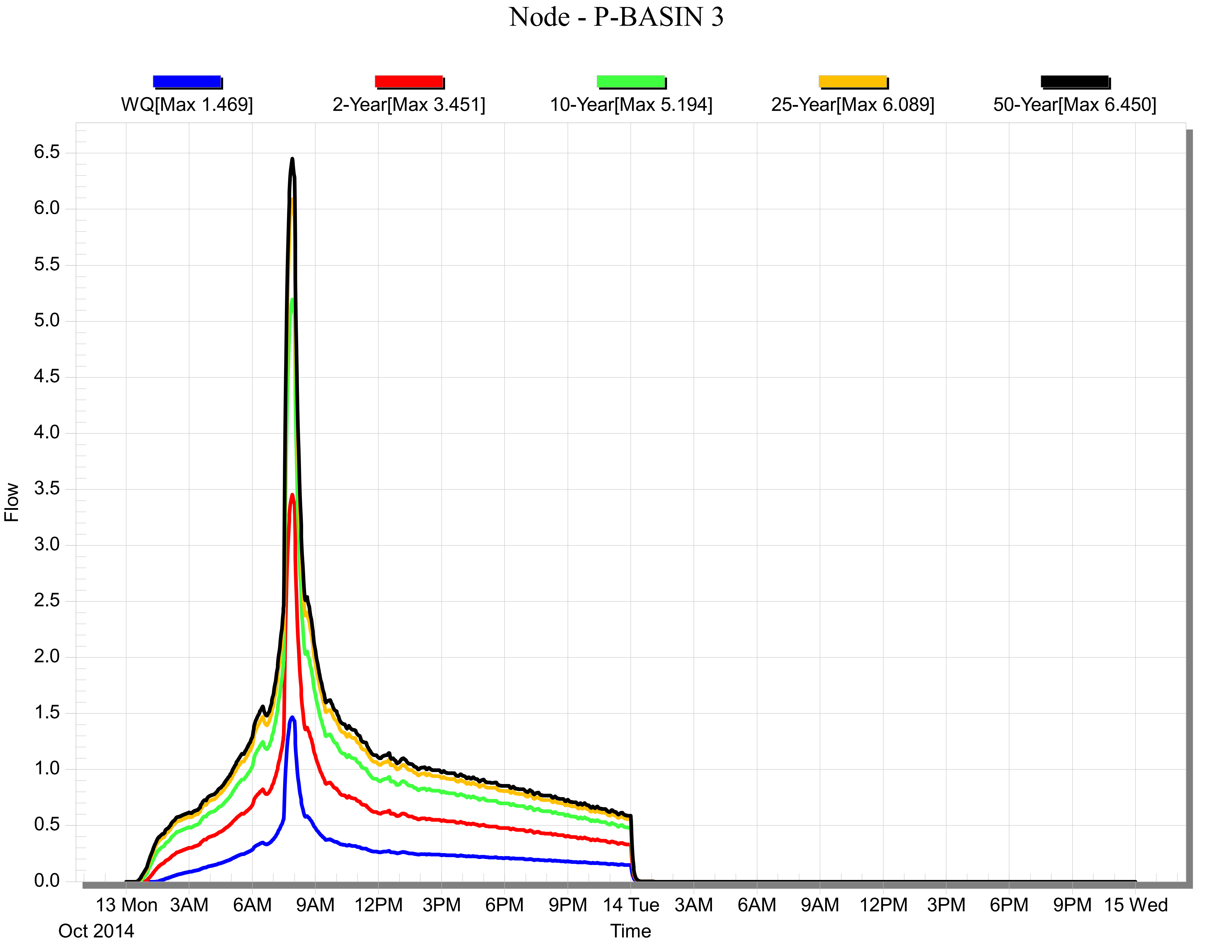
POST-DEVELOPED HYDROGRAPHS



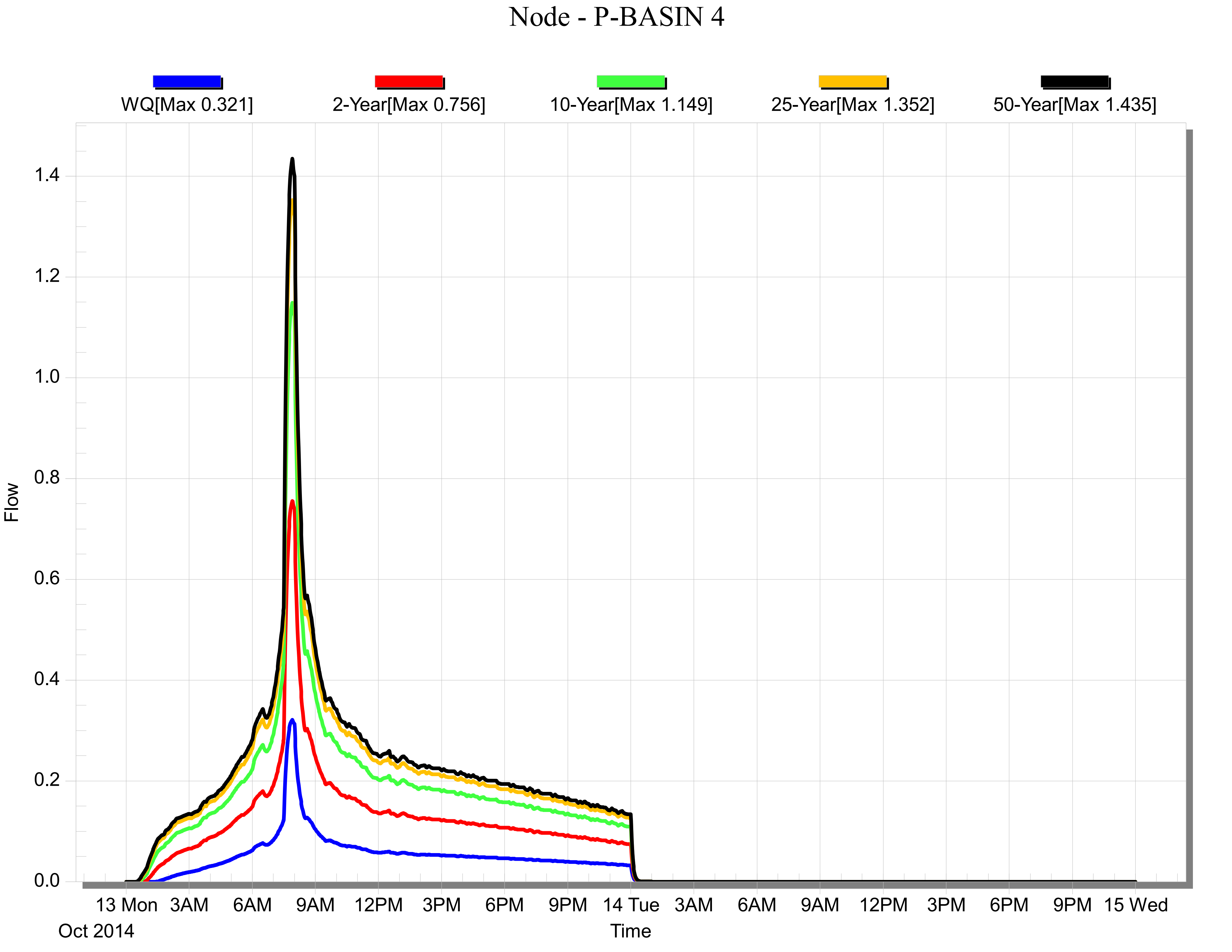
Node - P-BASIN 1
WQ[Max 1.110]
2-Year[Max 2.782]
10-Year[Max 4.459]
25-Year[Max 5.346]
50-Year[Max 5.707]
Flow
5.5
5.0
4.5
4.0
3.5
3.0
2.5
2.0
1.5
1.0
0.5
0.0
13 Mon
3AM
6AM
9AM
12PM
3PM
6PM
9PM
14 Tue
3AM
6AM
9AM
12PM
3PM
6PM
9PM
15 Wed
Oct 2014
Time

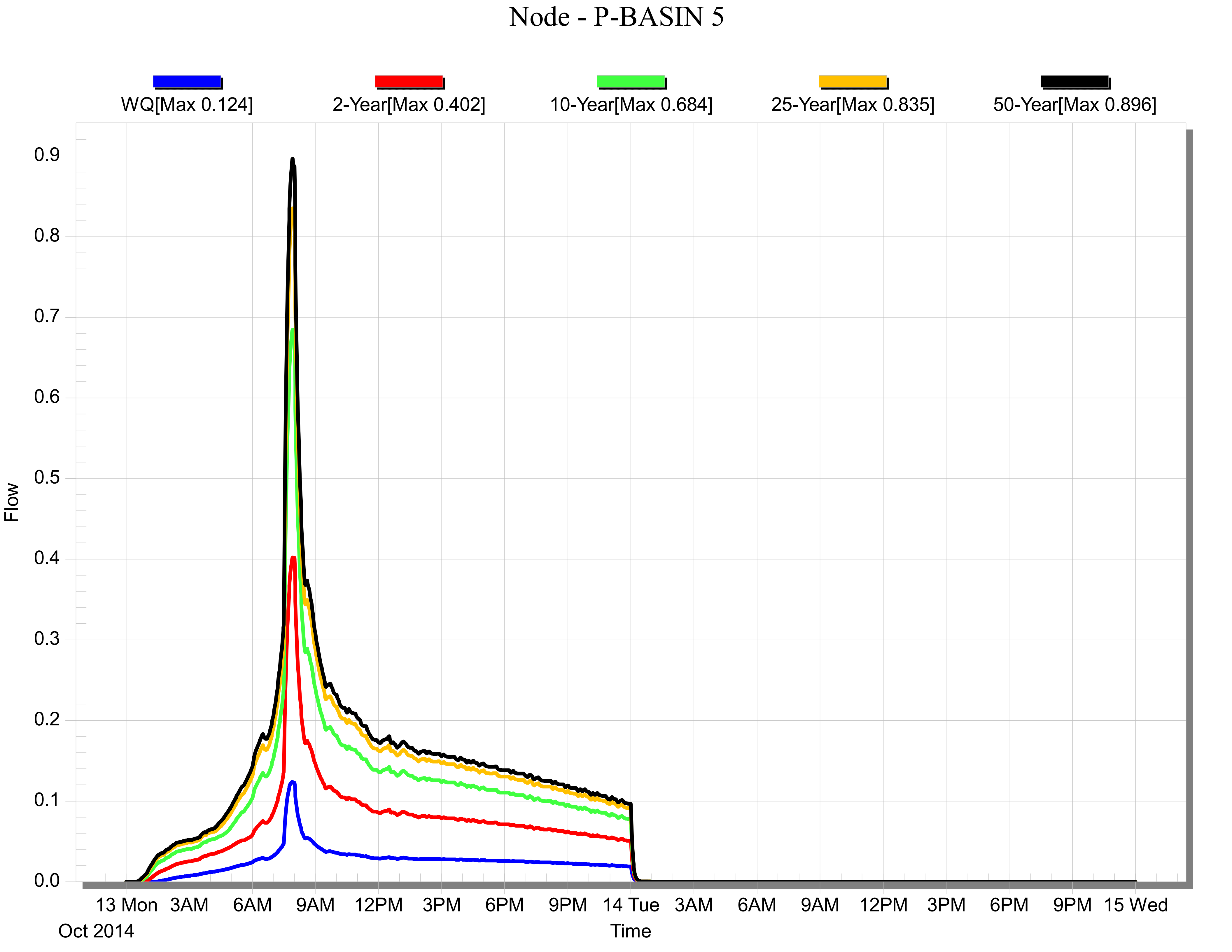


Node - P-BASIN 2
WQ[Max 1.546]
2-Year[Max 4.027]
10-Year[Max 6.367]
25-Year[Max 7.592]
50-Year[Max 8.089]
Flow
0
1
2
3
4
5
6
7
8
13 Mon
3AM
6AM
9AM
12PM
3PM
6PM
9PM
14 Tue
3AM
6AM
9AM
12PM
3PM
6PM
9PM
15 Wed
Oct 2014
Time

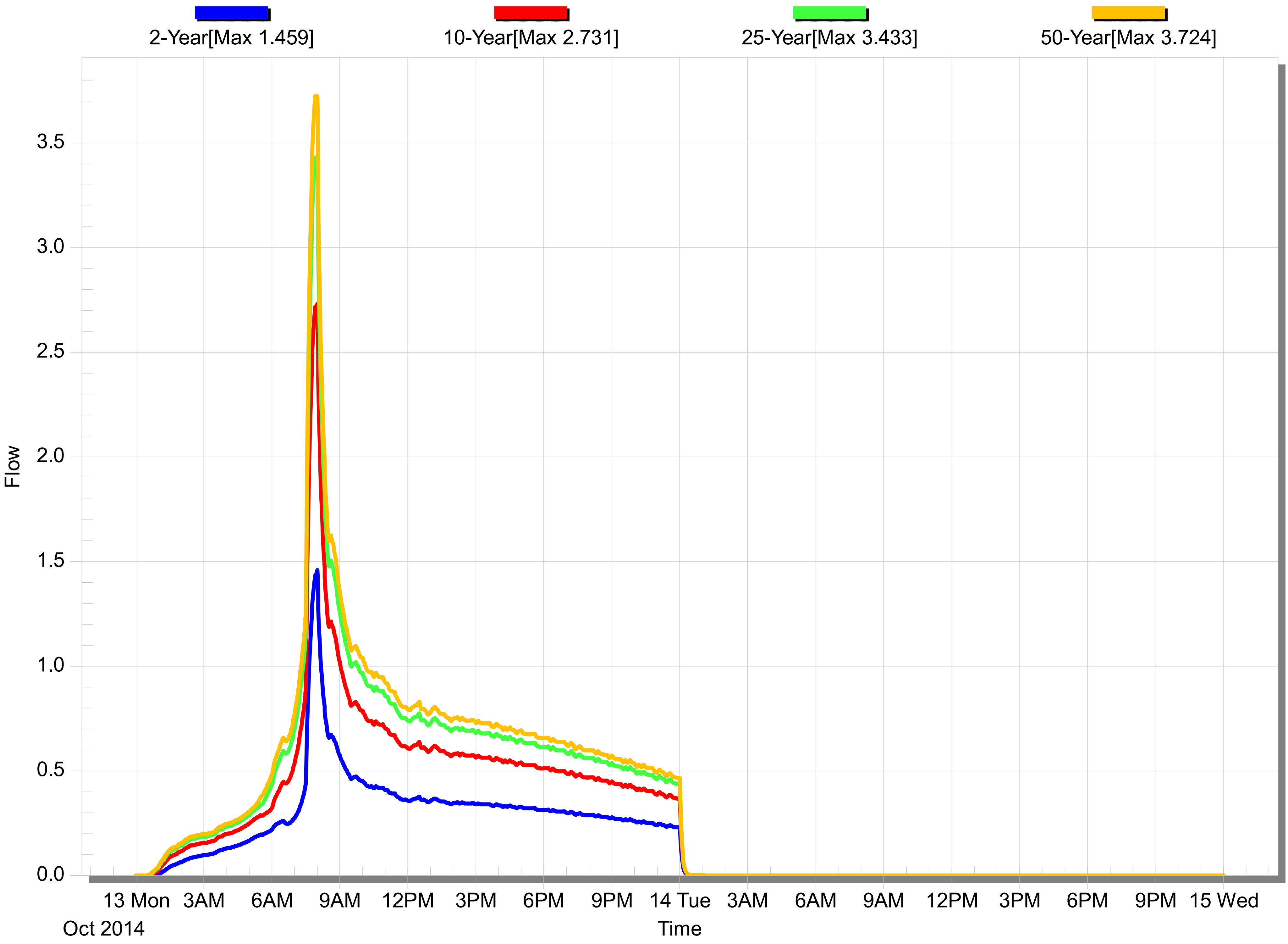


Node - P-BASIN 3
WQ[Max 1.469]
2-Year[Max 3.451]
10-Year[Max 5.194]
25-Year[Max 6.089]
50-Year[Max 6.450]
Flow
6.5
6.0
5.5
5.0
4.5
4.0
3.5
3.0
2.5
2.0
1.5
1.0
0.5
0.0
13 Mon
3AM
6AM
9AM
12PM
3PM
6PM
9PM
14 Tue
3AM
6AM
9AM
12PM
3PM
6PM
9PM
15 Wed
Oct 2014
Time

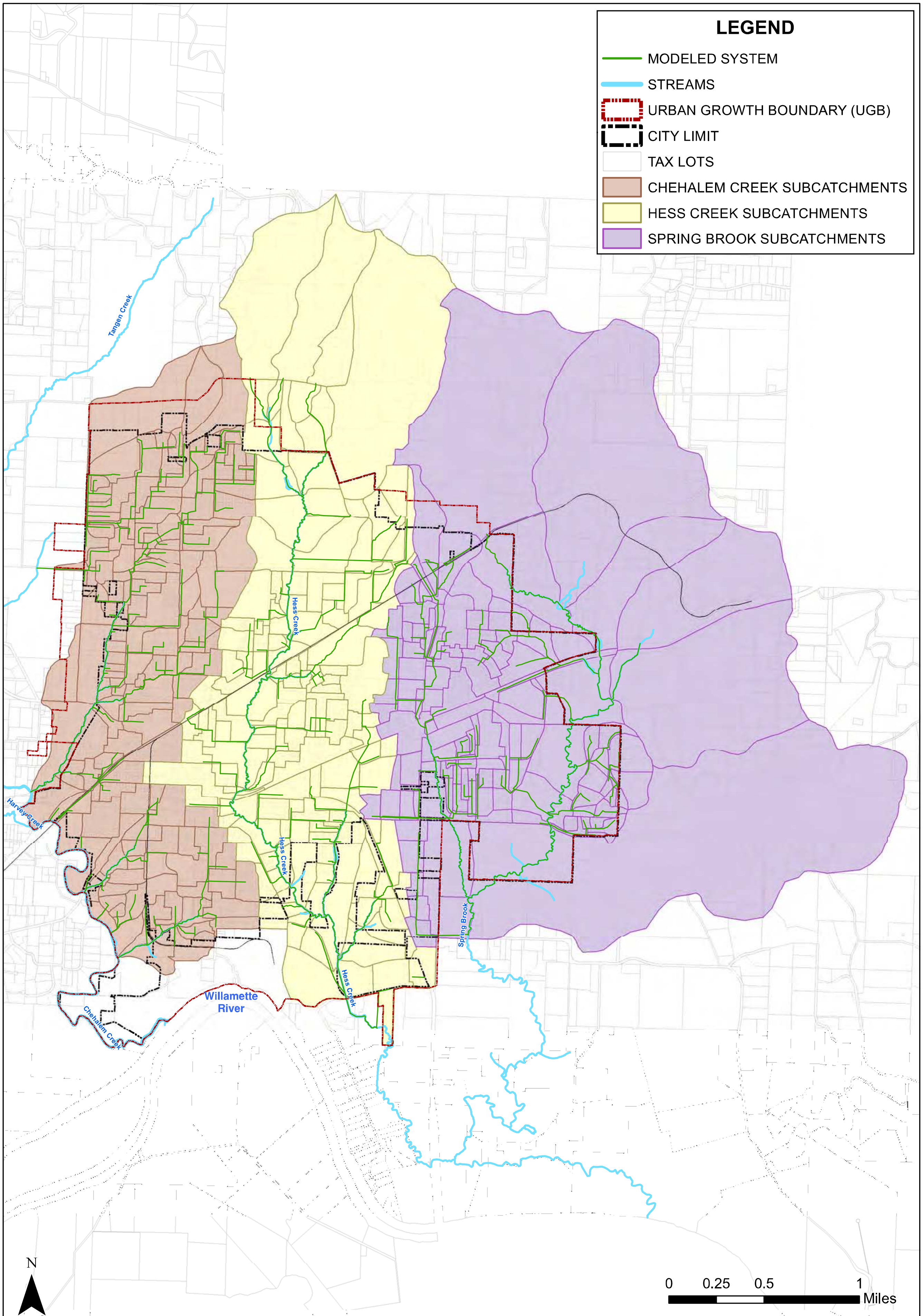

Node - P-BASIN 4
WQ[Max 0.321]
2-Year[Max 0.756]
10-Year[Max 1.149]
25-Year[Max 1.352]
50-Year[Max 1.435]
Flow
0.0
0.2
0.4
0.6
0.8
1.0
1.2
1.4
13 Mon
Oct 2014
3AM
6AM
9AM
12PM
3PM
6PM
9PM
14 Tue
3AM
6AM
9AM
12PM
3PM
6PM
9PM
15 Wed
Time


Node - P-BASIN 5
WQ[Max 0.124]
2-Year[Max 0.402]
10-Year[Max 0.684]
25-Year[Max 0.835]
50-Year[Max 0.896]
Flow
0.0
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
0.9
13 Mon
3AM
6AM
9AM
12PM
3PM
6PM
9PM
14 Tue
3AM
6AM
9AM
12PM
3PM
6PM
9PM
15 Wed
Oct 2014
Time

Node - OFFSITE BASIN WEST



DOWNSTREAM ANALYSIS



City of Newberg

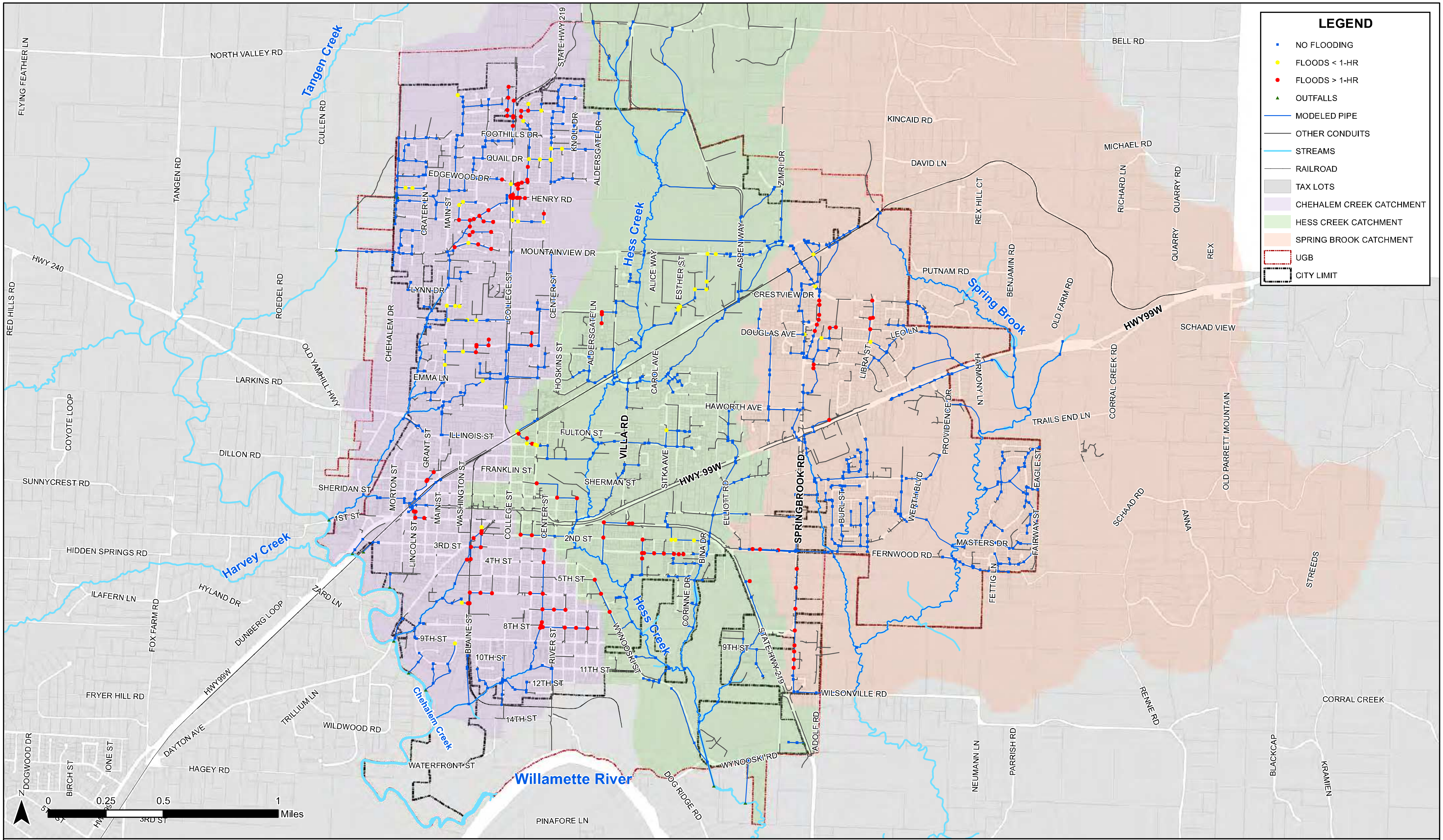
STORMWATER MASTER PLAN UPDATE

FIGURE 2-6. DRAINAGE SYSTEM AND STUDY AREA

NEWBERG, OREGON

Brown AND Caldwell

JUNE 2014



STORMWATER MASTER PLAN UPDATE

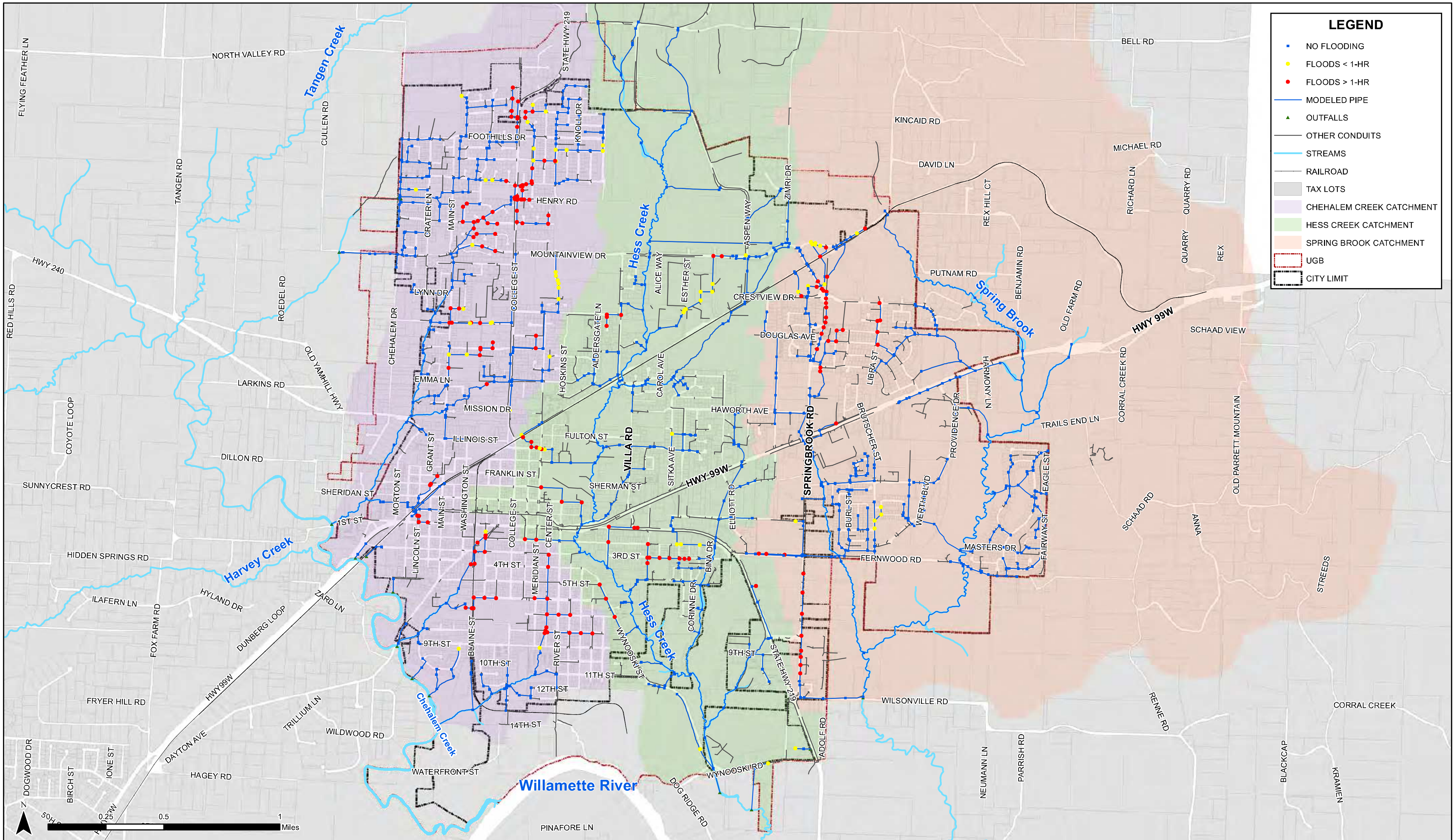
FIGURE 3-1. PREDICTED FLOODING: EXISTING LAND USE, 10-YR DESIGN STORM

NEWBERG, OREGON

City of Newberg

Brown AND Caldwell

JUNE 2014



STORMWATER MASTER PLAN UPDATE

FIGURE 3-2. PREDICTED FLOODING: FUTURE LAND USE, 10-YR DESIGN STORM

NEWBERG, OREGON

JUNE 2014

OPERATIONS & MAINTENANCE

3J CONSULTING
CIVIL ENGINEERING | WATER RESOURCES | LAND USE PLANNING

PRELIMINARY OPERATIONS & MAINTENANCE PLAN

CRESTVIEW CROSSING
Newberg, Oregon

June 6, 2018

Prepared For:

JT Smith Companies
5285 Meadows Road
Lake Oswego, OR 97035

Prepared By:
3J Consulting, Inc.
5075 Griffith Drive, Suite 150
Beaverton, Oregon 97005
Project No: 17393
KEF

PURPOSE

The purpose of this Operations and Maintenance (O&M) Plan is to bring attention to the on-going needs of the storm water management facilities that will be located at the proposed Crestview Crossing. In order for the facilities to operate as intended and increase the environmental benefits, a high quality maintenance program is required.

This document has been prepared to provide the Crestview Crossing development with a *Preliminary* single source document that will explain the maintenance requirements of the storm water facilities. This also serves the regulatory agencies in which legal requirements have been placed on this site. A formal maintenance agreement and O&M plan will be prepared and submitted as part of the CC&R's upon completion of construction.

STORMWATER FACILITIES

Water quality treatment will occur through trapped catch basins, sedimentation water quality manholes, stormwater vegetated swales and rain gardens and an underground mechanical treatment facility.

The vegetated swales will be located in the bottom of each detention pond. Water quality treatment and detention for lots 1-7 in the northern portion of the site will be provided on each lot. Treatment will consist of rain gardens or LIDA swales; treatment facilities will release to an underground detention system located on each lot designed to detain all storm events previously discussed.

Stormwater facility locations will be fully identified in the final O&M plan.

INSPECTION/MAINTENANCE SCHEDULE

Each part of the system shall be inspected and maintained quarterly and within 48 hours after each major storm event for the first three (3) years and at least twice thereafter. For this O&M plan, a major storm event is defined as at least 1.0 inch of rain in 24 hours or more. All components of the storm system as described above must be inspected and maintained frequently or they will cease to function effectively. All stormwater must drain out of the catch basins within 24-hours after rainfall ends. All structural components including inlets and outlets must freely convey stormwater. Desirable vegetation in the swales must cover at least 90% of the facility, excluding dead or stressed vegetation, dry grass or other plants and weeds.

The facility owner shall keep a log, recording all inspection dates, observations, and maintenance activities. Receipts shall be saved when maintenance is performed and there is a record of expense. The stormwater facilities will be operated and maintained by the Crestview Crossing HOA once construction has been completed. Prior to completion, Jesse Nemec from JT Smith Companies will be the responsible party.

Jesse Nemec Phone No: 503-730-8620
City of Newberg Public Works Maintenance Dept: 503-538-8321

Sedimentation Manhole and Catch Basins

- Remove sediment, oil, and debris from catch basins when 1/3 full and from gutters, inlets, outlets and pipes.
- Inspect and clean grate from catch basins. Remove debris and sediment.
- Manholes: remove oil, sediment and debris when sediment is 30% of the capacity or soil is 1 inch deep.

Maintenance Schedule:
- *Summer*: Make any structural repairs. Remove sediment, oil and debris from conveyance system and manholes.
- *Winter*: Monitor water levels and sediment level.

Vegetated Facilities (See excerpts from Clean Water Services Low Impact Development Approaches Handbook)
- Remove sediment when:
  - o Sediment depth reaches 4 inches.
  - o Sediment depth is damaging or killing vegetation
  - o Sediment is preventing the facility from draining in the time specified.

Maintenance Schedule:
- *Summer*: Make any structural repairs. Improve filter medium as needed. Clear drain. Irrigate as needed.
- *Fall:* Replant exposed soil and replace dead plants. Remove sediment and plant debris.
- *Winter*: Monitor infiltration/flow-through rates. Clear inlets and outlets/overflows to maintain conveyance.
- *Spring:* Remove sediment and plant debris. Replant exposed soil and replace dead plants. Mulch.
- *All seasons:* Weed as necessary.

Baysaver Bayfilter™ Vault
The Vault shall be inspected and maintained quarterly for the first 2 years of operation and once per year thereafter. Additionally the vault shall be inspected within 48 hours after each major storm event.
- Maintenance should be performed per the attached BayFilter maintenance document).

StormTech Chambers - After the first 2 years of operation:
- The Chamber shall be inspected and maintained quarterly for the first 2 years of operation and once per year thereafter. Additionally the vault shall be inspected within 48 hours after each major storm event.
- Inspect per StormTech Chamber Inspection and Maintenance Guidance (Table 10).

Source Control
Measures should be taken to prevent pollutants from mixing with stormwater. Typically non-structural control measures include raking and removing leaves, sweeping, vacuum sweeping and limited controlled application of pesticides, herbicides and fertilizers.

Spill Prevention
Spill prevention measurements shall be exercised when handling substances that can contaminate stormwater. Activities that pose the chance of hazardous material spills shall not take place on or near any catch basins or inlets. Contact the proper authority and the property owner immediately if a spill is observed.

Flow Control
All facilities shall drain within 96 hours. Time/date, weather, and site conditions when ponding occurs shall be recorded.

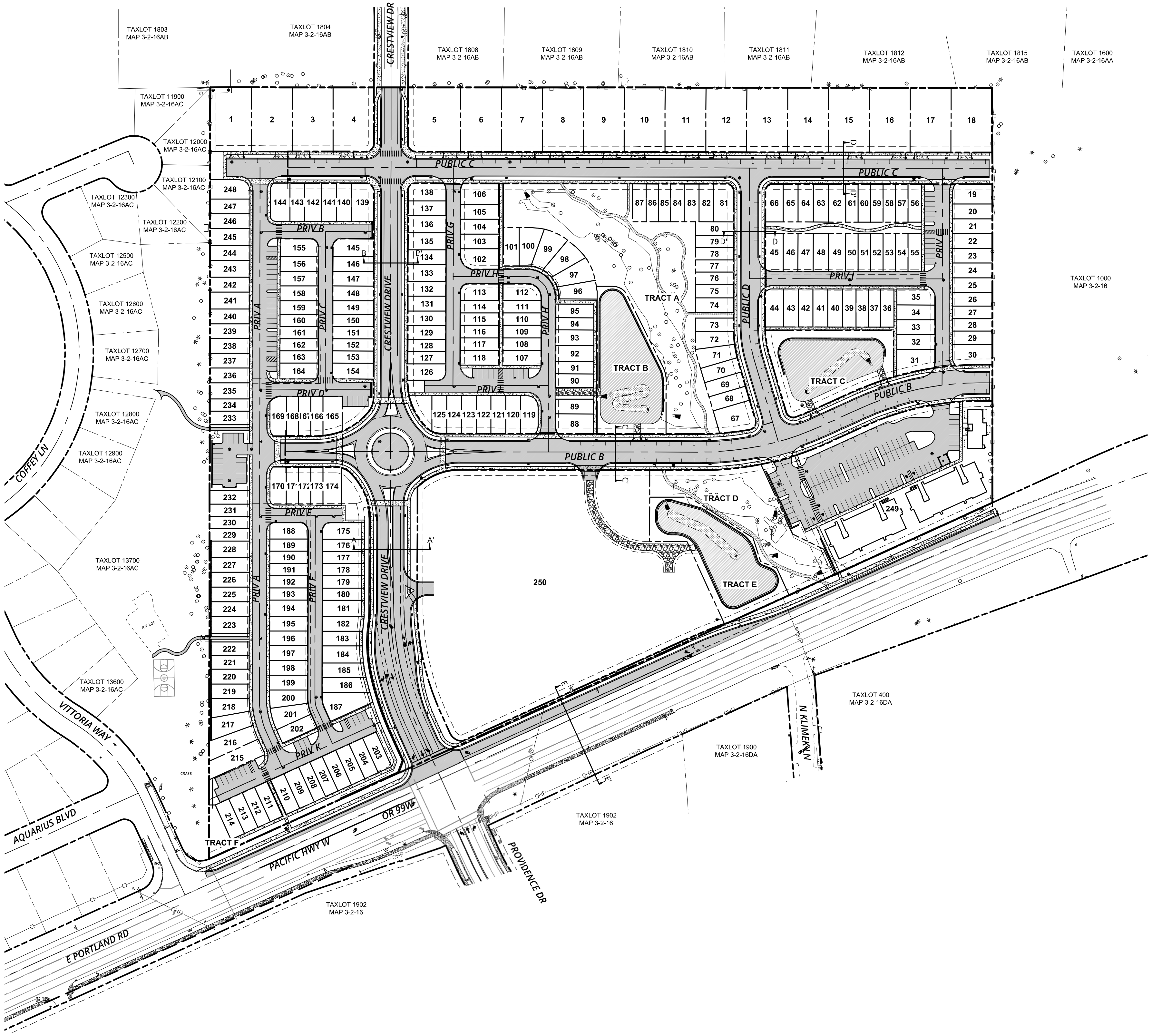
Pollution Prevention
All sites shall implement best management practices to prevent hazardous wastes, litter, or excessive oil and sediment from contaminating stormwater. Contact City of Newberg Public Works Maintenance Department at 503-538-8321 for immediate assistance with responding to spills. Record time/date, weather, and site conditions if site activities are found to contaminate stormwater.

Vectors (mosquitoes and rodents)
Stormwater facilities shall not harbor mosquito larvae or rats that pose a threat to public health or that undermine the facility structure. Monitor standing water for small wiggling sticks perpendicular to the water's surface. Note holes/burrows in and around facilities. Call City of Newberg Public Works Maintenance Department at 503-538-8321 for immediate assistance with eradicating vectors. Record time/date, weather, and site conditions when vector activity is observed.

ELEMENTS

This document contains the following information.

1. Sheets C210, C215, C300 & C303
2. Vegetated Swale Operations and Maintenance Plan (CWS Low Impact Development Approaches Handbook)
3. Extended Dry Basin Operations and Maintenance Plan (CWS Low Impact Development Approaches Handbook)
4. Maintenance of the BayFilter™ System
5. 13.0 Inspection and Maintenance StormTech
6. Maintenance Logs



LEGEND

- PROJECT BOUNDARY
- EXISTING RIGHT-OF-WAY LINE
- EXISTING RIGHT-OF-WAY CENTERLINE
- EXISTING ADJACENT PROPERTY LINE
- PROPOSED RIGHT-OF-WAY LINE
- PROPOSED RIGHT-OF-WAY CENTERLINE
- PROPOSED LOT LINE
- PROPOSED SETBACK LINE
- PROPOSED EASEMENT
- PROPOSED CURB FACE
- PROPOSED CURB BACK
- PROPOSED LIP OF GUTTER
- PROPOSED WHITE STRIPING
- PROPOSED CONCRETE
- PROPOSED ASPHALT
- PROPOSED STORM FACILITY
- PROPOSED SWALE
- PROPOSED GRAVEL
- PROPOSED WOODCHIP PATH
- PROPOSED RETAINING WALL
- PROPOSED DRIVEWAY
- PROPOSED PEDESTRIAN CROSSWALK STRIPING
- A — A' PROPOSED TYPICAL STREET SECTION SEE SHEETS C200 & C201

811 Know what's below. Call before you dig.

N E S W

SCALE: 1" = 100'
0 100' 200'

PUBLISH DATE
06.06.2018
ISSUED FOR
LAND USE DOCUMENTS

OVERALL SITE PLAN
CRESTVIEW CROSSING PLANNED UNIT DEVELOPMENT
JT SMITH COMPANIES
NEWBERG, OR

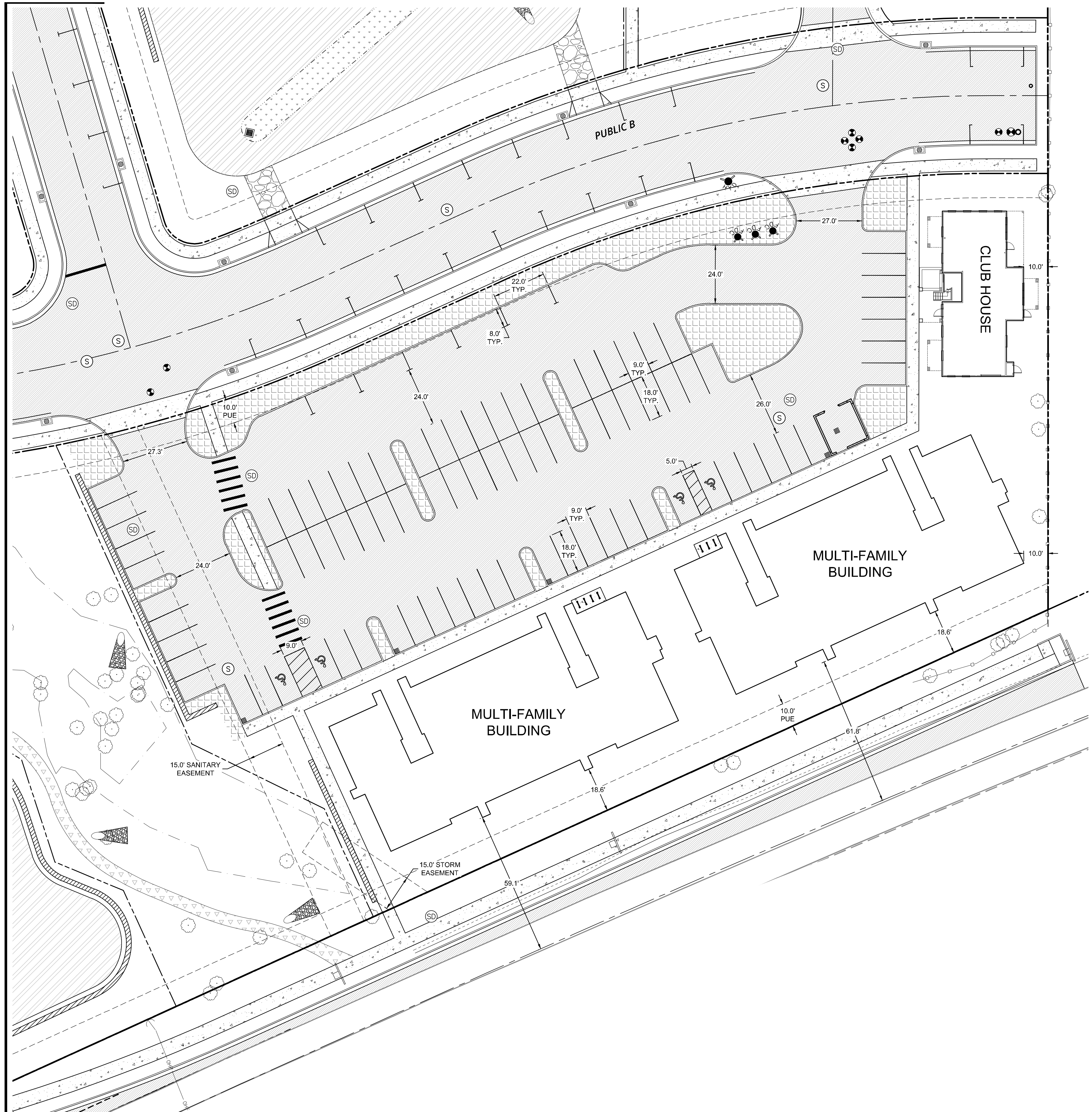
3J CONSULTING
CIVIL ENGINEERING
WATER RESOURCES
LAND USE PLANNING
5075 SW GRIFFITH DRIVE, SUITE 150, BEAVERTON, OR 97005

PROJECT INFORMATION

3J PROJECT #	17393
TAX LOT(S)	3S2W16 13800, 1100
LAND USE #	N/A
DESIGNED BY	ARS, JEJ, BMO
CHECKED BY	AJM, RGW

SHEET NUMBER
C210

P:\17393-JTS-CRESTVIEW CROSSING\CAD\DD\C210 SITE PLAN.DWG



LEGEND

- PROJECT BOUNDARY
- EXISTING RIGHT-OF-WAY LINE
- EXISTING RIGHT-OF-WAY CENTERLINE
- EXISTING ADJACENT PROPERTY LINE
- PROPOSED RIGHT-OF-WAY LINE
- PROPOSED RIGHT-OF-WAY CENTERLINE
- PROPOSED LOT LINE
- PROPOSED SETBACK LINE
- PROPOSED EASEMENT
- PROPOSED CURB FACE
- PROPOSED CURB BACK
- PROPOSED LIP OF GUTTER
- PROPOSED WHITE STRIPING
- PROPOSED CONCRETE
- PROPOSED ASPHALT
- PROPOSED LANDSCAPING
- PROPOSED GRAVEL
- PROPOSED WOODCHIP PATH
- PROPOSED RETAINING WALL
- PROPOSED DRIVEWAY
- PROPOSED PEDESTRIAN CROSSWALK STRIPING
- PROPOSED BIKE PARKING
- PROPOSED ACCESSIBLE PARKING STALL
- PROPOSED HYDRANT
- PROPOSED VALVE
- PROPOSED BLOW-OFF / AIR RELEASE ASSY.
- PROPOSED FIRE DPT. CONNECTION
- PROPOSED SEWER MANHOLE
- PROPOSED STORM MANHOLE
- PROPOSED CATCH BASIN
- EXISTING DECIDUOUS TREE

PARKING STATISTICS - MULITFAMILY LOT

PROPOSED STALL COUNT & SUMMARY

TYPE = (WIDTH x DEPTH)	STANDARD 9' x 18'	PARALLEL 8' x 22'	ADA 9' x 18'	ADA - VAN 9' x 18'	TOTAL
MULTIPLE FAMILY APARTMENTS =	80	7	3	1	91
TOTAL =	80	7	3	1	91

VEHICLES

DEVELOPMENT CODE CHAPTER 15.440.30

MAXIMUM PARKING - MULTI-FAMILY	NONE
MINIMUM PARKING - MULTI-FAMILY	74
PROPOSED	91

BICYCLES

DEVELOPMENT CODE CHAPTER 15.440.90

	MINIMUM	PROPOSED
MINIMUM BICYCLE PARKING - MULTI-FAMILY	13	14

ACCESSIBLE

OSSC SECTION 1106.1

MULTI-FAMILY PARKING LOT (76 TO 100)	MINIMUM	PROPOSED
ACCESSIBLE SPACES	4	4
VAN ACCESSIBLE SPACES	1	1

LANDSCAPING

DEVELOPMENT CODE CHAPTER 15.420.010

	REQUIRED	PROPOSED
MULTI-FAMILY PARKING LOT (25 SF PER STALL)	2,275 SF	6,357 SF

SETBACKS

ZONE C3 - MULTI-FAMILY LOT

FRONT	10 FT
INTERIOR	0 FT/10 FT
STREET - EXPRESSWAY CENTERLINE	50 Ft

811 Know what's below. Call before you dig.

N W E S

SCALE: 1" = 20'

0 20 40

PUBLISH DATE
06.06.2018

ISSUED FOR
LAND USE DOCUMENTS

MULTI-FAMILY SITE PLAN

CRESTVIEW CROSSING

PLANNED UNIT DEVELOPMENT

JT SMITH COMPANIES
NEWBERG, OR

3J CONSULTING
CIVIL ENGINEERING
WATER RESOURCES
LAND USE PLANNING
5075 SW GRIFFITH DRIVE, SUITE 150; BEAVERTON, OR 97005

PROJECT INFORMATION

3J PROJECT #	17393
TAX LOT(S)	3S2W16 13800, 1100
LAND USE #	N/A
DESIGNED BY	ARS, JEJ, BMO
CHECKED BY	AJM, RGW

SHEET NUMBER
C215

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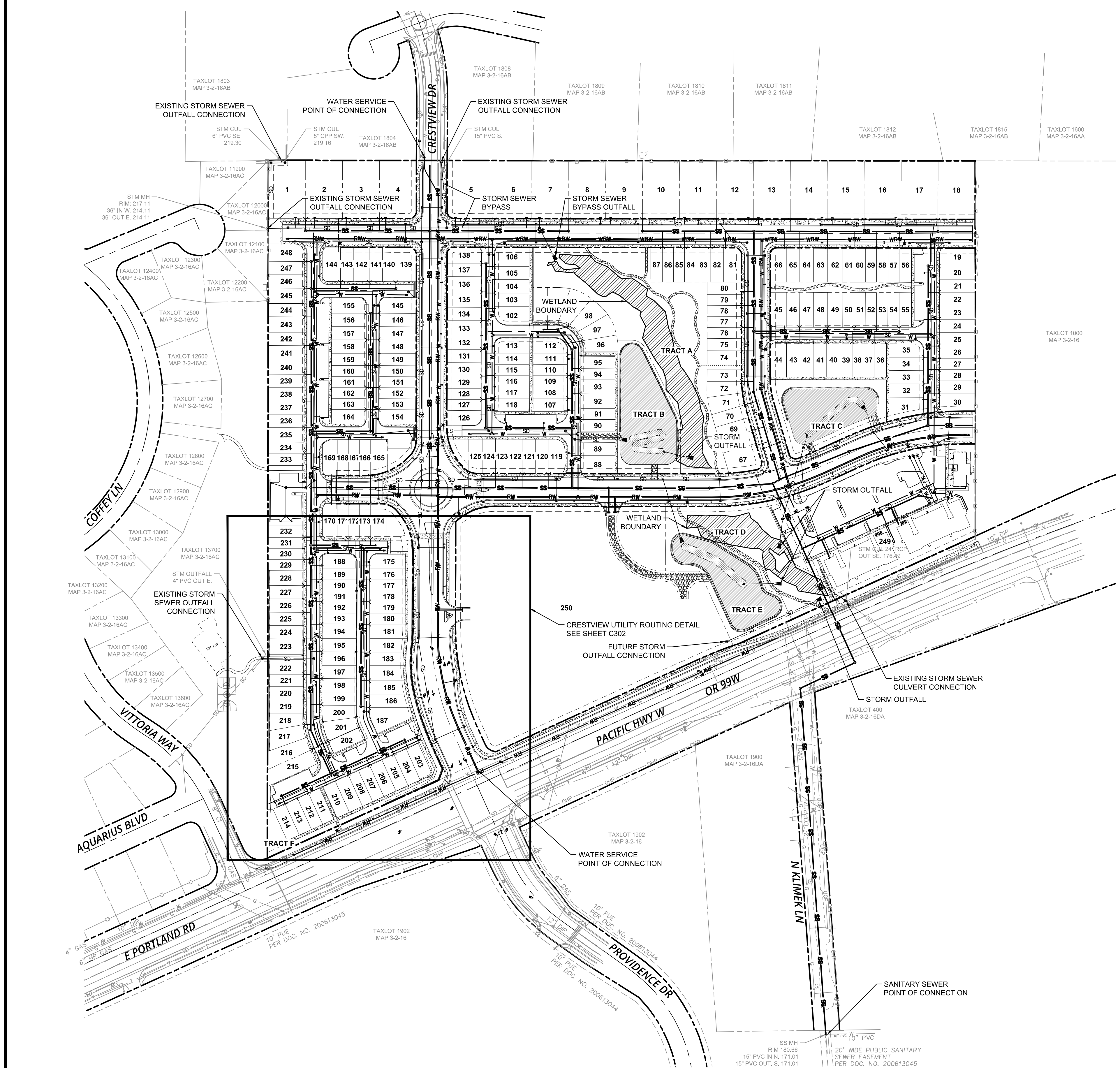
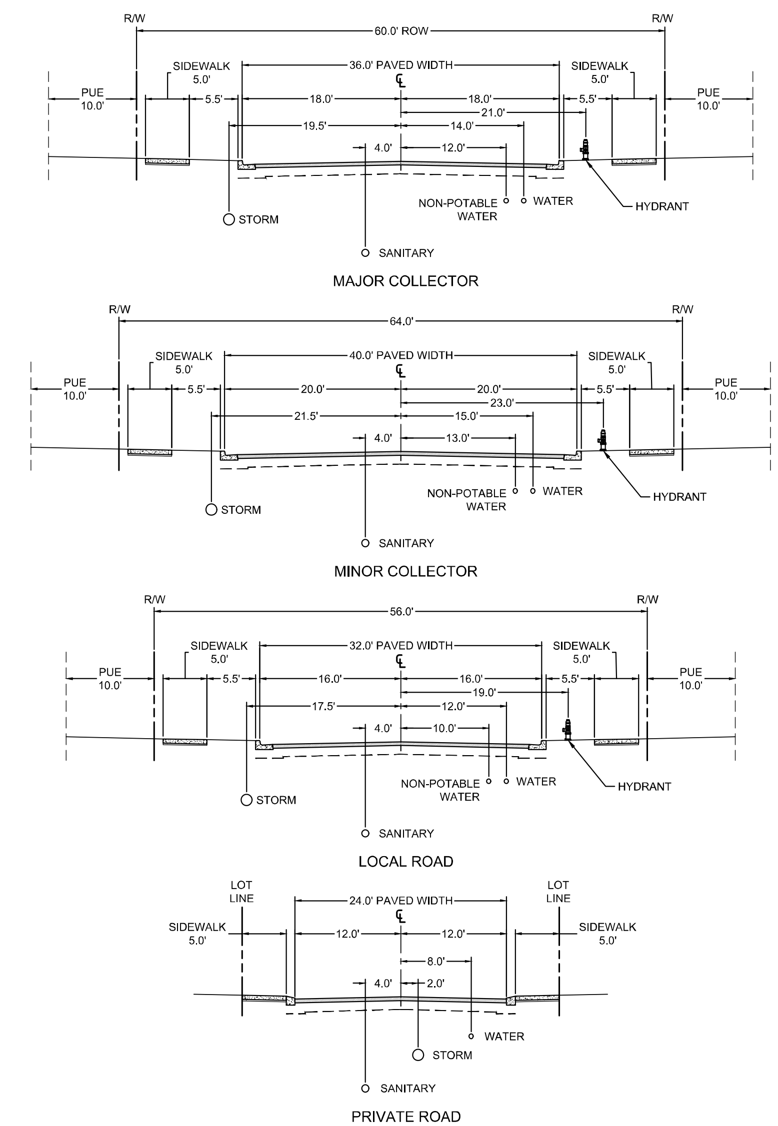
GENERAL NOTES

1. LOTS 1 THROUGH 7 SHALL HAVE STORMWATER QUALITY TREATMENT LOCATED WITHIN LOT BOUNDARIES. STORMWATER DISCHARGE FROM THESE LOTS SHALL CONNECT TO PROPOSED STORM SEWER BYPASS AND OUTFALL TO THE WETLAND.

LEGEND

PROPOSED STORM PIPE	EXISTING TELECOM. LINE
PROPOSED SANITARY MAIN	EXISTING GAS LINE
PROPOSED WATER MAIN	EXISTING UNDERGROUND POWER
PROPOSED NON-POTABLE WATER MAIN	EXISTING OVERHEAD POWER
PROPOSED WATER FIRE SERVICE	EXISTING SANITARY SEWER
PROPOSED DETENTION POND	EXISTING STORM DRAIN
PROPOSED WATER QUALITY SWALE	EXISTING WATER MAIN
PIPE CAP / STUB	EXISTING HYDRANT
PROPOSED HYDRANT	EXISTING WATER VALVE
PROPOSED WATER VALVE	EXISTING SANITARY MANHOLE
PROPOSED WATER PIPE BLOWOFF/ PROPOSED AIR RELEASE ASSEMBLY	EXISTING STORM MANHOLE
PROPOSED FIRE DPT. CONNECTION	EXISTING STORM INLET
PROPOSED SANITARY MANHOLE	EXISTING POWER METER
PROPOSED SANITARY SERVICE LATERAL WITH CLEANOUT	EXISTING GAS METER
PROPOSED STORM MANHOLE	EXISTING TELEPHONE PEDESTAL
PROPOSED STORM OUTFALL PROTECTION	EXISTING GUY ANCHOR
PROPOSED STANDARD INLET MANHOLE	EXISTING LIGHT POLE
PROPOSED SUPERSIZED INLET MANHOLE	EXISTING UTILITY POLE
PROPOSED CATCH BASIN	EXISTING INTERSECTION SIGNAL
PROPOSED DITCH INLET	EXISTING ELECTRICAL BOX
PROPOSED STREET LIGHTING	





STREET UTILITIES TYPICAL SECTIONS

SCALE: NTS

811 Know what's below. Call before you dig.

SCALE: 1" = 100'

0 100' 200'

PUBLISH DATE
06.06.2018

ISSUED FOR
LAND USE DOCUMENTS

COMPOSITE UTILITY PLAN
CRESTVIEW CROSSING PLANNED UNIT DEVELOPMENT
JT SMITH COMPANIES
NEWBERG, OR

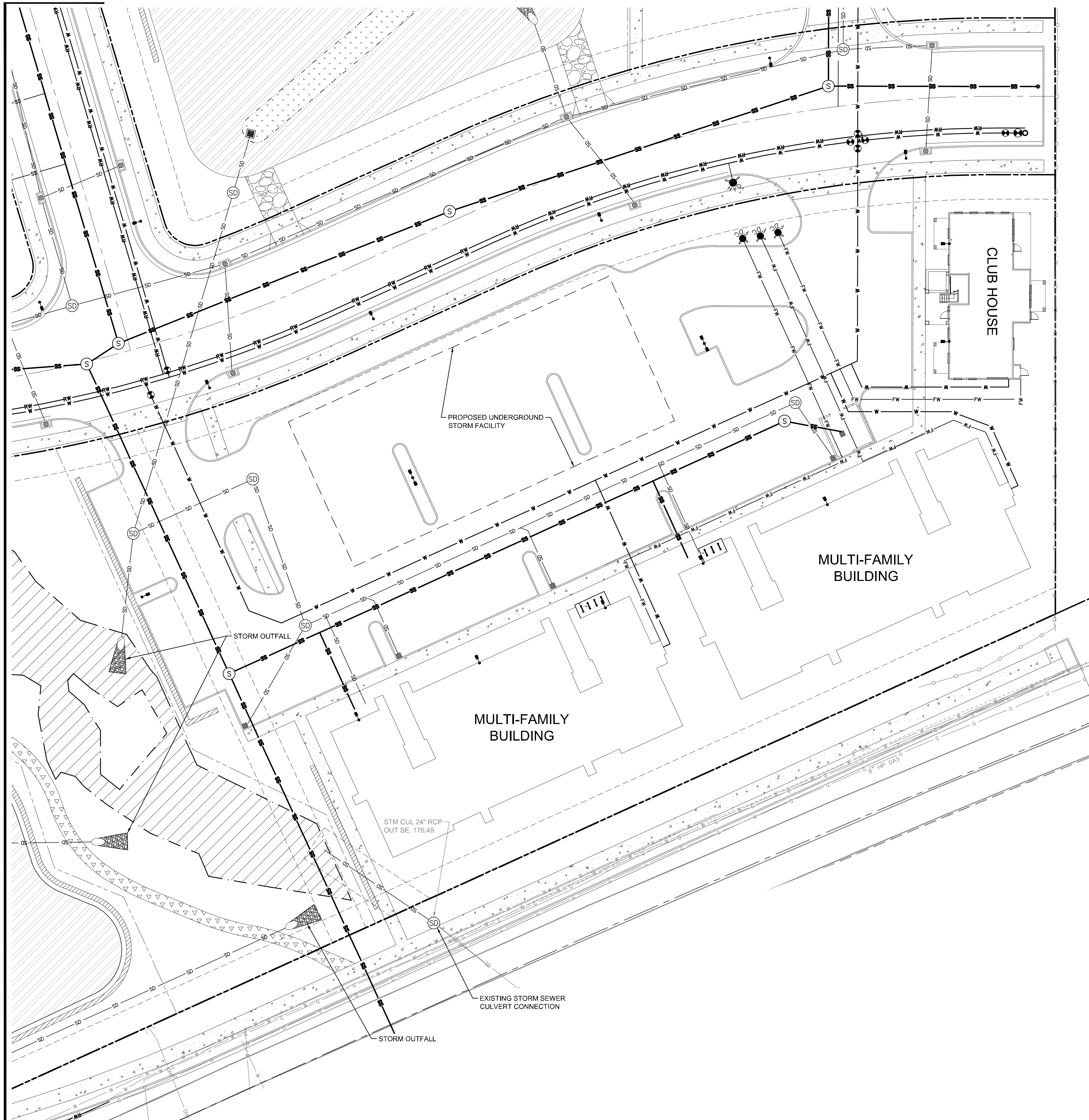
3J CONSULTING
CIVIL ENGINEERING
WATER RESOURCES
LAND USE PLANNING
5075 SW GRIFFITH DRIVE, SUITE 150; BEAVERTON, OR 97005

PROJECT INFORMATION

3J PROJECT #	17393
TAX LOT(S)	3S2W16 13800, 1100
LAND USE #	N/A
DESIGNED BY	ARS, JEJ, BMO
CHECKED BY	AJM, RGW

SHEET NUMBER
C300

P:\17393-JTS-CRESTVIEW CROSSING\CADD\C300 COMPOSITE UTILITY PLAN.DWG



LEGEND

PROPOSED STORM PIPE	EXISTING TELECOM. LINE
PROPOSED SANITARY MAIN	EXISTING GAS LINE
PROPOSED WATER MAIN	EXISTING UNDERGROUND POWER
PROPOSED NON-POTABLE WATER MAIN	EXISTING OVERHEAD POWER
PROPOSED WATER FIRE SERVICE	EXISTING SANITARY SEWER
PROPOSED DETENTION POND	EXISTING STORM DRAIN
PROPOSED WATER QUALITY SWALE	EXISTING WATER MAIN
PIPE CAP / STUB	EXISTING HYDRANT
PROPOSED HYDRANT	EXISTING WATER VALVE
PROPOSED FIRE DEPARTMENT CONNECTION	EXISTING SANITARY MANHOLE
PROPOSED WATER VALVE	EXISTING STORM MANHOLE
PROPOSED WATER PIPE BLOWOFF/ AIR RELEASE ASSEMBLY	EXISTING STORM INLET
PROPOSED SANITARY MANHOLE	EXISTING POWER METER
PROPOSED SANITARY SERVICE LATERAL WITH CLEANOUT	EXISTING GAS METER
PROPOSED STORM MANHOLE	EXISTING TELEPHONE PEDESTAL
PROPOSED STORM OUTFALL PROTECTION	EXISTING GUY ANCHOR
PROPOSED STANDARD INLET MANHOLE	EXISTING LIGHT POLE
PROPOSED SUPERSIZED INLET MANHOLE	EXISTING UTILITY POLE
PROPOSED CATCH BASIN	EXISTING INTERSECTION SIGNAL
PROPOSED DITCH INLET	EXISTING ELECTRICAL BOX
PROPOSED STREET LIGHTING	

Know what's below. Call before you dig.

N E S W

SCALE: 1" = 100'

0 100' 200'

PUBLISH DATE
06.06.2018
ISSUED FOR
LAND USE DOCUMENTS

MULTI-FAMILY COMPOSITE UTILITY PLAN
CRESTVIEW CROSSING
PLANNED UNIT DEVELOPMENT
JT SMITH COMPANIES
NEWBERG, OR

3J CONSULTING
CIVIL ENGINEERING
WATER RESOURCES
LAND USE PLANNING
5075 SW GRIFFITH DRIVE, SUITE 150, BEAVERTON, OR 97005

PROJECT INFORMATION

3J PROJECT #	17393
TAX LOT(S)	3S2W16 13800, 1100
LAND USE #	N/A
DESIGNED BY	ARS, JEJ, BMO
CHECKED BY	AJM, RGW

SHEET NUMBER
C303

P:\17393-JTS-CRESTVIEW CROSSING\CAD\DD\C303 MULTI FAM - COMPOSITE UTILITY PLAN.DWG

Vegetated Swale Operation and Maintenance Plan

Annual inspections are required. It is recommended that the facility is inspected on a monthly basis to ensure proper function. The plan below describes inspection and maintenance activities, and may be used as an inspection log. Contact the design engineer, Clean Water Services or City representative for more information.

Identified Problem	Condition to Check for	Maintenance Activity	Maintenance Timing	✔ Task Complete Comments
Obstructed Inlet/Outlet	Material such as vegetation, sediment is blocking more than 10% of Inlet/outlet pipe or basin opening	Remove blockages from facility	WINTER SPRING	
Flow not distributed evenly	Flows unevenly distributed through swale due to uneven or clogged flow spreader	Level and clean the spreader so that flows spread evenly over entire swale width	WINTER SPRING	
Sediment Accumulation in Treatment Area	Sediment depth in treatment area exceeds 3 inches	Remove sediment from treatment area. Ensure facility is level from side to side and drains freely toward outlet; no standing water once inflow has ceased	SUMMER FALL Ideally in the dry season	
Tree/Shrub Growth	Tree/shrub growth shades out wetland/emergent grass in treatment area. Interferes with access for maintenance/inspection	Prune trees and shrubs that block sun from reaching treatment area. Remove trees that block access points. Do not remove trees that are not interfering with access or maintenance without first contacting Clean Water Services or local City	WINTER Ideal timing for pruning is winter	
Hazard Trees	Observed dead, dying or diseased trees	Remove hazard trees. A certified arborist may be needed to determine health of tree or removal requirements	As Needed	

Vegetated Swale Operation and Maintenance Plan (continued)

Annual inspections are required. It is recommended that the facility is inspected on a monthly basis to ensure proper function. The plan below describes inspection and maintenance activities, and may be used as an inspection log. Contact the design engineer, Clean Water Services or City representative for more information.

Identified Problem	Condition to Check for	Maintenance Activity	Maintenance Timing	✔ Task Complete Comments
Erosion	Erosion or channelization that impacts or effects the function of the facility or creates a safety concern	Repair eroded areas and stabilized using proper erosion control measures. Establish appropriate vegetation as needed.	FALL WINTER SPRING	
Poor Vegetation Coverage	80% survival of approved vegetation and no bare areas large enough to affect function of facility	Determine cause of poor growth and correct the condition. Replant per the approved planting plan and applicable standards at time of construction. Remove excessive weeds and all invasive plants.	FALL SPRING Ideal time to plant is spring and fall seasons	
Invasive Vegetation as outlined in Appendix A	Invasive vegetation is found in facility. Examples include: Himalayan Blackberry; Reed Canary Grass; Teasel; English Ivy; Nightshade; Clematis; Cattail; Thistle; Scotch Broom	Remove excessive weeds and all invasive plants. Attempt to control even if complete eradication is not feasible. Refer to Clean Water Services Integrated Pest Management Plan for appropriate control methods, including proper use of chemical treatment	SPRING SUMMER FALL	
Excessive Vegetation	Vegetation grows so tall it competes with or shades approved emergent wetland grass/shrubs; interferes with access or becomes fire danger	Cut tall grass to 4" to 6" and remove clippings. Prune emergent wetland grass/shrubs that have become overgrown.	SPRING Ideal time to prune emergent wetland grass is spring. Cut grass in dry months	
Trash and Debris	Visual evidence of trash, debris or dumping	Trash and debris removed from facility. Dispose of properly	SPRING SUMMER FALL WINTER	

Vegetated Swale Operation and Maintenance Plan (continued)

Annual inspections are required. It is recommended that the facility is inspected on a monthly basis to ensure proper function. The plan below describes inspection and maintenance activities, and may be used as an inspection log. Contact the design engineer, Clean Water Services or City representative for more information.

Identified Problem	Condition to Check for	Maintenance Activity	Maintenance Timing	✔ Task Complete Comments
Standing Water	Standing water in the swale between storms that does not drain freely	Remove sediment or trash blockages; improve grade from end to end of swale; no standing water 24 hours after any major storm (1-inch in 24 hours)	WINTER SPRING Inspect after any major storm (1-inch in 24 hours)	
Vector Control	Evidence of rodents or water piping through facility via rodent holes. Harmful insects such as wasps and hornets interfere with maintenance/ inspection activities	Repair facility if damaged. Remove harmful insects, use professional if needed. Refer to Clean Water Services Integrated Pest Management Plan for management options	As Needed	
Contamination and Pollution	Evidence of oil, gasoline, contaminants, or other pollutants. Look for sheens, odor or signs of contamination	If contaminants or pollutants present, coordinate removal/ cleanup with local jurisdiction	SPRING SUMMER FALL WINTER	
Grate Damaged, missing or not in place	Grate is missing or only partially in place, may have missing or broken grate members	Grate must be in place and meet design standards. Replace or repair any open structure, replace grate if missing.	As Needed	
Damage to Outlet Structure	Frame not sitting flush on top slab (more than ¾ inch between frame and top slab); frame not securely attached	Ensure frame is firmly attached and sits flush on riser rings or on top of slab. Structure replaced or repaired to design standards	As Needed	

Vegetated Swale Operation and Maintenance Plan (continued)

Annual inspections are required. It is recommended that the facility is inspected on a monthly basis to ensure proper function. The plan below describes inspection and maintenance activities, and may be used as an inspection log. Contact the design engineer, Clean Water Services or City representative for more information.

Identified Problem	Condition to Check for	Maintenance Activity	Maintenance Timing	✔ Task Complete Comments
Damage to Outlet Structure	Fractures or Cracks in Walls or Bottom. Maintenance person determines the structure is unsound. Soil entering structure through cracks	Structure replaced or repaired to design standards	As Needed	
Damage to Outlet Structure	Settlement or Misalignment. Failure of basin has created a safety, function, or design problem	Structure replaced or repaired to design standards	As Needed	

Extended Dry Basin Operation and Maintenance Plan

Annual inspections are required. It is recommended that the facility is inspected on a monthly basis to ensure proper function. The plan below describes inspection and maintenance activities, and may be used as an inspection log. Contact the design engineer, Clean Water Services or City representative for more information.

Identified Problem	Condition to Check for	Maintenance Activity	Maintenance Timing	✔ Task Complete Comments
Trash and Debris	Visual evidence of trash, debris or dumping	Remove trash and debris from facility. Dispose of properly	SPRING SUMMER FALL WINTER	
Contamination and Pollution	Evidence of oil, gasoline, contaminants, or other pollutants. Look for sheens, odor or signs of contamination	Locate source of contamination and correct. Remove oil using oil-absorbent pads or vactor truck. If low levels of oil persist plant wetland plants that can uptake small concentrations of oil such as Juncus effuses. (soft rush) If high levels of contaminants or pollutants are present, coordinate removal/ cleanup with local jurisdiction	SPRING SUMMER FALL WINTER	
Invasive vegetation as outlined in Appendix A.	Invasive vegetation found in facility. Examples include: Himalayan Blackberry, Reed Canary Grass, Teasel, English Ivy, Nightshade, Clematis, Cattail, Thistle, Scotch Broom	Remove excessive weeds and all invasive plants. Attempt to control even if complete eradication is not feasible; refer to Clean Water Services Integrated Pest Management Plan for appropriate control methods, including proper use of chemical treatment	SPRING SUMMER FALL	
Obstructed Inlet/Outlet	Material such as vegetation, trash, sediment is blocking more than 10% of inlet/outlet pipe or basin opening	Remove blockages from facility	WINTER SPRING Inspect after major storm (1-inch in 24 hours)	
Poor Vegetation Cover	80% survival of approved vegetation and no bare areas large enough to affect function of facility.	Determine cause of poor growth and correct the condition. Replant with plugs or containerized plants per the approved planting plan and applicable standards at time of construction. Remove excessive weeds and all invasive plants.	SPRING FALL Ideal time to plant is spring and fall seasons	

Extended Dry Basin Operation and Maintenance Plan (continued)

Annual inspections are required. It is recommended that the facility is inspected on a monthly basis to ensure proper function. The plan below describes inspection and maintenance activities, and may be used as an inspection log. Contact the design engineer, Clean Water Services or City representative for more information.

Identified Problem	Condition to Check for	Maintenance Activity	Maintenance Timing	✔ Task Complete Comments
Vector Control	Evidence of rodents or water piping through facility via rodent holes. Harmful insects present such as wasps and hornets that interfere with maintenance/ inspection activities	Repair facility if damaged. Remove harmful insects, use professional if needed. Refer to Clean Water Services Integrated Pest Management Plan for management options	As Needed	
Tree/Shrub Growth	Tree/shrub growth shades out wetland/ emergent grass in treatment area. Interferes with access for maintenance/ inspection	Prune trees and shrubs that block sun from reaching treatment area. Remove trees that block access points. Do not remove trees that are not interfering with access or maintenance without first contacting Clean Water Services or local City	WINTER Ideal time for pruning is winter	
Hazard Trees	Observed dead, dying or diseased trees	Remove hazard trees. A certified Arborist may need to determine health of tree or removal requirements	As Needed	
Excessive Vegetation	Vegetation grows so tall that it competes with approved emergent wetland grass/shrubs, interferes with access or becomes a fire danger	Cut tall grass 4" to 6" and remove clippings. Prune emergent wetland grass/shrubs that have become overgrown.	SPRING Ideal time to prune emergent wetland grass is spring. Cut grass in dry months	
Erosion	Erosion or channelization that impacts or effects the function of the facility or creates a safety concern	Repair eroded areas and stabilize using proper erosion control measures. Establish appropriate vegetation as needed	FALL WINTER SPRING	

Extended Dry Basin Operation and Maintenance Plan (continued)

Annual inspections are required. It is recommended that the facility is inspected on a monthly basis to ensure proper function. The plan below describes inspection and maintenance activities, and may be used as an inspection log. Contact the design engineer, Clean Water Services or City representative for more information.

Identified Problem	Condition to Check for	Maintenance Activity	Maintenance Timing	✔ Task Complete Comments
Settlement of Pond Dike/ Berm	Look for any part of dike/berm that has settled 4 inches or more lower than the design elevation	Repair dike/berm to approved design specifications. A licensed civil engineer should be consulted to determine the source of the settlement	As Needed	
Blockage of Emergency Overflow/ Spillway	Blockage of overflow/ spillway by trees, vegetation or other material. Blockages may cause the berm to fail due to uncontrolled overtopping	Remove blockage. Small root system (base less than 4 inches) may be left in place; otherwise, roots are removed. A licensed civil engineer should be consulted for proper berm/spillway restoration.	WINTER SPRING Inspect after major storm (1-inch in 24 hours)	
Erosion of Emergency Overflow/Spillway	Native soil is exposed at the spillway, or there is only one layer of rock in an area of 5 square feet or larger	Restore rock and pad depth to appropriate depth. Refer to design specifications	WINTER SPRING Inspect after major storm (1-inch in 24 hours)	
Blockage of Overflow Structure/ Orifice Plate	Excessive standing water or water is not detained for required time.	Inspect and if needed clear orifice plate for proper drainage or re-install to ensure required detention.	WINTER SPRING Inspect after major storm (1-inch in 24 hours)	
Sediment Accumulation in Pond Bottom	Sediment accumulation in pond bottom exceeds 6 inches or affects facility inlet/ outlet or plant growth in treatment area	Remove sediment from pond bottom. Re-establish designed pond shape and depth. Establish appropriate vegetation in treatment area	SUMMER FALL Ideally in the dry season	

Extended Dry Basin Operation and Maintenance Plan (continued)

Annual inspections are required. It is recommended that the facility is inspected on a monthly basis to ensure proper function. The plan below describes inspection and maintenance activities, and may be used as an inspection log. Contact the design engineer, Clean Water Services or City representative for more information.

Identified Problem	Condition to Check for	Maintenance Activity	Maintenance Timing	✔ Task Complete Comments
Grate Damaged, missing or not in place	Grate is missing or only partially in place, may have missing or broken grate members.	Grate must be in place and meet design standards. Replace or repair any open structure, replace grate if missing	As Needed	
Damage to Outlet Structure	Damage to Frame or Top Slab. Frame not sitting flush on top slab (more than ¾ inch between frame and top slab); frame not securely attached	Ensure frame is firmly attached and sits flush on the riser rings or top slab	As Needed	
Damage to Outlet Structure	Fractures or Cracks in Walls or Bottom. Maintenance person determines the structure is unsound. Soil entering structure through cracks.	Structure replaced or repaired to design standards.	As Needed	
Damage to Outlet Structure	Settlement or Misalignment of Basin. Failure of basin has created a safety, function, or design problem	Structure replaced or repaired to design standards	As Needed	

Chapter

4

Maintenance of the BayFilter™ System

The BayFilter™ system requires periodic maintenance to continue operating at the design efficiency. The maintenance process comprises the removal and replacement of each BayFilter™ cartridge and drain down module and the cleaning of the vault or manhole with a vacuum truck. BayFilter™ maintenance should be performed by a BaySaver Technologies, Inc. certified maintenance contractor.

The maintenance cycle of the BayFilter™ system will be driven mostly by the actual solids load on the filter. The system should be periodically monitored to be certain it is operating correctly. Since stormwater solids loads can be variable, it is possible that the maintenance cycle could be more or less than the projected duration.

The BayFilter systems in New Development applications are designed to treat the WQv in 24 hours initially. Later in the cycle these cartridges will flow at a slower rate, and when the WQv does not drain down within +/- 40 hours after the storm event, the system must be maintained.

When a BayFilter™ system is first installed, it is recommended that it be inspected every six (6) months. When the filter system exhibits flows below design levels the system should be maintained. Filter cartridge replacement should also be considered when sediment levels are at or above the level of the 4 inch manifold system. Please contact the BaySaver Technologies Inc. Engineering Department for maintenance cycle estimations or assistance at 1.800.229.7283.

Maintenance Procedures

1. Remove the manhole covers and open all access hatches.

2. Before entering the system make sure the air is safe per OSHA Standards or use a breathing apparatus. Use low O_2, high CO, or other applicable warning devices per regulatory requirements.

3. Using a vacuum truck remove any liquid and sediments that can be removed prior to entry.

4. Using a small lift or the boom of the vacuum truck, remove the used cartridges by lifting them out.

5. Any cartridges that cannot be readily lifted directly out of the vault should be removed from their location and carried to the lifting point using the Trolley system installed in the Vault (if applicable).

6. When all cartridges and drain down modules are removed, remove the balance of the solids and water; then loosen the stainless clamps on the Fernco couplings in the pipe manifold; remove the drain pipes as well. Carefully cap the manifold and the Fernco's and rinse the floor removing the balance of the collected solids.

7. Clean the manifold pipes, inspect, and reinstall.

8. Install the exchange cartridges and close all covers.

9. The used cartridges must be sent back to BaySaver Technologies, Inc. for exchange/recycling and credit on undamaged units.

13.1 TREATMENT TRAIN INSPECTION AND MAINTENANCE

The StormTech recommended treatment train inlet system has three tiers of treatment upstream of the StormTech chambers. It is recommended that inspection and maintenance (I&M) be initiated at the furthest upstream treatment tier and continue downstream as necessary. The following I&M procedures follow this approach providing I&M information in the following order: Tier 1 – Pretreatment (BMP); Tier 2 – StormTech Isolator Row, and ; Tier 3 – Eccentric Pipe Header System.

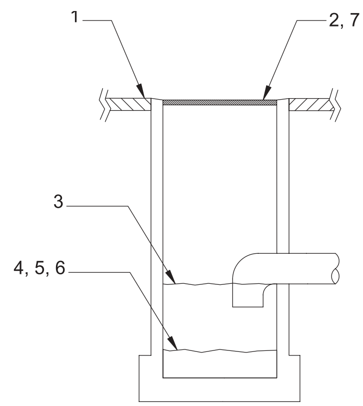
13.2 CATCHBASIN/MANHOLE I&M

Typically a stormwater system will have catchbasins and manholes upstream of the detention/retention system. In some cases these may be the only pre-treatment devices. Regular I&M of catchbasins and manholes should be scheduled and performed as part of a site's routine maintenance plan.

Catchbasin/Manhole – Step-by-Step Maintenance Procedures

1) Inspect catch basins and manholes upstream of StormTech chambers for sediment
2) Remove grate or cover
3) Skim off oils and floatables
4) Using a stadia rod, measure the depth of sediment
5) If sediment is at a depth greater than 6" proceed to step 6. If not proceed to step 7.
6) Vacuum or manually remove sediment
7) Replace grate
8) Record depth & date and schedule next inspection

Figure 17 – Catchbasin/Manhole I&M Steps



13.3 PRE-TREATMENT DEVICE I&M

Manufacturer's I&M procedures should be followed for proprietary pretreatment devices such as baffle boxes, swirl concentrators, oil-water separators, and filtration units. **Table 10** provides some general guidelines but is not a substitute for a manufacturer's specific instructions.

TABLE 10 – Pretreatment Inspection and Maintenance Guidelines

SEDIMENT CONTROL INSPECTION	INSPECTION*	MAINTENANCE**
StormTech Isolator™ Row	Bi-Annually	JetVac - Culvert Cleaning Nozzle Preferred
Sediment Basin	Quarterly or after large storm event	Excavate sediment
Catch Basin Sump	Quarterly	Excavate,pump, or vacuum
Sedimentation Structure	Quarterly	Excavate,pump, or vacuum
Catch Basin Filter Bags	After all storm events	Clean and/or replace filter bags
Porous Pavement	Quarterly	Sweep Pavement
Pipe Header Design	Quarterly	Excavate,pump, or vacuum
Water Quality Inlet	Quarterly	Excavate,pump, or vacuum
Sand Filters	Quarterly or after storm event	Remove & replace sand filter

13.0 Inspection & Maintenance

13.4 ISOLATOR™ ROW INSPECTION

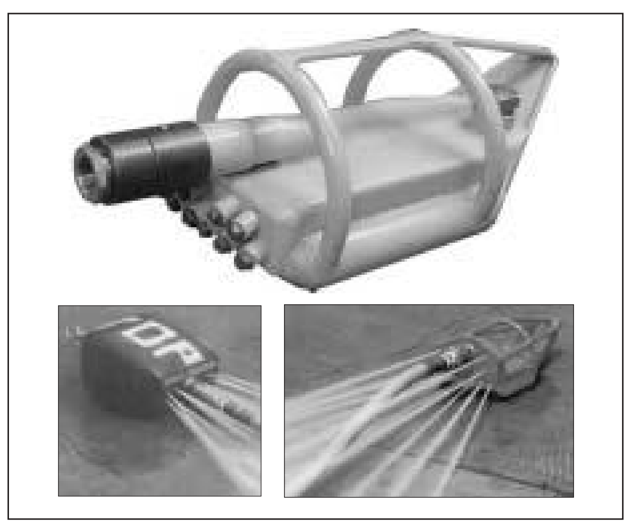
Regular inspection and maintenance are essential to assure a properly functioning stormwater system. Inspection is easily accomplished through the manhole or optional inspection ports of an Isolator Row. Please follow local and OSHA rules for a confined space entry.

Inspection ports can allow inspection to be accomplished completely from the surface without the need for a confined space entry. Inspection ports provide visual access to the system with the use of a flashlight. A stadia rod may be inserted to determine the depth of sediment. If upon visual inspection it is found that sediment has accumulated to an average depth exceeding 3 inches, cleanout is required.

A StormTech Isolator Row should initially be inspected immediately after completion of the site's construction. While every effort should be made to prevent sediment from entering the system during construction, it is during this time that excess amounts of sediments are most likely to enter any stormwater system. Inspection and maintenance, if necessary, should be performed prior to passing responsibility over to the site's owner. Once in normal service, a StormTech Isolator Row should be inspected bi-annually until an understanding of the sites characteristics is developed. The site's maintenance manager can then revise the inspection schedule based on experience or local requirements.

13.5 ISOLATOR ROW MAINTENANCE

JetVac maintenance is required if sediment has been collected to an average depth of 3 inches or more inside the Isolator Row. The JetVac process utilizes a high pressure water nozzle to propel itself down the Isolator Row while scouring and suspending sediments. As the nozzle is retrieved, a wave of suspended sediments is flushed back into the manhole for vacuuming. Most sewer and pipe maintenance companies have vacuum/JetVac combination vehicles. Fixed nozzles designed for culverts or large diameter pipe cleaning are preferable. Rear facing jets with an effective spread of at least 45" are best. Most JetVac reels have a minimum of 400 feet of hose allowing maintenance of an Isolator Row up to 50 chambers long. The JetVac process shall only be performed on StormTech Rows that have AASHTO class 1 woven geotextile over their angular base stone.



STORMTECH ISOLATOR™ ROW - STEP-BY-STEP MAINTENANCE PROCEDURES

Step 1) Inspect Isolator Row for sediment

A) Inspection ports (if present)

i. Remove lid from floor box frame

ii. Remove cap from inspection riser

iii. Using a flashlight and stadia rod, measure depth of sediment

iv. If sediment is at, or above, 3 inch depth proceed to Step 2. If not proceed to step 3.

B) All Isolator Rows

i. Remove cover from manhole at upstream end of Isolator Row

ii. Using a flashlight, inspect down Isolator Row through outlet pipe

1. Mirrors on poles or cameras may be used to avoid a confined space entry

2. Follow OSHA regulations for confined space entry if entering manhole

iii. If sediment is at or above the lower row of sidewall holes (approximately 3 inches) proceed to Step 2. If not proceed to Step 3.

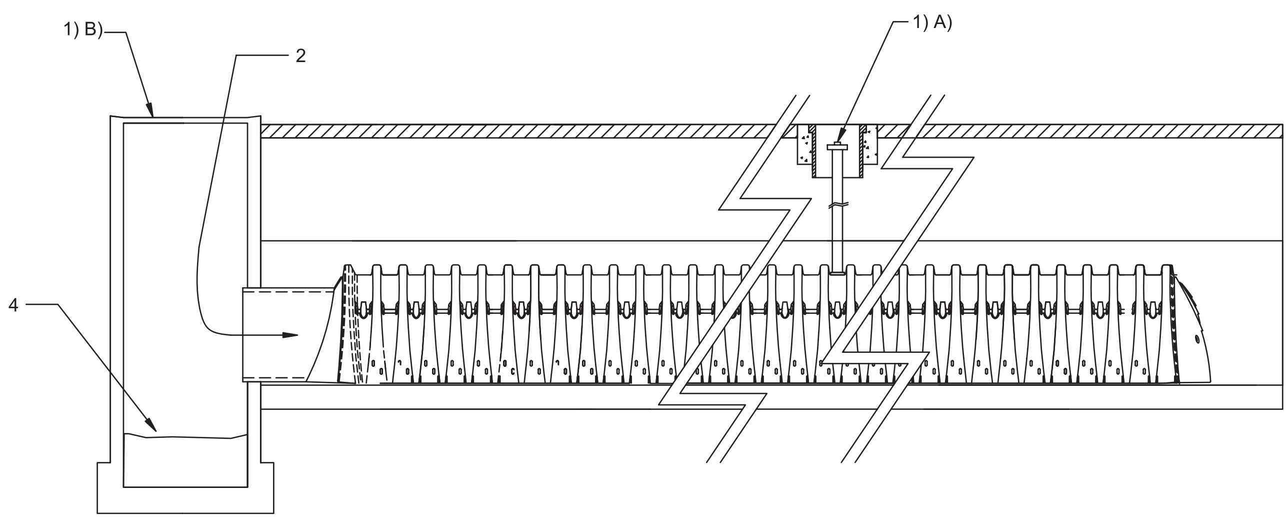
Step 2) Clean out Isolator Row using the JetVac process

A) A fixed culvert cleaning nozzle with rear facing nozzle spread of 45 inches or more is preferable
B) Apply multiple passes of JetVac until backflush water is clean
C) Vacuum manhole sump as required

Step 3) Replace all caps, lids and covers

Step 4) Inspect & clean catch basins and manholes upstream of the StormTech system following the procedures for Classic Manifold Inlet System

Figure 18
StormTech Isolator Row (not to scale)



13.0 Inspection & Maintenance

13.6 ECCENTRIC PIPE HEADER INSPECTION

Theses guidelines do not supercede a pipe manufacturer's recommended I&M procedures. Consult with the manufacturer of the pipe header system for specific I&M procedures. Inspection of the header system should be carried out quarterly. On sites which generate higher levels of sediment more frequent inspections may be necessary. Headers may be accessed through risers, access ports or manholes. Measurement of sediment may be taken with a stadia rod or similar device. Cleanout of sediment should occur when the sediment volume has reduced the storage area by 25% or the depth of sediment has reached approximately 25% of the diameter of the structure.

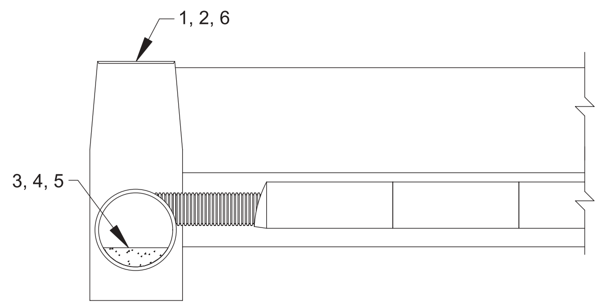
13.7 ECCENTRIC PIPE HEADER MAINTENANCE

Cleanout of accumulated material should be accomplished by vacuum pumping the material from the header. Cleanout should be accomplished during dry weather. Care should be taken to avoid flushing sediments out through the outlet pipes and into the chamber rows.

Eccentric Header Step-by-Step Maintenance Procedures

1. Locate manholes, access ports or risers connected to the header system
2. Remove grates or covers
3. Using a stadia rod, measure the depth of sediment
4. If sediment is at a depth of about 25% pipe volume or 25% pipe diameter proceed to step 5. If not proceed to step 6.
5. Vacuum pump the sediment. Do not flush sediment out inlet pipes.
6. Replace grates and covers
7. Record depth & date and schedule next inspection

Figure 19 – Manifold Maintenance



SAMPLE:

Month: Year: Initial & Date	**Flow Control Manhole**	**Bayfilter Facilities**	**Catch Basins**	**Perfilter Facilities**	**Storm Tech System**	**Spill Kit**	**Drainblock er/cover**	**Document if materials are removed from catch basins**
January								
February								
March								
April								
May								
June								
July								
August								
September								
October								
November								
December								

GEOTECHNICAL REPORT

Geotechnical Engineering Report

Crestview Crossing Development
Newberg, Oregon

for
J.T. Smith Companies

March 12, 2018

GeoEngineers
Earth Science + Technology

Geotechnical Engineering Report

Crestview Crossing Development
Newberg, Oregon

for
J.T. Smith Companies

March 12, 2018

GeoEngineers

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Portland, Oregon 97209
503.624.9274

Geotechnical Engineering Report

Crestview Crossing Development
Newberg, Oregon

File No. 6748-002-00

March 12, 2018

Prepared for:

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Principal

EXPIRES: 06/30/18

TAP:JCV:cje

GeoEngineers

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APPENDICES

INTRODUCTION

This geotechnical report summarizes our geotechnical engineering services provided for the proposed Crestview Crossing development in Newberg, Oregon. The proposed project is located north of Pacific Highway West (Hwy 99W) between Vittoria Way and North Harmony Lane. The site is currently undeveloped and is approximately 33 acres.

A preliminary site development drawing for Crestview Crossing was provided to us by 3J Consulting Engineers (3J). The plan is titled "Crestview Planned Development – Preliminary Zoning Map," dated June 2017. The preliminary zoning plan indicates the project will consist of multi-story apartment buildings, residential lots, commercial buildings, new City streets and shared access roadways, utilities associated with site development and off-site road improvements. The off-site road improvements include widening and intersection improvements along Hwy 99W adjacent to the site to the south.

Our recommendations for earthwork and retaining structures assume that maximum cuts and fills will be less than 10 feet each and that on-site retaining walls will be less than 10 feet in height.

Our structural design recommendations are based on the following:

- For commercial buildings, we assumed that maximum column and wall loads will be on the order of 40 kips per column and 2 kips per lineal foot (klf) respectively and that floor loads for slabs on grade will be 100 pounds per square foot (psf) or less.
- For apartments, we assumed typical light wood-frame structural loads.

The purpose of our services was to provide geotechnical design and construction recommendations for general site development (infrastructure development, overall site grading and design recommendations) and for proposed commercial and apartment buildings. Our report should not be used for individual residential lot development. Depending on building type, lot configuration and location, and final grading and site development as it varies across the site, lot-specific evaluation and additional geotechnical investigations may be required for future development for individual residential lots and near retaining walls, or for critical facilities if they are developed on site.

SCOPE OF SERVICES

The purpose of our services was to evaluate soil and groundwater conditions as a basis for developing geotechnical engineering design recommendations for general site development. Our proposed scope of services included the following:

1. Reviewed selected information regarding subsurface soil and groundwater at the site.
2. Coordinated and managed the field explorations, including public utility notification and scheduling of subcontractors and GeoEngineers' field staff.
3. Explored subsurface soil and groundwater conditions at the site by conducting:
    a. Twenty-one test pit explorations in proposed building and parking areas to depths of 8 to 12 feet below the ground surface (bgs).

b. Nine pavement explorations (on the shoulder lane) along the proposed lane widening of Hwy 99W to depths between 4 and 6½ feet bgs.

c. Four direct cone penetration tests (DCP) tests in four of the pavement explorations.

d. Four hand augers and DCP in on-site new roadway areas to depths between 3 and 4½ feet bgs.

e. Two infiltration tests near the proposed enhanced wetland areas.

4. Obtained samples at representative intervals from the explorations, observed groundwater conditions and maintained detailed logs in general accordance with ASTM International (ASTM) Standard Practices Test Method D 2488. Qualified staff from our office observed and documented field activities.

5. Performed laboratory tests on selected soil samples obtained from the explorations to evaluate pertinent engineering characteristics.

6. Performed a general geologic assessment of slopes at the site relative to existing stability and impact on proposed site development.

7. Provided a geotechnical evaluation of the site and design recommendations in this geotechnical report to address the following geotechnical engineering components:

   a. A general description of site topography, geology and subsurface conditions.

   b. An opinion, from a geotechnical engineering standpoint, as to the adequacy of the encountered soils to support the proposed development based on our recommendations.

   c. Recommendations for site preparation measures, including disposition of undocumented fill and unsuitable native soils, recommendations for temporary cut slopes and constraints for wet weather construction.

   d. Recommendations for temporary excavation and temporary excavation protection, such as excavation sheeting and bracing.

   e. Recommendations for earthwork construction, including use of on-site and imported structural fill and fill placement and compaction requirements.

   f. Geotechnical engineering recommendations for use in designing conventional retaining walls, including backfill and drainage requirements.

   g. Recommendations for foundations to support proposed structures, including minimum width and embedment, design soil bearing pressures, settlement estimates (total and differential), coefficient of friction and passive earth pressures for sliding resistance. We assumed that shallow foundations could be used to adequately support the structures.

   h. Recommendations for supporting on-grade slabs, including aggregate base, capillary break and modulus of subgrade reaction.

   i. Seismic design parameters, including soil site class evaluation in accordance with the current version of the International Building Code (IBC).

   j. Infiltration test results at infiltration facility locations provided by the project civil engineer.

   k. Pavement recommendations for widening Hwy 99W meeting Oregon Department of Transportation (ODOT) Pavement Design recommendations.

I. Pavement recommendations for constructing asphaltic concrete (AC) pavements for proposed on-site roadways, including subgrade, drainage, base rock and pavement section.

SITE CONDITIONS

Site Geology

The project site is located within the western edge of the Willamette Basin physiographic province near the border with the Chehalem Mountains that separate the Willamette and Tualatin Basins. The project site is located within the Chehalem Creek Valley, a broad alluvial drainage that forms an embayment of the Willamette Valley extending north and northwest into the Chehalem Mountains.

The *Engineering Geology of the Tualatin Valley Region, Oregon* (Schlicker and Deacon 1967) shows the Newberg area mantled by "Willamette Silt," the term used by this publication for what is now more typically referred to as "fine-grained flood deposits" (Madin 1990). This alluvial sediment is described as "unconsolidated beds and lenses of fine sand, silt and clay." The mapping shows the project site within an area mapped as mantled by more clayey materials that are reported to accumulate in low-lying areas (Schlicker and Deacon 1967). The topography of the site and our field investigation suggests that the area of clay mantling is incorrectly mapped at this location but that the near-surface site geology is otherwise generally consistent with published geologic mapping.

Surface Conditions

A representative of GeoEngineers performed a general visual reconnaissance of the site. The site was accessed from a driveway located just off Hwy 99W that leads up to the single-family residence identified as 4505 East Portland Road. The residence appeared abandoned at the time of our field reconnaissance.

The site is approximately 33 acres of undeveloped land aside from the single-family residence, a barn and several small structures (animal coops/pens or storage sheds). The site appears to have been farmland that was used for pasture/hay, with a smaller portion (approximately 3 acres) in the southwest corner used as an orchard. Portions of the site appear to have been used as a tree farm in the past; however, in recent years much of the subject property appears to have been left fallow.

Site vegetation is variable and consists of tall grasses, brush, shrubs and trees. The trees are small to large (semi-mature to mature) individual trees, dense stands of trees and an old orchard area.

Surrounding properties are generally residential and farmland (orchards and other crops) with a commercial development (Providence Medical Center) to the south of the site across Hwy 99W. The area immediately north of the site is generally single-family residential properties. The area to the east of the site is generally single-family residential with farmland. The area west of the site is generally single-family residential properties.

Slope Conditions

In addition to our general site reconnaissance, we performed a visual geologic reconnaissance on September 29, 2017, to observe existing slope conditions. Site topography is undulatory to gently sloping, with maximum gradients typically less than 4H:1V (horizontal to vertical) to as low as 10H:1V or flatter. The exception to this is the cut slope along the Hwy 99W right-of-way that has been constructed to gradients as steep as 1H:1V locally.

The interior site slopes appear planar to convex and regular. We did not observe indications of large, deeply-seated, recent or active slope instability such as concave, steeply-inclined bare-soil scarps, bulging or hummocky topography, anomalous drainage features or vegetation. Minor sloughing or slumping along a portion of the Hwy 99W cut slope appears related to localized oversteepening of the slope cut. The exposed soils in this cut are fine-grained soils that correspond to the same silt soil unit we encountered in the site test pits.

Light Detection and Ranging (LiDAR) landslide hazard mapping has not been completed for the Newberg area. The Oregon State Landslide Information Layer (SLIDO) (Oregon Department of Geology and Mineral Industries 2017) shows a large area of "landslide topography" extending to within ¼ mile of the site. The SLIDO layer states that this is based on the hazard mapping of Schlicker and Deacon (1967), but a close examination of the hazard map from the earlier publication shows that the investigators did not extend the "landslide area" as far south as shown on the SLIDO database. Our observations likewise do not support the proximity of this old or ancient landslide to the project site.

Subsurface Conditions

We completed field explorations at the site on September 20, 21 and 26, 2017. Our explorations included:

- Twenty-one test pit (TP) explorations, TP-1 to TP-21, to depths of 8 to 12 feet bgs.
- Nine pavement borings, B-1 to B-9, to depths between 4 and 6½ feet bgs, with four DCP tests completed in four of the borings (B-2, B-4, B-6 and B-8).
- Four hand augers with DCP to depths between 3 and 4½ feet bgs.
- Two infiltration tests near the proposed onsite enhanced wetlands.

The approximate locations of the explorations are shown in the Site Plan, Figure 2. A member of our professional staff maintained detailed logs of the soils encountered and gathered representative soil samples. Appendix A summarizes our exploration methods and presents our exploration logs and DCP results. Laboratory test results are provided in the exploration logs and described in Appendix A.

Hwy 99W Pavement Explorations

In general, our Hwy 99W pavement explorations encountered typical pavement sections (AC underlain by aggregate base) over native subgrade material. Specifically, the ground surface at the pavement explorations consisted of 3 to 9½ inches of AC. The AC was underlain by gravel fill (aggregate base) having a variable thickness between approximately 11½ and 26 inches. In six of the pavement explorations, the gravel fill was underlain by native medium stiff brown silt. However, we encountered additional layers of fill materials underlying the pavement section in three of the borings, B-6, B-8 and B-9. The reader is referred to the boring logs and DCP results in Appendix A for more detailed information about the soils encountered in the pavement explorations.

Site Test Pits and Hand Augers

In general, our test pit and hand-auger explorations conducted on the proposed development site encountered a topsoil layer, underlain by a tilled soil zone, which was in turn underlain by native soil materials. The topsoil is approximately 6 inches thick and consists of brown to dark brown silt with roots and organic material.

The material underlying the topsoil is a tilled zone typical of previously farmed land and extends approximately 12 inches below the topsoil. The tilled zone is brown and gray silt classified as soft in consistency based on its disturbed state.

The tilled zone is underlain by native soils consisting primarily of medium stiff to stiff brown and gray silt. The consistency of the silt material has some variability with depth based on encountering some areas of stiff silt in addition to the medium stiff silt in several explorations. The silt also had zones of yellow, orange and red mottling. Although the primary native material observed in our test pits was silt, we encountered clay in two of our test pits, TP-3 and TP-8. The reader is referred to the exploration logs and DCP results for more detailed information about the soils encountered in the pavement explorations.

Groundwater

Our explorations revealed the following information about groundwater:

- Areal groundwater was not observed in most of our explorations.
- We did observe groundwater in boring B-7, which was drilled in Hwy 99W. Based on adjacent site grades (uphill to the north on to the site from Hwy 99W), and the nature of the native fine-grained silt and clay to perch groundwater, downslope areas may encounter perched groundwater above the level of permanent groundwater.
- The site soils, particularly the near-surface soils, contain high amounts of moisture.

Based on our site explorations, we expect that groundwater will be present at shallow depths in a perched condition during wet times of the year or during extended periods of wet weather. Some artesian-type groundwater conditions (upward flowing from perched conditions upslope) may be encountered in downslope areas. Groundwater conditions at the site are expected to vary seasonally due to rainfall events and other factors not observed in our explorations. For example, our past experience with agricultural sites indicates that remnant drainage features, such as buried clay tiles and cisterns, can produce local groundwater and temporary strong flow into excavations where drain tiles are pierced.

CONCLUSIONS

General

Based on our explorations, testing and analyses, it is our opinion that the site is suitable for the proposed project from a geotechnical standpoint, provided the recommendations in this report are incorporated into the project design and implemented during construction. We offer the following conclusions regarding geotechnical engineering design and construction at the site.

- Existing site structures and structural features designated for removal should be demolished and completely removed from the site.
- Existing utilities below proposed structural areas, including proposed buildings and roads, should be relocated or abandoned and grouted full if left in place.
- Surface conditions at the site consist primarily of vegetated areas covered with grasses, shrubs and trees; therefore, clearing, stripping and grubbing will be required. We anticipate a stripping depth of approximately 6 inches bgs to remove the topsoil layer. Grubbing and deeper excavations up to several feet will be required to remove the root zones of shrubs and trees. Portions of the site are heavily vegetated and previously buried roots are also expected, even in the current grassy areas of the site. Cleared, stripped and grubbed materials should be hauled off-site and properly disposed unless otherwise allowed by the project specifications for other uses such as landscaping, stockpiling or on-site burning.
- A "tilled zone" mantels the site from previous agriculture land use. The tilled zone consists of moist loose silt with trace roots and extends to a depth of approximately 18 inches bgs. The tilled zone is too loose to support structures, including buildings, foundations, floor slabs, pavements and other settlement-sensitive structures. Therefore, in areas designated to receive fill, and in areas where site cuts do not extend below the tilled zone, it should be either: (1) scarified, moisture-conditioned and compacted in place during the dry season; or (2) removed and replaced with Imported Select Structural Fill if construction occurs during the wet season or at other times when the material cannot be compacted in place.
- The soils at the site below the topsoil zone are suitable to use as structural fill if they are properly moisture conditioned and compacted. Because the site soils have a moisture content that is currently wet of optimum, they will become significantly disturbed from construction traffic, particularly during wet weather. Wet weather construction practices will be required over exposed native soils and to protect exposed subgrades, except during the dry summer months.
- Previously farmed areas can have buried features that are not encountered in geotechnical borings and test pits, for example: old foundations, structures, agricultural drain pipes and cisterns. We recommend a budget contingency for removing old buried features.
- Groundwater was not encountered during our explorations, but based on our experience and our observations, perched groundwater may be present during periods of persistent rainfall.
- Proposed commercial and apartment structures can be satisfactorily supported on continuous and isolated shallow foundations supported on the firm native soils encountered below the tilled zone, or on structural fill that extends to the firm native soils.
- Slabs on grade for proposed commercial and apartment structures can be satisfactorily supported on Aggregate Base that is founded on the firm native soils encountered below the tilled zone, or on structural fill that extends to the firm native soils. We recommend that slabs-on-grade be provided with proper moisture control by constructing the aggregate base as a capillary break and providing a vapor barrier for moisture-sensitive applications.
- Based on the assumed design loads described in the "Introduction" section of this report, we estimate total settlements will be less than 1 inch for foundations constructed as recommended. If larger structural loads are anticipated, we should review and reassess the estimated settlement.

- As stated earlier, our report should not be used for individual residential lot development. Lot-specific studies and additional geotechnical assessment/investigations may be required for future development for individual residential lots.
- Standard pavement sections as summarized in this report, consisting of AC over Aggregate Base and/or Aggregate Subbase, over properly prepared subgrade, can be used to support the estimated traffic loads provided the pavement sections are designed and constructed as recommended in this report.

EARTHWORK RECOMMENDATIONS

In general, site preparation and earthwork operations will include the following:

- Demolishing and disposing of debris from existing structures and hardscapes.
- Removing or relocating existing site utilities if present.
- Clearing to remove vegetation and grubbing to remove roots.
- Site stripping.
- Recompacting (dry weather) or replacing (wet weather) the tilled zone.
- Cutting and filling for mass grading.
- Excavating and filling for grade separators, such as retaining walls and slopes.
- Excavating and filling for roads and pavements.
- Excavating and filling for foundations and site utilities.
- Fine-grading to establish final surface grades.

Site Preparation

In general, site preparation will include demolishing existing structures, removing or relocating existing site utilities, grubbing and stripping.

Demolition

All structures and belowground structures to be demolished should be completely removed from proposed structural areas and for a margin of at least 3 feet around proposed structural areas. Proposed structural areas are areas where new structures will be built, including building pads and roadways. Existing utilities that will be abandoned on site should be identified prior to construction. Abandoned utility lines should be completely removed or filled with grout if abandoned and left in place to reduce potential settlement or caving in the future. Materials generated during demolition should be transported off site and properly disposed.

Clearing and Grubbing

Site clearing will be required to remove site vegetation, including grass, shrubs and trees that are designated for removal. Following clearing, grubbing and excavations up to several feet will be required to remove the root zones of shrubs and trees. Deeper excavations, up to 6 or 8 feet may be required to remove the root zones of large trees. Roots larger than ½ inch in diameter should be removed. Excavations to remove root zones should be done with a smooth-bucket to minimize subgrade disturbance. Portions of the site are heavily vegetated and previously buried roots are also expected, even in the current grassy areas of the site. Grubbed materials should be hauled off site and properly disposed unless otherwise allowed by the project specifications for other uses such as landscaping, stockpiling or on-site burning.

Existing voids and new depressions created during demolition, clearing, grubbing or other site preparation activities, should be excavated to firm soil and backfilled with Imported Select Structural Fill. Greater depths of disturbance should be expected if site preparation and earthwork are conducted during periods of wet weather.

Stripping

Based on our observations at the site, we estimate that the depth of stripping should be on the order of about 6 inches. Greater stripping depths may be required to remove localized zones of loose or organic soil, and in areas where moderate to heavy vegetation are present, or where surface disturbance from prior use has occurred. The actual stripping depth should be based on field observations at the time of construction. Stripped material should be transported off site for disposal unless otherwise allowed by the project specifications for other uses such as landscaping.

Subgrade Improvement for the Tilled Zone

A "tilled zone" mantels the site from previous agriculture land use. The tilled zone consists of disturbed soil comprised of moist, loose silt with trace roots and extends to a depth of approximately 18 inches bgs. The tilled zone is too loose to support structures, including buildings, foundations, floor slabs, pavements and other settlement-sensitive structures. Therefore, if the tilled zone remains in place to receive site fills during mass grading, it should be either: (1) scarified, moisture-conditioned and compacted in-place during the dry season; or (2) removed and replaced with Imported Select Structural Fill if construction occurs during the wet season, or at other times when the material cannot be compacted in place. If the tilled zone is cut away (cuts extend below the tilled zone) as a part of mass grading, recompaction or removal of in-place undisturbed soils is not required.

The tilled zone soil will be generally loose, especially when wet and will provide marginal to poor support for construction equipment. Wet weather construction practices will be required when improving the tilled zone, except during the dry summer months.

Subgrade improvement for the tilled zone can be accomplished by removing and replacing or scarifying and re-compacting the tilled zone. Scarification is typically performed by ripping with agricultural discs and aerating the soils to dry them during dry weather periods. Considerable soil processing, including moisture conditioning (primarily drying - to reduce the existing moisture content), should be expected to adequately compact the tilled zone. If the soil cannot be properly moisture conditioned (dried), the subgrade should be removed and replaced with Imported Select Structural Fill. If the project specifications allow, the tilled zone can be cement amended as described in "Soil Amendment with Cement" section of this report. Cement amendment is typically performed to depths of 12 to 18 inches. When performed in silty soils, such as those at the site, multiple tilling and application passes may be required to adequately blend and amend the soils.

Subgrade Evaluation

As described above, disturbed material may be present after demolition and site stripping are complete. Subgrade areas to be developed should be prepared to be in a uniformly firm and unyielding condition prior to placing structural fill or structural elements. We recommend that prepared subgrades be observed by a member of our firm, who will evaluate the suitability of the subgrade and identify areas of yielding, which are indicative of soft or loose soil.

Subgrades, including subgrades to receive fill, should be proof-rolled with heavy rubber-tired equipment and/or probed with a ½-inch-diameter steel rod, as appropriate depending on prevailing conditions. If soft, yielding or otherwise unsuitable areas revealed during probing or proof-rolling cannot be compacted to a stable and uniformly firm condition, we recommend that: (1) the subgrade soils be scarified, aerated and recompacted; or (2) the unsuitable soils be removed and replaced with Structural Fill.

Subgrade Protection and Wet Weather Considerations

The soils at the site are highly susceptible to moisture. Wet weather construction practices will be necessary if work is performed during periods of wet weather. If site grading will occur during wet weather conditions, it will be necessary to use track-mounted equipment, load removed material into trucks supported on gravel haul roads, use gravel working pads and employ other methods to reduce ground disturbance. The contractor should be responsible to protect the subgrade during construction.

Earthwork planning should include considerations for minimizing subgrade disturbance. We provide the following recommendations if wet weather construction is considered:

- The ground surface in and around the work area should be sloped so that surface water is directed to a sump or discharge location. The ground surface should be graded such that areas of ponded water do not develop. Measures should be taken by the contractor to prevent surface water from collecting in excavations and trenches. Measures should be implemented to remove surface water from the work areas.
- Earthwork activities should not take place during periods of heavy precipitation.
- Slopes with exposed soils should be covered with plastic sheeting or similar means.
- The site soils should not be left in a disturbed or uncompacted state and exposed to moisture. Sealing the surficial soils by rolling with a smooth-drum roller prior to periods of precipitation may reduce the extent to which these soils become wet or unstable.
- Construction activities should be scheduled so that the length of time that soils are left exposed to moisture is reduced to the extent practicable.
- Construction traffic should be restricted to specific areas of the site, preferably areas that are not susceptible to wet weather disturbance such as haul roads and areas that are adequately surfaced with working pad materials.
- When on-site soils are wet of optimum, they are easily disturbed and will not provide adequate support for construction traffic nor for the proposed development. The use of granular haul roads and staging areas will be necessary to support heavy construction traffic. Generally, a 12- to 16-inch-thick mat of Imported Select Structural Fill should be sufficient for light staging areas for the building pad and light staging activities but is not expected to be adequate to support repeated heavy equipment or truck

traffic. The thickness of the Imported Select Structural Fill for haul roads and areas with repeated heavy construction traffic should be increased to between 18 and 24 inches. The actual thickness of haul roads and staging areas should be determined at the time of construction and based on the contractor's approach to site development and the amount and type of construction traffic.

- The base rock (Aggregate Base and Aggregate Subbase) thicknesses described in the "Pavement Recommendations" sections of this report are intended to support post-construction design traffic loads. The design base rock thicknesses will likely not support repeated heavy construction traffic during site construction or during pavement construction. A thicker base rock section as described above for haul roads will likely be required to support construction traffic.
- During periods of wet weather, concrete should be placed as soon as practical after preparing foundation excavations. Foundation bearing surfaces should not be exposed to standing water. Should water infiltrate and pool in the excavation, the water should be removed, and the foundation subgrade should be re-evaluated before placing reinforcing steel or concrete. Foundation subgrade protection, such as a 3- to 4-inch thickness of Aggregate Base/Aggregate Subbase or lean concrete, may be necessary if footing excavations are exposed to extended wet weather conditions.

During wet weather, or when the exposed subgrade is wet or unsuitable for proof-rolling, the prepared subgrade should be evaluated by observing excavation activity and probing with a steel foundation probe. Observations and probing should be performed by a member of our staff. Wet soil that has been disturbed due to site preparation activities, or soft or loose zones identified during probing, should be removed and replaced with Imported Select Structural Fill.

Soil Amendment with Cement

As an alternative to the using Imported Select Structural Fill material for wet weather structural fill, an experienced contractor may be able to amend the on-site soil with portland cement concrete (PCC) to obtain suitable support properties. It is often less costly to amend on-site soils than to remove and replace soft soils with imported granular materials. We also considered lime amendment for the site soils. However, based on our experience on nearby sites, in-place soil moisture contents, observed soil types and processing speed, cement amendment would be more suitable at this site than lime amendment. Single pass tilling depths for cement amendment equipment is typically 18 inches or less. However, multiple tilling passes may be required to adequately blend in the cement with the soils and to sufficiently process the soils. It may also be necessary to place the recommended cement quantities in multiple passes between tilling passes, which requires intermediate compaction.

The contractor should be responsible for selecting the means and methods to construct the amended soil without disturbing exposed subgrades. We recommend low ground-pressure (such as balloon-tired) cement spreading equipment be required. We have observed other methods used for spreading that have resulted in significant site disturbance and high remedial costs. For example, we have observed amendment efforts using a spreader truck equipped with road tires pulled by track-mounted equipment that resulted in significant disturbance to the work area and required re-working large areas of cement-amended product at additional expense.

Some areas of the site, notably in the vicinity of test pits TP-3 and TP-8 appear to have higher clay contents, which typically results in higher cement volumes than in areas of predominantly silt and will likely require multiple tilling and cement spreading passes, as well as higher cement volumes in order to achieve target soil strengths and required levels of compaction.

Areas of standing water, or areas where traffic patterns are concentrated and disturbing the subgrade, will also create a need for higher amounts of cement to be applied and additional tilling for better mixing and cement hydration prior to final compaction.

Successful use of soil amendment depends on the use of correct mixing techniques, the soil moisture content at the time of amendment and amendment quantities. Specific recommendations, based on exposed site conditions for soil amending, can be provided if necessary. However, for preliminary planning purposes, it may be assumed that a minimum of 5 percent cement (by dry weight, assuming a unit weight of 100 pounds per cubic foot [pcf]) will be sufficient for improving on-site soils. Treatment depths of 12 to 16 inches are typical (assuming a seven-day unconfined compressive strength of at least 80 pounds per square inch [psi]), although they may be adjusted in the field depending on site conditions. Soil amending should be conducted in accordance with the specifications provided in Oregon Structural Specialty Code (OSSC) 00344 (Treated Subgrade).

We recommend a target strength for cement-amended soils of 80 psi. The amount of cement used to achieve this target generally varies with moisture content and soil type. It is difficult to predict field performance of soil-to-cement amendment due to variability in soil response and we recommend laboratory testing to confirm expectations. However, for preliminary design purposes, 4 to 5 percent cement by weight of dry soil can generally be used when the soil moisture content does not exceed approximately 20 percent. If the soil moisture content is in the range of 20 to 35 percent, 5 to 7 percent by weight of dry soil is recommended. The amount of cement added to the soil should be adjusted based on field observations and performance.

PCC-amended soil is hard and has low permeability; therefore, this soil does not drain well nor is it suitable for planting. Future landscape areas should not be cement amended, if practical, or accommodations should be planned for drainage and planting. Cement amendment should not be used if runoff during construction cannot be directed away from adjacent low-lying wet areas and active waterways and drainage paths.

When used for constructing pavement, staging, or haul road subgrades, the amended surface should be protected from abrasion by placing a minimum 4-inch thickness of base rock material (Aggregate Base/Aggregate Subbase). To prevent strength loss during curing, cement-amended soil should be allowed to cure for a minimum of four days prior to placing the base rock. The base rock typically becomes contaminated with soil during construction. Contaminated base rock should be removed and replaced with clean base rock in pavement areas to meet the required thickness(es) in the "Pavement Recommendations" section to this report.

It is not possible to amend soil during heavy or continuous rainfall. Work should be completed during suitable weather conditions.

Separation Geotextile Fabric

A separation geotextile fabric should be placed as a barrier between the subgrade and granular fill materials in staging areas, haul road areas and in areas of repeated construction traffic. The geotextile should have a minimum Mullen burst strength of 250 psi for puncture resistance and an apparent opening size (AOS) between U.S. Standard No. 70 and No. 100 sieves.

Erosion Control

Erosion control measures should be implemented in accordance with the City of Newberg's "Erosion and Sediment Control Manual."

Excavation

Based on the materials encountered in our subsurface exploration, it is our opinion that conventional earthmoving equipment in proper working condition should be capable of making necessary general excavations.

The earthwork contractor should be responsible for reviewing this report, including the boring logs, providing their own assessments and providing equipment and methods needed to excavate the site soils while protecting subgrades.

Dewatering

As discussed in the "Groundwater" section of this report, groundwater was not encountered in our explorations, and we do not expect groundwater to be a major factor during shallow excavations and earthwork. Excavations that extend into saturated/wet soils, or excavations that extend into perched groundwater, should be dewatered. Sump pumps are expected to adequately address groundwater encountered in shallow excavations. In addition to groundwater seepage, surface water inflow to the excavations during the wet season can be problematic. Provisions for surface water control during earthwork and excavations should be included in the project plans and should be installed prior to commencing earthwork.

Permanent Slopes

Permanent cut and fill slopes, where incorporated into the grading plan, should not exceed 2H:1V. The slopes should be planted with appropriate vegetation to provide protection against erosion as soon as possible after grading. Buildings, access roads and pavements should be located at least 10 feet from the top of new fill slopes or existing slopes. Placement of fill near the top of the existing slope should be limited to 2 feet or less in thickness. If the grading plan requires additional fill, we should be contacted to evaluate the impact of the additional loading on the slope. Surface water runoff should be collected and directed away from slopes to prevent water from running down the face of the slope.

Trench Cuts and Trench Shoring

All trench excavations should be made in accordance with applicable Occupational Safety and Health Administration (OSHA) and state regulations. In our opinion, native soils are generally OSHA Type B. Temporary excavations deeper than 4 feet should be shored or laid back at an inclination of 1H:1V or flatter if workers are required to enter. Excavations made to construct footings or other structural elements should be laid back or shored at the surface as necessary to prevent soil from falling into excavations.

It should be expected that unsupported cut slopes will experience some sloughing and raveling if exposed to water. Plastic sheeting, placed over the exposed slope and directing water away from the slope, will reduce the potential for sloughing and erosion of cut slopes during wet weather.

The contractor is responsible for shoring methods and shoring system design. Shoring systems should be designed by a professional engineer before installation.

In our opinion, the contractor will be in the best position to observe subsurface conditions continuously throughout the construction process and to respond to the soil and groundwater conditions. Construction site safety is generally the sole responsibility of the contractor, who also is solely responsible for the means, methods, and sequencing of the construction operations and choices regarding excavations and shoring.

Under no circumstances should the information provided by GeoEngineers be interpreted to mean that GeoEngineers is assuming responsibility for construction site safety or the contractor's activities; such responsibility is not being implied and should not be inferred.

Fill Materials

General

Structural areas include areas beneath foundations, floor slabs, pavements, and any other areas intended to support structures or within the influence zone of structures. Fill intended for use in structural areas should meet the criteria for structural fill presented below. All structural fill soils should be free of debris, clay balls, roots, organic matter, frozen soil, man-made contaminants, particles with greatest dimension exceeding 4 inches (3-inch-maximum particle size in building footprints) and other deleterious materials.

The suitability of soil for use as structural fill will depend on the gradation and moisture content of the soil. As the amount of fines in the soil matrix increases, the soil becomes increasingly more sensitive to small changes in moisture content and achieving the required degree of compaction becomes more difficult or impossible. Recommendations for suitable fill material are provided in the following sections.

On-Site Soils

The on-site soil is generally suitable for use as structural fill if it meets the requirements set forth in OSSC 00330.12 (Borrow Material). However, it will be very difficult to achieve adequate compaction during periods of wet weather or when the moisture content is above optimum. Accordingly, extended dry weather will be required to adequately condition and place the soils as structural fill.

The site soil is very sensitive to small changes in moisture content and highly susceptible to disturbance when wet. Use of the on-site soils as structural fill will be very difficult or may not be possible during wet weather (see the "Subgrade Protection and Wet Weather Considerations" section of this report).

The properly prepared and compacted on-site soils in the tilled zone qualify as structural fill provided they meet the recommendations in the "Subgrade Improvement for the Tilled Zone" section of this report.

Imported Select Structural Fill

Imported Select Structural Fill may be used as structural fill and should consist of pit or quarry run rock, crushed rock, or crushed gravel and sand that is fairly well-graded between coarse and fine sizes (approximately 25 to 65 percent passing the U.S. No. 4 sieve). It should have less than 5 percent passing the U.S. No. 200 sieve and have a minimum of 75 percent fractured particles according to American Association of State Highway and Transportation Officials (AASHTO) TP-61.

Aggregate Base

Aggregate Base material located under floor slabs and pavements, crushed rock used in footing overexcavations and retaining wall backfill should consist of imported clean, durable, crushed angular rock. Such rock should be well-graded, have a maximum particle size of 1 inch, have less than 5 percent passing the U.S. No. 200 sieve (3 percent for retaining walls) and meet the gradation requirements in Table 1. The gradations shown in Table 1 meet the requirements of ODOT Standard Section 02630. In addition, Aggregate Base shall have a minimum of 75 percent fractured particles according to AASHTO TP-61 and a sand equivalent of not less than 30 percent based on AASHTO T-176.

TABLE 1. RECOMMENDED GRADATION FOR AGGREGATE BASE

Sieve size	Percent Passing (by weight)
1 inch	100
½ inch	50 to 65
No. 4	40 to 60
No. 40	5 to 15
No. 200	0 to 5

Aggregate Subbase

Aggregate Subbase material should consist of imported, clean, durable, crushed angular rock. Such rock should be well-graded, have a maximum particle size of 1½ inch, have less than 5 percent passing the U.S. No. 200 sieve and meet the gradation requirements in ODOT Standard Section 00331. In addition, Aggregate Base shall have a minimum of 75 percent fractured particles according to AASHTO TP-61 and a sand equivalent of not less than 30 percent based on AASHTO T-176.

Trench Backfill

Backfill for pipe bedding and in the pipe zone should consist of well-graded granular material with a maximum particle size of ¾ inch and less than 5 percent passing the U.S. No. 200 sieve. The material should be free of organic matter and other deleterious materials. Further, the backfill should meet the pipe manufacturer's recommendations. Above the pipe zone backfill, Imported Select Structural Fill may be used as described above.

Fill Placement and Compaction

Structural fill should be compacted at moisture contents that are within 3 percent of the optimum moisture content as determined by ASTM Test Method D 1557 (Modified Proctor). The optimum moisture content varies with gradation and should be evaluated during construction. Fill material that is not near the optimum moisture content should be moisture conditioned prior to compaction.

Fill and backfill material should be placed in uniform, horizontal lifts and compacted with appropriate equipment. The appropriate lift thickness will vary depending on the material and compaction equipment used. Fill material should be compacted in accordance with Table 2. It is the contractor's responsibility to select appropriate compaction equipment and place the material in lifts that are thin enough to meet these criteria. However, in no case should the loose lift thickness exceed 18 inches.

TABLE 2. COMPACTION CRITERIA

Fill Type	Compaction Requirements Percent Maximum Dry Density Determined by ASTM Test Method D 1557 at ± 3% of Optimum Moisture		
	0 to 2 Feet Below Subgrade	> 2 Feet Below Subgrade	Pipe Zone
Fine-grained soils (non-expansive)	92	92	----
Imported Granular, maximum particle size < 1¼ inch	95	95	----
Imported Granular, maximum particle size 1¼ inch to 6 inches (3-inch-maximum under building footprints)	n/a (proof-roll)	n/a (proof-roll)	----
Retaining Wall Backfill*	92	92	-----
Nonstructural Zones	90	90	90
Trench Backfill	95	90	90

Note:

* Measures should be taken to prevent overcompaction of the backfill behind retaining walls. We recommend placing the zone of backfill located within 5 feet of the wall in lifts not exceeding about 6 inches in loose thickness and compacting this zone with hand-operated equipment such as a vibrating plate compactor or a jumping jack.

A representative from GeoEngineers should evaluate compaction of each lift of fill. Compaction should be evaluated by compaction testing unless other methods are proposed for oversized materials and are approved by GeoEngineers during construction. These other methods typically involve procedural placement and compaction specifications together with verification requirements such as proof-rolling.

INFILTRATION TESTING

As requested, we conducted infiltration testing to assist in evaluating the site for design for stormwater infiltration. We conducted infiltration testing in general accordance with the City of Portland Stormwater Design Manual (2014 version) at depths between 2 and 3 feet bgs, marked as IT-1 and IT-2 in Figure 2. Testing was conducted using the encased falling head and open pit infiltration testing procedures.

Testing Methods and Results

For the encased falling head testing a 6-inch-layer of pea gravel was placed in the pipe prior to adding water to diminish disturbance from water flowing at the base of the pipe interior. The test area was pre-soaked over a 4-hour period by adding water into the pipe when necessary. A good seal was present between the base of the pipe and the underlying soil, in our opinion.

For the open pit infiltration testing, test pits were 2 feet wide and 2 to 3 feet long with a testing depth of 1 foot. Approximately 2 inches of clean rock was placed in the bottom of the test locations to help minimize disturbance of the fine-grained materials in the excavation while adding water. Between 12 and 14 inches of water was added to the test pits for a period of 4 hours to saturate the underlying soils.

After the saturation period, the test locations were filled with clean water to at least 1 foot above the bottom of the pipe or excavation. The drop-in water level was measured over a period of 1 hour after the soak period. In the case where the water level falls during the time-measured testing, infiltration rates diminish as a result of less head from the water column in the test. In this test, we observed zero to negligible drops in the water level during the testing period. The field test results are summarized in Table 3.

TABLE 3. INFILTRATION RESULTS

Infiltration Test No.	Test Method	Depth (feet)	USCS Material Type	Field Measured Infiltration Rate[1] (inches/hour)
IT-1	Open Pit	2	ML	0.1
IT-2	Encased Falling Head	3	ML	0.0

Notes:

[1] Appropriate factors should be applied to the field-measured infiltration rate, based on the design methodology and specific system used.

USCS = Unified Soil Classification System

Based on the test results, we do not recommend on-site stormwater disposal unless additional testing is performed and yields higher infiltration rates in other areas of the site, or at different elevations.

The infiltration rates shown in Table 3 are field-measured infiltration rates. These represent a relatively short-term measured rate taken after the required saturation period, and factors of safety have not been applied for the type of infiltration system being considered, or for variability that may be present in the on-site soil. In our opinion, and consistent with the state of the practice, correction factors should be applied to this measured rate to reflect the small area of testing and the number of tests conducted.

During infiltration testing, we observed negligible infiltration rates (effectively zero). If other textural-based infiltration rates (even if they are very low infiltration rates) are used for design, appropriate correction factors should also be applied by the project civil engineer to account for long-term infiltration parameters. From a geotechnical perspective, we recommend a factor of safety (correction factor) of at least 3 be applied to the infiltration values derived from field observations to account for potential soil variability with depth and location within the area tested. In addition, the stormwater system design engineer should determine and apply appropriate remaining correction factor values, or factors of safety, to account for repeated wetting and drying that occur in this area, degree of in-system filtration, frequency and type of system maintenance, vegetation, potential for siltation and bio-fouling, etc., as well as system design correction factors for overflow or redundancy and base and facility size.

The actual depths, lateral extent and estimated infiltration rates can vary from the values presented above. Field testing/confirmation during construction is often required in large or long systems or other situations where soil conditions may vary within the area where the system is constructed. The results of this field testing might necessitate that the infiltration locations be modified to achieve the design infiltration rate.

Also, infiltration flow rate of a focused stormwater system typically diminishes over time as suspended solids and precipitates in the stormwater further clog the void spaces between the soil particles or cake on the infiltration surface. The serviceable life of an infiltration media in a stormwater system can be extended by pre-filtering or with on-going accessible maintenance. Eventually, most systems will fail and will need to be replaced or have media regenerated or replaced. We recommend that infiltration systems include an overflow that is connected to a suitable discharge point. Also, infiltration systems can cause localized high groundwater levels and should not be located near basement walls, retaining walls, or other embedded structures unless these are specifically designed to account for the resulting hydrostatic pressure. Infiltration locations should not be located on sloping ground, unless it is approved by a geotechnical engineer, and should not be infiltrated at a location that allows for flow to travel laterally toward a slope face, such as a mounded water condition or too close to a slope face.

Suitability of Infiltration System

Successful design and implementation of stormwater infiltration systems and whether a system is suitable for a development depend on several site-specific factors. Stormwater infiltration systems are generally best suited for sites having sandy or gravelly soil with saturated hydraulic conductivities greater than 2 inches per hour. Sites with silty or clayey soil such as encountered at this site, are generally not well-suited for stormwater infiltration. Soils that have fine-grained matrices are susceptible to volumetric change and softening during wetting and drying cycles. Fine-grained soils also have large variations in the magnitude of infiltration rates because of bedding and stratification that occurs during alluvial deposition, and often have thin layers of less permeable or impermeable soil within a larger layer.

Based on the fine-grained soil conditions and very low to negligible measured infiltration rates, we recommend infiltration of stormwater not be used as the sole method of stormwater management at this site unless those design factors can be otherwise accounted for.

PAVEMENT RECOMMENDATIONS

Our pavement recommendations are based on the results of our field testing and analysis. The Hwy 99W pavement analysis and recommendations were developed in general accordance with the ODOT Pavement Design Guide.

The recommended pavement sections assume that final improvements surrounding the pavement will be designed and constructed such that stormwater or excess irrigation water from landscape areas does not infiltrate below the pavement section into the base rock materials.

Dynamic Cone Penetrometer (DCP) Field Testing and Resilient Modulus (M_R)

We conducted four DCP tests onsite near the proposed locations of the new roadway and four DCP tests in the north shoulder of Hwy 99W for widening the road. The tests were conducted in general accordance with ASTM D 6951 to estimate the subgrade support value, M_R. At each test location, we recorded penetration depths of the cone versus hammer blow counts. The DCP tests were terminated at depths between 3 and 5 feet bgs. The resilient modulus was estimated in general accordance with the ODOT Pavement Design Guide using a conversion coefficient, C_f, of 0.35.

Table 4 lists the estimated subgrade resilient modulus at each test location based on data obtained in the upper 18 inches below the proposed pavement section. Field DCP data are summarized in Figures A-37 through A-44.

TABLE 4. ESTIMATED SUBGRADE RESILIENT MODULI BASED ON DCP TESTING

Boring Number	Estimated Resilient Modulus (psi)
HA-1	4,800
HA-2	3,900
HA-3	5,000
HA-5	4,500
B-2	4,600
B-4	4,800
B-6	5,200
B-8	5,000

On-Site Local Roads

Pavement subgrades should be prepared in accordance with the "Earthwork Recommendations" section of this report. Our pavement recommendations at the site are based on estimated average daily traffic provided by the project traffic engineer. We have based our design analysis for truck traffic percentages from a nearby traffic count on Hwy 99W provided by ODOT.

Our pavement recommendations are based on the following assumptions and design parameters included in the ODOT Pavement Design Guide:

- The pavement subgrades, fill subgrades and site earthwork used to establish road grades below the Aggregate Subbase and Aggregate Base materials have been prepared as described in the "Earthwork Recommendations" section of this report.
- A resilient modulus of 20,000 psi has been estimated for compacted Aggregate Subbase and Aggregate Base materials.
- A resilient modulus of 4,200 psi was estimated for firm native soils below the tilled zone or structural fill placed on firm native soils below the tilled zone.
- Initial and terminal serviceability indices of 4.2 and 2.0, respectively.
- Reliability and standard deviations of 75 percent and 0.49, respectively.
- Structural coefficients of 0.42 and 0.10 for the asphalt and base rock, respectively.
- A 20-year design life.
- Estimated traffic levels based on annul average daily traffic (AADT) provided by the project traffic engineer. The design Equivalent Single Axle Loads (ESAL) calculated from the AADT are 1,190,805 from

Hwy 99W to the roundabout and 1,069,585 for the remaining on-site roads, for a 20-year design life, 2 percent growth and single-lane, one-way traffic.

- Estimated combined truck percentage of 5.4 percent is based on nearby ODOT traffic counts on Hwy 99W.

If any of the noted assumptions vary from project design use, our office should be contacted with the appropriate information so that the pavement designs can be revised or confirmed adequate.

The recommended minimum pavement sections are provided in Table 5. Pavement recommendations for "On-Site Local Roads" are for roadways within the development.

The alternate pavement section using Aggregate Subbase material is provided because it may be more applicable during wet-weather construction where a gravel haul road or working surface is needed to support construction traffic. Wet weather construction recommendations are provided in the "Earthworks Recommendations" section of this report. The sub-base material can be incorporated into the gravel working blankets and haul roads provided the material meets the minimum thickness in Table 5 and meets the specifications for Aggregate Subbase. Working blanket and haul road materials that pump excessively, or have excessive fines from construction traffic, should be removed and replaced with specified materials prior to constructing roadways over those areas.

If cement amendment is used during site development, as described in the "Earthwork Recommendations" section of this report, it may be possible to reduce the amount of aggregate base for the pavement sections. This will depend on several factors, including the prevailing weather conditions, depth of amendment and condition of the subgrade after amendment. GeoEngineers can provide additional information for on-site pavement sections if cement amendment will be used during construction.

TABLE 5. MINIMUM PAVEMENT SECTIONS FOR ON-SITE ROADS

Road Section	Minimum Asphalt Thickness (inches)	Minimum Aggregate Base Thickness (inches)	Minimum Aggregate Sub-Base Thickness (inches)
On-site Local Road between Hwy 99W and Roundabout	6.0	17.5	0.0
	6.0	8.0	12.0
Other On-site Local Roads	6.0	15.5	0.0
	6.0	6.0	12.0

The aggregate base course should conform to the "Aggregate Base" section of this report and be compacted to at least 95 percent of the maximum dry density (MDD) determined in accordance with AASHTO T-180/ASTM Test Method D 1557.

The AC pavement should conform to Section 00745 of the most current edition of the ODOT Standard Specifications for Highway Construction. The Job Mix Formula should meet the requirements for a ½-inch Dense Graded Level 2 Mix. The AC should be PG 64-22 grade meeting the ODOT Standard Specifications for Asphalt Materials. AC pavement should be compacted to 92.0 percent at Maximum Theoretical Unit Weight (Rice Gravity) of AASHTO T-209.

Hwy 99W Widening Pavement

Project development includes widening Hwy 99W to include a turn lane into the development. Widening the roadway will involve raising the current grade to match the existing roadway elevation. Fill placement to raise subgrade elevations and pavement subgrades should be prepared in accordance with the "Earthwork Recommendations" section of this report.

Our pavement recommendations for the right turn lane are based on estimated ADT provided by the traffic engineers. We have based our design analysis for truck traffic percentages from a nearby traffic count on Hwy 99W provided by ODOT.

Our pavement recommendations are based on the following assumptions and design parameters included in the ODOT Pavement Design Guide:

- The pavement subgrades, fill subgrades and site earthwork used to establish road grades below the Aggregate Subbase and Aggregate Base materials have been prepared as described in the "Earthwork Recommendations" section of this report.
- A resilient modulus of 20,000 psi has been estimated for compacted Aggregate Base.
- A resilient modulus of 4,800 psi was estimated for subgrade prepared and compacted as recommended.
- Initial and terminal serviceability indices of 4.2 and 2.5, respectively.
- Reliability and standard deviations of 85 percent and 0.49, respectively.
- Structural coefficients of 0.42 and 0.10 for the asphalt and base rock, respectively.
- A 20-year design life.
- Estimated traffic levels based on estimated AADT from the traffic engineer. Estimated combined truck percentage of 5.4 percent is based on nearby ODOT traffic counts on Hwy 99W. The design ESALs calculated from the AADT are 2,907,533 for a 20-year design life, 3.4 percent growth and single-lane, one-way traffic.
- Truck traffic consists of a range of 2- to 6-axle trucks with the distribution equaling the truck counts at the ODOT traffic counts on Hwy 99W.

Road widening AC pavement recommendations are for the turn lane widening entering the development. The recommended pavement sections are provided in Table 6. If any of the noted assumptions vary from project design use, our office should be contacted with the appropriate information so that the pavement designs can be revised or confirmed adequate.

TABLE 6. MINIMUM PAVEMENT SECTIONS FOR HWY 99W TURN LANE

Minimum Asphalt Thickness (inches)	Minimum Aggregate Base Thickness (inches)	Minimum Aggregate Sub-Base Thickness (inches)
7.0	18.0	0.0
7.0	8.5	12.0

The AC pavement should conform to Section 00745 of the most current edition of the ODOT Standard Specifications for Highway Construction. The Job Mix Formula should meet the requirements for a ½-inch Dense Graded Level 2 Mix. The AC should be PG 70-22 grade meeting the ODOT Standard Specifications for Asphalt Materials. AC pavement should be compacted to 91.0 percent at Maximum Theoretical Unit Weight (Rice Gravity) of AASHTO T-209.

STRUCTURAL DESIGN RECOMMENDATIONS

Foundation Support Recommendations

Proposed commercial and apartment structures can be satisfactorily founded on continuous wall or isolated column footings supported on firm native soils encountered below the tilled zone, or on structural fill placed over firm native soils. Exterior footings should be established at least 18 inches below the lowest adjacent grade. The recommended minimum footing depth is greater than the anticipated frost depth. Interior footings can be founded a minimum of 12 inches below the top of the first-floor slab. Isolated column and continuous wall footings should have minimum widths of 24 and 18 inches, respectively. We have assumed that the column loads will be 40 kips or less, wall loads will be 2 klf or less, and floor loads for slabs on grade will be 100 psf or less for the proposed buildings. If design loads exceed these values, our recommendations may need to be revised.

Foundation Subgrade Preparation

The subgrades beneath proposed structural elements should be prepared as described below and in the "Earthworks Recommendations" section of this report. We recommend loose or disturbed soils resulting from foundation excavation be removed before placing reinforcing steel and concrete. Foundation bearing surfaces should not be exposed to standing water. If water infiltrates and pools in the excavation, the water, along with any disturbed soil, should be removed before placing reinforcing steel and concrete. A thin gravel layer consisting of Aggregate Base or Aggregate Subbase material can be placed at the base of foundation excavations to help protect the subgrade from weather and light foot traffic. The layer thickness for the gravel layer should be determined at the time of construction but is typically 3 to 4 inches. The gravel layer should be compacted as described in the "Fill Placement and Compaction" section.

We recommend GeoEngineers observe all foundation subgrades before placing concrete forms and reinforcing steel to determine that bearing surfaces have been adequately prepared and the soil conditions are consistent with those observed during our explorations.

Bearing Capacity – Spread Footings

We recommend conventional footings be proportioned using a maximum allowable bearing pressure of 2,500 psf if supported on firm native soils below the tilled zone, or on structural fill placed over firm native soils. This bearing pressure applies to the total of dead and long-term live loads and may be increased by one-third when considering earthquake or wind loads. This is a net bearing pressure. The weight of the footing and overlying backfill can be ignored in calculating footing sizes.

Foundation Settlement

Foundations designed and constructed as recommended are expected to experience settlements of less than 1 inch. Differential settlements of up to one half of the total settlement magnitude can be expected between adjacent footings supporting comparable loads.

Lateral Resistance

The ability of the soil to resist lateral loads is a function of frictional resistance, which can develop on the base of footings and slabs, and the passive resistance, which can develop on the face of below-grade elements of the structure as these elements tend to move into the soil. For footings and floor slabs founded in accordance with the recommendations presented above, the allowable frictional resistance may be computed using a coefficient of friction of 0.30 applied to vertical dead-load forces. Our analysis indicates that the available passive earth pressure for footings confined by on-site soil and structural fill is 350 pcf, modeled as an equivalent fluid pressure. Typically, the movement required to develop the available passive resistance may be relatively large; therefore, we recommend using a reduced passive pressure of 250 pcf equivalent fluid pressure. In addition, in order to rely on passive resistance, a minimum of 10 feet of horizontal clearance must exist between the face of the footings and adjacent downslopes.

The passive earth pressure and friction components may be combined provided that the passive component does not exceed two-thirds of the total. The passive earth pressure value is based on the assumptions that the adjacent grade is level and that groundwater remains below the base of the footing throughout the year. The top foot of soil should be neglected when calculating passive lateral earth pressures unless the foundation area is covered with pavement or slab-on-grade. The lateral resistance values include a safety factor of approximately 1.5.

Drainage Considerations

We recommend the ground surface be sloped away from the buildings at least 2 percent. All downspouts should be tightlined away from the building foundation areas and should be discharged into a stormwater system. Downspouts should not be connected to footing drains.

Although not required based on groundwater depths observed in our explorations, if perimeter footing drains are used for below-grade structural elements or walls or to capture perched groundwater resulting from downslope cuts, they should be installed at the base of the exterior footings. The perimeter footing drains should be provided with cleanouts and should consist of at least 4-inch-diameter perforated pipe placed on a 3-inch bed of, and surrounded by, 6 inches of granular drainage material. Aggregate Base can be used for the granular pipe bedding and drainage materials provided the material has less than 3 percent passing the U.S. No. 200 sieve. The drainage material should be enclosed in a non-woven geotextile such as Mirafi 140N (or approved alternate) to prevent fine soil from migrating into the drain material. We recommend against using flexible tubing for footing drainpipes. The perimeter drains should be sloped to drain by gravity to a suitable discharge, preferably a storm drain. We recommend that the cleanouts be covered and placed in flush-mounted utility boxes. Water collected in roof downspout lines must not be routed to the footing drain lines.

Floor Slabs

Satisfactory subgrade support for floor slabs on grade supporting the planned 100 psf floor loads can be obtained provided the floor slab subgrade is described in the “Earthworks Recommendations” section of this report. Slabs should be reinforced according to their proposed use and per the structural engineer's recommendations. Subgrade support for concrete slabs can be obtained from the firm native soils underlying the tilled zone or on structural fill placed over firm native soils.

We recommend that on-grade slabs be underlain by a minimum 6-inch-thickness of Aggregate Base acting as a capillary break material to reduce the potential for moisture migration into the slab. The capillary break material should be placed as recommended in the "Fill Placement and Compaction" section of this report.

If dry on-grade slabs are required, for example at interior spaces where adhesives are used to anchor carpet or tile to the slab, a waterproof liner may be placed as a vapor barrier below the slab. The vapor barrier should be selected by the structural engineer and should be accounted for in the design floor section and mix design selection for the concrete, to accommodate the effect of the vapor barrier on concrete slab curing. Load-bearing concrete slabs should be designed assuming a modulus of subgrade reaction (k) of 150 psi per inch. We estimate that concrete slabs constructed as recommended will settle less than ½ inch. Floor slab subgrades should be evaluated according to the "Subgrade Evaluation" section of this report.

Conventional Retaining Walls

Drainage

Positive drainage is imperative behind retaining structures. This can be accomplished by providing a drainage zone behind the wall consisting of free-draining material and perforated pipes to collect and dispose the water. The drainage material should consist of Aggregate Base having less than 3 percent passing the U.S. No. 200 sieve. The wall drainage zone should extend horizontally at least 18 inches from the back of the wall.

A perforated smooth-walled rigid drainpipe having a minimum diameter of 4 inches should be placed at the bottom of the drainage zone along the entire length of the wall, with the pipe invert at or below the base of the wall footing. The drainpipes should discharge to a tightline leading to an appropriate collection and disposal system. An adequate number of cleanouts should be incorporated into the design of the drains to provide access for regular maintenance. Roof downspouts, perimeter drains, or other types of drainage systems should not be connected to retaining wall drain systems.

Design Parameters

The pressures presented assume that backfill placed within 2 feet of the wall is compacted by hand-operated equipment to a density of 90 percent of the MDD and that wall drainage measures are included as previously recommended. For walls constructed as described above, we recommend using an active lateral earth pressure corresponding to an equivalent fluid density of 35 pcf for the level backfill condition. For walls with backfill sloping upward behind the wall at 2H:1V, an equivalent fluid density of 55 pcf should be used. This assumes that the tops of the walls are not structurally restrained and are free to rotate. For the at-rest condition (walls restrained from movement at the top) an equivalent fluid density of 55 pcf should be used for design. For seismic conditions, we recommend a uniform lateral pressure of 4H (where H is the height of the wall) psf be added to these lateral pressures. If the retaining system is designed as a braced system but is expected to yield a small amount during a seismic event, an active earth pressure condition may be assumed and combined with the uniform seismic surcharge pressure.

The recommended pressures do not include the effects of surcharges from surface loads. If vehicles will be operated within one-half the height of the wall, a traffic surcharge should be added to the wall pressure. The traffic surcharge can be approximated by the equivalent weight of an additional 2 feet of backfill behind the wall. Additional surcharge loading conditions should also be considered on a case-by-case basis.

Retaining walls founded on native soil, or structural fill extending to these materials, may be designed using the allowable soil bearing values and lateral resistance values presented above in the "Shallow Foundations" section of this report. We estimate settlement of retaining structures will be similar to the values previously presented for building foundations.

Seismic Design

We recommend seismic design be performed using the procedure outlined in the 2012/2015 IBC and the 2014 OSSC. The parameters provided in Table 7 are based on the conditions encountered during our subsurface exploration program and should be used in preparation of response spectra for the proposed structures.

TABLE 7. SEISMIC DESIGN PARAMETERS

Parameter	Value
Site Class	D
Spectral Response Acceleration, S_s	0.95 g
Spectral Response Acceleration, S_1	0.43 g
Site Coefficient, F_a	1.12
Site Coefficient, F_v	1.57
Spectral Response Acceleration (Short Period), S_{DS}	0.71 g
Spectral Response Acceleration (1-Second Period) S_{D1}	0.45 g

Liquefaction Potential

Liquefaction is a phenomenon caused by a rapid increase in pore water pressure that reduces the effective stress between soil particles to near zero. The excessive buildup of pore water pressure results in the sudden loss of shear strength in a soil. Granular soil, which relies on interparticle friction for strength, is susceptible to liquefaction until the excess pore pressures can dissipate. Sand boils and flows observed at the ground surface after an earthquake are the result of excess pore pressures dissipating upwards, carrying soil particles with the draining water. In general, loose, saturated sand soil with low silt and clay contents is the most susceptible to liquefaction. Low plasticity, silty sand may be moderately susceptible to liquefaction under relatively higher levels of ground shaking.

Based on our analysis, the site soils are not prone to liquefaction during the design level earthquake. Accordingly, lateral spreading or liquefaction induced deformations are not expected.

DESIGN REVIEW AND CONSTRUCTION SERVICES

Recommendations provided in this report are based on the assumptions and preliminary design information stated herein. We welcome the opportunity to review and discuss construction plans and specifications for this project as they are being developed. In addition, GeoEngineers should be retained to review the geotechnical-related portions of the plans and specifications to evaluate whether they are in conformance with the recommendations provided in this report.

Satisfactory foundation and earthwork performance depends to a large degree on quality of construction. Sufficient monitoring of the contractor's activities is a key part of determining that the work is completed in accordance with the construction drawings and specifications. Subsurface conditions observed during construction should be compared with those encountered during the subsurface explorations. Recognition of changed conditions often requires experience; therefore, qualified personnel should visit the site with sufficient frequency to detect whether subsurface conditions change significantly from those anticipated.

We recommend that GeoEngineers be retained to observe construction at the site to confirm that subsurface conditions are consistent with the site explorations, and to confirm that the intent of project plans and specifications relating to earthwork, pavement and foundation construction are being met.

LIMITATIONS

We have prepared this report for the exclusive use of 3J Consulting, Inc., J.T. Smith Companies and their authorized agents and/or regulatory agencies for the proposed Crestview Crossing Development at located north of Hwy 99W between Vittoria Way and North Harmony Way in Newberg, Oregon.

This report is not intended for use by others and the information contained herein is not applicable to other sites. No other party may rely on the product of our services unless we agree in advance and in writing to such reliance.

Within the limitations of scope, schedule, and budget, our services have been executed in accordance with generally accepted practices in the area at the time this report was prepared. No warranty or other conditions, express or implied, should be understood.

Please refer to Appendix C titled "Report Limitations and Guidelines for Use" for additional information pertaining to use of this report.

REFERENCES

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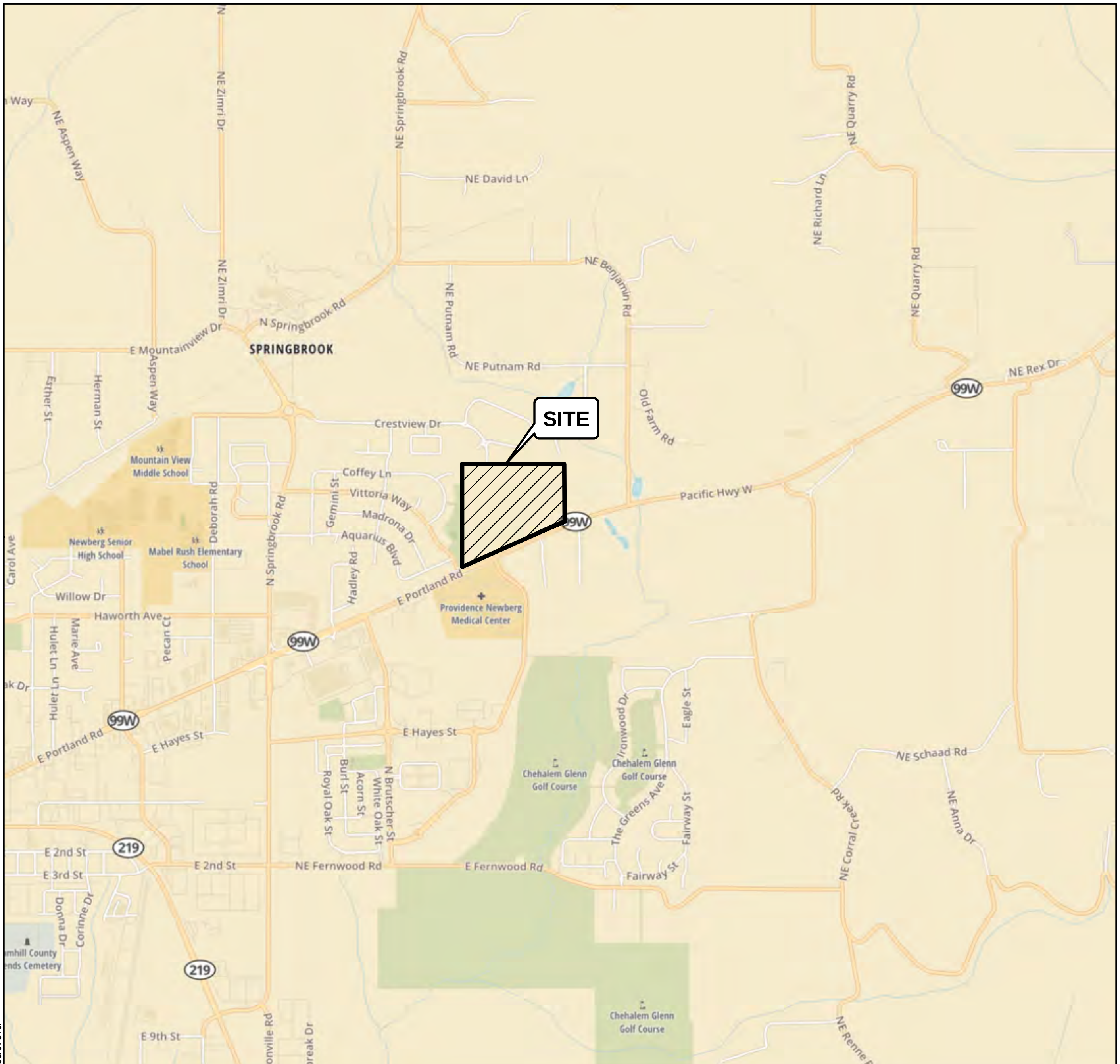
FIGURES



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Feet

Vicinity Map

Crestview Crossing
Newberg, Oregon

GEOENGINEERS

Figure 1

Notes:

1. The locations of all features shown are approximate.
2. This drawing is for information purposes. It is intended to assist in showing features discussed in an attached document. GeoEngineers, Inc. cannot guarantee the accuracy and content of electronic files. The master file is stored by GeoEngineers, Inc. and will serve as the official record of this communication.

Data Source: Mapbox Open Street Map, 2017

Projection: NAD 1983 UTM Zone 10N

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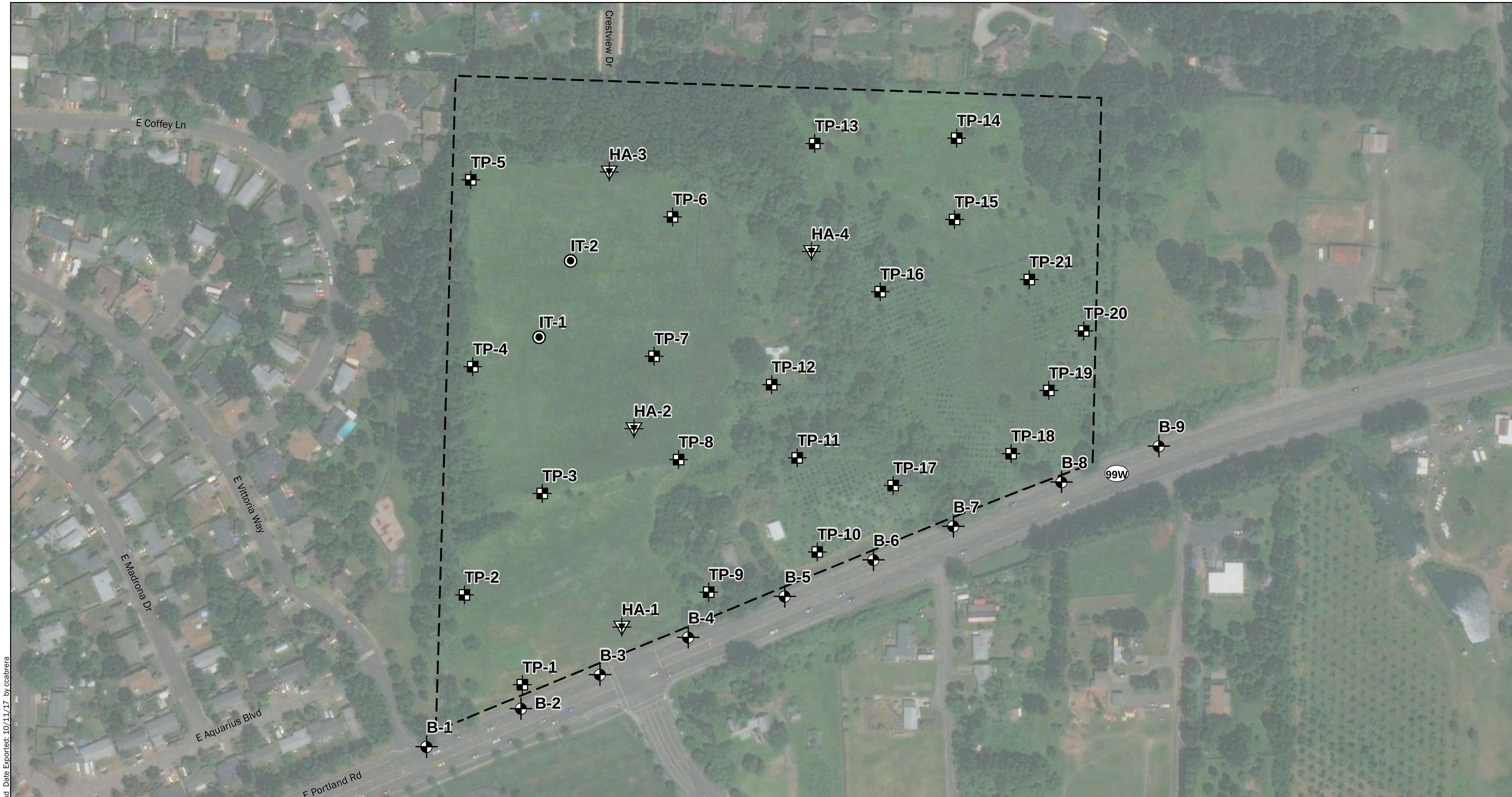

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Notes:

1. The locations of all features shown are approximate.
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Data Source: Aerial from ESRI ArcGIS Online.
Base image from 3J Consulting, August 8, 2017.

Projection: NAD 1983 HARN StatePlane Oregon North FIPS 3601 IntlFeet

Legend

- B-1 Boring Number and Approximate Location
- HA-1 Hand Auger Number and Approximate Location
- IT-1 Infiltration Test Number and Approximate Location
- TP-1 Test Pit Number and Approximate Location
- Project Approximate Extents

N W E S

200 0 200

Feet

Site Plan

Crestview Crossing
Newberg, Oregon

GeoEngineers

Figure 2

APPENDICES

APPENDIX A
Field Explorations and Laboratory Testing

APPENDIX A
FIELD EXPLORATIONS AND LABORATORY TESTING

Field Explorations

Soil and groundwater conditions at the proposed Crestview Crossing Development locations were explored on August 20, 21 and 26, 2017, by completing nine borings (B-1 through B-9), twenty-one test pits (TP-1 through TP-21), four hand augers (HA-1 through HA-4), two infiltration tests (IT-1 and IT-2) and eight DCP soundings. Boring depths extended between 4 and 6½ feet bgs, test pits were extended to depths between 8 and 12 feet bgs, hand augers were extended to depth between 3 and 4½ feet bgs, and DCP soundings were extended to depths between 3 and 4 feet bgs at the approximate locations shown in Figure 2.

The borings were advanced using solid stem drilling techniques using a trailer-mounted drill rig owned and operated by Dan Fischer Excavating of Banks, Oregon. Test pits were excavated using a mini-excavator owned and operated by K&E Excavating out of Salem, Oregon.

The drilling was continuously monitored by a staff engineer from our office who maintained a detailed log of subsurface explorations, visually classified the soil encountered and obtained representative soil samples from the borings. Representative soil samples were obtained from each boring at approximate 2½- to 5-foot-depth intervals using a standard split spoon sampler. The samplers were driven into the soil using an automatic 140-pound hammer, free-falling 30 inches on each blow. The number of blows required to drive the sampler each of three, 6-inch increments of penetration were recorded in the field. The sum of the blow counts for the last two, 6-inch increments of penetration is reported on the boring logs as the ASTM D 1556 Standard Penetration Test (SPT) N-value.

The test pit excavations were continuously monitored by an engineer from our office who maintained a detailed log of subsurface explorations, visually classified the soil encountered and obtained representative soil samples from the test pits, from the sidewalls above a depth of 4 feet bgs and from excavation spoil below that depth.

DCP soundings were performed by a staff geotechnical engineer from our office who recorded blow count versus cumulative penetration depth. This penetration resistance data was compared to the nearby borings where a detailed log of subsurface explorations was maintained, the soils encountered were visually classified and representative soil samples from the borings were obtained. The results of the DCP soundings are presented in Figures A-3 through A-10.

Recovered soil samples from exploratory borings were visually classified in the field in general accordance with ASTM D 2488 and the classification chart listed in Key to Exploration Logs, Figure A-1. Logs of the borings are presented in Figures A-2 through A-10. Logs of the test pits are presented in Figures A-11 through A-31. Logs of the hand augers are presented in Figures A-32 through A-35. The logs are based on interpretation of the field and laboratory data and indicate the depth at which subsurface materials or their characteristics change, although these changes might actually be gradual.

Laboratory Testing

Soil samples obtained from the explorations were visually classified in the field and in our laboratory using the USCS and ASTM classification methods. ASTM Test Method D 2488 was used to visually classify the soil samples, while ASTM D 2487 was used to classify the soils based on laboratory tests results. Moisture content tests were performed in general accordance with ASTM D 2216-05. Atterberg limits test (ASTM 4813) were completed on representative soil samples. Results of the moisture contents testing are presented in the appropriate exploration logs at the respective sample depths and the Atterberg limits results in Figure A-36 in this appendix.

SOIL CLASSIFICATION CHART

MAJOR DIVISIONS			SYMBOLS GRAPH	SYMBOLS LETTER	TYPICAL DESCRIPTIONS
COARSE GRAINED SOILS MORE THAN 50% RETAINED ON NO. 200 SIEVE	GRAVEL AND GRAVELLY SOILS MORE THAN 50% OF COARSE FRACTION RETAINED ON NO. 4 SIEVE	CLEAN GRAVELS (LITTLE OR NO FINES)		GW	WELL-GRADED GRAVELS, GRAVEL - SAND MIXTURES
				GP	POORLY-GRADED GRAVELS, GRAVEL - SAND MIXTURES
		GRAVELS WITH FINES (APPRECIABLE AMOUNT OF FINES)		GM	SILTY GRAVELS, GRAVEL - SAND - SILT MIXTURES
				GC	CLAYEY GRAVELS, GRAVEL - SAND - CLAY MIXTURES
	SAND AND SANDY SOILS MORE THAN 50% OF COARSE FRACTION PASSING ON NO. 4 SIEVE	CLEAN SANDS (LITTLE OR NO FINES)		SW	WELL-GRADED SANDS, GRAVELLY SANDS
				SP	POORLY-GRADED SANDS, GRAVELLY SAND
		SANDS WITH FINES (APPRECIABLE AMOUNT OF FINES)		SM	SILTY SANDS, SAND - SILT MIXTURES
				SC	CLAYEY SANDS, SAND - CLAY MIXTURES
FINE GRAINED SOILS MORE THAN 50% PASSING NO. 200 SIEVE	SILTS AND CLAYS	LIQUID LIMIT LESS THAN 50		ML	INORGANIC SILTS, ROCK FLOUR, CLAYEY SILTS WITH SLIGHT PLASTICITY
				CL	INORGANIC CLAYS OF LOW TO MEDIUM PLASTICITY, GRAVELLY CLAYS, SANDY CLAYS, SILTY CLAYS, LEAN CLAYS
				OL	ORGANIC SILTS AND ORGANIC SILTY CLAYS OF LOW PLASTICITY
	SILTS AND CLAYS	LIQUID LIMIT GREATER THAN 50		MH	INORGANIC SILTS, MICACEOUS OR DIATOMACEOUS SILTY SOILS
				CH	INORGANIC CLAYS OF HIGH PLASTICITY
				OH	ORGANIC CLAYS AND SILTS OF MEDIUM TO HIGH PLASTICITY
HIGHLY ORGANIC SOILS				PT	PEAT, HUMUS, SWAMP SOILS WITH HIGH ORGANIC CONTENTS

NOTE: Multiple symbols are used to indicate borderline or dual soil classifications

ADDITIONAL MATERIAL SYMBOLS

SYMBOLS GRAPH	SYMBOLS LETTER	TYPICAL DESCRIPTIONS
	AC	Asphalt Concrete
	CC	Cement Concrete
	CR	Crushed Rock/ Quarry Spalls
	SOD	Sod/Forest Duff
	TS	Topsoil

Groundwater Contact

Measured groundwater level in exploration, well, or piezometer

Measured free product in well or piezometer

Graphic Log Contact

Distinct contact between soil strata

Approximate contact between soil strata

Material Description Contact

Contact between geologic units

Contact between soil of the same geologic unit

Sampler Symbol Descriptions

2.4-inch I.D. split barrel

Standard Penetration Test (SPT)

Shelby tube

Piston

Direct-Push

Bulk or grab

Continuous Coring

Blowcount is recorded for driven samplers as the number of blows required to advance sampler 12 inches (or distance noted). See exploration log for hammer weight and drop.

"P" indicates sampler pushed using the weight of the drill rig.

"WOH" indicates sampler pushed using the weight of the hammer.

Laboratory / Field Tests

%F	Percent fines
%G	Percent gravel
AL	Atterberg limits
CA	Chemical analysis
CP	Laboratory compaction test
CS	Consolidation test
DD	Dry density
DS	Direct shear
HA	Hydrometer analysis
MC	Moisture content
MD	Moisture content and dry density
Mohs	Mohs hardness scale
OC	Organic content
PM	Permeability or hydraulic conductivity
PI	Plasticity index
PP	Pocket penetrometer
SA	Sieve analysis
TX	Triaxial compression
UC	Unconfined compression
VS	Vane shear

Sheen Classification

NS	No Visible Sheen
SS	Slight Sheen
MS	Moderate Sheen
HS	Heavy Sheen

NOTE: The reader must refer to the discussion in the report text and the logs of explorations for a proper understanding of subsurface conditions. Descriptions on the logs apply only at the specific exploration locations and at the time the explorations were made; they are not warranted to be representative of subsurface conditions at other locations or times.

Key to Exploration Logs

GEOENGINEERS

Figure A-1

Drilled	Start 9/21/2017	End 9/21/2017	Total Depth (ft)	6.5	Logged By TAP / Checked By TAP	Driller	Dan Fischer Excavating, Inc.	Drilling Method	Solid-stem Auger

Surface Elevation (ft) / Vertical Datum	220 / NAVD88	Hammer Data	Rope & Cathead / 140 (lbs) / 30 (in) Drop	Drilling Equipment	Portable Beaver Drill Trailer Mounted
Easting (X) / Northing (Y)	7575194 / 608424	System Datum	OR State Plane North / NAD83 (feet)	Groundwater not observed at time of exploration	

Notes:

Elevation (feet)	Depth (feet)	FIELD DATA: Interval	Recovered (in)	Blows/foot	Collected Sample	Sample Name / Testing	Graphic Log	Group Classification	MATERIAL DESCRIPTION	Moisture Content (%)	Fines Content (%)	REMARKS
	0							AC	7 inches asphalt			
								GM	11 inches brown silty gravel with sand (fill)			
			18	11		1 / MC		ML	Gray silt with sand (stiff, moist)	19		
215	5		18	9		2						

Note: See Figure A-1 for explanation of symbols.
Coordinates Data Source: Horizontal approximated based on Aerial Imagery, Vertical approximated based on DEM

Log of Boring B-1/C-1

GeoEngineers

Project: Crestview Crossing
Project Location: Newberg, Oregon
Project Number: 6748-002-00

Drilled	Start 9/21/2017	End 9/21/2017	Total Depth (ft)	6.5	Logged By TAP / Checked By TAP	Driller	Dan Fischer Excavating, Inc.	Drilling Method	Solid-stem Auger

Surface Elevation (ft) / Vertical Datum	218 / NAVD88	Hammer Data	Rope & Cathead / 140 (lbs) / 30 (in) Drop	Drilling Equipment	Portable Beaver Drill Trailer Mounted
Easting (X) / Northing (Y)	7575389 / 608503	System Datum	OR State Plane North / NAD83 (feet)	Groundwater not observed at time of exploration	

Notes:

Elevation (feet)	Depth (feet)	FIELD DATA: Interval	Recovered (in)	Blows/foot	Collected Sample	Sample Name / Testing	Graphic Log	Group Classification	MATERIAL DESCRIPTION	Moisture Content (%)	Fines Content (%)	REMARKS
	0							AC	5½ inches asphalt			
								GM	13 inches silty gravel with sand (fill)			
			18	13		1						PP = 4 tsf
								ML	Brown silt with trace sand (stiff, moist)			
215												
	5		18	6		2			Becomes medium stiff			PP = 1.5 tsf

Note: See Figure A-1 for explanation of symbols.
Coordinates Data Source: Horizontal approximated based on Aerial Imagery, Vertical approximated based on DEM

Log of Boring B-2/C-2

GeoEngineers

Project: Crestview Crossing
Project Location: Newberg, Oregon
Project Number: 6748-002-00

Drilled	Start 9/21/2017	End 9/21/2017	Total Depth (ft)	6.5	Logged By TAP	Checked By TAP	Driller	Dan Fischer Excavating, Inc.	Drilling Method	Solid-stem Auger

Surface Elevation (ft) / Vertical Datum	211 / NAVD88	Hammer Data	Rope & Cathead / 140 (lbs) / 30 (in) Drop	Drilling Equipment	Portable Beaver Drill Trailer Mounted
Easting (X) / Northing (Y)	7575553 / 608574	System Datum	OR State Plane North / NAD83 (feet)	Groundwater not observed at time of exploration	

Notes:

Elevation (feet)	Depth (feet)	FIELD DATA: Interval	Recovered (in)	Blows/foot	Collected Sample	Sample Name / Testing	Graphic Log	Group Classification	MATERIAL DESCRIPTION	Moisture Content (%)	Fines Content (%)	REMARKS
	0							AC	4½ inches asphalt			
210								GM	8½ inches silty fine to coarse gravel with sand (fill)			
								ML	Brown silt with trace sand (medium stiff, moist)			
			18	7		1 / AL				32		AL (LL = 39; PI = 14)
	5		18	5		2						
205												

Note: See Figure A-1 for explanation of symbols.
Coordinates Data Source: Horizontal approximated based on Aerial Imagery, Vertical approximated based on DEM

Log of Boring B-3/C-3

GEOENGINEERS

Project: Crestview Crossing
Project Location: Newberg, Oregon
Project Number: 6748-002-00

Date:11/1/17 Path:P:\6\6748002\GINT\674800200.GPJ DBLibrary/Library:GEOENGINEERS_DF_STD_US_JUNE_2017.GLB/GEI8_GEOTECH_STANDARD_%F_NO_GW

Drilled	Start 9/21/2017	End 9/21/2017	Total Depth (ft) 6.5	Logged By TAP / Checked By TAP	Driller Dan Fischer Excavating, Inc.	Drilling Method Solid-stem Auger

Surface Elevation (ft) / Vertical Datum	213 / NAVD88	Hammer Data	Rope & Cathead / 140 (lbs) / 30 (in) Drop	Drilling Equipment	Portable Beaver Drill Trailer Mounted
Easting (X) / Northing (Y)	7575736 / 608651	System Datum	OR State Plane North / NAD83 (feet)	Groundwater not observed at time of exploration	

Notes:

Elevation (feet)	Depth (feet)	FIELD DATA: Interval	Recovered (in)	Blows/foot	Collected Sample	Sample Name / Testing	Graphic Log	Group Classification	MATERIAL DESCRIPTION	Moisture Content (%)	Fines Content (%)	REMARKS
	0							AC	3 inches asphalt			
								GM	26 inches silty fine to coarse gravel with sand (fill)			
			4	7		1						
210								ML	Brown silt (medium stiff, moist)			
	5		18	7		2			Becomes red brown			

Note: See Figure A-1 for explanation of symbols.
Coordinates Data Source: Horizontal approximated based on Aerial Imagery, Vertical approximated based on DEM

Log of Boring B-4/C-4

GeoEngineers

Project: Crestview Crossing
Project Location: Newberg, Oregon
Project Number: 6748-002-00

Figure A-5
Sheet 1 of 1

Drilled	Start 9/21/2017	End 9/21/2017	Total Depth (ft) 6.5	Logged By TAP / Checked By TAP	Driller Dan Fischer Excavating, Inc.	Drilling Method Solid-stem Auger

Surface Elevation (ft) / Vertical Datum: 202 / NAVD88	Hammer Data: Rope & Cathead, 140 (lbs) / 30 (in) Drop	Drilling Equipment: Portable Beaver Drill Trailer Mounted	
Easting (X) / Northing (Y): 7575936 / 608735	System Datum: OR State Plane North, NAD83 (feet)	Groundwater not observed at time of exploration	

Notes:

Elevation (feet)	Depth (feet)	FIELD DATA: Interval	Recovered (in)	Blows/foot	Collected Sample	Sample Name / Testing	Graphic Log	Group Classification	MATERIAL DESCRIPTION	Moisture Content (%)	Fines Content (%)	REMARKS
	0							AC	5½ inches asphalt			
								GM	16½ inches silty fine to coarse gravel with sand (fill)			
200			18	7		1		ML	Brown silt with trace sand (medium stiff, moist)			PP = 2 tsf
	5			4		MC				33		PP = 1 tsf

Note: See Figure A-1 for explanation of symbols.
Coordinates Data Source: Horizontal approximated based on Aerial Imagery, Vertical approximated based on DEM

Log of Boring B-5/C-5

GEOENGINEERS

Project: Crestview Crossing
Project Location: Newberg, Oregon
Project Number: 6748-002-00

Drilled	Start 9/21/2017	End 9/21/2017	Total Depth (ft)	6.5	Logged By TAP / Checked By TAP	Driller	Dan Fischer Excavating, Inc.	Drilling Method	Solid-stem Auger

Surface Elevation (ft) / Vertical Datum	200 / NAVD88	Hammer Data	Rope & Cathead 140 (lbs) / 30 (in) Drop	Drilling Equipment	Portable Beaver Drill Trailer Mounted
Easting (X) / Northing (Y)	7576120 / 608811	System Datum	OR State Plane North NAD83 (feet)	Groundwater not observed at time of exploration	

Notes:

Elevation (feet)	Depth (feet)	FIELD DATA: Interval	Recovered (in)	Blows/foot	Collected Sample	Sample Name / Testing	Graphic Log	Group Classification	MATERIAL DESCRIPTION	Moisture Content (%)	Fines Content (%)	REMARKS
	0							AC	9½ inches asphalt			
								GP	11½ inches brown fine gravel with sand, trace silt (fill)			
			18	8		1		ML	Brown silt with trace sand (medium stiff, moist)			PP = 2.5 tsf
195	5			6		2			Becomes clayey silt			PP 1.25 tsf

Note: See Figure A-1 for explanation of symbols.
Coordinates Data Source: Horizontal approximated based on Aerial Imagery, Vertical approximated based on DEM

Log of Boring B-6/C-6

GeoEngineers

Project: Crestview Crossing
Project Location: Newberg, Oregon
Project Number: 6748-002-00

Figure A-7
Sheet 1 of 1

Drilled	Start 9/21/2017	End 9/21/2017	Total Depth (ft)	4.5	Logged By TAP / Checked By TAP	Driller	Dan Fischer Excavating, Inc.	Drilling Method	Solid-stem Auger

Surface Elevation (ft) / Vertical Datum	190 / NAVD88	Hammer Data	Rope & Cathead / 140 (lbs) / 30 (in) Drop	Drilling Equipment	Portable Beaver Drill Trailer Mounted
Easting (X) / Northing (Y)	7576285 / 608880	System Datum	OR State Plane North / NAD83 (feet)	Groundwater not observed at time of exploration	

Notes:

Elevation (feet)	Depth (feet)	FIELD DATA: Interval	Recovered (in)	Blows/foot	Collected Sample	Sample Name / Testing	Graphic Log	Group Classification	MATERIAL DESCRIPTION	Moisture Content (%)	Fines Content (%)	REMARKS
	0							AC	5½ inches asphalt			
								GM	19½ inches silty gravel (fill)			
				20		1 / MC		ML	Orange-brown sandy silt, trace organic matter (very stiff, dry)	32		Organic matter are roots and some burnt
												Smooth, hard drilling at 4 feet below ground surface Unable to drill past 4½ feet below ground surface. Attempt to sample 50/2" sample. Water is filling up the hole. Public works notified and observed water and stated that it was not from a utility.

Boring terminated due to refusal

Note: See Figure A-1 for explanation of symbols.
Coordinates Data Source: Horizontal approximated based on Aerial Imagery, Vertical approximated based on DEM

Log of Boring B-7/C-7

GeoEngineers

Project: Crestview Crossing
Project Location: Newberg, Oregon
Project Number: 6748-002-00

Drilled	Start 9/21/2017	End 9/21/2017	Total Depth (ft) 6.5	Logged By TAP / Checked By TAP	Driller Dan Fischer Excavating, Inc.	Drilling Method Solid-stem Auger

Surface Elevation (ft) 184 / Vertical Datum NAVD88	Hammer Data: Rope & Cathead 140 (lbs) / 30 (in) Drop	Drilling Equipment: Portable Beaver Drill Trailer Mounted
Easting (X) 7576509 / Northing (Y) 608972	System Datum: OR State Plane North NAD83 (feet)	Groundwater not observed at time of exploration

Notes:

Elevation (feet)	Depth (feet)	FIELD DATA: Interval	Recovered (in)	Blows/foot	Collected Sample	Sample Name / Testing	Graphic Log	Group Classification	MATERIAL DESCRIPTION	Moisture Content (%)	Fines Content (%)	REMARKS
	0							AC	5½ inches asphalt			
								GM	17 inches silty fine to coarse gravel with sand (fill)			
			18	19		1		ML	Gray brown silt with sand (stiff, moist)			
180								GM	Gray silty fine to coarse gravel with trace sand (medium dense, moist)			
								ML	Gray silt with orange mottling (medium stiff, moist)			
	5			10		2 MC				24		

Note: See Figure A-1 for explanation of symbols.
Coordinates Data Source: Horizontal approximated based on Aerial Imagery, Vertical approximated based on DEM

Log of Boring B-8/C-8

GeoEngineers

Project: Crestview Crossing
Project Location: Newberg, Oregon
Project Number: 6748-002-00

Figure A-9
Sheet 1 of 1

	Start	End					
Drilled	9/21/2017	9/21/2017	Total Depth (ft) 4	Logged By TAP Checked By TAP	Driller Dan Fischer Excavating, Inc.	Drilling Method	Solid-stem Auger

Surface Elevation (ft) Vertical Datum	182 NAVD88	Hammer Data	Rope & Cathead 140 (lbs) / 30 (in) Drop	Drilling Equipment	Portable Beaver Drill Trailer Mounted
Easting (X) Northing (Y)	7576711 609047	System Datum	OR State Plane North NAD83 (feet)	Groundwater not observed at time of exploration	

Notes:

Elevation (feet)	Depth (feet)	FIELD DATA: Interval	FIELD DATA: Recovered (in)	FIELD DATA: Blows/foot	FIELD DATA: Collected Sample	FIELD DATA: Sample Name / Testing	Graphic Log	Group Classification	MATERIAL DESCRIPTION	Moisture Content (%)	Fines Content (%)	REMARKS
	0							AC	5½ inches asphalt			
								GM	16½ inches brown silty fine to coarse gravel with sand (fill)			
180			18	23		1		ML	Gray brown silt with trace sand (stiff, moist) (fill)			
								GM	Gray silty gravel with sand (medium dense, moist) (fill)			
								AC	Asphalt			

Boring terminated due to presence of unlocatable utility and encountering asphalt

Note: See Figure A-1 for explanation of symbols.
Coordinates Data Source: Horizontal approximated based on Aerial Imagery, Vertical approximated based on DEM

Log of Boring B-9/C-9

GEOENGINEERS

Project: Crestview Crossing
Project Location: Newberg, Oregon
Project Number: 6748-002-00

Figure A-10
Sheet 1 of 1

Date:11/1/17 Path:P:\6\6748002\GINT\674800200.GPJ DBLibrary/Library:GEOENGINEERS_DF_STD_US_JUNE_2017.GLB/GEI8_GEOTECH_STANDARD_%F_NO_GW

Date Excavated	9/20/2017	Total Depth (ft)	11.5	Logged By	DMH	Excavator	Dan Fischer Excavating, Inc.	Groundwater not observed
				Checked By	TAP	Equipment	CAT 305 E Mini-excavator	Caving not observed

Surface Elevation (ft)	218	Easting (X)	7575392	Coordinate System	OR State Plane North
Vertical Datum	NAVD88	Northing (Y)	608552	Horizontal Datum	NAD83 (feet)

Elevation (feet)	Depth (feet)	SAMPLE: Testing Sample	SAMPLE: Sample Name / Testing	Graphic Log	Group Classification	MATERIAL DESCRIPTION	Moisture Content (%)	Fines Content (%)	REMARKS
	0				OL	Dark brown topsoil with organic matter (topsoil)			
217	1				ML	Light brown silt with trace organic matter (medium stiff, moist) (tilled zone)			
216	2		1 MC		ML	Light brown silt with trace organic matter (stiff, moist) (native)	21		
215	3								
214	4								
213	5					Becomes medium stiff			
212	6								
211	7								
210	8								
209	9								
208	10								
207	11		2						

Test pit completed at 11½ feet below ground surface

Notes: See Figure A-1 for explanation of symbols.
The depths on the test pit logs are based on an average of measurements across the test pit and should be considered accurate to ½ foot.
Coordinates Data Source: Horizontal approximated based on Aerial Imagery, Vertical approximated based on DEM

Log of Test Pit TP-1

GeoEngineers

Project: Crestview Crossing
Project Location: Newberg, Oregon
Project Number: 6748-002-00

Date Excavated	9/20/2017	Total Depth (ft)	12	Logged By DMH Checked By TAP	Excavator Dan Fischer Excavating, Inc. Equipment CAT 305 E Mini-excavator	Groundwater not observed Caving not observed

Surface Elevation (ft)	209	Easting (X)	7575272	Coordinate System	OR State Plane North
Vertical Datum	NAVD88	Northing (Y)	608739	Horizontal Datum	NAD83 (feet)

Elevation (feet)	Depth (feet)	SAMPLE: Testing Sample	SAMPLE: Sample Name Testing	Graphic Log	Group Classification	MATERIAL DESCRIPTION	Moisture Content (%)	Fines Content (%)	REMARKS
	0				OL	Dark brown topsoil with organic matter (soft, moist) (topsoil)			
208	1				ML	Light brown silt with organic matter (medium stiff, dry to moist) (tilled zone)			
207	2				ML	Light brown silt with organic matter (medium stiff, dry to moist) (native)			
206	3		1						
205	4								
204	5								
203	6								
202	7								
201	8								
200	9								
199	10					Becomes light brown with dark brown mottling			
198	11		2						
197	12		3						

Test pit completed at 12 feet below ground surface

Notes: See Figure A-1 for explanation of symbols.
The depths on the test pit logs are based on an average of measurements across the test pit and should be considered accurate to ½ foot.
Coordinates Data Source: Horizontal approximated based on Aerial Imagery, Vertical approximated based on DEM

Log of Test Pit TP-2

GeoEngineers

Project: Crestview Crossing
Project Location: Newberg, Oregon
Project Number: 6748-002-00

Date Excavated	9/21/2017	Total Depth (ft)	9.5	Logged By	DMH	Excavator	Dan Fischer Excavating, Inc.	Groundwater not observed
				Checked By	TAP	Equipment	CAT 305 E Mini-excavator	Caving not observed

Surface Elevation (ft)	207	Easting (X)	7575434	Coordinate System	OR State Plane North
Vertical Datum	NAVD88	Northing (Y)	608948	Horizontal Datum	NAD83 (feet)

Elevation (feet)	Depth (feet)	SAMPLE: Testing Sample	SAMPLE: Sample Name / Testing	Graphic Log	Group Classification	MATERIAL DESCRIPTION	Moisture Content (%)	Fines Content (%)	REMARKS
	0				OL	Dark brown topsoil with organic matter (soft, moist) (topsoil)			
206	0.5–2				ML	Gray silt with trace organic matter (stiff, dry) (tilled zone)			
205–199	2–8		1 MC		CL	Dark gray clay with trace organic matter (very stiff, dry to moist) (native)	24		
198	8–9.5		2		ML	Gray brown silt with trace fine sand (stiff, moist)			

Test pit completed at 9½ feet below ground surface

Notes: See Figure A-1 for explanation of symbols.
The depths on the test pit logs are based on an average of measurements across the test pit and should be considered accurate to ½ foot.
Coordinates Data Source: Horizontal approximated based on Aerial Imagery, Vertical approximated based on DEM

Log of Test Pit TP-3

GEOENGINEERS

Project: Crestview Crossing
Project Location: Newberg, Oregon
Project Number: 6748-002-00

Date Excavated 9/21/2017	Total Depth (ft) 10.5	Logged By DMH Checked By TAP	Excavator Dan Fischer Excavating, Inc. Equipment CAT 305 E Mini-excavator	Groundwater not observed Caving not observed

Surface Elevation (ft) 211 Vertical Datum NAVD88	Easting (X) 7575289 Northing (Y) 609211	Coordinate System OR State Plane North Horizontal Datum NAD83 (feet)

Elevation (feet)	Depth (feet)	SAMPLE: Testing Sample	SAMPLE: Sample Name Testing	Graphic Log	Group Classification	MATERIAL DESCRIPTION	Moisture Content (%)	Fines Content (%)	REMARKS
210	1				OL	Dark brown topsoil with organic matter (soft, moist) (topsoil)			
209	2				ML	Gray silt with trace organic matter (stiff, dry to moist) (tilled zone)			
208	3		1		ML	Gray silt with trace organic matter (stiff, dry to moist) (native) Becomes brown, moist			
207	4								
206	5								
205	6								
204	7								
203	8								
202	9					Becomes brown with orange mottling, with trace fine sand			
201	10		2						

Test pit completed at 10½ feet below ground surface

Notes: See Figure A-1 for explanation of symbols.
The depths on the test pit logs are based on an average of measurements across the test pit and should be considered accurate to ½ foot.
Coordinates Data Source: Horizontal approximated based on Aerial Imagery, Vertical approximated based on DEM

Log of Test Pit TP-4

GeoEngineers

Project: Crestview Crossing
Project Location: Newberg, Oregon
Project Number: 6748-002-00

Date Excavated	9/21/2017	Total Depth (ft)	11	Logged By DMH Checked By TAP	Excavator Dan Fischer Excavating, Inc. Equipment CAT 305 E Mini-excavator	Groundwater not observed Caving not observed

Surface Elevation (ft)	213	Easting (X)	7575285	Coordinate System	OR State Plane North
Vertical Datum	NAVD88	Northing (Y)	609598	Horizontal Datum	NAD83 (feet)

Elevation (feet)	Depth (feet)	SAMPLE: Testing Sample	SAMPLE: Sample Name / Testing	Graphic Log	Group Classification	MATERIAL DESCRIPTION	Moisture Content (%)	Fines Content (%)	REMARKS
213	0				OL	Dark brown topsoil with organic matter (soft, moist) (topsoil)			
212	1				ML	Brown silt with trace organic matter (stiff, dry to moist) (tilled zone)			
211	2				ML	Brown silt with trace organic matter (stiff, dry to moist) (native)			
210	3		1 AL				16		AL (LL = 44; PI = 16)
209	4								
208	5								
207	6					Becomes moist			
206	7					Becomes very stiff			
205	8								
204	9								
203	10					Grades to with trace fine sand			
202	11		2						

Test pit completed at 11 feet below ground surface

Notes: See Figure A-1 for explanation of symbols.
The depths on the test pit logs are based on an average of measurements across the test pit and should be considered accurate to ½ foot.
Coordinates Data Source: Horizontal approximated based on Aerial Imagery, Vertical approximated based on DEM

Log of Test Pit TP-5

GEOENGINEERS

Project: Crestview Crossing
Project Location: Newberg, Oregon
Project Number: 6748-002-00

Date Excavated	9/21/2017	Total Depth (ft)	10	Logged By DMH Checked By TAP	Excavator: Dan Fischer Excavating, Inc. Equipment: CAT 305 E Mini-excavator	Groundwater not observed Caving not observed

Surface Elevation (ft): 207 Vertical Datum: NAVD88	Easting (X): 7575703 Northing (Y): 609521	Coordinate System: OR State Plane North Horizontal Datum: NAD83 (feet)	

Elevation (feet)	Depth (feet)	SAMPLE: Testing Sample	SAMPLE: Sample Name / Testing	Graphic Log	Group Classification	MATERIAL DESCRIPTION	Moisture Content (%)	Fines Content (%)	REMARKS
					OL	Dark brown topsoil with organic matter (stiff, moist) (topsoil)			
206	1				ML	Gray-brown silt with trace organic matter (stiff, dry) (tilled zone)			
205	2		1 / MC		ML	Gray-brown silt with trace organic matter (stiff, dry) (native) Becomes brown, moist	21		
204	3								
203	4								
202	5								
201	6								
200	7								
199	8								
198	9								
197	10		2						

Test completed at 10 feet below ground surface

Notes: See Figure A-1 for explanation of symbols.
The depths on the test pit logs are based on an average of measurements across the test pit and should be considered accurate to ½ foot.
Coordinates Data Source: Horizontal approximated based on Aerial Imagery, Vertical approximated based on DEM

Log of Test Pit TP-6

GEOENGINEERS

Project: Crestview Crossing
Project Location: Newberg, Oregon
Project Number: 6748-002-00

Date Excavated	9/21/2017	Total Depth (ft)	10.5	Logged By	DMH	Excavator	Dan Fischer Excavating, Inc.	Groundwater not observed
				Checked By	TAP	Equipment	CAT 305 E Mini-excavator	Caving not observed

Surface Elevation (ft)	204	Easting (X)	7575665	Coordinate System	OR State Plane North
Vertical Datum	NAVD88	Northing (Y)	609233	Horizontal Datum	NAD83 (feet)

Elevation (feet)	Depth (feet)	SAMPLE: Testing Sample	SAMPLE: Sample Name Testing	Graphic Log	Group Classification	MATERIAL DESCRIPTION	Moisture Content (%)	Fines Content (%)	REMARKS
					OL	Dark brown topsoil with organic matter (soft, moist) (topsoil)			
203	1				ML	Gray-brown silt with trace organic matter (stiff, dry) (tilled zone)			
202	2				ML	Gray-brown silt with trace organic matter (stiff, moist) (native)			
201	3								
200	4		1						
199	5								
198	6								
197	7								
196	8								
195	9					Becomes gray-brown and black mottling, trace fine sand			
194	10		2						

Test pit completed at 10½ feet below ground surface

Notes: See Figure A-1 for explanation of symbols.
The depths on the test pit logs are based on an average of measurements across the test pit and should be considered accurate to ½ foot.
Coordinates Data Source: Horizontal approximated based on Aerial Imagery, Vertical approximated based on DEM

Log of Test Pit TP-7

GeoEngineers

Project: Crestview Crossing
Project Location: Newberg, Oregon
Project Number: 6748-002-00

Date Excavated	9/21/2017	Total Depth (ft)	9.5	Logged By	DMH	Excavator	Dan Fischer Excavating, Inc.	Groundwater not observed
				Checked By	TAP	Equipment	CAT 305 E Mini-excavator	Caving not observed

Surface Elevation (ft)	202	Easting (X)	7575716	Coordinate System	OR State Plane North
Vertical Datum	NAVD88	Northing (Y)	609019	Horizontal Datum	NAD83 (feet)

Elevation (feet)	Depth (feet)	SAMPLE: Testing Sample	SAMPLE: Sample Name / Testing	Graphic Log	Group Classification	MATERIAL DESCRIPTION	Moisture Content (%)	Fines Content (%)	REMARKS
202	0				OL	Dark brown topsoil with organic matter (soft, moist) (topsoil)			
201.5	0.5				ML	Gray silt with trace organic matter (stiff, dry) (tilled zone)			
200	2				CL	Dark gray clay with trace organic matter (very stiff, dry to moist)			
			1 MC				21		
195	7				ML	Gray-brown silt with orange mottling (stiff, moist)			
			2						

Test pit completed at 9½ feet below ground surface

Notes: See Figure A-1 for explanation of symbols.
The depths on the test pit logs are based on an average of measurements across the test pit and should be considered accurate to ½ foot.
Coordinates Data Source: Horizontal approximated based on Aerial Imagery, Vertical approximated based on DEM

Log of Test Pit TP-8

GeoEngineers

Project: Crestview Crossing
Project Location: Newberg, Oregon
Project Number: 6748-002-00

Date Excavated	9/21/2017	Total Depth (ft)	11.5	Logged By	DMH	Excavator	Dan Fischer Excavating, Inc.	Groundwater not observed
				Checked By	TAP	Equipment	CAT 305 E Mini-excavator	Caving not observed

Surface Elevation (ft)	210	Easting (X)	7575778	Coordinate System	OR State Plane North
Vertical Datum	NAVD88	Northing (Y)	608744	Horizontal Datum	NAD83 (feet)

Elevation (feet)	Depth (feet)	SAMPLE: Testing Sample	SAMPLE: Sample Name Testing	Graphic Log	Group Classification	MATERIAL DESCRIPTION	Moisture Content (%)	Fines Content (%)	REMARKS
	0				ML	Brown silt with organic matter (soft, moist) (topsoil)			
209	1				ML	Brown silt with organic matter (stiff, moist) (native)			
208	2					Grades to trace organic matter			
207	3		1						
206	4								
205	5								
204	6								
203	7								
202	8								
201	9								
200	10								
199	11		2						

Test pit completed at 11½ feet below ground surface

Notes: See Figure A-1 for explanation of symbols.
The depths on the test pit logs are based on an average of measurements across the test pit and should be considered accurate to ½ foot.
Coordinates Data Source: Horizontal approximated based on Aerial Imagery, Vertical approximated based on DEM

Log of Test Pit TP-9

GeoEngineers

Project: Crestview Crossing
Project Location: Newberg, Oregon
Project Number: 6748-002-00

Date Excavated	9/20/2017	Total Depth (ft)	12	Logged By	DMH	Excavator	Dan Fischer Excavating, Inc.	Groundwater not observed	
				Checked By	TAP	Equipment	CAT 305 E Mini-excavator	Caving not observed	

Surface Elevation (ft)	202	Easting (X)	7576003	Coordinate System	OR State Plane North
Vertical Datum	NAVD88	Northing (Y)	608827	Horizontal Datum	NAD83 (feet)

Elevation (feet)	Depth (feet)	SAMPLE: Testing Sample	SAMPLE: Sample Name / Testing	Graphic Log	Group Classification	MATERIAL DESCRIPTION	Moisture Content (%)	Fines Content (%)	REMARKS
	0				OL	Dark brown topsoil with organic matter (soft, dry to moist) (topsoil)			
201	1				ML	Light brown silt with organic matter (soft, dry to moist) (tilled zone)			
200	2				ML	Light brown silt (soft, dry to moist) (native)			
199	3		1 MC			Becomes to without organic matter	24		
198	4								
197	5								
196	6								
195	7					Becomes stiff			
194	8								
193	9								
192	10								
191	11								
190	12		2						

Test pit completed at 12 feet below ground surface

Notes: See Figure A-1 for explanation of symbols.
The depths on the test pit logs are based on an average of measurements across the test pit and should be considered accurate to ½ foot.
Coordinates Data Source: Horizontal approximated based on Aerial Imagery, Vertical approximated based on DEM

Log of Test Pit TP-10

GeoEngineers

Project: Crestview Crossing
Project Location: Newberg, Oregon
Project Number: 6748-002-00

Date Excavated	9/20/2017	Total Depth (ft)	11.5	Logged By	DMH	Excavator	Dan Fischer Excavating, Inc.	Groundwater not observed
				Checked By	TAP	Equipment	CAT 305 E Mini-excavator	Caving not observed

Surface Elevation (ft)	194	Easting (X)	7575961	Coordinate System	OR State Plane North
Vertical Datum	NAVD88	Northing (Y)	609022	Horizontal Datum	NAD83 (feet)

Elevation (feet)	Depth (feet)	SAMPLE: Testing Sample	SAMPLE: Sample Name Testing	Graphic Log	Group Classification	MATERIAL DESCRIPTION	Moisture Content (%)	Fines Content (%)	REMARKS
					OL	Dark brown topsoil with organic matter (topsoil)			
193	1				ML	Light brown silt with organic matter (medium stiff, dry to moist) (tilled zone)			
192	2				ML	Light brown silt (medium stiff, dry to moist) (native)			
191	3		1			Becomes light brown-gray with black mottling			
190	4								
189	5								
188	6								
187	7								
186	8								
185	9								
184	10								
183	11		2						

Test pit completed at 11½ feet below ground surface

Notes: See Figure A-1 for explanation of symbols.
The depths on the test pit logs are based on an average of measurements across the test pit and should be considered accurate to ½ foot.
Coordinates Data Source: Horizontal approximated based on Aerial Imagery, Vertical approximated based on DEM

Log of Test Pit TP-11

GEOENGINEERS

Project: Crestview Crossing
Project Location: Newberg, Oregon
Project Number: 6748-002-00

Date Excavated	9/20/2017	Total Depth (ft)	8	Logged By DMH Checked By TAP	Excavator Dan Fischer Excavating, Inc. Equipment CAT 305 E Mini-excavator	Groundwater not observed Caving not observed

Surface Elevation (ft) 198 Vertical Datum NAVD88	Easting (X) 7575909 Northing (Y) 609174	Coordinate System OR State Plane North Horizontal Datum NAD83 (feet)	

Elevation (feet)	Depth (feet)	SAMPLE: Testing Sample	SAMPLE: Sample Name / Testing	Graphic Log	Group Classification	MATERIAL DESCRIPTION	Moisture Content (%)	Fines Content (%)	REMARKS
					OL	Dark brown topsoil with organic matter (topsoil)			
197	1				ML	Brown silt with organic matter (medium stiff, moist) (tilled zone)			
196	2				ML	Brown silt (medium stiff, moist) (native)			
195	3								
194	4								
193	5								
192	6								
191	7								
190	8		1 AL				31		AL (LL = 33; PI = 5)

Test pit completed at 8 feet below ground surface

Notes: See Figure A-1 for explanation of symbols.
The depths on the test pit logs are based on an average of measurements across the test pit and should be considered accurate to ½ foot.
Coordinates Data Source: Horizontal approximated based on Aerial Imagery, Vertical approximated based on DEM

Log of Test Pit TP-12

GEOENGINEERS

Project: Crestview Crossing
Project Location: Newberg, Oregon
Project Number: 6748-002-00

Figure A-22
Sheet 1 of 1

Date Excavated	9/20/2017	Total Depth (ft)	8.5	Logged By	DMH	Excavator	Dan Fischer Excavating, Inc.	Groundwater not observed
				Checked By	TAP	Equipment	CAT 305 E Mini-excavator	Caving not observed

Surface Elevation (ft)	206	Easting (X)	7575998	Coordinate System	OR State Plane North
Vertical Datum	NAVD88	Northing (Y)	609673	Horizontal Datum	NAD83 (feet)

Elevation (feet)	Depth (feet)	SAMPLE: Testing Sample	SAMPLE: Sample Name / Testing	Graphic Log	Group Classification	MATERIAL DESCRIPTION	Moisture Content (%)	Fines Content (%)	REMARKS
					OL	Dark brown topsoil with organic matter (topsoil)			
205	1				ML	Gray-brown silt with organic matter (medium dense, dry to moist) (tilled zone)			
204	2				ML	Gray-brown silt (medium dense, dry to moist) (native)			
203	3								
202	4								
201	5								
200	6					Becomes moist			
199	7								
198	8		1						

Notes: See Figure A-1 for explanation of symbols.
The depths on the test pit logs are based on an average of measurements across the test pit and should be considered accurate to ½ foot.
Coordinates Data Source: Horizontal approximated based on Aerial Imagery, Vertical approximated based on DEM

Log of Test Pit TP-13

GeoEngineers

Project: Crestview Crossing
Project Location: Newberg, Oregon
Project Number: 6748-002-00

Figure A-23
Sheet 1 of 1

Date Excavated 9/20/2017	Total Depth (ft) 9	Logged By DMH Checked By TAP	Excavator Dan Fischer Excavating, Inc. Equipment CAT 305 E Mini-excavator	Groundwater not observed Caving not observed

Surface Elevation (ft) 205 Vertical Datum NAVD88	Easting (X) 7576292 Northing (Y) 609684	Coordinate System OR State Plane North Horizontal Datum NAD83 (feet)

Elevation (feet)	Depth (feet)	SAMPLE: Testing Sample	SAMPLE: Sample Name Testing	Graphic Log	Group Classification	MATERIAL DESCRIPTION	Moisture Content (%)	Fines Content (%)	REMARKS
	0				OL	Dark brown topsoil with organic matter (topsoil)			
204	1				ML	Brown silt with organic matter (medium stiff, moist) (tilled zone)			
203	2				ML	Brown silt (medium stiff, moist) (native)			
202	3								
201	4								
200	5								
199	6								
198	7								
197	8								
196	9		1 AL				30		AL (LL = 41; PI = 17)

Test pit completed at 9 feet below ground surface

Notes: See Figure A-1 for explanation of symbols.
The depths on the test pit logs are based on an average of measurements across the test pit and should be considered accurate to ½ foot.
Coordinates Data Source: Horizontal approximated based on Aerial Imagery, Vertical approximated based on DEM

Log of Test Pit TP-14

GeoEngineers

Project: Crestview Crossing
Project Location: Newberg, Oregon
Project Number: 6748-002-00

Date Excavated	9/20/2017	Total Depth (ft)	9	Logged By	DMH	Excavator	Dan Fischer Excavating, Inc.	Groundwater not observed
				Checked By	TAP	Equipment	CAT 305 E Mini-excavator	Caving not observed

Surface Elevation (ft)	201	Easting (X)	7576287	Coordinate System	OR State Plane North
Vertical Datum	NAVD88	Northing (Y)	609516	Horizontal Datum	NAD83 (feet)

Elevation (feet)	Depth (feet)	SAMPLE: Testing Sample	SAMPLE: Sample Name / Testing	Graphic Log	Group Classification	MATERIAL DESCRIPTION	Moisture Content (%)	Fines Content (%)	REMARKS
	0				OL	Dark brown topsoil with organic matter (topsoil)			
200	1				ML	Gray silt with organic matter (medium stiff, dry) (tilled zone)			
199	2				ML	Gray silt (medium stiff, dry) (native)			
198	3								
197	4					Becomes gray-brown, moist			
196	5								
195	6								
194	7								
193	8								
192	9		1 MC				36		

Test pit completed at 9 feet below ground surface

Notes: See Figure A-1 for explanation of symbols.
The depths on the test pit logs are based on an average of measurements across the test pit and should be considered accurate to ½ foot.
Coordinates Data Source: Horizontal approximated based on Aerial Imagery, Vertical approximated based on DEM

Log of Test Pit TP-15

GeoEngineers

Project: Crestview Crossing
Project Location: Newberg, Oregon
Project Number: 6748-002-00

Date Excavated	9/20/2017	Total Depth (ft)	8.5	Logged By	DMH	Excavator	Dan Fischer Excavating, Inc.	Groundwater not observed
				Checked By	TAP	Equipment	CAT 305 E Mini-excavator	Caving not observed

Surface Elevation (ft)	196	Easting (X)	7576133	Coordinate System	OR State Plane North
Vertical Datum	NAVD88	Northing (Y)	609366	Horizontal Datum	NAD83 (feet)

Elevation (feet)	Depth (feet)	SAMPLE: Testing Sample	SAMPLE: Sample Name / Testing	Graphic Log	Group Classification	MATERIAL DESCRIPTION	Moisture Content (%)	Fines Content (%)	REMARKS
	0				OL	Dark brown topsoil with organic matter (topsoil)			
195	1				ML	Brown silt with organic matter (medium stiff, moist) (tilled zone)			
194	2				ML	Brown silt (medium stiff, moist) (native)			
193	3								
192	4								
191	5								
190	6								
189	7								
188	8		1 MC				34		

Test pit completed at 8½ feet below ground surface

Notes: See Figure A-1 for explanation of symbols.
The depths on the test pit logs are based on an average of measurements across the test pit and should be considered accurate to ½ foot.
Coordinates Data Source: Horizontal approximated based on Aerial Imagery, Vertical approximated based on DEM

Log of Test Pit TP-16

GeoEngineers

Project: Crestview Crossing
Project Location: Newberg, Oregon
Project Number: 6748-002-00

Date Excavated	9/20/2017	Total Depth (ft)	11.5	Logged By: DMH Checked By: TAP	Excavator: Dan Fischer Excavating, Inc. Equipment: CAT 305 E Mini-excavator	Groundwater not observed Caving not observed

Surface Elevation (ft)	193	Easting (X)	7576160	Coordinate System	OR State Plane North
Vertical Datum	NAVD88	Northing (Y)	608965	Horizontal Datum	NAD83 (feet)

Elevation (feet)	Depth (feet)	SAMPLE: Testing Sample	SAMPLE: Sample Name Testing	Graphic Log	Group Classification	MATERIAL DESCRIPTION	Moisture Content (%)	Fines Content (%)	REMARKS
	0				OL	Dark brown topsoil with organic matter (topsoil)			
192	1				ML	Brown silt with organic matter (soft, dry to moist) (tilled zone)			
191	2				ML	Brown silt (soft, dry to moist) (native)			
190	3		1 MC				23		
189	4								
188	5					Becomes soft, moist			
187	6								
186	7								
185	8					Becomes gray-brown with black mottling (soft, moist)			
184	9								
183	10		2						
182	11		3			Becomes light brown with orange mottling			

Test pit completed at 11½ feet below ground surface

Notes: See Figure A-1 for explanation of symbols.
The depths on the test pit logs are based on an average of measurements across the test pit and should be considered accurate to ½ foot.
Coordinates Data Source: Horizontal approximated based on Aerial Imagery, Vertical approximated based on DEM

Log of Test Pit TP-17

GEOENGINEERS

Project: Crestview Crossing
Project Location: Newberg, Oregon
Project Number: 6748-002-00

Figure A-27
Sheet 1 of 1

Date Excavated	9/20/2017	Total Depth (ft)	8	Logged By DMH Checked By TAP	Excavator Dan Fischer Excavating, Inc. Equipment CAT 305 E Mini-excavator	Groundwater not observed Caving not observed

Surface Elevation (ft) Vertical Datum	187 NAVD88	Easting (X) Northing (Y)	7576405 609031	Coordinate System Horizontal Datum	OR State Plane North NAD83 (feet)

Elevation (feet)	Depth (feet)	SAMPLE: Testing Sample	SAMPLE: Sample Name / Testing	Graphic Log	Group Classification	MATERIAL DESCRIPTION	Moisture Content (%)	Fines Content (%)	REMARKS
					OL	Dark brown topsoil with organic matter (topsoil)			
186	1				ML	Light brown-gray silt with organic matter (medium stiff, dry to moist) (tilled zone)			
185	2				ML	Light brown-gray silt (medium stiff, dry to moist) (native)			
184	3					Becomes moist			
183	4								
182	5								
181	6					Becomes gray with orange mottling			
180	7								
179	8		1						

Test pit completed at 8 feet below ground surface

Notes: See Figure A-1 for explanation of symbols.
The depths on the test pit logs are based on an average of measurements across the test pit and should be considered accurate to ½ foot.
Coordinates Data Source: Horizontal approximated based on Aerial Imagery, Vertical approximated based on DEM

Log of Test Pit TP-18

GEOENGINEERS

Project: Crestview Crossing
Project Location: Newberg, Oregon
Project Number: 6748-002-00

Date Excavated	9/20/2017	Total Depth (ft)	8	Logged By DMH Checked By TAP	Excavator Dan Fischer Excavating, Inc. Equipment CAT 305 E Mini-excavator	Groundwater not observed Caving not observed

Surface Elevation (ft)	191	Easting (X)	7576483	Coordinate System	OR State Plane North
Vertical Datum	NAVD88	Northing (Y)	609162	Horizontal Datum	NAD83 (feet)

Elevation (feet)	Depth (feet)	SAMPLE: Testing Sample	SAMPLE: Sample Name / Testing	Graphic Log	Group Classification	MATERIAL DESCRIPTION	Moisture Content (%)	Fines Content (%)	REMARKS
	0				OL	Dark brown topsoil with organic matter (topsoil)			
190	1				ML	Light brown-gray silt with organic matter (medium stiff, dry to moist) (tilled zone)			
189	2				ML	Light brown-gray silt (medium stiff, dry to moist) (native)			
188	3								
187	4					Becomes moist			
186	5								
185	6								
184	7								
183	8		1 MC				37		

Test pit completed at 8 feet below ground surface

Notes: See Figure A-1 for explanation of symbols.
The depths on the test pit logs are based on an average of measurements across the test pit and should be considered accurate to ½ foot.
Coordinates Data Source: Horizontal approximated based on Aerial Imagery, Vertical approximated based on DEM

Log of Test Pit TP-19

GeoEngineers

Project: Crestview Crossing
Project Location: Newberg, Oregon
Project Number: 6748-002-00

Date Excavated	9/20/2017	Total Depth (ft)	9.5	Logged By	DMH	Excavator	Dan Fischer Excavating, Inc.	Groundwater not observed
				Checked By	TAP	Equipment	CAT 305 E Mini-excavator	Caving not observed

Surface Elevation (ft)	192	Easting (X)	7576555	Coordinate System	OR State Plane North
Vertical Datum	NAVD88	Northing (Y)	609285	Horizontal Datum	NAD83 (feet)

Elevation (feet)	Depth (feet)	SAMPLE: Testing Sample	SAMPLE: Sample Name Testing	Graphic Log	Group Classification	MATERIAL DESCRIPTION	Moisture Content (%)	Fines Content (%)	REMARKS
					OL	Dark brown topsoil with organic matter (topsoil)			
191	1				ML	LIght brown silt with organic matter (medium stiff, dry to moist) (tilled zone)			
190	2				ML	LIght brown silt (medium stiff, dry to moist) (native)			
189	3					Becomes moist			
188	4								
187	5								
186	6								
185	7								
184	8								
183	9		1						

Test pit completed at 9½ feet below ground surface

Notes: See Figure A-1 for explanation of symbols.
The depths on the test pit logs are based on an average of measurements across the test pit and should be considered accurate to ½ foot.
Coordinates Data Source: Horizontal approximated based on Aerial Imagery, Vertical approximated based on DEM

Log of Test Pit TP-20

GeoEngineers

Project: Crestview Crossing
Project Location: Newberg, Oregon
Project Number: 6748-002-00

Date Excavated	9/20/2017	Total Depth (ft)	8.5	Logged By	DMH	Excavator	Dan Fischer Excavating, Inc.	Groundwater not observed
				Checked By	TAP	Equipment	CAT 305 E Mini-excavator	Caving not observed

Surface Elevation (ft)	195	Easting (X)	7576442	Coordinate System	OR State Plane North
Vertical Datum	NAVD88	Northing (Y)	609391	Horizontal Datum	NAD83 (feet)

Elevation (feet)	Depth (feet)	SAMPLE: Testing Sample	SAMPLE: Sample Name / Testing	Graphic Log	Group Classification	MATERIAL DESCRIPTION	Moisture Content (%)	Fines Content (%)	REMARKS
	0				OL	Dark brown topsoil with organic matter (topsoil)			
194	1				ML	Gray silt with organic matter (medium stiff, dry to moist) (tilled zone)			
193	2				ML	Gray silt (medium stiff, dry to moist) (native)			
192	3								
191	4					Becomes gray-brown, moist			
190	5								
189	6								
188	7								
187	8		1 / MC				36		

Test pit completed at 8½ feet below ground surface

Notes: See Figure A-1 for explanation of symbols.
The depths on the test pit logs are based on an average of measurements across the test pit and should be considered accurate to ½ foot.
Coordinates Data Source: Horizontal approximated based on Aerial Imagery, Vertical approximated based on DEM

Log of Test Pit TP-21

GeoEngineers

Project: Crestview Crossing
Project Location: Newberg, Oregon
Project Number: 6748-002-00

Date Excavated 9/26/2017	Total Depth (ft) 4.5	Logged By JLL Checked By TAP	Excavator GeoEngineers, Inc. Equipment Hand Tools	Groundwater not observed Caving not observed

Surface Elevation (ft) 214 Vertical Datum NAVD88	Easting (X) 7575598 Northing (Y) 608672	Coordinate System OR State Plane North Horizontal Datum NAD83 (feet)

Elevation (feet)	Depth (feet)	SAMPLE: Testing Sample	SAMPLE: Sample Name Testing	Graphic Log	Group Classification	MATERIAL DESCRIPTION	Moisture Content (%)	Fines Content (%)	REMARKS
					OL	Dark brown topsoil with organic matter (topsoil)			
213	1				ML	Brown silt with organic matter (stiff, dry to moist) (tilled zone)			
212	2		1		ML	Yellow-brown silt (medium stiff to stiff) (native)			
211	3								
210	4								

Notes: See Figure A-1 for explanation of symbols.
The depths on the hand-augered boring logs are based on an average of measurements across the hand-auger and should be considered accurate to ½ foot.
Coordinates Data Source: Horizontal approximated based on Aerial Imagery, Vertical approximated based on DEM

Log of Hand Auger HA-1

GeoEngineers

Project: Crestview Crossing
Project Location: Newberg, Oregon
Project Number: 6748-002-00

Date Excavated	9/26/2017	Total Depth (ft)	4.5	Logged By	JLL	Excavator	GeoEngineers, Inc.	Groundwater not observed
				Checked By	TAP	Equipment	Hand Tools	Caving not observed

Surface Elevation (ft)	204	Easting (X)	7575624	Coordinate System	OR State Plane North
Vertical Datum	NAVD88	Northing (Y)	609083	Horizontal Datum	NAD83 (feet)

Elevation (feet)	Depth (feet)	SAMPLE: Testing Sample	SAMPLE: Sample Name / Testing	Graphic Log	Group Classification	MATERIAL DESCRIPTION	Moisture Content (%)	Fines Content (%)	REMARKS
	0				OL	Dark brown topsoil with organic matter (topsoil)			
203	1				ML	Dark brown silt with organic matter (medium stiff, moist) (tilled zone)			
202	2				ML	Yellow-brown silt (medium stiff, moist) (native)			
201	3		1			Grades to brown with red-brown mottling			
200	4								

Notes: See Figure A-1 for explanation of symbols.
The depths on the hand-augered boring logs are based on an average of measurements across the hand-auger and should be considered accurate to ½ foot.
Coordinates Data Source: Horizontal approximated based on Aerial Imagery, Vertical approximated based on DEM

Log of Hand Auger HA-2

GeoEngineers

Project: Crestview Crossing
Project Location: Newberg, Oregon
Project Number: 6748-002-00

Figure A-33
Sheet 1 of 1

Date Excavated	9/26/2017	Total Depth (ft)	4	Logged By	JLL	Excavator	GeoEngineers, Inc.	Groundwater not observed
				Checked By	TAP	Equipment	Hand Tools	Caving not observed

Surface Elevation (ft)	210	Easting (X)	7575572	Coordinate System	OR State Plane North
Vertical Datum	NAVD88	Northing (Y)	609614	Horizontal Datum	NAD83 (feet)

Elevation (feet)	Depth (feet)	SAMPLE: Testing Sample	SAMPLE: Sample Name Testing	Graphic Log	Group Classification	MATERIAL DESCRIPTION	Moisture Content (%)	Fines Content (%)	REMARKS
					OL	Dark brown topsoil with organic matter (topsoil)			
209	1				ML	Brown silt organic matter (stiff, moist) (topsoil)			
					ML	Yellow-brown silt (native)			
208	2								
207	3								
206	4								

Notes: See Figure A-1 for explanation of symbols.
The depths on the hand-augered boring logs are based on an average of measurements across the hand-auger and should be considered accurate to ½ foot.
Coordinates Data Source: Horizontal approximated based on Aerial Imagery, Vertical approximated based on DEM

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Log of Hand Auger HA-3

GEOENGINEERS

Project: Crestview Crossing
Project Location: Newberg, Oregon
Project Number: 6748-002-00

Figure A-34
Sheet 1 of 1

Date Excavated	9/26/2017	Total Depth (ft)	3	Logged By	JLL	Excavator	GeoEngineers, Inc.	Groundwater not observed
				Checked By	TAP	Equipment	Hand Tools	Caving not observed

Surface Elevation (ft)	200	Easting (X)	7575991	Coordinate System	OR State Plane North
Vertical Datum	NAVD88	Northing (Y)	609449	Horizontal Datum	NAD83 (feet)

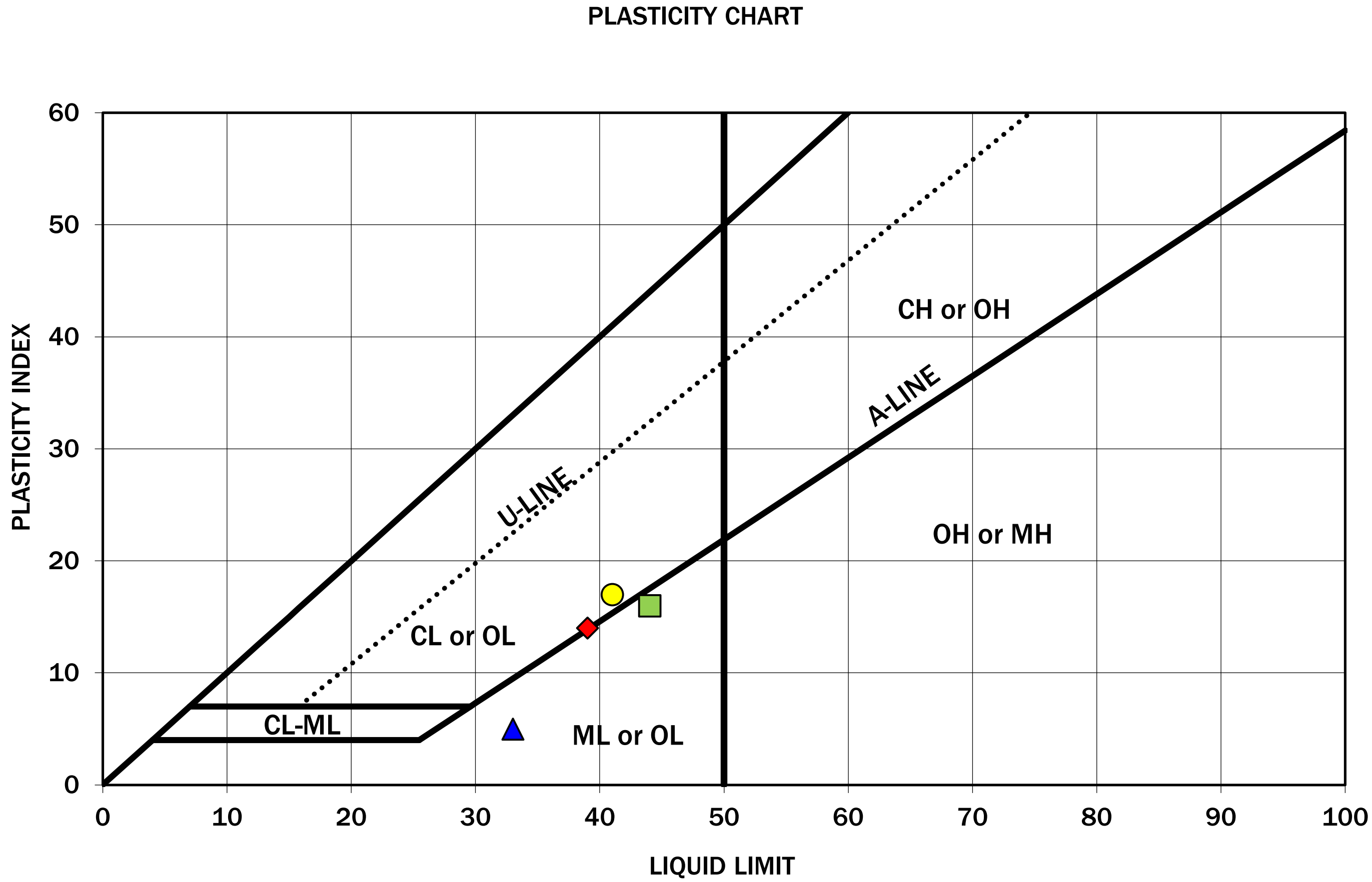
Elevation (feet)	Depth (feet)	SAMPLE: Testing Sample	SAMPLE: Sample Name / Testing	Graphic Log	Group Classification	MATERIAL DESCRIPTION	Moisture Content (%)	Fines Content (%)	REMARKS
					OL	Dark brown topsoil with organic matter (topsoil)			
199	1				ML	Light brown silt, fine roots and organic matter (stiff, dry) (tilled zone)			
					ML	Yellow-brown silt (stiff, dry to moist) (native)			
198	2								
197	3								

Notes: See Figure A-1 for explanation of symbols.
The depths on the hand-augered boring logs are based on an average of measurements across the hand-auger and should be considered accurate to ½ foot.
Coordinates Data Source: Horizontal approximated based on Aerial Imagery, Vertical approximated based on DEM

Log of Hand Auger HA-4

GEOENGINEERS

Project: Crestview Crossing
Project Location: Newberg, Oregon
Project Number: 6748-002-00



Symbol	Boring Number	Depth (feet)	Moisture Content (%)	Liquid Limit (%)	Plasticity Index (%)	Soil Description
◆	B-3	2.5	32	39	14	Silt (ML)
■	TP-5	3	16	44	16	Silt (ML)
▲	TP-12	8	31	33	5	Silt (ML)
●	TP-14	9	30	41	17	Lean clay (CL)

The liquid limit and plasticity index were obtained in general accordance with ASTM D 4318.

XXXX-XXX-XX Date Exported: 06/18/15

Atterberg Limits Test Results

Crestview Crossing Development
Newberg, Oregon

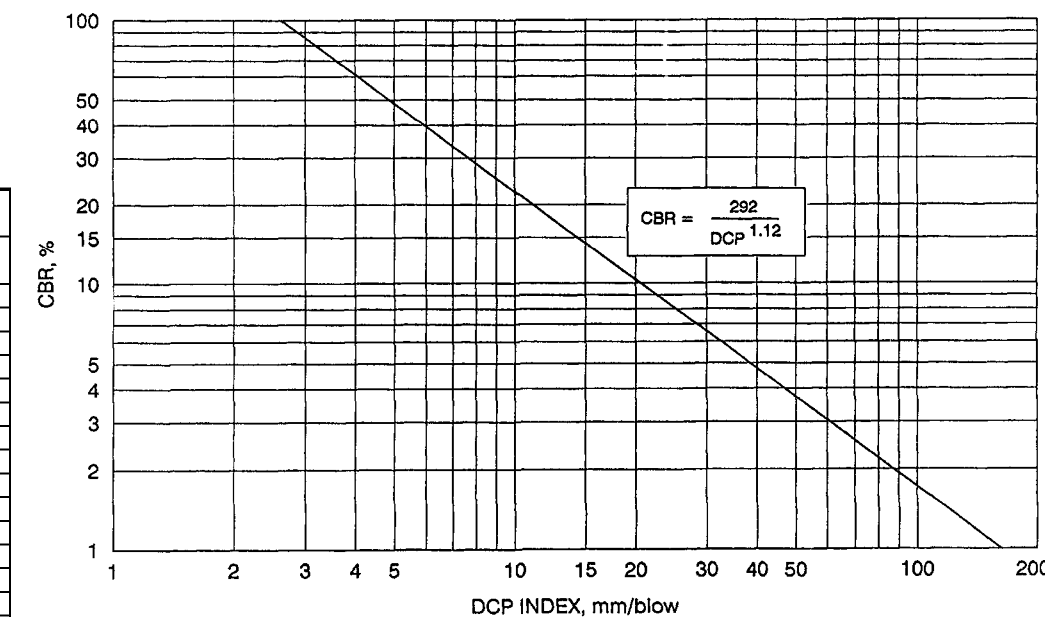
GeoEngineers

Figure A-36

Location:	Pacific Highway at NE Harmony	Date:	9/26/2017		Test Hole Number:	HA-1
Depth to bottom:	2.86' (87.3cm)	Dimension:	4"	N/A	Test Method:	Dynamic Cone Penetration
Tester's Name:	John Lawes				GeoEngineers Job:	6748-002-00
Tester's Company:	GeoEngineers, Inc.	Tester's Contact No:				

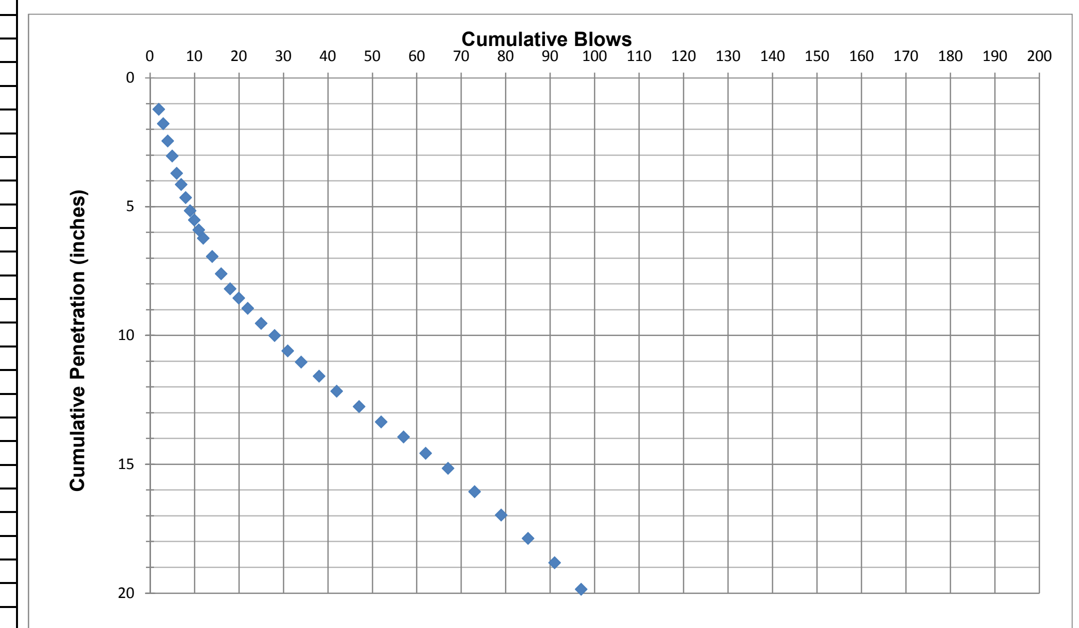
Depth, feet	Soil Texture
0-4.5	Yellow-brown SILT, topsoil in the top 12-14"

Test increment	Number of blows	Cumulative blows	Depth below ground surface	Penetration per increment	Cumulative penetration	Cummulative Penetration	Penetration per blow set	Penetration per blow	Hammer blow factor	DCP Index	DCP Index	CBR	M_R
#	#	#	(in)	(mm)	(mm)	(in)	(in)	(in)	1 for 8-kg 2 for 4.6-kg hammer	in/blow	mm/blow	%	psi
1	1	2	1.2	31.0	31.0	1.2	1.2	1.22	2	2.44	62.00	3	3431
2	1	3	1.8	14.0	45.0	1.8	0.6	0.55	2	1.10	28.00	7	4678
3	1	4	2.4	17.0	62.0	2.4	0.7	0.67	2	1.34	34.00	6	4337
4	1	5	3.0	15.0	77.0	3.0	0.6	0.59	2	1.18	30.00	6	4554
5	1	6	3.7	17.0	94.0	3.7	0.7	0.67	2	1.34	34.00	6	4337
6	1	7	4.1	11.0	105.0	4.1	0.4	0.43	2	0.87	22.00	9	5140
7	1	8	4.6	13.0	118.0	4.6	0.5	0.51	2	1.02	26.00	8	4815
8	1	9	5.2	13.0	131.0	5.2	0.5	0.51	2	1.02	26.00	8	4815
9	1	10	5.5	9.0	140.0	5.5	0.4	0.35	2	0.71	18.00	11	5558
10	1	11	5.9	10.0	150.0	5.9	0.4	0.39	2	0.79	20.00	10	5334
11	1	12	6.2	8.0	158.0	6.2	0.3	0.31	2	0.63	16.00	13	5819
12	2	14	6.9	18.0	176.0	6.9	0.7	0.35	2	0.71	18.00	11	5558
13	2	16	7.6	17.0	193.0	7.6	0.7	0.33	2	0.67	17.00	12	5683
14	2	18	8.2	15.0	208.0	8.2	0.6	0.30	2	0.59	15.00	14	5967
15	2	20	8.5	9.0	217.0	8.5	0.4	0.18	2	0.35	9.00	25	7283
16	2	22	8.9	10.0	227.0	8.9	0.4	0.20	2	0.39	10.00	22	6990
17	3	25	9.5	15.0	242.0	9.5	0.6	0.20	2	0.39	10.00	22	6990
18	3	28	10.0	12.0	254.0	10.0	0.5	0.16	2	0.31	8.00	28	7625
19	3	31	10.6	15.0	269.0	10.6	0.6	0.20	2	0.39	10.00	22	6990
20	3	34	11.0	11.0	280.0	11.0	0.4	0.14	2	0.29	7.33	31	7889
21	4	38	11.6	14.0	294.0	11.6	0.6	0.14	2	0.28	7.00	33	8033
22	4	42	12.2	15.0	309.0	12.2	0.6	0.15	2	0.30	7.50	31	7820
23	5	47	12.8	15.0	324.0	12.8	0.6	0.12	2	0.24	6.00	39	8531
24	5	52	13.3	15.0	339.0	13.3	0.6	0.12	2	0.24	6.00	39	8531
25	5	57	13.9	15.0	354.0	13.9	0.6	0.12	2	0.24	6.00	39	8531
26	5	62	14.6	16.0	370.0	14.6	0.6	0.13	2	0.25	6.40	37	8319
27	5	67	15.2	15.0	385.0	15.2	0.6	0.12	2	0.24	6.00	39	8531
28	6	73	16.1	23.0	408.0	16.1	0.9	0.15	2	0.30	7.67	30	7753
29	6	79	17.0	23.0	431.0	17.0	0.9	0.15	2	0.30	7.67	30	7753
30	6	85	17.9	23.0	454.0	17.9	0.9	0.15	2	0.30	7.67	30	7753
31	6	91	18.8	24.0	478.0	18.8	0.9	0.16	2	0.31	8.00	28	7625
32	6	97	19.8	26.0	504.0	19.8	1.0	0.17	2	0.34	8.67	26	7391
33	6	103	20.9	26.0	530.0	20.9	1.0	0.17	2	0.34	8.67	26	7391
34	6	109	21.9	27.0	557.0	21.9	1.1	0.18	2	0.35	9.00	25	7283
35	6	115	23.0	28.0	585.0	23.0	1.1	0.18	2	0.37	9.33	24	7180
36	6	121	24.5	37.0	622.0	24.5	1.5	0.24	2	0.49	12.33	18	6441
37	6	127	26.0	38.0	660.0	26.0	1.5	0.25	2	0.50	12.67	17	6374
38	6	133	28.0	52.0	712.0	28.0	2.0	0.34	2	0.68	17.33	12	5640
39	2	135	28.8	20.0	732.0	28.8	0.8	0.39	2	0.79	20.00	10	5334
40	2	137	29.5	17.0	749.0	29.5	0.7	0.33	2	0.67	17.00	12	5683
41	2	139	32.0	63.0	812.0	32.0	2.5	1.24	2	2.48	63.00	3	3410
42	2	141	32.6	15.0	827.0	32.6	0.6	0.30	2	0.59	15.00	14	5967
43	2	143	33.1	15.0	842.0	33.1	0.6	0.30	2	0.59	15.00	14	5967
44	2	145	33.8	16.0	858.0	33.8	0.6	0.31	2	0.63	16.00	13	5819
45	2	147	34.4	15.0	873.0	34.4	0.6	0.30	2	0.59	15.00	14	5967



(after Webster et al., 1992)

Webster, S. L., Grau, R. H., and Williams, T. P. (1992). Description and application of dual mass dynamic cone penetrometer. Department of the Army Waterways Equipment Station, No. GL-92-3.



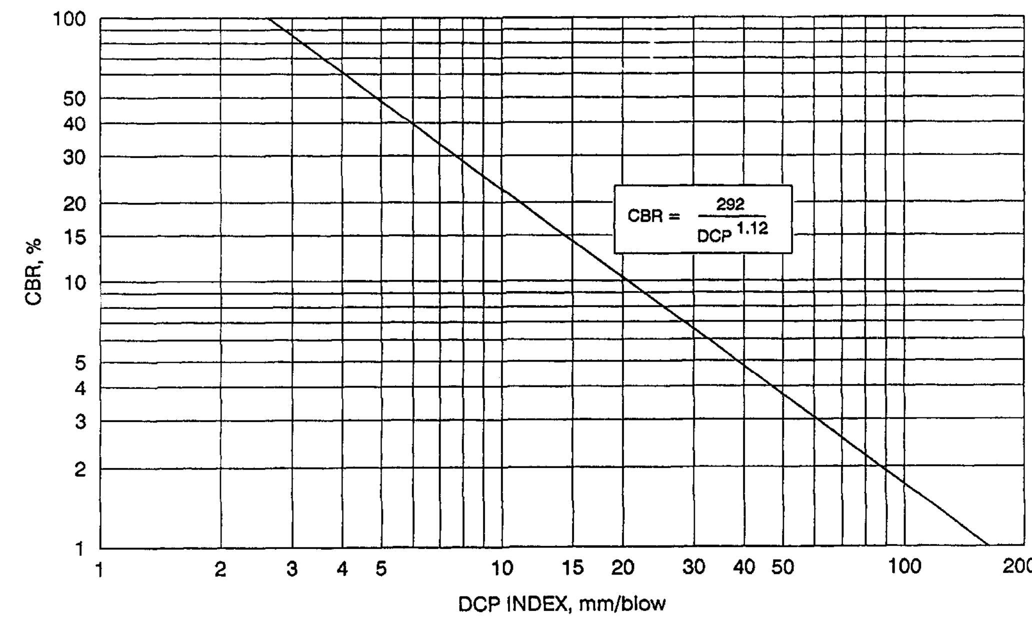
Location: Pacific Highway at NE Harmony
Depth to bottom: 2.67' (81.4cm)
Tester's Name: John Lawes
Tester's Company: GeoEngineers, Inc.

Date: 9/26/2017
Dimension: 4" N/A
Tester's Contact No:

Test Hole Number: HA-2
Test Method: Dynamic Cone Penetration
GeoEngineers Job: 6748-002-00

Depth, feet	**Soil Texture**
0-4.5	Yellow-brown SILT, topsoil in the top 12-14"

Test increment	Number of blows	Cumulative blows	Depth below ground surface	Penetration per increment	Cumulative penetration	Cummulative Penetration	Penetration per blow set	Penetration per blow	Hammer blow factor	DCP Index	DCP Index	CBR	M_R
#	#	#	(in)	(mm)	(mm)	(in)	(in)	(in)	1 for 8-kg 2 for 4.6-kg hammer	in/blow	mm/blow	%	psi
1	1	2	16.7	44.0	44.0	1.7	1.7	1.73	2	3.46	88.00	2	2993
2	1	3	17.9	30.0	74.0	2.9	1.2	1.18	2	2.36	60.00	3	3475
3	1	4	18.8	22.0	96.0	3.8	0.9	0.87	2	1.73	44.00	4	3922
4	1	5	19.4	17.0	113.0	4.4	0.7	0.67	2	1.34	34.00	6	4337
5	1	6	20.1	17.0	130.0	5.1	0.7	0.67	2	1.34	34.00	6	4337
6	1	7	20.7	14.0	144.0	5.7	0.6	0.55	2	1.10	28.00	7	4678
7	1	8	21.2	13.0	157.0	6.2	0.5	0.51	2	1.02	26.00	8	4815
8	1	9	21.9	18.0	175.0	6.9	0.7	0.71	2	1.42	36.00	5	4241
9	1	10	23.0	28.0	203.0	8.0	1.1	1.10	2	2.20	56.00	3	3570
10	1	11	24.8	47.0	250.0	9.8	1.9	1.85	2	3.70	94.00	2	2917
11	1	12	26.9	52.0	302.0	11.9	2.0	2.05	2	4.09	104.00	2	2804
12	1	13	28.0	28.0	330.0	13.0	1.1	1.10	2	2.20	56.00	3	3570
13	1	14	28.6	15.0	345.0	13.6	0.6	0.59	2	1.18	30.00	6	4554
14	1	15	29.1	14.0	359.0	14.1	0.6	0.55	2	1.10	28.00	7	4678
15	1	16	29.6	12.0	371.0	14.6	0.5	0.47	2	0.94	24.00	8	4968
16	2	18	30.4	21.0	392.0	15.4	0.8	0.41	2	0.83	21.00	10	5234
17	2	20	31.3	22.0	414.0	16.3	0.9	0.43	2	0.87	22.00	9	5140
18	2	22	32.1	21.0	435.0	17.1	0.8	0.41	2	0.83	21.00	10	5234
19	2	24	33.1	24.0	459.0	18.1	0.9	0.47	2	0.94	24.00	8	4968
20	2	26	34.1	25.0	484.0	19.1	1.0	0.49	2	0.98	25.00	8	4890
21	2	28	35.0	23.0	507.0	20.0	0.9	0.45	2	0.91	23.00	9	5051
22	2	30	35.9	25.0	532.0	20.9	1.0	0.49	2	0.98	25.00	8	4890
23	2	32	36.8	22.0	554.0	21.8	0.9	0.43	2	0.87	22.00	9	5140
24	2	34	37.6	20.0	574.0	22.6	0.8	0.39	2	0.79	20.00	10	5334
25	2	36	38.4	21.0	595.0	23.4	0.8	0.41	2	0.83	21.00	10	5234
26	2	38	39.2	19.0	614.0	24.2	0.7	0.37	2	0.75	19.00	11	5442
27	2	40	39.9	18.0	632.0	24.9	0.7	0.35	2	0.71	18.00	11	5558
28	2	42	40.7	22.0	654.0	25.7	0.9	0.43	2	0.87	22.00	9	5140
29	2	44	41.5	18.0	672.0	26.5	0.7	0.35	2	0.71	18.00	11	5558
30	2	46	42.2	20.0	692.0	27.2	0.8	0.39	2	0.79	20.00	10	5334
31	2	48	43.0	20.0	712.0	28.0	0.8	0.39	2	0.79	20.00	10	5334
32	2	50	43.8	20.0	732.0	28.8	0.8	0.39	2	0.79	20.00	10	5334
33	2	52	44.5	17.0	749.0	29.5	0.7	0.33	2	0.67	17.00	12	5683
34	2	54	45.1	15.0	764.0	30.1	0.6	0.30	2	0.59	15.00	14	5967
35	2	56	45.9	20.0	784.0	30.9	0.8	0.39	2	0.79	20.00	10	5334
36	2	58	46.5	15.0	799.0	31.5	0.6	0.30	2	0.59	15.00	14	5967
37	2	60	47.0	15.0	814.0	32.0	0.6	0.30	2	0.59	15.00	14	5967



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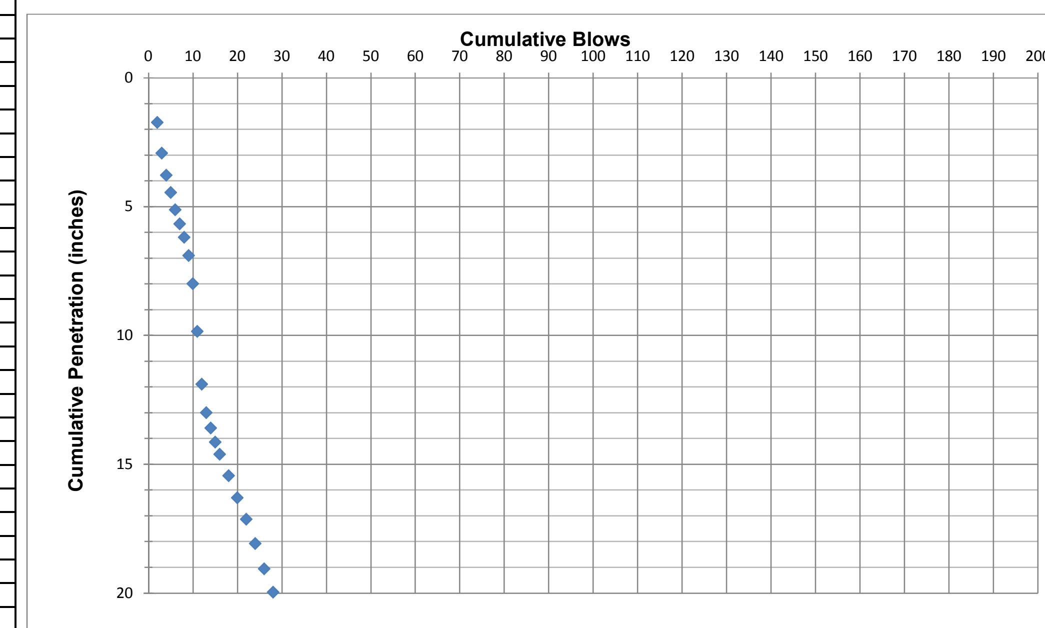


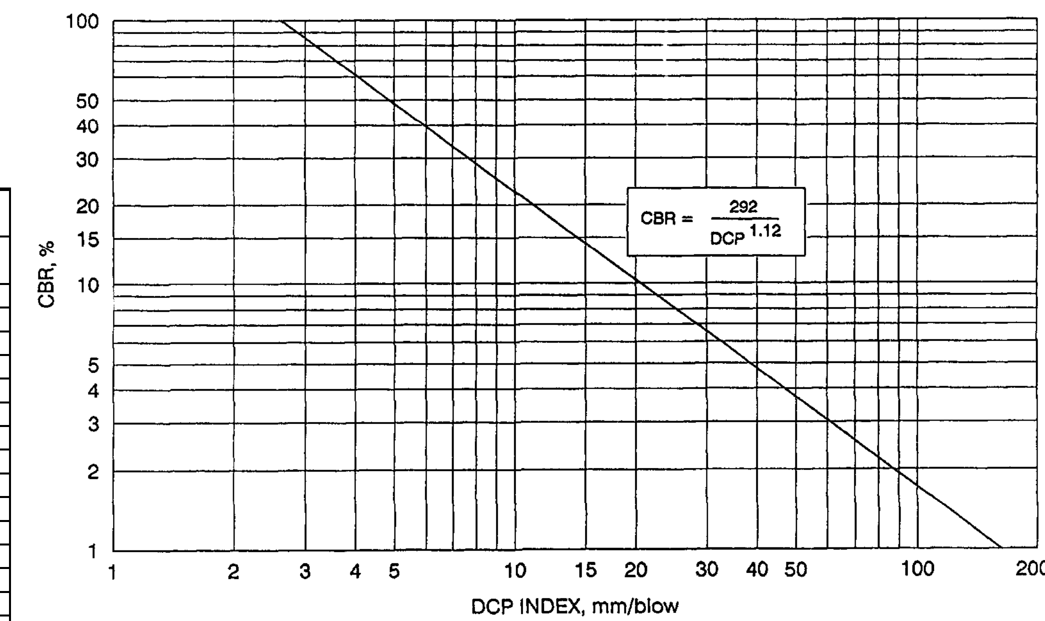
Location: Pacific Highway at NE Harmony
Depth to bottom: 2.58' (78.8cm)
Tester's Name: John Lawes
Tester's Company: GeoEngineers, Inc.

Date: 9/26/2017
Dimension: 4" N/A
Tester's Contact No:

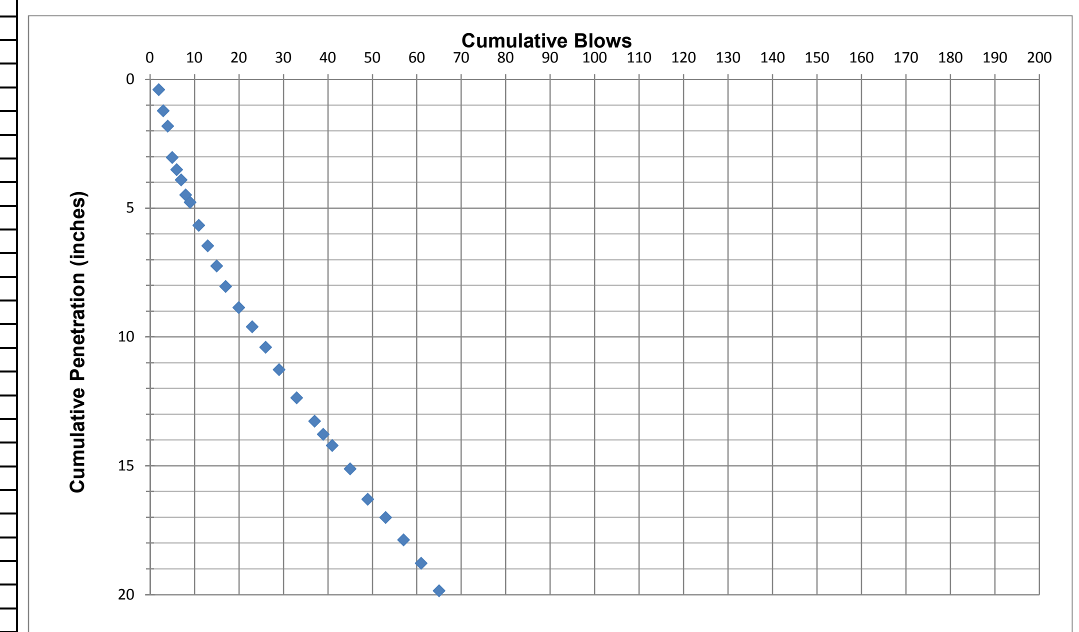
Test Hole Number: HA-3
Test Method: Dynamic Cone Penetration
GeoEngineers Job: 6748-002-00

Depth, feet	Soil Texture
0-4	Yellow-brown SILT, topsoil in the top 12-14"

Test increment	Number of blows	Cumulative blows	Depth below ground surface	Penetration per increment	Cumulative penetration	Cummulative Penetration	Penetration per blow set	Penetration per blow	Hammer blow factor	DCP Index	DCP Index	CBR	M_R
#	#	#	(in)	(mm)	(mm)	(in)	(in)	(in)	1 for 8-kg 2 for 4.6-kg hammer	in/blow	mm/blow	%	psi
1	1	2	15.4	10.0	10.0	0.4	0.4	0.39	2	0.79	20.00	10	5334
2	1	3	16.2	21.0	31.0	1.2	0.8	0.83	2	1.65	42.00	4	3994
3	1	4	16.8	15.0	46.0	1.8	0.6	0.59	2	1.18	30.00	6	4554
4	1	5	18.0	31.0	77.0	3.0	1.2	1.22	2	2.44	62.00	3	3431
5	1	6	18.5	12.0	89.0	3.5	0.5	0.47	2	0.94	24.00	8	4968
6	1	7	18.9	10.0	99.0	3.9	0.4	0.39	2	0.79	20.00	10	5334
7	1	8	19.5	15.0	114.0	4.5	0.6	0.59	2	1.18	30.00	6	4554
8	1	9	19.8	7.0	121.0	4.8	0.3	0.28	2	0.55	14.00	15	6130
9	2	11	20.7	23.0	144.0	5.7	0.9	0.45	2	0.91	23.00	9	5051
10	2	13	21.5	20.0	164.0	6.5	0.8	0.39	2	0.79	20.00	10	5334
11	2	15	22.2	20.0	184.0	7.2	0.8	0.39	2	0.79	20.00	10	5334
12	2	17	23.0	20.0	204.0	8.0	0.8	0.39	2	0.79	20.00	10	5334
13	3	20	23.9	21.0	225.0	8.9	0.8	0.28	2	0.55	14.00	15	6130
14	3	23	24.6	19.0	244.0	9.6	0.7	0.25	2	0.50	12.67	17	6374
15	3	26	25.4	20.0	264.0	10.4	0.8	0.26	2	0.52	13.33	16	6248
16	3	29	26.3	22.0	286.0	11.3	0.9	0.29	2	0.58	14.67	14	6020
17	4	33	27.4	28.0	314.0	12.4	1.1	0.28	2	0.55	14.00	15	6130
18	4	37	28.3	23.0	337.0	13.3	0.9	0.23	2	0.45	11.50	19	6619
19	2	39	28.8	13.0	350.0	13.8	0.5	0.26	2	0.51	13.00	17	6310
20	2	41	29.2	11.0	361.0	14.2	0.4	0.22	2	0.43	11.00	20	6735
21	4	45	30.1	23.0	384.0	15.1	0.9	0.23	2	0.45	11.50	19	6619
22	4	49	31.3	30.0	414.0	16.3	1.2	0.30	2	0.59	15.00	14	5967
23	4	53	32.0	18.0	432.0	17.0	0.7	0.18	2	0.35	9.00	25	7283
24	4	57	32.9	22.0	454.0	17.9	0.9	0.22	2	0.43	11.00	20	6735
25	4	61	33.8	23.0	477.0	18.8	0.9	0.23	2	0.45	11.50	19	6619
26	4	65	34.8	27.0	504.0	19.8	1.1	0.27	2	0.53	13.50	16	6218
27	4	69	35.8	24.0	528.0	20.8	0.9	0.24	2	0.47	12.00	18	6510
28	4	73	36.9	29.0	557.0	21.9	1.1	0.29	2	0.57	14.50	15	6047
29	6	79	38.5	39.0	596.0	23.5	1.5	0.26	2	0.51	13.00	17	6310
30	6	85	39.8	35.0	631.0	24.8	1.4	0.23	2	0.46	11.67	19	6582
31	6	91	41.3	38.0	669.0	26.3	1.5	0.25	2	0.50	12.67	17	6374
32	6	97	42.7	35.0	704.0	27.7	1.4	0.23	2	0.46	11.67	19	6582
33	6	103	44.2	38.0	742.0	29.2	1.5	0.25	2	0.50	12.67	17	6374
34	6	109	45.4	31.0	773.0	30.4	1.2	0.20	2	0.41	10.33	21	6901
35	6	115	46.0	15.0	788.0	31.0	0.6	0.10	2	0.20	5.00	48	9159



(after Webster et al., 1992)
Webster, S. L., Grau, R. H., and Williams, T. P. (1992). Description and application of dual mass dynamic cone penetrometer. Department of the Army Waterways Equipment Station, No. GL-92-3.



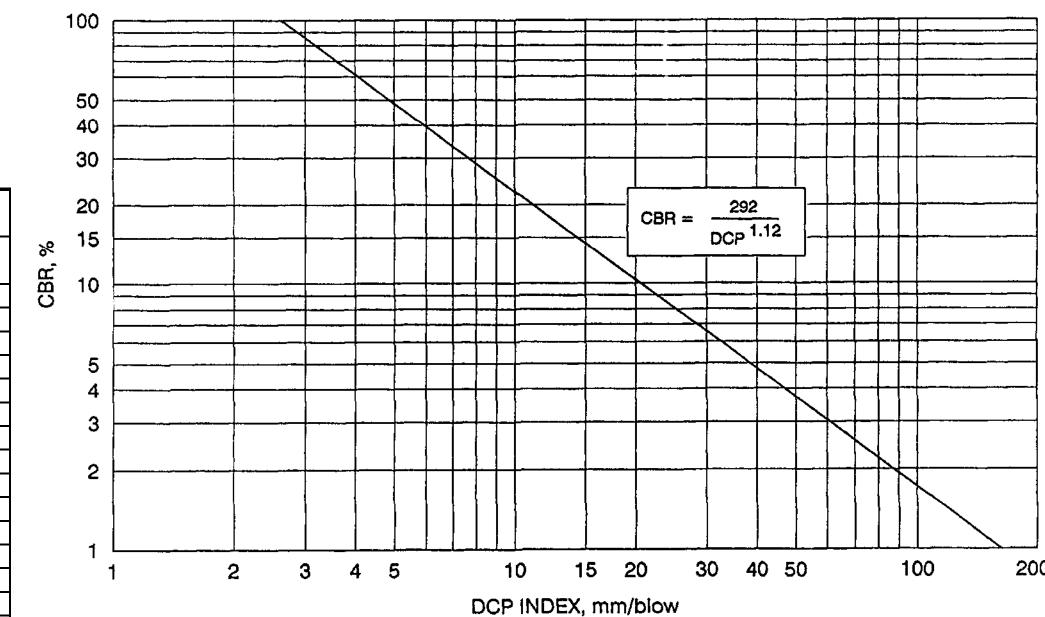
Location: Pacific Highway at NE Harmony
Depth to bottom: 2.12' (64.6cm)
Tester's Name: John Lawes
Tester's Company: GeoEngineers, Inc.

Date: 9/26/2017
Dimension: 4" N/A
Tester's Contact No:

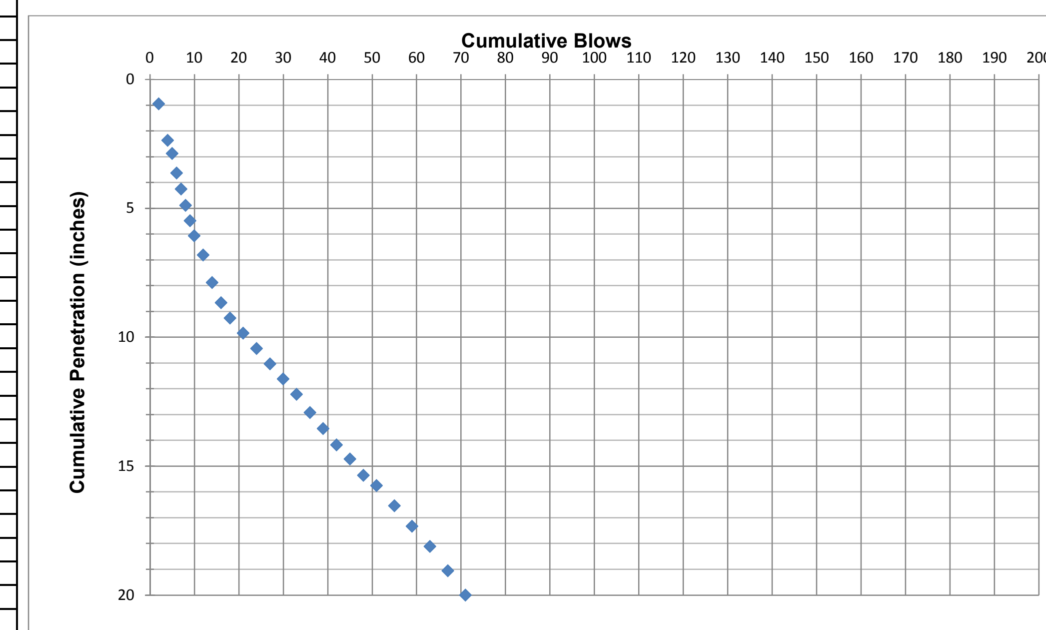
Test Hole Number: HA-4
Test Method: Dynamic Cone Penetration
GeoEngineers Job: 6748-002-00

Depth, feet	Soil Texture
0-3	Yellow-brown SILT, topsoil in the top 10-12"

Test increment	Number of blows	Cumulative blows	Depth below ground surface	Penetration per increment	Cumulative penetration	Cummulative Penetration	Penetration per blow set	Penetration per blow	Hammer blow factor	DCP Index	DCP Index	CBR	M_R
#	#	#	(in)	(mm)	(mm)	(in)	(in)	(in)	1 for 8-kg 2 for 4.6-kg hammer	in/blow	mm/blow	%	psi
1	2	2	15.9	24.0	24.0	0.9	0.9	0.47	2	0.94	24.00	8	4968
2	2	4	17.4	36.0	60.0	2.4	1.4	0.71	2	1.42	36.00	5	4241
3	1	5	17.9	13.0	73.0	2.9	0.5	0.51	2	1.02	26.00	8	4815
4	1	6	18.6	19.0	92.0	3.6	0.7	0.75	2	1.50	38.00	5	4153
5	1	7	19.3	16.0	108.0	4.3	0.6	0.63	2	1.26	32.00	6	4441
6	1	8	19.9	16.0	124.0	4.9	0.6	0.63	2	1.26	32.00	6	4441
7	1	9	20.5	15.0	139.0	5.5	0.6	0.59	2	1.18	30.00	6	4554
8	1	10	21.1	15.0	154.0	6.1	0.6	0.59	2	1.18	30.00	6	4554
9	2	12	21.8	19.0	173.0	6.8	0.7	0.37	2	0.75	19.00	11	5442
10	2	14	22.9	27.0	200.0	7.9	1.1	0.53	2	1.06	27.00	7	4745
11	2	16	23.7	20.0	220.0	8.7	0.8	0.39	2	0.79	20.00	10	5334
12	2	18	24.3	15.0	235.0	9.3	0.6	0.30	2	0.59	15.00	14	5967
13	3	21	24.8	15.0	250.0	9.8	0.6	0.20	2	0.39	10.00	22	6990
14	3	24	25.4	15.0	265.0	10.4	0.6	0.20	2	0.39	10.00	22	6990
15	3	27	26.0	15.0	280.0	11.0	0.6	0.20	2	0.39	10.00	22	6990
16	3	30	26.6	15.0	295.0	11.6	0.6	0.20	2	0.39	10.00	22	6990
17	3	33	27.2	15.0	310.0	12.2	0.6	0.20	2	0.39	10.00	22	6990
18	3	36	27.9	18.0	328.0	12.9	0.7	0.24	2	0.47	12.00	18	6510
19	3	39	28.5	16.0	344.0	13.5	0.6	0.21	2	0.42	10.67	21	6816
20	3	42	29.2	16.0	360.0	14.2	0.6	0.21	2	0.42	10.67	21	6816
21	3	45	29.7	14.0	374.0	14.7	0.6	0.18	2	0.37	9.33	24	7180
22	3	48	30.4	16.0	390.0	15.4	0.6	0.21	2	0.42	10.67	21	6816
23	3	51	30.7	10.0	400.0	15.7	0.4	0.13	2	0.26	6.67	35	8187
24	4	55	31.5	20.0	420.0	16.5	0.8	0.20	2	0.39	10.00	22	6990
25	4	59	32.3	20.0	440.0	17.3	0.8	0.20	2	0.39	10.00	22	6990
26	4	63	33.1	20.0	460.0	18.1	0.8	0.20	2	0.39	10.00	22	6990
27	4	67	34.1	24.0	484.0	19.1	0.9	0.24	2	0.47	12.00	18	6510
28	4	71	35.0	24.0	508.0	20.0	0.9	0.24	2	0.47	12.00	18	6510
29	4	75	35.8	20.0	528.0	20.8	0.8	0.20	2	0.39	10.00	22	6990
30	4	79	36.7	22.0	550.0	21.7	0.9	0.22	2	0.43	11.00	20	6735
31	4	83	37.6	24.0	574.0	22.6	0.9	0.24	2	0.47	12.00	18	6510
32	4	87	38.6	25.0	599.0	23.6	1.0	0.25	2	0.49	12.50	17	6407
33	4	91	39.6	25.0	624.0	24.6	1.0	0.25	2	0.49	12.50	17	6407
34	4	95	40.4	22.0	646.0	25.4	0.9	0.22	2	0.43	11.00	20	6735
	4												



(after Webster et al., 1992)
Webster, S. L., Grau, R. H., and Williams, T. P. (1992). Description and application of dual mass dynamic cone penetrometer. Department of the Army Waterways Equipment Station, No. GL-92-3.

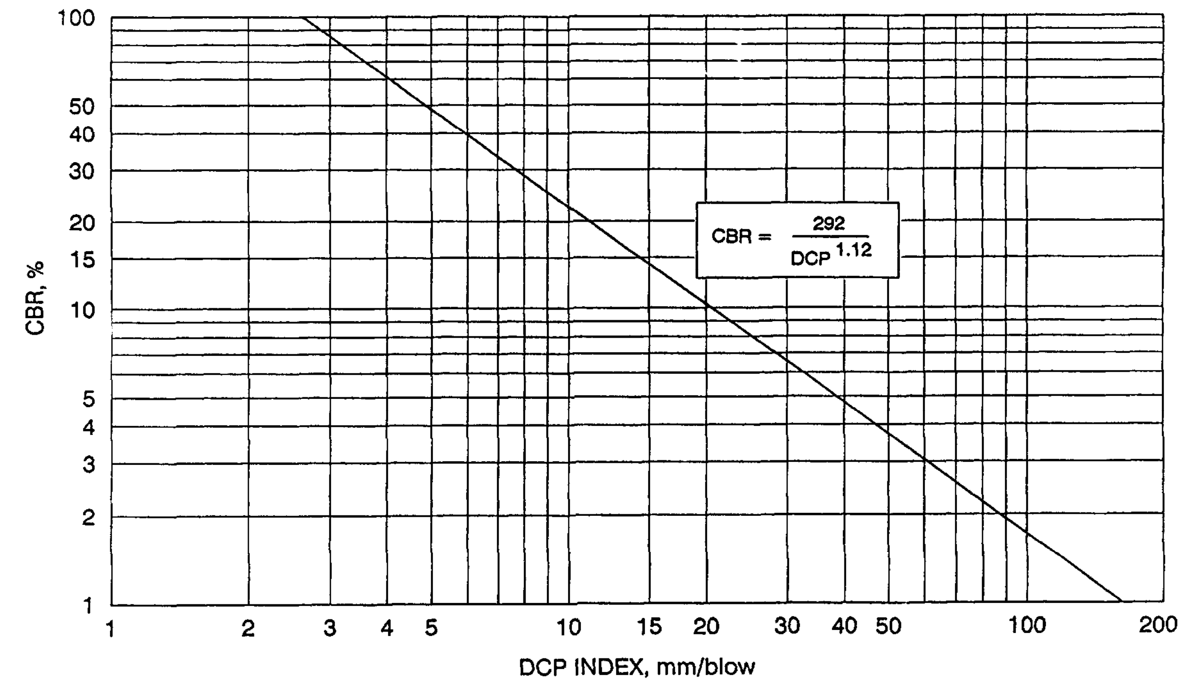


GeoEngineers

Location: Crestview, Newber, OR | Date: 9/21/2017 | Test Hole Number: B-2
Depth to bottom: 13" | Dimension: 4" | Test Method: Dynamic Cone Penetration
Tester's Name: TAP | GeoEngineers Job: 6748-002-00
Tester's Company: GeoEngineers, Inc. | Tester's Contact No: 503-951-1810

Depth, feet	Soil Texture
0-13"	Silty Gravel Fill
13"-6.5'	Brown Silt trace sand

Test increment	Number of blows	Cumulative blows	Depth below ground surface	Cummulative Penetration	Penetration per blow set	Penetration per blow	Hammer blow factor	DCP Index	DCP Index	CBR	M_R
#	#	#	(in)	(in)	(in)	(in)	1 for 8-kg 2 for 4.6-kg hammer	in/blow	mm/blow	%	psi
1	1	1	14.2	1.2	1.2	1.2	1	1.2	30.48	6.357496	4525.87
2	1	2	15.2	2.2	1.0	1	1	1	25.4	7.797746	4859.401
3	1	3	16.1	3.1	0.9	0.9	1	0.9	22.86	8.774401	5063.236
4	1	4	17.2	4.2	1.1	1.1	1	1.1	27.94	7.008245	4682.089
5	1	5	18.2	5.2	1.0	1	1	1	25.4	7.797746	4859.401
6	1	6	19.3	6.3	1.1	1.1	1	1.1	27.94	7.008245	4682.089
7	1	7	20.5	7.5	1.2	1.2	1	1.2	30.48	6.357496	4525.87
8	1	8	21.6	8.6	1.1	1.1	1	1.1	27.94	7.008245	4682.089
9	1	9	22.6	9.6	1.0	1	1	1	25.4	7.797746	4859.401
10	1	10	23.6	10.6	1.0	1	1	1	25.4	7.797746	4859.401
11	1	11	24.7	11.7	1.1	1.1	1	1.1	27.94	7.008245	4682.089
12	1	12	25.5	12.5	0.8	0.8	1	0.8	20.32	10.01171	5301.243
13	1	13	26.2	13.2	0.7	0.7	1	0.7	17.78	11.62678	5584.632
14	1	14	26.8	13.8	0.6	0.6	1	0.6	15.24	13.81783	5930.67
15	1	15	28.1	15.1	1.3	1.3	1	1.3	33.02	5.81236	4386.77
16	1	16	29.3	16.3	1.2	1.2	1	1.2	30.48	6.357496	4525.87
17	1	17	30.6	17.6	1.3	1.3	1	1.3	33.02	5.81236	4386.77
18	1	18	31.8	18.8	1.2	1.2	1	1.2	30.48	6.357496	4525.87
19	1	19	33	20	1.2	1.2	1	1.2	30.48	6.357496	4525.87
20	1	20	34.1	21.1	1.1	1.1	1	1.1	27.94	7.008245	4682.089
21	1	21	35.1	22.1	1.0	1	1	1	25.4	7.797746	4859.401
22	1	22	36.1	23.1	1.0	1	1	1	25.4	7.797746	4859.401
23	1	23	37	24	0.9	0.9	1	0.9	22.86	8.774401	5063.236
24	1	24	37.9	24.9	0.9	0.9	1	0.9	22.86	8.774401	5063.236



(after Webster et al., 1992)

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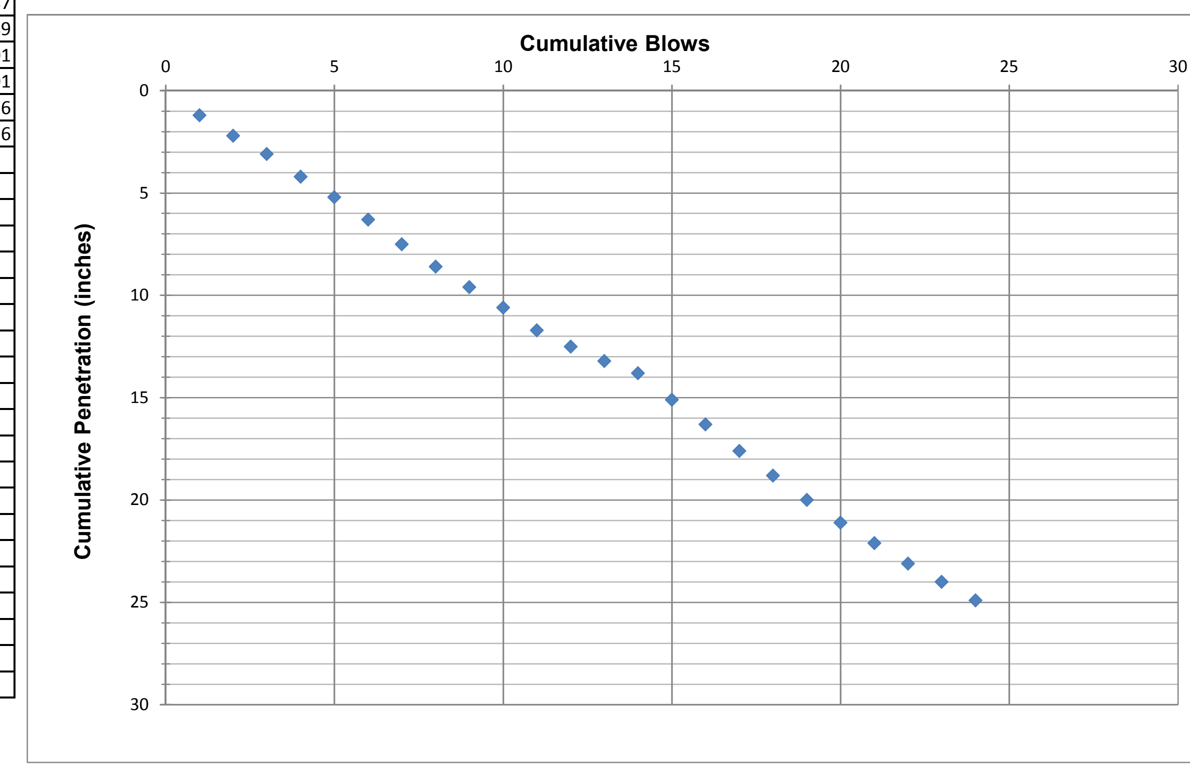


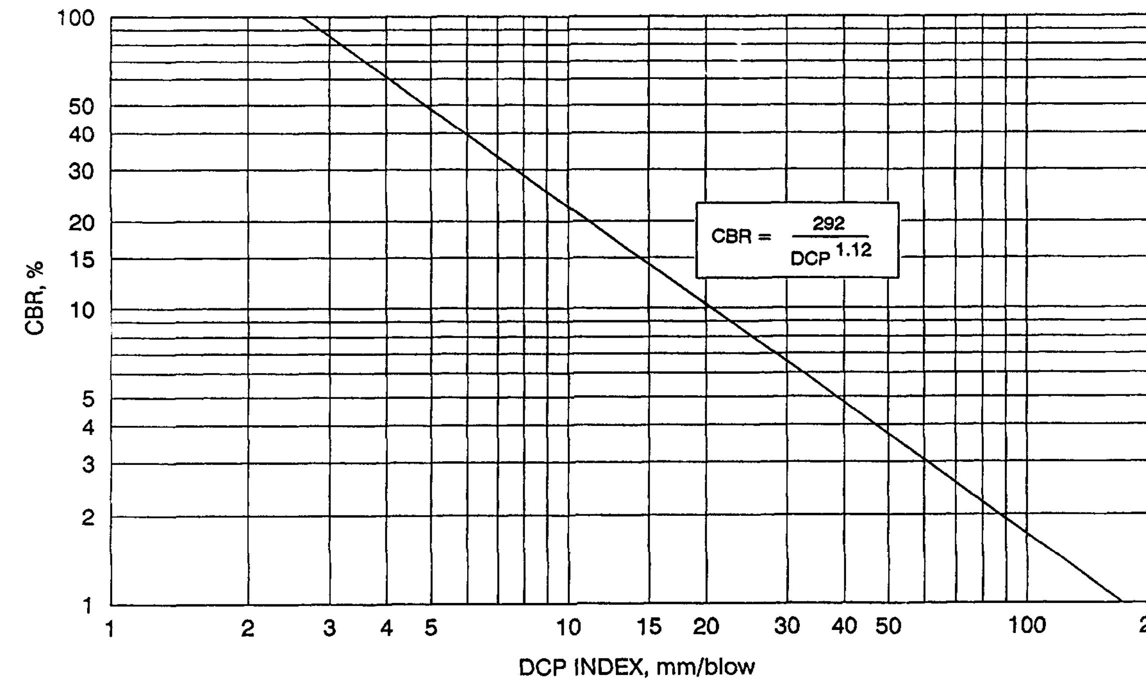
Location: Crestview, Newber, OR
Depth to bottom: 26"
Tester's Name: TAP
Tester's Company: GeoEngineers, Inc.

Date: 9/21/2017
Dimension: 4"
Tester's Contact No: 503-951-1810

Test Hole Number: B-4
Test Method: Dynamic Cone Penetration
GeoEngineers Job: 6748-002-00

Depth, feet	Soil Texture
0-26"	Silty Gravel Fill
26"-6.5'	Brown Silt

Test increment	Number of blows	Cumulative blows	Depth below ground surface	Cummulative Penetration	Penetration per blow set	Penetration per blow	Hammer blow factor	DCP Index	DCP Index	CBR	M_R
#	#	#	(in)	(in)	(in)	(in)	1 for 8-kg 2 for 4.6-kg hammer	in/blow	mm/blow	%	psi
1	1	1	27.8	1.8	1.8	1.7716545	1	1.771655	45.00002	4.109458	3887.899
2	1	2	29.2	3.2	1.5	1.4566937	1	1.456694	37.00002	5.116779	4196.325
3	1	3	30.3	4.3	1.1	1.1023628	1	1.102363	28.00002	6.991423	4678.172
4	1	4	31.2	5.2	0.8	0.8267721	1	0.826772	21.00001	9.649326	5233.622
5	1	5	32.0	6.0	0.8	0.8267721	1	0.826772	21.00001	9.649326	5233.622
6	1	6	32.9	6.9	0.9	0.9055123	1	0.905512	23.00001	8.714599	5051.193
7	1	7	33.9	7.9	1.0	0.9842525	1	0.984253	25.00001	7.93761	4889.576
8	1	8	34.7	8.7	0.8	0.787402	1	0.787402	20.00001	10.19129	5334.161
9	1	9	35.5	9.5	0.8	0.8267721	1	0.826772	21.00001	9.649326	5233.622
10	1	10	36.5	10.5	1.0	0.9842525	1	0.984253	25.00001	7.93761	4889.576
11	1	11	37.4	11.4	0.9	0.9055123	1	0.905512	23.00001	8.714599	5051.193
12	1	12	38.2	12.2	0.9	0.8661422	1	0.866142	22.00001	9.159446	5139.525
13	1	13	39.2	13.2	0.9	0.9448824	1	0.944882	24.00001	8.308947	4968.044
14	1	14	40.0	14.0	0.8	0.8267721	1	0.826772	21.00001	9.649326	5233.622
15	1	15	40.9	14.9	0.9	0.9055123	1	0.905512	23.00001	8.714599	5051.193
16	1	16	41.6	15.6	0.6	0.6299216	1	0.629922	16.00001	13.08483	5819.17
17	1	17	42.3	16.3	0.7	0.7480319	1	0.748032	19.00001	10.7939	5441.942
18	1	18	43.1	17.1	0.8	0.8267721	1	0.826772	21.00001	9.649326	5233.622
19	1	19	43.7	17.7	0.6	0.5905515	1	0.590552	15.00001	14.06567	5967.498
20	1	20	44.4	18.4	0.7	0.7086618	1	0.708662	18.00001	11.46773	5557.911
21	1	21	45.0	19.0	0.6	0.5905515	1	0.590552	15.00001	14.06567	5967.498
22	1	22	45.6	19.6	0.6	0.6299216	1	0.629922	16.00001	13.08483	5819.17
23	1	23	46.2	20.2	0.6	0.5905515	1	0.590552	15.00001	14.06567	5967.498
24	1	24	46.9	20.9	0.6	0.6299216	1	0.629922	16.00001	13.08483	5819.17



(after Webster et al., 1992)
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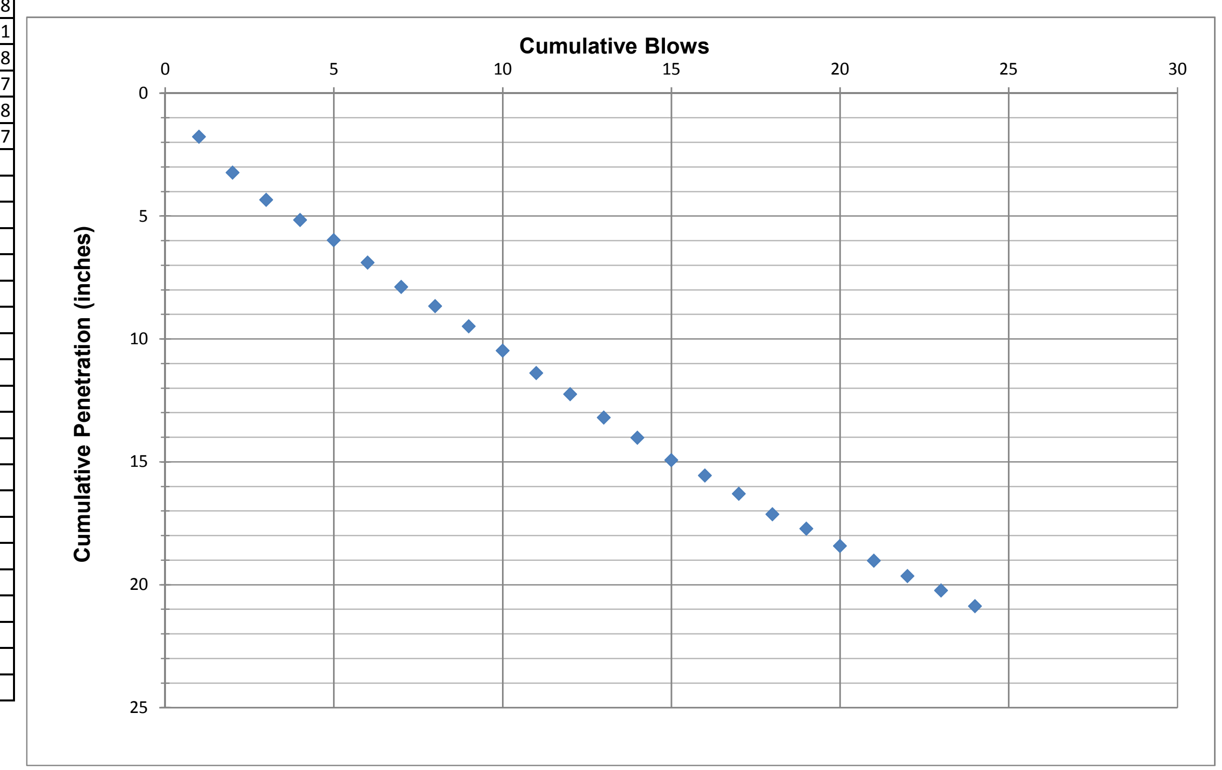


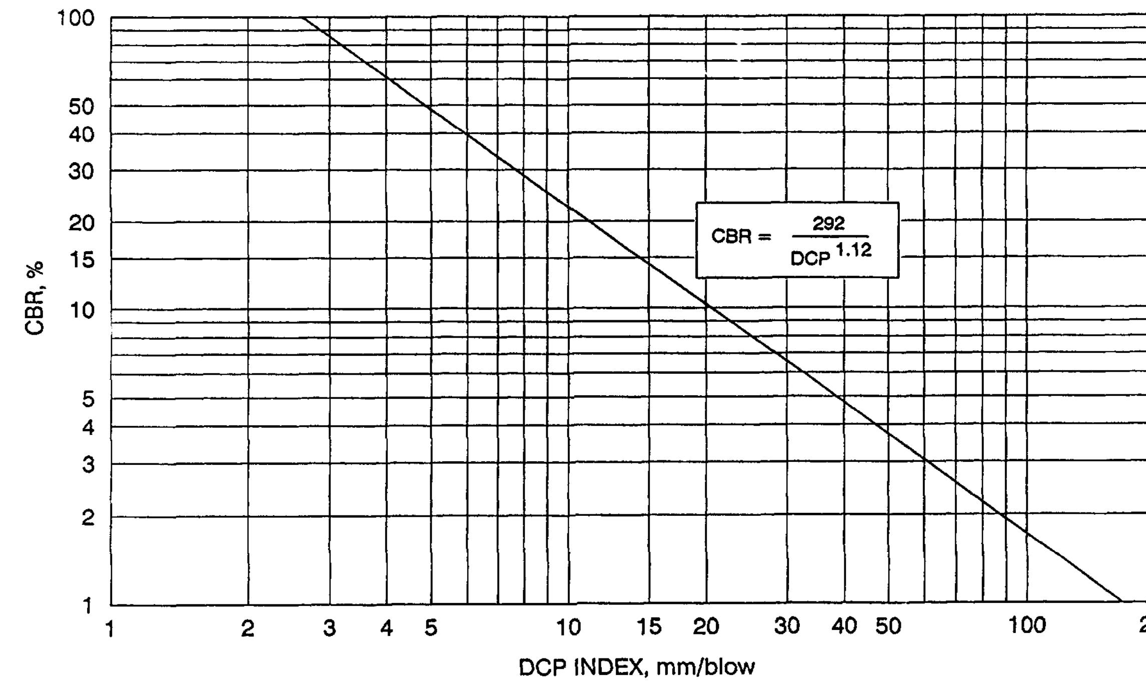
Location: Crestview, Newberg, OR
Depth to bottom: 22"
Tester's Name: TAP
Tester's Company: GeoEngineers, Inc.

Date: 9/21/2017
Dimension: 4"
Tester's Contact No: 503-951-1810

Test Hole Number: B-6
Test Method: Dynamic Cone Penetration
GeoEngineers Job: 6748-002-00

Depth, feet	Soil Texture
0-22"	Silty Gravel Fill
22"-6.5'	Brown Silt

Test increment	Number of blows	Cumulative blows	Depth below ground surface	Cummulative Penetration	Penetration per blow set	Penetration per blow	Hammer blow factor	DCP Index	DCP Index	CBR	M_R
#	#	#	(in)	(in)	(in)	(in)	1 for 8-kg 2 for 4.6-kg hammer	in/blow	mm/blow	%	psi
1	1	1	23.9	1.9	1.9	1.9	1	1.9	48.26	3.799838	3783.283
2	1	2	25.8	3.8	1.9	1.9	1	1.9	48.26	3.799838	3783.283
3	1	3	26.8	4.8	1.0	1	1	1	25.4	7.797746	4859.401
4	1	4	27.7	5.7	0.9	0.9	1	0.9	22.86	8.774401	5063.236
5	1	5	28.6	6.6	0.9	0.9	1	0.9	22.86	8.774401	5063.236
6	1	6	29.5	7.5	0.9	0.9	1	0.9	22.86	8.774401	5063.236
7	1	7	30.3	8.3	0.8	0.8	1	0.8	20.32	10.01171	5301.243
8	1	8	31.2	9.2	0.9	0.9	1	0.9	22.86	8.774401	5063.236
9	1	9	32	10	0.8	0.8	1	0.8	20.32	10.01171	5301.243
10	1	10	32.8	10.8	0.8	0.8	1	0.8	20.32	10.01171	5301.243
11	2	12	34.1	12.1	1.3	0.65	1	0.65	16.51	12.63299	5748.395
12	2	14	35.4	13.4	1.3	0.65	1	0.65	16.51	12.63299	5748.395
13	2	16	36.6	14.6	1.2	0.6	1	0.6	15.24	13.81783	5930.67
14	2	18	37.8	15.8	1.2	0.6	1	0.6	15.24	13.81783	5930.67
15	2	20	38.8	16.8	1.0	0.5	1	0.5	12.7	16.94817	6367.728
16	3	23	40.3	18.3	1.5	0.5	1	0.5	12.7	16.94817	6367.728
17	3	26	41.6	19.6	1.3	0.433333333	1	0.433333	11.00667	19.89429	6733.21
18	3	29	42.9	20.9	1.3	0.433333333	1	0.433333	11.00667	19.89429	6733.21
19	3	32	44.1	22.1	1.2	0.4	1	0.4	10.16	21.76015	6946.713
20	3	35	45.5	23.5	1.4	0.466666667	1	0.466667	11.85333	18.30971	6541.391
21	3	38	46.6	24.6	1.1	0.366666667	1	0.366667	9.313333	23.98751	7186.492
22	3	41	47.7	25.7	1.1	0.366666667	1	0.366667	9.313333	23.98751	7186.492
23	3	44	48.7	26.7	1.0	0.333333333	1	0.333333	8.466667	26.68977	7458.647



(after Webster et al., 1992)
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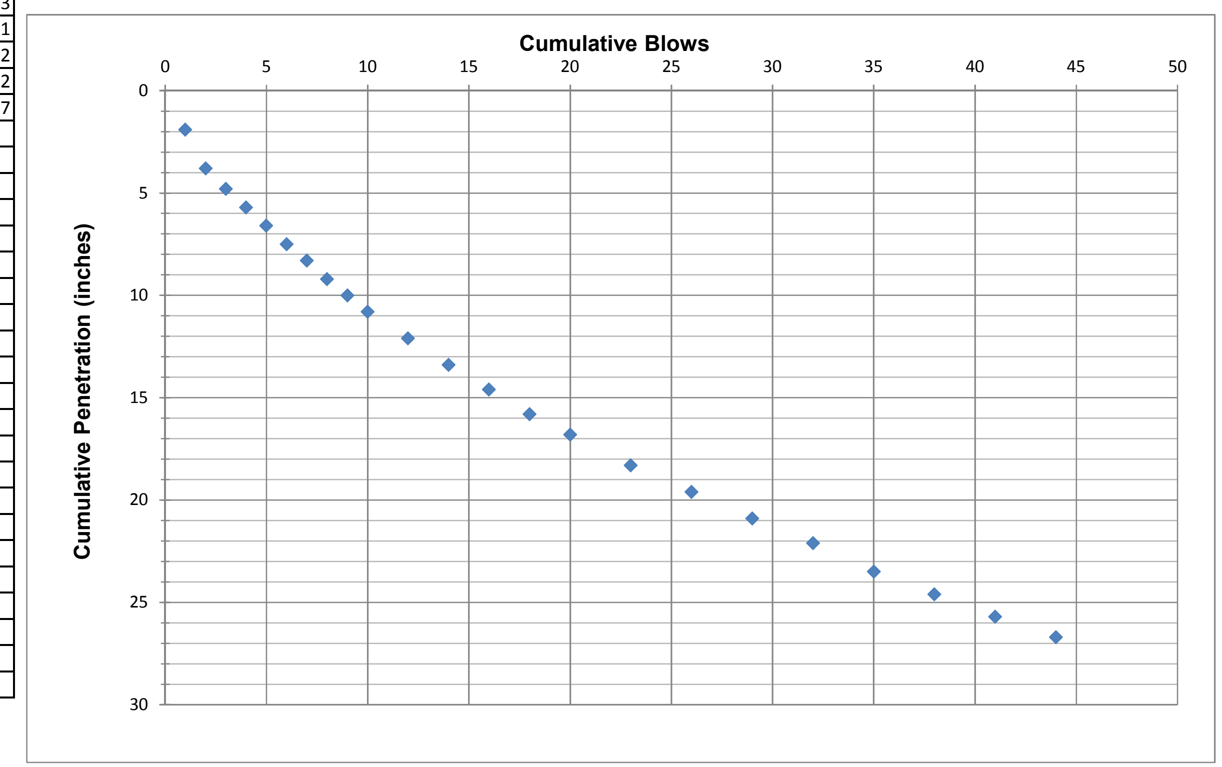


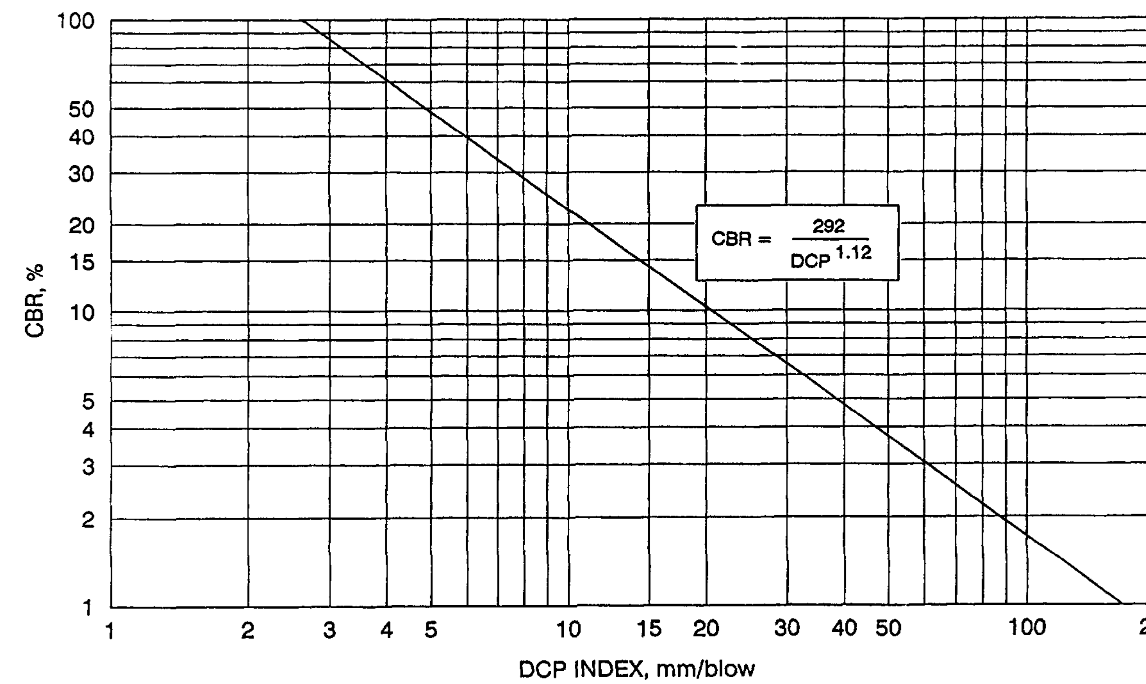
Location: Crestview, Newberg, OR
Depth to bottom: 22.5
Tester's Name: TAP
Tester's Company: GeoEngineers, Inc.

Date: 9/21/2017
Dimension: 4"
Tester's Contact No: 503-951-1810

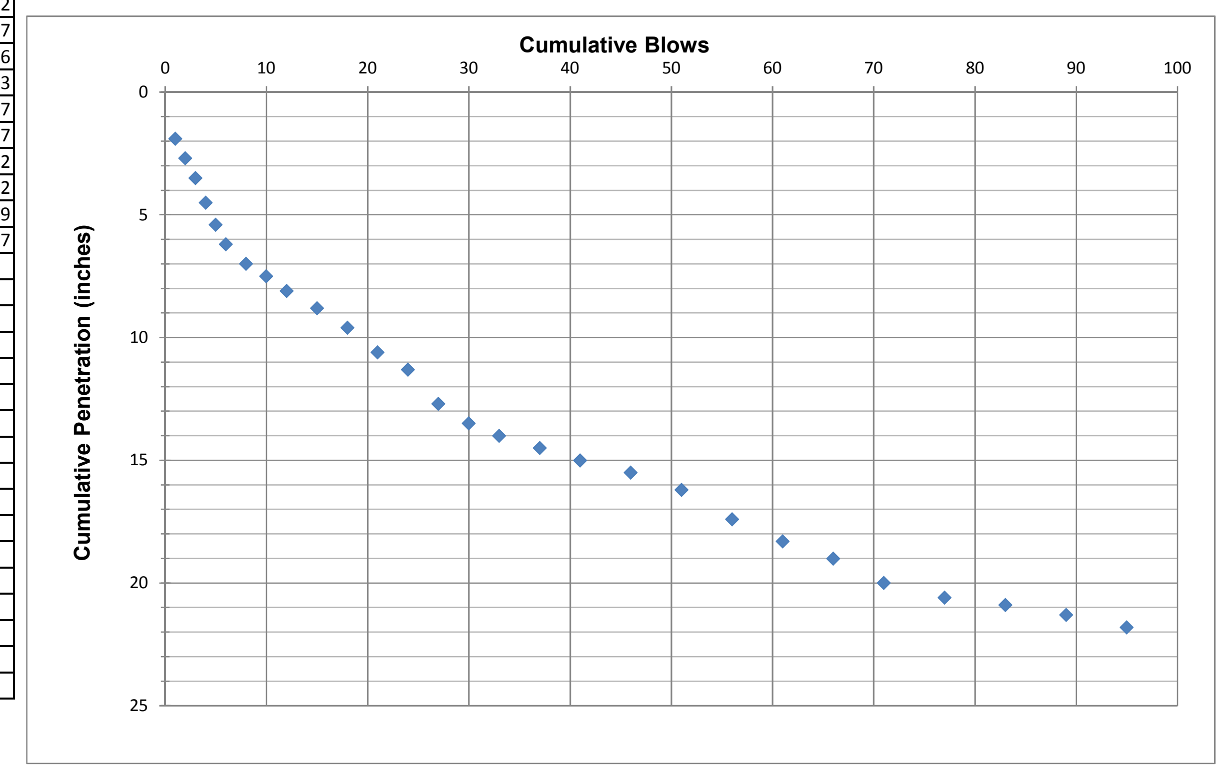
Test Hole Number: B-8
Test Method: Dynamic Cone Penetration
GeoEngineers Job: 6748-002-00

Depth, feet	Soil Texture
0-22.5"	Silty Gravel Fill
22.5"-6.5'	Brown Silt

Test increment	Number of blows	Cumulative blows	Depth below ground surface	Cummulative Penetration	Penetration per blow set	Penetration per blow	Hammer blow factor	DCP Index	DCP Index	CBR	M_R
#	#	#	(in)	(in)	(in)	(in)	1 for 8-kg 2 for 4.6-kg hammer	in/blow	mm/blow	%	psi
1	1	1	24.4	1.9	1.9	1.9	1	1.9	48.26	3.799838	3783.283
2	1	2	25.2	2.7	0.8	0.8	1	0.8	20.32	10.01171	5301.243
3	1	3	26	3.5	0.8	0.8	1	0.8	20.32	10.01171	5301.243
4	1	4	27	4.5	1.0	1	1	1	25.4	7.797746	4859.401
5	1	5	27.9	5.4	0.9	0.9	1	0.9	22.86	8.774401	5063.236
6	1	6	28.7	6.2	0.8	0.8	1	0.8	20.32	10.01171	5301.243
7	2	8	29.5	7	0.8	0.4	1	0.4	10.16	21.76015	6946.713
8	2	10	30	7.5	0.5	0.25	1	0.25	6.35	36.83632	8344.228
9	2	12	30.6	8.1	0.6	0.3	1	0.3	7.62	30.03262	7771.511
10	3	15	31.3	8.8	0.7	0.233333333	1	0.233333	5.926667	39.7956	8571.796
11	3	18	32.1	9.6	0.8	0.266666667	1	0.266667	6.773333	34.26763	8136.825
12	3	21	33.1	10.6	1.0	0.333333333	1	0.333333	8.466667	26.68977	7458.647
13	3	24	33.8	11.3	0.7	0.233333333	1	0.233333	5.926667	39.7956	8571.796
14	3	27	35.2	12.7	1.4	0.466666667	1	0.466667	11.85333	18.30971	6541.391
15	3	30	36	13.5	0.8	0.266666667	1	0.266667	6.773333	34.26763	8136.825
16	3	33	36.5	14	0.5	0.166666667	1	0.166667	4.233333	58.00942	9773.762
17	4	37	37	14.5	0.5	0.125	1	0.125	3.175	80.06263	10934.22
18	4	41	37.5	15	0.5	0.125	1	0.125	3.175	80.06263	10934.22
19	5	46	38	15.5	0.5	0.1	1	0.1	2.54	102.7943	11928.42
20	5	51	38.7	16.2	0.7	0.14	1	0.14	3.556	70.51893	10461.47
21	5	56	39.9	17.4	1.2	0.24	1	0.24	6.096	38.5596	8478.136
22	5	61	40.8	18.3	0.9	0.18	1	0.18	4.572	53.21865	9484.763
23	5	66	41.5	19	0.7	0.14	1	0.14	3.556	70.51893	10461.47
24	5	71	42.5	20	1.0	0.2	1	0.2	5.08	47.29503	9102.927
25	6	77	43.1	20.6	0.6	0.1	1	0.1	2.54	102.7943	11928.42
26	6	83	43.4	20.9	0.3	0.05	1	0.05	1.27	223.4203	15630.92
27	6	89	43.8	21.3	0.4	0.066666667	1	0.066667	1.693333	161.8793	13971.99
28	6	95	44.3	21.8	0.5	0.083333333	1	0.083333	2.116667	126.0817	12807.47



(after Webster et al., 1992)
Webster, S. L., Grau, R. H., and Williams, T. P. (1992). Description and application of dual mass dynamic cone penetrometer. Department of the Army Waterways Equipment Station, No. GL-92-3.



Location: Newberg, OR
Depth to bottom: 2'
Tester's Name: Danny Hess
Tester's Company: GeoEngineers, Inc.

Date: 9/21/2018
Dimension: 6"

Test Hole Number: IT-1
Test Method: Open Pit Fallin Head
GeoEngineers Job: 6748-002-00

	Depth	Soil Texture
	0-2'	Brown silt

Time of Day	Time Interval (min)	Total Time (min)	Depth to Water from Top of Pipe (inches)	Dist. Interval (inches)	Infiltration (inches/hour)	
10:43	0		1.17			Test #1
10:44	1	1	1.21	0.04	2.4	
10:45	1	2	1.23	0.02	1.2	
10:46	1	3	1.25	0.02	1.2	
10:47	1	4	1.27	0.02	1.2	
10:48	1	5	1.29	0.02	1.2	
10:49	1	6	1.31	0.02	1.2	
10:50	1	7	1.33	0.02	1.2	
10:51	1	8	1.36	0.03	1.8	
10:52	1	9	1.38	0.02	1.2	
10:53	1	10	1.38	0.00	0.0	
10:58	5	15	1.44	0.06	0.7	
11:03	5	20	1.50	0.06	0.7	
11:08	5	25	1.54	0.04	0.5	
11:13	5	30	1.58	0.04	0.5	
11:23	10	40	1.64	0.06	0.4	
11:33	10	50	1.70	0.06	0.4	
11:43	10	60	1.74	0.04	0.2	

Location: Newberg, OR
Depth to bottom: 3'
Tester's Name: Danny Hess
Tester's Company: GeoEngineers, Inc.

Date: 9/21/2018
Dimension: 6"

Test Hole Number: IT-2
Test Method: Encased Falling Head
GeoEngineers Job: 6748-002-00

	Depth	Soil Texture
	0-3'	Brown silt

Time of Day	Time Interval (min)	Total Time (min)	Depth to Water from Top of Pipe (inches)	Dist. Interval (inches)	Infiltration (inches/hour)	
15:00			3.98			Test #1
15:10	10	10	3.98	0.00	0.0	
15:20	10	20	3.98	0.00	0.0	
15:30	10	30	3.98	0.00	0.0	
15:40	10	40	3.98	0.00	0.0	
15:50	10	50	3.99	0.01	0.1	
16:00	10	60	3.99	0.00	0.0	

APPENDIX B
Asphalt Core Photographs

Top

Asphalt Core Photographs

Crestview Crossing Development
Newberg, Oregon

GeoEngineers

Figure B-1

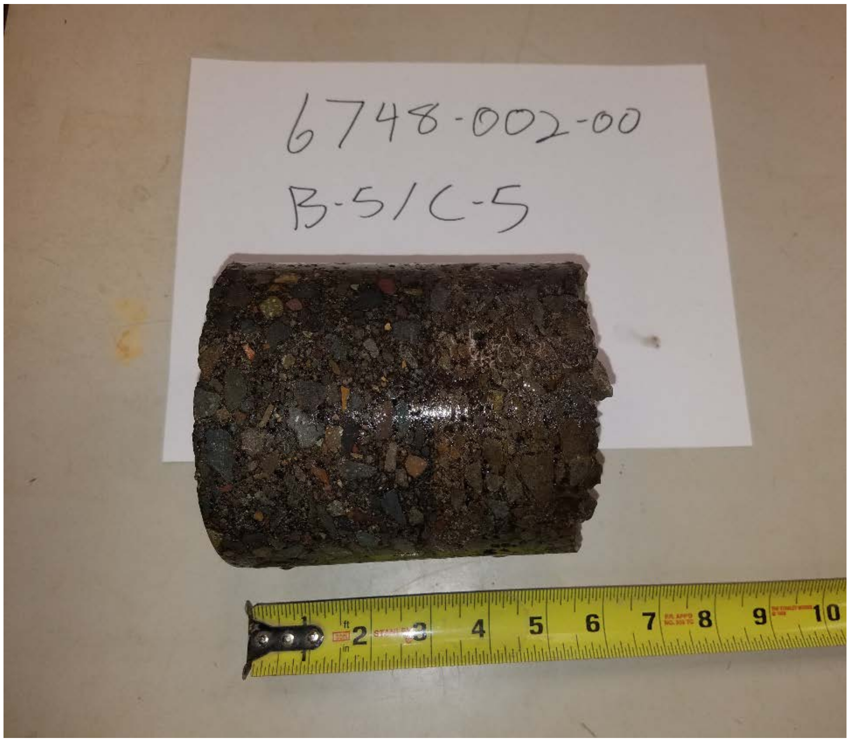
Top

Asphalt Core Photographs

Crestview Crossing Development
Newberg, Oregon

GEOENGINEERS

Figure B-2



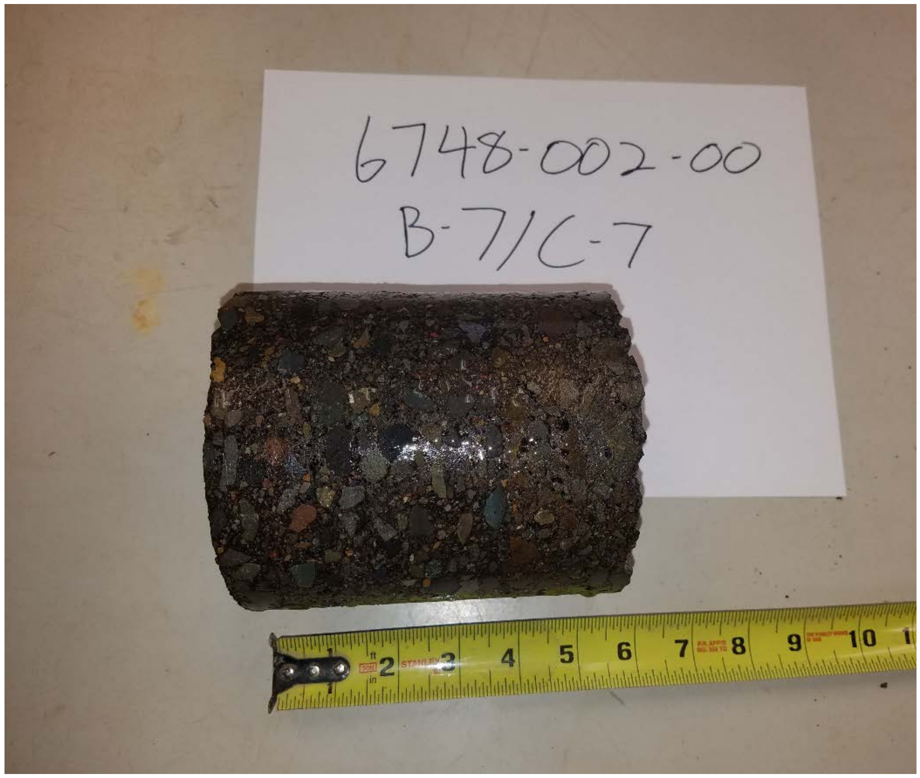
Top

Asphalt Core Photographs

Crestview Crossing Development
Newberg, Oregon

GeoEngineers

Figure B-3



Top

Asphalt Core Photographs

Crestview Crossing Development
Newberg, Oregon

GeoEngineers

Figure B-4

Top

Asphalt Core Photographs

Crestview Crossing Development
Newberg, Oregon

GeoEngineers

Figure B-5

APPENDIX C
Report Limitations and Guidelines for Use

APPENDIX C
REPORT LIMITATIONS AND GUIDELINES FOR USE[1]

This appendix provides information to help you manage your risks with respect to the use of this report.

Read These Provisions Closely

It is important to recognize that the geoscience practices (geotechnical engineering, geology and environmental science) rely on professional judgment and opinion to a greater extent than other engineering and natural science disciplines, where more precise and/or readily observable data may exist. To help clients better understand how this difference pertains to our services, GeoEngineers includes the following explanatory "limitations" provisions in its reports. Please confer with GeoEngineers if you need to know more how these "Report Limitations and Guidelines for Use" apply to your project or site.

Geotechnical Services Are Performed for Specific Purposes, Persons and Projects

This report has been prepared for 3J Consulting, Inc., J.T. Smith Companies and their authorized agents and/or regulatory agencies for the project specifically identified in the report. The information contained herein is not applicable to other sites or projects.

GeoEngineers structures its services to meet the specific needs of its clients. No party other than the party to whom this report is addressed may rely on the product of our services unless we agree to such reliance in advance and in writing. Within the limitations of the agreed scope of services for the Project, and its schedule and budget, our services have been executed in accordance with our Agreement with J.T. Smith Companies dated June 29, 2017 and generally accepted geotechnical practices in this area at the time this report was prepared. We do not authorize, and will not be responsible for, the use of this report for any purposes or projects other than those identified in the report.

A Geotechnical Engineering or Geologic Report is Based on a Unique Set of Project-Specific Factors

This report has been prepared for the proposed Crestview Crossing Development north of Hwy 99W between Vittoria Way and North Harmony Lane in Newberg, Oregon. GeoEngineers considered a number of unique, project-specific factors when establishing the scope of services for this project and report. Unless GeoEngineers specifically indicates otherwise, it is important not to rely on this report if it was:

- not prepared for you,
- not prepared for your project,
- not prepared for the specific site explored, or
- completed before important project changes were made.

---

[1] Developed based on material provided by ASFE, Professional Firms Practicing in the Geosciences; www.asfe.org.

For example, changes that can affect the applicability of this report include those that affect:

- the function of the proposed structure;
- elevation, configuration, location, orientation or weight of the proposed structure;
- composition of the design team; or
- project ownership.

If changes occur after the date of this report, GeoEngineers cannot be responsible for any consequences of such changes in relation to this report unless we have been given the opportunity to review our interpretations and recommendations. Based on that review, we can provide written modifications or confirmation, as appropriate.

Environmental Concerns Are Not Covered

Unless environmental services were specifically included in our scope of services, this report does not provide any environmental findings, conclusions, or recommendations, including but not limited to, the likelihood of encountering underground storage tanks or regulated contaminants.

Subsurface Conditions Can Change

This geotechnical or geologic report is based on conditions that existed at the time the study was performed. The findings and conclusions of this report may be affected by the passage of time, by man-made events such as construction on or adjacent to the site, new information or technology that becomes available subsequent to the report date, or by natural events such as floods, earthquakes, slope instability or groundwater fluctuations. If more than a few months have passed since issuance of our report or work product, or if any of the described events may have occurred, please contact GeoEngineers before applying this report for its intended purpose so that we may evaluate whether changed conditions affect the continued reliability or applicability of our conclusions and recommendations.

Geotechnical and Geologic Findings Are Professional Opinions

Our interpretations of subsurface conditions are based on field observations from widely spaced sampling locations at the site. Site exploration identifies the specific subsurface conditions only at those points where subsurface tests are conducted or samples are taken. GeoEngineers reviewed field and laboratory data and then applied its professional judgment to render an informed opinion about subsurface conditions at other locations. Actual subsurface conditions may differ, sometimes significantly, from the opinions presented in this report. Our report, conclusions and interpretations are not a warranty of the actual subsurface conditions.

Geotechnical Engineering Report Recommendations Are Not Final

We have developed the following recommendations based on data gathered from subsurface investigation(s). These investigations sample just a small percentage of a site to create a snapshot of the subsurface conditions elsewhere on the site. Such sampling on its own cannot provide a complete and accurate view of subsurface conditions for the entire site. Therefore, the recommendations included in this report are preliminary and should not be considered final. GeoEngineers' recommendations can be finalized only by observing actual subsurface conditions revealed during construction. GeoEngineers cannot assume responsibility or liability for the recommendations in this report if we do not perform construction observation.

We recommend that you allow sufficient monitoring, testing and consultation during construction by GeoEngineers to confirm that the conditions encountered are consistent with those indicated by the explorations, to provide recommendations for design changes if the conditions revealed during the work differ from those anticipated, and to evaluate whether earthwork activities are completed in accordance with our recommendations. Retaining GeoEngineers for construction observation for this project is the most effective means of managing the risks associated with unanticipated conditions. If another party performs field observation and confirms our expectations, the other party must take full responsibility for both the observations and recommendations. Please note, however, that another party would lack our project-specific knowledge and resources.

A Geotechnical Engineering or Geologic Report Could Be Subject to Misinterpretation

Misinterpretation of this report by members of the design team or by contractors can result in costly problems. GeoEngineers can help reduce the risks of misinterpretation by conferring with appropriate members of the design team after submitting the report, reviewing pertinent elements of the design team's plans and specifications, participating in pre-bid and preconstruction conferences, and providing construction observation.

Do Not Redraw the Exploration Logs

Geotechnical engineers and geologists prepare final boring and testing logs based upon their interpretation of field logs and laboratory data. The logs included in a geotechnical engineering or geologic report should never be redrawn for inclusion in architectural or other design drawings. Photographic or electronic reproduction is acceptable but separating logs from the report can create a risk of misinterpretation.

Give Contractors a Complete Report and Guidance

To help reduce the risk of problems associated with unanticipated subsurface conditions, GeoEngineers recommends giving contractors the complete geotechnical engineering or geologic report, including these "Report Limitations and Guidelines for Use." When providing the report, you should preface it with a clearly written letter of transmittal that:

- advises contractors that the report was not prepared for purposes of bid development and that its accuracy is limited; and
- encourages contractors to confer with GeoEngineers and/or to conduct additional study to obtain the specific types of information they need or prefer.

Contractors Are Responsible for Site Safety on Their Own Construction Projects

Our geotechnical recommendations are not intended to direct the contractor's procedures, methods, schedule or management of the work site. The contractor is solely responsible for job site safety and for managing construction operations to minimize risks to on-site personnel and adjacent properties.

Biological Pollutants

GeoEngineers' Scope of Work specifically excludes the investigation, detection, prevention or assessment of the presence of Biological Pollutants. Accordingly, this report does not include any interpretations, recommendations, findings or conclusions regarding the detecting, assessing, preventing or abating of Biological Pollutants, and no conclusions or inferences should be drawn regarding Biological Pollutants as they may relate to this project. The term "Biological Pollutants" includes, but is not limited to, molds, fungi, spores, bacteria and viruses, and/or any of their byproducts.

A Client that desires these specialized services is advised to obtain them from a consultant who offers services in this specialized field.

Transportation Impact Analysis

Crestview Crossing

Newberg, Oregon

Final

June 2018

Transportation Impact Analysis

Crestview Crossing

Newberg, Oregon

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Project No. 21709

June 2018

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Section 1
Executive Summary

EXECUTIVE SUMMARY

JT Smith Companies proposes to develop a 33.13-acre property in Newberg, Oregon into a residential development consisting of up to 260 single-family homes and 48 apartment units. The development is occurring adjacent to a 4.43-acre commercial property that is not included as part of this development application. The site is located on the north side of OR 99W (Portland Road) near the intersection with Providence Drive and will include an extension of Crestview Drive to the south through the property and connecting to OR 99W to form the north leg of the OR 99W/Providence Drive intersection.

The subject property is currently occupied by farm land and one single-family home. It is bordered by residential uses to the west, north, and east and by OR 99W to the south. No direct accesses to the residential units or civic space are proposed on OR 99W or the Crestview Drive extension—these will instead be accessed via new internal local roadways and one new east-west connector that will connect to Crestview Drive north of OR 99W. Completion and occupancy of the development as described in this report is expected to occur by 2020.

The results of this study indicate that the proposed Crestview Crossing development can be constructed while maintaining acceptable traffic operations and safety at the study intersections, assuming provision of the recommended mitigation measures.

FINDINGS

Year 2017 Existing Conditions

- All of the study intersections currently meet City of Newberg (and Oregon Department of Transportation, where applicable) mobility targets during the weekday AM and PM peak hours, with the following exceptions:
  - The Springbrook Road/OR 99W intersection currently experiences a volume-to-capacity ratio (v/c) of 0.86 during the weekday AM peak hour, which exceeds the ODOT mobility standard of 0.85. The intersection also operates at level of service (LOS) E during the weekday PM peak hour, which exceeds the City standard of LOS D under current conditions.
  - The southbound stop-controlled approach to the Vittoria Way/OR 99W intersection currently operates at LOS E during the weekday PM peak hour, which exceeds the City standard of LOS D.
- A review of historical crash data did not reveal any patterns or trends in the site vicinity that require mitigation associated with this project.
  - One fatal crash was reported at the Springbrook Road/Crestview Drive roundabout—this crash occurred when a southbound motorcyclist struck a curb and was thrown from the vehicle. The crash report lists the cause as driver error—driving too fast for conditions.
  - Based upon a 2016 analysis, the Springbrook Road/OR 99W intersection is currently within the top five percent of the highest-scoring intersections in Region 2.

Since 2016, pavement marking improvements and an additional westbound left turn lane on OR 99W were added to this intersection, and the proposed Crestview Crossing development is expected to result in a net decrease in traffic at this intersection due to the reassignment of traffic to the Crestview Drive extension.

Year 2020 Background Conditions

- A two-percent annual growth rate was applied to the existing mainline traffic volumes on OR 99W to reflect general background growth in the area before any in-process traffic was considered.
- Traffic generated by the Oregon Clinic, to be located on the west side of Providence Drive south of Providence Newberg Medical Center, was included in the background traffic volumes as in-process traffic.

Background traffic conditions with the assumed build-out of the north leg of the Providence Drive/OR 99W intersection (and no site-added traffic) were assumed as the base case against which future traffic conditions are compared.

- The proposed development will extend Crestview Drive south through the property and to the existing Providence Drive/OR 99W intersection, where it will form the north leg.
- Traffic volumes were assigned to the Crestview Drive extension based upon existing turning movement volumes at the study intersections and the Newberg Transportation System Plan.
- The background traffic condition includes rerouted traffic from the proposed Crestview Drive extension but does not include trips associated with new land uses within the proposed development.
- All of the study intersections are expected to continue operating acceptably during the weekday AM and PM peak hours under 2020 background traffic conditions with reassigned traffic, with the following exceptions:
  - The Springbrook Rd/OR 99W intersection is forecast to operate with a v/c ratio of 0.88 during the weekday PM peak hour, which exceeds the ODOT mobility standard of 0.85.
  - The weekday AM and PM peak hour v/c ratios at the Providence Drive/OR 99W intersection are forecast to be 0.89 and 0.92, respectively, which both exceed the ODOT mobility standard of 0.80.

Proposed Development Plan

- The proposed development is expected to generate approximately 4,126 weekday daily trips, of which approximately 213 (53 in, 160 out) are forecast to occur during the AM peak hour and approximately 285 (180 in, 105 out) are forecast to occur during the PM peak hour.
- A select-zone analysis of the Newberg Transportation Planning Model was used to develop a trip distribution pattern for the proposed development.

Year 2020 Total Conditions

- All of the study intersections are expected to continue operating acceptably during the weekday AM and PM peak hours under 2020 total traffic volumes, with the following exceptions:
  - The Springbrook Rd/OR 99W intersection is forecast to operate with a v/c ratio of 0.86 during the weekday PM peak hour, which exceeds the ODOT mobility standard of 0.85 but does not exceed the v/c ratio under background conditions with reassigned traffic.
  - The weekday AM and PM peak hour v/c ratios at the Providence Drive/OR 99W intersection are forecast to be 0.98 and 1.08, respectively, which both exceed the ODOT mobility standard of 0.80.
  - The new proposed Crestview Diver/East-West Connector intersection within the Crestview Crossing development is expected to operate acceptably as a single-lane roundabout.

Year 2020 Total Mitigated Conditions

- The Crestview Drive/Providence Drive/OR 99W intersection was analyzed under total traffic conditions with the following additional lane improvements:
  - Add an exclusive left turn lane on southbound Crestview Drive,
  - Add an exclusive right turn lane on southbound Crestview Drive,
  - Add an exclusive right turn lane on westbound OR 99W,
  - Restripe eastbound OR 99W to include an exclusive left turn lane, and,
  - Restripe the northbound Providence Drive approach to include an exclusive left turn lane and an exclusive right turn lane.

  With these improvements, the weekday AM and PM peak hour v/c ratios at the intersection are forecast to be 0.88 and 0.89, respectively. These exceed the ODOT mobility standard of 0.80 but do not exceed the respective v/c ratios under background conditions with reassigned traffic. As such, the impact of the development has been mitigated.

95th-percentile Queuing Analysis

- All 95th-percentile queues are projected to be accommodated by the provided storage lengths under 2020 total traffic conditions, with the following exceptions:
  - The southbound right turn at Springbrook Road/OR 99W during the weekday PM peak hour.
  - The northbound left turn at Brutscher Street/OR 99W during the weekday PM peak hour.

  Each of the queues noted above is expected to decrease under total traffic conditions compared with existing conditions due to reassigned traffic from Springbrook Road and OR 99W to the Crestview Drive extension.

Commercial Property Sensitivity Analysis

A planning-level analysis was prepared to account for the future development potential of the 4.43-acre commercial property adjacent to the development site. While this is NOT part of this development application, the analysis was conducted to evaluate the future effectiveness of the recommended mitigations.

- A planning-level estimate for developable commercial area was used to estimate the number of potential commercial-related site trips. The gross leasable area-to-acreage ratio was assumed at 25 percent, and the entire commercial property was assumed as shopping center land use.
- The commercial development trips were added to the residential trips of this application to arrive at a total development estimate of 6,220 weekday daily trips, of which 370 (155 in, 215 out) will occur during the AM peak hour and 440 (247 in, 193 out) will occur during the PM peak hour. The development is also expected to generate approximately 96 pass-by trips during the weekday PM peak hour—these were treated as diverted trips from OR 99W.
- The Crestview Drive/Providence Drive/OR 99W intersection and Crestview Drive/East-West Connector roundabout were analyzed assuming development of the 4.43-acre commercial property.
- The Crestview Drive/East-West Connector intersection is expected to continue operating acceptably as a single-lane roundabout.
- With the mitigation improvements associated with the residential development in place, the weekday AM and PM peak hour v/c ratios at the Crestview Drive/Providence Drive/OR 99W intersection are forecast to be 0.90 and 0.94, respectively.

  Per ODOT policy guidance, when an intersection exceeds mobility targets but the v/c ratio increases by less than 0.03 as a result of development, the impacts are not considered significant. For this reason, no additional mitigation measures would be warranted as a result of additional commercial development.

RECOMMENDATIONS

Providence Drive/Crestview Drive/OR 99W Intersection

- The new north leg of the intersection, which will be an extension of Crestview Drive, should be configured as a four-lane section with one northbound lane and three southbound lanes (exclusive lanes for left-turn, through, and right-turn movements). At least 250 feet of southbound left turn storage and at least 150 feet of southbound right turn storage should be provided to accommodate the forecast 95th percentile queue lengths.
- The south leg of the intersection should be restriped to a four-lane section with one southbound lane and three northbound lanes (exclusive lanes for left-turn, through, and right-turn movements).
- Based on the forecast 95th percentile queuing analysis:
  - A westbound right turn lane should be constructed with at least 300 feet of storage.

   - An eastbound left turn lane should be striped to provide at least 150 feet of storage.
- Recommended signal phasing: the intersection should be operated with permissive left turn movements on the northbound and southbound approaches and fully protected left turn movements on the eastbound and westbound approaches.

On-Site Circulation/Site Access Operations

- Driveways, landscaping, utilities, and signage within the site should be located and maintained to provide sufficient sight distance at all new internal intersections and accesses.
- Other than at the Providence Drive/Crestview Drive/OR 99W intersection, a two-lane section of Crestview Drive should be adequate to accommodate turning movements and queuing within the proposed development.

Additional details of the study methodology, findings, and recommendations are provided within this report.

Section 2
Introduction

INTRODUCTION

PROJECT DESCRIPTION

JT Smith Companies proposes to develop a 33.13-acre property in Newberg, Oregon consisting of up to 260 single-family homes and 48 apartment units. The ultimate number of residential units may vary but is not anticipated to exceed the number of units analyzed in this report. The development is located adjacent to 4.43 acres of commercial property that are not included in this application but may be developed as part of a future phase.

Figure 1 displays the site vicinity, and Figure 2 illustrates the proposed site plan. The site is located on the north side of OR 99W (Portland Road) near the intersection with Providence Drive and will include an extension of Crestview Drive to the south through the property and connecting to OR 99W to form the north leg of the OR 99W/Providence Drive intersection. No direct accesses to the residential units or adjacent commercial property are proposed on OR 99W or the Crestview Drive extension—these will instead be accessed via new internal local roadways and one new east-west connector that will connect to Crestview Drive north of OR 99W. Completion and occupancy of the development as described in this report is expected to occur by 2020.

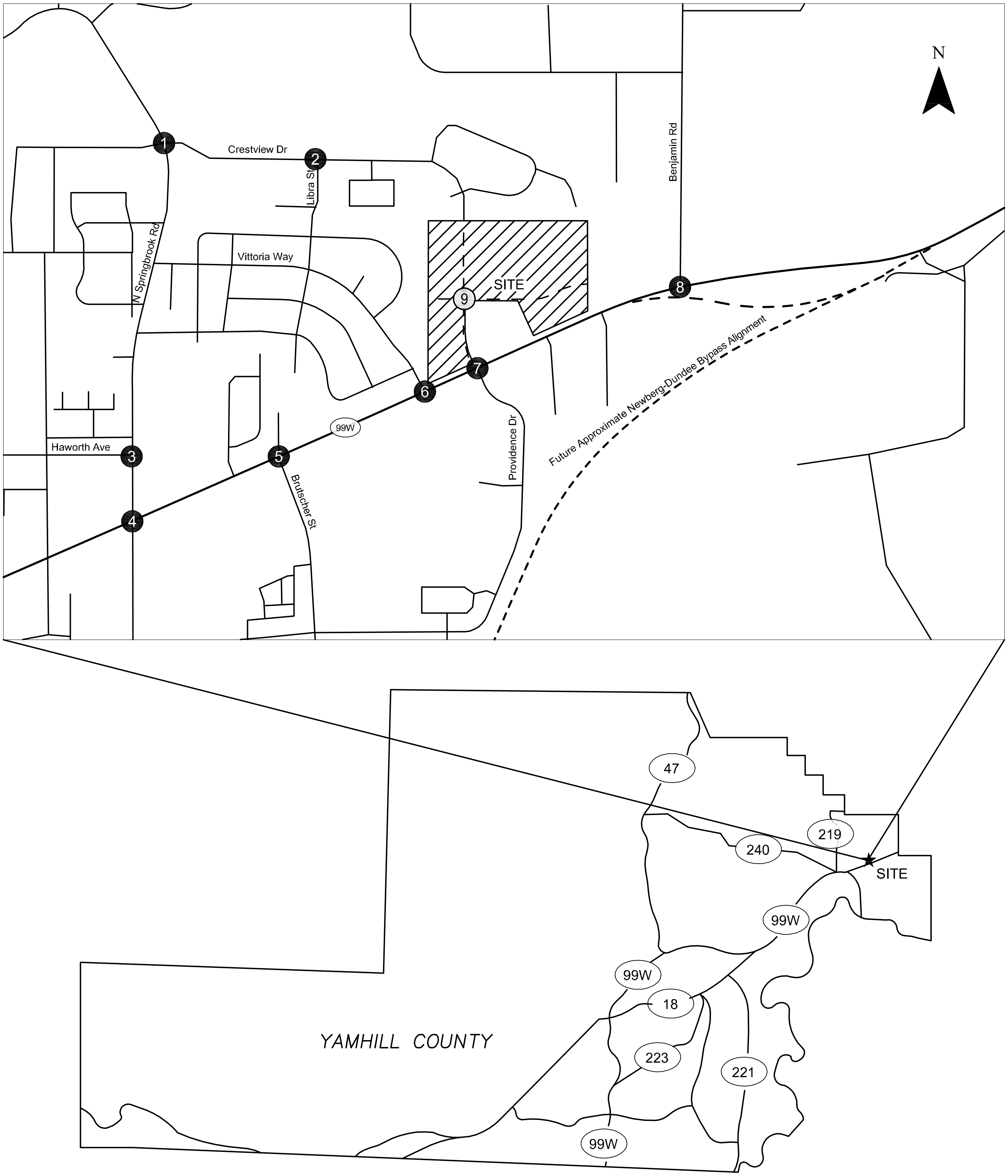
SCOPE AND ANALYSIS METHODOLOGY

This analysis determines the transportation-related impacts associated with the proposed Crestview Crossing development and was prepared in accordance with City of Newberg and Oregon Department of Transportation (ODOT) requirements for traffic impact analyses. The study intersections and scope of this project were selected based on conversations with City and ODOT staff and are documented in a scoping memorandum (dated October 19, 2017) and subsequent City and ODOT comments (*Appendix "A"*).

Study Intersections

This report includes an analysis of operations and safety at the following study intersections:

1. Springbrook Road/Crestview Drive,
2. Libra Street/Crestview Drive,
3. Springbrook Road/Haworth Avenue,
4. Springbrook Road/OR 99W,
5. Brutscher Street/OR 99W,
6. Vittoria Way/OR 99W,
7. Providence Drive/Future Crestview Drive extension/OR 99W,
8. Benjamin Road/OR 99W, and
9. Future Crestview Drive extension/Future east-west connector.



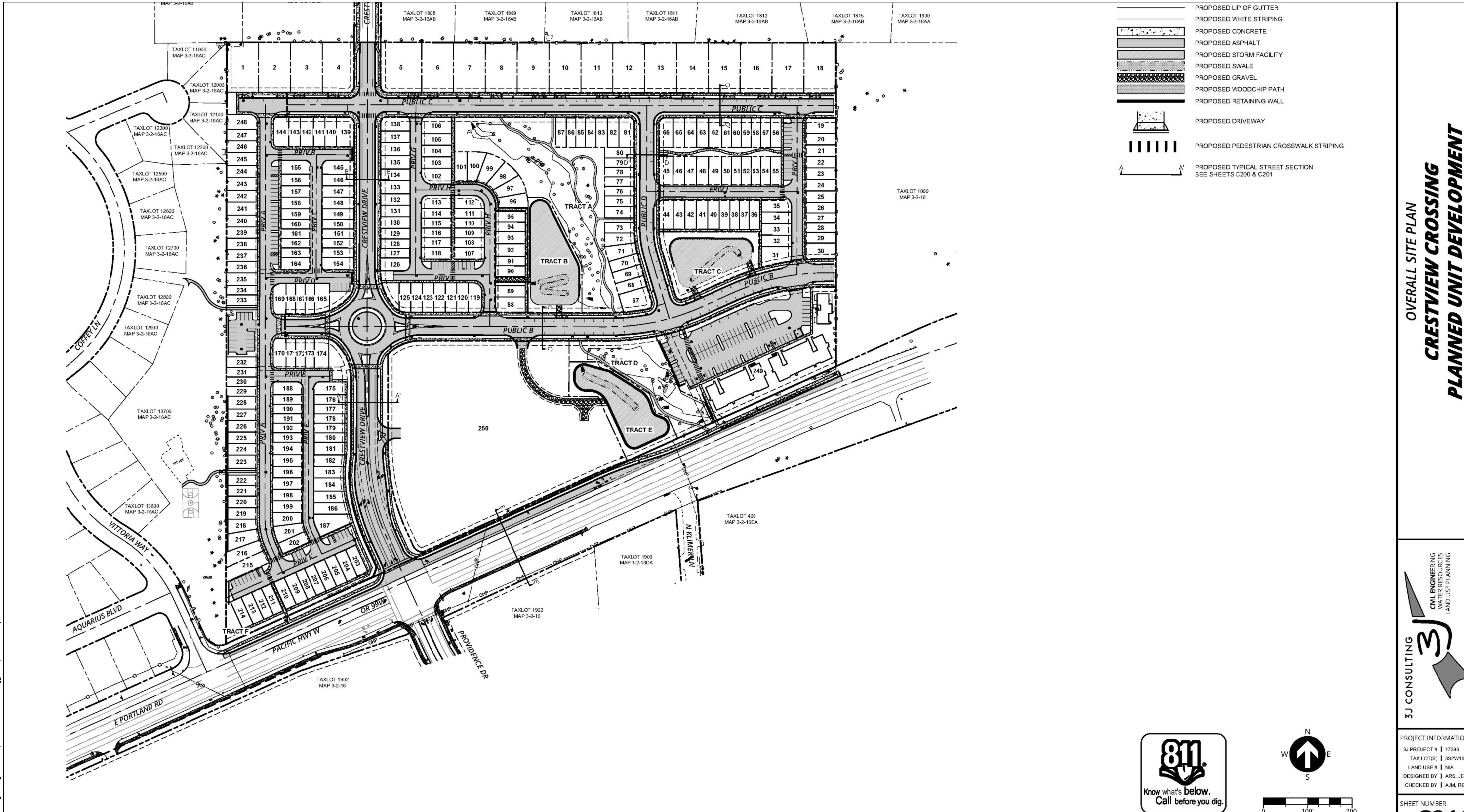
- Study Intersection

Site Vicinity
Newberg, Oregon

Figure
1

C:\Users\zbugg\Desktop\21709 figs-.dwg Jun 05, 2018 - 2:21pm - zbugg Layout Tab: Site Vicinity Map

KITTELSON & ASSOCIATES



Site Plan Provided by 3J Consulting 6/5/2018

Proposed Site Plan
Newberg, Oregon

Figure
2

Study Scope

This report documents evaluation of the following transportation items:

- Year 2017 existing conditions analysis, including *Highway Capacity Manual 2000* (HCM 2000, Reference 1) volume-to-capacity (v/c) ratio, control delay, and 95th-percentile queuing analysis at the study intersections during the weekday AM and PM peak hours;
- A review of reported crash data from ODOT at the study intersections for the most recent five-year period available;
- Build-out Year 2020 background conditions (includes in-process traffic and regional growth but not traffic from the development), including HCM 2000 v/c ratio, control delay, and 95th-percentile queuing analysis at the study intersections during the weekday AM and PM peak hours;
- Build-out Year 2020 total conditions analysis, including HCM 2000 v/c ratio, control delay, and 95th-percentile queuing analysis at the study intersections during the weekday AM and PM peak hours; and,
- On-site traffic operations and circulation.

Analysis Methodology and Applicable Standards

All Level of Service analyses described in this report were performed in accordance with the procedures stated in the HCM 2000. The operations and queuing analyses presented in this report were completed using *Synchro 9 and SimTraffic 9* software, with the exception of the roundabout analyses, which were completed using *Highway Capacity Software (HCS) 7*. Per HCM 2000 methodology, the reported traffic operations are based upon the worst 15 minutes of each peak hour—consequently, the study intersections are expected to perform better during the rest of the day, in general.

The study intersections along OR 99W are all subject to ODOT v/c ratio mobility targets, defined by the *1999 Oregon Highway Plan,* Policy 1F. The study intersections along OR 99W are within the Newberg urban growth boundary, on a Statewide Highway, on a freight route, outside a Metropolitan Planning Organization, outside a Special Transportation Area, and not on a freeway. Thus, the mobility target for each study intersection along OR 99W is a function of the posted speed limit, as shown in Table 1.

Table 1: OR 99W Mobility Targets

Intersection	Posted Speed (mph)	Mobility Target (v/c)
OR 99W/Springbrook Road	35	0.85
OR 99W/Brutcher Street	35	0.85
OR 99W/Vittoria Way	45	0.80
OR 99W/Providence Drive	45	0.80
OR 99W/Benjamin Road	55	0.75

With the exception of OR 99W/Benjamin Road, which is outside the City limits, all study intersections are additionally subject to City of Newberg mobility standards, which require LOS D or better.

Section 3
Existing Conditions

EXISTING CONDITIONS

The existing conditions analysis identifies the site conditions and current operational and geometric characteristics of the roadways within the study area. These conditions will be compared with future conditions later in this report.

Kittelson & Associates, Inc. (KAI) staff visited and inventoried the proposed Crestview Crossing site in November 2017. At that time, KAI collected information regarding site conditions, adjacent land uses, existing traffic operations, and transportation facilities in the study area.

SITE CONDITIONS AND ADJACENT LAND USES

The subject property is located on the north side of OR 99W (Portland Road) near the intersection with Providence Drive. The site is currently occupied by farm land and one single-family home, and it is bordered by residential uses to the west, north, and east and by OR 99W to the south.

Transportation Facilities

Existing lane configurations and traffic control devices at the study intersections are displayed in Figure 3. Table 2 summarizes the existing transportation facilities and roadways in the study area.

Table 2: Existing transportation facilities and roadways in the study area

Roadway	Functional Classification[1]	Number of Lanes	Posted Speed	Sidewalks	Bicycle Lanes	On-Street Parking
OR 99W	Major Arterial	4-5	35 mph – 55 mph[2]	Partial[3]	Yes	No
Springbrook Road	Minor Arterial	2-3	35 mph	Both Sides	South of Haworth Avenue	No
Crestview Drive	Major Collector	2	25 mph	Both sides east of Birdhaven Loop	East of Birdhaven Loop	No
Providence Drive	Major Collector	2	25 mph	Partial[4]	Yes	No
Brutscher Street	Major Collector	2-3	25 mph	Both Sides south of OR 99W	South of Fred Meyer entrance	No
Haworth Avenue	Major Collector	2	25 mph	Both Sides	No	Yes
Vittoria Way	Minor Collector	2	25 mph	Partial[5]	No	Yes
Libra Street	Local Street	2	25 mph	Both Sides	No	Yes
Benjamin Road	Local Street	2	45 mph	No	No	No

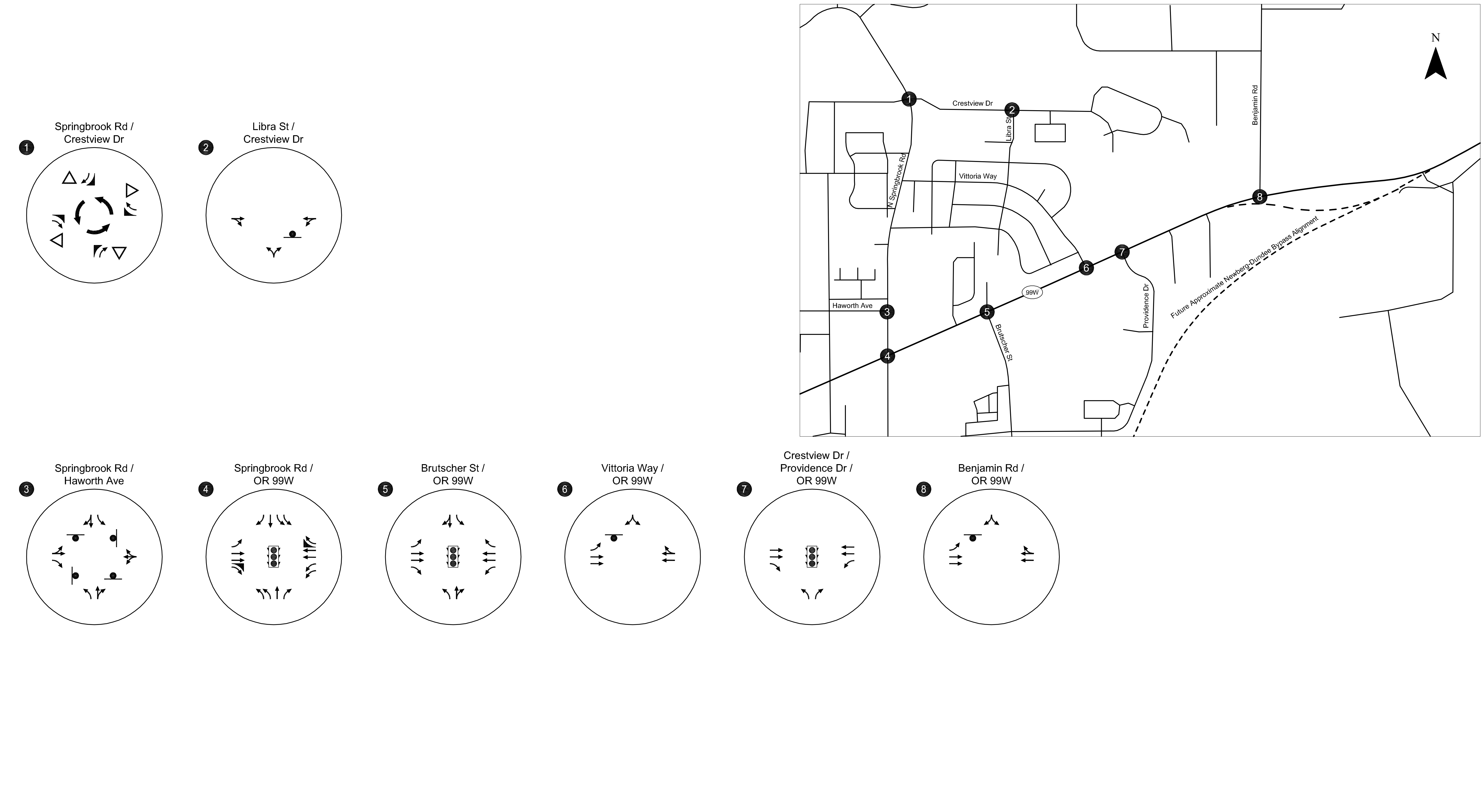
[1]City of Newberg Transportation System Plan (TSP, Reference 2)

[2]Posted speed is 35 mph at and west of Brutscher Street, 45 mph from east of Brutscher Street to east of Providence Drive, and 55 mph at and east of Benjamin Road

[3]Sidewalks are provided on both sides of OR 99W throughout the study area except on the north side from 250 feet east of Brutscher Street to the east end of the study area and on the south side from 400 feet east of Providence Drive to the east end of the study area

[4]The sidewalk on the east side of Providence Drive ends approximately 270 feet south of OR 99W.

[5]No sidewalk is provided on the east side of Vittoria Way south of Aquarius Boulevard.



- STOP SIGN
- TRAFFIC SIGNAL
- ROUNDABOUT
- YIELD

Existing Lane Configurations and Traffic Control Devices
Newberg, Oregon

Figure 3

Roadway Facilities

The proposed Crestview Crossing development site is bordered to the south by OR 99W, which is maintained by ODOT and is classified a Major Arterial in the Newberg TSP. Crestview Drive, which is classified a Major Collector, will be extended south through the proposed development site and will connect to OR 99W to form the fourth leg of the existing OR 99W/Providence Drive intersection. The Crestview Drive extension will consist of one travel lane in either direction, except where turn lanes are needed. As shown in Figure 2, several new local streets will be constructed to serve the development, and one east-west connector roadway will intersect the Crestview Drive at a roundabout approximately 500 feet north of OR 99W.

Pedestrian and Bicycle Facilities

There are currently no sidewalks provided within the proposed site frontage along OR 99W, but sidewalks and bicycle lanes are provided on both sides of Crestview Drive and Providence Drive north and south of the proposed site. While paved shoulders are provided along both sides of OR 99W within the site vicinity, OR 99W is a high-speed roadway with no separated bicycle facilities.

TRANSIT FACILITIES

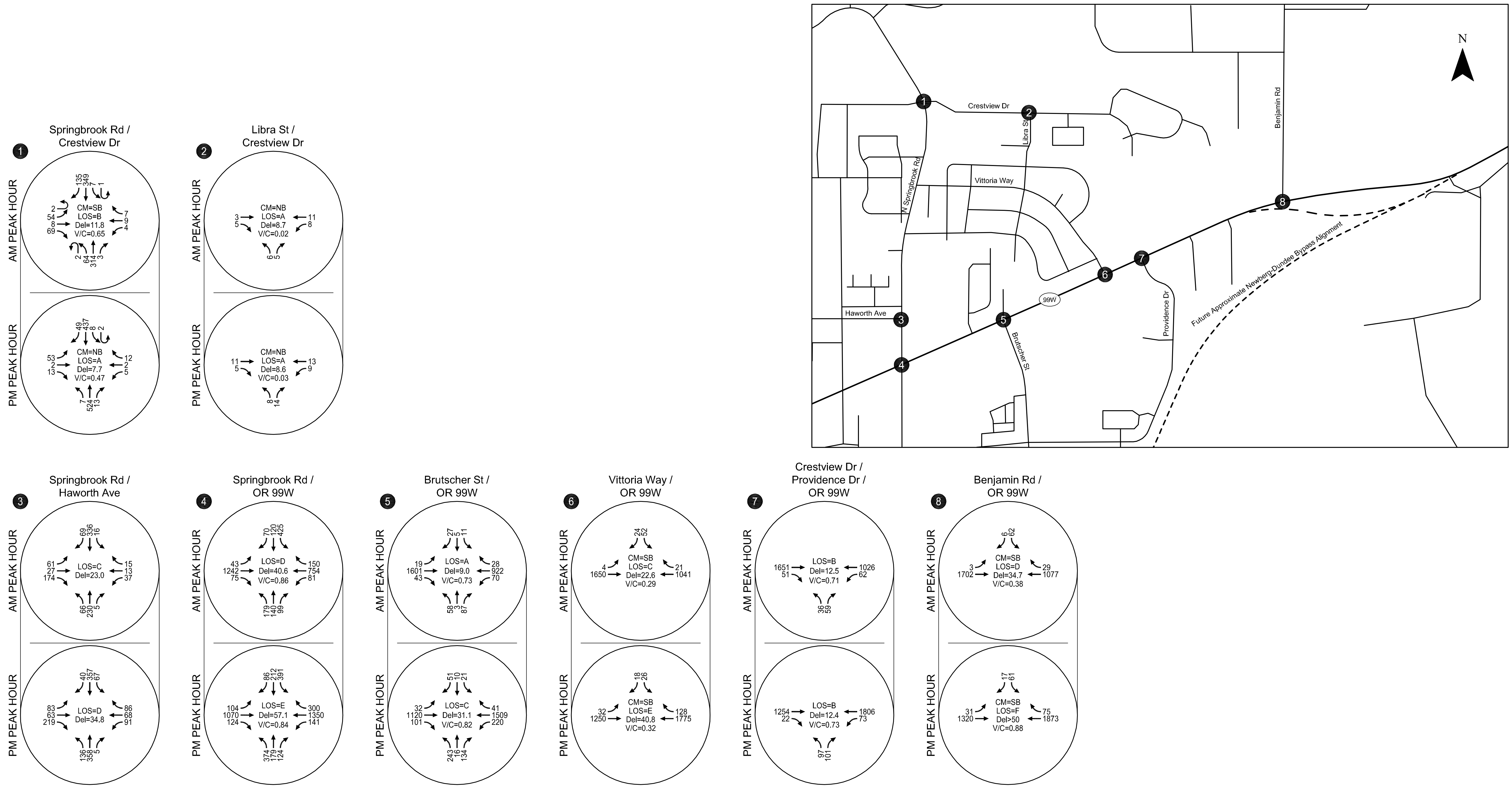
Transit service in the site vicinity is provided by Yamhill County Transit Area (YCTA, Reference 3). Route 7: Newberg Providence connects Providence Newberg Medical Center, which is approximately 0.15 mile south of the proposed development, to the Newberg Central Business District. Service is provided on weekdays at approximately one-hour intervals from approximately 7:15 AM to 6:15 PM.

TRAFFIC VOLUMES AND PEAK HOUR OPERATIONS

Turning movement counts were conducted at the Libra Street/Crestview Drive and Springbrook Road/Haworth Avenue intersections in November 2017 when school was in session. Counts were conducted at all other existing study intersections in September 2017 when school was in session—per scoping discussions with ODOT staff, the study intersections along OR 99W are heavily influenced by both seasonal traffic and school traffic, with the peak travel period occurring in September. Therefore, no seasonal count adjustment along OR 99W is required.

All counts used in this analysis were conducted on a typical midweek day during the morning (6:00 to 9:00 AM) and afternoon (3:00 to 6:00 PM) peak periods. The analysis time periods are based on a corridor-wide peak hour along OR 99W and individual intersection peak hours at the remaining study intersections. Figure 4 provides a summary of the year 2017 turning-movement counts.

Appendix "B" contains the traffic count worksheets used in this study.



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Del = INTERSECTION AVERAGE CONTROL DELAY (SIGNALIZED)/ CRITICAL MOVEMENT CONTROL DELAY (UNSIGNALIZED)
V/C = CRITICAL VOLUME-TO-CAPACITY RATIO

Existing Traffic Conditions
Weekday AM and PM Peak Hours
Newberg, Oregon

Figure
4

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Saturation Flow Rate Calibration

ODOT requires a base saturation flow rate of 1,750 vehicles per hour per lane outside the Portland metro area. Based on field observation and video data, vehicles exhibited driving behavior typical of urban areas. Thus, a saturation flow-rate study was prepared to calibrate the analysis to real-world observations. Using video data, the base saturation flow rate was calibrated to 1,800 vehicles per hour for the following two movements:

- Westbound OR 99W at Springbrook Road, and
- Westbound OR 99W at Providence Drive.

All analysis for these movements assumes the calibrated base saturation flow rates. *Appendix "C" contains the saturation flow study worksheets for these movements.*

Level of Service Analysis

Figure 4 also displays the existing levels of service at each of the study intersections during the weekday AM and PM peak hours. As shown in the figure, each of the study intersections currently meets ODOT and City mobility standards, with the following exceptions:

- The volume-to-capacity ratio of the Springbrook Road/OR 99W intersection is 0.86 during the weekday AM peak hour, which exceeds the ODOT mobility standard of 0.85. The weekday PM peak hour level of service of this intersection (LOS E) does not meet the City standard of LOS D.
- The weekday PM peak hour level of service of the Vittoria Way approach to the intersection with OR 99W (LOS E) does not meet the City standard of LOS D.

Appendix "C" contains the existing conditions Level of Service worksheets.

Traffic Safety

ODOT-reported crash data was reviewed for the most recent five-year period, from January 1, 2011 to December 31, 2015. Table 3 summarizes the reported crash data at the study intersections.

Table 3: ODOT-Reported Crash Data (January 1, 2011 to December 31, 2015)

Intersection	Crash Severity			Crash Type						Crash Rate[2]
	Fatal	Injury	PDO[1]	Rear End	Turning	Sideswipe	Angle	Other	Total	
Springbrook Rd / Crestview Dr	1	0	1	1	0	0	0	1	2	0.10
Libra St / Crestview Dr	0	0	0	0	0	0	0	0	0	0.00
Springbrook Rd / Haworth Ave	0	2	5	1	2	0	3	1	7	0.24
Springbrook Rd / OR 99W	0	27	41	53	9	2	2	2	68	0.84
Brutscher St / OR 99W	0	13	7	15	4	0	0	1	20	0.31
Vittoria Way / OR 99W	0	2	2	2	2	0	0	0	4	0.07
Providence Dr / OR 99W	0	2	9	11	0	0	0	0	11	0.18
Benjamin Rd / OR 99W	0	3	1	0	4	0	0	0	4	0.06

[1]Property Damage Only

[2]Per million entering vehicles

As shown in the table, one fatal crash was reported at the Springbrook Road/Crestview Drive roundabout—this crash occurred in 2013 when a southbound motorcyclist struck a curb and was thrown from the vehicle. The crash report lists the cause as driver error—driving too fast for conditions.

ODOT maintains a ranking of intersections with potential safety problems known as the Safety Priority Index System (SPIS). Based upon a 2016 analysis, the Springbrook Road/OR 99W intersection is currently within the top 5 percent of the highest-scoring intersections in Region 2. Pavement marking improvements and an additional westbound left turn lane on OR 99W have been added to this intersection since 2016.

Additionally, ODOT has identified basic signing and marking improvements for the Springbrook Road/Haworth Avenue intersection to improve stop sign visibility.

No other crash trends or safety deficiencies were identified at the study intersections.

Appendix "D" contains the reported crash data from ODOT.

Section 4
Transportation Impact Analysis

TRANSPORTATION IMPACT ANALYSIS

The transportation impact analysis identifies how the study area's transportation system will operate in the year the proposed Crestview Crossing development is expected to be fully built and occupied, year 2020. The impact of traffic generated by the proposed Crestview Crossing development during the weekday AM and PM peak hours was examined as follows:

- The Oregon Clinic was identified as an in-process development by City of Newberg and included in the background traffic volumes;
- Year 2020 background traffic volumes at the study intersections were developed by applying a two-percent annual growth rate to the existing mainline volumes along OR 99W and then adding the in-process trips;
- Some traffic was reassigned based upon the new network link created by the Crestview Drive extension;
- Site trip distribution patterns were identified based upon a select zone analysis of the Newberg Model;
- Site-generated trips were estimated for build-out of the site and assigned to the study intersections based upon the assumed trip distribution pattern;
- Year 2020 total traffic volumes at the study intersections were developed by adding the site-generated trips to the 2020 background traffic volumes, accounting for reassigned traffic due to the Crestview Drive extension; and
- On-site circulation issues and site-access operations were evaluated.

YEAR 2020 BACKGROUND TRAFFIC CONDITIONS

The year 2020 background traffic analysis identifies how the study area's transportation system will operate without the proposed Crestview Crossing development. This analysis includes traffic attributed to planned developments within the study area and to general growth in the region but does not include traffic from the proposed development.

Planned Developments and Transportation Improvements

The City of Newberg identified one in-process development within the site vicinity: the Oregon Clinic, to be located on the west side of Providence Drive south of Providence Newberg Medical Center.

In-process trips are summarized in a graphic in Appendix "E".

The following two planned transportation improvements were identified, neither of which will be completed prior to development of the proposed Crestview Crossing:

- The aforementioned Crestview Drive extension, which will be incorporated into site development and is described later in this report under Proposed Development Plan; and

- The Newberg-Dundee Bypass, which will intersect OR 99W approximately 0.5 miles east of the proposed development site and is not expected to be completed until after the proposed Crestview Crossing development is fully built and occupied (2020).

Background Growth

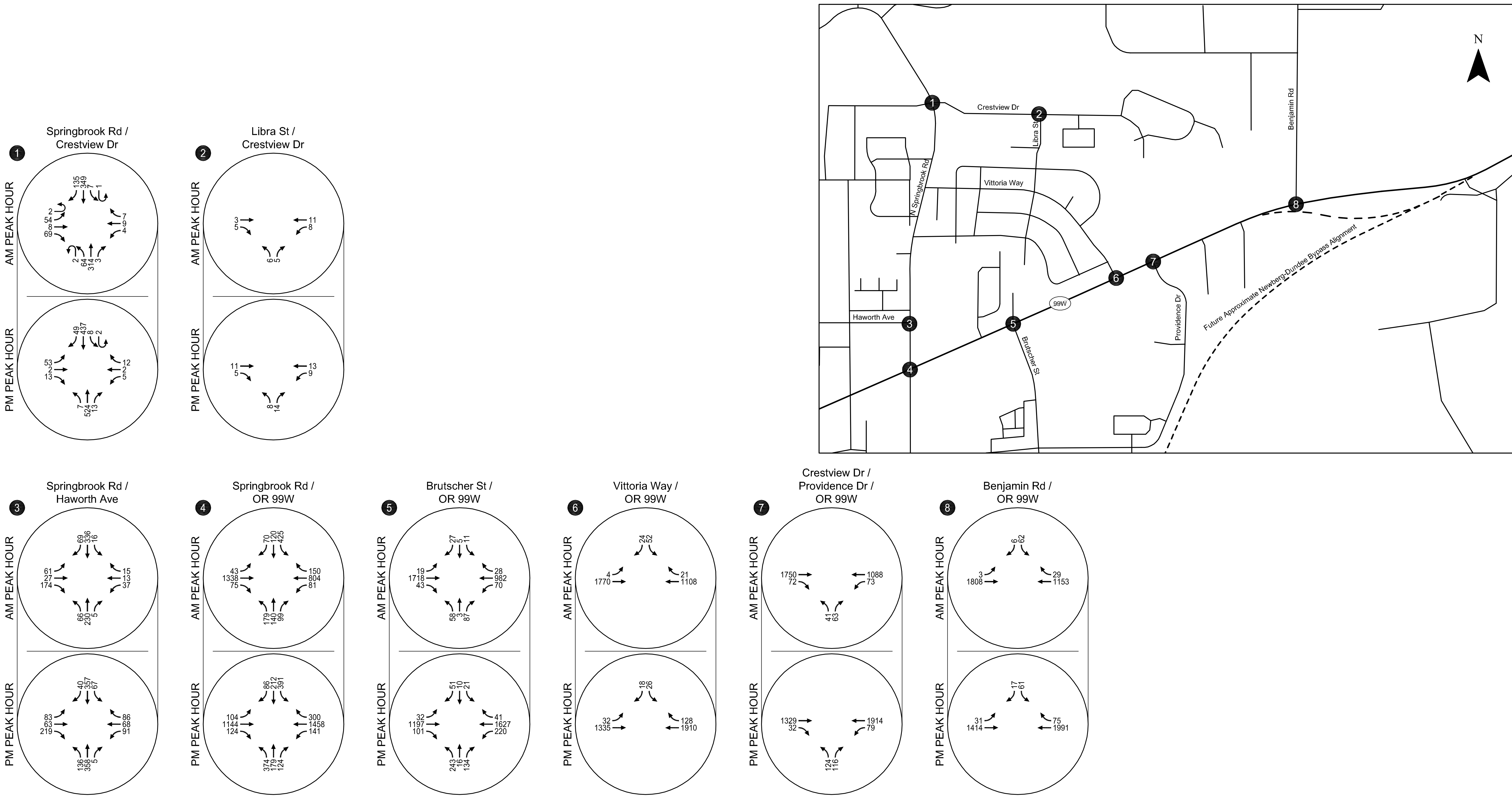
To account for general area growth, a two-percent annual growth rate was applied to the existing mainline volumes along OR 99W at the study intersections.

Figure 5 displays the 2020 background traffic volumes at the study intersections during the weekday AM and PM peak hours, which include general area growth and in-process trips identified previously.

Crestview Drive Extension

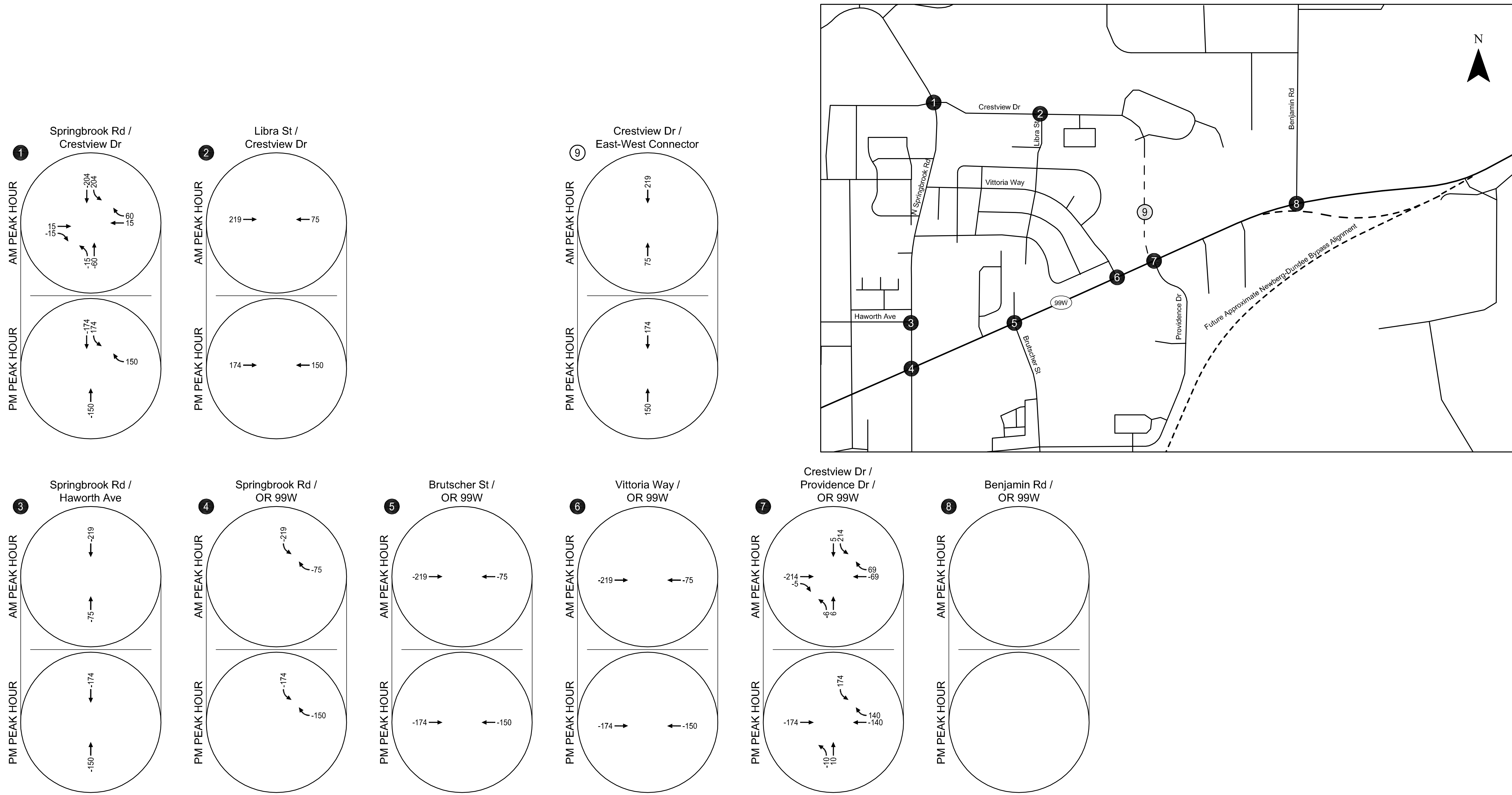
The Crestview Drive extension is contained within the City's Transportation System Plan and can be considered a regional system improvement independent of the land uses contained within the Crestview Crossing development. The construction of the Crestview Drive extension is expected to cause some traffic to shift from Springbrook Road and OR 99W. For this analysis, ttraffic volumes were reassigned to the new street system based on existing turning movement demand at the intersections of Springbrook Road/Crestview Drive, Springbrook Road/Haworth Avenue, and Springbrook Road/OR 99W.The City's Transportation System Plan was also consulted for consistency in assumptions. Figure 6 displays the estimated reassigned traffic volumes.

The reassigned traffic volumes shown in Figure 6 were added to the background traffic volumes in Figure 5 to arrive at the 2020 background traffic conditions, shown in Figure 7. Based on concurrence from ODOT transportation planning staff, this scenario serves as the base case against which future traffic conditions are prepared. The background condition for the Crestview Drive extension assumes a two-lane cross section, including the new north leg of the Providence Drive/OR 99W intersection. Any potential turn lane additions at the Crestview Drive/Providence Drive/OR 99W intersection will be considered mitigation measures associated with the Crestview Crossing development and are described under 2020 total traffic conditions. The assumed lane configurations for this scenario are displayed in Figure 8.



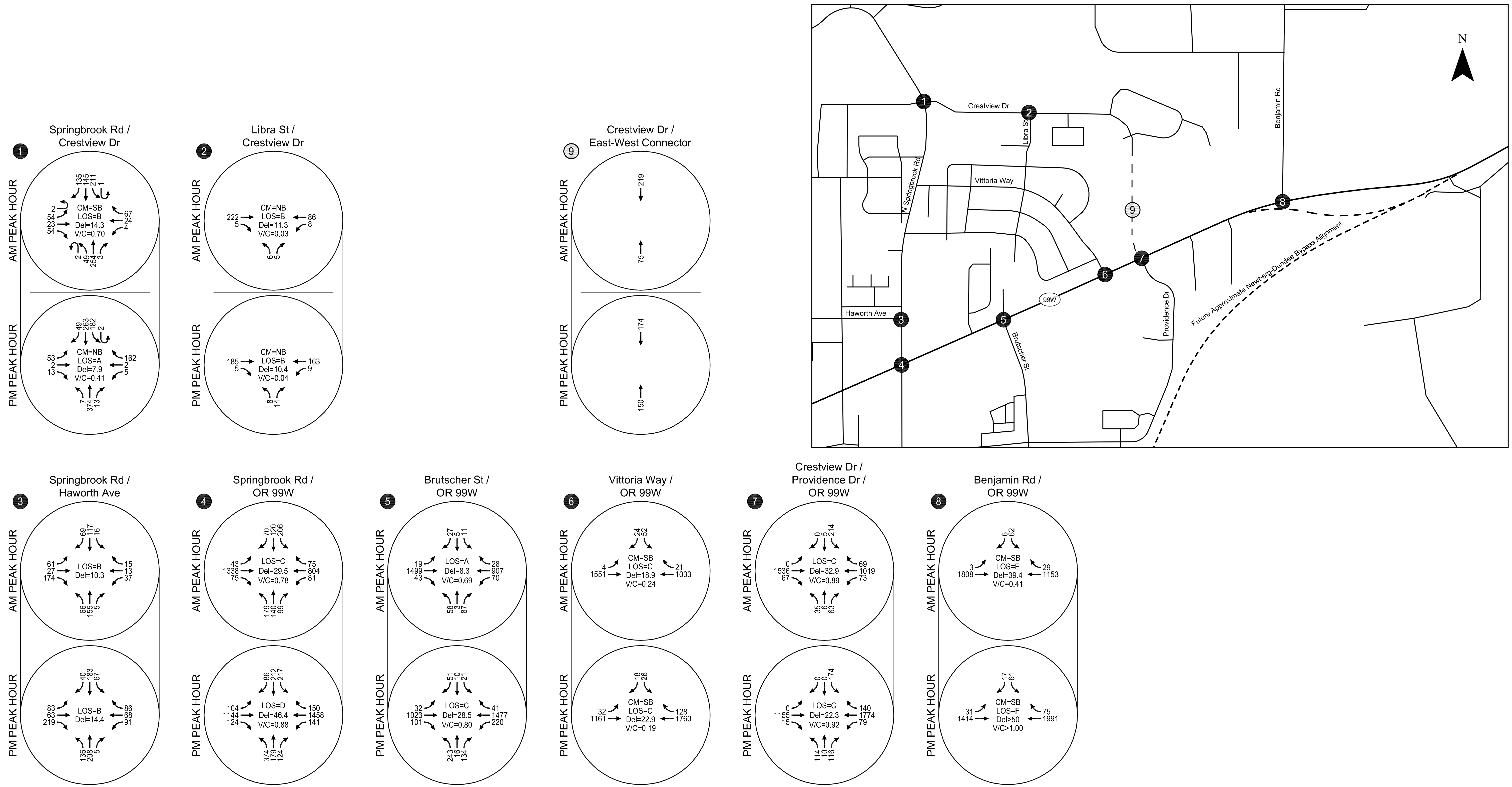
Year 2020 Background Traffic Volumes
Weekday AM and PM Peak Hours
Newberg, Oregon

Figure
5



Reassigned Traffic Volumes
Weekday AM and PM Peak Hours
Newberg, Oregon

Figure 6



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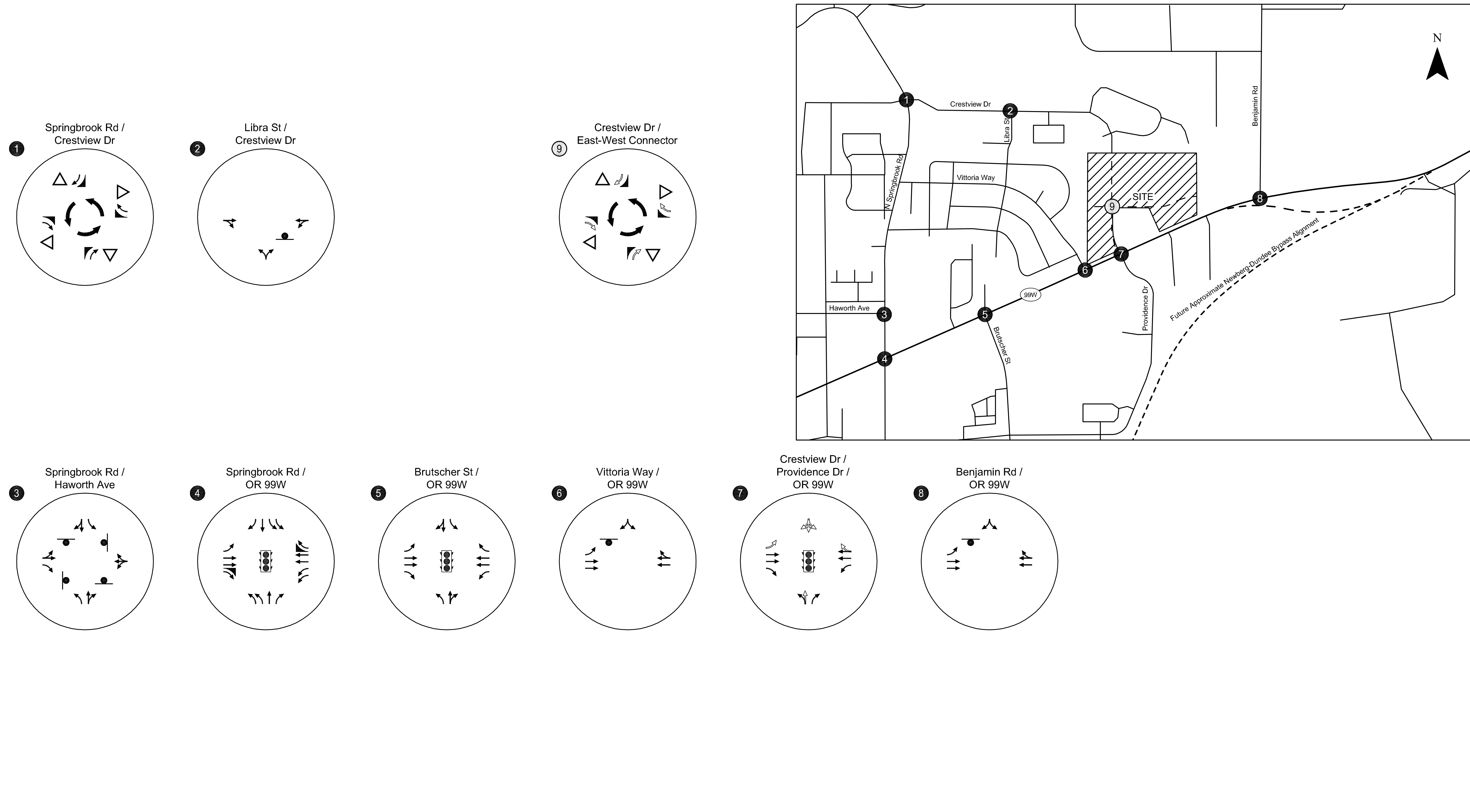
V/C = CRITICAL VOLUME-TO-CAPACITY RATIO

Year 2020 Background Traffic Conditions with Reassigned Traffic
Weekday AM and PM Peak Hours
Newberg, Oregon

Figure
7



- STOP SIGN
- TRAFFIC SIGNAL
- ROUNDABOUT
- YIELD
- EXISTING
- PROPOSED

Assumed Lane Configurations and Traffic Control Devices
Newberg, Oregon

Figure 8

Level of Service Analysis

Figure 7 also shows the corresponding level of service analysis—each of the study intersections is expected to continue meeting ODOT and City mobility standards, with the following exceptions:

- The Springbrook Rd/OR 99W intersection is forecast to operate with a v/c ratio of 0.88 during the weekday PM peak hour, which exceeds the ODOT mobility standard of 0.85.
- The weekday AM and PM peak hour v/c ratios at the Providence Drive/OR 99W intersection are forecast to be 0.89 and 0.92, respectively, which both exceed the ODOT mobility standard of 0.80.

Appendix "F" contains the year 2020 background with reassigned traffic Level of Service worksheets.

PROPOSED DEVELOPMENT PLAN

Per the site plan displayed in Figure 2, the Crestview Crossing development includes 248 single-family homes and 48 apartment units. However, given the potential for fluctuation in the final number of units, up to 260 single-family homes were analyzed in this report to provide a conservative analysis of the impacts. The site development will also include an extension of Crestview Drive to the south through the development and connecting to OR 99W to form the north leg of the OR 99W/Providence Drive intersection. Full-build out and occupancy of the phase of the development included in this report is expected to occur in 2020. A future development phase may include an additional 4.43 acres of commercial space adjacent to the development site but is not included in this application.

Trip Generation

The projected weekday daily, AM, and PM peak-hour vehicle trip ends for the proposed development were based on the *Trip Generation Manual*, 10th Edition (Reference 4). Table 4 summarizes the anticipated number of trips that will be generated by the proposed Crestview Crossing development.

Table 4: Proposed Trip Generation

Land Use	ITE Code	Size		Weekday Trips	Weekday AM Peak Hour			Weekday PM Peak Hour		
					Total	In	Out	Total	In	Out
Single-Family Detached Housing	210	260	units	2,504	189	47	142	254	160	94
Apartment	220	48	units	1,622	24	6	18	31	20	11
Total				**4,126**	**213**	**53**	**160**	**285**	**180**	**105**

As shown in Table 4, the proposed development is expected to generate approximately 4,126 weekday daily trips, of which 213 (53 in, 160 out) will occur during the AM peak hour and 285 (180 in, 105 out) will occur during the PM peak hour.

Site Trip Distribution/Trip Assignment

The site-generated trips were distributed onto the study area roadway system according to a select zone analysis of TAZ 117, which includes the proposed development site, from the Newberg Transportation Planning Model, provided by ODOT. This model was reviewed and adjusted based on field-observed turning movement patterns. The traffic generated by the proposed Crestview Crossing development is expected to follow the following trip distribution pattern:

- 15 percent to the east along OR 99W;
- 10 percent to the south along Providence Drive;
- 10 percent to the south along Brutscher Street;
- 35 percent to the west along OR 99W to Springbrook Road; and
- 30 percent to the north along the Crestview Drive extension to Springbrook Road.

Trips were then distributed at the Springbrook Road/Crestview Drive and Springbrook Road/OR 99W intersections based upon existing turning movement counts. Figure 9 illustrates the estimated trip distribution pattern for the proposed development.

The estimated site-generated trips were assigned to the network by distributing the trips shown in Table 5 according to the trip distribution pattern shown in Figure 9. Figure 9 illustrates the site-generated trips that are expected to use the roadway system during the weekday AM and PM peak hours.

Appendix "G" contains the select zone analysis results received from ODOT.

YEAR 2020 TOTAL TRAFFIC CONDITIONS

The total traffic conditions analysis forecasts how the study area's transportation system will operate with the traffic generated by the proposed Crestview Crossing development. The weekday AM and PM peak hour site-generated traffic volumes (shown in Figure 9) were added to the year 2020 background traffic volumes with reassigned traffic (shown in Figure 7) to arrive at the total traffic volumes shown in Figure 10.

Level of Service Analysis

The weekday AM and PM peak hour turning-movement volumes shown in Figure 10 were used to conduct an operational analysis at each study intersection to determine the year 2020 total traffic levels of service. The assumed lane configurations at the Crestview Drive/Providence Drive/OR 99W and Crestview Drive/East-West Connector intersections are displayed in Figure 8. The results of the total traffic analysis shown in Figure 10 indicate that all of the study intersections and site access points are forecast to meet ODOT and City mobility standards under 2020 total traffic conditions during the weekday AM and PM peak hours, with the following exceptions:

- The Springbrook Rd/OR 99W intersection is forecast to operate with a v/c ratio of 0.86 during the weekday PM peak hour, which exceeds the ODOT mobility standard of 0.85 but does not exceed the v/c ratio under background conditions with reassigned traffic.
- The weekday AM and PM peak hour v/c ratios at the Crestview Drive/Providence Drive/OR 99W intersection are forecast to be 0.98 and 1.08, respectively. These both exceed the ODOT mobility standard of 0.80.

Appendix "H" contains the year 2020 total traffic Level of Service worksheets.

Mitigation at Crestview Drive/Providence Drive/OR 99W

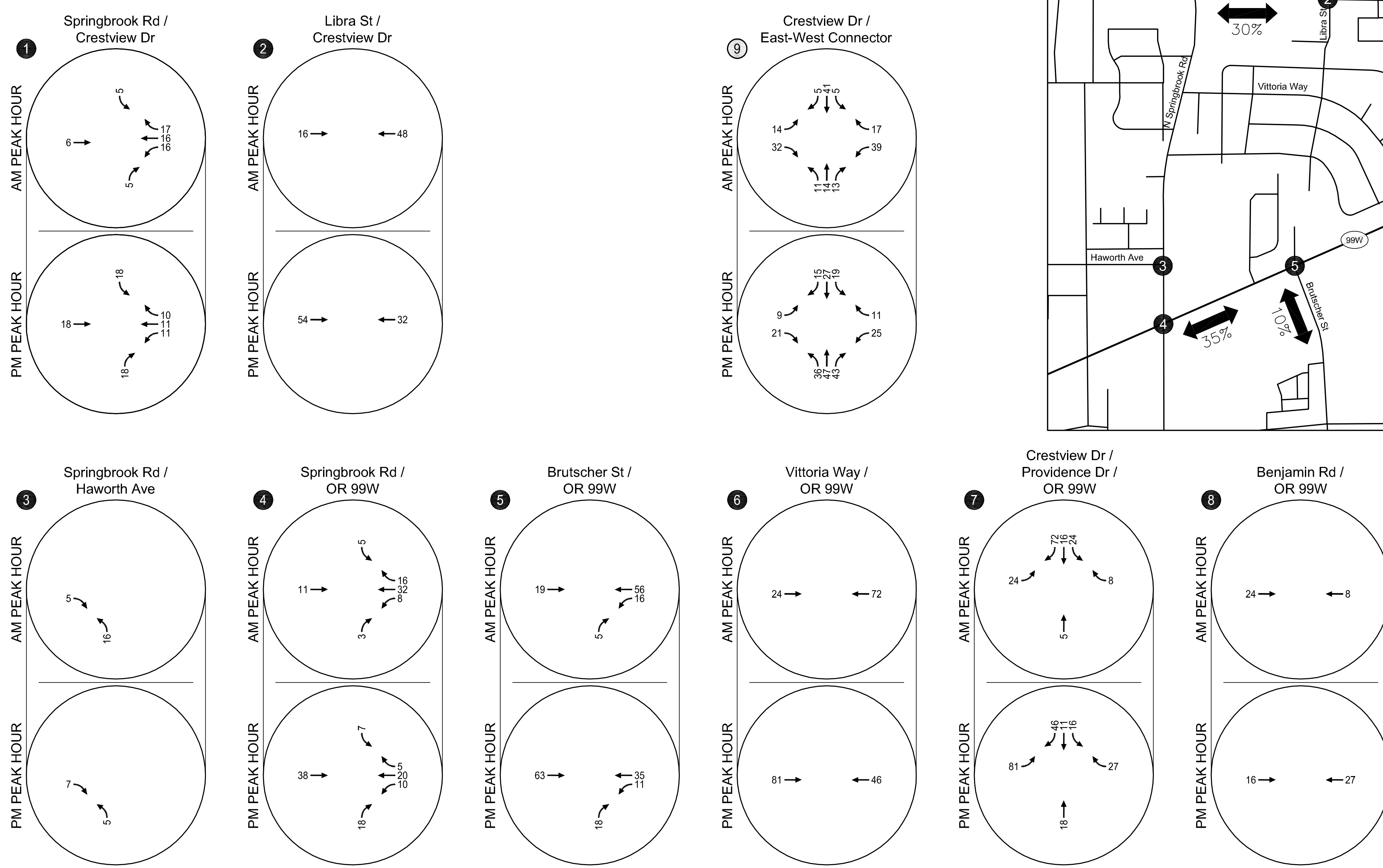
In conjunction with site development, JT Smith Companies proposes to add lanes to the Crestview Drive/Providence Drive/OR 99W intersection, shown in Figure 11 and described below:

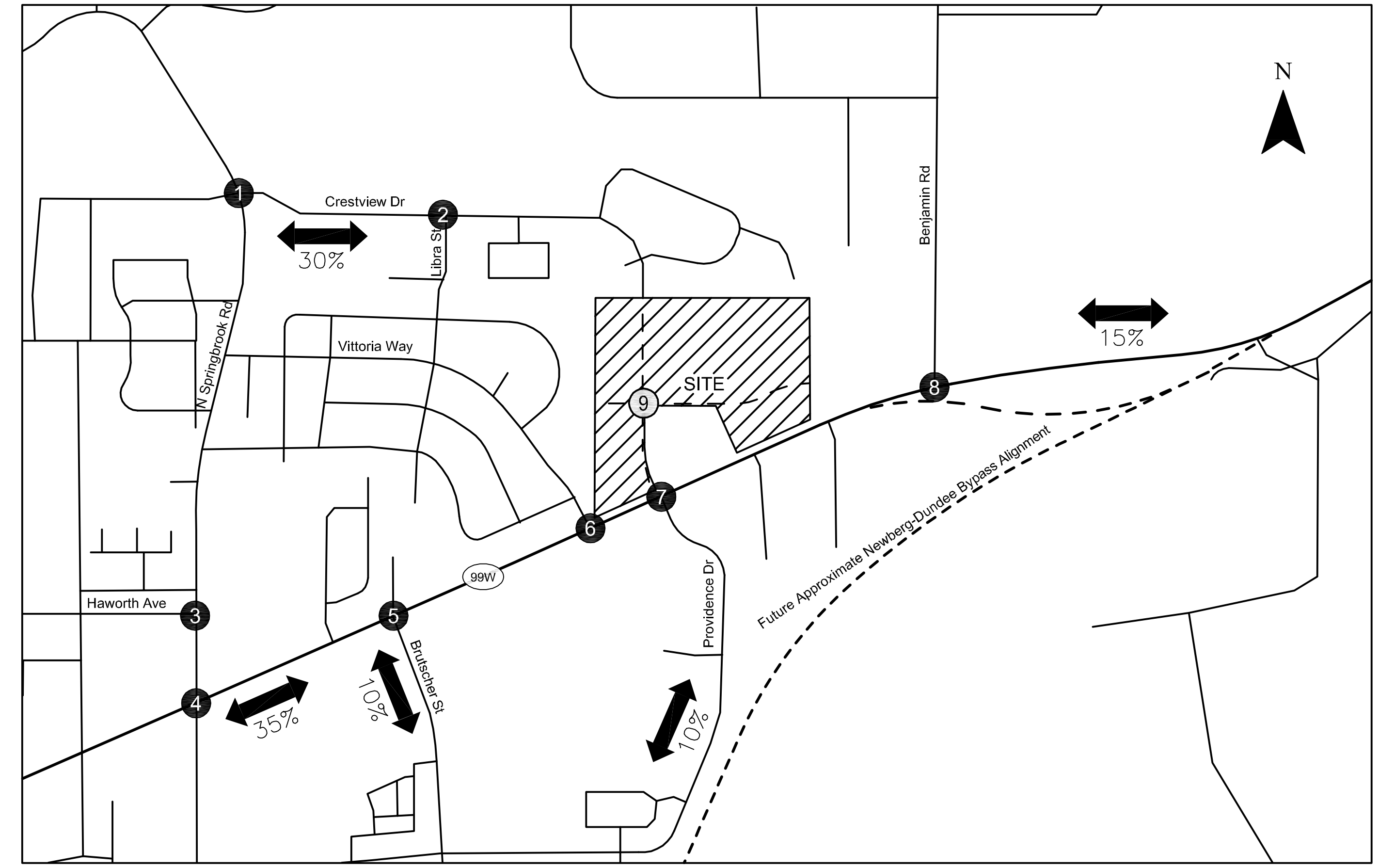
- Add an exclusive left turn lane on southbound Crestview Drive,
- Add an exclusive right turn lane on southbound Crestview Drive,
- Add an exclusive right turn lane on westbound OR 99W, and,
- Restripe the northbound Providence Drive approach to include an exclusive left turn lane and an exclusive right turn lane.

These improvements are considered to be above and beyond the geometry needed to construct the Crestview Drive extension.

As shown in Figure 11, with these mitigation measures in place, the weekday AM and PM peak hour v/c ratios at the intersection are forecast to be 0.88 and 0.89, respectively. These both exceed the ODOT mobility standard of 0.80 but do not exceed the respective v/c ratios for background conditions with reassigned traffic.

Appendix "I" contains the year 2020 total traffic with mitigation Level of Service worksheets.





	TOTAL	IN	OUT
AM	213	53	160
PM	285	180	105

Site-Generated Trips
Weekday AM and PM Peak Hours
Newberg, Oregon

Figure
9

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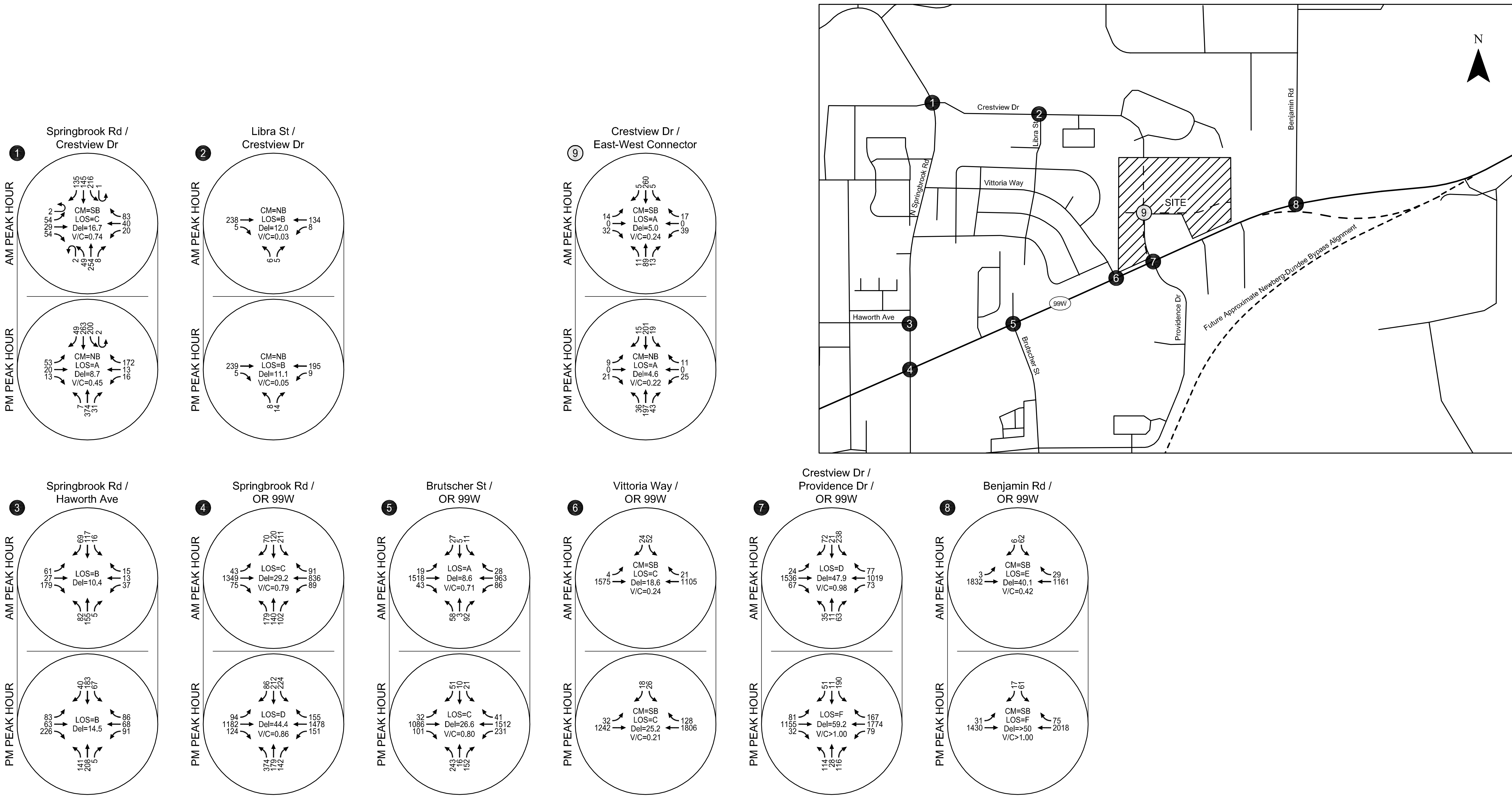

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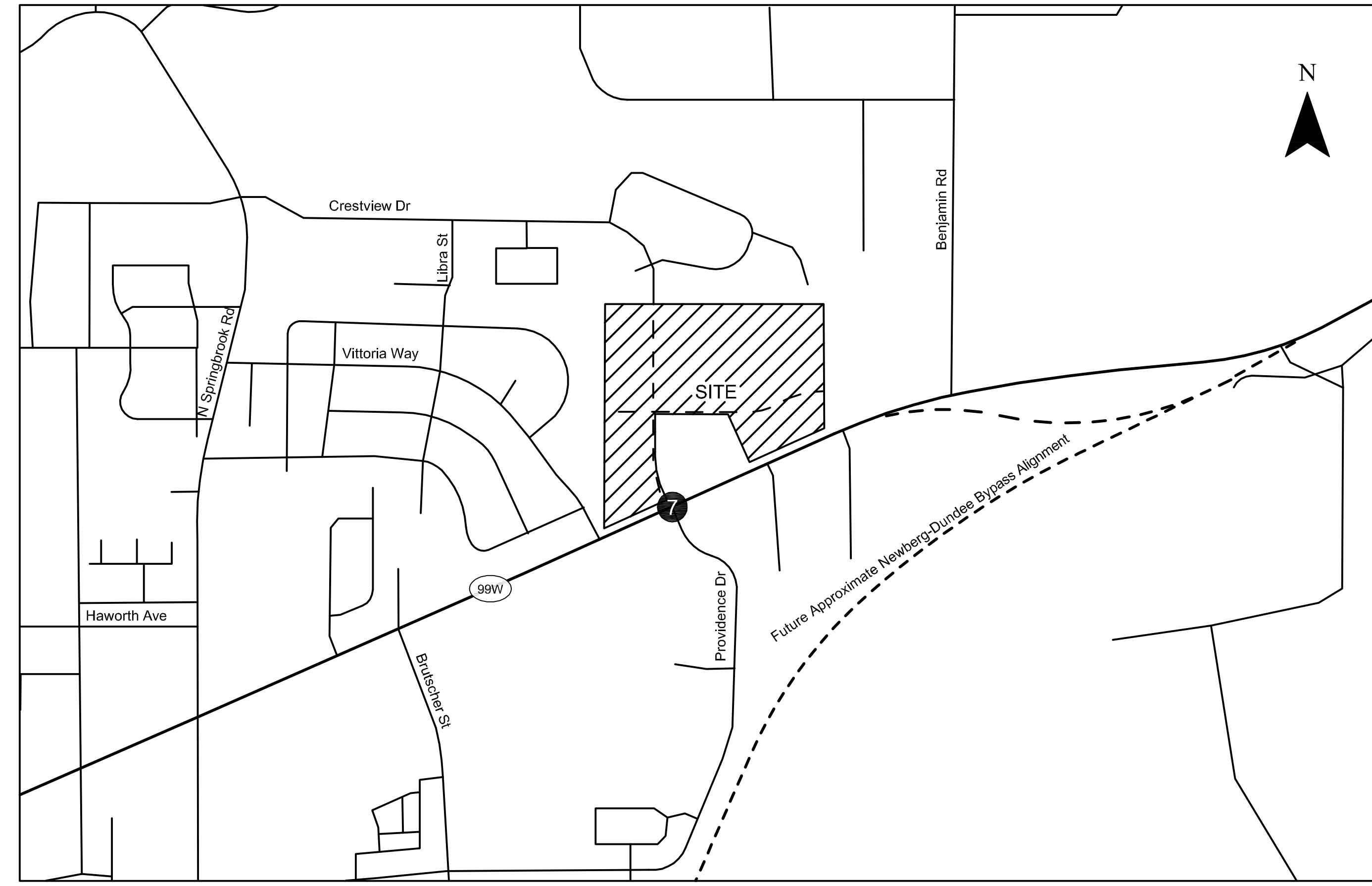
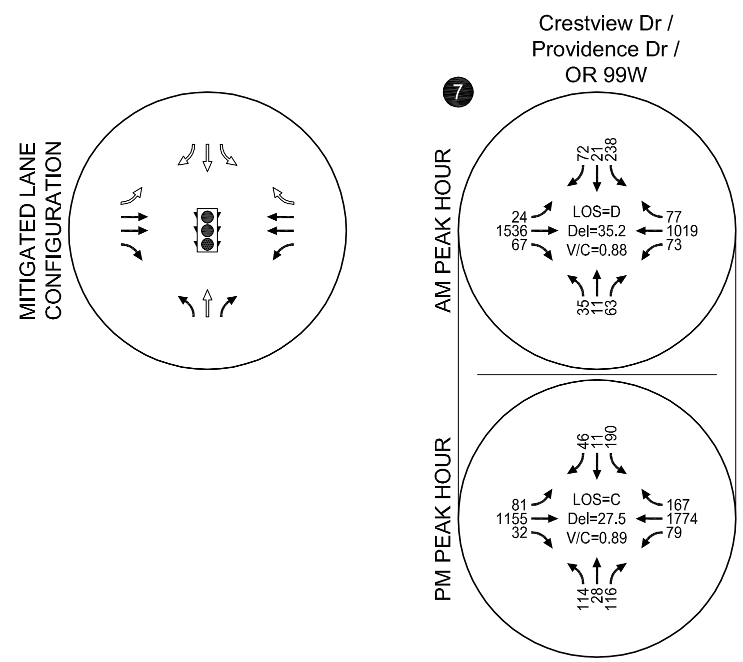
Year 2020 Total Traffic Conditions
Weekday AM and PM Peak Hours
Newberg, Oregon

Figure 10





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V/C = CRITICAL VOLUME-TO-CAPACITY RATIO

- EXISTING
- PROPOSED

Year 2020 Total Mitigated Traffic Conditions
Weekday AM and PM Peak Hours
Newberg, Oregon

Figure 11

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95th-percentile Queuing Analysis

95th-percentile queues at the study intersections were reviewed to assess whether adequate storage would be provided at turn lanes and between intersections. *SimTraffic* was used to estimate the 95th-percentile queues at the signalized intersections along OR 99W (reflecting an average of five simulation runs), HCS was used to estimate the 95th-percentile queues at the roundabouts, and Synchro was used to estimate 95th-percentile queues elsewhere. Table 5 lists the estimated 95th-percentile queue for each movement at the study intersections. Reported queues are rounded to the nearest vehicle length (approximately 25 feet).

Table 5: Summary of 95th-percentile Queues

Intersection	Movement	Storage (ft)	95th-percentile Queue (ft)						Adequate Storage Provided?
			Existing		2020 Background with Reassigned Traffic		2020 Total Mitigated		
			AM	PM	AM	PM	AM	PM	
1: Springbrook Rd/ Crestview Dr	EB	N/A	25	<25	25	<25	25	<25	Yes
	WB	N/A	<25	<25	25	25	25	25	Yes
	NB	N/A	100	100	100	50	100	50	Yes
	SB	N/A	200	75	150	50	175	50	Yes
2: Libra St/ Crestview Dr	EB	N/A	<25	<25	<25	<25	<25	<25	Yes
	WB	N/A	<25	<25	<25	<25	<25	<25	Yes
	NB	N/A	<25	<25	<25	<25	<25	<25	Yes
3: Springbrook Rd/ Haworth Ave	EB L/T	N/A	25	50	25	25	25	25	Yes
	EB R	100	50	75	25	50	25	50	Yes
	WB	N/A	25	125	25	75	25	75	Yes
	NB L	90	25	50	25	25	25	25	Yes
	NB T/R	N/A	75	225	25	25	25	25	Yes
	SB L	90	<25	25	<25	25	<25	25	Yes
	SB T/R	N/A	250	300	50	50	50	50	Yes
4: Springbrook Rd/ OR 99W	EB L	350	150	375	125	275	150	250	Yes
	EB T	N/A	450	475	225	400	450	425	Yes
	EB R	350	150	75	75	125	125	150	Yes
	WB L	450	75	250	75	375	100	450	Yes
	WB T	N/A	225	550	150	850	150	650	Yes
	WB R	450	<25	350	<25	525	<25	425	Yes
	NB L	320	125	400	175	300	175	225	Yes
	NB T	N/A	175	1900	175	225	175	275	Yes
	NB R	320	100	250	100	100	100	125	Yes
	SB L	170	225	250	175	225	175	225	Yes
	SB T	N/A	350	475	250	375	175	375	Yes
	SB R	130	100	175	125	175	100	175	**No**

Table 5: Summary of 95th-percentile Queues (continued)

Intersection	Movement	Storage (ft)	95th-percentile Queue (ft)						Adequate Storage Provided?
			Existing		2020 Background with Reassigned Traffic		2020 Total Mitigated		
			AM	PM	AM	PM	AM	PM	
5: Brutscher St/ OR 99W	EB L	260	50	100	25	50	25	100	Yes
	EB T	N/A	125	375	150	325	175	350	Yes
	EB R	200	25	225	25	200	50	175	Yes
	WB L	350	100	450	100	450	150	375	Yes
	WB T	N/A	125	1375	75	1300	50	525	Yes
	WB R	80	25	50	25	75	25	75	Yes
	NB L	220	125	300	100	300	125	275	**No**
	NB T/R	N/A	100	475	100	450	100	275	Yes
	SB L	50	25	50	25	50	25	25	Yes
	SB T/R	N/A	50	75	50	100	75	50	Yes
6: Vittoria Way/ OR 99W	EB L	100	<25	<25	<25	<25	<25	<25	Yes
	EB T	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Yes
	WB T/R	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Yes
	SB	N/A	25	25	25	25	25	25	Yes
7: Crestview Dr/ Providence Dr/ OR 99W	EB L	150	N/A	N/A	<25	200	75	125	Yes
	EB T	N/A	225	225	400	200	450	150	Yes
	EB R	100	75	50	125	25	100	50	Yes
	WB L	230	125	200	100	175	125	200	Yes
	WB T	N/A	75	1175	150	775	225	550	Yes
	WB R	300	N/A	N/A	N/A	NA	50	275	Yes
	NB L	160	75	175	75	175	75	175	Yes
	NB T	N/A	N/A	N/A	N/A	N/A	25	100	Yes
	NB R	160	75	100	75	125	75	100	Yes
	SB L	250	N/A	N/A	N/A	N/A	225	250	Yes
	SB T	N/A	N/A	N/A	275	250	225	225	Yes
	SB R	150	N/A	N/A	N/A	N/A	75	75	Yes
8: Benjamin Rd/ OR 99W	EB L	250	N/A	N/A	N/A	N/A	N/A	N/A	Yes
	EB T	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Yes
	WB T/R	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Yes
	SB	N/A	50	125	75	150	50	150	Yes
9: Crestview Dr/ East-West Connector	EB	N/A	N/A	N/A	N/A	N/A	<25	<25	Yes
	WB	N/A	N/A	N/A	N/A	N/A	<25	<25	Yes
	NB	N/A	N/A	N/A	N/A	N/A	<25	25	Yes
	SB	N/A	N/A	N/A	N/A	N/A	25	25	Yes

The table indicates the following 95th-percentile queues are projected to exceed the provided storage lengths under 2020 total traffic conditions with the proposed mitigation measures:

- The southbound right turn at Springbrook Road/OR 99W during the weekday PM peak hour.
- The northbound left turn at Brutscher Street/OR 99W during the weekday PM peak hour.

Each of the queues noted above is expected to decrease compared with existing conditions due to reassigned traffic from Springbrook Road and OR 99W to the Crestview Drive extension. Consequently, no additional mitigation measures are recommended to accommodate the 95th-percentile queues at the study intersections the proposed development thus adds no further degradation to the system.

Appendix "J" contains the SimTraffic *queuing worksheets.*

On-Site Circulation/Site-Access Operations

Internal circulation was evaluated to ensure that the site provides sufficient on-site circulation for pedestrian movements and internal traffic. Figure 2 illustrates the proposed development plan. The following activities are recommended to ensure adequate safety and operation at the internal intersections and roadways:

- All local streets within the development should have two travel lanes.
- Other than at the Providence Drive/Crestview Drive/OR 99W intersection, a two-lane section of Crestview Drive should be adequate to accommodate turning movements and queuing within the proposed development.
- Shrubbery and landscaping near the internal intersections and site access points should be maintained to ensure adequate sight distance.

COMMERCIAL DEVELOPMENT SENSITIVITY ANALYSIS

As noted previously, approximately 4.43 acres adjacent to the proposed site could be developed in the future as commercial property. This commercial property is not included in this land use application but could be constructed at an undetermined time as part of a separate land use application. We investigated the potential impacts of developing the 4.43 acres of commercial property for the following reasons:

- To estimate the additional mitigations, if any, needed to meet ODOT policy, and
- To consider compatibility between these additional mitigations and the proposed lane geometry and mitigations on roadways and at intersections within and around the site, including the Crestview Drive/Providence Drive/OR 99W intersection and proposed Crestview Drive/East-West Connector roundabout.

A build-out year of 2020 was assumed for this analysis for simplicity. Assuming a later background year would result in marginally different background traffic volumes because traffic on OR 99W could either increase (if more in process developments are approved) or decrease (as a result of completion of the Newberg-Dundee Bypass).

Table 6 displays the trip generation for the commercial traffic (in addition to the residential), assuming 25 percent of the 4.43 acres becomes leasable floor space and that all of the property is developed as shopping center.

Table 6: Trip Generation Including Phase II

Land Use	ITE Code	Size		Daily Trips	Weekday AM Peak Hour			Weekday PM Peak Hour		
					Total	In	Out	Total	In	Out
Single-Family Detached Housing	210	260	Units	2,504	189	47	142	254	160	94
Less Internal Trips				*226*	*9*	*2*	*7*	*28*	*18*	*10*
Apartment	220	48	Units	1,622	24	6	18	31	20	11
Less Internal Trips				*146*	*1*	*0*	*1*	*3*	*2*	*1*
Shopping Center	820	48,243*	ft^2	3,662	176	109	67	317	152	165
Less Internal Trips				*330*	*9*	*5*	*4*	*35*	*17*	*18*
Less Pass-by Trips				*866*	*0*	*0*	*0*	*96*	*48*	*48*
Total Gross Trips				**7,788**	**389**	**162**	**227**	**602**	**332**	**270**
Less Internal Trips				***702***	***19***	***7***	***12***	***66***	***37***	***29***
Less Pass-by Trips				***866***	***0***	***0***	***0***	***96***	***48***	***48***
Total Net New Trips				**6,220**	**370**	**155**	**215**	**440**	**247**	**193**

*Assumes a gross leasable area to acreage ratio of 0.25.

As shown, if the commercial property is developed, then the total development is estimated to generate 6,220 weekday daily trips, of which 370 (155 in, 215 out) will occur during the AM peak hour and 440 (247 in, 193 out) will occur during the PM peak hour. The development is also expected to generate approximately 96 pass-by trips during the weekday PM peak hour—to conservatively estimate the impacts to the Crestview Drive/Providence Drive/OR 99W intersection, all of the pass-by trips were treated as diverted from OR 99W.

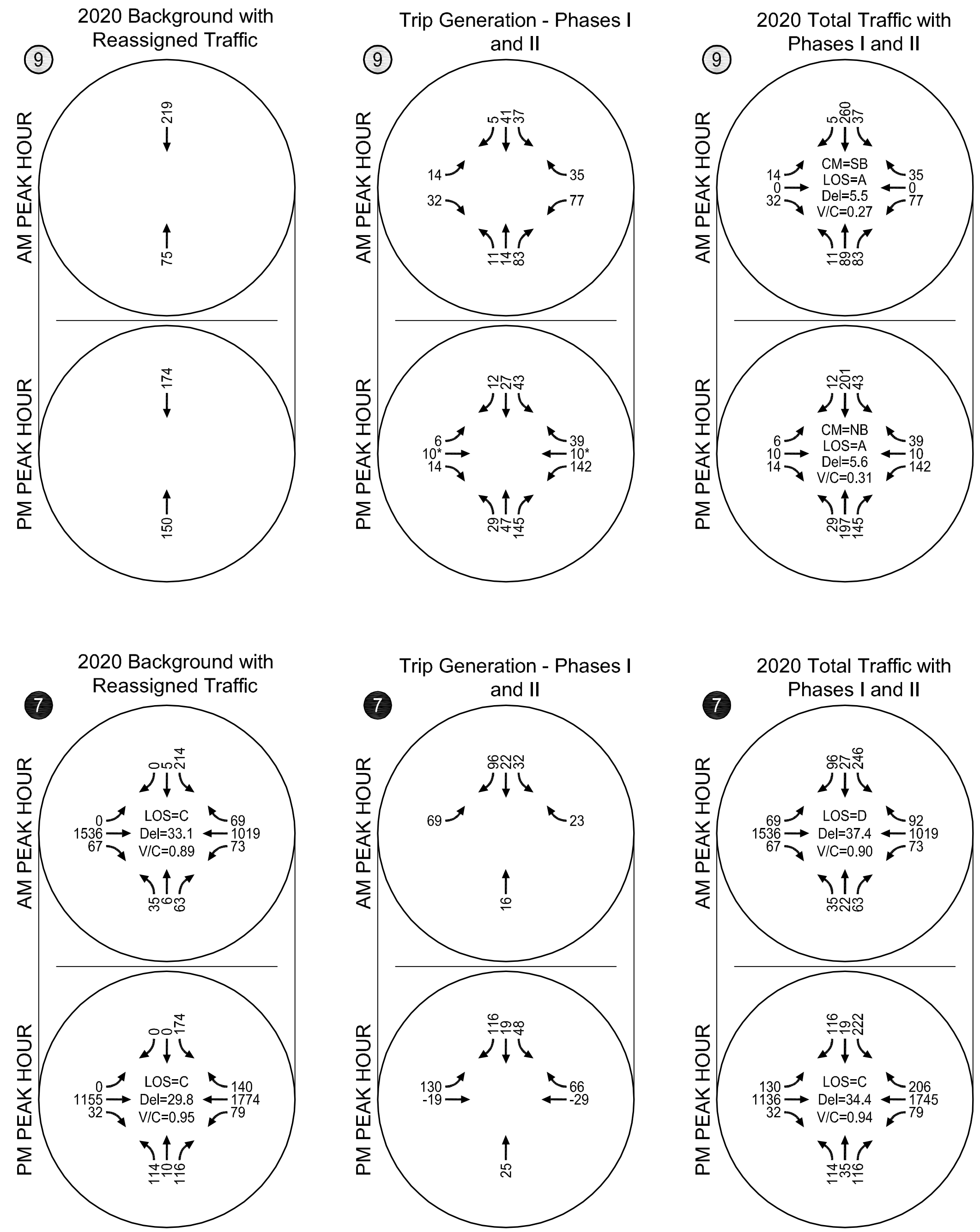
Figure 12 shows the trip generation and total traffic conditions at the Crestview Drive/Providence Drive/OR 99W intersection and Crestview Drive/East-West Connector Roundabout. As shown, the Crestview Drive/East-West Connector Roundabout is expected to continue operating acceptably as a single-lane roundabout. With the mitigation improvements associated with the residential development in place, the weekday AM and PM peak hour v/c ratios at the Crestview Drive/Providence Drive/OR 99W intersection are forecast to be 0.90 and 0.94, respectively. ODOT defines no significant impact as a v/c ratio of 0.03 above the background condition—therefore, assuming the same background conditions, no additional mitigations would be required.

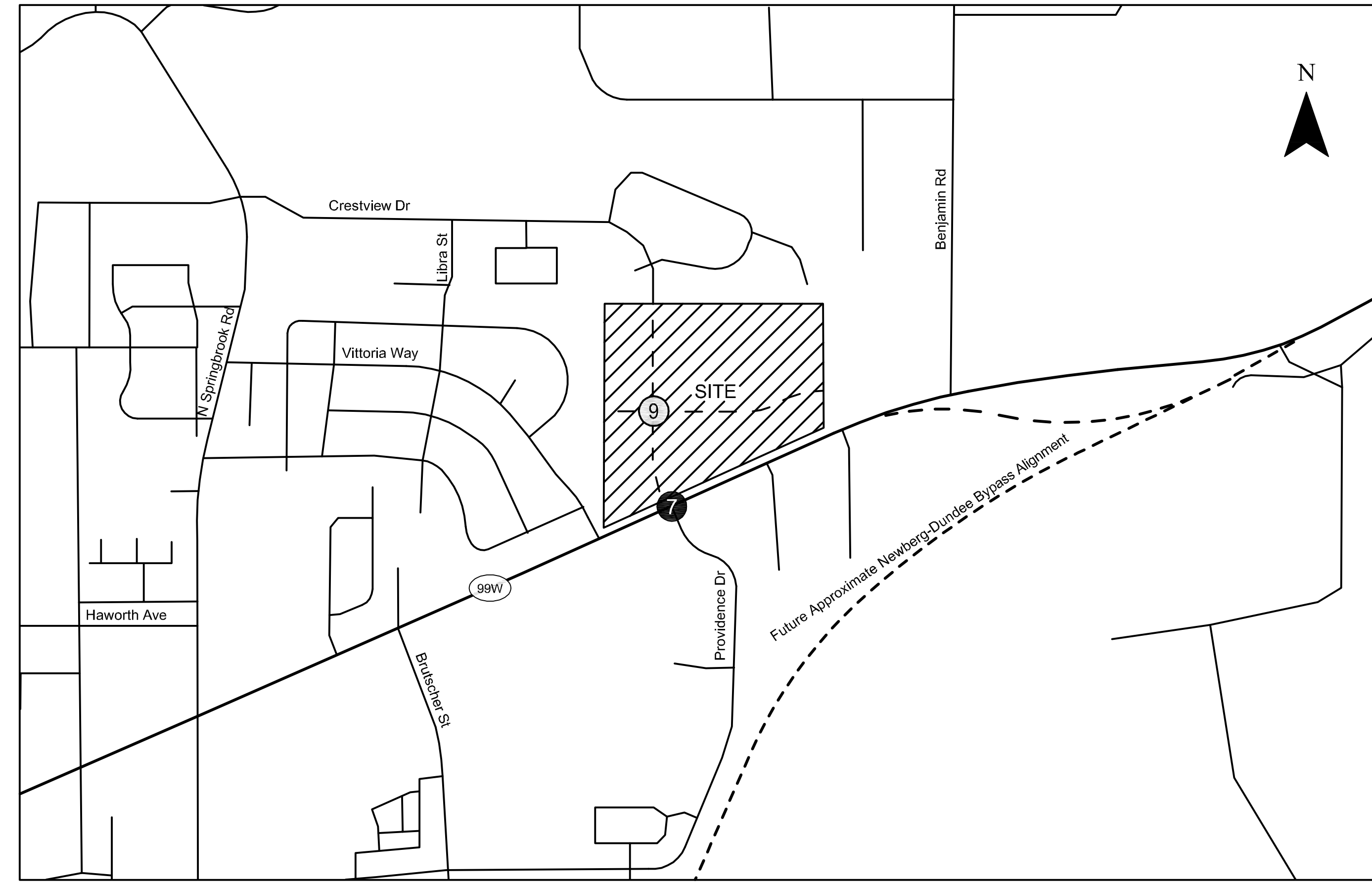
Table 7 displays the estimated resulting 95th-percentile queues at the Crestview Drive/Providence Drive/OR 99W intersection from *SimTraffic*.

Table 7: Summary of 95th-percentile Queues Including Phase II

Intersection	Movement	Storage (ft)	95th-percentile Queue (ft)	
			2020 Phase II	
			AM	PM
7: Crestview Dr/ Providence Dr/ OR 99W	EB L	150	125	150
	EB T	N/A	475	250
	EB R	100	125	25
	WB L	230	125	250
	WB T	N/A	250	975
	WB R	300	100	300
	NB L	160	75	150
	NB T	N/A	50	75
	NB R	160	75	100
	SB L	250	250	250
	SB T	N/A	300	350
	SB R	150	100	125

Appendix "K" contains the Phase II Sensitivity Analysis Level of Service worksheets.





*Estimated retail-residential internal trips
Negative values indicate retail pass-by trips.

CM = CRITICAL MOVEMENT (UNSIGNALIZED)
LOS = INTERSECTION LEVEL OF SERVICE (SIGNALIZED)/ CRITICAL MOVEMENT LEVEL OF SERVICE (UNSIGNALIZED)
Del = INTERSECTION AVERAGE CONTROL DELAY (SIGNALIZED)/ CRITICAL MOVEMENT CONTROL DELAY (UNSIGNALIZED)
V/C = CRITICAL VOLUME-TO-CAPACITY RATIO

Year 2020 Total Traffic Conditions - Phase II Sensitivity Analysis
Weekday AM and PM Peak Hours
Newberg, Oregon

Figure 12

Section 5
Conclusions and Recommendations

CONCLUSIONS AND RECOMMENDATIONS

The results of the traffic impact analysis indicate that the proposed Crestview Crossing development can be constructed while maintaining acceptable levels of service and safety on the surrounding transportation system, provided the appropriate mitigations are in place. The findings of this analysis and our recommendations are discussed below.

Year 2017 Existing Conditions

- All of the study intersections currently meet City of Newberg (and Oregon Department of Transportation, where applicable) mobility targets during the weekday AM and PM peak hours, with the following exceptions:
  - The Springbrook Road/OR 99W intersection currently experiences a volume-to-capacity ratio (v/c) of 0.86 during the weekday AM peak hour, which exceeds the ODOT mobility standard of 0.85. The intersection also operates at level of service (LOS) E during the weekday PM peak hour, which exceeds the City standard of LOS D under current conditions.
  - The southbound stop-controlled approach to the Vittoria Way/OR 99W intersection currently operates at LOS E during the weekday PM peak hour, which exceeds the City standard of LOS D.
- A review of historical crash data did not reveal any patterns or trends in the site vicinity that require mitigation associated with this project.
  - One fatal crash was reported at the Springbrook Road/Crestview Drive roundabout—this crash occurred when a southbound motorcyclist struck a curb and was thrown from the vehicle. The crash report lists the cause as driver error—driving too fast for conditions.
  - Based upon a 2016 analysis, the Springbrook Road/OR 99W intersection is currently within the top five percent of the highest-scoring intersections in Region 2.

    Since 2016, pavement marking improvements and an additional westbound left turn lane on OR 99W were added to this intersection, and the proposed Crestview Crossing development is expected to result in a net decrease in traffic at this intersection due to the reassignment of traffic to the Crestview Drive extension.

Year 2020 Background Conditions

- A two-percent annual growth rate was applied to the existing mainline traffic volumes on OR 99W to reflect general background growth in the area before any in-process traffic was considered.
- Traffic generated by the Oregon Clinic, to be located on the west side of Providence Drive south of Providence Newberg Medical Center, was included in the background traffic volumes as in-process traffic.

Background traffic conditions with the assumed build-out of the north leg of the Providence Drive/OR 99W intersection (and no site-added traffic) were assumed as the base case against which future traffic conditions are compared.

- The proposed development will extend Crestview Drive south through the property and to the existing Providence Drive/OR 99W intersection, where it will form the north leg.
- Traffic volumes were assigned to the Crestview Drive extension based upon existing turning movement volumes at the study intersections and the Newberg Transportation System Plan.
- The background traffic condition includes rerouted traffic from the proposed Crestview Drive extension but does not include trips associated with new land uses within the proposed development.
- All of the study intersections are expected to continue operating acceptably during the weekday AM and PM peak hours under 2020 background traffic conditions with reassigned traffic, with the following exceptions:
  - The Springbrook Rd/OR 99W intersection is forecast to operate with a v/c ratio of 0.88 during the weekday PM peak hour, which exceeds the ODOT mobility standard of 0.85.
  - The weekday AM and PM peak hour v/c ratios at the Providence Dr/OR 99W intersection are forecast to be 0.89 and 0.92, respectively, which both exceed the ODOT mobility standard of 0.80.

Proposed Development Plan

- The proposed development is expected to generate approximately 4,126 weekday daily trips, of which approximately 213 (53 in, 160 out) are forecast to occur during the AM peak hour and approximately 285 (180 in, 105 out) are forecast to occur during the PM peak hour.
- A select-zone analysis of the Newberg Transportation Planning Model was used to develop a trip distribution pattern for the proposed development.

Year 2020 Total Conditions

- All of the study intersections are expected to continue operating acceptably during the weekday AM and PM peak hours under 2020 total traffic volumes, with the following exceptions:
  - The Springbrook Rd/OR 99W intersection is forecast to operate with a v/c ratio of 0.86 during the weekday PM peak hour, which exceeds the ODOT mobility standard of 0.85 but does not exceed the v/c ratio under background conditions with reassigned traffic.
  - The weekday AM and PM peak hour v/c ratios at the Providence Drive/OR 99W intersection are forecast to be 0.98 and 1.08, respectively, which both exceed the ODOT mobility standard of 0.80.
  - The new proposed Crestview Diver/East-West Connector intersection within the Crestview Crossing development is expected to operate acceptably as a single-lane roundabout.

Year 2020 Total Mitigated Conditions

- The Crestview Drive/Providence Drive/OR 99W intersection was analyzed under total traffic conditions with the following additional lane improvements:

- Add an exclusive left turn lane on southbound Crestview Drive,
- Add an exclusive right turn lane on southbound Crestview Drive,
- Add an exclusive right turn lane on westbound OR 99W,
- Restripe eastbound OR 99W to include an exclusive left turn lane, and,
- Restripe the northbound Providence Drive approach to include an exclusive left turn lane and an exclusive right turn lane.

With these improvements, the weekday AM and PM peak hour v/c ratios at the intersection are forecast to be 0.88 and 0.89, respectively. These exceed the ODOT mobility standard of 0.80 but do not exceed the respective v/c ratios under background conditions with reassigned traffic. As such, the impact of the development has been mitigated.

95th-percentile Queuing Analysis

- All 95th-percentile queues are projected to be accommodated by the provided storage lengths under 2020 total traffic conditions, with the following exceptions:
  - The southbound right turn at Springbrook Road/OR 99W during the weekday PM peak hour.
  - The northbound left turn at Brutscher Street/OR 99W during the weekday PM peak hour.

  Each of the queues noted above is expected to decrease under total traffic conditions compared with existing conditions due to reassigned traffic from Springbrook Road and OR 99W to the Crestview Drive extension.

Commercial Property Sensitivity Analysis

A planning-level analysis was prepared to account for the future development potential of the 4.43-acre commercial property adjacent to the development site. While this is NOT part of this development application, the analysis was conducted to evaluate the future effectiveness of the recommended mitigations.

- The gross leasable area-to-acreage ratio was assumed at 25 percent, and the entire commercial property was assumed as shopping center land use.
- The total development (including residential and commercial) is estimated to generate 6,220 weekday daily trips, of which 370 (155 in, 215 out) will occur during the AM peak hour and 440 (247 in, 193 out) will occur during the PM peak hour. The development is also expected to generate approximately 96 pass-by trips during the weekday PM peak hour—these were treated as diverted trips from OR 99W.
- The Crestview Drive/Providence Drive/OR 99W intersection and Crestview Drive/East-West Connector roundabout were analyzed assuming development of the 4.43-acre commercial property.
- The Crestview Drive/East-West Connector intersection is expected to continue operating acceptably as a single-lane roundabout.

- With the mitigation improvements associated with the residential development in place, the weekday AM and PM peak hour v/c ratios at the Crestview Drive/Providence Drive/OR 99W intersection are forecast to be 0.90 and 0.94, respectively. ODOT defines no significant impact as a v/c ratio of 0.03 above the background condition—therefore, assuming the same background conditions, no additional mitigations would be required.

RECOMMENDATIONS

Providence Drive/Crestview Drive/OR 99W Intersection

- The new north leg of the intersection, which will be an extension of Crestview Drive, should be configured as a four-lane section with one northbound lane and three southbound lanes (exclusive lanes for left-turn, through, and right-turn movements). At least 250 feet of southbound left turn storage and at least 150 feet of southbound right turn storage should be provided to accommodate the forecast 95^{th} percentile queue lengths.
- The south leg of the intersection should be restriped to a four-lane section with one southbound lane and three northbound lanes (exclusive lanes for left-turn, through, and right-turn movements).
- Based on the forecast 95^{th} percentile queuing analysis:
  - A westbound right turn lane should be constructed with at least 300 feet of storage.
  - An eastbound left turn lane should be striped to provide at least 150 feet of storage.
- Recommended signal phasing: the intersection should be operated with permissive left turn movements on the northbound and southbound approaches and fully protected left turn movements on the eastbound and westbound approaches.

On-Site Circulation/Site Access Operations

- Driveways, landscaping, utilities, and signage within the site should be located and maintained to provide sufficient sight distance at all new internal intersections and accesses.
- Other than at the Providence Drive/Crestview Drive/OR 99W intersection, a two-lane section of Crestview Drive should be adequate to accommodate turning movements and queuing within the proposed development.

Section 6
References

REFERENCES

1. Transportation Research Board of the National Academies. *Highway Capacity Manual 2000*. 2000.

2. City of Newberg, Oregon. *Transportation System Plan*. 2016.

3. Yamhill County Transit Area. "Routes and Schedules." 2017. <http://www.yctransitarea.org/ index.php/routes-and-schedules/>. Accessed 12-21-2017.

4. Institute of Transportation Engineers. *Trip Generation: 10th Edition*. 2017.

Appendix A
Scoping Memorandum

KITTELSON & ASSOCIATES, INC.
TRANSPORTATION ENGINEERING / PLANNING
610 SW Alder Street, Suite 700, Portland, OR 97205 P 503.228.5230 F 503.273.8169

SCOPING MEMORANDUM

Date: October 19, 2017 Project #: 21709

To: Steve Olson, City of Newberg
Gerry Juster and Keith Blair, ODOT

From: Zachary Bugg, PhD; Diego Arguea, PE; and Matt Hughart, AICP

Project: Crestview Crossing

Subject: Traffic Impact Analysis Scoping Memorandum

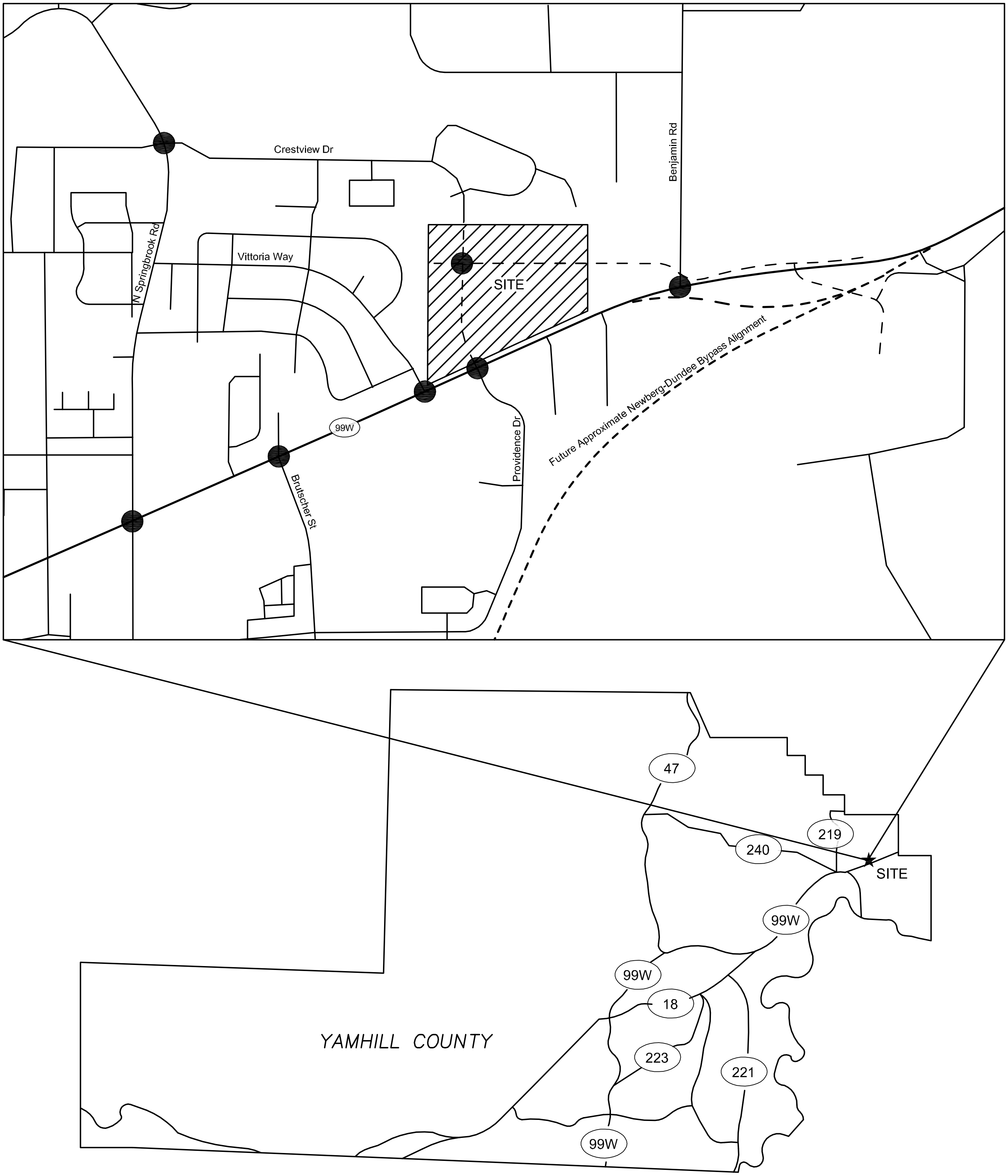
This memorandum represents a scoping needs assessment for preparing the Traffic Impact Analysis (TIA) associated with the proposed development located at the northeast corner of the OR 99W/ Providence Drive intersection in Newberg, Oregon. The assumptions for scoping the TIA are based on a review of a conceptual site plan, a preapplication meeting and discussions between City of Newberg staff and the Applicant, and our working knowledge of the transportation policies of City of Newberg and the Oregon Department of Transportation (ODOT).

Proposed Development

The Applicant, JT Smith Companies, is in the process of preparing an application to develop a 33.13-acre mixed-use development on the subject property. The site is currently occupied by farm land and one single family home. The site is bordered by OR 99W to the south and by residential uses to the west, north, and east.

Figure 1 displays a site vicinity map, and Figure 2 displays the proposed site plan. Per the current site plan, the development will include 249 single-family homes, 48 apartment units, 4.43 acres of commercial property, and 1.17 acres of civic space. As shown, the site development includes an extension of Crestview Drive to the south through the proposed development, connecting to OR 99W to form the north leg of the OR 99W/Providence Drive intersection.

Per ODOT and City of Newberg criteria, a TIA is needed as part of the design review application for the development. This memorandum presents the proposed methodology to prepare the TIA and reflects the outcome of conversations with City and ODOT staff.



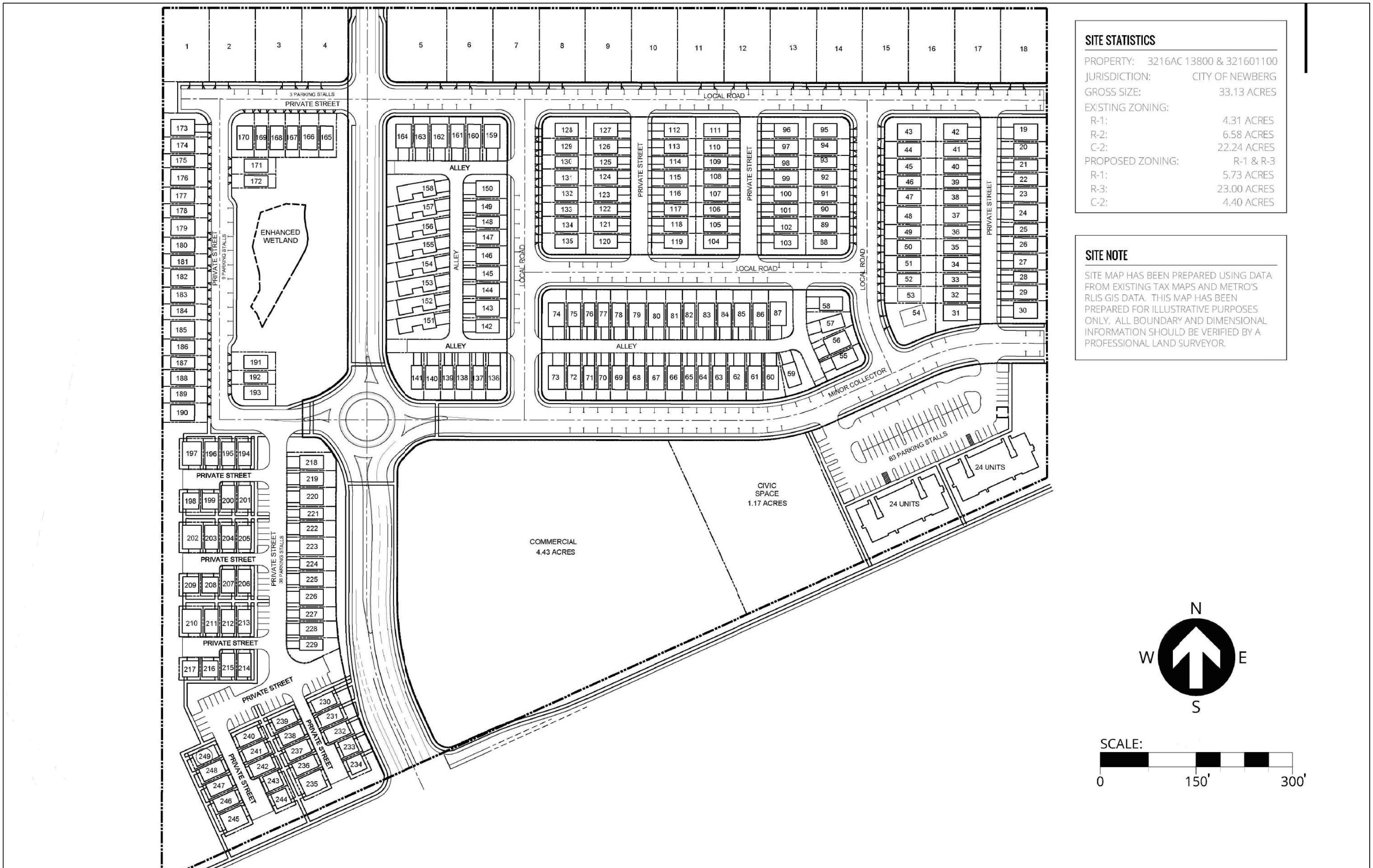
- Study Intersection

Site Vicinity
Newberg, Oregon

Figure
1

C:\Users\zbugg\Desktop\21709 figs-.dwg Oct 19, 2017 - 12:31pm - zbugg Layout Tab: Site Vicinity Map

KITTELSON & ASSOCIATES



Site Plan Provided by 3J Consulting 8/14/2017

Proposed Site Plan
Newberg, Oregon

Figure
2

C:\Users\zbugg\Desktop\21709 figs-.dwg Oct 19, 2017 - 12:36pm - zbugg Layout Tab: Proposed Site Plan

Trip Generation

Preliminary trip generation estimates for the proposed development were prepared based on the Institute of Transportation Engineers' (ITE) *Trip Generation Manual*, 9th Edition (Reference 1) for weekday daily, AM peak hour, and PM peak hour time periods. The trip generation is based on the residential and commercial mix, with an assumed use of the civic space for a community center. Internal and pass-by trips were estimated based on rates identified in the *Trip Generation Handbook,* 2nd Edition (Institute of Transportation Engineers, 2004)[1]. The trip generation is summarized below in Table 1.

Table 1. Preliminary Trip Generation Estimate

Land Use	ITE Code	Size	Daily Trips	Weekday AM Peak Hour			Weekday PM Peak Hour		
				Total	In	Out	Total	In	Out
Single-Family Detached Housing	210	249 units	2,370	187	47	140	249	157	92
Less Internal Trips (13% Daily, 8% AM, 12% PM)			*308*	*15*	*4*	*11*	*30*	*19*	*11*
Apartment	220	48 units	320	24	5	19	30	20	10
Less Internal Trips (13% Daily, 8% AM, 12% PM)			*42*	*2*	*0*	*2*	*4*	*2*	*2*
Shopping Center	820	48,243 ft²*	2,060	46	29	17	179	86	93
Less Internal Trips (13% Daily, 8% AM, 12% PM)			*268*	*4*	*2*	*2*	*21*	*10*	*11*
Less Pass-by Trips (34% Daily, AM, PM)			*610*	*14*	*7*	*7*	*54*	*27*	*27*
Recreational Community Center	495	12,741 ft²*	292	26	17	9	35	17	18
Less Internal Trips (13% Daily, 8% AM, 12% PM)			*38*	*2*	*1*	*1*	*4*	*2*	*2*
Total Gross Trips			**5,042**	**283**	**98**	**185**	**493**	**280**	**213**
Less Internal Trips			***656***	***23***	***7***	***16***	***59***	***33***	***26***
Less Pass-by Trips			***610***	***14***	***7***	***7***	***54***	***27***	***27***
Total Net New Trips			**3,776**	**246**	**84**	**162**	**380**	**220**	**160**

*Assumes gross floor area/acreage = 0.25

As shown in Table 1, the proposed development is estimated to generate a potential of up to 246 weekday AM peak hour trips and 380 weekday PM peak hour trips.

To provide a high estimate that would result in a more conservative analysis, the trip generation in Table 1 reflects the commercial property as a general Shopping Center—no further details about the development of this property are known at this time. Also, the trip generation assumes that the civic space will function as a community area, and thus has been estimated to operate as a Recreational Community Center for trip generation estimate purposes. Should the civic space only be available as a private amenity to the residential community (such as a community pool/fitness center), then all trips associated with this land use will be internal to the development, and thus the total net new trips will

[1] The ITE Trip Generation Handbook does not include trip internalization rates for the weekday AM peak hour time period. The weekday midday peak hour trip internalization rates were applied as the best available data.

be lower than what is shown in Table 1. The final TIA will document all assumptions and reflect the revised trip generation accordingly.

The internalization calculations and assumptions are included in Attachment "A" to this memorandum.

Trip Distribution and Assignment

The study area is contained within the Newberg Transportation Planning Model. A select-zone analysis will be used to develop a trip distribution pattern for the proposed site (TAZ 117). Please provide two select zone analyses, one with the Crestview Road connection and one without the Crestview Road connection through the proposed site.

Study Area and Intersections

Based on the estimated trip generation and assignment patterns, the following intersections and accesses are proposed for analysis:

- OR 99W/Springbrook Road
- OR 99W/Brutscher Street
- OR 99W/Vittoria Way
- OR 99W/Providence Drive/Crestview Drive
- OR 99W/Benjamin Road
- Crestview Drive/Site Access
- Springbrook Road/Crestview Drive

Additionally, all accesses to the commercial property and civic property will be analyzed.

Time Periods for Analysis

Existing and estimated build-out year 2020 conditions at the identified study intersections will be analyzed using Synchro/SimTraffic Version 9 software. Turning movement counts at the study intersections will be collected during the morning (6 – 9 AM) and afternoon (3 – 6 PM) periods on a typical mid-week day when school is in session. Additionally, a 16-hour count (6 AM – 10 PM) will be performed at the OR 99W/Providence Drive intersection in support of a potential modified signal design and complete safety analysis.

Based on conversations with ODOT staff, the site is located in an area influenced by both seasonal traffic and school traffic, with the peak travel period occurring in September. Therefore, the counts will be performed between September 12, 2017 and September 21, 2017 per ODOT direction, and no seasonal volume adjustment will be required.

In-process Developments

A two percent annual growth rate will be applied to the existing mainline traffic volumes on OR 99W to generate future background traffic volumes before any trips associated with approved in-process developments are added to the background traffic volumes. We request that City of Newberg and/or ODOT confirm the two percent annual growth rate and provide any other developments to be included as in-process.

Network Traffic Reassignment

The proposed development will result in a major network connection via the southward extension of Crestview Drive to OR 99W. The methodology for reassigning existing traffic to this new connection will be based upon a combination of the Transportation System Plan and the results of the select-zone analysis applying the Newberg Transportation Planning Model.

Queuing Analysis

An analysis of average and 95th-percentile queues will be prepared based on *SimTraffic* microsimulation. The analysis will be based on five simulation runs per intersection and analysis scenario.

Crash Analysis

The most recent five years of reported crash data at the study intersections will be requested from ODOT and reviewed in detail. The ODOT Statewide Priority Index System (SPIS) will also be reviewed to identify any sites where safety issues may encourage further investigation.

Signal Timing

We will obtain the latest signal timing and phasing information for the three signalized study intersections from ODOT:

- OR 99W/Springbrook Road
- OR 99W/Brutscher Street
- OR 99W/Providence Drive

Next Steps

We trust this memorandum provides adequate documentation of the proposed land use action, methodology, and specific study intersections and analysis periods to address in the TIA. We formally request that City of Newberg and ODOT Region 2 provide written confirmation and/or questions regarding the proposed methodology and project TIA assumptions as soon as possible so that we may proceed with our analysis. If you have any questions, please give us a call at (503) 228-5230.

REFERENCES

1. Institute of Transportation Engineers. *Trip Generation Manual, 9th Edition*. 2012.
2. Institute of Transportation Engineers. *Trip Generation Handbook, 2nd Edition*. 2004.

ATTACHMENT A

Trip Generation Internalization Calculations

Analyst	ZHB
Project	21709
Date	October 19, 2017
Time Period	Daily

Exit to External
1,239

1,216
Enter from External

LAND USE A	Residential		
ITE LU Code	210 220		
Size	160		
	Total	Internal	External
Enter	1,345	129	1,216
Exit	1,345	106	1,239
Total	2,690	235	2,455
%	100%	9%	91%

38%	511
Demand	

33%	444	38%	511
Demand		Demand	

33%	444
Demand	

93
Balanced

113
Balanced

13
Balanced

16
Balanced

9%	93
Demand	

11%	113
Demand	

9%	13
Demand	

11%	16
Demand	

Exit to External
876

894
Enter from External

LAND USE B	Retail		
ITE LU Code	820		
Size			
	Total	Internal	External
Enter	1,030	137	894
Exit	1,030	154	876
Total	2,060	291	1,769
%	100%	14%	86%

28%	288	44	30%	44
Demand		Balanced	Demand	

30%	309	41	28%	41
Demand		Balanced	Demand	

LAND USE C	Retail		
ITE LU Code	495		
Size			
	Total	Internal	External
Enter	146	54	92
Exit	146	60	86
Total	292	114	178
%	100%	39%	61%

Enter to External
92

86
Exit from External

NET EXTERNAL TRIPS FOR MULTI-USE DEVELOPMENT

	LAND USE A	LAND USE B	LAND USE C	TOTAL	
Enter	1,216	894	92	2,201	
Exit	1,239	876	86	2,201	
Total	2,455	1,769	178	4,402	INTERNAL CAPTURE
Single-Use Trip Gen Est.	2,690	2,060	292	5,042	13%

Analyst	ZHB
Project	21709
Date	October 19, 2017
Time Period	AM

Exit to External
157

50
Enter from External

LAND USE A	Residential		
ITE LU Code	210 220		
Size	160		
	Total	Internal	External
Enter	52	2	50
Exit	159	2	157
Total	211	4	207
%	100%	2%	98%

34%	54
Demand	

37%	19	34%	54
Demand		Demand	

37%	19
Demand	

2
Balanced

1
Balanced

1
Balanced

1
Balanced

5%	2
Demand	

7%	1
Demand	

5%	1
Demand	

7%	1
Demand	

Exit to External
11

25
Enter from External

LAND USE B	Retail		
ITE LU Code	820		
Size			
	Total	Internal	External
Enter	29	4	25
Exit	17	6	11
Total	46	10	36
%	100%	22%	78%

31%	9	3	29%	3
Demand		Balanced	Demand	

29%	5	5	31%	5
Demand		Balanced	Demand	

LAND USE C	Retail		
ITE LU Code	495		
Size			
	Total	Internal	External
Enter	17	6	11
Exit	9	3	6
Total	26	9	17
%	100%	35%	65%

Enter to External
11

6
Exit from External

NET EXTERNAL TRIPS FOR MULTI-USE DEVELOPMENT

	LAND USE A	LAND USE B	LAND USE C	TOTAL	
Enter	50	25	11	86	
Exit	157	11	6	173	
Total	207	36	17	260	INTERNAL CAPTURE
Single-Use Trip Gen Est.	211	46	26	283	8%

Analyst	ZHB
Project	21709
Date	October 19, 2017
Time Period	AM

Exit to External
93

164
Enter from External

LAND USE A		Residential	
ITE LU Code		210 220	
Size		160	
	Total	Internal	External
Enter	177	13	164
Exit	102	9	93
Total	279	23	256
%	100%	8%	92%

53% 54
Demand

31% 55
Demand

53% 54
Demand

31% 55
Demand

8
Balanced

11
Balanced

2
Balanced

2
Balanced

9% 8
Demand

12% 11
Demand

9% 2
Demand

12% 2
Demand

Exit to External
78

75
Enter from External

LAND USE B		Retail	
ITE LU Code		820	
Size			
	Total	Internal	External
Enter	86	11	75
Exit	93	15	78
Total	179	26	153
%	100%	14%	86%

20%	17	4	20%	4
Demand		Balanced	Demand	
20%	19	3	20%	3
Demand		Balanced	Demand	

LAND USE C		Retail	
ITE LU Code		495	
Size			
	Total	Internal	External
Enter	17	5	12
Exit	18	6	12
Total	35	11	24
%	100%	31%	69%

Enter to External
12

12
Exit from External

NET EXTERNAL TRIPS FOR MULTI-USE DEVELOPMENT

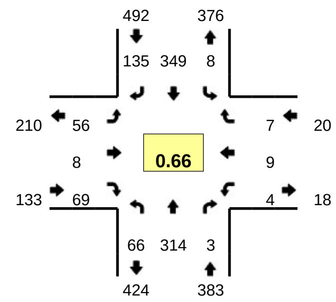
	LAND USE A	LAND USE B	LAND USE C	TOTAL	
Enter	164	75	12	250	
Exit	93	78	12	183	
Total	256	153	24	434	INTERNAL CAPTURE
Single-Use Trip Gen Est.	279	179	35	493	12%

Appendix B
Turning Movement Counts

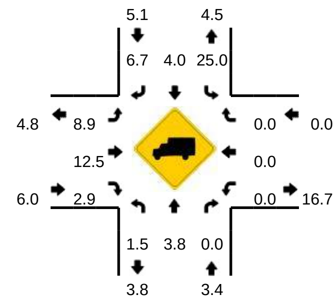
Type of peak hour being reported: User-Defined | Method for determining peak hour: Total Entering Volume

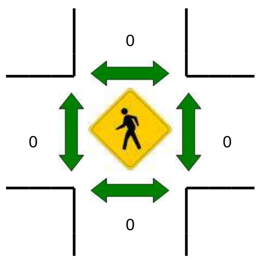
LOCATION: Springbrook Rd -- Crestview Dr | **QC JOB #:** 14505611

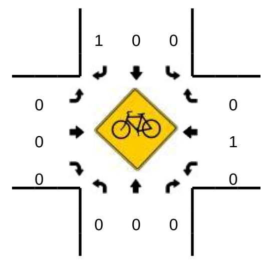
CITY/STATE: Newberg, OR | **DATE:** Thu, Sep 14 2017

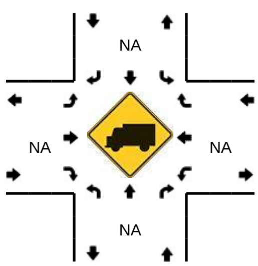


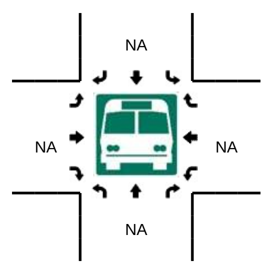
Peak-Hour: 7:05 AM -- 8:05 AM
Peak 15-Min: 7:20 AM -- 7:35 AM











5-Min Count Period Beginning At	Springbrook Rd (Northbound) Left	Thru	Right	U	Springbrook Rd (Southbound) Left	Thru	Right	U	Crestview Dr (Eastbound) Left	Thru	Right	U	Crestview Dr (Westbound) Left	Thru	Right	U	Total	Hourly Totals
6:35 AM	0	9	0	0	0	19	2	0	0	0	1	0	0	0	0	0	31	
6:40 AM	1	10	0	0	0	22	5	0	1	0	3	0	0	0	1	0	43	
6:45 AM	0	20	0	0	0	35	5	0	0	0	1	0	0	0	0	0	61	
6:50 AM	0	10	0	0	1	30	12	0	1	0	0	0	0	2	1	0	57	
6:55 AM	0	23	0	0	1	22	9	0	1	1	0	0	1	1	0	0	59	485
7:00 AM	1	13	0	0	1	27	4	0	2	0	0	0	1	1	2	0	52	511
7:05 AM	6	21	1	1	1	23	11	1	3	0	0	0	1	0	0	0	69	558
7:10 AM	5	15	0	0	0	37	14	0	1	0	3	0	0	1	1	0	77	596
7:15 AM	14	16	0	0	1	26	23	0	9	2	6	1	0	0	0	0	98	660
7:20 AM	15	37	1	0	1	26	28	0	7	2	14	0	0	2	0	0	133	758
7:25 AM	10	30	0	0	0	29	26	0	7	3	21	0	0	5	1	0	132	851
7:30 AM	5	39	0	0	0	31	15	0	14	0	19	1	0	0	0	0	124	936
7:35 AM	1	25	1	1	1	30	8	0	8	1	2	0	0	0	1	0	79	984
7:40 AM	1	24	0	0	1	39	1	0	1	0	0	0	0	0	0	0	67	1008
7:45 AM	0	25	0	0	0	28	0	0	1	0	0	0	0	0	1	0	55	1002
7:50 AM	2	23	0	0	0	28	3	0	1	0	2	0	2	1	2	0	64	1009
7:55 AM	5	30	0	0	0	23	5	0	2	0	2	0	0	0	0	0	67	1017
8:00 AM	0	29	0	0	2	29	1	0	0	0	0	0	1	0	1	0	63	1028
8:05 AM	1	24	0	0	0	35	0	0	2	0	1	0	0	0	3	0	66	1025
8:10 AM	0	38	1	0	0	25	4	0	0	0	0	0	2	1	4	0	75	1023
8:15 AM	1	18	0	2	0	28	2	0	0	0	2	0	0	0	1	0	54	979
8:20 AM	2	17	0	0	0	39	1	0	1	0	0	0	2	0	1	0	63	909
8:25 AM	0	8	1	0	0	28	3	0	3	0	1	0	0	0	0	0	44	821
8:30 AM	0	25	0	0	0	22	0	0	2	0	0	0	0	0	0	0	49	746

Peak 15-Min Flowrates	Northbound Left	Thru	Right	U	Southbound Left	Thru	Right	U	Eastbound Left	Thru	Right	U	Westbound Left	Thru	Right	U	Total
All Vehicles	120	424	4	0	4	344	276	0	112	20	216	4	0	28	4	0	1556
Heavy Trucks	0	12	0		0	16	16		4	4	8		0	0	0		60
Pedestrians		0				0				0				0			0
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0
Railroad																	
Stopped Buses																	

Comments:

Type of peak hour being reported: User-Defined — Method for determining peak hour: Total Entering Volume

LOCATION: N Libra St -- Crestview Dr — **QC JOB #:** 14566406
CITY/STATE: Newberg, OR — **DATE:** Wed, Nov 15 2017

Peak-Hour: 8:00 AM -- 9:00 AM
Peak 15-Min: 8:10 AM -- 8:25 AM

5-Min Count Period Beginning At	N Libra St (Northbound) Left	Thru	Right	U	N Libra St (Southbound) Left	Thru	Right	U	Crestview Dr (Eastbound) Left	Thru	Right	U	Crestview Dr (Westbound) Left	Thru	Right	U	Total	Hourly Totals
7:00 AM	2	0	0	0	0	0	0	0	0	0	1	0	0	3	0	0	6	
7:05 AM	0	0	0	0	0	0	0	0	0	0	0	0	1	2	0	0	3	
7:10 AM	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	
7:15 AM	1	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	3	
7:20 AM	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	
7:25 AM	0	0	0	0	0	0	0	0	0	0	0	0	2	2	0	0	4	
7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	2	1	0	0	3	
7:35 AM	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	2	
7:40 AM	1	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	3	
7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	2	2	0	0	4	
7:50 AM	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	
7:55 AM	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	33
8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	28
8:05 AM	0	0	0	0	0	0	0	0	0	1	0	0	1	1	0	0	3	28
8:10 AM	4	0	0	0	0	0	0	0	0	0	0	0	1	2	0	0	7	33
8:15 AM	0	0	0	0	0	0	0	0	0	1	0	0	0	2	0	0	3	33
8:20 AM	1	0	1	0	0	0	0	0	0	0	1	0	0	1	0	0	4	36
8:25 AM	0	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0	2	34
8:30 AM	0	0	1	0	0	0	0	0	0	0	1	0	0	1	0	0	3	34
8:35 AM	0	0	0	0	0	0	0	0	0	0	1	0	0	2	0	0	3	35
8:40 AM	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1	33
8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	2	31
8:50 AM	0	0	2	0	0	0	0	0	0	0	1	0	1	1	0	0	5	35
8:55 AM	1	0	0	0	0	0	0	0	0	0	0	0	2	1	0	0	4	38

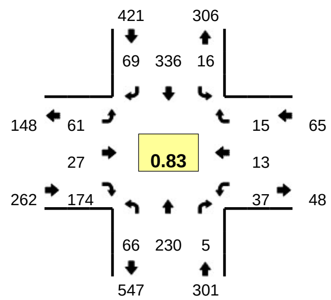
Peak 15-Min Flowrates	Northbound Left	Thru	Right	U	Southbound Left	Thru	Right	U	Eastbound Left	Thru	Right	U	Westbound Left	Thru	Right	U	Total
All Vehicles	20	0	4	0	0	0	0	0	0	4	4	0	4	20	0	0	56
Heavy Trucks	4	0	0		0	0	0		0	0	4		0	0	0		8
Pedestrians		0				0				0				0			0
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0
Railroad																	
Stopped Buses																	

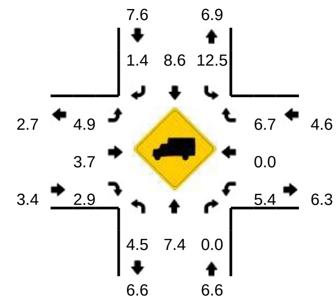
Comments:

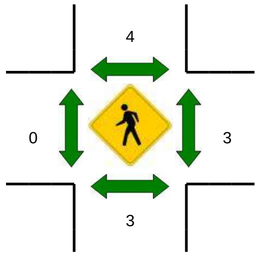
Type of peak hour being reported: User-Defined | Method for determining peak hour: Total Entering Volume

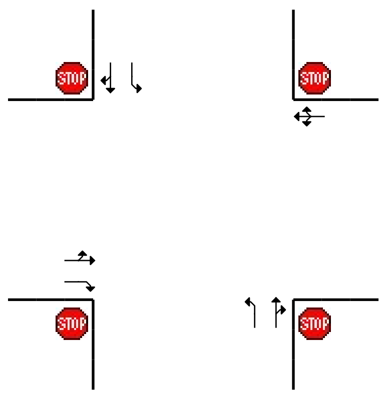
LOCATION: N Springbrook Rd -- Haworth Ave | **QC JOB #:** 14566404
CITY/STATE: Newberg, OR | **DATE:** Wed, Nov 15 2017

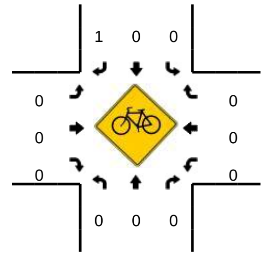
Peak-Hour: 8:00 AM -- 9:00 AM
Peak 15-Min: 8:20 AM -- 8:35 AM

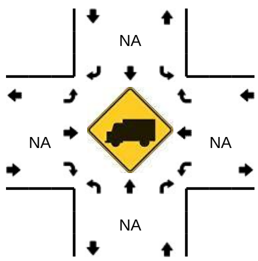


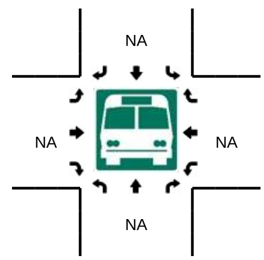












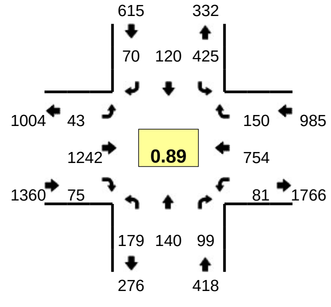
5-Min Count Period Beginning At	N Springbrook Rd (Northbound) Left	Thru	Right	U	N Springbrook Rd (Southbound) Left	Thru	Right	U	Haworth Ave (Eastbound) Left	Thru	Right	U	Haworth Ave (Westbound) Left	Thru	Right	U	Total	Hourly Totals
7:00 AM	3	28	0	0	1	17	7	0	15	1	21	0	2	1	0	0	96	
7:05 AM	5	21	0	0	0	24	7	0	10	1	15	0	1	0	0	0	84	
7:10 AM	5	17	0	0	1	26	5	0	4	1	19	0	2	1	2	0	83	
7:15 AM	3	18	0	0	0	30	5	0	11	0	23	0	0	0	0	0	90	
7:20 AM	6	20	1	0	0	24	4	0	8	1	17	0	2	2	1	0	86	
7:25 AM	6	13	0	0	1	26	4	0	7	3	16	0	1	0	0	0	77	
7:30 AM	3	17	0	0	1	22	6	0	10	1	13	0	4	1	2	0	80	
7:35 AM	6	24	0	0	0	31	5	0	5	0	13	0	0	0	1	0	85	
7:40 AM	1	19	2	0	3	24	9	0	6	0	10	0	4	1	1	0	80	
7:45 AM	2	12	0	0	0	19	4	0	5	0	6	0	2	1	2	0	53	
7:50 AM	8	23	0	0	3	16	10	0	9	1	14	0	2	0	0	0	86	
7:55 AM	3	10	1	0	0	28	5	0	0	4	8	0	1	0	0	0	60	960
8:00 AM	5	17	0	0	1	19	5	0	5	0	11	0	3	0	3	0	69	933
8:05 AM	4	24	1	0	1	19	7	0	4	1	11	0	3	0	3	0	78	927
8:10 AM	2	24	0	0	1	23	7	0	5	3	15	0	4	1	1	0	86	930
8:15 AM	6	28	0	0	2	26	3	0	9	4	11	0	0	1	0	0	90	930
8:20 AM	5	28	0	0	1	42	5	0	3	3	11	0	5	2	0	0	105	949
8:25 AM	6	17	0	0	2	36	10	0	9	2	18	0	0	0	0	0	100	972
8:30 AM	9	13	0	0	3	35	11	0	7	3	21	0	4	3	1	0	110	1002
8:35 AM	6	17	0	0	0	40	5	0	2	2	22	0	3	1	1	0	99	1016
8:40 AM	5	14	1	0	1	30	5	0	1	3	19	0	5	1	2	0	87	1023
8:45 AM	7	17	1	0	2	16	6	0	9	2	13	0	4	0	1	0	78	1048
8:50 AM	6	16	2	0	1	18	2	0	1	1	8	0	4	1	1	0	59	1021
8:55 AM	5	15	2	0	1	32	3	0	6	3	14	0	2	3	2	0	88	1049

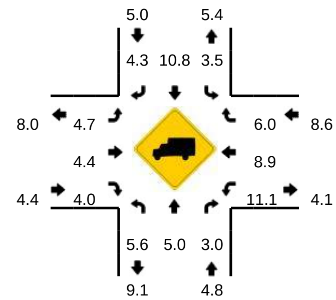
Peak 15-Min Flowrates	Northbound Left	Thru	Right	U	Southbound Left	Thru	Right	U	Eastbound Left	Thru	Right	U	Westbound Left	Thru	Right	U	Total
All Vehicles	80	232	0	0	24	452	104	0	76	32	200	0	36	20	4	0	1260
Heavy Trucks	4	8	0		4	36	4		0	4	8		0	0	0		68
Pedestrians		8				4				0				4			16
Bicycles	0	0	0		0	0	1		0	0	0		0	0	0		1
Railroad																	
Stopped Buses																	

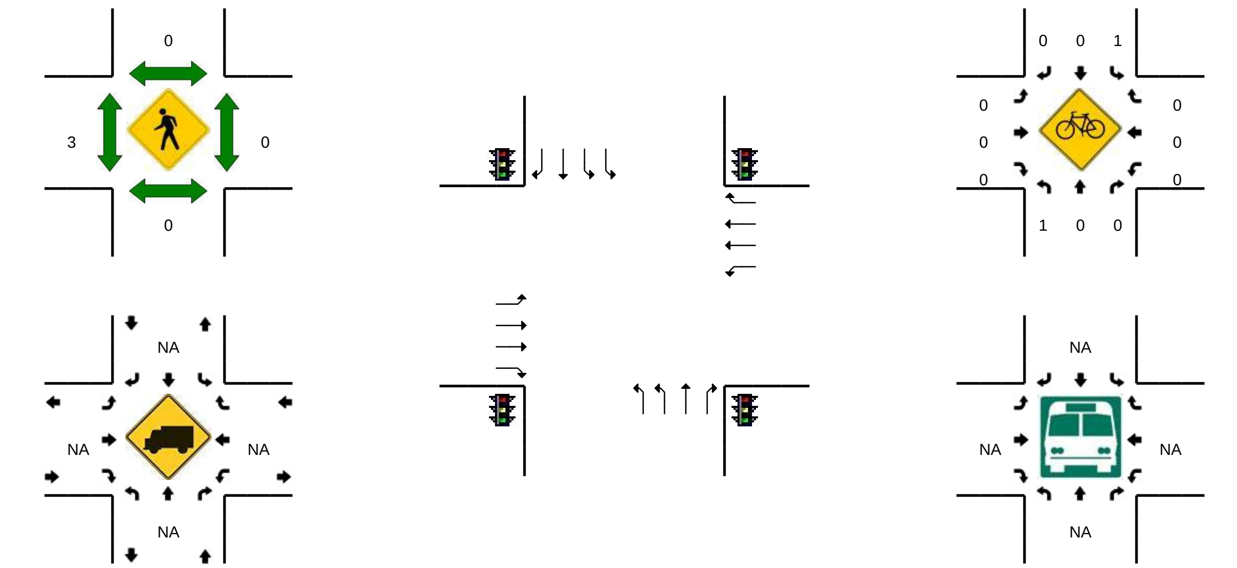
Comments:

LOCATION: N Springbrook Rd -- OR 99W | **QC JOB #:** 14505601
CITY/STATE: Newberg, OR | **DATE:** Thu, Sep 14 2017

Peak-Hour: 6:55 AM -- 7:55 AM
Peak 15-Min: 7:20 AM -- 7:35 AM







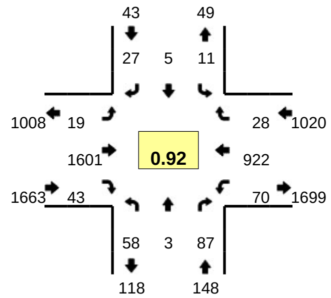
5-Min Count Period Beginning At	N Springbrook Rd (Northbound) Left	Thru	Right	U	N Springbrook Rd (Southbound) Left	Thru	Right	U	OR 99W (Eastbound) Left	Thru	Right	U	OR 99W (Westbound) Left	Thru	Right	U	Total	Hourly Totals
6:25 AM	5	2	7	0	27	11	3	0	0	104	3	0	2	32	4	0	200	
6:30 AM	9	4	6	0	27	7	3	0	1	141	6	0	3	39	5	0	251	
6:35 AM	12	4	11	0	43	8	1	0	0	109	3	0	5	50	4	1	251	
6:40 AM	7	5	10	0	26	6	1	0	2	136	2	0	3	42	4	0	244	
6:45 AM	5	7	9	0	23	7	4	0	3	119	0	0	0	63	9	0	249	
6:50 AM	7	9	9	0	44	4	6	0	1	111	1	0	5	52	6	0	255	
6:55 AM	5	9	7	0	36	2	4	0	4	101	5	0	6	49	14	0	242	2665
7:00 AM	6	10	6	0	33	7	9	0	4	112	2	0	4	49	19	0	261	2739
7:05 AM	8	12	7	0	17	10	6	0	3	85	3	0	8	60	12	0	231	2795
7:10 AM	13	16	7	0	42	8	5	0	3	114	5	1	7	51	6	0	278	2858
7:15 AM	14	18	9	0	33	8	9	0	1	103	2	0	7	44	13	0	261	2952
7:20 AM	18	12	7	0	41	13	7	0	3	114	3	0	6	54	11	0	289	3012
7:25 AM	18	17	15	0	31	15	5	0	1	104	15	0	5	87	21	0	334	3146
7:30 AM	20	8	11	0	48	13	7	0	5	108	6	0	5	80	15	0	326	3221
7:35 AM	20	12	11	0	33	17	6	0	6	84	9	0	8	68	10	0	284	3254
7:40 AM	19	9	8	0	48	6	2	0	2	116	12	0	8	65	9	0	304	3314
7:45 AM	18	11	6	0	25	12	5	0	10	90	6	0	9	78	11	0	281	3346
7:50 AM	20	6	5	0	38	9	5	0	0	111	7	0	8	69	9	0	287	3378
7:55 AM	10	16	11	0	17	7	6	0	3	92	11	0	16	74	14	0	277	3413
8:00 AM	13	9	9	0	35	11	9	0	0	65	10	2	10	79	14	0	266	3418
8:05 AM	17	11	9	0	28	5	11	0	3	105	8	0	4	68	11	0	280	3467
8:10 AM	23	27	14	0	22	14	8	0	3	67	8	0	9	82	17	0	294	3483
8:15 AM	25	15	11	0	29	10	5	0	2	97	1	0	4	57	7	0	263	3485
8:20 AM	11	4	8	0	34	20	4	0	5	83	6	0	8	62	8	0	253	3449

Peak 15-Min Flowrates	Northbound Left	Thru	Right	U	Southbound Left	Thru	Right	U	Eastbound Left	Thru	Right	U	Westbound Left	Thru	Right	U	Total
All Vehicles	224	148	132	0	480	164	76	0	36	1304	96	0	64	884	188	0	3796
Heavy Trucks	16	4	0		12	20	4		4	60	8		0	80	8		216
Pedestrians		0				0				4				0			4
Bicycles	1	0	0		1	0	0		0	0	0		0	0	0		2
Railroad																	
Stopped Buses																	

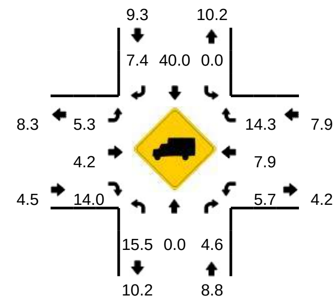
Comments:

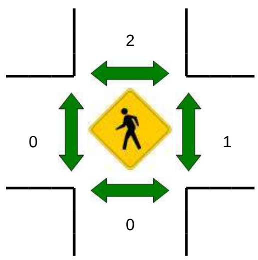
Type of peak hour being reported: User-Defined | Method for determining peak hour: Total Entering Volume

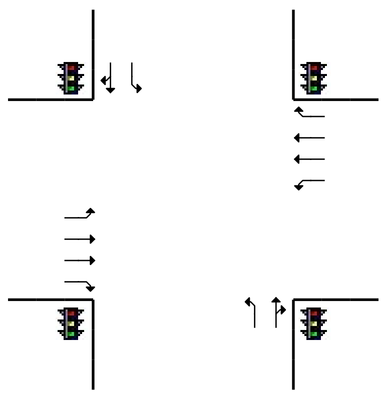
LOCATION: Brutscher St -- OR 99W | **QC JOB #:** 14505603
CITY/STATE: Newberg, OR | **DATE:** Thu, Sep 14 2017

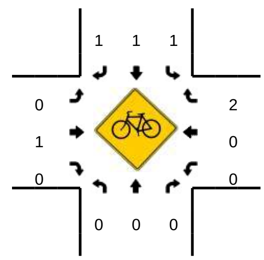


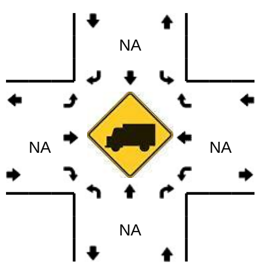
Peak-Hour: 6:55 AM -- 7:55 AM
Peak 15-Min: 7:25 AM -- 7:40 AM

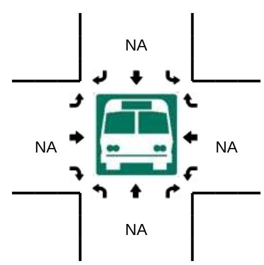












5-Min Count Period Beginning At	Brutscher St (Northbound) Left	Thru	Right	U	Brutscher St (Southbound) Left	Thru	Right	U	OR 99W (Eastbound) Left	Thru	Right	U	OR 99W (Westbound) Left	Thru	Right	U	Total	Hourly Totals
6:25 AM	0	0	4	0	0	0	6	0	0	139	1	0	4	36	3	0	193	
6:30 AM	2	0	10	0	0	0	2	0	1	154	3	0	3	50	0	0	225	
6:35 AM	1	0	4	0	1	0	1	0	0	173	1	0	3	48	2	0	234	
6:40 AM	2	1	10	0	1	2	0	0	4	133	1	0	6	51	0	0	211	
6:45 AM	2	1	9	0	2	0	1	0	1	170	1	0	2	66	4	0	259	
6:50 AM	1	2	14	0	4	0	3	0	1	140	5	0	11	59	3	0	243	
6:55 AM	3	0	4	0	1	1	2	0	1	148	3	0	5	73	1	0	242	2513
7:00 AM	3	0	5	0	2	0	1	0	0	126	2	0	7	55	4	0	205	2547
7:05 AM	4	0	12	0	2	0	1	0	1	117	2	0	3	73	2	0	217	2604
7:10 AM	4	0	4	0	1	0	3	0	2	132	1	0	6	64	3	0	220	2643
7:15 AM	4	0	11	0	0	0	3	0	1	158	2	0	10	62	2	0	253	2717
7:20 AM	8	0	3	0	1	1	1	0	1	124	6	0	2	71	1	0	219	2721
7:25 AM	7	0	11	0	0	0	2	0	2	145	7	1	3	94	3	0	275	2803
7:30 AM	6	1	6	0	1	0	2	0	3	128	4	0	9	92	0	0	252	2830
7:35 AM	3	1	6	0	1	2	2	0	0	144	2	0	3	81	6	0	251	2847
7:40 AM	2	0	15	0	1	0	9	0	3	131	6	0	9	65	3	0	244	2880
7:45 AM	7	1	7	0	1	0	1	0	0	137	4	0	3	98	1	0	260	2881
7:50 AM	7	0	3	0	0	1	0	0	4	111	4	0	10	94	2	0	236	2874
7:55 AM	10	2	10	0	4	0	2	0	1	122	5	1	5	78	1	0	241	2873
8:00 AM	10	1	11	0	1	0	2	0	1	83	14	0	9	80	2	0	214	2882
8:05 AM	8	0	6	0	0	1	3	0	1	106	1	0	1	90	4	0	221	2886
8:10 AM	16	2	6	0	0	1	1	0	2	100	5	1	4	80	2	0	220	2886
8:15 AM	6	0	5	0	2	1	2	0	3	93	5	1	15	69	0	0	202	2835
8:20 AM	7	1	9	0	2	0	1	0	1	114	7	1	8	60	0	0	211	2827

Peak 15-Min Flowrates	Northbound Left	Thru	Right	U	Southbound Left	Thru	Right	U	Eastbound Left	Thru	Right	U	Westbound Left	Thru	Right	U	Total
All Vehicles	64	8	92	0	8	8	24	0	20	1668	52	4	60	1068	36	0	3112
Heavy Trucks	16	0	0		0	0	0		0	40	4		0	92	0		152
Pedestrians		0				4				0				4			8
Bicycles	0	0	0		1	0	0		0	1	0		0	0	1		3
Railroad																	
Stopped Buses																	

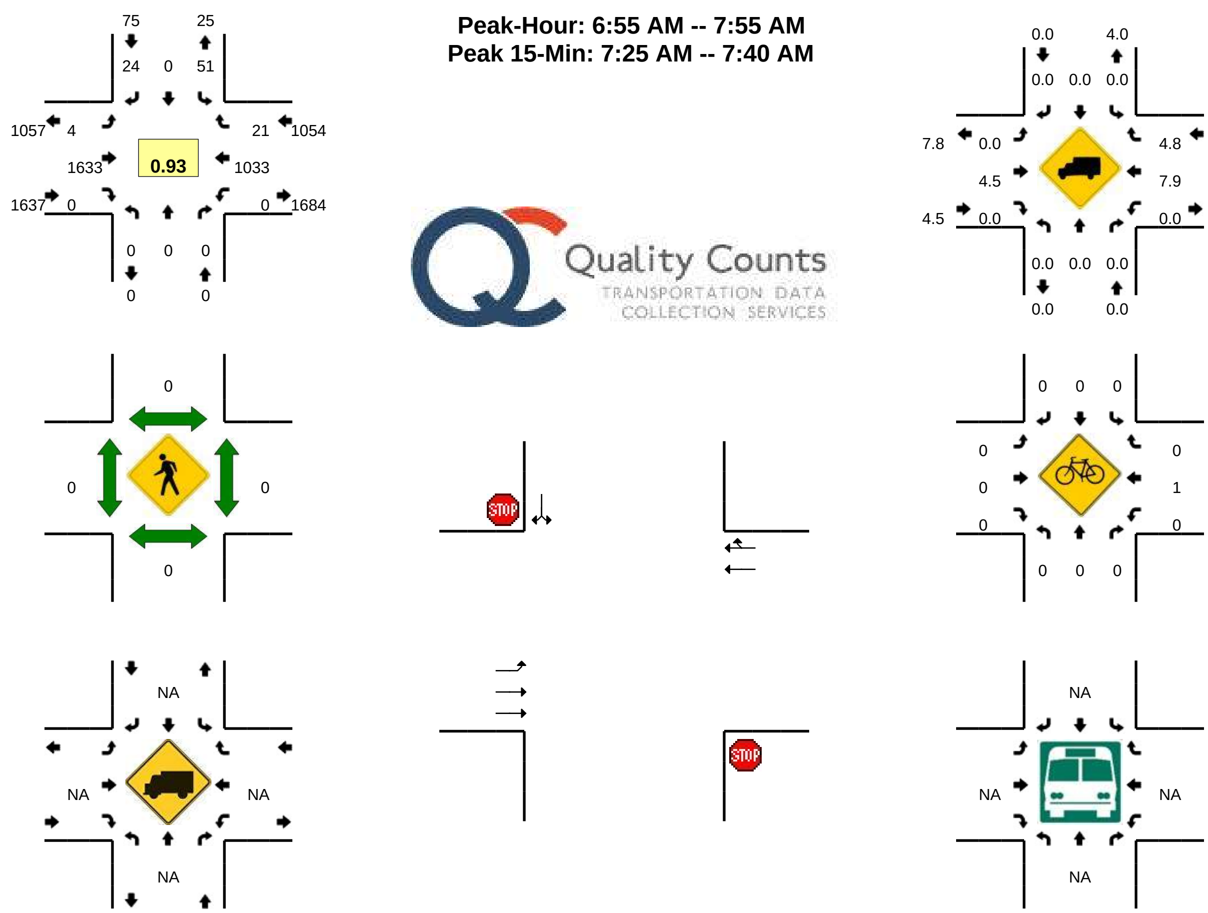
Comments:

Type of peak hour being reported: User-Defined — Method for determining peak hour: Total Entering Volume

LOCATION: Vittoria Way -- OR 99W — **QC JOB #:** 14505605

CITY/STATE: Newberg, OR — **DATE:** Thu, Sep 14 2017

Peak-Hour: 6:55 AM -- 7:55 AM
Peak 15-Min: 7:25 AM -- 7:40 AM



5-Min Count Period Beginning At	Vittoria Way (Northbound) Left	Thru	Right	U	Vittoria Way (Southbound) Left	Thru	Right	U	OR 99W (Eastbound) Left	Thru	Right	U	OR 99W (Westbound) Left	Thru	Right	U	Total	Hourly Totals
6:25 AM	0	0	0	0	10	0	0	0	0	155	0	0	0	39	3	0	207	
6:30 AM	0	0	0	0	7	0	2	0	0	141	0	0	0	54	1	0	205	
6:35 AM	0	0	0	0	3	0	2	0	0	182	0	0	0	60	1	0	248	
6:40 AM	0	0	0	0	4	0	1	0	0	126	0	0	0	63	0	0	194	
6:45 AM	0	0	0	0	1	0	3	0	1	180	0	0	0	69	0	0	254	
6:50 AM	0	0	0	0	4	0	3	0	0	131	0	0	0	65	0	0	203	
6:55 AM	0	0	0	0	7	0	1	0	0	156	0	0	0	89	1	0	254	2446
7:00 AM	0	0	0	0	3	0	0	0	0	123	0	0	0	66	2	0	194	2477
7:05 AM	0	0	0	0	6	0	2	0	0	142	0	0	0	76	1	0	227	2532
7:10 AM	0	0	0	0	5	0	3	0	0	125	0	0	0	78	2	0	213	2590
7:15 AM	0	0	0	0	5	0	1	0	1	165	0	0	0	66	0	0	238	2633
7:20 AM	0	0	0	0	6	0	1	0	1	131	0	0	0	72	2	0	213	2650
7:25 AM	0	0	0	0	5	0	3	0	1	133	0	0	0	106	4	0	252	2695
7:30 AM	0	0	0	0	3	0	2	0	0	130	0	0	0	95	2	0	232	2722
7:35 AM	0	0	0	0	3	0	2	0	1	153	0	0	0	97	4	0	260	2734
7:40 AM	0	0	0	0	3	0	1	0	0	130	0	0	0	72	1	0	207	2747
7:45 AM	0	0	0	0	2	0	2	0	0	147	0	0	0	113	1	0	265	2758
7:50 AM	0	0	0	0	3	0	6	0	0	98	0	0	0	103	1	0	211	2766
7:55 AM	0	0	0	0	2	0	1	0	0	124	0	0	0	90	3	0	220	2732
8:00 AM	0	0	0	0	2	0	3	0	3	91	0	0	0	89	1	0	189	2727
8:05 AM	0	0	0	0	1	0	0	0	0	99	0	0	0	80	1	0	181	2681
8:10 AM	0	0	0	0	1	0	0	0	2	95	0	0	0	97	0	0	195	2663
8:15 AM	0	0	0	0	4	0	1	0	1	95	0	0	0	80	2	0	183	2608
8:20 AM	0	0	0	0	1	0	0	0	4	113	0	0	0	81	1	0	200	2595

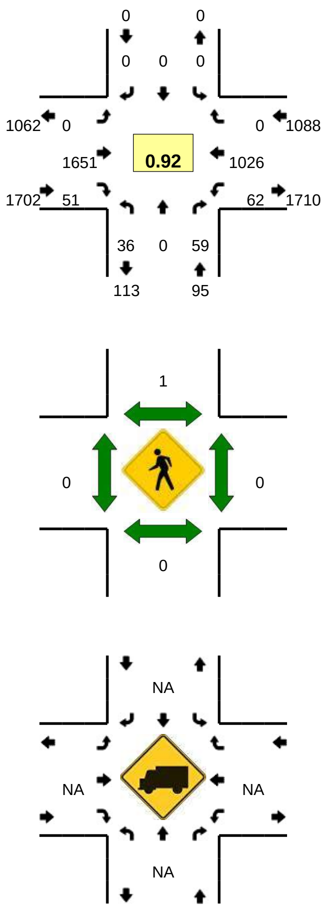
Peak 15-Min Flowrates	Northbound Left	Thru	Right	U	Southbound Left	Thru	Right	U	Eastbound Left	Thru	Right	U	Westbound Left	Thru	Right	U	Total
All Vehicles	0	0	0	0	44	0	28	0	8	1664	0	0	0	1192	40	0	2976
Heavy Trucks	0	0	0		0	0	0		0	48	0		0	104	0		152
Pedestrians		0				0				0				0			0
Bicycles	0	0	0		0	0	0		0	0	0		0	1	0		1
Railroad																	
Stopped Buses																	

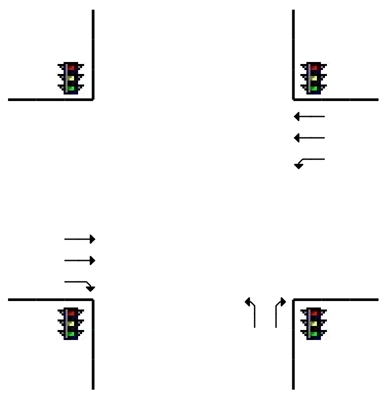
Comments:

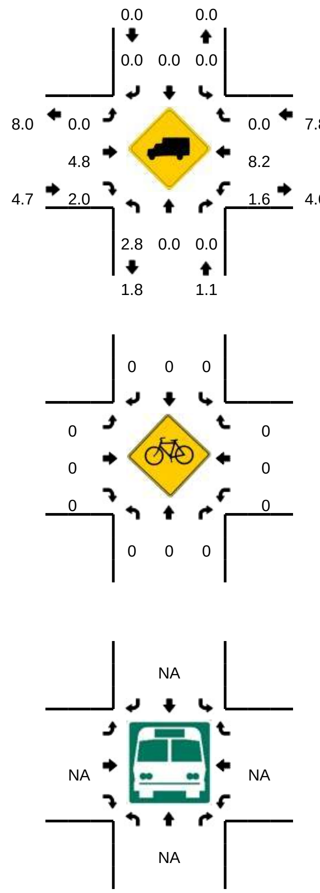
Type of peak hour being reported: User-Defined | Method for determining peak hour: Total Entering Volume

LOCATION: Providence Dr -- OR 99W | **QC JOB #:** 14505607
CITY/STATE: Newberg, OR | **DATE:** Thu, Sep 14 2017

Peak-Hour: 6:55 AM -- 7:55 AM
Peak 15-Min: 7:25 AM -- 7:40 AM







5-Min Count Period Beginning At	Providence Dr (Northbound) Left	Thru	Right	U	Providence Dr (Southbound) Left	Thru	Right	U	OR 99W (Eastbound) Left	Thru	Right	U	OR 99W (Westbound) Left	Thru	Right	U	Total	Hourly Totals
6:25 AM	1	0	2	0	0	0	0	0	0	167	3	0	4	42	0	0	219	
6:30 AM	0	0	6	0	0	0	0	0	0	149	3	0	3	53	0	0	214	
6:35 AM	0	0	3	0	0	0	0	0	0	184	6	0	6	64	0	0	263	
6:40 AM	1	0	5	0	0	0	0	0	0	132	2	0	6	60	0	0	206	
6:45 AM	0	0	1	0	0	0	0	0	0	174	6	0	2	69	0	0	252	
6:50 AM	2	0	3	0	0	0	0	0	0	130	4	0	4	63	0	0	206	
6:55 AM	2	0	4	0	0	0	0	0	0	146	4	0	14	86	0	0	256	2501
7:00 AM	1	0	2	0	0	0	0	0	0	132	3	0	6	68	0	0	212	2556
7:05 AM	0	0	3	0	0	0	0	0	0	143	5	0	4	77	0	0	232	2619
7:10 AM	3	0	9	0	0	0	0	0	0	131	2	0	3	80	0	0	228	2677
7:15 AM	2	0	3	0	0	0	0	0	0	164	2	0	3	62	0	0	236	2711
7:20 AM	2	0	10	0	0	0	0	0	0	128	6	0	4	74	0	0	224	2748
7:25 AM	4	0	2	0	0	0	0	0	0	141	4	0	6	106	0	0	263	2792
7:30 AM	6	0	8	0	0	0	0	0	0	126	3	0	7	93	0	0	243	2821
7:35 AM	4	0	6	0	0	0	0	0	0	163	4	0	5	97	0	0	279	2837
7:40 AM	5	0	7	0	0	0	0	0	0	130	6	0	4	71	0	0	223	2854
7:45 AM	4	0	2	0	0	0	0	0	0	150	5	0	6	116	0	0	283	2885
7:50 AM	3	0	3	0	0	0	0	0	0	97	7	0	0	96	0	0	206	2885
7:55 AM	2	0	2	0	0	0	0	0	0	111	14	0	6	98	0	0	233	2862
8:00 AM	1	0	3	0	0	0	0	0	0	81	1	0	5	82	0	0	173	2823
8:05 AM	8	0	3	0	0	0	0	0	0	93	7	0	4	75	0	0	190	2781
8:10 AM	1	0	3	0	0	0	0	0	0	92	5	0	4	96	0	0	201	2754
8:15 AM	2	0	0	0	0	0	0	0	0	91	10	0	3	76	0	0	182	2700
8:20 AM	3	0	1	0	0	0	0	0	0	102	8	0	6	80	0	0	200	2676

Peak 15-Min Flowrates	Northbound Left	Thru	Right	U	Southbound Left	Thru	Right	U	Eastbound Left	Thru	Right	U	Westbound Left	Thru	Right	U	Total
All Vehicles	56	0	64	0	0	0	0	0	0	1720	44	0	72	1184	0	0	3140
Heavy Trucks	0	0	0		0	0	0		0	52	0		4	96	0		152
Pedestrians		0				4				0				0			4
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0
Railroad																	
Stopped Buses																	

Comments:

Report generated on 6/5/2018 10:59 AM | SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

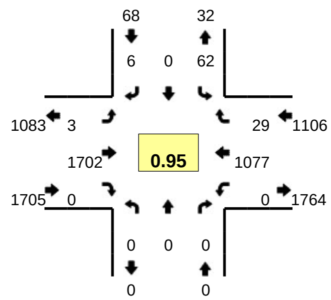
Type of peak hour being reported: User-Defined | Method for determining peak hour: Total Entering Volume

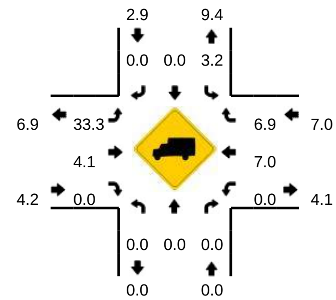
LOCATION: NE Benjamin Rd -- OR 99W | **QC JOB #:** 14505609

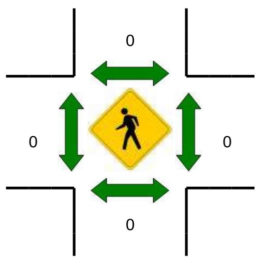
CITY/STATE: Newberg, OR | **DATE:** Thu, Sep 14 2017

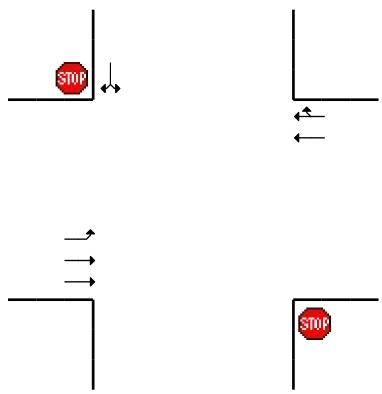
Peak-Hour: 6:55 AM -- 7:55 AM

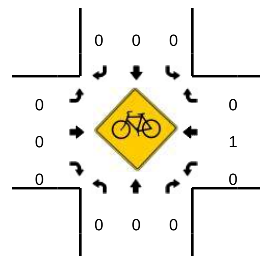
Peak 15-Min: 7:20 AM -- 7:35 AM

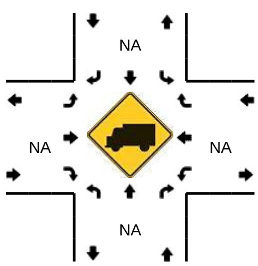


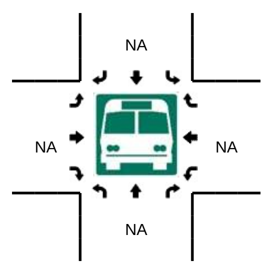












5-Min Count Period Beginning At	NE Benjamin Rd (Northbound) Left	Thru	Right	U	NE Benjamin Rd (Southbound) Left	Thru	Right	U	OR 99W (Eastbound) Left	Thru	Right	U	OR 99W (Westbound) Left	Thru	Right	U	Total	Hourly Totals
6:25 AM	0	0	0	0	3	0	2	0	1	155	0	0	0	47	0	0	208	
6:30 AM	0	0	0	0	2	0	0	0	0	160	0	0	0	49	0	0	211	
6:35 AM	0	0	0	0	4	0	0	0	0	180	0	0	0	71	0	0	255	
6:40 AM	0	0	0	0	7	0	0	0	0	156	0	0	0	70	1	0	234	
6:45 AM	0	0	0	0	6	0	0	0	0	170	0	0	0	74	3	0	253	
6:50 AM	0	0	0	0	3	0	1	0	0	141	0	0	0	73	3	0	221	
6:55 AM	0	0	0	0	4	0	1	0	0	127	0	0	0	95	2	0	229	2520
7:00 AM	0	0	0	0	7	0	1	0	0	154	0	0	0	72	2	0	236	2601
7:05 AM	0	0	0	0	7	0	0	0	0	139	0	0	0	77	2	0	225	2650
7:10 AM	0	0	0	0	10	0	0	0	0	145	0	0	0	85	1	0	241	2722
7:15 AM	0	0	0	0	10	0	1	0	1	149	0	0	0	60	1	0	222	2742
7:20 AM	0	0	0	0	1	0	0	0	0	158	0	0	0	95	1	0	255	2790
7:25 AM	0	0	0	0	2	0	0	0	1	126	0	0	0	107	7	0	243	2825
7:30 AM	0	0	0	0	8	0	0	0	0	150	0	0	0	101	1	0	260	2874
7:35 AM	0	0	0	0	3	0	1	0	0	153	0	0	0	86	6	0	249	2868
7:40 AM	0	0	0	0	3	0	1	0	0	152	0	0	0	76	3	0	235	2869
7:45 AM	0	0	0	0	5	0	1	0	1	136	0	0	0	116	2	0	261	2877
7:50 AM	0	0	0	0	2	0	0	0	0	113	0	0	0	107	1	0	223	2879
7:55 AM	0	0	0	0	5	0	0	0	0	106	0	0	0	99	5	0	215	2865
8:00 AM	0	0	0	0	6	0	0	0	0	105	0	0	0	82	4	0	197	2826
8:05 AM	0	0	0	0	1	0	1	0	0	103	0	0	0	82	8	0	195	2796
8:10 AM	0	0	0	0	5	0	1	0	1	81	0	0	0	93	1	0	182	2737
8:15 AM	0	0	0	0	4	0	1	0	0	106	0	0	0	78	4	0	193	2708
8:20 AM	0	0	0	0	1	0	1	0	0	94	0	0	0	93	1	0	190	2643

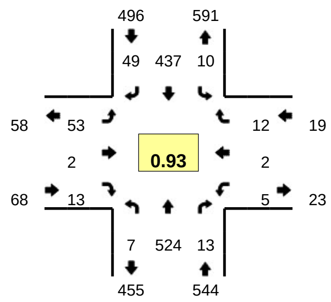
Peak 15-Min Flowrates	Northbound Left	Thru	Right	U	Southbound Left	Thru	Right	U	Eastbound Left	Thru	Right	U	Westbound Left	Thru	Right	U	Total
All Vehicles	0	0	0	0	44	0	0	0	4	1736	0	0	0	1212	36	0	3032
Heavy Trucks	0	0	0		0	0	0		0	56	0		0	80	8		144
Pedestrians		0				0				0				0			0
Bicycles	0	0	0		0	0	0		0	0	0		0	1	0		1
Railroad																	
Stopped Buses																	

Comments:

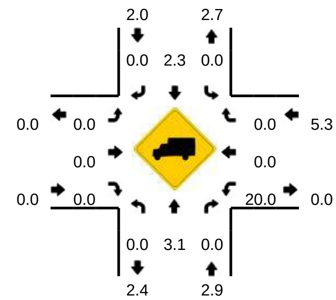
Type of peak hour being reported: User-Defined | Method for determining peak hour: Total Entering Volume

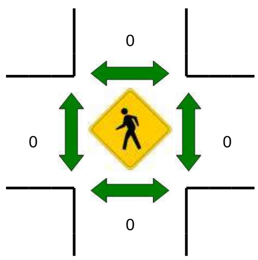
LOCATION: Springbrook Rd -- Crestview Dr | **QC JOB #:** 14505612

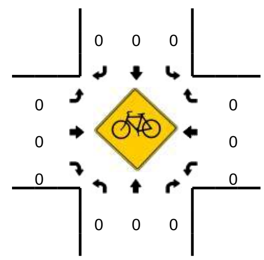
CITY/STATE: Newberg, OR | **DATE:** Thu, Sep 14 2017

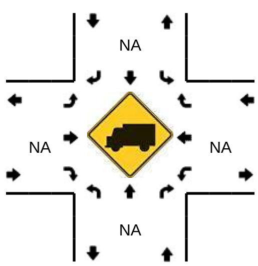


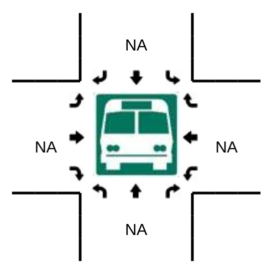
Peak-Hour: 4:40 PM -- 5:40 PM
Peak 15-Min: 4:40 PM -- 4:55 PM











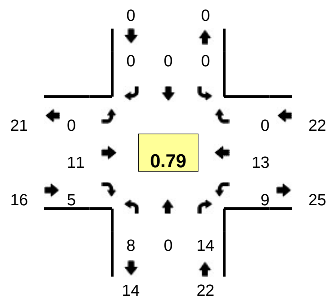
5-Min Count Period Beginning At	Springbrook Rd (Northbound) Left	Thru	Right	U	Springbrook Rd (Southbound) Left	Thru	Right	U	Crestview Dr (Eastbound) Left	Thru	Right	U	Crestview Dr (Westbound) Left	Thru	Right	U	Total	Hourly Totals
4:00 PM	0	27	0	0	0	40	0	1	4	1	0	0	0	0	0	0	73	913
4:05 PM	1	31	0	0	1	55	3	0	2	0	0	0	1	0	1	0	95	925
4:10 PM	0	34	1	0	1	41	2	0	2	0	1	0	0	0	1	0	83	933
4:15 PM	2	26	2	0	1	35	2	0	0	0	0	0	1	0	1	0	70	923
4:20 PM	1	47	0	0	0	27	3	0	2	0	2	0	0	0	1	0	83	930
4:25 PM	1	36	1	0	0	32	6	0	1	0	0	0	0	0	0	0	77	939
4:30 PM	1	39	0	0	0	32	1	0	2	0	2	0	2	0	2	0	81	942
4:35 PM	1	31	3	0	0	38	4	0	3	0	0	0	2	0	0	0	82	922
4:40 PM	0	39	1	0	0	56	2	1	0	0	0	0	1	0	2	0	102	953
4:45 PM	2	47	1	0	2	40	4	0	2	0	0	0	0	0	2	0	100	986
4:50 PM	0	46	0	0	1	44	8	0	0	0	2	0	0	0	0	0	101	1017
4:55 PM	1	46	3	0	0	30	12	0	6	0	1	0	0	0	1	0	100	1047
5:00 PM	0	44	1	0	0	25	3	0	15	0	3	0	2	0	1	0	94	1068
5:05 PM	2	46	0	0	0	30	6	0	8	0	3	0	1	0	1	0	97	1070
5:10 PM	1	44	2	0	0	37	1	0	8	0	1	0	0	0	1	0	95	1082
5:15 PM	1	46	1	0	0	30	1	0	4	0	0	0	0	2	0	0	85	1097
5:20 PM	0	43	0	0	1	47	4	0	3	0	0	0	0	0	2	0	100	1114
5:25 PM	0	45	1	0	2	29	2	0	1	0	1	0	0	0	0	0	81	1118
5:30 PM	0	31	2	0	0	40	3	1	3	2	2	0	0	0	2	0	86	1123
5:35 PM	0	47	1	0	2	29	3	0	3	0	0	0	1	0	0	0	86	1127
5:40 PM	1	41	0	0	0	33	0	0	1	1	0	0	1	0	0	0	78	1103
5:45 PM	1	29	1	0	1	41	1	0	7	0	0	0	1	0	2	0	84	1087
5:50 PM	3	34	0	0	1	34	2	0	4	0	0	0	2	1	0	0	81	1067
5:55 PM	1	27	0	0	0	37	0	0	0	0	0	0	0	0	0	0	65	1032

Peak 15-Min Flowrates	Northbound Left	Thru	Right	U	Southbound Left	Thru	Right	U	Eastbound Left	Thru	Right	U	Westbound Left	Thru	Right	U	Total
All Vehicles	8	528	8	0	12	560	56	4	8	0	8	0	4	0	16	0	1212
Heavy Trucks	0	12	0		0	8	0		0	0	0		0	0	0		20
Pedestrians		0				0				0				0			0
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0
Railroad																	
Stopped Buses																	

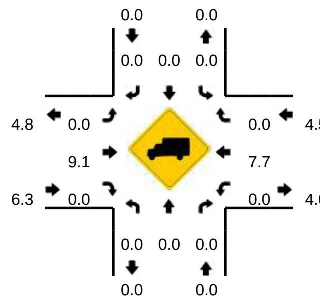
Comments:

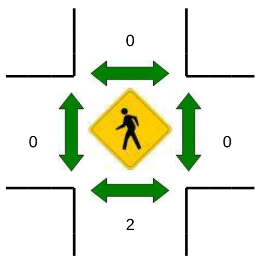
Type of peak hour being reported: User-Defined | Method for determining peak hour: Total Entering Volume

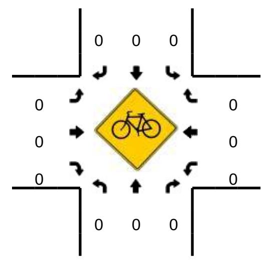
LOCATION: N Libra St -- Crestview Dr | **QC JOB #:** 14566407
CITY/STATE: Newberg, OR | **DATE:** Wed, Nov 15 2017

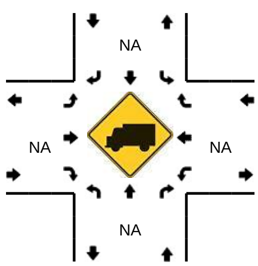


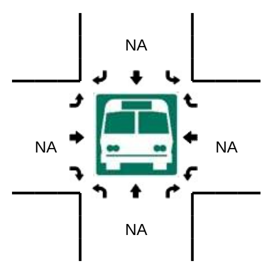
Peak-Hour: 3:40 PM -- 4:40 PM
Peak 15-Min: 4:25 PM -- 4:40 PM











5-Min Count Period Beginning At	N Libra St (Northbound) Left	Thru	Right	U	N Libra St (Southbound) Left	Thru	Right	U	Crestview Dr (Eastbound) Left	Thru	Right	U	Crestview Dr (Westbound) Left	Thru	Right	U	Total	Hourly Totals
3:10 PM	0	0	1	0	0	0	0	0	0	0	1	0	0	1	0	0	3	
3:15 PM	0	0	3	0	0	0	0	0	0	1	0	0	0	0	0	0	4	
3:20 PM	1	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	3	
3:25 PM	0	0	0	1	0	0	0	0	0	0	1	0	1	1	0	0	4	
3:30 PM	0	0	2	0	0	0	0	0	0	1	0	0	0	1	0	0	4	
3:35 PM	0	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	2	
3:40 PM	0	0	1	0	0	0	0	0	0	0	1	0	1	1	0	0	4	
3:45 PM	0	0	1	0	0	0	0	0	0	2	1	0	0	1	0	0	5	
3:50 PM	0	0	2	0	0	0	0	0	0	1	0	0	0	2	0	0	5	
3:55 PM	0	0	2	0	0	0	0	0	0	0	0	0	2	1	0	0	5	47
4:00 PM	2	0	0	0	0	0	0	0	0	0	1	0	0	1	0	0	4	49
4:05 PM	0	0	0	0	0	0	0	0	0	3	0	0	1	1	0	0	5	48
4:10 PM	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	2	47
4:15 PM	0	0	3	0	0	0	0	0	0	1	0	0	1	0	0	0	5	48
4:20 PM	1	0	2	0	0	0	0	0	0	2	0	0	1	0	0	0	6	51
4:25 PM	0	0	1	0	0	0	0	0	0	1	0	0	0	2	0	0	4	51
4:30 PM	2	0	0	0	0	0	0	0	0	1	1	0	1	3	0	0	8	55
4:35 PM	2	0	1	0	0	0	0	0	0	0	1	0	2	1	0	0	7	60
4:40 PM	1	0	1	0	0	0	0	0	0	1	0	0	0	0	0	0	3	59
4:45 PM	0	0	1	0	0	0	0	0	0	0	0	0	1	0	0	0	2	56
4:50 PM	0	0	1	0	0	0	0	0	0	0	0	0	0	1	0	0	2	53
4:55 PM	2	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	3	51
5:00 PM	0	0	3	0	0	0	0	0	0	3	0	0	0	0	0	0	6	53
5:05 PM	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	2	50

Peak 15-Min Flowrates	Northbound Left	Thru	Right	U	Southbound Left	Thru	Right	U	Eastbound Left	Thru	Right	U	Westbound Left	Thru	Right	U	Total
All Vehicles	16	0	8	0	0	0	0	0	0	8	8	0	12	24	0	0	76
Heavy Trucks	0	0	0		0	0	0		0	0	0		0	0	0		0
Pedestrians		0				0				0				0			0
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0
Railroad																	
Stopped Buses																	

Comments:

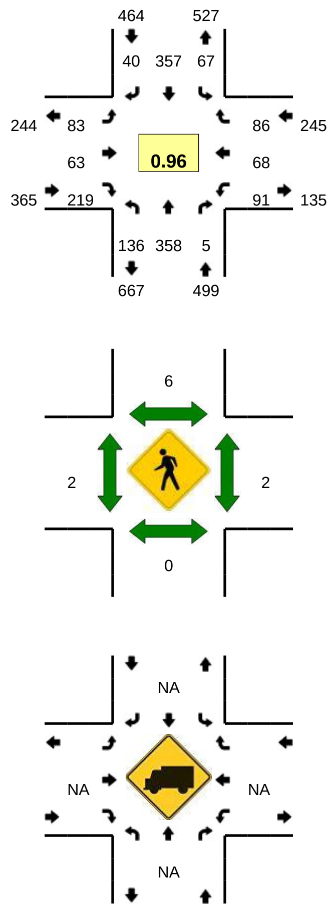
Report generated on 6/5/2018 11:04 AM

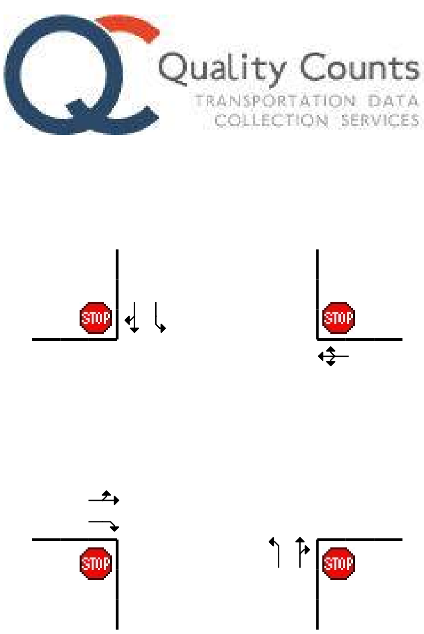
SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

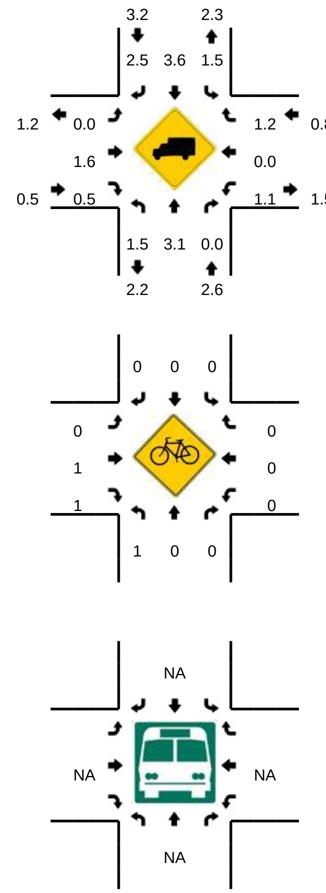
Type of peak hour being reported: User-Defined — Method for determining peak hour: Total Entering Volume

LOCATION: N Springbrook Rd -- Haworth Ave — **QC JOB #:** 14566405
CITY/STATE: Newberg, OR — **DATE:** Wed, Nov 15 2017

Peak-Hour: 4:20 PM -- 5:20 PM
Peak 15-Min: 4:50 PM -- 5:05 PM







5-Min Count Period Beginning At	N Springbrook Rd (Northbound) Left	Thru	Right	U	N Springbrook Rd (Southbound) Left	Thru	Right	U	Haworth Ave (Eastbound) Left	Thru	Right	U	Haworth Ave (Westbound) Left	Thru	Right	U	Total	Hourly Totals
3:50 PM	8	18	1	0	5	30	3	0	5	5	10	0	9	4	7	0	105	
3:55 PM	10	24	0	0	3	28	5	0	10	1	18	0	10	7	4	0	120	1317
4:00 PM	11	21	3	0	2	21	3	0	7	4	11	0	7	2	1	0	93	1309
4:05 PM	14	24	1	0	9	33	5	0	7	5	18	0	7	4	3	0	130	1328
4:10 PM	11	22	2	0	6	31	5	0	7	4	13	0	11	10	5	0	127	1340
4:15 PM	12	25	0	0	6	29	3	0	8	5	11	0	11	7	7	0	124	1359
4:20 PM	8	33	0	0	9	28	5	0	4	9	12	0	6	6	7	0	127	1360
4:25 PM	13	22	1	0	3	33	3	0	5	4	12	0	10	4	1	0	111	1367
4:30 PM	14	30	0	0	4	23	5	0	12	3	18	0	6	8	6	0	129	1380
4:35 PM	12	31	0	0	5	30	4	0	10	4	16	0	9	3	5	0	129	1402
4:40 PM	9	33	2	0	5	28	6	0	5	7	27	0	4	6	10	0	142	1424
4:45 PM	14	22	1	0	3	28	2	0	8	2	18	0	8	7	8	0	121	1458
4:50 PM	12	26	1	0	2	31	5	0	6	4	23	0	12	9	8	0	139	1492
4:55 PM	6	23	0	0	9	34	3	0	9	5	17	0	5	7	7	0	125	1497
5:00 PM	13	29	0	0	6	29	2	0	9	7	23	0	8	8	10	0	144	1548
5:05 PM	13	36	0	0	6	27	0	0	3	4	16	0	6	3	8	0	122	1540
5:10 PM	13	31	0	0	8	31	2	0	6	10	14	0	11	3	6	0	135	1548
5:15 PM	9	42	0	0	7	35	3	0	6	4	23	0	6	4	10	0	149	1573
5:20 PM	19	26	2	0	2	27	3	0	3	5	16	0	10	6	6	0	125	1571
5:25 PM	8	24	0	0	1	29	4	0	7	5	12	0	10	5	6	0	111	1571
5:30 PM	14	20	2	0	3	23	3	0	6	5	7	0	5	7	7	0	102	1544
5:35 PM	18	31	1	0	3	21	3	0	7	5	18	0	4	4	5	0	120	1535
5:40 PM	10	36	2	0	2	16	5	0	3	6	15	0	11	7	5	0	118	1511
5:45 PM	11	24	0	0	2	17	1	0	1	6	5	0	14	3	4	0	88	1478

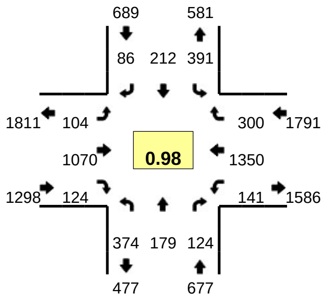
Peak 15-Min Flowrates	Northbound Left	Thru	Right	U	Southbound Left	Thru	Right	U	Eastbound Left	Thru	Right	U	Westbound Left	Thru	Right	U	Total
All Vehicles	124	312	4	0	68	376	40	0	96	64	252	0	100	96	100	0	1632
Heavy Trucks	0	16	0		0	4	0		0	4	4		0	0	0		28
Pedestrians		0				8				0				0			8
Bicycles	0	0	0		0	0	0		0	0	1		0	0	0		1
Railroad																	
Stopped Buses																	

Comments:

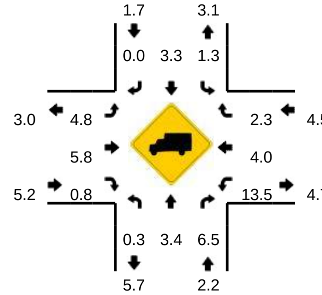
Report generated on 6/5/2018 11:05 AM — SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

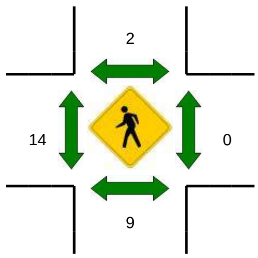
Type of peak hour being reported: User-Defined　　Method for determining peak hour: Total Entering Volume

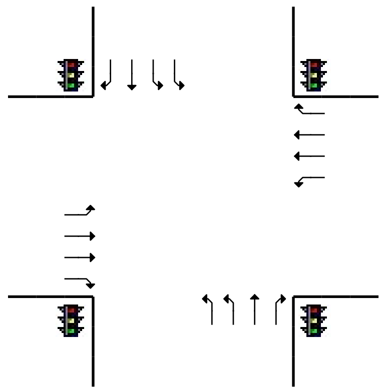
LOCATION: N Springbrook Rd -- OR 99W　　**QC JOB #:** 14505602
CITY/STATE: Newberg, OR　　**DATE:** Thu, Sep 14 2017

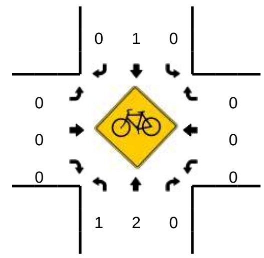


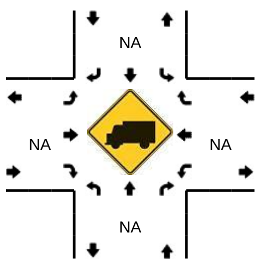
Peak-Hour: 4:45 PM -- 5:45 PM
Peak 15-Min: 5:20 PM -- 5:35 PM

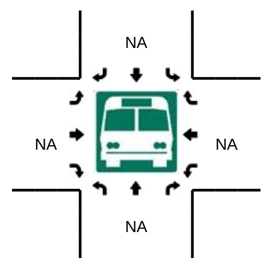












5-Min Count Period Beginning At	N Springbrook Rd (Northbound) Left	Thru	Right	U	N Springbrook Rd (Southbound) Left	Thru	Right	U	OR 99W (Eastbound) Left	Thru	Right	U	OR 99W (Westbound) Left	Thru	Right	U	Total	Hourly Totals
4:00 PM	30	10	12	0	29	9	5	0	12	90	11	0	16	105	20	0	349	4050
4:05 PM	31	12	9	0	20	16	9	0	7	103	12	0	15	114	22	0	370	4104
4:10 PM	25	14	16	0	33	11	7	0	3	90	5	1	8	111	23	0	347	4133
4:15 PM	34	14	10	0	31	10	6	0	7	99	14	1	12	129	21	0	388	4191
4:20 PM	33	18	15	0	28	15	16	0	7	91	10	0	16	115	24	0	388	4241
4:25 PM	27	18	14	0	31	17	8	0	11	93	8	0	17	99	29	0	372	4270
4:30 PM	42	14	13	0	36	8	8	0	12	96	10	0	17	118	15	0	389	4304
4:35 PM	29	13	7	0	27	15	7	0	8	81	5	1	15	133	20	0	361	4307
4:40 PM	33	12	11	0	15	14	12	0	6	93	11	0	15	137	16	0	375	4338
4:45 PM	28	12	12	0	31	20	9	0	10	98	13	0	12	108	28	0	381	4368
4:50 PM	31	15	10	0	24	11	5	0	11	91	16	0	14	123	25	0	376	4432
4:55 PM	35	18	7	0	26	27	6	0	3	89	9	0	11	96	35	0	362	4458
5:00 PM	40	17	16	1	45	16	9	0	8	86	10	0	11	97	23	0	379	4488
5:05 PM	32	16	10	0	38	17	7	0	7	81	5	0	11	85	22	0	331	4449
5:10 PM	32	17	10	0	27	21	4	0	12	84	11	2	21	103	28	0	372	4474
5:15 PM	26	8	7	0	33	14	5	0	5	104	9	0	9	119	26	0	365	4451
5:20 PM	33	12	10	0	29	9	9	0	9	101	9	0	12	140	21	0	394	4457
5:25 PM	31	14	9	0	29	13	6	0	7	73	11	0	9	138	28	0	368	4453
5:30 PM	20	19	12	0	35	32	6	0	12	90	9	0	9	110	24	1	379	4443
5:35 PM	35	17	8	0	43	18	8	0	7	93	14	0	8	118	16	0	385	4467
5:40 PM	30	14	13	0	31	14	12	0	11	80	8	0	13	113	24	0	363	4455
5:45 PM	36	12	11	0	21	12	10	0	9	81	9	1	14	121	21	1	359	4433
5:50 PM	27	16	5	0	26	15	7	0	11	104	14	0	11	136	19	0	391	4448
5:55 PM	28	13	6	0	25	12	10	0	9	102	15	0	11	120	17	0	368	4454

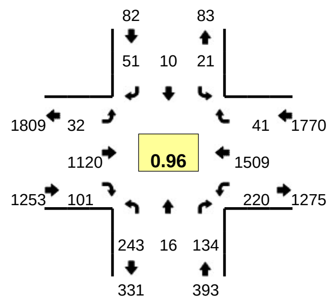
Peak 15-Min Flowrates	Northbound Left	Thru	Right	U	Southbound Left	Thru	Right	U	Eastbound Left	Thru	Right	U	Westbound Left	Thru	Right	U	Total
All Vehicles	336	180	124	0	372	216	84	0	112	1056	116	0	120	1552	292	4	4564
Heavy Trucks	0	8	8		8	4	0		4	44	0		16	64	0		156
Pedestrians		4				0				0				0			4
Bicycles	0	1	0		0	0	0		0	0	0		0	0	0		1
Railroad																	
Stopped Buses																	

Comments:

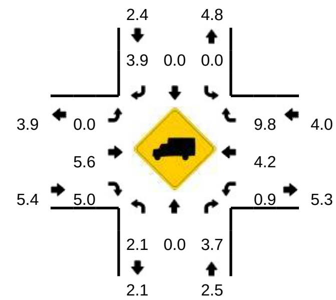
Type of peak hour being reported: User-Defined | Method for determining peak hour: Total Entering Volume

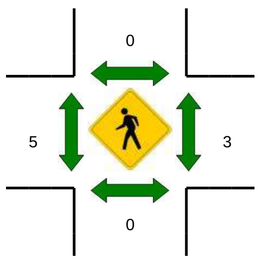
LOCATION: Brutscher St -- OR 99W | **QC JOB #:** 14505604

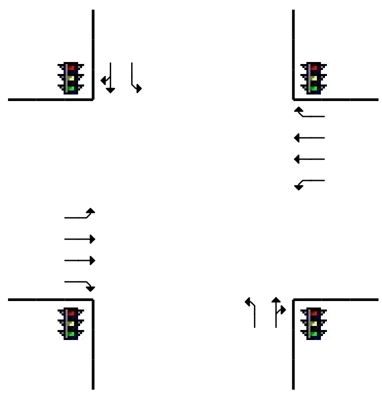
CITY/STATE: Newberg, OR | **DATE:** Thu, Sep 14 2017

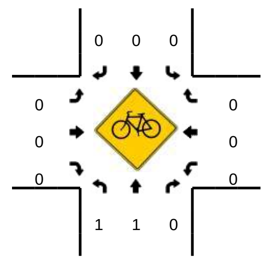


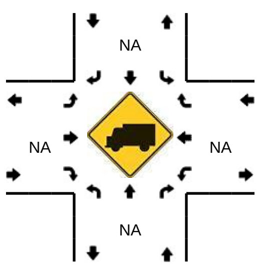
Peak-Hour: 4:45 PM -- 5:45 PM
Peak 15-Min: 5:30 PM -- 5:45 PM

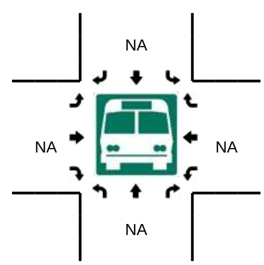












5-Min Count Period Beginning At	Brutscher St (Northbound) Left	Thru	Right	U	Brutscher St (Southbound) Left	Thru	Right	U	OR 99W (Eastbound) Left	Thru	Right	U	OR 99W (Westbound) Left	Thru	Right	U	Total	Hourly Totals
4:00 PM	10	1	15	0	1	4	10	0	0	87	5	1	30	121	3	0	288	3289
4:05 PM	16	4	5	0	0	1	6	0	3	88	7	1	20	120	7	0	278	3283
4:10 PM	25	3	7	0	4	2	5	0	2	91	13	1	16	123	5	0	297	3335
4:15 PM	23	2	5	0	1	1	5	0	1	80	7	1	20	135	3	0	284	3307
4:20 PM	17	2	7	0	1	1	6	0	3	118	7	0	17	138	5	0	322	3368
4:25 PM	24	3	9	0	2	1	3	0	1	101	13	2	12	112	5	0	288	3385
4:30 PM	13	2	10	0	1	1	6	0	1	96	11	1	21	151	5	1	320	3433
4:35 PM	17	1	13	0	0	2	9	0	2	77	11	0	18	135	4	0	289	3462
4:40 PM	13	4	8	0	2	1	4	0	0	78	5	0	18	150	0	0	283	3500
4:45 PM	21	1	7	0	1	1	6	0	3	78	12	0	22	117	4	0	273	3469
4:50 PM	29	5	12	0	1	2	5	0	2	81	10	0	22	118	1	0	288	3501
4:55 PM	22	0	11	0	1	0	6	0	2	118	9	0	13	127	4	0	313	3523
5:00 PM	23	0	12	0	1	1	2	0	3	82	7	0	21	112	6	0	270	3505
5:05 PM	23	2	13	0	5	0	7	0	2	102	5	0	19	99	4	0	281	3508
5:10 PM	19	0	19	0	1	1	6	0	0	92	9	1	21	142	0	0	311	3522
5:15 PM	14	1	15	0	1	0	1	0	3	98	9	0	15	130	4	0	291	3529
5:20 PM	17	1	8	0	4	0	4	0	0	83	7	1	15	124	2	0	266	3473
5:25 PM	19	3	5	0	3	0	2	0	2	94	9	1	18	132	4	0	292	3477
5:30 PM	14	0	9	0	2	0	3	0	2	98	10	2	22	132	1	0	295	3452
5:35 PM	21	1	9	0	0	2	6	0	5	94	7	1	20	139	6	0	311	3474
5:40 PM	21	2	14	0	1	3	3	0	2	100	7	0	12	137	5	0	307	3498
5:45 PM	16	2	12	0	2	3	4	0	0	70	12	0	16	142	4	0	283	3508
5:50 PM	15	1	15	0	0	0	5	0	1	77	9	0	29	124	2	0	278	3498
5:55 PM	26	0	15	0	0	2	5	0	2	86	10	0	7	101	3	0	257	3442

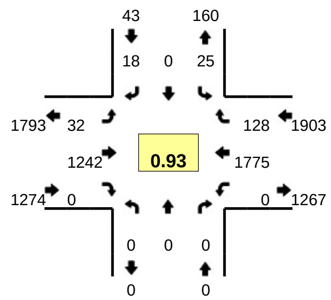
Peak 15-Min Flowrates	Northbound Left	Thru	Right	U	Southbound Left	Thru	Right	U	Eastbound Left	Thru	Right	U	Westbound Left	Thru	Right	U	Total
All Vehicles	224	12	128	0	12	20	48	0	36	1168	96	12	216	1632	48	0	3652
Heavy Trucks	4	0	0		0	0	4		0	72	4		0	64	8		156
Pedestrians		0				0				4				0			4
Bicycles	1	0	0		0	0	0		0	0	0		0	0	0		1
Railroad																	
Stopped Buses																	

Comments:

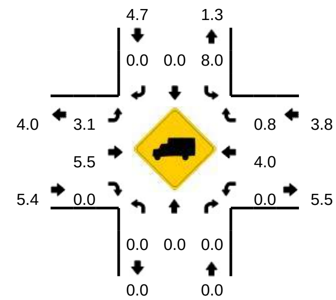
Report generated on 6/5/2018 11:01 AM

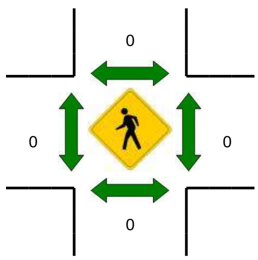
Type of peak hour being reported: User-Defined | Method for determining peak hour: Total Entering Volume

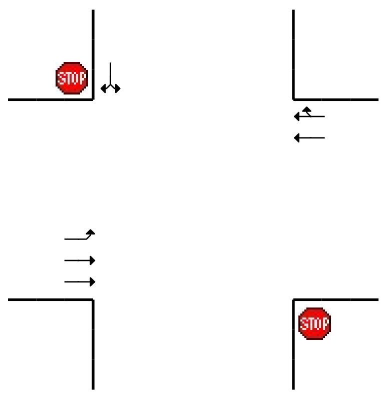
LOCATION: Vittoria Way -- OR 99W | **QC JOB #:** 14505606
CITY/STATE: Newberg, OR | **DATE:** Thu, Sep 14 2017

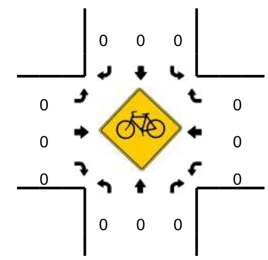


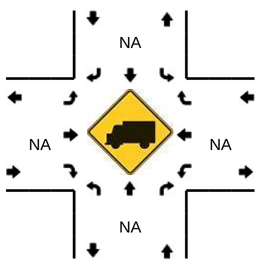
Peak-Hour: 4:45 PM -- 5:45 PM
Peak 15-Min: 5:30 PM -- 5:45 PM

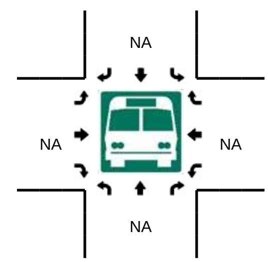












5-Min Count Period Beginning At	Vittoria Way (Northbound) Left	Thru	Right	U	Vittoria Way (Southbound) Left	Thru	Right	U	OR 99W (Eastbound) Left	Thru	Right	U	OR 99W (Westbound) Left	Thru	Right	U	Total	Hourly Totals
4:00 PM	0	0	0	0	1	0	1	0	2	98	0	0	0	133	5	0	240	2850
4:05 PM	0	0	0	0	0	0	2	0	1	95	0	0	0	140	10	0	248	2876
4:10 PM	0	0	0	0	2	0	2	0	1	103	0	0	0	167	5	0	280	2938
4:15 PM	0	0	0	0	2	0	2	0	1	76	0	0	0	154	3	0	238	2917
4:20 PM	0	0	0	0	1	0	2	0	3	107	0	0	0	144	10	0	267	2937
4:25 PM	0	0	0	0	1	0	0	0	0	117	0	0	0	139	6	0	263	2976
4:30 PM	0	0	0	0	0	0	1	0	2	115	0	0	0	172	11	0	301	3061
4:35 PM	0	0	0	0	2	0	1	0	1	87	0	0	0	147	12	0	250	3071
4:40 PM	0	0	0	0	1	0	0	0	1	91	0	0	0	156	14	0	263	3111
4:45 PM	0	0	0	0	0	0	3	0	0	88	0	0	0	157	10	0	258	3127
4:50 PM	0	0	0	0	2	0	0	0	2	88	0	0	0	148	11	0	251	3134
4:55 PM	0	0	0	0	1	0	1	0	1	107	0	0	0	139	8	0	257	3116
5:00 PM	0	0	0	0	3	0	0	0	1	101	0	0	0	129	15	0	249	3125
5:05 PM	0	0	0	0	0	0	3	0	3	116	0	0	0	134	9	0	265	3142
5:10 PM	0	0	0	0	1	0	0	0	8	112	0	0	0	158	13	0	292	3154
5:15 PM	0	0	0	0	3	0	0	0	4	112	0	0	0	142	10	0	271	3187
5:20 PM	0	0	0	0	4	0	3	0	5	96	0	0	0	146	7	0	261	3181
5:25 PM	0	0	0	0	5	0	2	0	2	84	0	0	0	148	9	0	250	3168
5:30 PM	0	0	0	0	1	0	1	0	2	105	0	0	0	158	14	0	281	3148
5:35 PM	0	0	0	0	3	0	3	0	1	88	0	0	0	176	8	0	279	3177
5:40 PM	0	0	0	0	2	0	2	0	3	145	0	0	0	140	14	0	306	3220
5:45 PM	0	0	0	0	3	0	1	0	1	82	0	0	0	161	7	0	255	3217
5:50 PM	0	0	0	0	1	0	3	0	1	88	0	0	0	151	5	0	249	3215
5:55 PM	0	0	0	0	1	0	0	0	2	94	0	0	0	123	6	0	226	3184

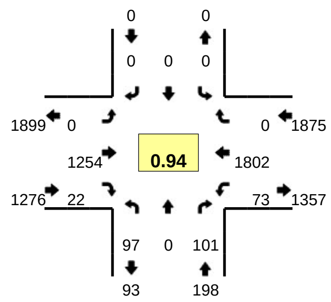
Peak 15-Min Flowrates	Northbound Left	Thru	Right	U	Southbound Left	Thru	Right	U	Eastbound Left	Thru	Right	U	Westbound Left	Thru	Right	U	Total
All Vehicles	0	0	0	0	24	0	24	0	24	1352	0	0	0	1896	144	0	3464
Heavy Trucks	0	0	0		0	0	0		0	72	0		0	76	0		148
Pedestrians		0				0				0				0			0
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0
Railroad																	
Stopped Buses																	

Comments:

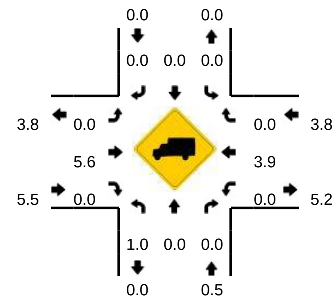
Type of peak hour being reported: User-Defined Method for determining peak hour: Total Entering Volume

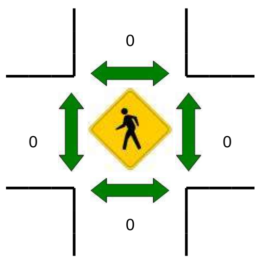
LOCATION: Providence Dr -- OR 99W **QC JOB #:** 14505608

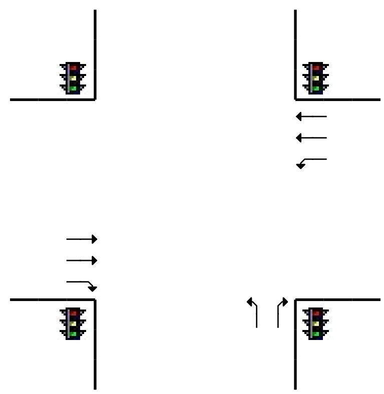
CITY/STATE: Newberg, OR **DATE:** Thu, Sep 14 2017

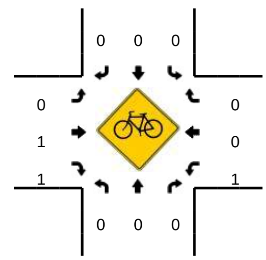


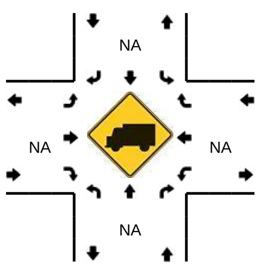
Peak-Hour: 4:45 PM -- 5:45 PM
Peak 15-Min: 5:05 PM -- 5:20 PM

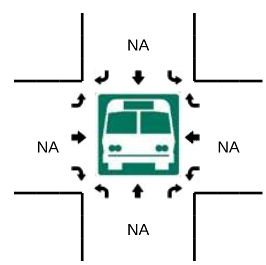












5-Min Count Period Beginning At	Providence Dr (Northbound) Left	Thru	Right	U	Providence Dr (Southbound) Left	Thru	Right	U	OR 99W (Eastbound) Left	Thru	Right	U	OR 99W (Westbound) Left	Thru	Right	U	Total	Hourly Totals
4:00 PM	8	0	2	0	0	0	0	0	0	98	6	0	6	133	0	0	253	2940
4:05 PM	10	0	5	0	0	0	0	0	0	93	4	0	7	137	0	0	256	2965
4:10 PM	22	0	11	0	0	0	0	0	0	101	5	0	7	149	0	0	295	3032
4:15 PM	6	0	5	0	0	0	0	0	0	77	2	0	7	157	0	0	254	3028
4:20 PM	7	0	5	0	0	0	0	0	0	106	0	0	8	140	0	0	266	3033
4:25 PM	7	0	5	0	0	0	0	0	0	117	0	0	2	142	0	0	273	3076
4:30 PM	9	0	9	0	0	0	0	0	0	115	1	0	5	169	0	0	308	3155
4:35 PM	10	0	10	0	0	0	0	0	0	91	2	0	5	154	0	0	272	3173
4:40 PM	11	0	8	0	0	0	0	0	0	92	2	0	6	151	0	0	270	3223
4:45 PM	11	0	4	0	0	0	0	0	0	87	1	0	4	156	0	0	263	3238
4:50 PM	8	0	4	0	0	0	0	0	0	85	2	0	2	153	0	0	254	3242
4:55 PM	6	0	9	0	0	0	0	0	0	105	1	0	7	139	0	0	267	3231
5:00 PM	9	0	4	0	0	0	0	0	0	99	2	0	3	138	0	2	257	3235
5:05 PM	11	0	14	0	0	0	0	0	0	117	1	0	6	132	0	0	281	3260
5:10 PM	5	0	11	0	0	0	0	0	0	121	3	0	9	165	0	0	314	3279
5:15 PM	12	0	16	0	0	0	0	0	0	116	2	0	8	140	0	0	294	3319
5:20 PM	9	0	9	0	0	0	0	0	0	94	4	0	6	142	0	0	264	3317
5:25 PM	6	0	11	0	0	0	0	0	0	93	2	0	6	154	0	0	272	3316
5:30 PM	11	0	2	0	0	0	0	0	0	100	0	0	7	161	0	0	281	3289
5:35 PM	6	0	7	0	0	0	0	0	0	91	1	0	8	173	0	0	286	3303
5:40 PM	3	0	10	0	0	0	0	0	0	146	3	0	5	149	0	0	316	3349
5:45 PM	1	0	2	0	0	0	0	0	0	86	1	0	4	170	0	0	264	3350
5:50 PM	9	0	5	0	0	0	0	0	0	90	1	0	0	146	0	0	251	3347
5:55 PM	5	0	6	0	0	0	0	0	0	91	3	0	7	121	0	0	233	3313

Peak 15-Min Flowrates	Northbound Left	Thru	Right	U	Southbound Left	Thru	Right	U	Eastbound Left	Thru	Right	U	Westbound Left	Thru	Right	U	Total
All Vehicles	112	0	164	0	0	0	0	0	0	1416	24	0	92	1748	0	0	3556
Heavy Trucks	0	0	0		0	0	0		0	108	0		0	68	0		176
Pedestrians		0				0				0				0			0
Bicycles	0	0	0		0	0	0		0	1	0		1	0	0		2
Railroad																	
Stopped Buses																	

Comments:

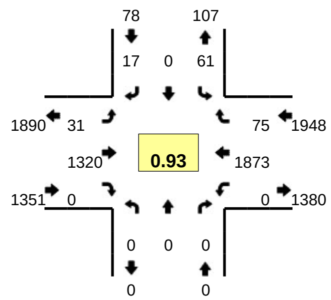
Report generated on 6/5/2018 11:01 AM SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

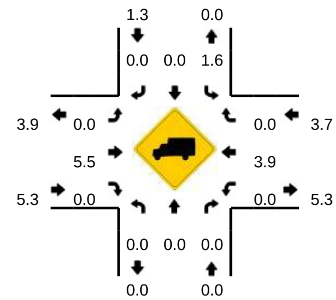
Type of peak hour being reported: User-Defined | Method for determining peak hour: Total Entering Volume

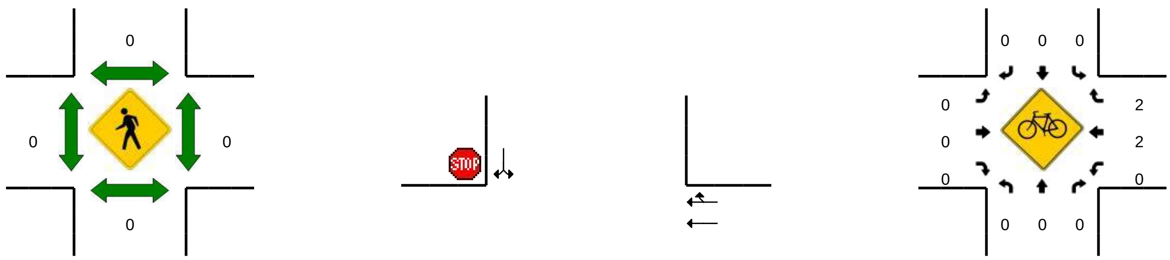
LOCATION: NE Benjamin Rd -- OR 99W | **QC JOB #:** 14505610

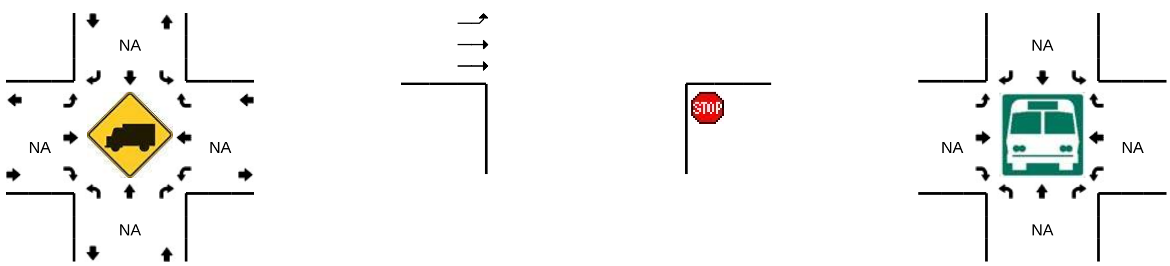
CITY/STATE: Newberg, OR | **DATE:** Thu, Sep 14 2017

Peak-Hour: 4:45 PM -- 5:45 PM
Peak 15-Min: 5:10 PM -- 5:25 PM









5-Min Count Period Beginning At	NE Benjamin Rd (Northbound) Left	Thru	Right	U	NE Benjamin Rd (Southbound) Left	Thru	Right	U	OR 99W (Eastbound) Left	Thru	Right	U	OR 99W (Westbound) Left	Thru	Right	U	Total	Hourly Totals
4:00 PM	0	0	0	0	0	0	1	0	2	105	0	0	0	137	4	0	249	2869
4:05 PM	0	0	0	0	8	0	1	0	1	103	0	0	0	150	11	0	274	2932
4:10 PM	0	0	0	0	3	0	1	0	2	114	0	0	0	151	2	0	273	2975
4:15 PM	0	0	0	0	2	0	1	0	1	82	0	0	0	168	8	0	262	3002
4:20 PM	0	0	0	0	3	0	1	0	1	105	0	0	0	128	7	0	245	2982
4:25 PM	0	0	0	0	1	0	0	0	2	100	0	0	0	160	6	0	269	3025
4:30 PM	0	0	0	0	3	0	0	0	2	126	0	0	0	166	5	0	302	3086
4:35 PM	0	0	0	0	3	0	3	0	0	110	0	0	0	155	6	0	277	3114
4:40 PM	0	0	0	0	5	0	0	0	0	108	0	0	0	164	4	0	281	3171
4:45 PM	0	0	0	0	3	0	1	0	1	92	0	0	0	186	4	0	287	3222
4:50 PM	0	0	0	0	5	0	1	0	3	85	0	0	0	139	1	0	234	3220
4:55 PM	0	0	0	0	5	0	0	0	1	105	0	0	0	131	7	0	249	3202
5:00 PM	0	0	0	0	3	0	6	0	4	106	0	0	0	139	5	0	263	3216
5:05 PM	0	0	0	0	3	0	0	0	3	124	0	0	0	133	4	0	267	3209
5:10 PM	0	0	0	0	6	0	0	0	1	128	0	0	0	178	7	0	320	3256
5:15 PM	0	0	0	0	2	0	1	0	3	137	0	0	0	153	10	0	306	3300
5:20 PM	0	0	0	0	4	0	0	0	6	104	0	0	0	164	8	0	286	3341
5:25 PM	0	0	0	0	5	0	4	0	2	96	0	0	0	168	5	0	280	3352
5:30 PM	0	0	0	0	7	0	2	0	0	97	0	0	0	150	10	0	266	3316
5:35 PM	0	0	0	0	7	0	1	1	3	102	0	0	0	172	8	0	294	3333
5:40 PM	0	0	0	0	10	0	1	0	4	144	0	0	0	160	6	0	325	3377
5:45 PM	0	0	0	0	1	0	2	0	3	78	0	0	0	165	5	0	254	3344
5:50 PM	0	0	0	0	3	0	2	0	1	105	0	0	0	140	3	0	254	3364
5:55 PM	0	0	0	0	1	0	3	0	2	100	0	0	0	133	7	0	246	3361

Peak 15-Min Flowrates	Northbound Left	Thru	Right	U	Southbound Left	Thru	Right	U	Eastbound Left	Thru	Right	U	Westbound Left	Thru	Right	U	Total
All Vehicles	0	0	0	0	48	0	4	0	40	1476	0	0	0	1980	100	0	3648
Heavy Trucks	0	0	0		0	0	0		0	80	0		0	84	0		164
Pedestrians		0				0				0				0			0
Bicycles	0	0	0		0	0	0		0	0	0		0	1	1		2
Railroad																	
Stopped Buses																	

Comments:

Report generated on 6/5/2018 11:01 AM

SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

Appendix C
Year 2017 Existing Conditions
Level of Service Worksheets

HCS 2010 Roundabouts Report

General Information		Site Information	
Analyst	ZHB	Intersection	Springbrook/Crestview
Agency or Co.	KAI	E/W Street Name	Crestview Dr
Date Performed	10/21/2017	N/S Street Name	Springbrook Rd
Analysis Year	2017	Analysis Time Period (hrs)	0.25
Time Period	Existing AM	Peak Hour Factor	0.66
Project Description	Crestview Crossing	Jurisdiction	

Volume Adjustments and Site Characteristics

Approach	EB				WB				NB				SB			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Number of Lanes (N)	0	0	1	0	0	0	1	0	0	0	1	0	0	0	1	0
Lane Assignment			LTR				LTR				LTR				LTR	
Volume (V), veh/h	2	54	8	69	0	4	9	7	2	64	314	3	1	7	349	135
Percent Heavy Vehicles, %	9	9	13	3	0	0	0	0	2	2	4	0	25	25	4	7
Flow Rate (v_{PCE}), pc/h	3	89	14	108	0	6	14	11	3	99	495	5	2	13	550	219
Right-Turn Bypass	None				None				None				None			
Conflicting Lanes	1				1				1				1			
Pedestrians Crossing, p/h	0				0				0				0			

Critical and Follow-Up Headway Adjustment

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Critical Headway (s)		4.9734			4.9734			4.9734			4.9734	
Follow-Up Headway (s)		2.6087			2.6087			2.6087			2.6087	

Flow Computations, Capacity and v/c Ratios

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Entry Flow (v_e), pc/h		214			31			602			784	
Entry Volume veh/h		202			31			581			746	
Circulating Flow (v_c), pc/h	574			691			121			125		
Exiting Flow (v_{ex}), pc/h	32			335			597			667		
Capacity (c_{pce}), pc/h		769			682			1220			1215	
Capacity (c), veh/h		724			682			1177			1155	
v/c Ratio (x)		0.28			0.05			0.49			0.65	

Delay and Level of Service

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Lane Control Delay (d), s/veh		8.3			5.8			8.5			11.8	
Lane LOS		A			A			A			B	
95% Queue, veh		1.1			0.1			2.8			5.0	
Approach Delay, s/veh	8.3			5.8			8.5			11.8		
Approach LOS	A			A			A			B		
Intersection Delay, s/veh | LOS	10.0						A					

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	3	5	8	11	6	5
Future Volume (Veh/h)	3	5	8	11	6	5
Sign Control	Free			Free	Stop	
Grade	0%			0%	2%	
Peak Hour Factor	0.68	0.68	0.68	0.68	0.68	0.68
Hourly flow rate (vph)	4	7	12	16	9	7
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			11		48	8
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			11		48	8
tC, single (s)			4.1		6.6	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.7	3.3
p0 queue free %			99		99	99
cM capacity (veh/h)			1621		919	1081

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	11	28	16
Volume Left	0	12	9
Volume Right	7	0	7
cSH	1700	1621	983
Volume to Capacity	0.01	0.01	0.02
Queue Length 95th (ft)	0	1	1
Control Delay (s)	0.0	3.1	8.7
Lane LOS		A	A
Approach Delay (s)	0.0	3.1	8.7
Approach LOS			A

Intersection Summary			
Average Delay	4.1		
Intersection Capacity Utilization	17.7%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	61	27	174	37	13	15	66	230	5	16	336	69
Future Volume (vph)	61	27	174	37	13	15	66	230	5	16	336	69
Peak Hour Factor	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83
Hourly flow rate (vph)	73	33	210	45	16	18	80	277	6	19	405	83

Direction, Lane #	EB 1	EB 2	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total (vph)	106	210	79	80	283	19	488
Volume Left (vph)	73	0	45	80	0	19	0
Volume Right (vph)	0	210	18	0	6	0	83
Hadj (s)	0.42	-0.65	0.05	0.58	0.10	0.72	0.01
Departure Headway (s)	7.7	6.6	7.8	7.3	6.8	7.2	6.5
Degree Utilization, x	0.23	0.38	0.17	0.16	0.53	0.04	0.88
Capacity (veh/h)	448	519	423	471	501	480	547
Control Delay (s)	11.7	12.4	12.4	10.5	16.1	9.3	38.3
Approach Delay (s)	12.2		12.4	14.9		37.2	
Approach LOS	B		B	B		E	

Intersection Summary			
Delay	23.0		
Level of Service	C		
Intersection Capacity Utilization	48.1%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	43	1242	75	81	754	150	179	140	99	425	120	70
Future Volume (vph)	43	1242	75	81	754	150	179	140	99	425	120	70
Ideal Flow (vphpl)	1750	1750	1750	1750	1800	1750	1750	1750	1750	1750	1750	1750
Grade (%)		0%			0%			3%			0%	
Total Lost time (s)	4.0	4.5	4.5	4.0	4.5	4.5	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	0.95	1.00	0.97	0.95	1.00	0.97	1.00	1.00	0.97	1.00	1.00
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.98
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1583	3197	1430	2906	3138	1403	2997	1642	1423	3101	1577	1408
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1583	3197	1430	2906	3138	1403	2997	1642	1423	3101	1577	1408
Peak-hour factor, PHF	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Adj. Flow (vph)	48	1396	84	91	847	169	201	157	111	478	135	79
RTOR Reduction (vph)	0	0	45	0	0	88	0	0	96	0	0	69
Lane Group Flow (vph)	48	1396	39	91	847	81	201	157	15	478	135	10
Confl. Peds. (#/hr)							3					3
Heavy Vehicles (%)	5%	4%	4%	11%	9%	6%	6%	5%	3%	4%	11%	4%
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			2			6			8			4
Actuated Green, G (s)	7.2	55.2	55.2	9.3	57.3	57.3	24.1	16.0	16.0	23.0	14.9	14.9
Effective Green, g (s)	7.2	55.2	55.2	9.3	57.3	57.3	24.1	16.0	16.0	23.0	14.9	14.9
Actuated g/C Ratio	0.06	0.46	0.46	0.08	0.48	0.48	0.20	0.13	0.13	0.19	0.12	0.12
Clearance Time (s)	4.0	4.5	4.5	4.0	4.5	4.5	4.0	4.0	4.0	4.0	4.0	4.0
Vehicle Extension (s)	2.3	4.2	4.2	2.3	4.0	4.0	2.3	2.3	2.3	2.3	2.3	2.3
Lane Grp Cap (vph)	94	1470	657	225	1498	669	601	218	189	594	195	174
v/s Ratio Prot	0.03	c0.44		0.03	c0.27		0.07	c0.10		c0.15	0.09	
v/s Ratio Perm			0.03			0.06			0.01			0.01
v/c Ratio	0.51	0.95	0.06	0.40	0.57	0.12	0.33	0.72	0.08	0.80	0.69	0.06
Uniform Delay, d1	54.7	31.1	18.0	52.7	22.4	17.4	41.1	49.9	45.5	46.4	50.4	46.3
Progression Factor	1.00	1.00	1.00	0.95	0.87	1.38	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	2.9	14.2	0.2	0.6	1.5	0.3	0.2	10.1	0.1	7.5	8.9	0.1
Delay (s)	57.5	45.3	18.2	50.8	21.0	24.3	41.3	59.9	45.6	53.9	59.3	46.4
Level of Service	E	D	B	D	C	C	D	E	D	D	E	D
Approach Delay (s)		44.2			23.9			48.5			54.1	
Approach LOS		D			C			D			D	

Intersection Summary			
HCM 2000 Control Delay	40.6	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.86		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	16.5
Intersection Capacity Utilization	70.4%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	19	1601	43	70	922	28	58	3	87	11	5	27
Future Volume (vph)	19	1601	43	70	922	28	58	3	87	11	5	27
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Grade (%)		2%			0%			0%			-2%	
Total Lost time (s)	4.0	4.5	4.5	4.0	4.5	4.5	4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00		1.00	1.00	
Frpb, ped/bikes	1.00	1.00	0.98	1.00	1.00	0.98	1.00	0.99		1.00	0.99	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.85		1.00	0.87	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1567	3165	1265	1568	3079	1273	1433	1408		1678	1361	
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.73	1.00		0.56	1.00	
Satd. Flow (perm)	1567	3165	1265	1568	3079	1273	1109	1408		991	1361	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	21	1740	47	76	1002	30	63	3	95	12	5	29
RTOR Reduction (vph)	0	0	13	0	0	7	0	86	0	0	26	0
Lane Group Flow (vph)	21	1740	34	76	1002	23	63	12	0	12	8	0
Confl. Peds. (#/hr)	2					2			1	1		
Confl. Bikes (#/hr)			1									1
Heavy Vehicles (%)	5%	4%	14%	6%	8%	14%	16%	0%	5%	0%	40%	7%
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Perm	NA		Perm	NA	
Protected Phases	5	2		1	6			4			8	
Permitted Phases			2			6	4			8		
Actuated Green, G (s)	3.2	86.6	86.6	9.2	92.6	92.6	11.7	11.7		11.7	11.7	
Effective Green, g (s)	3.2	86.6	86.6	9.2	92.6	92.6	11.7	11.7		11.7	11.7	
Actuated g/C Ratio	0.03	0.72	0.72	0.08	0.77	0.77	0.10	0.10		0.10	0.10	
Clearance Time (s)	4.0	4.5	4.5	4.0	4.5	4.5	4.0	4.0		4.0	4.0	
Vehicle Extension (s)	2.3	4.8	4.8	2.3	4.8	4.8	2.5	2.5		2.5	2.5	
Lane Grp Cap (vph)	41	2284	912	120	2375	982	108	137		96	132	
v/s Ratio Prot	0.01	c0.55		c0.05	0.33			0.01			0.01	
v/s Ratio Perm			0.03			0.02	c0.06			0.01		
v/c Ratio	0.51	0.76	0.04	0.63	0.42	0.02	0.58	0.09		0.12	0.06	
Uniform Delay, d1	57.6	10.3	4.8	53.8	4.6	3.2	51.8	49.3		49.5	49.2	
Progression Factor	1.29	0.22	0.06	0.96	0.95	0.89	1.00	1.00		1.00	1.00	
Incremental Delay, d2	3.1	1.2	0.0	8.1	0.5	0.0	6.5	0.2		0.4	0.1	
Delay (s)	77.7	3.5	0.3	59.9	4.9	2.9	58.3	49.5		49.9	49.3	
Level of Service	E	A	A	E	A	A	E	D		D	D	
Approach Delay (s)		4.3			8.6			53.0			49.5	
Approach LOS		A			A			D			D	

Intersection Summary			
HCM 2000 Control Delay	9.0	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.73		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	12.5
Intersection Capacity Utilization	73.4%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	4	1650	1041	21	52	24
Future Volume (Veh/h)	4	1650	1041	21	52	24
Sign Control		Free	Free		Stop	
Grade		-2%	2%		0%	
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93
Hourly flow rate (vph)	4	1774	1119	23	56	26
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		TWLTL	TWLTL			
Median storage veh)		2	2			
Upstream signal (ft)			521			
pX, platoon unblocked	0.93				0.93	0.93
vC, conflicting volume	1142				2026	571
vC1, stage 1 conf vol					1130	
vC2, stage 2 conf vol					895	
vCu, unblocked vol	996				1949	380
tC, single (s)	4.1				6.8	6.9
tC, 2 stage (s)					5.8	
tF (s)	2.2				3.5	3.3
p0 queue free %	99				76	96
cM capacity (veh/h)	652				231	578

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	SB 1
Volume Total	4	887	887	746	396	82
Volume Left	4	0	0	0	0	56
Volume Right	0	0	0	0	23	26
cSH	652	1700	1700	1700	1700	286
Volume to Capacity	0.01	0.52	0.52	0.44	0.23	0.29
Queue Length 95th (ft)	0	0	0	0	0	29
Control Delay (s)	10.6	0.0	0.0	0.0	0.0	22.6
Lane LOS	B					C
Approach Delay (s)	0.0			0.0		22.6
Approach LOS						C

Intersection Summary			
Average Delay	0.6		
Intersection Capacity Utilization	60.9%	ICU Level of Service	B
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	1651	51	62	1026	36	59
Future Volume (vph)	1651	51	62	1026	36	59
Ideal Flow (vphpl)	1750	1750	1750	1800	1750	1750
Grade (%)	-3%			2%	3%	
Total Lost time (s)	6.0	6.0	4.5	4.5	4.5	4.5
Lane Util. Factor	0.95	1.00	1.00	0.95	1.00	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	3214	1480	1614	3135	1590	1465
Flt Permitted	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (perm)	3214	1480	1614	3135	1590	1465
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	1795	55	67	1115	39	64
RTOR Reduction (vph)	0	6	0	0	0	60
Lane Group Flow (vph)	1795	49	67	1115	39	4
Heavy Vehicles (%)	5%	2%	2%	8%	3%	0%
Turn Type	NA	Perm	Prot	NA	Prot	Perm
Protected Phases	2		1	6	8	
Permitted Phases		2				8
Actuated Green, G (s)	87.1	87.1	9.8	102.9	8.1	8.1
Effective Green, g (s)	87.1	87.1	9.8	102.9	8.1	8.1
Actuated g/C Ratio	0.73	0.73	0.08	0.86	0.07	0.07
Clearance Time (s)	6.0	6.0	4.5	4.5	4.5	4.5
Vehicle Extension (s)	5.0	5.0	4.0	4.0	4.0	4.0
Lane Grp Cap (vph)	2332	1074	131	2688	107	98
v/s Ratio Prot	c0.56		c0.04	0.36	c0.02	
v/s Ratio Perm		0.03				0.00
v/c Ratio	0.77	0.05	0.51	0.41	0.36	0.04
Uniform Delay, d1	10.2	4.7	52.8	1.9	53.5	52.3
Progression Factor	1.30	0.61	1.00	1.00	1.00	1.00
Incremental Delay, d2	1.8	0.1	4.4	0.5	2.9	0.3
Delay (s)	15.1	2.9	57.2	2.4	56.4	52.6
Level of Service	B	A	E	A	E	D
Approach Delay (s)	14.7			5.5	54.0	
Approach LOS	B			A	D	

Intersection Summary			
HCM 2000 Control Delay	12.5	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.71		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	15.0
Intersection Capacity Utilization	67.6%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Intersection	
Int Delay, s/veh	0.8

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	3	1702	1077	29	62	6
Future Vol, veh/h	3	1702	1077	29	62	6
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	250	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	1	-
Grade, %	-	0	0	-	-2	-
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	33	4	7	7	3	0
Mvmt Flow	3	1792	1134	31	65	6

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	1164	0	-	0	2051	582
Stage 1	-	-	-	-	1149	-
Stage 2	-	-	-	-	902	-
Critical Hdwy	4.76	-	-	-	6.46	6.7
Critical Hdwy Stg 1	-	-	-	-	5.46	-
Critical Hdwy Stg 2	-	-	-	-	5.46	-
Follow-up Hdwy	2.53	-	-	-	3.53	3.3
Pot Cap-1 Maneuver	447	-	-	-	~ 60	477
Stage 1	-	-	-	-	298	-
Stage 2	-	-	-	-	391	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	447	-	-	-	~ 60	477
Mov Cap-2 Maneuver	-	-	-	-	181	-
Stage 1	-	-	-	-	298	-
Stage 2	-	-	-	-	388	-

Approach	EB	WB	SB
HCM Control Delay, s	0	0	34.7
HCM LOS			D

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	447	-	-	-	191
HCM Lane V/C Ratio	0.007	-	-	-	0.375
HCM Control Delay (s)	13.1	-	-	-	34.7
HCM Lane LOS	B	-	-	-	D
HCM 95th %tile Q(veh)	0	-	-	-	1.6

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

HCS 2010 Roundabouts Report

General Information		Site Information	
Analyst	ZHB	Intersection	Springbrook/Crestview
Agency or Co.	KAI	E/W Street Name	Crestview Dr
Date Performed	10/21/2017	N/S Street Name	Springbrook Rd
Analysis Year	2017	Analysis Time Period (hrs)	0.25
Time Period	Existing PM	Peak Hour Factor	0.93
Project Description	Crestview Crossing	Jurisdiction	

Volume Adjustments and Site Characteristics

Approach	EB				WB				NB				SB			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Number of Lanes (N)	0	0	1	0	0	0	1	0	0	0	1	0	0	0	1	0
Lane Assignment			LTR				LTR				LTR				LTR	
Volume (V), veh/h	0	53	2	13	0	5	2	12	0	7	524	13	2	8	437	49
Percent Heavy Vehicles, %	0	0	0	0	20	20	0	0	0	0	3	0	0	0	2	0
Flow Rate (v_{PCE}), pc/h	0	57	2	14	0	6	2	13	0	8	580	14	2	9	479	53
Right-Turn Bypass	None				None				None				None			
Conflicting Lanes	1				1				1				1			
Pedestrians Crossing, p/h	0				0				0				0			

Critical and Follow-Up Headway Adjustment

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Critical Headway (s)		4.9734			4.9734			4.9734			4.9734	
Follow-Up Headway (s)		2.6087			2.6087			2.6087			2.6087	

Flow Computations, Capacity and v/c Ratios

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Entry Flow (v_e), pc/h		73			21			602			543	
Entry Volume veh/h		73			20			585			534	
Circulating Flow (v_c), pc/h	496			647			70			16		
Exiting Flow (v_{ex}), pc/h	25			63			652			499		
Capacity (c_{pce}), pc/h		832			714			1285			1358	
Capacity (c), veh/h		832			680			1249			1334	
v/c Ratio (x)		0.09			0.03			0.47			0.40	

Delay and Level of Service

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Lane Control Delay (d), s/veh		5.2			5.6			7.7			6.5	
Lane LOS		A			A			A			A	
95% Queue, veh		0.3			0.1			2.6			2.0	
Approach Delay, s/veh	5.2			5.6			7.7			6.5		
Approach LOS	A			A			A			A		
Intersection Delay, s/veh | LOS	7.0						A					

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	11	5	9	13	8	14
Future Volume (Veh/h)	11	5	9	13	8	14
Sign Control	Free			Free	Stop	
Grade	0%			0%	2%	
Peak Hour Factor	0.79	0.79	0.79	0.79	0.79	0.79
Hourly flow rate (vph)	14	6	11	16	10	18
Pedestrians					2	
Lane Width (ft)					12.0	
Walking Speed (ft/s)					3.5	
Percent Blockage					0	
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			22		57	19
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			22		57	19
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			99		99	98
cM capacity (veh/h)			1604		947	1063

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	20	27	28
Volume Left	0	11	10
Volume Right	6	0	18
cSH	1700	1604	1018
Volume to Capacity	0.01	0.01	0.03
Queue Length 95th (ft)	0	1	2
Control Delay (s)	0.0	3.0	8.6
Lane LOS		A	A
Approach Delay (s)	0.0	3.0	8.6
Approach LOS			A

Intersection Summary			
Average Delay	4.3		
Intersection Capacity Utilization	17.8%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	83	63	219	91	68	86	136	358	5	67	357	40
Future Volume (vph)	83	63	219	91	68	86	136	358	5	67	357	40
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Hourly flow rate (vph)	86	66	228	95	71	90	142	373	5	70	372	42

Direction, Lane #	EB 1	EB 2	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total (vph)	152	228	256	142	378	70	414
Volume Left (vph)	86	0	95	142	0	70	0
Volume Right (vph)	0	228	90	0	5	0	42
Hadj (s)	0.30	-0.68	-0.12	0.53	0.04	0.53	0.00
Departure Headway (s)	9.0	8.0	8.6	8.8	8.3	8.8	8.2
Degree Utilization, x	0.38	0.51	0.61	0.35	0.87	0.17	0.95
Capacity (veh/h)	379	428	395	398	426	399	426
Control Delay (s)	16.3	17.9	24.4	15.2	44.9	12.4	58.4
Approach Delay (s)	17.3		24.4	36.8		51.8	
Approach LOS	C		C	E		F	

Intersection Summary			
Delay	34.8		
Level of Service	D		
Intersection Capacity Utilization	59.5%	ICU Level of Service	B
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	104	1070	124	141	1350	300	374	179	124	391	212	86
Future Volume (vph)	104	1070	124	141	1350	300	374	179	124	391	212	86
Ideal Flow (vphpl)	1750	1750	1750	1750	1800	1750	1750	1750	1750	1750	1750	1750
Grade (%)		0%			0%			3%			0%	
Total Lost time (s)	4.0	4.5	4.5	4.0	4.5	4.5	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	0.95	1.00	0.97	0.95	1.00	0.97	1.00	1.00	0.97	1.00	1.00
Frpb, ped/bikes	1.00	1.00	0.98	1.00	1.00	0.98	1.00	1.00	0.98	1.00	1.00	0.97
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1583	3137	1440	2854	3288	1423	3177	1674	1361	3193	1699	1438
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1583	3137	1440	2854	3288	1423	3177	1674	1361	3193	1699	1438
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	106	1092	127	144	1378	306	382	183	127	399	216	88
RTOR Reduction (vph)	0	0	56	0	0	138	0	0	111	0	0	76
Lane Group Flow (vph)	106	1092	71	144	1378	168	382	183	16	399	216	12
Confl. Peds. (#/hr)	2		9	9		2	14					14
Confl. Bikes (#/hr)									2			1
Heavy Vehicles (%)	5%	6%	1%	13%	4%	2%	0%	3%	6%	1%	3%	0%
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			2			6			8			4
Actuated Green, G (s)	12.5	77.8	77.8	11.7	77.0	77.0	15.1	17.7	17.7	16.3	18.9	18.9
Effective Green, g (s)	12.5	77.8	77.8	11.7	77.0	77.0	15.1	17.7	17.7	16.3	18.9	18.9
Actuated g/C Ratio	0.09	0.56	0.56	0.08	0.55	0.55	0.11	0.13	0.13	0.12	0.13	0.13
Clearance Time (s)	4.0	4.5	4.5	4.0	4.5	4.5	4.0	4.0	4.0	4.0	4.0	4.0
Vehicle Extension (s)	2.3	4.2	4.2	2.3	4.0	4.0	2.3	2.3	2.3	2.3	2.3	2.3
Lane Grp Cap (vph)	141	1743	800	238	1808	782	342	211	172	371	229	194
v/s Ratio Prot	c0.07	0.35		0.05	c0.42		0.12	0.11		c0.12	c0.13	
v/s Ratio Perm			0.05			0.12			0.01			0.01
v/c Ratio	0.75	0.63	0.09	0.61	0.76	0.22	1.12	0.87	0.09	1.08	0.94	0.06
Uniform Delay, d1	62.2	21.2	14.5	61.9	24.4	16.1	62.5	60.0	54.1	61.9	60.0	52.8
Progression Factor	1.00	1.00	1.00	0.96	1.16	3.14	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	18.7	1.7	0.2	2.2	2.0	0.4	84.1	28.6	0.1	68.3	43.5	0.1
Delay (s)	80.9	22.9	14.7	61.6	30.2	50.9	146.5	88.6	54.2	130.2	103.5	52.9
Level of Service	F	C	B	E	C	D	F	F	D	F	F	D
Approach Delay (s)		26.8			36.2			114.3			112.3	
Approach LOS		C			D			F			F	

Intersection Summary			
HCM 2000 Control Delay	57.1	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	0.84		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	16.5
Intersection Capacity Utilization	87.6%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	32	1120	101	220	1509	41	243	16	134	21	10	51
Future Volume (vph)	32	1120	101	220	1509	41	243	16	134	21	10	51
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Grade (%)		2%			0%			0%			-2%	
Total Lost time (s)	4.0	4.5	4.5	4.0	4.5	4.5	4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00		1.00	1.00	
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.98		1.00	0.98	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	0.99	1.00		1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.87		1.00	0.87	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1646	3105	1402	1646	3197	1352	1620	1442		1674	1471	
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.72	1.00		0.52	1.00	
Satd. Flow (perm)	1646	3105	1402	1646	3197	1352	1221	1442		911	1471	
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	33	1167	105	229	1572	43	253	17	140	22	10	53
RTOR Reduction (vph)	0	0	40	0	0	13	0	110	0	0	42	0
Lane Group Flow (vph)	33	1167	65	229	1572	30	253	47	0	22	21	0
Confl. Peds. (#/hr)							5		3	3		5
Confl. Bikes (#/hr)									1			
Heavy Vehicles (%)	0%	6%	5%	1%	4%	10%	2%	0%	4%	0%	0%	4%
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Perm	NA		Perm	NA	
Protected Phases	5	2		1	6			4			8	
Permitted Phases			2			6	4			8		
Actuated Green, G (s)	5.4	74.9	74.9	22.3	91.8	91.8	30.3	30.3		30.3	30.3	
Effective Green, g (s)	5.4	74.9	74.9	22.3	91.8	91.8	30.3	30.3		30.3	30.3	
Actuated g/C Ratio	0.04	0.54	0.54	0.16	0.66	0.66	0.22	0.22		0.22	0.22	
Clearance Time (s)	4.0	4.5	4.5	4.0	4.5	4.5	4.0	4.0		4.0	4.0	
Vehicle Extension (s)	2.3	4.8	4.8	2.3	4.8	4.8	2.5	2.5		2.5	2.5	
Lane Grp Cap (vph)	63	1661	750	262	2096	886	264	312		197	318	
v/s Ratio Prot	0.02	c0.38		c0.14	c0.49			0.03			0.01	
v/s Ratio Perm			0.05			0.02	c0.21			0.02		
v/c Ratio	0.52	0.70	0.09	0.87	0.75	0.03	0.96	0.15		0.11	0.07	
Uniform Delay, d1	66.0	24.3	15.9	57.5	16.3	8.5	54.2	44.4		44.0	43.6	
Progression Factor	0.81	1.07	1.81	0.95	0.80	0.29	1.00	1.00		1.00	1.00	
Incremental Delay, d2	3.4	1.7	0.2	19.9	1.8	0.1	43.5	0.2		0.2	0.1	
Delay (s)	57.2	27.7	28.8	74.5	14.9	2.5	97.7	44.6		44.2	43.7	
Level of Service	E	C	C	E	B	A	F	D		D	D	
Approach Delay (s)		28.6			22.0			77.4			43.8	
Approach LOS		C			C			E			D	

Intersection Summary			
HCM 2000 Control Delay	31.1	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.82		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	12.5
Intersection Capacity Utilization	80.8%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	32	1250	1775	128	26	18
Future Volume (Veh/h)	32	1250	1775	128	26	18
Sign Control		Free	Free		Stop	
Grade		-2%	2%		0%	
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93
Hourly flow rate (vph)	34	1344	1909	138	28	19
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		TWLTL	TWLTL			
Median storage veh)		2	2			
Upstream signal (ft)			522			
pX, platoon unblocked	0.72				0.72	0.72
vC, conflicting volume	2047				2718	1024
vC1, stage 1 conf vol					1978	
vC2, stage 2 conf vol					740	
vCu, unblocked vol	1672				2607	246
tC, single (s)	4.2				7.0	6.9
tC, 2 stage (s)					6.0	
tF (s)	2.2				3.6	3.3
p0 queue free %	87				71	97
cM capacity (veh/h)	269				98	546

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	SB 1
Volume Total	34	672	672	1273	774	47
Volume Left	34	0	0	0	0	28
Volume Right	0	0	0	0	138	19
cSH	269	1700	1700	1700	1700	146
Volume to Capacity	0.13	0.40	0.40	0.75	0.46	0.32
Queue Length 95th (ft)	11	0	0	0	0	32
Control Delay (s)	20.3	0.0	0.0	0.0	0.0	40.8
Lane LOS	C					E
Approach Delay (s)	0.5			0.0		40.8
Approach LOS						E

Intersection Summary			
Average Delay	0.8		
Intersection Capacity Utilization	67.7%	ICU Level of Service	C
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	1254	22	73	1806	97	101
Future Volume (vph)	1254	22	73	1806	97	101
Ideal Flow (vphpl)	1750	1750	1750	1800	1750	1750
Grade (%)	-3%			2%	3%	
Total Lost time (s)	6.0	6.0	4.5	4.5	4.5	4.5
Lane Util. Factor	0.95	1.00	1.00	0.95	1.00	1.00
Frpb, ped/bikes	1.00	0.98	1.00	1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	3184	1479	1646	3256	1621	1465
Flt Permitted	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (perm)	3184	1479	1646	3256	1621	1465
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	1334	23	78	1921	103	107
RTOR Reduction (vph)	0	3	0	0	0	95
Lane Group Flow (vph)	1334	20	78	1921	103	12
Confl. Bikes (#/hr)		1				
Heavy Vehicles (%)	6%	0%	0%	4%	1%	0%
Turn Type	NA	Perm	Prot	NA	Prot	Perm
Protected Phases	2		1	6	8	
Permitted Phases		2				8
Actuated Green, G (s)	96.9	96.9	12.9	115.8	15.2	15.2
Effective Green, g (s)	96.9	96.9	12.9	115.8	15.2	15.2
Actuated g/C Ratio	0.69	0.69	0.09	0.83	0.11	0.11
Clearance Time (s)	6.0	6.0	4.5	4.5	4.5	4.5
Vehicle Extension (s)	5.0	5.0	4.0	4.0	4.0	4.0
Lane Grp Cap (vph)	2203	1023	151	2693	175	159
v/s Ratio Prot	0.42		0.05	c0.59	c0.06	
v/s Ratio Perm		0.01				0.01
v/c Ratio	0.61	0.02	0.52	0.71	0.59	0.07
Uniform Delay, d1	11.4	6.7	60.6	5.1	59.4	56.1
Progression Factor	0.79	1.03	1.00	1.00	1.00	1.00
Incremental Delay, d2	1.0	0.0	3.9	1.6	5.9	0.3
Delay (s)	10.0	7.0	64.5	6.7	65.3	56.3
Level of Service	B	A	E	A	E	E
Approach Delay (s)	10.0			9.0	60.7	
Approach LOS	A			A	E	

Intersection Summary			
HCM 2000 Control Delay	12.4	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.73		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	15.0
Intersection Capacity Utilization	66.0%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Intersection	
Int Delay, s/veh	3.5

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	31	1320	1873	75	61	17
Future Vol, veh/h	31	1320	1873	75	61	17
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	250	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	1	-
Grade, %	-	0	0	-	-2	-
Peak Hour Factor	93	93	93	93	93	93
Heavy Vehicles, %	0	5	4	0	2	0
Mvmt Flow	33	1419	2014	81	66	18

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	2095	0	-	0	2830	1047
Stage 1	-	-	-	-	2054	-
Stage 2	-	-	-	-	776	-
Critical Hdwy	4.1	-	-	-	6.44	6.7
Critical Hdwy Stg 1	-	-	-	-	5.44	-
Critical Hdwy Stg 2	-	-	-	-	5.44	-
Follow-up Hdwy	2.2	-	-	-	3.52	3.3
Pot Cap-1 Maneuver	267	-	-	-	~ 19	242
Stage 1	-	-	-	-	106	-
Stage 2	-	-	-	-	452	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	267	-	-	-	~ 17	242
Mov Cap-2 Maneuver	-	-	-	-	81	-
Stage 1	-	-	-	-	106	-
Stage 2	-	-	-	-	396	-

Approach	EB	WB	SB
HCM Control Delay, s	0.5	0	142
HCM LOS			F

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	267	-	-	-	95
HCM Lane V/C Ratio	0.125	-	-	-	0.883
HCM Control Delay (s)	20.4	-	-	-	142
HCM Lane LOS	C	-	-	-	F
HCM 95th %tile Q(veh)	0.4	-	-	-	5

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Appendix D
ODOT Crash Data

OREGON DEPARTMENT OF TRANSPORTATION - TRANSPORTATION DEVELOPMENT DIVISION
TRANSPORTATION DATA SECTION - CRASH ANALYSIS AND REPORTING UNIT
URBAN NON-SYSTEM CRASH LISTING

CITY OF NEWBERG, YAMHILL COUNTY

Springbrook Rd & Crestview Dr
January 1, 2011 through December 31, 2015

SER# INVEST UNLOC?	SPEED ALC DRUGS SCHL WORK (S P E E D / E A L C / D R U G S / R S C H L / S W O R K)	DATE DAY/TIME *LAT/LONG*	FC DISTNC	CITY STREET FIRST STREET SECOND STREET INTERSECTION SEQ #	RD CHAR DIRECT LOCTN	INT-TYP (MEDIAN) LEGS (#LANES)	INT-REL TRAF- CONTL	OFF-RD RNDBT DRVWY	WTHR SURF LIGHT	CRASH TYP COLL TYP SVRTY	V#	SPCL USE TRLR QTY OWNER VEH TYPE	MOVE FROM TO	P#	PRTC TYPE	INJ SVRTY	AGE	SEX	LICNS RES	PED LOC	ERROR	ACTN	EVENT	CAUSE
00762	Y N N N N	09/01/2013	16	CRESTVIEW DR	INTER	CROSS	N	Y	CLR	FIX OBJ	01	NONE 0	STRGHT										040,001	01
CITY		Sun 1P	0	SPRINGBROOK RD	S		UNKNOWN	Y	DRY	FIX		PRVTE	N S									000	040	00
No		*45 18 55.04 -122 56 45.33*		1	05	4		N	DAY	FAT		MTRCYCLE		01	DRVR	KILL	72	F	OR-Y		047,081	000	001	01
																			OR<25					
00109	N N N	02/12/2013	17	CRESTVIEW DR	INTER	CROSS	N	N	CLR	S-1STOP	01	NONE	STRGHT											07
NONE		Tue 9P	0	SPRINGBROOK RD	S		YIELD	Y	DRY	REAR		PRVTE	S N									000		00
No		*45 18 55.04 -122 56 45.33*		1	06	0		N	DARK	PDO		PSNGR CAR		01	DRVR	NONE	21	M	OR-Y		026	000		07
																			OR<25					
											02	NONE 0	STOP											
												PRVTE	S N									011		00
												PSNGR CAR		01	DRVR	NONE	46	M	OR-Y		000	000		00
																			OR<25					

OREGON DEPARTMENT OF TRANSPORTATION - TRANSPORTATION DEVELOPMENT DIVISION
TRANSPORTATION DATA SECTION - CRASH ANALYSIS AND REPORTING UNIT
CRASH SUMMARIES BY YEAR BY COLLISION TYPE

Libra St & Crestview Dr
January 1, 2011 through December 31, 2015

COLLISION TYPE	FATAL CRASHES	NON-FATAL CRASHES	PROPERTY DAMAGE ONLY	TOTAL CRASHES	PEOPLE KILLED	PEOPLE INJURED	TRUCKS	DRY SURF	WET SURF	DAY	DARK	INTER-SECTION	INTER-SECTION RELATED	OFF-ROAD
YEAR:														
TOTAL														
FINAL TOTAL														

Disclaimer: A higher number of crashes may be reported as of 2011 compared to prior years. This does not reflect an increase in annual crashes. The higher numbers result from a change to an internal departmental process that allows the Crash Analysis and Reporting Unit to add previously unavailable, non-fatal crash reports to the annual data file. Please be aware of this change when comparing pre-2011 crash statistics.

OREGON DEPARTMENT OF TRANSPORTATION - TRANSPORTATION DEVELOPMENT DIVISION
TRANSPORTATION DATA SECTION - CRASH ANALYSIS AND REPORTING UNIT
URBAN NON-SYSTEM CRASH LISTING

CITY OF NEWBERG, YAMHILL COUNTY

N Springbrook Rd & Haworth Ave
January 1, 2011 through December 31, 2015

SER# INVEST UNLOC?	S D P R S W E A U C O E L G H R D C S L K	DATE DAY/TIME *LAT/LONG*	FC DISTNC	CITY STREET FIRST STREET SECOND STREET INTERSECTION SEQ #	RD CHAR DIRECT LOCTN	INT-TYP (MEDIAN) LEGS (#LANES)	INT-REL TRAF- CONTL	OFF-RD RNDBT DRVWY	WTHR SURF LIGHT	CRASH TYP COLL TYP SVRTY	V#	SPCL USE TRLR QTY OWNER VEH TYPE	MOVE FROM TO	P#	PRTC TYPE	INJ SVRTY	A G E	S E X	LICNS RES	PED LOC	ERROR	ACTN EVENT	CAUSE
00274	N N N N N	03/27/2012	17	HAWORTH AVE	INTER	CROSS	N	N	CLR	PED	01	NONE 0	TURN-L										02
CITY		Tue 2P	0	SPRINGBROOK RD	N		STOP SIGN	N	DRY	PED		PRVTE	E S									000	00
No		*45 18 28.71 -122 56 48.98*		1	06	0		N	DAY	INJ		PSNGR CAR		01	DRVR	NONE	33	M	OR-Y		029	000	02
																			OR<25				
													STRGHT	01	CONV	INJB	53	M		01	000	000	00
													N S										
00286	N N N	03/31/2012	17	HAWORTH AVE	INTER	CROSS	N	N	CLR	S-1STOP	01	NONE 0	STRGHT										07
NONE		Sat 4P	0	SPRINGBROOK RD	S		UNKNOWN	N	DRY	REAR		PRVTE	S N									000	00
No		*45 18 28.71 -122 56 48.98*		1	06	0		N	DAY	PDO		PSNGR CAR		01	DRVR	NONE	32	F	OR-Y		026	000	07
																			OR<25				
											02	NONE 0	STOP										
												PRVTE	S N									011	00
												PSNGR CAR		01	DRVR	NONE	17	F	OR-Y		000	000	00
																			OR<25				
01227	N N N N N	11/16/2014	16	HAWORTH AVE	INTER	3-LEG	N	N	CLR	O-1 L-TURN	01	NONE 0	STRGHT										03
CITY		Sun 3P	0	SPRINGBROOK RD	CN		STOP SIGN	N	DRY	TURN		PRVTE	N S									000	00
No		*45 18 28.71 -122 56 48.98*		1	01	0		N	DAY	PDO		PSNGR CAR		01	DRVR	NONE	57	F	OTH-Y		021	000	03
																			N-RES				
											02	NONE 0	TURN-L										
												PRVTE	S W									000	00
												PSNGR CAR		01	DRVR	NONE	55	M	OR-Y		000	000	00
																			OR<25				
00505	N N N	06/17/2013	17	HAWORTH AVE	INTER	3-LEG	N	N	CLR	ANGL-OTH	01	NONE 0	STRGHT										02
NO RPT		Mon 2P	0	SPRINGBROOK RD	CN		STOP SIGN	N	DRY	TURN		PRVTE	N S									000	00
No		*45 18 28.71 -122 56 48.98*		1	03	0		N	DAY	PDO		PSNGR CAR		01	DRVR	NONE	77	M	OR-Y		028	000	02
																			OR<25				
											02	NONE 0	TURN-R										
												PRVTE	W S									000	00
												PSNGR CAR		01	DRVR	NONE	78	F	OR-Y		000	000	00
																			OR<25				
00038	N N N	01/11/2014	17	HAWORTH AVE	INTER	3-LEG	N	N	CLD	ANGL-OTH	01	NONE 0	STRGHT										02
NO RPT		Sat 7P	0	SPRINGBROOK RD	CN		STOP SIGN	N	WET	ANGL		PRVTE	W E									000	00
No		*45 18 28.71 -122 56 48.98*		1	03	0		N	DARK	PDO		PSNGR CAR		01	DRVR	NONE	24	M	OR-Y		028	000	02
																			OR<25				
											02	NONE 0	STRGHT										
												PRVTE	N S									000	00
												PSNGR CAR		01	DRVR	NONE	68	M	OR-Y		000	000	00
																			OR<25				
00685	N N N N N	06/24/2014	16	HAWORTH AVE	INTER	3-LEG	N	N	CLR	ANGL-OTH	01	NONE 0	STRGHT										02
CITY		Tue 9A	0	SPRINGBROOK RD	CN		STOP SIGN	N	DRY	ANGL		PRVTE	N S									000	00
No		*45 18 28.71 -122 56 48.98*		1	03	0		N	DAY	INJ		PSNGR CAR		01	DRVR	NONE	23	F	OR-Y		028	000	02
																			OR<25				
											02	NONE 0	STRGHT										
												PRVTE	W E									000	00
												PSNGR CAR		01	DRVR	INJC	41	M	OR-Y		000	000	00
																			OR<25				

TRANSPORTATION DATA SECTION - CRASH ANALYSIS AND REPORTING UNIT

URBAN NON-SYSTEM CRASH LISTING

CITY OF NEWBERG, YAMHILL COUNTY

N Springbrook Rd & Haworth Ave

January 1, 2011 through December 31, 2015

SER# INVEST UNLOC?	S P E E D	A L C	D R U G S	S C H L	W O R K	DATE DAY/TIME *LAT/LONG*	FC DISTNC	CITY STREET FIRST STREET SECOND STREET INTERSECTION SEQ #	RD CHAR DIRECT LOCTN	INT-TYP (MEDIAN) LEGS (#LANES)	INT-REL TRAF- CONTL	OFF-RD RNDBT DRVWY	WTHR SURF LIGHT	CRASH TYP COLL TYP SVRTY	V#	SPCL USE TRLR QTY OWNER VEH TYPE	MOVE FROM TO	P#	PRTC TYPE	INJ SVRTY	AGE	SEX	LICNS RES	PED LOC	ERROR	ACTN EVENT	CAUSE
00578	N	N	N			07/05/2013	17	HAWORTH AVE	INTER	3-LEG	N	N	CLR	ANGL-OTH	01	NONE 0	STRGHT										02
NO RPT						Fri 4P	0	SPRINGBROOK RD	CN		STOP SIGN	N	DRY	ANGL		PRVTE	W E									000	00
No						*45 18 28.71 -122 56 48.98*		1	04	0		N	DAY	PDO		PSNGR CAR		01	DRVR	NONE	58	F	OR-Y OR<25		028	000	02
																		02	PSNG	NO<5	04	M			000	000	00
															02	NONE 0	STRGHT										
																PRVTE	S N									000	00
																PSNGR CAR		01	DRVR	NONE	75	F	OR-Y OR<25		000	000	00

TRANSPORTATION DATA SECTION - CRASH ANALYSIS AND REPORTING UNIT

CONTINUOUS SYSTEM CRASH LISTING

091 PACIFIC HIGHWAY WEST

OR 99W & Springbrook Rd

January 1, 2011 through December 31, 2015

SER# / INVEST / UNLOC?	S D / P R S W / E A U C O / E L G H R / D C S L K	DATE / DAY/TIME / *LAT/LONG*	COUNTY / CITY / URBAN AREA	RD# FC / CMPT/MLG / MILEPNT / LRS	CONN # / FIRST STREET / SECOND STREET / INTERSECTION SEQ#	RD CHAR / DIRECT / LOCTN	INT-TYP / (MEDIAN) / LEGS / (#LANES)	INT-REL / TRAF- / CNTL	OFFRD / RNDBT / DRVWY	WTHR / SURF / LIGHT	CRASH TYP / COLL TYP / SVRTY	V#	SPCL USE / TRLR QTY / OWNER / VEH TYPE	MOVE / FROM / TO	P#	PRTC / TYPE	INJ / SVRTY	A / G / E	S / E / X	LICNS / RES	PED / LOC	ERROR	ACTN	EVENT	CAUSE
00029	N N N N N	01/10/2012	YAMHILL	1 14		INTER	CROSS	N	N	CLR	PED	01	NONE 0	TURN-R											02
CITY		Tue 3P	NEWBERG	MN 0	PACIFIC HY 99W	UN		TRF SIGNAL	N	DRY	PED		PRVTE	W S									000		00
			NEWBERG UA	22.03	SPRINGBROOK RD	05	0		N	DAY	INJ		PSNGR CAR		01	DRVR	NONE	71	F	OR-Y		029	026		02
No		*45 18 23.12 -122 56 48.94*		009100100S00	1															OR<25					
														STRGHT	01	PED	INJB	14	F		01	000	035		00
														W E											
00178	N N N	02/24/2012	YAMHILL	1 14		INTER	CROSS	N	N	CLR	S-1STOP	01	NONE 0	STRGHT											07
NONE		Fri 9P	NEWBERG	MN 0	PACIFIC HY 99W	E		TRF SIGNAL	N	DRY	REAR		PRVTE	E W									000		00
			NEWBERG UA	22.03	SPRINGBROOK RD	06	2		N	DARK	PDO		PSNGR CAR		01	DRVR	NONE	50	M	OR-Y		026	000		07
No		*45 18 23.12 -122 56 48.94*		009100100S00	1															OR<25					
												02	NONE 0	STOP											
													PRVTE	E W									011		00
													PSNGR CAR		01	DRVR	NONE	65	F	OR-Y		000	000		00
																				OR<25					
00248	N N N	03/19/2012	YAMHILL	1 14		INTER	CROSS	N	N	RAIN	S-1STOP	01	NONE 0	STRGHT										013	27
NO RPT		Mon 7A	NEWBERG	MN 0	PACIFIC HY 99W	W		TRF SIGNAL	N	WET	REAR		PRVTE	W E									000		00
			NEWBERG UA	22.03	SPRINGBROOK RD	06	0		N	DAY	PDO		PSNGR CAR		01	DRVR	NONE	29	M	OR-Y		026	000		07
No		*45 18 23.12 -122 56 48.94*		009100100S00	1															OR<25					
												02	NONE	STOP											
													PRVTE	W E									011	013	00
													PSNGR CAR		01	DRVR	NONE	73	M	OR-Y		000	000		00
																				OR<25					
												03	NONE 0	STOP											
													PRVTE	W E									011		00
													PSNGR CAR		01	DRVR	NONE	61	M	OR-Y		000	000		00
																				OR<25					
00319	N N N N N	04/18/2013	YAMHILL	1 14		INTER	CROSS	N	N	CLR	S-OTHER	01	NONE 0	TURN-L											05
CITY		Thu 8P	NEWBERG	MN 0	PACIFIC HY 99W	UN		TRF SIGNAL	N	DRY	TURN		PRVTE	N E									000		00
			NEWBERG UA	22.05	SPRINGBROOK RD	05	0		N	DARK	INJ		PSNGR CAR		01	DRVR	NONE	69	M	OR-Y		080	000		05
No		*45 18 23.12 -122 56 48.94*		009100100S00	1															OR<25					
												02	NONE 0	TURN-L											
													PRVTE	N E									000		00
													PSNGR CAR		01	DRVR	NONE	42	M	OR-Y		000	000		00
																				OR<25					
															02	PSNG	INJC	41	F			000	000		00
															03	PSNG	INJC	12	F			000	000		00
00732	N N N	09/11/2011	YAMHILL	1 14		INTER	CROSS	N	N	CLR	S-STRGHT	01	NONE 0	STRGHT											13
NONE		Sun 7P	NEWBERG	MN 0	PACIFIC HY 99W	NE		TRF SIGNAL	N	DRY	SS-O		PRVTE	SW NE									000		00
			NEWBERG UA	22.05	SPRINGBROOK RD	05	0		N	DAY	PDO		PSNGR CAR		01	DRVR	NONE	00	F	OR-Y		045	000		13
No		*45 18 23.12 -122 56 48.94*		009100100S00	1															OR<25					

```
      S  D
      P   R S W                                RD#  FC   CONN #                            INT-TYP                                      SPCL USE
SER#   E A U C O  DATE        COUNTY           CMPT/MLG  FIRST  STREET       RD CHAR (MEDIAN)   INT-REL  OFFRD WTHR  CRASH TYP  TRLR QTY  MOVE                      A  S
INVEST E L G H R  DAY/TIME    CITY             MILEPNT   SECOND STREET       DIRECT    LEGS     TRAF-    RNDBT SURF  COLL TYP   OWNER     FROM      PRTC INJ      G  E  LICNS PED
UNLOC? D C S L K  LAT/LONG    URBAN AREA       LRS       INTERSECTION SEQ#   LOCTN   (#LANES)   CNTL     DRVWY LIGHT SVRTY   V# VEH TYPE  TO     P# TYPE SVRTY  E  X  RES   LOC ERROR     ACTN EVENT     CAUSE

                                                                                                                         02 NONE   0 STRGHT
                                                                                                                            PRVTE     SW NE                                                    000            00
                                                                                                                           PSNGR CAR          01 DRVR NONE  31 F OR-Y       000              000            00
                                                                                                                                                                 OR<25

00516  N N N      07/07/2011 YAMHILL           1   14                        INTER     CROSS  N          N UNK  S-1STOP   01 NONE   0 STRGHT                                                                07
NONE              Thu    8A  NEWBERG           MN   0   PACIFIC HY 99W       NE                TRF SIGNAL N UNK  REAR        PRVTE     NE SW                                                    000            00
                             NEWBERG UA         22.05   SPRINGBROOK RD       06          0              N DAY  PDO        PSNGR CAR          01 DRVR NONE  00 M OR-Y       026              000            07
No     45 18 23.12  -122 56 48.94              009100100S00             1                                                                                        UNK

                                                                                                                         02 NONE   0 STOP
                                                                                                                            PRVTE     NE SW                                                    011            00
                                                                                                                           PSNGR CAR          01 DRVR NONE  60 M OR-Y       000              000            00
                                                                                                                                                                 OR<25

00692  N N N      08/26/2011 YAMHILL           1   14                        INTER     CROSS  N          N CLR  S-1STOP   01 NONE   0 STRGHT                                                                07
NONE              Fri    3P  NEWBERG           MN   0   PACIFIC HY 99W       NE                TRF SIGNAL N DRY  REAR        PRVTE     NE SW                                                    000            00
                             NEWBERG UA         22.05   SPRINGBROOK RD       06          0              N DAY  PDO        PSNGR CAR          01 DRVR NONE  39 M OR-Y       026              000            07
No     45 18 23.12  -122 56 48.94              009100100S00             1                                                                                        OR<25

                                                                                                                         02 NONE   0 STOP
                                                                                                                            PRVTE     NE SW                                                    011            00
                                                                                                                           PSNGR CAR          01 DRVR NONE  25 F OR-Y       000              000            00
                                                                                                                                                                 OR<25
                                                                                                                                              02 PSNG NO<5  02 F            000              000            00
                                                                                                                                              03 PSNG NO<5  01 M            000              000            00

01087  N N N      12/23/2011 YAMHILL           1   14                        INTER     CROSS  N          N CLR  S-1STOP   01 NONE   0 BACK                                                                  10
NONE              Fri    5P  NEWBERG           MN   0   PACIFIC HY 99W       NE                TRF SIGNAL N DRY  REAR        UNKN      SW NE                                                    000            00
                             NEWBERG UA         22.05   SPRINGBROOK RD       06          0              N DLIT PDO        PSNGR CAR          01 DRVR NONE  00 F OR-Y       011              000            10
No     45 18 23.12  -122 56 48.94              009100100S00             1                                                                                        UNK

                                                                                                                         02 NONE   0 STOP
                                                                                                                            PRVTE     NE SW                                                    011            00
                                                                                                                           PSNGR CAR          01 DRVR NONE  25 F OR-Y       000              000            00
                                                                                                                                                                 OR<25

00690  N N N      08/11/2012 YAMHILL           1   14                        INTER     CROSS  N          N CLR  S-1TURN   01 NONE   0 STRGHT                                                                13
NO RPT            Sat   11A  NEWBERG           MN   0   PACIFIC HY 99W       NE                TRF SIGNAL N DRY  TURN        PRVTE     NE SW                                                    000            00
                             NEWBERG UA         22.05   SPRINGBROOK RD       06          0              N DAY  PDO        PSNGR CAR          01 DRVR NONE  24 F OR-Y       045              000            13
No     45 18 23.12  -122 56 48.94              009100100S00             1                                                                                        OR<25

                                                                                                                         02 NONE   0 TURN-L
                                                                                                                            PRVTE     NE S                                                     000            00
                                                                                                                           PSNGR CAR          01 DRVR NONE  74 M OR-Y       000              000            00
                                                                                                                                                                 OR>25

00851  N N N      09/28/2012 YAMHILL           1   14                        INTER     CROSS  N          N CLR  S-1STOP   01 NONE   0 STRGHT                                                                07
NO RPT            Fri    2P  NEWBERG           MN   0   PACIFIC HY 99W       NE                TRF SIGNAL N DRY  REAR        PRVTE     NE SW                                                    000            00
                             NEWBERG UA         22.05   SPRINGBROOK RD       06          2              N DAY  PDO        PSNGR CAR          01 DRVR NONE  19 M OR-Y       026              000            07
No     45 18 23.12  -122 56 48.94              009100100S00             1                                                                                        OR<25
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      S  D
      P   R S W                                 RD#  FC   CONN #                         INT-TYP                                      SPCL USE
SER#   E A U C O  DATE        COUNTY            CMPT/MLG  FIRST  STREET        RD CHAR (MEDIAN)  INT-REL  OFFRD WTHR  CRASH TYP   TRLR QTY  MOVE                         A  S
INVEST E L G H R  DAY/TIME    CITY              MILEPNT   SECOND STREET        DIRECT     LEGS   TRAF-    RNDBT SURF  COLL TYP    OWNER     FROM       PRTC  INJ       G  E  LICNS  PED
UNLOC? D C S L K  LAT/LONG    URBAN AREA        LRS       INTERSECTION SEQ#    LOCTN    (#LANES) CNTL     DRVWY LIGHT SVRTY     V# VEH TYPE  TO      P# TYPE  SVRTY  E  X  RES    LOC  ERROR        ACTN  EVENT        CAUSE

                                                                                                                              02 NONE    0 STOP
                                                                                                                                 PRVTE     NE SW                                                    011                00
                                                                                                                                PSNGR CAR          01 DRVR NONE  86 M OR-Y       000             000                00
                                                                                                                                                                      OR<25

01210  N N N      12/27/2012 YAMHILL           1    14                      INTER      CROSS  N           N CLR  S-1STOP    01 NONE    0 STRGHT                                                                        27
NO RPT            Thu    9P  NEWBERG           MN    0   PACIFIC HY 99W      NE                TRF SIGNAL  N DRY  REAR         PRVTE     NE SW                                                    000                00
                             NEWBERG UA         22.05    SPRINGBROOK RD      06           2                N DLIT PDO         PSNGR CAR          01 DRVR NONE  30 F OR-Y       016,026         038                27
No      45 18 23.12  -122 56 48.94             009100100S00              1                                                                                            OR<25
                                                                                                                                                   02 PSNG NO<5  04 M             000             000                00

                                                                                                                              02 NONE    0 STOP
                                                                                                                                 PRVTE     NE SW                                                    011                00
                                                                                                                                PSNGR CAR          01 DRVR NONE  47 M OR-Y       000             000                00
                                                                                                                                                                      OR<25

00766  N N N      09/02/2013 YAMHILL           1    14                      INTER      CROSS  N           N CLR  S-1STOP    01 NONE    0 STRGHT                                                                        07
NO RPT            Mon    5P  NEWBERG           MN    0   PACIFIC HY 99W      NE                TRF SIGNAL  N DRY  REAR         PRVTE     NE SW                                                    000                00
                             NEWBERG UA         22.05    SPRINGBROOK RD      06           1                N DAY  INJ         PSNGR CAR          01 DRVR NONE  22 F OR-Y       026             000                07
No      45 18 23.12  -122 56 48.94             009100100S00              1                                                                                            OR<25

                                                                                                                              02 NONE    0 STOP
                                                                                                                                 PRVTE     NE SW                                                    011                00
                                                                                                                                PSNGR CAR          01 DRVR INJC  52 F OR-Y       000             000                00
                                                                                                                                                                      OR<25
                                                                                                                                                   02 PSNG INJC  17 F             000             000                00

00947  N N N      10/26/2013 YAMHILL           1    14                      INTER      CROSS  N           N CLR  S-1STOP    01 NONE    0 TURN-L                                                                        07
NONE              Sat   10A  NEWBERG           MN    0   PACIFIC HY 99W      NE                L-GRN-SIG   N DRY  REAR         PRVTE     NE S                                                     000                00
                             NEWBERG UA         22.05    SPRINGBROOK RD      06           0                N DAY  INJ         PSNGR CAR          01 DRVR NONE  48 M OR-Y       026             000                07
No      45 18 23.12  -122 56 48.94             009100100S00              1                                                                                            OR>25

                                                                                                                              02 NONE    0 STOP
                                                                                                                                 PRVTE     NE SW                                                    012                00
                                                                                                                                PSNGR CAR          01 DRVR INJC  24 M OR-Y       000             000                00
                                                                                                                                                                      OR<25
                                                                                                                                                   02 PSNG INJC  23 F             000             000                00

00636  N N N      06/11/2014 YAMHILL           1    14                      INTER      CROSS  N           N CLR  S-1STOP    01 NONE    0 STRGHT                                                        004             07
NONE              Wed    8A  NEWBERG           MN    0   PACIFIC HY 99W      NE                TRF SIGNAL  N DRY  REAR         PRVTE     NE SW                                                    000                00
                             NEWBERG UA         22.05    SPRINGBROOK RD      06           0                N DAY  PDO         PSNGR CAR          01 DRVR NONE  30 M OR-Y       026             000                07
No      45 18 23.12  -122 56 48.94             009100100S00              1                                                                                            OR<25

                                                                                                                              02 NONE    0 STOP
                                                                                                                                 PRVTE     NE SW                                                    011  004           00
                                                                                                                                PSNGR CAR          01 DRVR NONE  65 M OR-Y       000             000                00
                                                                                                                                                                      OR<25

00630  N N N      06/12/2014 YAMHILL           1    14                      INTER      CROSS  N           N CLR  S-1STOP    01 NONE    0 STRGHT                                                                        07
NONE              Thu   12P  NEWBERG           MN    0   PACIFIC HY 99W      NE                TRF SIGNAL  N DRY  REAR         PRVTE     NE SW                                                    000                00
                             NEWBERG UA         22.05    SPRINGBROOK RD      06           0                N DAY  PDO         PSNGR CAR          01 DRVR NONE  70 M OR-Y       026             000                07
No      45 18 23.12  -122 56 48.94             009100100S00              1                                                                                            OR<25
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091 PACIFIC HIGHWAY WEST

OR 99W & Springbrook Rd
January 1, 2011 through December 31, 2015

```
      S  D
      P  R S W                                RD#  FC   CONN #                          INT-TYP                                          SPCL USE
SER#   E A U C O  DATE         COUNTY          CMPT/MLG FIRST  STREET       RD CHAR (MEDIAN)  INT-REL OFFRD WTHR  CRASH TYP    TRLR QTY  MOVE                    A  S
INVEST E L G H R  DAY/TIME     CITY            MILEPNT  SECOND STREET       DIRECT    LEGS    TRAF-   RNDBT SURF  COLL TYP     OWNER     FROM      PRTC INJ      G  E  LICNS PED
UNLOC? D C S L K  LAT/LONG     URBAN AREA      LRS      INTERSECTION SEQ#   LOCTN   (#LANES)  CNTL    DRVWY LIGHT SVRTY     V# VEH TYPE  TO     P# TYPE SVRTY  E  X  RES   LOC ERROR      ACTN EVENT      CAUSE

                                                                                                                       02 NONE   0 STOP
                                                                                                                          PRVTE    NE SW                                                  011             00
                                                                                                                          PSNGR CAR        01 DRVR NONE  53 M OR-Y      000              000             00
                                                                                                                                                              OR<25

00715  N N N     07/03/2014 YAMHILL          1    14                        INTER     CROSS  N          N CLR  S-1STOP   01 NONE   0 STRGHT                                                                07
NONE             Thu    6P  NEWBERG          MN    0   PACIFIC HY 99W       NE               TRF SIGNAL N DRY  REAR         PRVTE    NE SW                                                  000             00
                            NEWBERG UA        22.05    SPRINGBROOK RD       06          0               N DAY  INJ          PSNGR CAR        01 DRVR NONE  56 F OR-Y      026              000             07
No     45 18 23.12  -122 56 48.94            009100100S00              1                                                                                      OR<25

                                                                                                                       02 NONE   0 STOP
                                                                                                                          PRVTE    NE SW                                                  011             00
                                                                                                                          PSNGR CAR        01 DRVR INJC  63 F OR-Y      000              000             00
                                                                                                                                                              OR<25
                                                                                                                                           02 PSNG INJC  22 F           000              000             00

00773  N N N N N 07/17/2014 YAMHILL          1    14                        INTER     CROSS  N          N CLR  S-1STOP   01 NONE   0 STRGHT                                                                07
STATE            Thu    4P  NEWBERG          MN    0   PACIFIC HY 99W       NE               TRF SIGNAL N DRY  REAR         PRVTE    NE SW                                                  000             00
                            NEWBERG UA        22.05    SPRINGBROOK RD       06          2               N DAY  INJ          PSNGR CAR        01 DRVR NONE  41 M OR-Y      000,026          000             00,07
No     45 18 23.12  -122 56 48.94            009100100S00              1                                                                                      OR<25

                                                                                                                       02 NONE   0 STOP
                                                                                                                          PRVTE    NE SW                                                  011             00
                                                                                                                          PSNGR CAR        01 DRVR INJC  50 M OR-Y      000              000             00
                                                                                                                                                              OR<25

01266  N N N     11/21/2014 YAMHILL          1    14                        INTER     CROSS  N          N RAIN S-1STOP   01 NONE   0 STRGHT                                                                29
NONE             Fri    4P  NEWBERG          MN    0   PACIFIC HY 99W       NE               TRF SIGNAL N WET  REAR         PRVTE    SW NE                                                  000             00
                            NEWBERG UA        22.05    SPRINGBROOK RD       06          2               N DUSK PDO          PSNGR CAR        01 DRVR NONE  49 M OR-Y      026              000             29
No     45 18 23.12  -122 56 48.94            009100100S00              1                                                                                      OR<25

                                                                                                                       02 NONE   0 STOP
                                                                                                                          PRVTE    SW NE                                                  011             00
                                                                                                                          PSNGR CAR        01 DRVR NONE  38 F OR-Y      000              000             00
                                                                                                                                                              OR<25

00541  N N N     06/08/2015 YAMHILL          1    14                        INTER     CROSS  N          N CLR  S-1STOP   01 NONE   0 STRGHT                                                                29
NONE             Mon    4P  NEWBERG          MN    0   PACIFIC HY 99W       NE               TRF SIGNAL N DRY  REAR         PRVTE    NE SW                                                  000             00
                            NEWBERG UA        22.05    SPRINGBROOK RD       06          2               N DAY  INJ          PSNGR CAR        01 DRVR NONE  36 F OR-Y      026              000             29
No     45 18 23.12  -122 56 48.94            009100100S00              1                                                                                      OR<25

                                                                                                                       02 NONE   0 STOP
                                                                                                                          PRVTE    NE SW                                                  011             00
                                                                                                                          PSNGR CAR        01 DRVR INJC  51 F OR-Y      000              000             00
                                                                                                                                                              OR<25

00858  N N N     08/24/2015 YAMHILL          1    14                        INTER     CROSS  N          N CLR  S-1STOP   01 NONE   0 STRGHT                                                                29
CITY             Mon    7P  NEWBERG          MN    0   PACIFIC HY 99W       NE               TRF SIGNAL N DRY  REAR         PRVTE    NE SW                                                  000             00
                            NEWBERG UA        22.05    SPRINGBROOK RD       06          2               N DAY  PDO          PSNGR CAR        01 DRVR NONE  21 F OR-Y      026              026             29
No     45 18 23.12  -122 56 48.94            009100100S00              1                                                                                      OR<25
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091 PACIFIC HIGHWAY WEST

OR 99W & Springbrook Rd
January 1, 2011 through December 31, 2015

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      S  D
      P  R S W                                RD#  FC   CONN #                     INT-TYP                                       SPCL USE
SER#   E A U C O  DATE        COUNTY          CMPT/MLG  FIRST  STREET       RD CHAR (MEDIAN)  INT-REL  OFFRD WTHR  CRASH TYP   TRLR QTY  MOVE                     A  S
INVEST E L G H R  DAY/TIME    CITY            MILEPNT   SECOND STREET       DIRECT    LEGS    TRAF-    RNDBT SURF  COLL TYP    OWNER     FROM       PRTC  INJ     G  E  LICNS PED
UNLOC? D C S L K  LAT/LONG    URBAN AREA      LRS       INTERSECTION SEQ#   LOCTN   (#LANES)  CNTL     DRVWY LIGHT SVRTY    V# VEH TYPE TO    P# TYPE  SVRTY   E  X  RES   LOC ERROR       ACTN EVENT      CAUSE

                                                                                                                          02 NONE   0 STOP
                                                                                                                             PRVTE     NE SW                                                   011              00
                                                                                                                           PSNGR CAR        01 DRVR NONE  34 M OR-Y      000           000              00
                                                                                                                                                                OR<25

00124  Y N N N N 02/19/2011 YAMHILL         1    14                         INTER     CROSS  N          N CLD   ANGL-OTH   01 NONE   0 U-TURN                                                               08,01
CITY             Sat    2P  NEWBERG         MN    0   PACIFIC HY 99W        E                TRF SIGNAL N DRY   TURN          PRVTE     E  E                                                   000              00
                            NEWBERG UA       22.05    SPRINGBROOK RD        05          2               N DAY   PDO         PSNGR CAR        01 DRVR NONE  32 M OR-Y      008           000              08,01
No      45 18 23.12  -122 56 48.94          009100100S00              1                                                                                 OR<25

                                                                                                                          02 NONE   0 TURN-R
                                                                                                                             PRVTE     S  E                                                    016              00
                                                                                                                           PSNGR CAR        01 DRVR NONE  17 M OR-Y      000           000              00
                                                                                                                                                                OR<25

00711  N N N N N 09/02/2011 YAMHILL         1    14                         INTER     CROSS  N          N CLR   S-1STOP    01 POLCE     STRGHT                                                                  07
CITY             Fri    4P  NEWBERG         MN    0   PACIFIC HY 99W        E                TRF SIGNAL N DRY   REAR          PRVTE     E  W                                                   000              00
                            NEWBERG UA       22.05    SPRINGBROOK RD        06          0               N DAY   PDO         PSNGR CAR        01 DRVR NONE  39 M OR-Y      026           000              07
No      45 18 23.12  -122 56 48.94          009100100S00              1                                                                                 OR<25

                                                                                                                          02 NONE   1 STOP
                                                                                                                             PRVTE     E  W                                                    011              00
                                                                                                                           PSNGR CAR        01 DRVR NONE  41 F OR-Y      000           000              00
                                                                                                                                                                OR<25

00125  N N N     02/19/2013 YAMHILL         1    14                         INTER     CROSS  N          N RAIN S-1STOP     01 NONE   0 STRGHT                                                               07
CITY             Tue    7A  NEWBERG         MN    0   PACIFIC HY 99W        E                TRF SIGNAL N WET   REAR          PRVTE     E  W                                                   000              00
                            NEWBERG UA       22.05    SPRINGBROOK RD        06          0               N DAY   INJ         PSNGR CAR        01 DRVR NONE  25 F OR-Y      026           000              07
No      45 18 23.12  -122 56 48.94          009100100S00              1                                                                                 OR<25

                                                                                                                          02 NONE   0 STOP
                                                                                                                             PRVTE     E  W                                                    011              00
                                                                                                                           PSNGR CAR        01 DRVR INJC  38 M OR-Y      000           000              00
                                                                                                                                                                OR<25

00667  N N N     07/31/2013 YAMHILL         1    14                         INTER     CROSS  N          N CLR   S-1STOP    01 NONE   0 STRGHT                                                    013          32
CITY             Wed    3P  NEWBERG         MN    0   PACIFIC HY 99W        E                NONE       N DRY   REAR          PRVTE     E  W                                                   000              00
                            NEWBERG UA       22.05    SPRINGBROOK RD        06          0               N DAY   INJ         PSNGR CAR        01 DRVR NONE  59 M OR-Y      052,026       000              32
No      45 18 23.12  -122 56 48.94          009100100S00              1                                                                                 OR<25

                                                                                                                          02 NONE   0 STOP
                                                                                                                             PRVTE     E  W                                                    011  013         00
                                                                                                                           PSNGR CAR        01 DRVR INJC  50 M OR-Y      000           000              00
                                                                                                                                                                OR<25

                                                                                                                          03 NONE   0 STOP
                                                                                                                             PRVTE     E  W                                                    011              00
                                                                                                                           PSNGR CAR        01 DRVR INJC  52 F OR-Y      000           000              00
                                                                                                                                                                OR<25
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091 PACIFIC HIGHWAY WEST

OR 99W & Springbrook Rd
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      S  D
      P  R S W                                RD#  FC   CONN #                            INT-TYP                                           SPCL USE
SER#  E A U C O  DATE          COUNTY         CMPT/MLG  FIRST  STREET        RD CHAR (MEDIAN)  INT-REL  OFFRD WTHR  CRASH TYP       TRLR QTY  MOVE                          A  S
INVEST E L G H R  DAY/TIME     CITY           MILEPNT   SECOND STREET        DIRECT     LEGS   TRAF-    RNDBT SURF  COLL TYP        OWNER     FROM        PRTC INJ     G  E  LICNS PED
UNLOC? D C S L K  LAT/LONG     URBAN AREA     LRS       INTERSECTION SEQ#    LOCTN   (#LANES)  CNTL     DRVWY LIGHT SVRTY       V# VEH TYPE   TO       P# TYPE SVRTY E  X  RES    LOC ERROR          ACTN EVENT      CAUSE

00845  N N N     09/26/2013  YAMHILL      1    14                            INTER     CROSS  N            N RAIN  S-1STOP     01 NONE    0 STRGHT                                                                        07
NO RPT           Thu    5P   NEWBERG      MN   0   PACIFIC HY 99W            E                TRF SIGNAL   N WET   REAR           PRVTE      E  W                                                       000              00
                             NEWBERG UA    22.05   SPRINGBROOK RD            06          0                 N DAY   INJ            PSNGR CAR            01 DRVR NONE  23 F OR-Y        026            000              07
No      45 18 23.12  -122 56 48.94        009100100S00              1                                                                                                   OR<25

                                                                                                                            02 NONE    0 STOP
                                                                                                                               PRVTE      E  W                                                       011              00
                                                                                                                              MTRCYCLE             01 DRVR INJC  42 M OR-Y        000            000              00
                                                                                                                                                                          OR<25

01195  N N N     12/21/2012  YAMHILL      1    14                            INTER     CROSS  N            N RAIN  S-1STOP     01 POLCE   0 STRGHT                                                                        07
STATE            Fri    9A   NEWBERG      MN   0   PACIFIC HY 99W            S                TRF SIGNAL   N WET   REAR           PUBLC      S  N                                                       000              00
                             NEWBERG UA    22.05   SPRINGBROOK RD            06          2                 N DAY   INJ            PSNGR CAR            01 DRVR NONE  28 M OR-Y        026            000              07
No      45 18 23.12  -122 56 48.94        009100100S00              1                                                                                                   OR<25

                                                                                                                            02 NONE    0 STOP
                                                                                                                               PRVTE      S  N                                                       011              00
                                                                                                                              PSNGR CAR            01 DRVR INJC  35 F OR-Y        000            000              00
                                                                                                                                                                          OR<25

00987  N N N     11/01/2012  YAMHILL      1    14                            INTER     CROSS  N            N RAIN  ANGL-OTH    01 NONE    0 TURN-L                                                                        08,02
NO RPT           Thu    7A   NEWBERG      MN   0   PACIFIC HY 99W            SW               L-GRN-SIG    N WET   TURN           PRVTE      S  SW                                                      000              00
                             NEWBERG UA    22.05   SPRINGBROOK RD            05          0                 N DAWN  PDO            SCHL BUS             01 DRVR NONE  58 M OR-Y        007,028        000              08,02
No      45 18 23.12  -122 56 48.94        009100100S00              1                                                                                                   OR<25

                                                                                                                            02 NONE    0 TURN-L
                                                                                                                               PRVTE      S  SW                                                      000              00
                                                                                                                              PSNGR CAR            01 DRVR NONE  48 M OR-Y        000            000              00
                                                                                                                                                                          OR<25

00976  N N N N N 09/12/2014  YAMHILL      1    14                            INTER     CROSS  N            N CLR   S-STRGHT    01 NONE    0 STRGHT                                                      062,121     10
CITY             Fri   12P   NEWBERG      MN   0   PACIFIC HY 99W            SW               TRF SIGNAL   N DRY   SS-O           PRVTE      SW NE                                                      000 062,121     00
                             NEWBERG UA    22.05   SPRINGBROOK RD            05          0                 N DAY   INJ            PSNGR CAR            01 DRVR NONE  30 F OR-Y        080            000              10
No      45 18 23.12  -122 56 48.94        009100100S00              1                                                                                                   OR<25

                                                                                                                            02 NONE    0 STRGHT
                                                                                                                               PRVTE      SW NE                                                      000              00
                                                                                                                              PSNGR CAR            01 DRVR INJC  37 M OR-Y        000            000              00
                                                                                                                                                                          OR<25

                                                                                                                            03 NONE    0 STRGHT
                                                                                                                               PRVTE      SW NE                                                      000              00
                                                                                                                              PSNGR CAR            01 DRVR NONE  51 M OR-Y        000            000              00
                                                                                                                                                                          OR<25

00507  N N N     06/20/2011  YAMHILL      1    14                            INTER     CROSS  N            N CLR   S-1STOP     01 NONE    0 STRGHT                                                      013         07
NO RPT           Mon    3P   NEWBERG      MN   0   PACIFIC HY 99W            SW               UNKNOWN      N DRY   REAR           PRVTE      SW NE                                                      000              00
                             NEWBERG UA    22.05   SPRINGBROOK RD            06          0                 N DAY   PDO            PSNGR CAR            01 DRVR NONE  59 F OR-Y        026            000              07
No      45 18 23.12  -122 56 48.94        009100100S00              1                                                                                                   OR<25
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091 PACIFIC HIGHWAY WEST

OR 99W & Springbrook Rd
January 1, 2011 through December 31, 2015

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      S  D
      P   R S W                                RD#  FC   CONN #                          INT-TYP                                      SPCL USE
SER#   E A U C O  DATE        COUNTY           CMPT/MLG  FIRST  STREET       RD CHAR (MEDIAN)  INT-REL  OFFRD WTHR  CRASH TYP   TRLR QTY  MOVE                         A  S
INVEST E L G H R  DAY/TIME    CITY             MILEPNT   SECOND STREET       DIRECT     LEGS   TRAF-    RNDBT SURF  COLL TYP    OWNER     FROM       PRTC  INJ      G  E  LICNS PED
UNLOC? D C S L K  LAT/LONG    URBAN AREA       LRS       INTERSECTION SEQ#   LOCTN   (#LANES)  CNTL     DRVWY LIGHT SVRTY    V# VEH TYPE  TO      P# TYPE  SVRTY    E  X  RES   LOC  ERROR      ACTN  EVENT     CAUSE

                                                                                                                          02 NONE   0 STOP
                                                                                                                             PRVTE     SW NE                                                    011  013        00
                                                                                                                            PSNGR CAR          01 DRVR NONE  51 M OTH-Y       000              000              00
                                                                                                                                                                  N-RES

                                                                                                                          03 NONE   0 STOP
                                                                                                                             PRVTE     SW NE                                                    011             00
                                                                                                                            PSNGR CAR          01 DRVR NONE  31 F OR-Y        000              000              00
                                                                                                                                                                  OR<25

01023  N N N     12/06/2011 YAMHILL          1    14                         INTER      CROSS  N          N CLR   S-1STOP    01 NONE   0 STRGHT                                                                         07
NONE             Tue    2P  NEWBERG          MN    0   PACIFIC HY 99W        SW                TRF SIGNAL N DRY   REAR          PRVTE     SW NE                                                    000             00
                            NEWBERG UA        22.05    SPRINGBROOK RD        06           0               N DAY   PDO          PSNGR CAR          01 DRVR NONE  00 M UNK         026              000              07
No     45 18 23.12  -122 56 48.94            009100100S00              1                                                                                          OR<25

                                                                                                                          02 NONE   0 STOP
                                                                                                                             PRVTE     SW NE                                                    011             00
                                                                                                                            PSNGR CAR          01 DRVR NONE  72 M OR-Y        000              000              00
                                                                                                                                                                  OR<25

01058  N N N     12/15/2011 YAMHILL          1    14                         INTER      CROSS  N          N CLD   S-1STOP    01 NONE   0 STRGHT                                                                         07
NONE             Thu    8A  NEWBERG          MN    0   PACIFIC HY 99W        SW                TRF SIGNAL N WET   REAR          PRVTE     SW NE                                                    000             00
                            NEWBERG UA        22.05    SPRINGBROOK RD        06           0               N DAY   PDO          PSNGR CAR          01 DRVR NONE  25 M OR-Y        026              000              07
No     45 18 23.12  -122 56 48.94            009100100S00              1                                                                                          OR>25

                                                                                                                          02 NONE   0 STOP
                                                                                                                             PRVTE     SW NE                                                    011             00
                                                                                                                            PSNGR CAR          01 DRVR NONE  40 M OR-Y        000              000              00
                                                                                                                                                                  OR<25

00066  N N N     01/21/2012 YAMHILL          1    14                         INTER      CROSS  N          N CLR   ANGL-STP   01 NONE   0 TURN-L                                                                         13
NO RPT           Sat    9P  NEWBERG          MN    0   PACIFIC HY 99W        SW                UNKNOWN    N DRY   TURN          PRVTE     SW N                                                     000             00
                            NEWBERG UA        22.05    SPRINGBROOK RD        06           0               N DARK  PDO          PSNGR CAR          01 DRVR NONE  17 F OR-Y        045              000              13
No     45 18 23.12  -122 56 48.94            009100100S00              1                                                                                          OR<25

                                                                                                                          02 NONE   0 STOP
                                                                                                                             PRVTE     SW NE                                                    012             00
                                                                                                                            PSNGR CAR          01 DRVR NONE  57 M OR-Y        000              000              00
                                                                                                                                                                  OR<25

00818  N N N     09/21/2012 YAMHILL          1    14                         INTER      CROSS  N          N CLR   S-1STOP    01 NONE   0 STRGHT                                                        124             07
NONE             Fri    3P  NEWBERG          MN    0   PACIFIC HY 99W        SW                TRF SIGNAL N WET   REAR          PRVTE     SW NE                                                    000  124        00
                            NEWBERG UA        22.05    SPRINGBROOK RD        06           2               N DAY   PDO          PSNGR CAR          01 DRVR NONE  19 M OR-Y        026              000              07
No     45 18 23.12  -122 56 48.94            009100100S00              1                                                                                          OR<25

                                                                                                                          02 NONE   0 STOP
                                                                                                                             PRVTE     SW NE                                                    011             00
                                                                                                                            PSNGR CAR          01 DRVR NONE  26 F OR-Y        000              000              00
                                                                                                                                                                  OR<25
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091 PACIFIC HIGHWAY WEST

OR 99W & Springbrook Rd
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SER# INVEST UNLOC?	S P E D; D R A C; R U G S; S C H L; W O R K	DATE DAY/TIME *LAT/LONG*	COUNTY CITY URBAN AREA	RD# FC CMPT/MLG MILEPNT LRS	CONN # FIRST STREET SECOND STREET INTERSECTION SEQ#	RD CHAR DIRECT LOCTN	INT-TYP (MEDIAN) LEGS (#LANES)	INT-REL TRAF- CNTL	OFFRD RNDBT DRVWY	WTHR SURF LIGHT	CRASH TYP COLL TYP SVRTY	V# SPCL USE TRLR QTY OWNER VEH TYPE	MOVE FROM TO	P#	PRTC TYPE	INJ SVRTY	AGE	SEX	LICNS RES	PED LOC	ERROR	ACTN EVENT	CAUSE
00868	N N N N N	10/02/2012	YAMHILL	1 14		INTER	CROSS	N	N	CLR	S-1STOP	01 NONE 0	STRGHT										07
CITY		Tue 5P	NEWBERG	MN 0	PACIFIC HY 99W	SW		TRF SIGNAL	N	DRY	REAR	PRVTE	SW NE									000	00
			NEWBERG UA	22.05	SPRINGBROOK RD	06	2		N	DAY	INJ	PSNGR CAR		01	DRVR	NONE	44	M	OR-Y		043	000	07
No		*45 18 23.12 -122 56 48.94*		009100100S00	1														OR<25				
												02 NONE 0	STOP										
												PRVTE	SW NE									011	00
												PSNGR CAR		01	DRVR	INJC	41	M	OR-Y		000	000	00
																			OR<25				
														02	PSNG	INJC	39	F			000	000	00
00873	N N N	10/03/2012	YAMHILL	1 14		INTER	CROSS	N	N	CLR	S-1STOP	01 NONE 0	STRGHT										07
NONE		Wed 12P	NEWBERG	MN 0	PACIFIC HY 99W	SW		TRF SIGNAL	N	DRY	REAR	PRVTE	SW NE									000	00
			NEWBERG UA	22.05	SPRINGBROOK RD	06	2		N	DAY	INJ	PSNGR CAR		01	DRVR	NONE	20	F	OTH-Y		026	000	07
No		*45 18 23.12 -122 56 48.94*		009100100S00	1														OR<25				
												02 NONE 0	STOP										
												PRVTE	SW NE									011	00
												PSNGR CAR		01	DRVR	INJC	41	M	OR-Y		000	000	00
																			OR<25				
00888	Y N N	10/07/2012	YAMHILL	1 14		INTER	CROSS	N	N	CLR	S-1STOP	01 NONE 0	STRGHT									093	01
NO RPT		Sun 12P	NEWBERG	MN 0	PACIFIC HY 99W	SW		L-GRN-SIG	N	DRY	REAR	PRVTE	SW NE									000	00
			NEWBERG UA	22.05	SPRINGBROOK RD	06	2		N	DAY	INJ	PSNGR CAR		01	DRVR	NONE	24	M	OR-Y		047	088 093	01
No		*45 18 23.12 -122 56 48.94*		009100100S00	1														OR>25				
												02 NONE 0	STOP										
												PRVTE	SW NE									012	00
												PSNGR CAR		01	DRVR	INJC	69	M	OTH-Y		000	000	00
																			N-RES				
														02	PSNG	INJC	65	F			000	000	00
00278	N N N N N	04/04/2013	YAMHILL	1 14		INTER	CROSS	N	N	CLD	S-1STOP	01 NONE 0	STRGHT										07
CITY		Thu 7A	NEWBERG	MN 0	PACIFIC HY 99W	SW		TRF SIGNAL	N	DRY	REAR	PRVTE	SW NE									000	00
			NEWBERG UA	22.05	SPRINGBROOK RD	06	0		N	DAY	INJ	PSNGR CAR		01	DRVR	NONE	47	M	OR-Y		026	000	07
No		*45 18 23.12 -122 56 48.94*		009100100S00	1														OR<25				
												02 NONE 0	STOP										
												PRVTE	SW NE									011	00
												PSNGR CAR		01	DRVR	INJC	39	M	OR-Y		000	000	00
																			OR<25				
00294	N N N	04/09/2013	YAMHILL	1 14		INTER	CROSS	N	N	CLR	S-1STOP	01 NONE 0	STRGHT										07
NO RPT		Tue 1P	NEWBERG	MN 0	PACIFIC HY 99W	SW		TRF SIGNAL	N	DRY	REAR	PRVTE	SW NE									000	00
			NEWBERG UA	22.05	SPRINGBROOK RD	06	0		N	DAY	PDO	PSNGR CAR		01	DRVR	NONE	25	F	OR-Y		026	000	07
No		*45 18 23.12 -122 56 48.94*		009100100S00	1														OR<25				
												02 NONE 0	STOP										
												PRVTE	SW NE									011	00
												PSNGR CAR		01	DRVR	NONE	55	M	OR-Y		000	000	00
																			OR<25				

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OR 99W & Springbrook Rd
January 1, 2011 through December 31, 2015

SER# / INVEST / UNLOC?	S P E D / R S W / E A U C O / E L G H R / D C S L K	DATE / DAY/TIME / LAT/LONG	COUNTY / CITY / URBAN AREA	RD# FC / CMPT/MLG / MILEPNT / LRS	CONN # / FIRST STREET / SECOND STREET / INTERSECTION SEQ#	RD CHAR / DIRECT / LOCTN	INT-TYP (MEDIAN) / LEGS / (#LANES)	INT-REL / TRAF- / CNTL	OFFRD / RNDBT / DRVWY	WTHR / SURF / LIGHT	CRASH TYP / COLL TYP / SVRTY	V#	SPCL USE / TRLR QTY / OWNER / VEH TYPE	MOVE / FROM / TO	P#	PRTC TYPE	INJ SVRTY	A G E	S E X	LICNS / RES	PED LOC	ERROR	ACTN EVENT	CAUSE
00460	N N N	06/04/2013	YAMHILL	1 14		INTER	CROSS	N	N	CLR	S-1STOP	01	NONE 0	STRGHT										07
CITY		Tue 7A	NEWBERG	MN 0	PACIFIC HY 99W	SW		TRF SIGNAL	N	DRY	REAR		PRVTE	SW NE									000	00
			NEWBERG UA	22.05	SPRINGBROOK RD	06	0		N	DAY	INJ		PSNGR CAR		01	DRVR	NONE	62	M	OR-Y		026	000	07
No		45 18 23.12 -122 56 48.94		009100100S00	1															OR<25				
												02	NONE 0	STOP										
													PRVTE	SW NE									011	00
													PSNGR CAR		01	DRVR	INJC	44	M	OR-Y		000	000	00
																				OR<25				
00545	N N N	06/26/2013	YAMHILL	1 14		INTER	CROSS	N	N	CLR	S-1STOP	01	NONE 0	STRGHT										07
NONE		Wed 9A	NEWBERG	MN 0	PACIFIC HY 99W	SW		TRF SIGNAL	N	DRY	REAR		PRVTE	SW NE									000	00
			NEWBERG UA	22.05	SPRINGBROOK RD	06	0		N	DAY	PDO		PSNGR CAR		01	DRVR	NONE	00	F	UNK		026	000	07
No		45 18 23.12 -122 56 48.94		009100100S00	1															UNK				
												02	NONE 0	STOP										
													PRVTE	SW NE									011	00
													PSNGR CAR		01	DRVR	NONE	46	F	OR-Y		000	000	00
																				OR<25				
00688	N N N	08/06/2013	YAMHILL	1 14		INTER	CROSS	N	N	UNK	S-1STOP	01	NONE	STRGHT										07
NONE		Tue 3P	NEWBERG	MN 0	PACIFIC HY 99W	SW		TRF SIGNAL	N	UNK	REAR		PRVTE	SW NE									000	00
			NEWBERG UA	22.05	SPRINGBROOK RD	06	0		N	DAY	PDO		PSNGR CAR		01	DRVR	NONE	18	M	OR-Y		026	000	07
No		45 18 23.12 -122 56 48.94		009100100S00	1															OR<25				
												02	NONE 0	STOP										
													PRVTE	SW NE									011	00
													PSNGR CAR		01	DRVR	NONE	51	M	OR-Y		000	000	00
																				OR<25				
01203	N N N	12/31/2013	YAMHILL	1 14		INTER	CROSS	N	N	CLR	S-1STOP	01	NONE 0	STRGHT										07
NO RPT		Tue 5P	NEWBERG	MN 0	PACIFIC HY 99W	SW		TRF SIGNAL	N	DRY	REAR		PRVTE	SW NE									000	00
			NEWBERG UA	22.05	SPRINGBROOK RD	06	2		N	DUSK	INJ		PSNGR CAR		01	DRVR	NONE	41	F	OR-Y		026	000	07
No		45 18 23.12 -122 56 48.94		009100100S00	1															OR<25				
												02	NONE 0	STOP										
													PRVTE	SW NE									011	00
													PSNGR CAR		01	DRVR	INJC	61	F	OR-Y		000	000	00
																				OR<25				
															02	PSNG	INJC	59	M			000	000	00
00391	N N N	04/12/2014	YAMHILL	1 14		INTER	CROSS	N	N	CLR	S-1STOP	01	NONE	STRGHT										07
NONE		Sat 10A	NEWBERG	MN 0	PACIFIC HY 99W	SW		TRF SIGNAL	N	DRY	REAR		PRVTE	SW NE									000	00
			NEWBERG UA	22.05	SPRINGBROOK RD	06	0		N	DAY	INJ		PSNGR CAR		01	DRVR	INJC	26	F	OR-Y		026	000	07
No		45 18 23.12 -122 56 48.94		009100100S00	1															OR<25				
															02	PSNG	NO<5	04	F			000	000	00
															03	PSNG	NO<5	01	M			000	000	00
												02	NONE 0	STOP										
													PRVTE	SW NE									011	00
													PSNGR CAR		01	DRVR	INJC	27	F	OR-Y		000	000	00
																				OR<25				

091 PACIFIC HIGHWAY WEST

OR 99W & Springbrook Rd
January 1, 2011 through December 31, 2015

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      S  D
      P  R S W                                    RD#  FC   CONN #                        INT-TYP                                          SPCL USE
SER#   E A U C O  DATE         COUNTY             CMPT/MLG  FIRST  STREET        RD CHAR (MEDIAN)   INT-REL  OFFRD WTHR  CRASH TYP   TRLR QTY   MOVE                        A  S
INVEST E L G H R  DAY/TIME     CITY               MILEPNT   SECOND STREET        DIRECT    LEGS     TRAF-    RNDBT SURF  COLL TYP    OWNER      FROM       PRTC  INJ        G  E  LICNS PED
UNLOC? D C S L K  LAT/LONG     URBAN AREA         LRS       INTERSECTION SEQ#    LOCTN    (#LANES)  CNTL     DRVWY LIGHT SVRTY    V# VEH TYPE   TO      P# TYPE  SVRTY     E  X  RES   LOC ERROR     ACTN EVENT     CAUSE

01251  N N N      11/19/2014  YAMHILL           1    14                          INTER     CROSS    N             N CLR   S-1STOP   01 NONE   0 STRGHT                                                               29
NO RPT            Wed    1P   NEWBERG           MN    0   PACIFIC HY 99W         SW                 TRF SIGNAL    N DRY   REAR         PRVTE      SW NE                                              000              00
                              NEWBERG UA         22.05    SPRINGBROOK RD         06          2                    N DAY   PDO          PSNGR CAR          01 DRVR  NONE   51 M  OTH-Y       026       000              29
No      45 18 23.12  -122 56 48.94              009100100S00              1                                                                                                 N-RES

                                                                                                                                        02 NONE   0 STOP
                                                                                                                                           PRVTE      SW NE                                              011              00
                                                                                                                                           PSNGR CAR          01 DRVR  NONE   64 F  OR-Y        000       000              00
                                                                                                                                                                                    OR<25

00214  N N N N N  02/28/2015  YAMHILL           1    14                          INTER     CROSS    N             N CLR   S-STRGHT  01 NONE   0 STRGHT                                                               07
CITY              Sat    5P   NEWBERG           MN    0   PACIFIC HY 99W         SW                 TRF SIGNAL    N DRY   REAR         PRVTE      SW NE                                              000              00
                              NEWBERG UA         22.05    SPRINGBROOK RD         06          2                    N DAY   INJ          PSNGR CAR          01 DRVR  NONE   52 M  OR-Y        043       000              07
No      45 18 23.12  -122 56 48.94              009100100S00              1                                                                                                 OR<25

                                                                                                                                        02 NONE   0 STRGHT
                                                                                                                                           PRVTE      SW NE                                              006              00
                                                                                                                                           PSNGR CAR          01 DRVR  INJC   32 M  OR-Y        000       000              00
                                                                                                                                                                                    OR<25

00379  N N N N N  04/23/2015  YAMHILL           1    14                          INTER     CROSS    N             N CLD   S-1STOP   01 NONE   0 STRGHT                                                               32,29
CITY              Thu   11A   NEWBERG           MN    0   PACIFIC HY 99W         SW                 TRF SIGNAL    N DRY   REAR         PRVTE      SW NE                                              000              00
                              NEWBERG UA         22.05    SPRINGBROOK RD         06          2                    N DAY   PDO          PSNGR CAR          01 DRVR  NONE   22 F  OR-Y        052,026   000              32,29
No      45 18 23.12  -122 56 48.94              009100100S00              1                                                                                                 OR<25

                                                                                                                                        02 NONE   0 STOP
                                                                                                                                           PRVTE      SW NE                                              011              00
                                                                                                                                           PSNGR CAR          01 DRVR  NONE   66 M  OR-Y        000       000              00
                                                                                                                                                                                    OR<25

00296  N N N      03/23/2014  YAMHILL           1    14                          INTER     CROSS    N             N CLR   S-1STOP   01 NONE   0 TURN-R                                                               27
NONE              Sun    6P   NEWBERG           MN    0   PACIFIC HY 99W         SW                 YIELD         N DRY   REAR         PRVTE      SW S                                               000              00
                              NEWBERG UA         22.05    SPRINGBROOK RD         09          2                    N DARK  PDO          PSNGR CAR          01 DRVR  NONE   39 M  OR-Y        026       000              27
No      45 18 23.12  -122 56 48.94              009100100S00              1                                                                                                 OR<25

                                                                                                                                        02 NONE   0 STOP
                                                                                                                                           PRVTE      SW S                                               011              00
                                                                                                                                           PSNGR CAR          01 DRVR  NONE   00 F  UNK         000       000              00
                                                                                                                                                                                    UNK

00038  Y N N      01/12/2011  YAMHILL           1    14                          INTER     CROSS    N             N RAIN  S-STRGHT  01 NONE   0 STRGHT                                                               01
NONE              Wed    5P   NEWBERG           MN    0   PACIFIC HY 99W         W                  TRF SIGNAL    N WET   REAR         PRVTE      W  E                                               000              00
                              NEWBERG UA         22.05    SPRINGBROOK RD         06          0                    N DARK  INJ          PSNGR CAR          01 DRVR  NONE   58 F  OR-Y        042       000              01
No      45 18 23.12  -122 56 48.94              009100100S00              1                                                                                                 OR<25

                                                                                                                                        02 NONE   0 STRGHT
                                                                                                                                           PRVTE      W  E                                               000              00
                                                                                                                                           PSNGR CAR          01 DRVR  INJC   47 F  OR-Y        000       000              00
                                                                                                                                                                                    OR<25
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      S  D
      P   R S W                           RD#  FC   CONN #                         INT-TYP                                  SPCL USE
SER#  E A U C O  DATE        COUNTY       CMPT/MLG  FIRST  STREET      RD CHAR (MEDIAN)  INT-REL  OFFRD WTHR  CRASH TYP   TRLR QTY  MOVE                   A  S
INVEST E L G H R DAY/TIME    CITY         MILEPNT   SECOND STREET      DIRECT     LEGS   TRAF-    RNDBT SURF  COLL TYP    OWNER     FROM       PRTC  INJ    G  E  LICNS PED
UNLOC? D C S L K LAT/LONG    URBAN AREA   LRS       INTERSECTION SEQ#  LOCTN  (#LANES) CNTL     DRVWY LIGHT SVRTY    V# VEH TYPE  TO     P# TYPE  SVRTY  E  X  RES   LOC  ERROR        ACTN EVENT      CAUSE

00168  N N N     03/02/2011 YAMHILL       1    14                      INTER    CROSS  N          N UNK  S-1STOP   01 NONE       STRGHT                                                                07,27
NONE             Wed     4P NEWBERG       MN   0   PACIFIC HY 99W      W               UNKNOWN    N UNK  REAR         PRVTE      W  E                                                  000              00
                            NEWBERG UA     22.05   SPRINGBROOK RD      06          0              N DAY  PDO         PSNGR CAR          01 DRVR NONE  34 M OR-Y       026          000              07,27
No     45 18 23.12  -122 56 48.94         009100100S00             1                                                                                    OR<25

                                                                                                      02 NONE    0 STOP
                                                                                                         PRVTE      W  E                                                  011              00
                                                                                                         PSNGR CAR          01 DRVR NONE  35 M OR-Y       000          000              00
                                                                                                                                               OR<25

00493  Y N N     07/01/2011 YAMHILL       1    14                      INTER    CROSS  N          N CLR  S-1STOP   01 NONE    0 STRGHT                                                                01
CITY             Fri    12P NEWBERG       MN   0   PACIFIC HY 99W      W               TRF SIGNAL N DRY  REAR         PRVTE      E  W                                                  000              00
                            NEWBERG UA     22.05   SPRINGBROOK RD      06          0              N DAY  PDO         PSNGR CAR          01 DRVR NONE  00 U UNK        026          000              01
No     45 18 23.12  -122 56 48.94         009100100S00             1                                                                                    UNK

                                                                                                      02 NONE    0 STOP
                                                                                                         PRVTE      E  W                                                  011              00
                                                                                                         PSNGR CAR          01 DRVR NONE  37 F OR-Y       000          000              00
                                                                                                                                               OR<25
                                                                                                                            02 PSNG NO<5  01 M            000          000              00

00686  N N N     08/24/2011 YAMHILL       1    14                      INTER    CROSS  N          N CLR  S-1STOP   01 NONE       STRGHT                                                                07
NONE             Wed     4P NEWBERG       MN   0   PACIFIC HY 99W      W               UNKNOWN    N DRY  REAR         PRVTE      W  E                                                  000              00
                            NEWBERG UA     22.05   SPRINGBROOK RD      06          0              N DAY  PDO         PSNGR CAR          01 DRVR NONE  52 F OR-Y       026          000              07
No     45 18 23.12  -122 56 48.94         009100100S00             1                                                                                    OR<25

                                                                                                      02 NONE       STOP
                                                                                                         PRVTE      W  E                                                  011              00
                                                                                                         PSNGR CAR          01 DRVR NONE  34 F OR-Y       000          000              00
                                                                                                                                               OR<25

00138  N N N     02/21/2013 YAMHILL       1    14                      INTER    CROSS  N          N CLR  S-1STOP   01 NONE    0 STRGHT                                                                07
NONE             Thu     3P NEWBERG       MN   0   PACIFIC HY 99W      W               YIELD      N DRY  REAR         PRVTE      W  E                                                  000              00
                            NEWBERG UA     22.05   SPRINGBROOK RD      06          2              N DAY  INJ         PSNGR CAR          01 DRVR NONE  00 M UNK        026          000              07
No     45 18 23.12  -122 56 48.94         009100100S00             1                                                                                    OR>25

                                                                                                      02 NONE    0 STOP
                                                                                                         PRVTE      W  E                                                  011              00
                                                                                                         PSNGR CAR          01 DRVR INJC  32 M OR-Y       000          000              00
                                                                                                                                               OR>25

00468  N N N     05/01/2014 YAMHILL       1    14                      INTER    CROSS  N          N CLR  S-1STOP   01 NONE    0 STRGHT                                                                27
NONE             Thu     7A NEWBERG       MN   0   PACIFIC HY 99W      W               TRF SIGNAL N DRY  REAR         PRVTE      W  E                                                  000              00
                            NEWBERG UA     22.05   SPRINGBROOK RD      06          0              N DAY  INJ         PSNGR CAR          01 DRVR NONE  51 M OR-Y       026          000              27
No     45 18 23.12  -122 56 48.94         009100100S00             1                                                                                    OR<25

                                                                                                      02 NONE    0 STOP
                                                                                                         PRVTE      W  E                                                  011              00
                                                                                                         PSNGR CAR          01 DRVR INJC  55 M OR-Y       000          000              00
                                                                                                                                               OR<25
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091 PACIFIC HIGHWAY WEST

OR 99W & Springbrook Rd
January 1, 2011 through December 31, 2015

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      S  D
      P   R S W                                RD#  FC   CONN #                          INT-TYP                                      SPCL USE
SER#   E A U C O  DATE        COUNTY           CMPT/MLG  FIRST  STREET       RD CHAR (MEDIAN)  INT-REL  OFFRD WTHR  CRASH TYP    TRLR QTY  MOVE                          A  S
INVEST E L G H R  DAY/TIME    CITY             MILEPNT   SECOND STREET       DIRECT    LEGS    TRAF-    RNDBT SURF  COLL TYP     OWNER     FROM      PRTC INJ     G  E  LICNS PED
UNLOC? D C S L K  LAT/LONG    URBAN AREA       LRS       INTERSECTION SEQ#   LOCTN   (#LANES)  CNTL     DRVWY LIGHT SVRTY     V# VEH TYPE  TO    P# TYPE SVRTY  E  X  RES   LOC ERROR         ACTN EVENT        CAUSE

00821  N N N     09/21/2012  YAMHILL          1    14                        INTER     CROSS   N            N RAIN  O-1 L-TURN 01 NONE     0 STRGHT                                                                  04
NO RPT            Fri    6A  NEWBERG          MN    0   PACIFIC HY 99W       CN                L-GRN-SIG    N WET   TURN          PRVTE      NE SW                                            000               00
                             NEWBERG UA        22.05    SPRINGBROOK RD       02           2                 N DAY   PDO          PSNGR CAR          01 DRVR NONE  00 F UNK        020         000               04
No     45 18 23.12  -122 56 48.94            009100100S00              1                                                                                          UNK

                                                                                                                               02 NONE     0 TURN-L
                                                                                                                                  PRVTE      SW N                                             000               00
                                                                                                                                 PSNGR CAR          01 DRVR NONE  22 M OR-Y       000         000               00
                                                                                                                                                                   OR<25

01045  N N N     11/15/2012  YAMHILL          1    14                        INTER     CROSS   N            N CLD   S-1STOP    01 NONE     0 STRGHT                                                    092           07,14
NONE              Thu    3P  NEWBERG          MN    0   PACIFIC HY 99W       CN                TRF SIGNAL   N DRY   REAR          PRVTE      NE SW                                            000               00
                             NEWBERG UA        22.05    SPRINGBROOK RD       02           2                 N DAY   INJ          PSNGR CAR          01 DRVR NONE  25 F OR-Y       026         000               07,14
No     45 18 23.12  -122 56 48.94            009100100S00              1                                                                                          OR<25

                                                                                                                               02 NONE     0 STOP
                                                                                                                                  PRVTE      NE SW                                            011               00
                                                                                                                                 PSNGR CAR          01 DRVR INJC  30 M OR-Y       000         000               00
                                                                                                                                                                   OR<25

00400  N N N     05/28/2011  YAMHILL          1    14                        INTER     CROSS   N            N CLR   S-1STOP    01 NONE     0 STRGHT                                                                  07
NO RPT            Sat    4P  NEWBERG          MN    0   PACIFIC HY 99W       CN                TRF SIGNAL   N DRY   REAR          PRVTE      W  E                                             000               00
                             NEWBERG UA        22.05    SPRINGBROOK RD       03           2                 N DAY   PDO          PSNGR CAR          01 DRVR NONE  68 M OR-Y       026         000               07
No     45 18 23.12  -122 56 48.94            009100100S00              1                                                                                          OR>25

                                                                                                                               02 NONE     0 STOP
                                                                                                                                  PRVTE      W  E                                             011               00
                                                                                                                                 PSNGR CAR          01 DRVR NONE  33 F OR-Y       000         000               00
                                                                                                                                                                   OR<25

00272  N N N N N 03/27/2012  YAMHILL          1    14                        INTER     CROSS   N            N RAIN  ANGL-OTH   01 NONE     0 STRGHT                                                                  03
CITY              Tue    9P  NEWBERG          MN    0   PACIFIC HY 99W       CN                TRF SIGNAL   N WET   ANGL          PRVTE      W  E                                             000               00
                             NEWBERG UA        22.05    SPRINGBROOK RD       03           0                 N DARK  INJ          PSNGR CAR          01 DRVR NONE  17 F OR-Y       021         000               03
No     45 18 23.12  -122 56 48.94            009100100S00              1                                                                                          OR<25

                                                                                                                               02 NONE     0 STRGHT
                                                                                                                                  PRVTE      N  S                                             000               00
                                                                                                                                 PSNGR CAR          01 DRVR INJC  63 M OR-Y       000         000               00
                                                                                                                                                                   OR<25

00922  N N N N N 10/15/2012  YAMHILL          1    14                        INTER     CROSS   N            N RAIN  ANGL-OTH   01 NONE     0 STRGHT                                                                  02
CITY              Mon    7P  NEWBERG          MN    0   PACIFIC HY 99W       CN                TRF SIGNAL   N WET   ANGL          PRVTE      W  E                                             000               00
                             NEWBERG UA        22.05    SPRINGBROOK RD       03           2                 N DARK  PDO          PSNGR CAR          01 DRVR NONE  65 M OR-Y       028         000               02
No     45 18 23.12  -122 56 48.94            009100100S00              1                                                                                          OR<25

                                                                                                                               02 NONE     0 STRGHT
                                                                                                                                  PRVTE      N  S                                             015               00
                                                                                                                                 PSNGR CAR          01 DRVR NONE  56 M OR-Y       000         000               00
                                                                                                                                                                   OR<25
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091 PACIFIC HIGHWAY WEST

OR 99W & Springbrook Rd
January 1, 2011 through December 31, 2015

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      S  D
      P  R S W                                 RD#  FC   CONN #                        INT-TYP                                        SPCL USE
SER#  E A U C O DATE        COUNTY             CMPT/MLG  FIRST  STREET      RD CHAR (MEDIAN)  INT-REL OFFRD WTHR  CRASH TYP    TRLR QTY  MOVE                       A  S
INVEST E L G H R DAY/TIME   CITY               MILEPNT   SECOND STREET      DIRECT     LEGS   TRAF-   RNDBT SURF  COLL TYP     OWNER     FROM       PRTC INJ     G  E LICNS PED
UNLOC? D C S L K LAT/LONG   URBAN AREA         LRS       INTERSECTION SEQ#  LOCTN   (#LANES) CNTL     DRVWY LIGHT SVRTY     V# VEH TYPE  TO     P# TYPE SVRTY E  X RES   LOC ERROR        ACTN EVENT      CAUSE

00683  N N N N N 07/10/2015 YAMHILL           1    14                       INTER      CROSS  N            N CLR   O-1 L-TURN 01 NONE   0 STRGHT                                                             04
CITY            Fri   11P  NEWBERG           MN    0   PACIFIC HY 99W       CN                TRF SIGNAL  N DRY   TURN          PRVTE     SW NE                                           000              00
                           NEWBERG UA         22.05    SPRINGBROOK RD       03           2                N DLIT  PDO          PSNGR CAR         01 DRVR NONE  23 M OR-Y      020          000              04
No      45 18 23.12  -122 56 48.94           009100100S00              1                                                                                    OR<25

                                                                                                                      02 NONE   0 TURN-L
                                                                                                                         PRVTE     NE S                                            015              00
                                                                                                                        PSNGR CAR         01 DRVR NONE  23 M OR-Y      000          000              00
                                                                                                                                                            OR<25

01301  N N N     12/01/2014 YAMHILL           1    14                       INTER      CROSS  N            N RAIN  O-OTHER    01 NONE   0 TURN-R                                                             08,02
NONE            Mon   11A  NEWBERG           MN    0   PACIFIC HY 99W       CN                TRF SIGNAL  N WET   TURN          PRVTE     S  NE                                           016              00
                           NEWBERG UA         22.05    SPRINGBROOK RD       04           2                N DAY   INJ          PSNGR CAR         01 DRVR NONE  54 F OR-Y      028          000              02
No      45 18 23.12  -122 56 48.94           009100100S00              1                                                                                    OR<25

                                                                                                                      02 NONE   0 TURN-L
                                                                                                                         PRVTE     N  NE                                           000              00
                                                                                                                        PSNGR CAR         01 DRVR INJC  18 F OR-Y      007          000              08
                                                                                                                                                            OR<25

00073  N N N N N 01/21/2015 YAMHILL           1    14                       INTER      CROSS  N            N CLR   O-1 L-TURN 01 NONE   0 TURN-L                                                             04,27
CITY            Wed    6A  NEWBERG           MN    0   PACIFIC HY 99W       CN                TRF SIGNAL  N DRY   TURN          PRVTE     N  NE                                           015              00
                           NEWBERG UA         22.05    SPRINGBROOK RD       04           2                N DLIT  PDO          PSNGR CAR         01 DRVR NONE  45 F OR-Y      020,004,016  000              04,27
No      45 18 23.12  -122 56 48.94           009100100S00              1                                                                                    OR<25

                                                                                                                      02 NONE   0 STRGHT
                                                                                                                         PRVTE     S  N                                            000              00
                                                                                                                        PSNGR CAR         01 DRVR NONE  74 F OR-Y      000          000              00
                                                                                                                                                            OR<25

00445  N N N     04/23/2014 YAMHILL           1    14                       INTER      CROSS  N            N RAIN  S-STRGHT   01 NONE   0 STRGHT                                                             13
NONE            Wed    4P  NEWBERG           MN    0   PACIFIC HY 99W       W                 TRF SIGNAL  N WET   REAR          PRVTE     W  E                                            000              00
                           NEWBERG UA         22.06    SPRINGBROOK RD       06           2                N DAY   PDO          PSNGR CAR         01 DRVR NONE  25 M OR-Y      045          000              13
No      45 18 23.12  -122 56 48.94           009100100S00              1                                                                                    OR<25

                                                                                                                      02 NONE   0 STRGHT
                                                                                                                         PRVTE     W  E                                            000              00
                                                                                                                        PSNGR CAR         01 DRVR NONE  21 F OR-Y      000          000              00
                                                                                                                                                            OR<25
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TRANSPORTATION DATA SECTION - CRASH ANALYSIS AND REPORTING UNIT
URBAN NON-SYSTEM CRASH LISTING

CITY OF NEWBERG, YAMHILL COUNTY

OR 99W & Springbrook Rd
January 1, 2011 through December 31, 2015

```
       S   D
       P   R S W                            CITY STREET                          INT-TYP                                              SPCL USE
SER#   E A U C O  DATE                      FIRST STREET          RD CHAR      (MEDIAN) INT-REL OFF-RD WTHR   CRASH TYP       TRLR QTY  MOVE                     A S
INVEST E L G H R  DAY/TIME      FC          SECOND STREET         DIRECT        LEGS    TRAF-   RNDBT  SURF   COLL TYP        OWNER     FROM      PRTC INJ       G E LICNS  PED
UNLOC? D C S L K  LAT/LONG      DISTNC      INTERSECTION SEQ #    LOCTN       (#LANES)  CONTL   DRVWY  LIGHT  SVRTY      V#   VEH TYPE  TO     P# TYPE SVRTY     E X RES    LOC ERROR        ACTN EVENT      CAUSE

01068  N N N      11/07/2011  16      PACIFIC HY 99W          INTER         CROSS    N              N CLR  S-1STOP    01 NONE    0 STRGHT                                                                   07
NO RPT            Mon    7A    0      SPRINGBROOK RD          N                      TRF SIGNAL     N WET  REAR          PUBLC      N  S                                                 000            00
No     45 18 23.13  -122 56 48.94      1                      06              0                     N DAY  PDO           SCHL BUS           01 DRVR NONE  00 U UNK         026         000            07
                                                                                                                                                              UNK

                                                                                                                 02 NONE    0 STOP
                                                                                                                    PRVTE      N  S                                                 011            00
                                                                                                                    PSNGR CAR          01 DRVR NONE  51 F OR-Y        000         000            00
                                                                                                                                                              OR<25

00064  N N N N N  01/21/2011  14      PACIFIC HY 99W          INTER         CROSS    N              N CLR  S-1STOP    01 NONE    0 STRGHT                                                                   07
NONE              Fri    4P    0      SPRINGBROOK RD          S                      TRF SIGNAL     N DRY  REAR          PRVTE      S  N                                                 000            00
Yes    45 18 23.14  -122 56 48.90      1                      06              0                     N DAY  PDO           PSNGR CAR          01 DRVR NONE  00 M OR-Y        026         000            07
                                                                                                                                                              OR<25

                                                                                                                 02 NONE    0 STOP
                                                                                                                    PRVTE      S  N                                                 011            00
                                                                                                                    PSNGR CAR          01 DRVR NONE  36 F OR-Y        000         000            00
                                                                                                                                                              OR<25

00790  N N N N N  09/30/2011  14      PACIFIC HY 99W          INTER         CROSS    N              N CLR  S-1STOP    01 NONE    0 STRGHT                                                                   07
CITY              Fri    3P    0      SPRINGBROOK RD          S                      TRF SIGNAL     N DRY  REAR          PRVTE      S  N                                                 000            00
No     45 18 23.13  -122 56 48.94      1                      06              0                     N DAY  PDO           PSNGR CAR          01 DRVR NONE  32 F OR-Y        026         000            07
                                                                                                                                                              OR<25

                                                                                                                 02 NONE    0 STOP
                                                                                                                    PRVTE      S  N                                                 011            00
                                                                                                                    PSNGR CAR          01 DRVR NONE  31 F OR-Y        000         000            00
                                                                                                                                                              OR<25
                                                                                                                                       02 PSNG NO<5  02 F             000         000            00

00604  N N N      07/17/2012  16      PACIFIC HY 99W          INTER         CROSS    N              N RAIN S-1STOP    01 NONE    0 STRGHT                                                                   07
NONE              Tue   11A    0      SPRINGBROOK RD          S                      TRF SIGNAL     N WET  REAR          PRVTE      S  N                                                 000            00
No     45 18 23.12  -122 56 48.94      1                      06              0                     N DAY  PDO           PSNGR CAR          01 DRVR NONE  00 M UNK         026         000            07
                                                                                                                                                              UNK

                                                                                                                 02 NONE    0 STOP
                                                                                                                    PRVTE      S  N                                                 011            00
                                                                                                                    PSNGR CAR          01 DRVR NONE  62 F OR-Y        000         000            00
                                                                                                                                                              OR<25

00744  N N N      07/11/2014  16      PACIFIC HY 99W          INTER         CROSS    N              N CLR  S-1STOP    01 NONE    0 STRGHT                                                                   07
NONE              Fri    6A    0      SPRINGBROOK RD          S                      TRF SIGNAL     N DRY  REAR          PRVTE      S  N                                                 000            00
No     45 18 23.12  -122 56 48.94      1                      06              0                     N DAY  INJ           PSNGR CAR          01 DRVR NONE  00 M UNK         026         000            07
                                                                                                                                                              UNK

                                                                                                                 02 NONE    0 STOP
                                                                                                                    PRVTE      S  N                                                 011            00
                                                                                                                    PSNGR CAR          01 DRVR INJC  43 F OR-Y        000         000            00
                                                                                                                                                              OR<25

01229  N N N      11/26/2015  14      PACIFIC HY 99W          INTER         CROSS    N              N CLR  O-1STOP    01 NONE    0 BACK                                                                     10
NONE              Thu    1P    0      SPRINGBROOK RD          S                      TRF SIGNAL     N DRY  BACK          PRVTE      N  S                                                 000            00
No     45 18 23.15  -122 56 48.95      1                      06              2                     N DAY  PDO           PSNGR CAR          01 DRVR NONE  00 M UNK         011         000            10
                                                                                                                                                              OR<25
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CITY OF NEWBERG, YAMHILL COUNTY

OR 99W & Springbrook Rd

January 1, 2011 through December 31, 2015

SER# INVEST UNLOC?	S P E E D	A L C	D R U G S	S C H L	W O R K	DATE DAY/TIME *LAT/LONG*	FC DISTNC	CITY STREET FIRST STREET SECOND STREET INTERSECTION SEQ #	RD CHAR DIRECT LOCTN	INT-TYP (MEDIAN) LEGS (#LANES)	INT-REL TRAF-CONTL	OFF-RD RNDBT DRVWY	WTHR SURF LIGHT	CRASH TYP COLL TYP SVRTY	V#	SPCL USE TRLR QTY OWNER VEH TYPE	MOVE FROM TO	P#	PRTC TYPE	INJ SVRTY	AGE	SEX	LICNS RES	PED LOC	ERROR	ACTN	EVENT	CAUSE
															02	NONE 0	STOP											
																PRVTE	S N									011		00
																PSNGR CAR		01	DRVR	NONE	48	F	OR-Y		000	000		00
																							OR<25					

TRANSPORTATION DATA SECTION - CRASH ANALYSIS AND REPORTING UNIT

CONTINUOUS SYSTEM CRASH LISTING

091 PACIFIC HIGHWAY WEST

OR 99W & Brutscher St

January 1, 2011 through December 31, 2015

```
      S  D
      P  R S W                                RD# FC   CONN #                    INT-TYP                                     SPCL USE
SER#  E A U C O DATE       COUNTY             CMPT/MLG FIRST STREET     RD CHAR (MEDIAN)  INT-REL OFFRD WTHR  CRASH TYP   TRLR QTY  MOVE                    A S
INVEST E L G H R DAY/TIME  CITY               MILEPNT  SECOND STREET    DIRECT    LEGS    TRAF-   RNDBT SURF  COLL TYP    OWNER     FROM     PRTC INJ     G E LICNS PED
UNLOC? D C S L K LAT/LONG  URBAN AREA         LRS      INTERSECTION SEQ# LOCTN  (#LANES) CNTL     DRVWY LIGHT SVRTY    V# VEH TYPE  TO    P# TYPE SVRTY E X RES   LOC ERROR        ACTN EVENT       CAUSE

00415  N N N    05/19/2012 YAMHILL         1   14                   INTER     3-LEG  N          N CLR  S-1STOP   01 NONE    0 STRGHT                                             013           07
NO RPT          Sat   10A  NEWBERG         MN   0  BRUTSCHER ST     NE               TRF SIGNAL N DRY  REAR        PRVTE     NE SW                                         000                00
                           NEWBERG UA       21.80  PACIFIC HY 99W   06          0               N DAY  INJ        PSNGR CAR        01 DRVR NONE  31 M OR-Y      026        000                07
No     45 18 28.53  -122 56 31.38      009100100S00           1                                                                                  OR<25

                                                                                                            02 NONE    0 STOP
                                                                                                               PRVTE     NE SW                                         011  013           00
                                                                                                              PSNGR CAR        01 DRVR NONE  36 F OR-Y      000        000                00
                                                                                                                                                 OR<25

                                                                                                            03 NONE    0 STOP
                                                                                                               PRVTE     NE SW                                         011                00
                                                                                                              PSNGR CAR        01 DRVR INJC  38 M OR-Y      000        000                00
                                                                                                                                                 OR<25

00518  N N N    06/22/2012 YAMHILL         1   14                   INTER     3-LEG  N          N RAIN S-1STOP   01 NONE    0 STRGHT                                                           27
NO RPT          Fri    4P  NEWBERG         MN   0  BRUTSCHER ST     NE               TRF SIGNAL N WET  REAR        PRVTE     NE SW                                         000                00
                           NEWBERG UA       21.80  PACIFIC HY 99W   06          0               N DAY  INJ        PSNGR CAR        01 DRVR NONE  20 F OR-Y      026        000                27
No     45 18 28.53  -122 56 31.38      009100100S00           1                                                                                  OR<25

                                                                                                            02 NONE    0 STOP
                                                                                                               PRVTE     NE SW                                         011                00
                                                                                                              PSNGR CAR        01 DRVR INJC  42 F OR-Y      000        000                00
                                                                                                                                                 OR<25

00907  N N N    10/04/2012 YAMHILL         1   14                   INTER     CROSS  N          N CLR  S-1STOP   01 NONE    0 STRGHT                                                           07
NONE            Thu    5P  NEWBERG         MN   0  BRUTSCHER ST     NE               TRF SIGNAL N DRY  REAR        PRVTE     NE SW                                         000                00
                           NEWBERG UA       21.80  PACIFIC HY 99W   06          0               N DAY  PDO        PSNGR CAR        01 DRVR NONE  26 M OR-Y      026        000                07
No     45 18 28.53  -122 56 31.38      009100100S00           1                                                                                  OR<25

                                                                                                            02 NONE    0 STOP
                                                                                                               PRVTE     NE SW                                         011                00
                                                                                                              PSNGR CAR        01 DRVR NONE  40 M OR-Y      000        000                00
                                                                                                                                                 OR<25

00829  N N N    09/23/2013 YAMHILL         1   14                   INTER     3-LEG  N          N RAIN S-1STOP   01 NONE    0 STRGHT                                                           07
NONE            Mon    2P  NEWBERG         MN   0  BRUTSCHER ST     NE               TRF SIGNAL N WET  REAR        PRVTE     NE SW                                         000                00
                           NEWBERG UA       21.80  PACIFIC HY 99W   06          0               N DAY  INJ        PSNGR CAR        01 DRVR NONE  40 F OR-Y      026        000                07
No     45 18 28.53  -122 56 31.38      009100100S00           1                                                                                  OR<25

                                                                                                            02 NONE    0 STOP
                                                                                                               PRVTE     NE SW                                         011                00
                                                                                                              PSNGR CAR        01 DRVR INJC  71 M OR-Y      000        000                00
                                                                                                                                                 OR<25

01413  N N N    12/30/2014 YAMHILL         1   14                   INTER     3-LEG  N          N CLR  S-1STOP   01 NONE    0 STRGHT                                                           29
NO RPT          Tue    2P  NEWBERG         MN   0  BRUTSCHER ST     NE               TRF SIGNAL N DRY  REAR        PRVTE     NE SW                                         000                00
                           NEWBERG UA       21.80  PACIFIC HY 99W   06          0               N DAY  PDO        PSNGR CAR        01 DRVR NONE  33 M OR-Y      026        000                29
No     45 18 28.53  -122 56 31.38      009100100S00           1                                                                                  OR<25
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TRANSPORTATION DATA SECTION - CRASH ANALYSIS AND REPORTING UNIT
CONTINUOUS SYSTEM CRASH LISTING

091 PACIFIC HIGHWAY WEST

OR 99W & Brutscher St
January 1, 2011 through December 31, 2015

```
      S  D
      P   R S W                                 RD#  FC   CONN #                          INT-TYP                                        SPCL USE
SER#   E A U C O  DATE        COUNTY            CMPT/MLG  FIRST  STREET        RD CHAR (MEDIAN)  INT-REL  OFFRD WTHR  CRASH TYP    TRLR QTY  MOVE                       A  S
INVEST E L G H R  DAY/TIME    CITY              MILEPNT   SECOND STREET        DIRECT     LEGS    TRAF-   RNDBT SURF  COLL TYP     OWNER     FROM       PRTC  INJ     G  E  LICNS PED
UNLOC? D C S L K  LAT/LONG    URBAN AREA        LRS       INTERSECTION SEQ#    LOCTN    (#LANES)  CNTL    DRVWY LIGHT SVRTY     V# VEH TYPE  TO     P# TYPE  SVRTY  E  X  RES   LOC ERROR       ACTN EVENT       CAUSE

                                                                                                                                  02 NONE   0 STOP
                                                                                                                                     PRVTE     NE SW                                                 011              00
                                                                                                                                    PSNGR CAR         01 DRVR NONE  19 M OR-Y       000          000              00
                                                                                                                                                                          OR<25

00441  N N N     05/08/2015 YAMHILL          1    14                           INTER      3-LEG  N          N CLR  S-1STOP    01 NONE   0 STRGHT                                                                  29
NONE             Fri   UNK  NEWBERG          MN    0   BRUTSCHER ST            NE                TRF SIGNAL N DRY  REAR          UNKN      NE SW                                                 000              00
                            NEWBERG UA        21.80    PACIFIC HY 99W          06           0               N DAY  PDO           UNKNOWN          01 DRVR NONE  00 U UNK        026          000              29
No      45 18 28.53  -122 56 31.38          009100100S00              1                                                                                                   UNK

                                                                                                                                  02 NONE   0 STOP
                                                                                                                                     PRVTE     NE SW                                                 011              00
                                                                                                                                    PSNGR CAR         01 DRVR NONE  78 M OR-Y       000          000              00
                                                                                                                                                                          OR<25

00661  N N N     08/18/2011 YAMHILL          1    14                           INTER      3-LEG  N          N CLR  S-1STOP    01 NONE   0 STRGHT                                                      013         32
NO RPT           Thu    5P  NEWBERG          MN    0   BRUTSCHER ST            E                 UNKNOWN    N DRY  REAR          PRVTE     E  W                                                  000              00
                            NEWBERG UA        21.80    PACIFIC HY 99W          06           0               N DAY  INJ          PSNGR CAR         01 DRVR INJB  35 F OR-Y       052,026      000              32
No      45 18 28.53  -122 56 31.38          009100100S00              1                                                                                                   OR<25

                                                                                                                                  02 NONE   0 STOP
                                                                                                                                     PRVTE     E  W                                                  011  013         00
                                                                                                                                    PSNGR CAR         01 DRVR INJC  43 M OR-Y       000          000              00
                                                                                                                                                                          OR<25

                                                                                                                                  03 NONE   0 STOP
                                                                                                                                     PRVTE     E  W                                                  011              00
                                                                                                                                    PSNGR CAR         01 DRVR NONE  59 M OR-Y       000          000              00
                                                                                                                                                                          OR<25

01018  N N N     11/09/2012 YAMHILL          1    14                           INTER      CROSS  N          N CLD  ANGL-STP   01 NONE   0 TURN-L                                                      092         32,27
CITY             Fri    5P  NEWBERG          MN    0   BRUTSCHER ST            SW                TRF SIGNAL N DRY  TURN          PRVTE     SE SW                                                 000              00
                            NEWBERG UA        21.80    PACIFIC HY 99W          05           0               N DUSK PDO          PSNGR CAR         01 DRVR NONE  44 M OR-Y       052,016      038              32,27
No      45 18 28.53  -122 56 31.38          009100100S00              1                                                                                                   OR<25

                                                                                                                                  02 NONE   0 STOP
                                                                                                                                     PRVTE     NE SW                                                 011  092         00
                                                                                                                                    PSNGR CAR         01 DRVR NONE  71 M OR-Y       000          000              00
                                                                                                                                                                          OR<25

00469  N N N N N 06/11/2012 YAMHILL          1    14                           INTER      3-LEG  N          N CLR  S-1STOP    01 NONE   0 STRGHT                                                                  27
CITY             Mon   10A  NEWBERG          MN    0   BRUTSCHER ST            SW                TRF SIGNAL N DRY  REAR          PRVTE     SW NE                                                 000              00
                            NEWBERG UA        21.80    PACIFIC HY 99W          06           0               N DAY  INJ          PSNGR CAR         01 DRVR NONE  22 F OR-Y       026          000              27
No      45 18 28.53  -122 56 31.38          009100100S00              1                                                                                                   OR<25

                                                                                                                                  02 NONE   0 STOP
                                                                                                                                     PRVTE     SW NE                                                 011              00
                                                                                                                                    PSNGR CAR         01 DRVR INJB  46 F OR-Y       000          000              00
                                                                                                                                                                          OR<25
                                                                                                                                                      02 PSNG INJB  25 F            000          000              00
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091 PACIFIC HIGHWAY WEST

OR 99W & Brutscher St
January 1, 2011 through December 31, 2015

SER# / INVEST / UNLOC?	S P E L D C / A U C S / D R G L / S H K / W O R	DATE / DAY/TIME / *LAT/LONG*	COUNTY / CITY / URBAN AREA	RD# FC / CMPT/MLG / MILEPNT / LRS	CONN # / FIRST STREET / SECOND STREET / INTERSECTION SEQ#	RD CHAR / DIRECT / LOCTN	INT-TYP (MEDIAN) LEGS (#LANES)	INT-REL / TRAF- CNTL	OFFRD / RNDBT / DRVWY	WTHR / SURF / LIGHT	CRASH TYP / COLL TYP / SVRTY	V# SPCL USE TRLR QTY / OWNER / VEH TYPE	MOVE / FROM / TO	P#	PRTC TYPE	INJ SVRTY	A G E	S E X	LICNS RES	PED LOC	ERROR	ACTN	EVENT	CAUSE
00585	N N N N N	07/09/2013	YAMHILL	1 14		INTER	3-LEG	N	N	CLR	S-1STOP	01 NONE 0	STRGHT											07
CITY		Tue 6A	NEWBERG	MN 0	BRUTSCHER ST	SW		TRF SIGNAL	N	DRY	REAR	PRVTE	SW NE									000		00
			NEWBERG UA	21.80	PACIFIC HY 99W	06	0		N	DAY	INJ	PSNGR CAR		01	DRVR	NONE	50	M	OR-Y		026	000		07
No		*45 18 28.53 -122 56 31.38*		009100100S00	1														OR<25					
												02 NONE 0	STOP											
												PRVTE	SW NE									011		00
												PSNGR CAR		01	DRVR	INJC	36	M	OR-Y		000	000		00
																			OR<25					
00400	N N N	04/14/2014	YAMHILL	1 14		INTER	3-LEG	N	N	CLR	S-1STOP	01 NONE 0	STRGHT											07
CITY		Mon 4P	NEWBERG	MN 0	BRUTSCHER ST	SW		TRF SIGNAL	N	DRY	REAR	PRVTE	NE SW									000		00
			NEWBERG UA	21.80	PACIFIC HY 99W	06	0		N	DAY	INJ	PSNGR CAR		01	DRVR	NONE	25	M	OR-Y		026	000		07
No		*45 18 28.53 -122 56 31.38*		009100100S00	1														OR<25					
												02 NONE 0	STOP											
												PRVTE	NE SW									011		00
												PSNGR CAR		01	DRVR	INJC	24	M	OR-Y		000	000		00
																			OR<25					
00296	N N N	03/27/2015	YAMHILL	1 14		INTER	3-LEG	N	N	CLR	S-1STOP	01 NONE 1	STRGHT										013	07
NONE		Fri 12P	NEWBERG	MN 0	BRUTSCHER ST	SW		TRF SIGNAL	N	DRY	REAR	PRVTE	SW NE									000		00
			NEWBERG UA	21.80	PACIFIC HY 99W	06	0		N	DAY	INJ	PSNGR CAR		01	DRVR	NONE	46	M	OR-Y		043,026	000		07
No		*45 18 28.53 -122 56 31.38*		009100100S00	1														OR<25					
												02 NONE 0	STOP											
												PRVTE	SW NE									011	013	00
												PSNGR CAR		01	DRVR	INJC	73	F	OR-Y		000	000		00
																			OR<25					
												03 NONE 0	STOP											
												PRVTE	SW NE									011		00
												PSNGR CAR		01	DRVR	NONE	00	M	UNK		000	000		00
																			UNK					
00806	N N N	08/13/2015	YAMHILL	1 14		INTER	CROSS	N	N	CLR	S-STRGHT	01 NONE 0	STRGHT										092	29
NONE		Thu 5P	NEWBERG	MN 0	BRUTSCHER ST	SW		TRF SIGNAL	N	DRY	REAR	PRVTE	SW NE									000		00
			NEWBERG UA	21.80	PACIFIC HY 99W	06	0		N	DAY	INJ	PSNGR CAR		01	DRVR	INJC	29	M	OR-Y		042	000		29
No		*45 18 28.53 -122 56 31.38*		009100100S00	1														OR>25					
												02 NONE 0	STRGHT											
												PRVTE	SW NE									007	092	00
												PSNGR CAR		01	DRVR	INJC	19	F	OR-Y		000	000		00
																			OR<25					
00875	N N N	09/01/2015	YAMHILL	1 14		INTER	CROSS	N	N	CLR	S-1STOP	01 NONE 0	STRGHT										013	29
NONE		Tue 6P	NEWBERG	MN 0	BRUTSCHER ST	SW		TRF SIGNAL	N	DRY	REAR	PRVTE	SW NE									000		00
			NEWBERG UA	21.80	PACIFIC HY 99W	06	0		N	DAY	INJ	PSNGR CAR		01	DRVR	NONE	26	M	OR-Y		026	000		29
No		*45 18 28.53 -122 56 31.38*		009100100S00	1														OR<25					

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      S  D
      P   R S W                                RD#  FC   CONN #                   INT-TYP                                        SPCL USE
SER#   E A U C O  DATE         COUNTY          CMPT/MLG  FIRST  STREET      RD CHAR (MEDIAN)  INT-REL  OFFRD WTHR  CRASH TYP    TRLR QTY  MOVE                      A  S
INVEST E L G H R  DAY/TIME     CITY            MILEPNT   SECOND STREET      DIRECT    LEGS    TRAF-    RNDBT SURF  COLL TYP     OWNER     FROM      PRTC INJ      G  E  LICNS PED
UNLOC? D C S L K  LAT/LONG     URBAN AREA      LRS       INTERSECTION SEQ#  LOCTN   (#LANES)  CNTL     DRVWY LIGHT SVRTY     V# VEH TYPE  TO     P# TYPE SVRTY  E  X  RES   LOC  ERROR        ACTN EVENT      CAUSE

                                                                                                                          02 NONE   0 STOP
                                                                                                                             PRVTE     SW NE                                                     011  013        00
                                                                                                                            PSNGR CAR          01 DRVR INJC  53 F OR-Y      000            000             00
                                                                                                                                                                OR<25

                                                                                                                          03 NONE   0 STOP
                                                                                                                             PRVTE     SW NE                                                     012             00
                                                                                                                            PSNGR CAR          01 DRVR NONE  39 F OR-Y      000            000             00
                                                                                                                                                                OR<25

00045  N N N N N 01/14/2011 YAMHILL          1    14                    INTER      3-LEG  N          N RAIN  S-1STOP    01 NONE   0 STRGHT                                                          07
CITY             Fri    5P  NEWBERG          MN    0  BRUTSCHER ST      W                  TRF SIGNAL  N WET   REAR          PRVTE     W  E                                                      000             00
                            NEWBERG UA        21.80   PACIFIC HY 99W    06           0               N DARK  INJ          PSNGR CAR          01 DRVR NONE  23 M OR-Y      026            000             07
No     45 18 28.53  -122 56 31.38            009100100S00            1                                                                                                  OR<25

                                                                                                                          02 NONE   0 STOP
                                                                                                                             PRVTE     W  E                                                      011             00
                                                                                                                            PSNGR CAR          01 DRVR INJC  22 F OR-Y      000            000             00
                                                                                                                                                                OR<25

01005  N N N     11/07/2011 YAMHILL          1    14                    INTER      3-LEG  N          N CLR   S-1STOP    01 NONE   0 STRGHT                                                          07
NONE             Mon    5P  NEWBERG          MN    0  BRUTSCHER ST      W                  TRF SIGNAL  N DRY   REAR          PRVTE     W  E                                                      000             00
                            NEWBERG UA        21.80   PACIFIC HY 99W    06           0               N DLIT  INJ          PSNGR CAR          01 DRVR NONE  42 F OR-Y      026            000             07
No     45 18 28.53  -122 56 31.38            009100100S00            1                                                                                                  OR>25

                                                                                                                          02 NONE   0 STOP
                                                                                                                             PRVTE     W  E                                                      011             00
                                                                                                                            PSNGR CAR          01 DRVR INJC  31 M OR-Y      000            000             00
                                                                                                                                                                OR>25

00115  N N N N N 02/04/2014 YAMHILL          1    14                    INTER      CROSS  N          N CLD   O-OTHER    01 NONE     BACK                                                            10
CITY             Tue    3P  NEWBERG          MN    0  BRUTSCHER ST      W                  TRF SIGNAL  N SNO   BACK          PRVTE     E  W                                                      000             00
                            NEWBERG UA        21.80   PACIFIC HY 99W    06           0               N DAY   PDO          PSNGR CAR          01 DRVR NONE  59 F OR-Y      011            000             10
No     45 18 28.53  -122 56 31.38            009100100S00            1                                                                                                  OR<25

                                                                                                                          02 NONE   0 STOP
                                                                                                                             PRVTE     W  E                                                      011             00
                                                                                                                            PSNGR CAR          01 DRVR NONE  20 F OR-Y      000            000             00
                                                                                                                                                                OR<25

00375  N N N     05/05/2013 YAMHILL          1    14                    INTER      CROSS  N          N CLR   ANGL-OTH   01 NONE   0 U-TURN                                                          08
NO RPT           Sun   12P  NEWBERG          MN    0  BRUTSCHER ST      CN                 TRF SIGNAL  N DRY   TURN          PRVTE     S  S                                                      000             00
                            NEWBERG UA        21.80   PACIFIC HY 99W    01           0               N DAY   PDO          PSNGR CAR          01 DRVR NONE  63 M OR-Y      008            000             08
No     45 18 28.53  -122 56 31.38            009100100S00            1                                                                                                  OR<25

                                                                                                                          02 NONE   0 STRGHT
                                                                                                                             PRVTE     E  W                                                      000             00
                                                                                                                            PSNGR CAR          01 DRVR NONE  46 F OR-Y      000            000             00
                                                                                                                                                                OR<25
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091 PACIFIC HIGHWAY WEST

OR 99W & Brutscher St
January 1, 2011 through December 31, 2015

```
      S  D
      P  R S W                                RD#  FC   CONN #                        INT-TYP                                       SPCL USE
SER#   E A U C O  DATE         COUNTY          CMPT/MLG  FIRST  STREET       RD CHAR (MEDIAN)  INT-REL  OFFRD WTHR  CRASH TYP     TRLR QTY  MOVE                       A  S
INVEST E L G H R  DAY/TIME     CITY            MILEPNT   SECOND STREET       DIRECT    LEGS    TRAF-    RNDBT SURF  COLL TYP      OWNER     FROM      PRTC  INJ        G  E  LICNS  PED
UNLOC? D C S L K  LAT/LONG     URBAN AREA      LRS       INTERSECTION SEQ#   LOCTN   (#LANES)  CNTL     DRVWY LIGHT SVRTY     V#  VEH TYPE  TO     P# TYPE  SVRTY  E  X  RES    LOC  ERROR        ACTN EVENT    CAUSE

00740  N N N    08/23/2013  YAMHILL         1    14                          INTER      3-LEG  N            N CLR   O-1 L-TURN 01 NONE    0 STRGHT                                                                   002      04,27
NO RPT          Fri     1P  NEWBERG         MN    0   BRUTSCHER ST           CN                TRF SIGNAL   N DRY   TURN          PRVTE       W  E                                                          000               00
                            NEWBERG UA       21.80    PACIFIC HY 99W         01           0                 N DAY   PDO           PSNGR CAR          01 DRVR  NONE   31  F  OR-Y         020          000  002        04,27
No     45 18 28.53  -122 56 31.38           009100100S00               1                                                                                            OR<25
                                                                                                                                                 02 PSNG  NO<5   01  M               000          000               00

                                                                                                                       02 NONE    0 TURN-L
                                                                                                                          PRVTE       S  W                                                          000               00
                                                                                                                          PSNGR CAR          01 DRVR  NONE   23  F  OR-Y         000          000               00
                                                                                                                                                                    OR<25

01186  N N N    11/02/2014  YAMHILL         1    14                          INTER      3-LEG  N            N CLR   O-1 L-TURN 01 NONE    0 STRGHT                                                                             02
NONE            Sun     6P  NEWBERG         MN    0   BRUTSCHER ST           CN                TRF SIGNAL   N DRY   TURN          PRVTE       NE SW                                                         000               00
                            NEWBERG UA       21.80    PACIFIC HY 99W         02           0                 Y DUSK  INJ           PSNGR CAR          01 DRVR  INJC   40  M  OR-Y         000          000               00
No     45 18 28.53  -122 56 31.38           009100100S00               1                                                                                            OR<25

                                                                                                                       02 NONE    0 TURN-L
                                                                                                                          UNKN        SW NW                                                         019               00
                                                                                                                          PSNGR CAR          01 DRVR  NONE   00  U  UNK          028,004      000               02
                                                                                                                                                                    UNK
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TRANSPORTATION DATA SECTION - CRASH ANALYSIS AND REPORTING UNIT
CONTINUOUS SYSTEM CRASH LISTING

091 PACIFIC HIGHWAY WEST

OR 99W & Vittoria Way
January 1, 2011 through December 31, 2015

```
      S  D
      P  R S W                             RD#  FC   CONN #                          INT-TYP                                 SPCL USE
SER#  E A U C O DATE       COUNTY          CMPT/MLG FIRST  STREET      RD CHAR (MEDIAN)  INT-REL OFFRD WTHR  CRASH TYP   TRLR QTY  MOVE                          A  S
INVEST E L G H R DAY/TIME  CITY            MILEPNT  SECOND STREET      DIRECT    LEGS    TRAF-   RNDBT SURF  COLL TYP    OWNER     FROM      PRTC INJ        G  E  LICNS PED
UNLOC? D C S L K LAT/LONG  URBAN AREA      LRS      INTERSECTION SEQ#  LOCTN   (#LANES) CNTL    DRVWY LIGHT SVRTY   V# VEH TYPE  TO     P# TYPE SVRTY    E  X  RES   LOC ERROR       ACTN EVENT      CAUSE

00013  N N N N N 01/04/2012 YAMHILL    1   14                          INTER   3-LEG  N          N RAIN ANGL-OTH  01 NONE   0 TURN-L                                                         02
CITY          Wed    7P  NEWBERG       MN   0   PACIFIC HY 99W         NE             UNKNOWN    N WET  TURN         PRVTE     N  NE                                                 000            00
                         NEWBERG UA     21.54   VITTORIA WAY           05        0               N DARK PDO          PSNGR CAR         01 DRVR NONE  28 F OR-Y       028        000            02
No     45 18 34.08  -122 56 14.07      009100100S00            1                                                                                         OR<25

                                                                                                                  02 NONE   1 STRGHT
                                                                                                                     PRVTE     SW NE                                                000            00
                                                                                                                     SEMI TOW          01 DRVR NONE  52 M OTH-Y      000        000            00
                                                                                                                                                         N-RES

00066  N N N N N 01/21/2014 YAMHILL    1   14                          INTER   3-LEG  N          N CLR  S-1STOP   01 NONE   0 STRGHT                                                         32
CITY          Tue    8A  NEWBERG       MN   0   PACIFIC HY 99W         NE             STOP SIGN  N DRY  REAR         PRVTE     NE SW                                                000            00
                         NEWBERG UA     21.54   VITTORIA WAY           06        0               N DAY  INJ          PSNGR CAR         01 DRVR NONE  19 F OR-Y       052,026    000            32
No     45 18 34.08  -122 56 14.07      009100100S00            1                                                                                         OR<25

                                                                                                                  02 NONE   0 STOP
                                                                                                                     PRVTE     NE SW                                                011            00
                                                                                                                     PSNGR CAR         01 DRVR INJC  47 M OR-Y       000        000            00
                                                                                                                                                         OR<25

00836  N N N        10/13/2011 YAMHILL 1   14                          INTER   3-LEG  N          N RAIN S-1STOP   01 NONE   0 STRGHT                                                         07
NO RPT        Thu    6P  NEWBERG       MN   0   PACIFIC HY 99W         SW             TRF SIGNAL N WET  REAR         PRVTE     SW NE                                                000            00
                         NEWBERG UA     21.54   VITTORIA WAY           06        0               N DAY  PDO          PSNGR CAR         01 DRVR NONE  73 M OR-Y       026        000            07
No     45 18 34.08  -122 56 14.07      009100100S00            1                                                                                         OR<25

                                                                                                                  02 NONE   0 STOP
                                                                                                                     PRVTE     SW NE                                                011            00
                                                                                                                     PSNGR CAR         01 DRVR NONE  18 F OR-Y       000        000            00
                                                                                                                                                         OR<25

00131  N N N        02/13/2012 YAMHILL 1   14                          INTER   3-LEG  N          N CLR  ANGL-OTH  01 NONE   0 TURN-L                                                         32
NO RPT        Mon   10A  NEWBERG       MN   0   PACIFIC HY 99W         CN             UNKNOWN    N DRY  TURN         PRVTE     SE SW                                                000            00
                         NEWBERG UA     21.54   VITTORIA WAY           04        0               N DAY  INJ          PSNGR CAR         01 DRVR NONE  76 F OR-Y       052        000            32
No     45 18 34.08  -122 56 14.07      009100100S00            1                                                                                         OR<25

                                                                                                                  02 NONE   0 STRGHT
                                                                                                                     PRVTE     SW NE                                                000            00
                                                                                                                     PSNGR CAR         01 DRVR INJC  27 F OR-Y       000        000            00
                                                                                                                                                         OR<25
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091 PACIFIC HIGHWAY WEST

OR 99W & Providence Dr
January 1, 2011 through December 31, 2015

SER# / INVEST / UNLOC?	S P E A U C O / D R S W / E L G H R / D C S L K	DATE / DAY/TIME / LAT/LONG	COUNTY / CITY / URBAN AREA	RD# FC / CMPT/MLG / MILEPNT / LRS	CONN # / FIRST STREET / SECOND STREET / INTERSECTION SEQ#	RD CHAR / DIRECT / LOCTN	INT-TYP (MEDIAN) / LEGS / (#LANES)	INT-REL / TRAF- / CNTL	OFFRD / RNDBT / DRVWY	WTHR / SURF / LIGHT	CRASH TYP / COLL TYP / SVRTY	V# SPCL USE / TRLR QTY / OWNER / VEH TYPE	MOVE / FROM / TO	P# PRTC TYPE / INJ SVRTY	AGE	SEX	LICNS / RES	PED LOC	ERROR	ACTN EVENT	CAUSE
00144	N N N	02/12/2015	YAMHILL	1 14		INTER	3-LEG	N	N	CLR	S-1STOP	01 NONE 0	STRGHT								29
NONE		Thu 4P	NEWBERG	MN 0	PROVIDENCE DR	NE		UNKNOWN	N	DRY	REAR	UNKN	NE SW							000	00
			NEWBERG UA	21.45	PACIFIC HY 99W	06	0		N	DUSK	PDO	PSNGR CAR		01 DRVR NONE	00	M	UNK		026	000	29
No		45 18 36.29 -122 56 7.21		009100100S00	1												UNK				
												02 NONE 0	STOP								
												PRVTE	NE SW							011	00
												PSNGR CAR		01 DRVR NONE	24	F	OR-Y		000	000	00
																	OR<25				
00824	N N N N N	09/22/2012	YAMHILL	1 14		INTER	3-LEG	N	N	CLR	S-1STOP	01 NONE 0	STRGHT								32,16,27
CITY		Sat 2P	NEWBERG	MN 0	PROVIDENCE DR	NE		TRF SIGNAL	N	DRY	REAR	PRVTE	NE SW							000	00
			NEWBERG UA	21.46	PACIFIC HY 99W	06	0		N	DAY	INJ	PSNGR CAR		01 DRVR NONE	20	F	OR-Y		052,016	025	32,16,27
No		45 18 36.11 -122 56 7.77		009100100S00	1												OR<25				
												02 NONE 0	STOP								
												PRVTE	NE SW							011	00
												PSNGR CAR		01 DRVR NONE	25	F	OTH-Y		000	000	00
																	N-RES				
														02 PSNG INJC	23	F			000	000	00
														03 PSNG INJC	77	F			000	000	00
00565	N N N	06/12/2015	YAMHILL	1 14		INTER	3-LEG	N	N	CLR	S-1STOP	01 NONE 0	STRGHT								29
NONE		Fri 5P	NEWBERG	MN 0	PROVIDENCE DR	NE		TRF SIGNAL	N	DRY	REAR	PRVTE	NE SW							000	00
			NEWBERG UA	21.46	PACIFIC HY 99W	06	0		N	DAY	PDO	PSNGR CAR		01 DRVR NONE	18	F	OR-Y		026	000	29
No		45 18 36.11 -122 56 7.77		009100100S00	1												OR<25				
												02 NONE 0	STOP								
												PRVTE	NE SW							011	00
												PSNGR CAR		01 DRVR NONE	27	F	OR-Y		000	000	00
																	OR>25				
01108	N N N N N	12/30/2011	YAMHILL	1 14		INTER	3-LEG	N	N	RAIN	S-STRGHT	01 NONE 0	STRGHT								07
CITY		Fri 8A	NEWBERG	MN 0	PROVIDENCE DR	SW		TRF SIGNAL	N	WET	REAR	PRVTE	SW NE							000	00
			NEWBERG UA	21.46	PACIFIC HY 99W	06	0		N	DAY	PDO	PSNGR CAR		01 DRVR NONE	48	M	OR-Y		042	000	07
No		45 18 36.11 -122 56 7.77		009100100S00	1												OR>25				
												02 NONE 0	STRGHT								
												PRVTE	SW NE							006	00
												PSNGR CAR		01 DRVR NONE	83	M	OR-Y		000	000	00
																	OR<25				
00833	N N N	09/25/2012	YAMHILL	1 14		INTER	3-LEG	N	N	CLR	S-1STOP	01 NONE 0	STRGHT								07
NO RPT		Tue 2P	NEWBERG	MN 0	PROVIDENCE DR	SW		TRF SIGNAL	N	DRY	REAR	PRVTE	SW NE							000	00
			NEWBERG UA	21.46	PACIFIC HY 99W	06	0		N	DAY	INJ	PSNGR CAR		01 DRVR NONE	81	F	OTH-Y		026	000	07
No		45 18 36.11 -122 56 7.77		009100100S00	1												N-RES				
												02 NONE 0	STOP								
												PRVTE	SW NE							011	00
												PSNGR CAR		01 DRVR INJC	28	F	OR-Y		000	000	00
																	OR<25				

091 PACIFIC HIGHWAY WEST

OR 99W & Providence Dr
January 1, 2011 through December 31, 2015

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      S  D
      P  R S W                                RD#  FC   CONN #                        INT-TYP                                   SPCL USE
SER#  E A U C O  DATE       COUNTY            CMPT/MLG  FIRST  STREET      RD CHAR (MEDIAN)  INT-REL  OFFRD WTHR  CRASH TYP  TRLR QTY  MOVE                    A  S
INVEST E L G H R DAY/TIME   CITY              MILEPNT   SECOND STREET      DIRECT    LEGS    TRAF-    RNDBT SURF  COLL TYP    OWNER    FROM       PRTC INJ    G  E  LICNS PED
UNLOC? D C S L K LAT/LONG   URBAN AREA        LRS       INTERSECTION SEQ#  LOCTN   (#LANES) CNTL     DRVWY LIGHT SVRTY    V# VEH TYPE  TO     P# TYPE SVRTY E  X  RES   LOC ERROR        ACTN EVENT       CAUSE

00623  N N N N N 07/18/2013 YAMHILL           1    14                      INTER     3-LEG  N          N CLR   S-1STOP   01 NONE   0 STRGHT                                                                  27
CITY             Thu    7P  NEWBERG           MN   0   PROVIDENCE DR       SW               TRF SIGNAL N DRY   REAR         PRVTE    SW NE                                                  000              00
                            NEWBERG UA         21.46   PACIFIC HY 99W      06          0               N DAY   PDO         PSNGR CAR        01 DRVR NONE  32 M OR-Y       026          000              27
No     45 18 36.11  -122 56  7.77             009100100S00            1                                                                                     OR<25

                                                                                                                      02 NONE   0 STOP
                                                                                                                         PRVTE    SW NE                                                  011              00
                                                                                                                        PSNGR CAR        01 DRVR NONE  40 M OR-Y       000          000              00
                                                                                                                                                                OR<25

00589  N N N     06/03/2014 YAMHILL           1    14                      INTER     CROSS  N          N CLR   S-1STOP   01 NONE   0 STRGHT                                                      013         07
NONE             Tue    2P  NEWBERG           MN   0   PROVIDENCE DR       SW               TRF SIGNAL N DRY   REAR         PRVTE    SW NE                                                  000              00
                            NEWBERG UA         21.46   PACIFIC HY 99W      06          0               N DAY   PDO         PSNGR CAR        01 DRVR NONE  41 M OR-Y       026          000              07
No     45 18 36.11  -122 56  7.77             009100100S00            1                                                                                     OR<25

                                                                                                                      02 NONE   0 STOP
                                                                                                                         PRVTE    SW NE                                                  011              00
                                                                                                                        PSNGR CAR        01 DRVR NONE  40 M OR-Y       000          000              00
                                                                                                                                                                OR<25

                                                                                                                      03 NONE   0 STOP
                                                                                                                         PRVTE    SW NE                                                  011              00
                                                                                                                        MTRCYCLE         01 DRVR NONE  34 M OR-Y       000          000              00
                                                                                                                                                                OR<25

00725  N N N     07/07/2014 YAMHILL           1    14                      INTER     3-LEG  N          N CLR   S-1STOP   01 NONE   0 STRGHT                                                                  07
NONE             Mon    2P  NEWBERG           MN   0   PROVIDENCE DR       SW               TRF SIGNAL N DRY   REAR         PRVTE    SW NE                                                  000              00
                            NEWBERG UA         21.46   PACIFIC HY 99W      06          0               N DAY   PDO         PSNGR CAR        01 DRVR NONE  56 M OR-Y       026          000              07
No     45 18 36.11  -122 56  7.77             009100100S00            1                                                                                     OR<25

                                                                                                                      02 NONE   0 STOP
                                                                                                                         PRVTE    SW NE                                                  011              00
                                                                                                                        PSNGR CAR        01 DRVR NONE  00 M OR-Y       000          000              00
                                                                                                                                                                OR<25

00658  N N N     07/03/2015 YAMHILL           1    14                      INTER     3-LEG  N          N CLR   S-1STOP   01 NONE   0 STRGHT                                                                  29
CITY             Fri    2P  NEWBERG           MN   0   PROVIDENCE DR       SW               TRF SIGNAL N DRY   REAR         PRVTE    SW NE                                                  000              00
                            NEWBERG UA         21.46   PACIFIC HY 99W      06          0               N DAY   PDO         PSNGR CAR        01 DRVR NONE  19 F OR-Y       026          000              29
No     45 18 36.11  -122 56  7.77             009100100S00            1                                                                                     OR<25

                                                                                                                      02 NONE   0 STOP
                                                                                                                         PRVTE    SW NE                                                  011              00
                                                                                                                        PSNGR CAR        01 DRVR NONE  66 M OR-Y       000          000              00
                                                                                                                                                                OR<25

01343  N N N     12/21/2015 YAMHILL           1    14                      INTER     3-LEG  N          N CLR   S-1STOP   01 NONE   0 STRGHT                                                                  29
NONE             Mon   12P  NEWBERG           MN   0   PROVIDENCE DR       SW               TRF SIGNAL N DRY   REAR         PRVTE    SW NE                                                  000              00
                            NEWBERG UA         21.46   PACIFIC HY 99W      06          0               N DAY   PDO         PSNGR CAR        01 DRVR NONE  00 M UNK        026          000              29
No     45 18 36.11  -122 56  7.77             009100100S00            1                                                                                     OR<25
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OREGON DEPARTMENT OF TRANSPORTATION - TRANSPORTATION DEVELOPMENT DIVISION
TRANSPORTATION DATA SECTION - CRASH ANALYSIS AND REPORTING UNIT
CONTINUOUS SYSTEM CRASH LISTING

091 PACIFIC HIGHWAY WEST

OR 99W & Providence Dr
January 1, 2011 through December 31, 2015

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      S  D
      P   R S W                                  RD#  FC   CONN #                       INT-TYP                                         SPCL USE
SER#  E A U C O  DATE       COUNTY               CMPT/MLG  FIRST  STREET       RD CHAR (MEDIAN)  INT-REL  OFFRD WTHR  CRASH TYP    TRLR QTY  MOVE                         A  S
INVEST E L G H R  DAY/TIME   CITY                 MILEPNT   SECOND STREET      DIRECT     LEGS    TRAF-    RNDBT SURF  COLL TYP     OWNER     FROM       PRTC  INJ      G  E  LICNS  PED
UNLOC? D C S L K  LAT/LONG   URBAN AREA           LRS       INTERSECTION SEQ#  LOCTN   (#LANES)  CNTL     DRVWY LIGHT SVRTY     V# VEH TYPE  TO     P# TYPE  SVRTY    E  X  RES    LOC  ERROR        ACTN EVENT     CAUSE

                                                                                                                               02 NONE   0  STOP
                                                                                                                                  PRVTE     SW NE                                                         011            00
                                                                                                                                 PSNGR CAR        01 DRVR NONE  32  F  OR-Y        000                000            00
                                                                                                                                                                   OR<25

00616  N N N    07/20/2012  YAMHILL             1    14                       INTER      3-LEG  N            N RAIN  S-1STOP   01 NONE       STRGHT                                                                      07
NONE            Fri    7A   NEWBERG             MN    0   PROVIDENCE DR        W                 TRF SIGNAL  N WET   REAR         PRVTE     W  E                                                          000            00
                            NEWBERG UA           21.46    PACIFIC HY 99W       06          0                N DAY   PDO          PSNGR CAR        01 DRVR NONE  52  M  OR-Y        026                000            07
No     45 18 36.11  -122 56  7.77              009100100S00              1                                                                                                 OR<25

                                                                                                                               02 NONE   0  STOP
                                                                                                                                  PRVTE     W  E                                                          011            00
                                                                                                                                 PSNGR CAR        01 DRVR NONE  41  F  OR-Y        000                000            00
                                                                                                                                                                   OR<25
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091 PACIFIC HIGHWAY WEST

OR 99W & Benjamin Rd
January 1, 2011 through December 31, 2015

SER# INVEST UNLOC?	S P D E A U C O E L G H R D C S L K (R S W)	DATE DAY/TIME *LAT/LONG*	COUNTY CITY URBAN AREA	RD# FC CMPT/MLG MILEPNT LRS	CONN # FIRST STREET SECOND STREET INTERSECTION SEQ#	RD CHAR DIRECT LOCTN	INT-TYP (MEDIAN) LEGS (#LANES)	INT-REL TRAF- CNTL	OFFRD RNDBT DRVWY	WTHR SURF LIGHT	CRASH TYP COLL TYP SVRTY	V#	SPCL USE TRLR QTY OWNER VEH TYPE	MOVE FROM TO	P#	PRTC TYPE	INJ SVRTY	A G E	S E X	LICNS RES	PED LOC	ERROR	ACTN EVENT	CAUSE
00620	N N N	08/08/2011	YAMHILL	1 02		INTER	3-LEG	N	N	CLR	ANGL-OTH	01	NONE 0	TURN-L										02
NONE		Mon 4P		MN 0		CN		STOP SIGN	N	DRY	TURN		PRVTE	N E									000	00
				21.08		01	0		N	DAY	PDO		PSNGR CAR		01	DRVR	NONE	27	M	OR-Y		028	000	02
No		*45 18 43.08 -122 55 42.80*		009100100S00																OR<25				
												02	NONE 0	STRGHT										
													PRVTE	E W									000	00
													PSNGR CAR		01	DRVR	NONE	66	M	OR-Y		000	000	00
																				OR<25				
00579	N N N N N	07/09/2012	YAMHILL	1 02		INTER	3-LEG	N	N	CLR	ANGL-OTH	01	NONE 0	TURN-L										02
STATE		Mon 5P		MN 0		CN		STOP SIGN	N	DRY	TURN		PRVTE	N E									015	00
				21.08		01	0		N	DAY	INJ		PSNGR CAR		01	DRVR	NONE	51	F	OR-Y		028	000	02
No		*45 18 43.08 -122 55 42.80*		009100100S00																OR<25				
												02	NONE 0	STRGHT										
													PRVTE	E W									000	00
													PSNGR CAR		01	DRVR	INJC	38	M	OR-Y		000	000	00
																				OR<25				
00318	N N N	03/28/2014	YAMHILL	1 02		INTER	3-LEG	N	N	RAIN	ANGL-OTH	01	NONE 0	TURN-L										02
NO RPT		Fri 3P		MN 0		CN		STOP SIGN	N	WET	TURN		PRVTE	N E									000	00
				21.08		01	0		N	DAY	INJ		PSNGR CAR		01	DRVR	INJB	66	F	OR-Y		028	000	02
No		*45 18 43.08 -122 55 42.80*		009100100S00																OR<25				
															02	PSNG	NO<5	04	F			000	000	00
												02	NONE 0	STRGHT										
													PRVTE	E W									000	00
													PSNGR CAR		01	DRVR	NONE	56	M	OR-Y		000	000	00
																				OR<25				
00675	N N N N N	06/23/2014	YAMHILL	1 02		INTER	3-LEG	N	N	CLD	ANGL-OTH	01	NONE 0	TURN-R										02
CITY		Mon 3P		MN 0		CN		STOP SIGN	N	DRY	TURN		PRVTE	N W									000	00
				21.08		03	0		N	DAY	INJ		PSNGR CAR		01	DRVR	NONE	43	M	OR-Y		028	000	02
No		*45 18 43.08 -122 55 42.80*		009100100S00																OR<25				
												02	NONE 0	STRGHT										
													PRVTE	E W									000	00
													PSNGR CAR		01	DRVR	INJC	24	F	OR-Y		000	000	00
																				OR<25				

ACTION CODE TRANSLATION LIST

ACTION CODE	SHORT DESCRIPTION	LONG DESCRIPTION
000	NONE	NO ACTION OR NON-WARRANTED
001	SKIDDED	SKIDDED
002	ON/OFF V	GETTING ON OR OFF STOPPED OR PARKED VEHICLE
003	LOAD OVR	OVERHANGING LOAD STRUCK ANOTHER VEHICLE, ETC.
006	SLOW DN	SLOWED DOWN
007	AVOIDING	AVOIDING MANEUVER
008	PAR PARK	PARALLEL PARKING
009	ANG PARK	ANGLE PARKING
010	INTERFERE	PASSENGER INTERFERING WITH DRIVER
011	STOPPED	STOPPED IN TRAFFIC NOT WAITING TO MAKE A LEFT TURN
012	STP/L TRN	STOPPED BECAUSE OF LEFT TURN SIGNAL OR WAITING, ETC.
013	STP TURN	STOPPED WHILE EXECUTING A TURN
014	EMR V PKD	EMERGENCY VEHICLE LEGALLY PARKED IN THE ROADWAY
015	GO A/STOP	PROCEED AFTER STOPPING FOR A STOP SIGN/FLASHING RED.
016	TRN A/RED	TURNED ON RED AFTER STOPPING
017	LOSTCTRL	LOST CONTROL OF VEHICLE
018	EXIT DWY	ENTERING STREET OR HIGHWAY FROM ALLEY OR DRIVEWAY
019	ENTR DWY	ENTERING ALLEY OR DRIVEWAY FROM STREET OR HIGHWAY
020	STR ENTR	BEFORE ENTERING ROADWAY, STRUCK PEDESTRIAN, ETC. ON SIDEWALK OR SHOULDER
021	NO DRVR	CAR RAN AWAY - NO DRIVER
022	PREV COL	STRUCK, OR WAS STRUCK BY, VEHICLE OR PEDESTRIAN IN PRIOR COLLISION BEFORE ACC. STABILIZED
023	STALLED	VEHICLE STALLED OR DISABLED
024	DRVR DEAD	DEAD BY UNASSOCIATED CAUSE
025	FATIGUE	FATIGUED, SLEEPY, ASLEEP
026	SUN	DRIVER BLINDED BY SUN
027	HDLGHTS	DRIVER BLINDED BY HEADLIGHTS
028	ILLNESS	PHYSICALLY ILL
029	THRU MED	VEHICLE CROSSED, PLUNGED OVER, OR THROUGH MEDIAN BARRIER
030	PURSUIT	PURSUING OR ATTEMPTING TO STOP A VEHICLE
031	PASSING	PASSING SITUATION
032	PRKOFFRD	VEHICLE PARKED BEYOND CURB OR SHOULDER
033	CROS MED	VEHICLE CROSSED EARTH OR GRASS MEDIAN
034	X N/SGNL	CROSSING AT INTERSECTION - NO TRAFFIC SIGNAL PRESENT
035	X W/ SGNL	CROSSING AT INTERSECTION - TRAFFIC SIGNAL PRESENT
036	DIAGONAL	CROSSING AT INTERSECTION - DIAGONALLY
037	BTWN INT	CROSSING BETWEEN INTERSECTIONS
038	DISTRACT	DRIVER'S ATTENTION DISTRACTED
039	W/TRAF-S	WALKING, RUNNING, RIDING, ETC., ON SHOULDER WITH TRAFFIC
040	A/TRAF-S	WALKING, RUNNING, RIDING, ETC., ON SHOULDER FACING TRAFFIC
041	W/TRAF-P	WALKING, RUNNING, RIDING, ETC., ON PAVEMENT WITH TRAFFIC
042	A/TRAF-P	WALKING, RUNNING, RIDING, ETC., ON PAVEMENT FACING TRAFFIC
043	PLAYINRD	PLAYING IN STREET OR ROAD
044	PUSH MV	PUSHING OR WORKING ON VEHICLE IN ROAD OR ON SHOULDER
045	WORK ON	WORKING IN ROADWAY OR ALONG SHOULDER
046	W/ TRAFIC	NON-MOTORIST WALKING, RUNNING, RIDING, ETC. WITH TRAFFIC
047	A/ TRAFIC	NON-MOTORIST WALKING, RUNNING, RIDING, ETC. FACING TRAFFIC
050	LAY ON RD	STANDING OR LYING IN ROADWAY
051	ENT OFFRD	ENTERING / STARTING IN TRAFFIC LANE FROM OFF ROAD
052	MERGING	MERGING
055	SPRAY	BLINDED BY WATER SPRAY

ACTION CODE TRANSLATION LIST

ACTION CODE	SHORT DESCRIPTION	LONG DESCRIPTION
088	OTHER	OTHER ACTION
099	UNK	UNKNOWN ACTION

CAUSE CODE TRANSLATION LIST

CAUSE CODE	SHORT DESCRIPTION	LONG DESCRIPTION
00	NO CODE	NO CAUSE ASSOCIATED AT THIS LEVEL
01	TOO-FAST	TOO FAST FOR CONDITIONS (NOT EXCEED POSTED SPEED
02	NO-YIELD	DID NOT YIELD RIGHT-OF-WAY
03	PAS-STOP	PASSED STOP SIGN OR RED FLASHER
04	DIS SIG	DISREGARDED TRAFFIC SIGNAL
05	LEFT-CTR	DROVE LEFT OF CENTER ON TWO-WAY ROAD; STRADDLING
06	IMP-OVER	IMPROPER OVERTAKING
07	TOO-CLOS	FOLLOWED TOO CLOSELY
08	IMP-TURN	MADE IMPROPER TURN
09	DRINKING	ALCOHOL OR DRUG INVOLVED
10	OTHR-IMP	OTHER IMPROPER DRIVING
11	MECH-DEF	MECHANICAL DEFECT
12	OTHER	OTHER (NOT IMPROPER DRIVING)
13	IMP LN C	IMPROPER CHANGE OF TRAFFIC LANES
14	DIS TCD	DISREGARDED OTHER TRAFFIC CONTROL DEVICE
15	WRNG WAY	WRONG WAY ON ONE-WAY ROAD; WRONG SIDE DIVIDED RO
16	FATIGUE	DRIVER DROWSY/FATIGUED/SLEEPY
17	ILLNESS	PHYSICAL ILLNESS
18	IN RDWY	NON-MOTORIST ILLEGALLY IN ROADWAY
19	NT VISBL	NON-MOTORIST NOT VISIBLE; NON-REFLECTIVE CLOTHIN
20	IMP PKNG	VEHICLE IMPROPERLY PARKED
21	DEF STER	DEFECTIVE STEERING MECHANISM
22	DEF BRKE	INADEQUATE OR NO BRAKES
24	LOADSHFT	VEHICLE LOST LOAD OR LOAD SHIFTED
25	TIREFAIL	TIRE FAILURE
26	PHANTOM	PHANTOM / NON-CONTACT VEHICLE
27	INATTENT	INATTENTION
28	NM INATT	NON-MOTORIST INATTENTION
29	F AVOID	FAILED TO AVOID VEHICLE AHEAD
30	SPEED	DRIVING IN EXCESS OF POSTED SPEED
31	RACING	SPEED RACING (PER PAR)
32	CARELESS	CARELESS DRIVING (PER PAR)
33	RECKLESS	RECKLESS DRIVING (PER PAR)
34	AGGRESV	AGGRESSIVE DRIVING (PER PAR)
35	RD RAGE	ROAD RAGE (PER PAR)
40	VIEW OBS	VIEW OBSCURED
50	USED MDN	IMPROPER USE OF MEDIAN OR SHOULDER
51	FAIL LN	FAILED TO MAINTAIN LANE
52	OFF RD	RAN OFF ROAD

COLLISION TYPE CODE TRANSLATION LIST

COLL CODE	SHORT DESCRIPTION	LONG DESCRIPTION
&	OTH	MISCELLANEOUS
-	BACK	BACKING
0	PED	PEDESTRIAN
1	ANGL	ANGLE
2	HEAD	HEAD-ON
3	REAR	REAR-END
4	SS-M	SIDESWIPE - MEETING
5	SS-O	SIDESWIPE - OVERTAKING
6	TURN	TURNING MOVEMENT
7	PARK	PARKING MANEUVER
8	NCOL	NON-COLLISION
9	FIX	FIXED OBJECT OR OTHER OBJECT

CRASH TYPE CODE TRANSLATION LIST

CRASH TYPE	SHORT DESCRIPTION	LONG DESCRIPTION
&	OVERTURN	OVERTURNED
0	NON-COLL	OTHER NON-COLLISION
1	OTH RDWY	MOTOR VEHICLE ON OTHER ROADWAY
2	PRKD MV	PARKED MOTOR VEHICLE
3	PED	PEDESTRIAN
4	TRAIN	RAILWAY TRAIN
6	BIKE	PEDALCYCLIST
7	ANIMAL	ANIMAL
8	FIX OBJ	FIXED OBJECT
9	OTH OBJ	OTHER OBJECT
A	ANGL-STP	ENTERING AT ANGLE - ONE VEHICLE STOPPED
B	ANGL-OTH	ENTERING AT ANGLE - ALL OTHERS
C	S-STRGHT	FROM SAME DIRECTION - BOTH GOING STRAIGHT
D	S-1TURN	FROM SAME DIRECTION - ONE TURN, ONE STRAIGHT
E	S-1STOP	FROM SAME DIRECTION - ONE STOPPED
F	S-OTHER	FROM SAME DIRECTION-ALL OTHERS, INCLUDING PARKING
G	O-STRGHT	FROM OPPOSITE DIRECTION - BOTH GOING STRAIGHT
H	O-1 L-TURN	FROM OPPOSITE DIRECTION-ONE LEFT TURN,ONE STRAIGHT
I	O-1STOP	FROM OPPOSITE DIRECTION - ONE STOPPED
J	O-OTHER	FROM OPPOSITE DIRECTION-ALL OTHERS INCL. PARKING

DRIVER LICENSE CODE TRANSLATION LIST

LIC CODE	SHORT DESC	LONG DESCRIPTION
0	NONE	NOT LICENSED (HAD NEVER BEEN LICENSED)
1	OR-Y	VALID OREGON LICENSE
2	OTH-Y	VALID LICENSE, OTHER STATE OR COUNTRY
3	SUSP	SUSPENDED/REVOKED

DRIVER RESIDENCE CODE TRANSLATION LIST

RES CODE	SHORT DESC	LONG DESCRIPTION
1	OR<25	OREGON RESIDENT WITHIN 25 MILE OF HOME
2	OR>25	OREGON RESIDENT 25 OR MORE MILES FROM HOME
3	OR-?	OREGON RESIDENT - UNKNOWN DISTANCE FROM HOME
4	N-RES	NON-RESIDENT
9	UNK	UNKNOWN IF OREGON RESIDENT

ERROR CODE TRANSLATION LIST

ERROR CODE	SHORT DESCRIPTION	FULL DESCRIPTION
000	NONE	NO ERROR
001	WIDE TRN	WIDE TURN
002	CUT CORN	CUT CORNER ON TURN
003	FAIL TRN	FAILED TO OBEY MANDATORY TRAFFIC TURN SIGNAL, SIGN OR LANE MARKINGS
004	L IN TRF	LEFT TURN IN FRONT OF ONCOMING TRAFFIC
005	L PROHIB	LEFT TURN WHERE PROHIBITED
006	FRM WRNG	TURNED FROM WRONG LANE
007	TO WRONG	TURNED INTO WRONG LANE
008	ILLEG U	U-TURNED ILLEGALLY
009	IMP STOP	IMPROPERLY STOPPED IN TRAFFIC LANE
010	IMP SIG	IMPROPER SIGNAL OR FAILURE TO SIGNAL
011	IMP BACK	BACKING IMPROPERLY (NOT PARKING)
012	IMP PARK	IMPROPERLY PARKED
013	UNPARK	IMPROPER START LEAVING PARKED POSITION
014	IMP STRT	IMPROPER START FROM STOPPED POSITION
015	IMP LGHT	IMPROPER OR NO LIGHTS (VEHICLE IN TRAFFIC)
016	INATTENT	INATTENTION (FAILURE TO DIM LIGHTS PRIOR TO 4/1/97)
017	UNSF VEH	DRIVING UNSAFE VEHICLE (NO OTHER ERROR APPARENT)
018	OTH PARK	ENTERING/EXITING PARKED POSITION W/ INSUFFICIENT CLEARANCE; OTHER IMPROPER PARKING MANEUVER
019	DIS DRIV	DISREGARDED OTHER DRIVER'S SIGNAL
020	DIS SGNL	DISREGARDED TRAFFIC SIGNAL
021	RAN STOP	DISREGARDED STOP SIGN OR FLASHING RED
022	DIS SIGN	DISREGARDED WARNING SIGN, FLARES OR FLASHING AMBER
023	DIS OFCR	DISREGARDED POLICE OFFICER OR FLAGMAN
024	DIS EMER	DISREGARDED SIREN OR WARNING OF EMERGENCY VEHICLE
025	DIS RR	DISREGARDED RR SIGNAL, RR SIGN, OR RR FLAGMAN
026	REAR-END	FAILED TO AVOID STOPPED OR PARKED VEHICLE AHEAD OTHER THAN SCHOOL BUS
027	BIKE ROW	DID NOT HAVE RIGHT-OF-WAY OVER PEDALCYCLIST
028	NO ROW	DID NOT HAVE RIGHT-OF-WAY
029	PED ROW	FAILED TO YIELD RIGHT-OF-WAY TO PEDESTRIAN
030	PAS CURV	PASSING ON A CURVE
031	PAS WRNG	PASSING ON THE WRONG SIDE
032	PAS TANG	PASSING ON STRAIGHT ROAD UNDER UNSAFE CONDITIONS
033	PAS X-WK	PASSED VEHICLE STOPPED AT CROSSWALK FOR PEDESTRIAN
034	PAS INTR	PASSING AT INTERSECTION
035	PAS HILL	PASSING ON CREST OF HILL
036	N/PAS ZN	PASSING IN "NO PASSING" ZONE
037	PAS TRAF	PASSING IN FRONT OF ONCOMING TRAFFIC
038	CUT-IN	CUTTING IN (TWO LANES - TWO WAY ONLY)
039	WRNGSIDE	DRIVING ON WRONG SIDE OF THE ROAD (2-WAY UNDIVIDED ROADWAYS)
040	THRU MED	DRIVING THROUGH SAFETY ZONE OR OVER ISLAND
041	F/ST BUS	FAILED TO STOP FOR SCHOOL BUS

ERROR CODE TRANSLATION LIST

ERROR CODE	SHORT DESCRIPTION	FULL DESCRIPTION
042	F/SLO MV	FAILED TO DECREASE SPEED FOR SLOWER MOVING VEHICLE
043	TOO CLOSE	FOLLOWING TOO CLOSELY (MUST BE ON OFFICER'S REPORT)
044	STRDL LN	STRADDLING OR DRIVING ON WRONG LANES
045	IMP CHG	IMPROPER CHANGE OF TRAFFIC LANES
046	WRNG WAY	WRONG WAY ON ONE-WAY ROADWAY; WRONG SIDE DIVIDED ROAD
047	BASCRULE	DRIVING TOO FAST FOR CONDITIONS (NOT EXCEEDING POSTED SPEED)
048	OPN DOOR	OPENED DOOR INTO ADJACENT TRAFFIC LANE
049	IMPEDING	IMPEDING TRAFFIC
050	SPEED	DRIVING IN EXCESS OF POSTED SPEED
051	RECKLESS	RECKLESS DRIVING (PER PAR)
052	CARELESS	CARELESS DRIVING (PER PAR)
053	RACING	SPEED RACING (PER PAR)
054	X N/SGNL	CROSSING AT INTERSECTION, NO TRAFFIC SIGNAL PRESENT
055	X W/SGNL	CROSSING AT INTERSECTION, TRAFFIC SIGNAL PRESENT
056	DIAGONAL	CROSSING AT INTERSECTION - DIAGONALLY
057	BTWN INT	CROSSING BETWEEN INTERSECTIONS
059	W/TRAF-S	WALKING, RUNNING, RIDING, ETC., ON SHOULDER WITH TRAFFIC
060	A/TRAF-S	WALKING, RUNNING, RIDING, ETC., ON SHOULDER FACING TRAFFIC
061	W/TRAF-P	WALKING, RUNNING, RIDING, ETC., ON PAVEMENT WITH TRAFFIC
062	A/TRAF-P	WALKING, RUNNING, RIDING, ETC., ON PAVEMENT FACING TRAFFIC
063	PLAYINRD	PLAYING IN STREET OR ROAD
064	PUSH MV	PUSHING OR WORKING ON VEHICLE IN ROAD OR ON SHOULDER
065	WORK IN RD	WORKING IN ROADWAY OR ALONG SHOULDER
070	LAY ON RD	STANDING OR LYING IN ROADWAY
071	NM IMP USE	IMPROPER USE OF TRAFFIC LANE BY NON-MOTORIST
073	ELUDING	ELUDING / ATTEMPT TO ELUDE
079	F NEG CURV	FAILED TO NEGOTIATE A CURVE
080	FAIL LN	FAILED TO MAINTAIN LANE
081	OFF RD	RAN OFF ROAD
082	NO CLEAR	DRIVER MISJUDGED CLEARANCE
083	OVRSTEER	OVER-CORRECTING
084	NOT USED	CODE NOT IN USE
085	OVRLOAD	OVERLOADING OR IMPROPER LOADING OF VEHICLE WITH CARGO OR PASSENGERS
097	UNA DIS TC	UNABLE TO DETERMINE WHICH DRIVER DISREGARDED TRAFFIC CONTROL DEVICE

EVENT CODE TRANSLATION LIST

EVENT CODE	SHORT DESCRIPTION	LONG DESCRIPTION
001	FEL/JUMP	OCCUPANT FELL, JUMPED OR WAS EJECTED FROM MOVING VEHICLE
002	INTERFER	PASSENGER INTERFERED WITH DRIVER
003	BUG INTF	ANIMAL OR INSECT IN VEHICLE INTERFERED WITH DRIVER
004	INDRCT PED	PEDESTRIAN INDIRECTLY INVOLVED (NOT STRUCK)
005	SUB-PED	"SUB-PED": PEDESTRIAN INJURED SUBSEQUENT TO COLLISION, ETC.
006	INDRCT BIK	PEDALCYCLIST INDIRECTLY INVOLVED (NOT STRUCK)
007	HITCHIKR	HITCHHIKER (SOLICITING A RIDE)
008	PSNGR TOW	PASSENGER OR NON-MOTORIST BEING TOWED OR PUSHED ON CONVEYANCE
009	ON/OFF V	GETTING ON/OFF STOPPED/PARKED VEHICLE (OCCUPANTS ONLY; MUST HAVE PHYSICAL CONTACT W/ VEHIC
010	SUB OTRN	OVERTURNED AFTER FIRST HARMFUL EVENT
011	MV PUSHD	VEHICLE BEING PUSHED
012	MV TOWED	VEHICLE TOWED OR HAD BEEN TOWING ANOTHER VEHICLE
013	FORCED	VEHICLE FORCED BY IMPACT INTO ANOTHER VEHICLE, PEDALCYCLIST OR PEDESTRIAN
014	SET MOTN	VEHICLE SET IN MOTION BY NON-DRIVER (CHILD RELEASED BRAKES, ETC.)
015	RR ROW	AT OR ON RAILROAD RIGHT-OF-WAY (NOT LIGHT RAIL)
016	LT RL ROW	AT OR ON LIGHT-RAIL RIGHT-OF-WAY
017	RR HIT V	TRAIN STRUCK VEHICLE
018	V HIT RR	VEHICLE STRUCK TRAIN
019	HIT RR CAR	VEHICLE STRUCK RAILROAD CAR ON ROADWAY
020	JACKNIFE	JACKKNIFE; TRAILER OR TOWED VEHICLE STRUCK TOWING VEHICLE
021	TRL OTRN	TRAILER OR TOWED VEHICLE OVERTURNED
022	CN BROKE	TRAILER CONNECTION BROKE
023	DETACH TRL	DETACHED TRAILING OBJECT STRUCK OTHER VEHICLE, NON-MOTORIST, OR OBJECT
024	V DOOR OPN	VEHICLE DOOR OPENED INTO ADJACENT TRAFFIC LANE
025	WHEELOFF	WHEEL CAME OFF
026	HOOD UP	HOOD FLEW UP
028	LOAD SHIFT	LOST LOAD, LOAD MOVED OR SHIFTED
029	TIREFAIL	TIRE FAILURE
030	PET	PET: CAT, DOG AND SIMILAR
031	LVSTOCK	STOCK: COW, CALF, BULL, STEER, SHEEP, ETC.
032	HORSE	HORSE, MULE, OR DONKEY
033	HRSE&RID	HORSE AND RIDER
034	GAME	WILD ANIMAL, GAME (INCLUDES BIRDS; NOT DEER OR ELK)
035	DEER ELK	DEER OR ELK, WAPITI
036	ANML VEH	ANIMAL-DRAWN VEHICLE
037	CULVERT	CULVERT, OPEN LOW OR HIGH MANHOLE
038	ATENUATN	IMPACT ATTENUATOR
039	PK METER	PARKING METER
040	CURB	CURB (ALSO NARROW SIDEWALKS ON BRIDGES)
041	JIGGLE	JIGGLE BAR OR TRAFFIC SNAKE FOR CHANNELIZATION
042	GDRL END	LEADING EDGE OF GUARDRAIL
043	GARDRAIL	GUARD RAIL (NOT METAL MEDIAN BARRIER)
044	BARRIER	MEDIAN BARRIER (RAISED OR METAL)
045	WALL	RETAINING WALL OR TUNNEL WALL
046	BR RAIL	BRIDGE RAILING OR PARAPET (ON BRIDGE OR APPROACH)
047	BR ABUTMNT	BRIDGE ABUTMENT (INCLUDED "APPROACH END" THRU 2013)
048	BR COLMN	BRIDGE PILLAR OR COLUMN
049	BR GIRDR	BRIDGE GIRDER (HORIZONTAL BRIDGE STRUCTURE OVERHEAD)
050	ISLAND	TRAFFIC RAISED ISLAND
051	GORE	GORE
052	POLE UNK	POLE - TYPE UNKNOWN
053	POLE UTL	POLE - POWER OR TELEPHONE
054	ST LIGHT	POLE - STREET LIGHT ONLY
055	TRF SGNL	POLE - TRAFFIC SIGNAL AND PED SIGNAL ONLY
056	SGN BRDG	POLE - SIGN BRIDGE
057	STOPSIGN	STOP OR YIELD SIGN
058	OTH SIGN	OTHER SIGN, INCLUDING STREET SIGNS
059	HYDRANT	HYDRANT

EVENT CODE TRANSLATION LIST

EVENT CODE	SHORT DESCRIPTION	LONG DESCRIPTION
060	MARKER	DELINEATOR OR MARKER (REFLECTOR POSTS)
061	MAILBOX	MAILBOX
062	TREE	TREE, STUMP OR SHRUBS
063	VEG OHED	TREE BRANCH OR OTHER VEGETATION OVERHEAD, ETC.
064	WIRE/CBL	WIRE OR CABLE ACROSS OR OVER THE ROAD
065	TEMP SGN	TEMPORARY SIGN OR BARRICADE IN ROAD, ETC.
066	PERM SGN	PERMANENT SIGN OR BARRICADE IN/OFF ROAD
067	SLIDE	SLIDES, FALLEN OR FALLING ROCKS
068	FRGN OBJ	FOREIGN OBSTRUCTION/DEBRIS IN ROAD (NOT GRAVEL)
069	EQP WORK	EQUIPMENT WORKING IN/OFF ROAD
070	OTH EQP	OTHER EQUIPMENT IN OR OFF ROAD (INCLUDES PARKED TRAILER, BOAT)
071	MAIN EQP	WRECKER, STREET SWEEPER, SNOW PLOW OR SANDING EQUIPMENT
072	OTHER WALL	ROCK, BRICK OR OTHER SOLID WALL
073	IRRGL PVMT	OTHER BUMP (NOT SPEED BUMP), POTHOLE OR PAVEMENT IRREGULARITY (PER PAR)
074	OVERHD OBJ	OTHER OVERHEAD OBJECT (HIGHWAY SIGN, SIGNAL HEAD, ETC.); NOT BRIDGE
075	CAVE IN	BRIDGE OR ROAD CAVE IN
076	HI WATER	HIGH WATER
077	SNO BANK	SNOW BANK
078	LO-HI EDGE	LOW OR HIGH SHOULDER AT PAVEMENT EDGE
079	DITCH	CUT SLOPE OR DITCH EMBANKMENT
080	OBJ FRM MV	STRUCK BY ROCK OR OTHER OBJECT SET IN MOTION BY OTHER VEHICLE (INCL. LOST LOADS)
081	FLY-OBJ	STRUCK BY ROCK OR OTHER MOVING OR FLYING OBJECT (NOT SET IN MOTION BY VEHICLE)
082	VEH HID	VEHICLE OBSCURED VIEW
083	VEG HID	VEGETATION OBSCURED VIEW
084	BLDG HID	VIEW OBSCURED BY FENCE, SIGN, PHONE BOOTH, ETC.
085	WIND GUST	WIND GUST
086	IMMERSED	VEHICLE IMMERSED IN BODY OF WATER
087	FIRE/EXP	FIRE OR EXPLOSION
088	FENC/BLD	FENCE OR BUILDING, ETC.
089	OTHR CRASH	CRASH RELATED TO ANOTHER SEPARATE CRASH
090	TO 1 SIDE	TWO-WAY TRAFFIC ON DIVIDED ROADWAY ALL ROUTED TO ONE SIDE
091	BUILDING	BUILDING OR OTHER STRUCTURE
092	PHANTOM	OTHER (PHANTOM) NON-CONTACT VEHICLE
093	CELL PHONE	CELL PHONE (ON PAR OR DRIVER IN USE)
094	VIOL GDL	TEENAGE DRIVER IN VIOLATION OF GRADUATED LICENSE PGM
095	GUY WIRE	GUY WIRE
096	BERM	BERM (EARTHEN OR GRAVEL MOUND)
097	GRAVEL	GRAVEL IN ROADWAY
098	ABR EDGE	ABRUPT EDGE
099	CELL WTNSD	CELL PHONE USE WITNESSED BY OTHER PARTICIPANT
100	UNK FIXD	FIXED OBJECT, UNKNOWN TYPE.
101	OTHER OBJ	NON-FIXED OBJECT, OTHER OR UNKNOWN TYPE
102	TEXTING	TEXTING
103	WZ WORKER	WORK ZONE WORKER
104	ON VEHICLE	PASSENGER RIDING ON VEHICLE EXTERIOR
105	PEDAL PSGR	PASSENGER RIDING ON PEDALCYCLE
106	MAN WHLCHR	PEDESTRIAN IN NON-MOTORIZED WHEELCHAIR
107	MTR WHLCHR	PEDESTRIAN IN MOTORIZED WHEELCHAIR
108	OFFICER	LAW ENFORCEMENT / POLICE OFFICER
109	SUB-BIKE	"SUB-BIKE": PEDALCYCLIST INJURED SUBSEQUENT TO COLLISION, ETC.
110	N-MTR	NON-MOTORIST STRUCK VEHICLE
111	S CAR VS V	STREET CAR/TROLLEY (ON RAILS OR OVERHEAD WIRE SYSTEM) STRUCK VEHICLE
112	V VS S CAR	VEHICLE STRUCK STREET CAR/TROLLEY (ON RAILS OR OVERHEAD WIRE SYSTEM)
113	S CAR ROW	AT OR ON STREET CAR OR TROLLEY RIGHT-OF-WAY
114	RR EQUIP	VEHICLE STRUCK RAILROAD EQUIPMENT (NOT TRAIN) ON TRACKS
115	DSTRCT GPS	DISTRACTED BY NAVIGATION SYSTEM OR GPS DEVICE
116	DSTRCT OTH	DISTRACTED BY OTHER ELECTRONIC DEVICE
117	RR GATE	RAIL CROSSING DROP-ARM GATE

EVENT CODE TRANSLATION LIST

EVENT CODE	SHORT DESCRIPTION	LONG DESCRIPTION
118	EXPNSN JNT	EXPANSION JOINT
119	JERSEY BAR	JERSEY BARRIER
120	WIRE BAR	WIRE OR CABLE MEDIAN BARRIER
121	FENCE	FENCE
123	OBJ IN VEH	LOOSE OBJECT IN VEHICLE STRUCK OCCUPANT
124	SLIPPERY	SLIDING OR SWERVING DUE TO WET, ICY, SLIPPERY OR LOOSE SURFACE (NOT GRAVEL)
125	SHLDR	SHOULDER GAVE WAY
126	BOULDER	ROCK(S), BOULDER (NOT GRAVEL; NOT ROCK SLIDE)
127	LAND SLIDE	ROCK SLIDE OR LAND SLIDE
128	CURVE INV	CURVE PRESENT AT CRASH LOCATION
129	HILL INV	VERTICAL GRADE / HILL PRESENT AT CRASH LOCATION
130	CURVE HID	VIEW OBSCURED BY CURVE
131	HILL HID	VIEW OBSCURED BY VERTICAL GRADE / HILL
132	WINDOW HID	VIEW OBSCURED BY VEHICLE WINDOW CONDITIONS
133	SPRAY HID	VIEW OBSCURED BY WATER SPRAY

FUNCTIONAL CLASSIFICATION TRANSLATION LIST

FUNC CLASS	DESCRIPTION
01	RURAL PRINCIPAL ARTERIAL - INTERSTATE
02	RURAL PRINCIPAL ARTERIAL - OTHER
06	RURAL MINOR ARTERIAL
07	RURAL MAJOR COLLECTOR
08	RURAL MINOR COLLECTOR
09	RURAL LOCAL
11	URBAN PRINCIPAL ARTERIAL - INTERSTATE
12	URBAN PRINCIPAL ARTERIAL - OTHER FREEWAYS AND EXP
14	URBAN PRINCIPAL ARTERIAL - OTHER
16	URBAN MINOR ARTERIAL
17	URBAN MAJOR COLLECTOR
18	URBAN MINOR COLLECTOR
19	URBAN LOCAL
78	UNKNOWN RURAL SYSTEM
79	UNKNOWN RURAL NON-SYSTEM
98	UNKNOWN URBAN SYSTEM
99	UNKNOWN URBAN NON-SYSTEM

HIGHWAY COMPONENT TRANSLATION LIST

CODE	DESCRIPTION
0	MAINLINE STATE HIGHWAY
1	COUPLET
3	FRONTAGE ROAD
6	CONNECTION
8	HIGHWAY - OTHER

INJURY SEVERITY CODE TRANSLATION LIST

CODE	SHORT DESC	LONG DESCRIPTION
1	KILL	FATAL INJURY
2	INJA	INCAPACITATING INJURY - BLEEDING, BROKEN BONES
3	INJB	NON-INCAPACITATING INJURY
4	INJC	POSSIBLE INJURY - COMPLAINT OF PAIN
5	PRI	DIED PRIOR TO CRASH
7	NO<5	NO INJURY - 0 TO 4 YEARS OF AGE

LIGHT CONDITION CODE TRANSLATION LIST

CODE	SHORT DESC	LONG DESCRIPTION
0	UNK	UNKNOWN
1	DAY	DAYLIGHT
2	DLIT	DARKNESS - WITH STREET LIGHTS
3	DARK	DARKNESS - NO STREET LIGHTS
4	DAWN	DAWN (TWILIGHT)
5	DUSK	DUSK (TWILIGHT)

MEDIAN TYPE CODE TRANSLATION LIST

CODE	SHORT DESC	LONG DESCRIPTION
0	NONE	NO MEDIAN
1	RSDMD	SOLID MEDIAN BARRIER
2	DIVMD	EARTH, GRASS OR PAVED MEDIAN

MILEAGE TYPE CODE TRANSLATION LIST

CODE	LONG DESCRIPTION
0	REGULAR MILEAGE
T	TEMPORARY
Y	SPUR
Z	OVERLAPPING

MOVEMENT TYPE CODE TRANSLATION LIST

CODE	SHORT DESC	LONG DESCRIPTION
0	UNK	UNKNOWN
1	STRGHT	STRAIGHT AHEAD
2	TURN-R	TURNING RIGHT
3	TURN-L	TURNING LEFT
4	U-TURN	MAKING A U-TURN
5	BACK	BACKING
6	STOP	STOPPED IN TRAFFIC
7	PRKD-P	PARKED - PROPERLY
8	PRKD-I	PARKED - IMPROPERLY

PEDESTRIAN LOCATION CODE TRANSLATION LIST

CODE	LONG DESCRIPTION
00	AT INTERSECTION - NOT IN ROADWAY
01	AT INTERSECTION - INSIDE CROSSWALK
02	AT INTERSECTION - IN ROADWAY, OUTSIDE CROSSWALK
03	AT INTERSECTION - IN ROADWAY, XWALK AVAIL UNKNWN
04	NOT AT INTERSECTION - IN ROADWAY
05	NOT AT INTERSECTION - ON SHOULDER
06	NOT AT INTERSECTION - ON MEDIAN
07	NOT AT INTERSECTION - WITHIN TRAFFIC RIGHT-OF-WAY
08	NOT AT INTERSECTION - IN BIKE PATH OR PARKING LANE
09	NOT-AT INTERSECTION - ON SIDEWALK
10	OUTSIDE TRAFFICWAY BOUNDARIES
13	AT INTERSECTION - IN BIKE LANE
14	NOT AT INTERSECTION - IN BIKE LANE
15	NOT AT INTERSECTION - INSIDE MID-BLOCK CROSSWALK
16	NOT AT INTERSECTION - IN PARKING LANE

ROAD CHARACTER CODE TRANSLATION LIST

CODE	SHORT DESC	LONG DESCRIPTION
0	UNK	UNKNOWN
1	INTER	INTERSECTION
2	ALLEY	DRIVEWAY OR ALLEY
3	STRGHT	STRAIGHT ROADWAY
4	TRANS	TRANSITION
5	CURVE	CURVE (HORIZONTAL CURVE)
6	OPENAC	OPEN ACCESS OR TURNOUT
7	GRADE	GRADE (VERTICAL CURVE)
8	BRIDGE	BRIDGE STRUCTURE
9	TUNNEL	TUNNEL

PARTICIPANT TYPE CODE TRANSLATION LIST

CODE	SHORT DESC	LONG DESCRIPTION
0	OCC	UNKNOWN OCCUPANT TYPE
1	DRVR	DRIVER
2	PSNG	PASSENGER
3	PED	PEDESTRIAN
4	CONV	PEDESTRIAN USING A PEDESTRIAN CONVEYA
5	PTOW	PEDESTRIAN TOWING OR TRAILERING AN OB
6	BIKE	PEDALCYCLIST
7	BTOW	PEDALCYCLIST TOWING OR TRAILERING AN
8	PRKD	OCCUPANT OF A PARKED MOTOR VEHICLE
9	UNK	UNKNOWN TYPE OF NON-MOTORIST

TRAFFIC CONTROL DEVICE CODE TRANSLATION LIST

CODE	SHORT DESC	LONG DESCRIPTION
000	NONE	NO CONTROL
001	TRF SIGNAL	TRAFFIC SIGNALS
002	FLASHBCN-R	FLASHING BEACON - RED (STOP)
003	FLASHBCN-A	FLASHING BEACON - AMBER (SLOW)
004	STOP SIGN	STOP SIGN
005	SLOW SIGN	SLOW SIGN
006	REG-SIGN	REGULATORY SIGN
007	YIELD	YIELD SIGN
008	WARNING	WARNING SIGN
009	CURVE	CURVE SIGN
010	SCHL X-ING	SCHOOL CROSSING SIGN OR SPECIAL SIGNAL
011	OFCR/FLAG	POLICE OFFICER, FLAGMAN - SCHOOL PATROL
012	BRDG-GATE	BRIDGE GATE - BARRIER
013	TEMP-BARR	TEMPORARY BARRIER
014	NO-PASS-ZN	NO PASSING ZONE
015	ONE-WAY	ONE-WAY STREET
016	CHANNEL	CHANNELIZATION
017	MEDIAN BAR	MEDIAN BARRIER
018	PILOT CAR	PILOT CAR
019	SP PED SIG	SPECIAL PEDESTRIAN SIGNAL
020	X-BUCK	CROSSBUCK
021	THR-GN-SIG	THROUGH GREEN ARROW OR SIGNAL
022	L-GRN-SIG	LEFT TURN GREEN ARROW, LANE MARKINGS, OR SIGNAL
023	R-GRN-SIG	RIGHT TURN GREEN ARROW, LANE MARKINGS, OR SIGNAL
024	WIGWAG	WIGWAG OR FLASHING LIGHTS W/O DROP-ARM GATE
025	X-BUCK WRN	CROSSBUCK AND ADVANCE WARNING
026	WW W/ GATE	FLASHING LIGHTS WITH DROP-ARM GATES
027	OVRHD SGNL	SUPPLEMENTAL OVERHEAD SIGNAL (RR XING ONLY)
028	SP RR STOP	SPECIAL RR STOP SIGN
029	ILUM GRD X	ILLUMINATED GRADE CROSSING
037	RAMP METER	METERED RAMPS
038	RUMBLE STR	RUMBLE STRIP
090	L-TURN REF	LEFT TURN REFUGE (WHEN REFUGE IS INVOLVED)
091	R-TURN ALL	RIGHT TURN AT ALL TIMES SIGN, ETC.
092	EMR SGN/FL	EMERGENCY SIGNS OR FLARES
093	ACCEL LANE	ACCELERATION OR DECELERATION LANES
094	R-TURN PRO	RIGHT TURN PROHIBITED ON RED AFTER STOPPING

095	BUS STPSGN	BUS STOP SIGN AND RED LIGHTS
099	UNKNOWN	UNKNOWN OR NOT DEFINITE

VEHICLE TYPE CODE TRANSLATION LIST

CODE	SHORT DESC	LONG DESCRIPTION
00	PDO	NOT COLLECTED FOR PDO CRASHES
01	PSNGR CAR	PASSENGER CAR, PICKUP, LIGHT DELIVERY, ETC.
02	BOBTAIL	TRUCK TRACTOR WITH NO TRAILERS (BOBTAIL)
03	FARM TRCTR	FARM TRACTOR OR SELF-PROPELLED FARM EQUIPMENT
04	SEMI TOW	TRUCK TRACTOR WITH TRAILER/MOBILE HOME IN TOW
05	TRUCK	TRUCK WITH NON-DETACHABLE BED, PANEL, ETC.
06	MOPED	MOPED, MINIBIKE, SEATED MOTOR SCOOTER, MOTOR BIKE
07	SCHL BUS	SCHOOL BUS (INCLUDES VAN)
08	OTH BUS	OTHER BUS
09	MTRCYCLE	MOTORCYCLE, DIRT BIKE
10	OTHER	OTHER: FORKLIFT, BACKHOE, ETC.
11	MOTRHOME	MOTORHOME
12	TROLLEY	MOTORIZED STREET CAR/TROLLEY (NO RAILS/WIRES)
13	ATV	ATV
14	MTRSCTR	MOTORIZED SCOOTER (STANDING)
15	SNOWMOBILE	SNOWMOBILE
99	UNKNOWN	UNKNOWN VEHICLE TYPE

WEATHER CONDITION CODE TRANSLATION LIST

CODE	SHORT DESC	LONG DESCRIPTION
0	UNK	UNKNOWN
1	CLR	CLEAR
2	CLD	CLOUDY
3	RAIN	RAIN
4	SLT	SLEET
5	FOG	FOG
6	SNOW	SNOW
7	DUST	DUST
8	SMOK	SMOKE
9	ASH	ASH

Appendix E
In-Process Developments

Traffic Impact Analysis
Newberg Ambulatory Surgical Center

Newberg, Oregon

March 9, 2017

completed with
Anderson Dabrowski Architects, LLC
Portland, Oregon

Prepared by:
Associated Transportation Engineering & Planning, Inc.
Salem, Oregon
March 6, 2017
ATEP 17-346

ASSOCIATED TRANSPORTATION ENGINEERING & PLANNING INC.

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Tel.: 503-364-5066
FAX: 503-364-1260
e-mail: kbirky@atepinc.com

Traffic Impact Analysis
Newberg Ambulatory Surgical Center

Newberg, Oregon

March 9, 2017

REGISTERED PROFESSIONAL ENGINEER
19348PE
OREGON
JULY 22, 1997
KARL BIRKY
12/31/2017

completed with
Anderson Dabrowski Architects, LLC
Portland, Oregon

Prepared by:
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Traffic Impact Analysis
Newberg Ambulatory Surgical Center
Newberg, Oregon

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Introduction:

The Oregon Clinic intends to develop a 17,510 sq. ft. Ambulatory Surgery Center on 3 acres of tax lot 2001 of tax map 3S2W16 in Newberg, Oregon. The site is west of Providence Drive and south of the Providence Hospital in Newberg. The facility will be developed with access to Providence Dr.

The Newberg Ambulatory Surgical Center will use the Newberg transportation system and add traffic to the roadways. This analysis will consider the traffic impacts at the intersection of 1) Providence Dr at Hwy 99W, 2) Hayes St at Werth Blvd. 3) Hayes St at Brutscher St and 4) Site Access at Providence Dr. Brutscher St at Fernwood Rd was closed while this study was conducted, diverting traffic to other intersections. Crash data was provided by the ODOT Crash Data Unit for the most recent 5 years.

Figure 1 - Vicinity Map

Summary of Findings:

The Newberg Ambulatory Surgical Center will generate an estimated 633 trips each day. 42 of those trips will be in the AM Peak hour and 62 trips will be in the PM Peak hour. The performance metrics at the studied intersections are shown in the following table upon opening in 2017.

	AM Peak hour		PM Peak hour	
	LOS	v/c	LOS	v/c
Hwy 99W at Providence Dr	A	0.661	B	0.721
Hayes at Werth	A		A	
Hayes at Brutscher	A		A	
Site Access at Providence Dr	A	0.012	B	0.067

Crash data from ODOT Crash Data Unit identifies 9 crashes at the studied intersections in the last 5 years. None were fatal crashes, 4 were injury crashes and 5 were property damage only crashes.

History and Existing Conditions:

The site has been vacant in the recent past and was is adjacent to the Providence Medical Center. The site is zoned Residential/Specific Plan (R R/SP). Traffic from the planned ambulatory surgery center will travel north or south on Providence Dr to access the transportation system. The intersection of Providence

Dr at Hwy 99 W is signal controlled, the intersections of Hayes at Brutscher are roundabouts, and the site access is two way stop controlled.

ID	Intersection Name	Control Type	Method	Worst Mvmt	V/C	Delay (s/veh)	LOS
1	Hwy 99W at Providence Dr	Signalized	HCM 6th Edition	NWB Right	0.652	5.0	A
3	Brutsher St at Hayes St	Roundabout	HCM 6th Edition	NB Thru		3.8	A
4	Hayes at Werth	Roundabout	HCM 6th Edition	EB Thru		3.2	A

Existing AM Peak Hour Summary

ID	Intersection Name	Control Type	Method	Worst Mvmt	V/C	Delay (s/veh)	LOS
1	Hwy 99W at Providence Dr	Signalized	HCM 6th Edition	SWB Left	0.714	10.7	B
3	Brutsher St at Hayes St	Roundabout	HCM 6th Edition	SB Right		4.6	A
4	Hayes at Werth	Roundabout	HCM 6th Edition	WB Thru		3.5	A

Existing PM Peak Hour Summary

Figure 2 - Existing Traffic Conditions

Traffic Conditions when Newberg Surgical Center is Complete:

Newberg Ambulatory Surgical Center will add 42 trips to the AM Peak hour traffic and 62 trips to the PM Peak hour traffic. This study will assume that 60% of the traffic will travel north of the site then toward Newberg, 30% north on Providence Dr then toward Sherwood and 10% to the south of the site. The study assumed that traffic volumes will increase linearly 1% per year to estimate the 2017 and 2032 performance metrics.

ID	Intersection Name	Control Type	Method	Worst Mvmt	V/C	Delay (s/veh)	LOS
1	Hwy 99W at Providence Dr	Signalized	HCM 6th Edition	NWB Right	0.661	5.4	A
3	Brutsher St at Hayes St	Roundabout	HCM 6th Edition	NB Thru		3.8	A
4	Hayes at Werth	Roundabout	HCM 6th Edition	EB Thru		3.2	A
5	Site Access at Providence Dr.	Two-way stop	HCM 6th Edition	EB Left	0.012	9.3	A

2017 AM Peak Hour Summary with Newberg Surgical Center

ID	Intersection Name	Control Type	Method	Worst Mvmt	V/C	Delay (s/veh)	LOS
1	Hwy 99W at Providence Dr	Signalized	HCM 6th Edition	SWB Left	0.731	12.0	B
3	Brutsher St at Hayes St	Roundabout	HCM 6th Edition	SB Right		4.6	A
4	Hayes at Werth	Roundabout	HCM 6th Edition	WB Thru		3.5	A
5	Site Access at Providence Dr.	Two-way stop	HCM 6th Edition	EB Left	0.067	10.1	B

2017 PM Peak Hour Summary with Newberg Surgical Center

Figure 3 – 2017 Traffic Conditions with Newberg Surgical Center

It is anticipated traffic will continue to increase at a rate of 1% / year. The following tables estimate the performance metrics and traffic volumes in the intersections in 15 years (2032) for planning purposes.

ID	Intersection Name	Control Type	Method	Worst Mvmt	V/C	Delay (s/veh)	LOS
1	Hwy 99W at Providence Dr	Signalized	HCM 6th Edition	NWB Right	0.758	7.7	A
3	Brutsher St at Hayes St	Roundabout	HCM 6th Edition	NB Thru		4.0	A
4	Hayes at Werth	Roundabout	HCM 6th Edition	EB Thru		3.3	A
5	Site Access at Providence Dr.	Two-way stop	HCM 6th Edition	EB Left	0.012	9.4	A

2032 AM Peak Hour Summary with Newberg Surgical Center

ID	Intersection Name	Control Type	Method	Worst Mvmt	V/C	Delay (s/veh)	LOS
1	Hwy 99W at Providence Dr	Signalized	HCM 6th Edition	SWB Left	0.839	17.6	B
3	Brutsher St at Hayes St	Roundabout	HCM 6th Edition	SB Right		5.0	A
4	Hayes at Werth	Roundabout	HCM 6th Edition	WB Thru		3.6	A
5	Site Access at Providence Dr.	Two-way stop	HCM 6th Edition	EB Left	0.069	10.3	B

2032 PM Peak Hour Summary with Newberg Surgical Center

Figure 4 – 2032 Traffic Conditions with Newberg Surgical Center

Crash Data:

The ODOT Crash Data Unit provided information about reported crashes at the shown intersections for the past 5 years.

Intersection	Fatal	Injury	Property Damage	Total Crashes
Hwy 99W at Providence Dr	0	3	5	8
Hayes at Werth	0	0	0	0
Hayes at Brutscher	0	1	0	1

Figure 5 – Reported Crashes at Studied Intersections in 2010-2014

Summary:

The development of the planned Newberg Ambulatory Surgical Center in Newberg will add traffic to the transportation system. This study finds there is and will continue to be adequate capacity at the studied intersections when it is completed. Crash data does not indicate significant safety problems at the intersections.

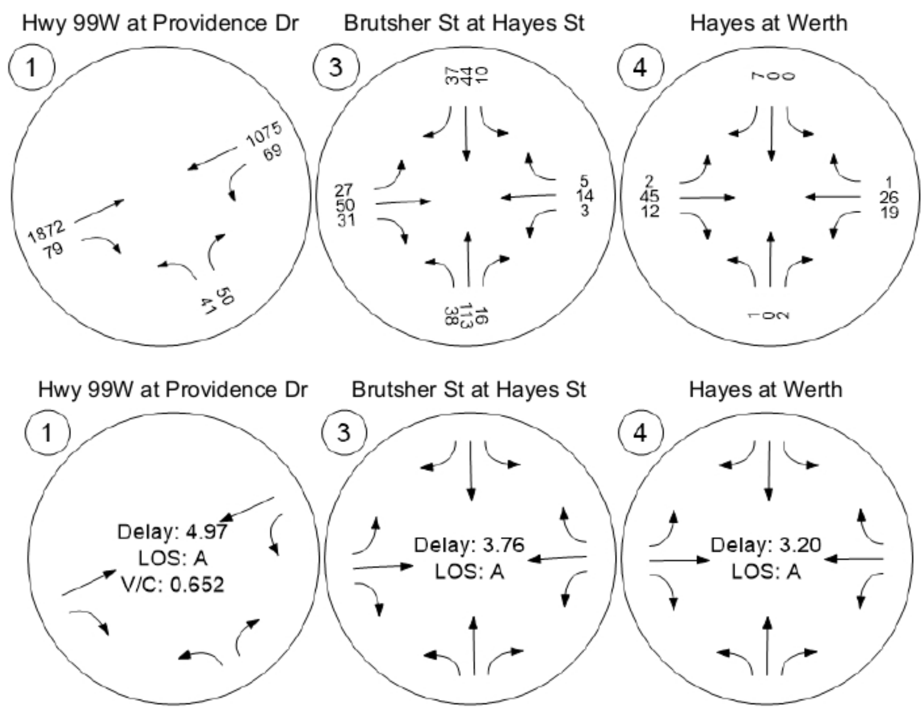


Figure 6 - Existing AM Peak hour Counts and Performance Metrics

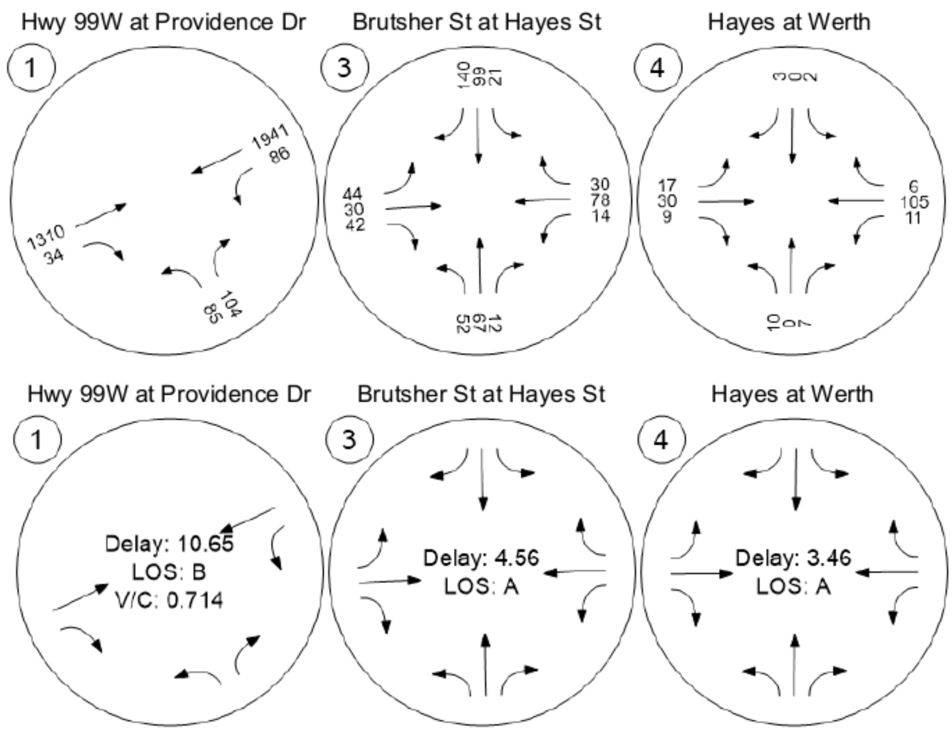


Figure 7 - Existing PM Peak hour Counts and Performance Metrics

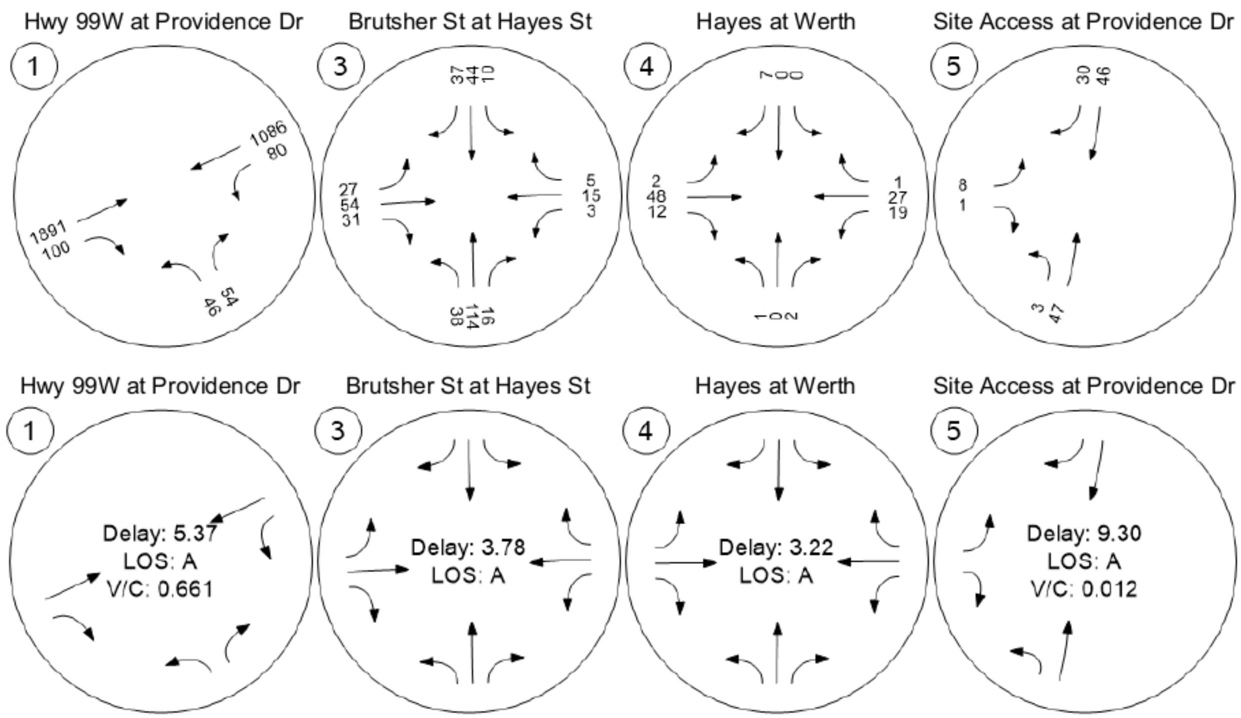


Figure 8 - 2017 AM Counts and Performance Metrics with Newberg Surgical Center

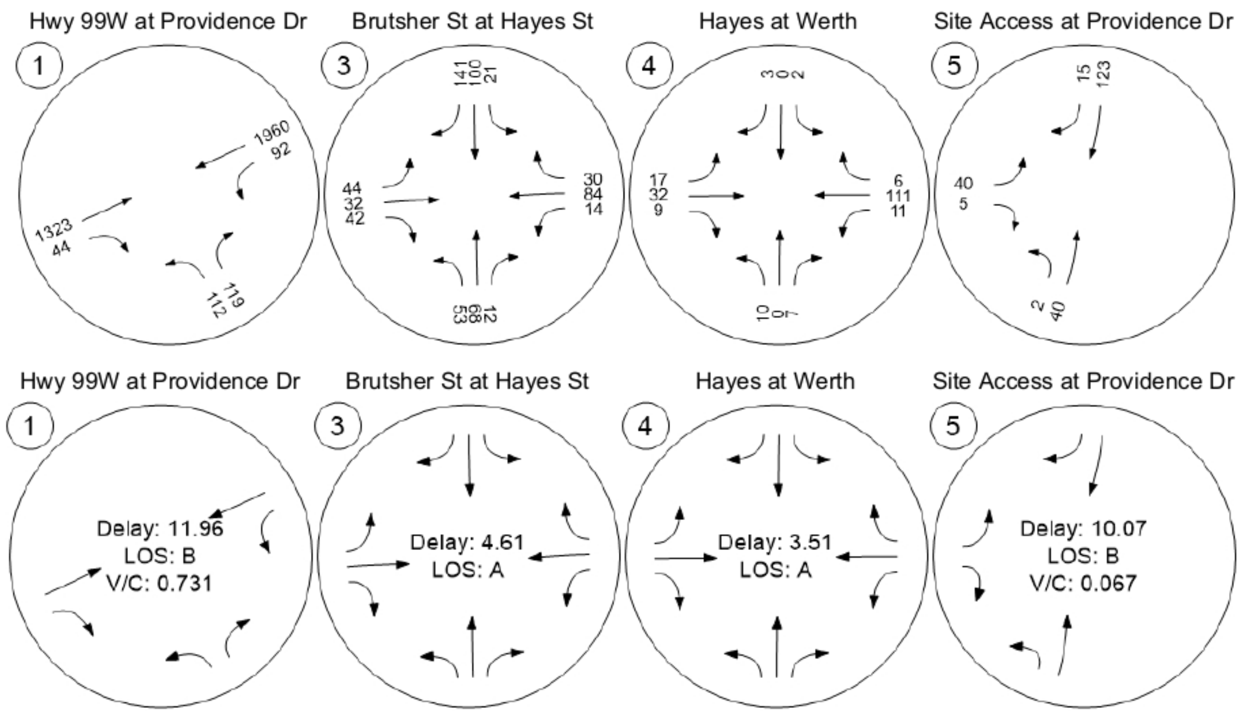


Figure 9 - 2017 PM Counts and Performance Metrics with Newberg Surgical Center

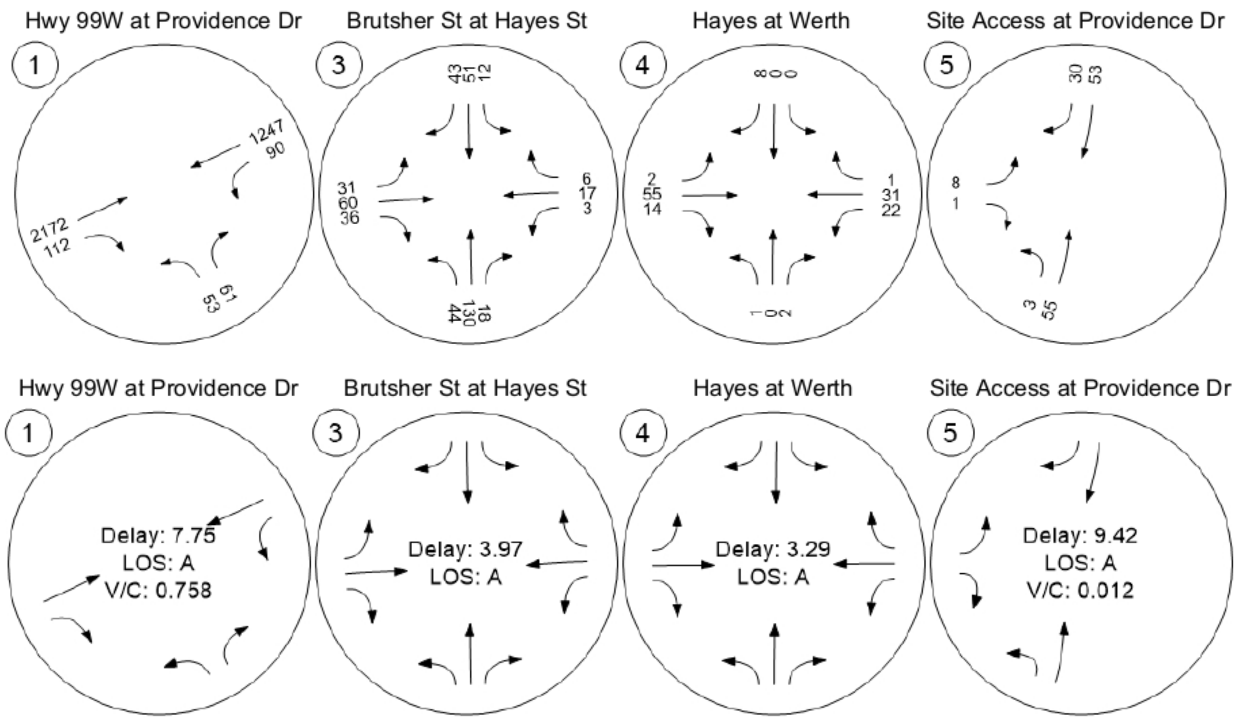


Figure 10 - 2032 AM Counts and Performance Metrics with Newberg Surgical Center

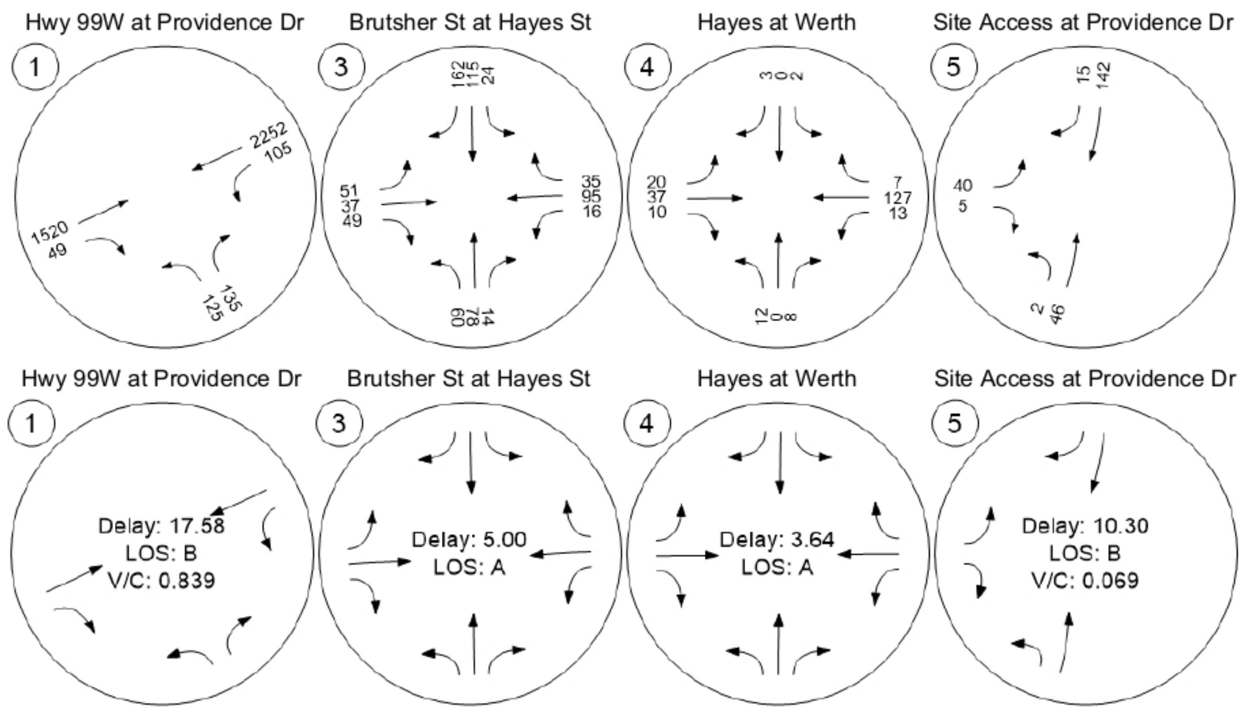
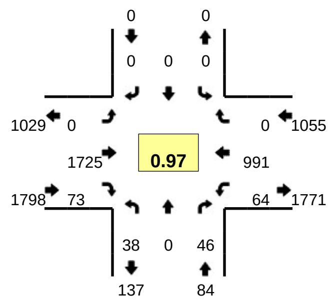


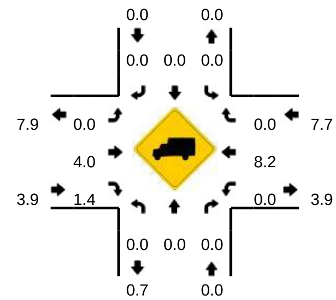
Figure 11 - 2032 PM Counts and Performance Metrics with Newberg Surgical Center

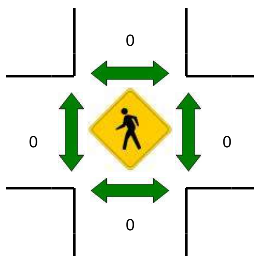
Type of peak hour being reported: Intersection Peak | Method for determining peak hour: Total Entering Volume

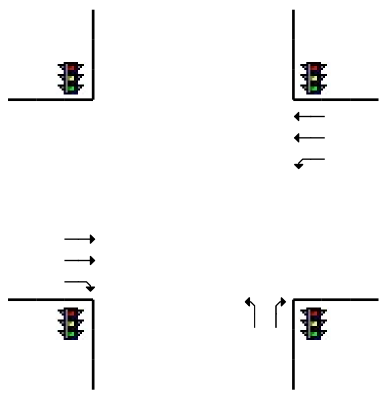
LOCATION: Providence Dr -- OR-99W | **QC JOB #:** 14233601
CITY/STATE: Newberg, OR | **DATE:** Tue, Feb 21 2017

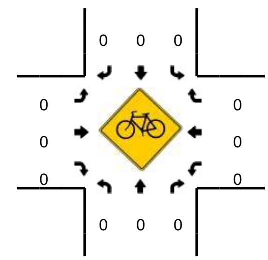
Peak-Hour: 7:00 AM -- 8:00 AM
Peak 15-Min: 7:45 AM -- 8:00 AM

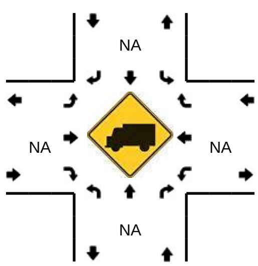


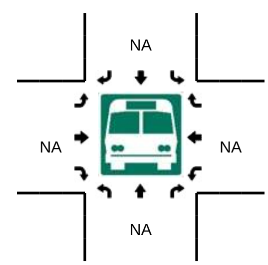










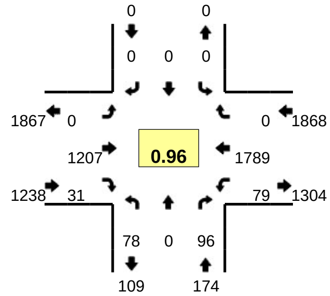


5-Min Count Period Beginning At	Providence Dr (Northbound) Left	Thru	Right	U	Providence Dr (Southbound) Left	Thru	Right	U	OR-99W (Eastbound) Left	Thru	Right	U	OR-99W (Westbound) Left	Thru	Right	U	Total	Hourly Totals
7:00 AM	0	0	1	0	0	0	0	0	0	171	5	0	5	68	0	0	250	
7:05 AM	1	0	4	0	0	0	0	0	0	169	6	0	4	73	0	0	257	
7:10 AM	3	0	3	0	0	0	0	0	0	132	3	0	3	88	0	0	232	
7:15 AM	1	0	1	0	0	0	0	0	0	143	2	0	10	74	0	0	231	
7:20 AM	3	0	4	0	0	0	0	0	0	176	6	0	4	77	0	0	270	
7:25 AM	4	0	8	0	0	0	0	0	0	128	3	0	3	79	0	0	225	
7:30 AM	7	0	7	0	0	0	0	0	0	141	6	0	4	87	0	0	252	
7:35 AM	1	0	6	0	0	0	0	0	0	146	7	0	10	77	0	0	247	
7:40 AM	4	0	1	0	0	0	0	0	0	134	7	0	2	70	0	0	218	
7:45 AM	6	0	5	0	0	0	0	0	0	135	4	0	7	100	0	0	257	
7:50 AM	4	0	5	0	0	0	0	0	0	129	11	0	6	96	0	0	251	
7:55 AM	4	0	1	0	0	0	0	0	0	121	13	0	6	102	0	0	247	2937
8:00 AM	3	0	7	0	0	0	0	0	0	119	5	0	4	83	0	0	221	2908
8:05 AM	1	0	4	0	0	0	0	0	0	102	4	0	7	77	0	0	195	2846
8:10 AM	4	0	3	0	0	0	0	0	0	97	4	0	3	79	0	0	190	2804
8:15 AM	6	0	2	0	0	0	0	0	0	109	7	0	2	68	0	0	194	2767
8:20 AM	4	0	5	0	0	0	0	0	0	113	7	0	9	75	0	0	213	2710
8:25 AM	4	0	5	0	0	0	0	0	0	120	1	0	2	69	0	0	201	2686
8:30 AM	2	0	4	0	0	0	0	0	0	105	4	0	5	69	0	0	189	2623
8:35 AM	5	0	3	0	0	0	0	0	0	114	6	0	3	87	0	0	218	2594
8:40 AM	7	0	3	0	0	0	0	0	0	75	4	0	4	59	0	0	152	2528
8:45 AM	11	0	6	0	0	0	0	0	0	113	5	0	6	51	0	0	192	2463
8:50 AM	9	0	2	0	0	0	0	0	0	91	4	0	3	89	0	0	198	2410
8:55 AM	7	0	0	0	0	0	0	0	0	100	5	0	3	56	0	0	171	2334

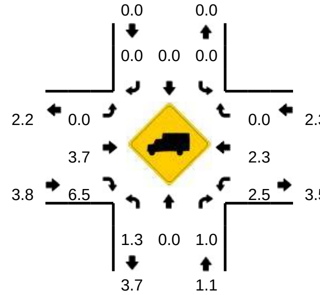
Peak 15-Min Flowrates	Northbound Left	Thru	Right	U	Southbound Left	Thru	Right	U	Eastbound Left	Thru	Right	U	Westbound Left	Thru	Right	U	Total
All Vehicles	56	0	44	0	0	0	0	0	0	1540	112	0	76	1192	0	0	3020
Heavy Trucks	0	0	0		0	0	0		0	48	4		0	84	0		136
Pedestrians		0				0				0				0			0
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0
Railroad																	
Stopped Buses																	

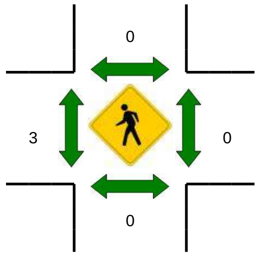
Comments:

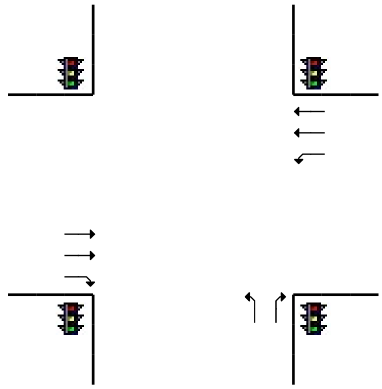
LOCATION: Providence Dr -- OR-99W   **QC JOB #:** 14233602
CITY/STATE: Newberg, OR   **DATE:** Tue, Feb 21 2017

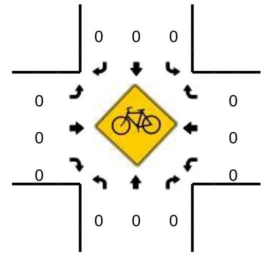


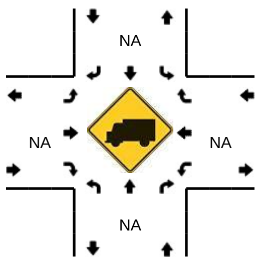
Peak-Hour: 4:30 PM -- 5:30 PM
Peak 15-Min: 4:40 PM -- 4:55 PM

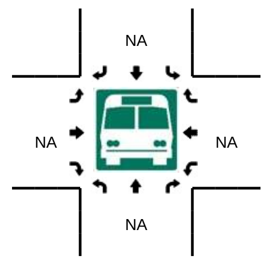












5-Min Count Period Beginning At	Providence Dr (Northbound) Left	Thru	Right	U	Providence Dr (Southbound) Left	Thru	Right	U	OR-99W (Eastbound) Left	Thru	Right	U	OR-99W (Westbound) Left	Thru	Right	U	Total	Hourly Totals
4:00 PM	4	0	4	0	0	0	0	0	0	88	0	0	7	149	0	1	253	
4:05 PM	12	0	9	0	0	0	0	0	0	91	2	0	4	145	0	0	263	
4:10 PM	6	0	8	0	0	0	0	0	0	100	3	0	11	166	0	0	294	
4:15 PM	8	0	4	0	0	0	0	0	0	92	3	0	6	146	0	0	259	
4:20 PM	9	0	6	0	0	0	0	0	0	81	4	0	7	151	0	0	258	
4:25 PM	9	0	5	0	0	0	0	0	0	97	4	0	2	114	0	0	231	
4:30 PM	5	0	6	0	0	0	0	0	0	82	5	0	2	167	0	0	267	
4:35 PM	16	0	15	0	0	0	0	0	0	86	4	0	2	133	0	0	256	
4:40 PM	1	0	7	0	0	0	0	0	0	106	3	0	8	179	0	1	305	
4:45 PM	5	0	8	0	0	0	0	0	0	90	2	0	7	147	0	0	259	
4:50 PM	6	0	10	0	0	0	0	0	0	111	4	0	6	156	0	0	293	
4:55 PM	3	0	9	0	0	0	0	0	0	105	1	0	8	151	0	0	277	3215
5:00 PM	4	0	9	0	0	0	0	0	0	82	2	0	10	138	0	0	245	3207
5:05 PM	13	0	9	0	0	0	0	0	0	121	1	0	11	120	0	0	275	3219
5:10 PM	5	0	6	0	0	0	0	0	0	123	3	0	9	132	0	0	278	3203
5:15 PM	7	0	10	0	0	0	0	0	0	96	3	0	3	146	0	0	265	3209
5:20 PM	7	0	6	0	0	0	0	0	0	94	2	0	9	167	0	0	285	3236
5:25 PM	6	0	1	0	0	0	0	0	0	111	1	0	3	153	0	0	275	3280
5:30 PM	6	0	6	0	0	0	0	0	0	98	1	0	7	140	0	0	258	3271
5:35 PM	5	0	4	0	0	0	0	0	0	84	2	0	5	151	0	1	252	3267
5:40 PM	7	0	5	0	0	0	0	0	0	101	3	0	10	149	0	0	275	3237
5:45 PM	8	0	5	0	0	0	0	0	0	86	0	0	4	142	0	0	245	3223
5:50 PM	2	0	4	0	0	0	0	0	0	84	3	0	8	147	0	0	248	3178
5:55 PM	1	0	3	0	0	0	0	0	0	108	3	0	1	145	0	0	261	3162

Peak 15-Min Flowrates	Northbound Left	Thru	Right	U	Southbound Left	Thru	Right	U	Eastbound Left	Thru	Right	U	Westbound Left	Thru	Right	U	Total
All Vehicles	48	0	100	0	0	0	0	0	0	1228	36	0	84	1928	0	4	3428
Heavy Trucks	0	0	0		0	0	0		0	48	4		4	56	0		112
Pedestrians		0				0				4				0			4
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0
Railroad																	
Stopped Buses																	

Comments:

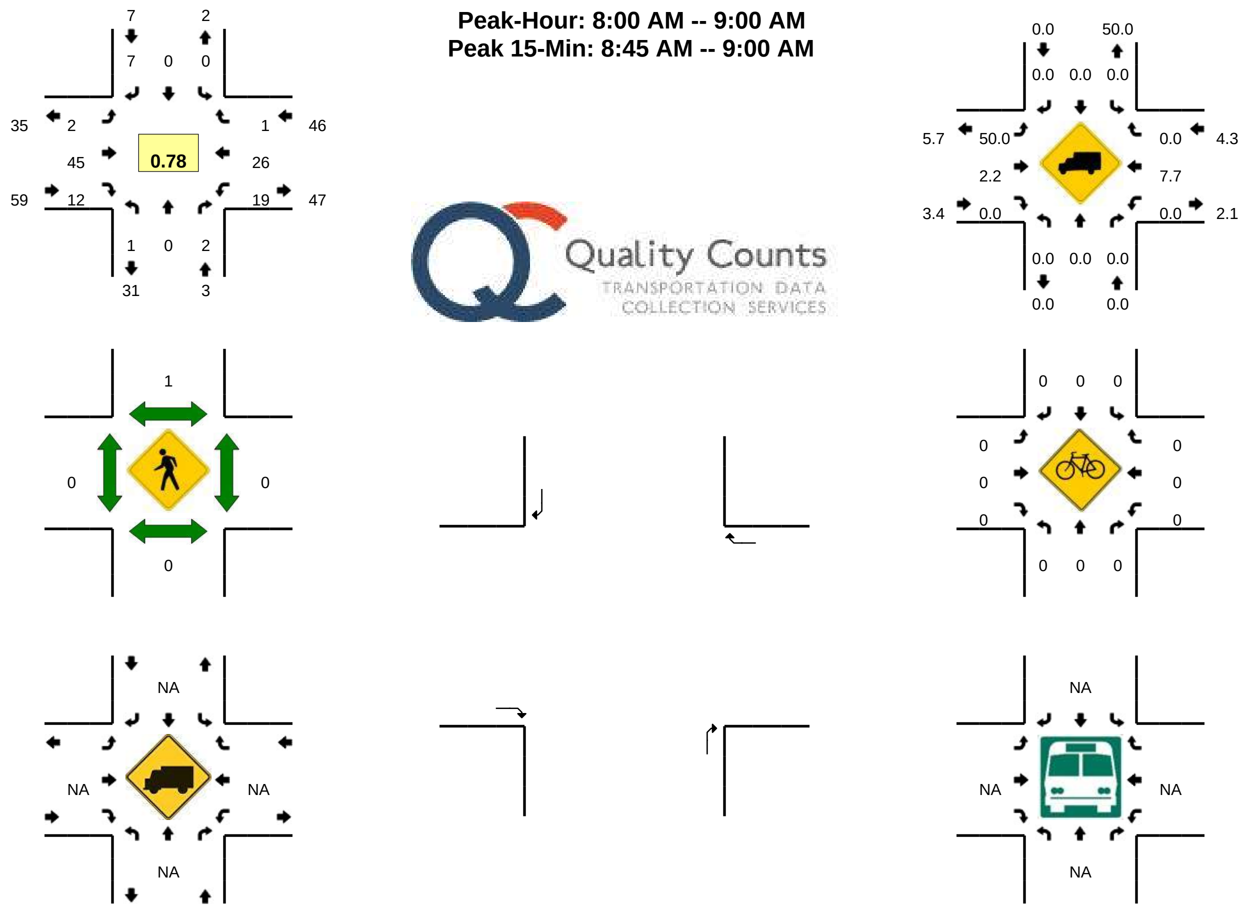
Type of peak hour being reported: Intersection Peak — Method for determining peak hour: Total Entering Volume

LOCATION: Werth Blvd -- Hayes St — **QC JOB #:** 14233603

CITY/STATE: Newberg, OR — **DATE:** Tue, Feb 21 2017

Peak-Hour: 8:00 AM -- 9:00 AM

Peak 15-Min: 8:45 AM -- 9:00 AM



5-Min Count Period Beginning At	Werth Blvd (Northbound) Left	Thru	Right	U	Werth Blvd (Southbound) Left	Thru	Right	U	Hayes St (Eastbound) Left	Thru	Right	U	Hayes St (Westbound) Left	Thru	Right	U	Total	Hourly Totals
7:00 AM	0	0	1	0	0	0	0	0	0	1	0	0	1	2	0	0	5	
7:05 AM	0	0	1	0	1	0	0	0	1	4	1	0	0	1	0	0	9	
7:10 AM	0	0	0	0	0	1	0	0	0	4	0	0	0	3	0	0	8	
7:15 AM	0	0	1	0	1	0	0	0	0	4	1	0	1	1	0	0	9	
7:20 AM	0	0	0	0	0	0	0	0	0	8	0	0	0	3	0	0	11	
7:25 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	2	
7:30 AM	0	0	0	0	1	0	0	0	0	7	0	0	1	0	0	0	9	
7:35 AM	0	0	0	0	0	0	0	0	0	3	0	0	0	2	0	0	5	
7:40 AM	0	0	0	0	0	0	0	0	0	4	2	1	0	3	0	0	10	
7:45 AM	0	0	0	0	0	0	0	0	0	10	1	0	0	1	0	0	12	
7:50 AM	0	0	0	0	0	0	0	0	0	6	1	0	0	0	0	0	7	
7:55 AM	0	0	0	0	0	0	0	0	0	1	0	0	1	2	0	0	4	91
8:00 AM	0	0	0	0	0	0	0	0	0	8	0	0	0	3	0	0	11	97
8:05 AM	0	0	0	0	0	0	0	0	0	4	1	0	0	1	0	0	6	94
8:10 AM	1	0	0	0	0	0	0	0	0	1	1	0	3	1	0	0	7	93
8:15 AM	0	0	0	0	0	0	0	0	0	3	0	0	4	1	1	0	9	93
8:20 AM	0	0	0	0	0	0	0	0	0	1	1	0	3	3	0	0	8	90
8:25 AM	0	0	0	0	0	0	1	0	0	5	0	0	1	1	0	0	8	96
8:30 AM	0	0	0	0	0	0	1	0	0	6	1	0	1	3	0	0	12	99
8:35 AM	0	0	0	0	0	0	2	0	0	3	2	0	1	5	0	0	13	107
8:40 AM	0	0	0	0	0	0	0	0	0	0	1	0	2	1	0	0	4	101
8:45 AM	0	0	0	0	0	0	1	0	0	6	1	0	1	2	0	0	11	100
8:50 AM	0	0	1	0	0	0	1	0	1	5	2	0	0	4	0	0	14	107
8:55 AM	0	0	1	0	0	0	1	0	0	3	2	1	3	1	0	0	12	115

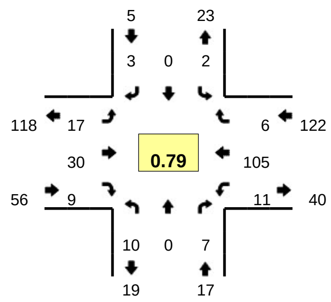
Peak 15-Min Flowrates	Northbound Left	Thru	Right	U	Southbound Left	Thru	Right	U	Eastbound Left	Thru	Right	U	Westbound Left	Thru	Right	U	Total
All Vehicles	0	0	8	0	0	0	12	0	4	56	20	4	16	28	0	0	148
Heavy Trucks	0	0	0		0	0	0		4	0	0		0	4	0		8
Pedestrians		0				0				0				0			0
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0
Railroad																	
Stopped Buses																	

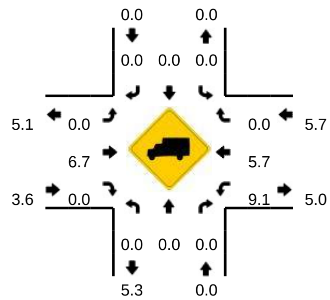
Comments:

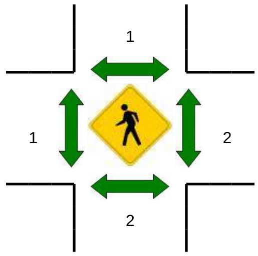
Type of peak hour being reported: Intersection Peak　　　　Method for determining peak hour: Total Entering Volume

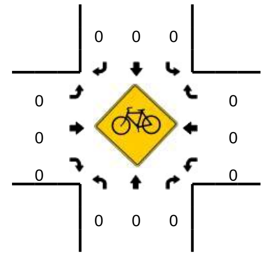
LOCATION: Werth Blvd -- Hayes St　　　　**QC JOB #:** 14233604
CITY/STATE: Newberg, OR　　　　**DATE:** Tue, Feb 21 2017

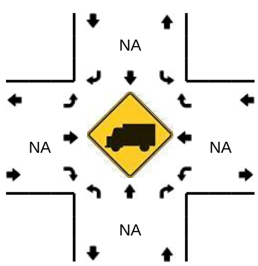
Peak-Hour: 4:10 PM -- 5:10 PM
Peak 15-Min: 4:55 PM -- 5:10 PM

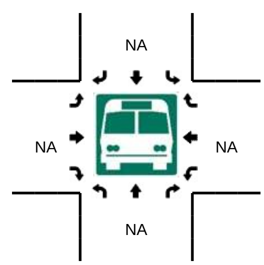












5-Min Count Period Beginning At	Werth Blvd (Northbound) Left	Thru	Right	U	Werth Blvd (Southbound) Left	Thru	Right	U	Hayes St (Eastbound) Left	Thru	Right	U	Hayes St (Westbound) Left	Thru	Right	U	Total	Hourly Totals
4:00 PM	2	0	1	0	0	0	0	0	1	2	0	0	1	9	1	0	17	
4:05 PM	1	0	1	0	0	0	0	0	2	2	2	0	0	8	0	0	16	
4:10 PM	0	0	0	0	0	0	0	0	2	2	2	0	0	8	2	0	16	
4:15 PM	0	0	0	0	0	0	1	0	2	2	2	0	1	9	1	0	18	
4:20 PM	1	0	0	0	0	0	0	0	2	1	0	0	0	11	0	0	15	
4:25 PM	0	0	2	0	0	0	1	0	6	3	2	0	2	5	1	0	22	
4:30 PM	2	0	2	0	0	0	0	0	0	1	0	0	2	4	1	0	12	
4:35 PM	1	0	1	0	0	0	0	0	1	2	0	0	0	10	0	1	16	
4:40 PM	0	0	0	0	0	0	0	0	0	4	0	0	0	6	0	0	10	
4:45 PM	2	0	1	0	0	0	0	0	0	3	2	0	1	12	0	0	21	
4:50 PM	0	0	0	0	0	0	1	0	1	2	0	0	1	2	0	0	7	
4:55 PM	0	0	0	0	0	0	0	0	0	4	0	0	1	14	0	0	19	189
5:00 PM	2	0	0	0	0	0	0	0	1	2	0	0	1	12	1	0	19	191
5:05 PM	2	0	1	0	2	0	0	0	2	4	1	0	1	12	0	0	25	200
5:10 PM	0	0	1	0	0	0	0	0	0	3	0	0	1	7	1	0	13	197
5:15 PM	0	0	1	0	0	0	1	0	0	5	1	0	0	5	0	0	13	192
5:20 PM	3	0	1	0	1	0	0	0	1	2	0	0	1	9	0	0	18	195
5:25 PM	0	0	0	0	1	0	1	0	0	3	0	0	2	8	0	0	15	188
5:30 PM	0	0	1	0	0	0	0	0	0	2	1	0	0	5	0	0	9	185
5:35 PM	0	0	0	0	0	0	0	0	0	1	0	0	0	8	0	0	9	178
5:40 PM	0	0	1	0	0	0	3	0	1	4	2	0	0	8	1	0	20	188
5:45 PM	1	0	0	0	1	0	0	0	0	2	0	0	0	5	0	0	9	176
5:50 PM	2	0	0	0	0	0	0	0	0	1	2	0	0	2	0	0	7	176
5:55 PM	0	0	0	0	0	0	0	0	0	4	1	0	0	4	0	0	9	166

Peak 15-Min Flowrates	Northbound Left	Thru	Right	U	Southbound Left	Thru	Right	U	Eastbound Left	Thru	Right	U	Westbound Left	Thru	Right	U	Total
All Vehicles	16	0	4	0	8	0	0	0	12	40	4	0	12	152	4	0	252
Heavy Trucks	0	0	0		0	0	0		0	0	0		0	4	0		4
Pedestrians		0				0				0				4			4
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0
Railroad																	
Stopped Buses																	

Comments:

Report generated on 2/28/2017 2:22 PM　　　　SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

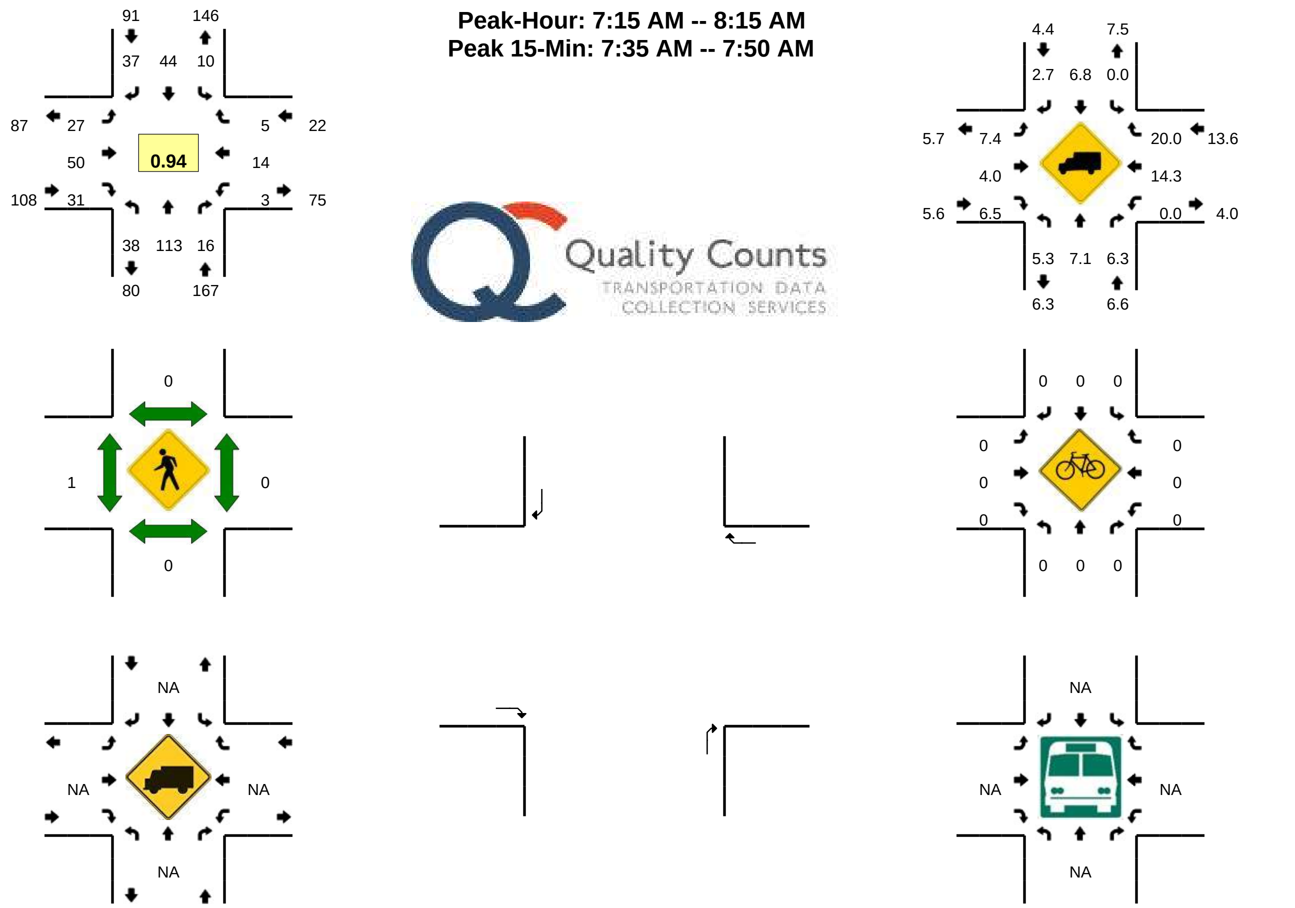
Type of peak hour being reported: Intersection Peak — Method for determining peak hour: Total Entering Volume

LOCATION: Brutscher St -- Hayes St — **QC JOB #:** 14233605

CITY/STATE: Newberg, OR — **DATE:** Tue, Feb 21 2017

Peak-Hour: 7:15 AM -- 8:15 AM

Peak 15-Min: 7:35 AM -- 7:50 AM



5-Min Count Period Beginning At	Brutscher St (Northbound)				Brutscher St (Southbound)				Hayes St (Eastbound)				Hayes St (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
7:00 AM	3	4	0	0	0	1	2	0	4	1	0	0	1	0	2	0	18	
7:05 AM	4	5	1	0	0	1	0	0	0	5	1	0	0	1	0	0	18	
7:10 AM	3	6	1	0	0	3	1	0	0	4	1	0	0	2	1	0	22	
7:15 AM	6	14	2	0	1	1	4	0	3	3	2	0	0	1	0	0	37	
7:20 AM	3	14	2	0	1	1	1	1	1	5	0	0	1	0	2	0	32	
7:25 AM	4	12	0	1	0	2	1	0	1	3	2	0	0	2	0	0	28	
7:30 AM	3	6	1	0	3	5	1	0	3	6	4	0	0	1	0	0	33	
7:35 AM	0	10	0	0	0	1	6	0	2	3	5	0	0	2	0	0	29	
7:40 AM	4	7	1	0	1	5	3	0	2	6	2	0	2	2	1	0	36	
7:45 AM	3	8	3	0	1	4	5	0	3	7	4	0	0	0	0	0	38	
7:50 AM	2	4	1	0	1	4	3	0	4	6	1	0	0	1	0	0	27	
7:55 AM	3	8	3	0	0	4	2	0	2	2	1	0	0	1	0	0	26	344
8:00 AM	1	4	1	1	1	6	3	0	1	4	4	0	0	2	1	0	29	355
8:05 AM	6	13	0	0	0	3	4	0	5	5	4	0	0	1	0	0	41	378
8:10 AM	1	13	2	0	0	8	4	0	0	0	2	0	0	1	1	0	32	388
8:15 AM	4	8	3	0	0	4	3	1	1	0	2	0	0	1	1	0	28	379
8:20 AM	5	9	1	0	0	6	2	0	2	2	2	0	0	0	2	0	31	378
8:25 AM	2	6	0	0	1	10	0	1	5	5	2	0	1	1	0	0	34	384
8:30 AM	4	6	3	0	0	4	1	0	3	3	2	0	0	2	2	0	30	381
8:35 AM	3	6	1	0	1	4	3	0	2	3	2	0	1	2	3	0	31	383
8:40 AM	1	3	1	0	0	6	4	0	1	3	3	0	0	2	1	0	25	372
8:45 AM	3	5	1	0	2	5	0	0	2	5	3	0	0	1	2	0	29	363
8:50 AM	2	1	0	0	3	8	4	0	3	3	5	0	1	2	3	0	35	371
8:55 AM	6	7	0	0	4	6	1	0	1	2	7	0	0	1	1	0	36	381

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	28	100	16	0	8	40	56	0	28	64	44	0	8	16	4	0	412
Heavy Trucks	0	4	0		0	0	0		4	4	4		0	0	0		16
Pedestrians		0				0				4				0			4
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0
Railroad																	
Stopped Buses																	

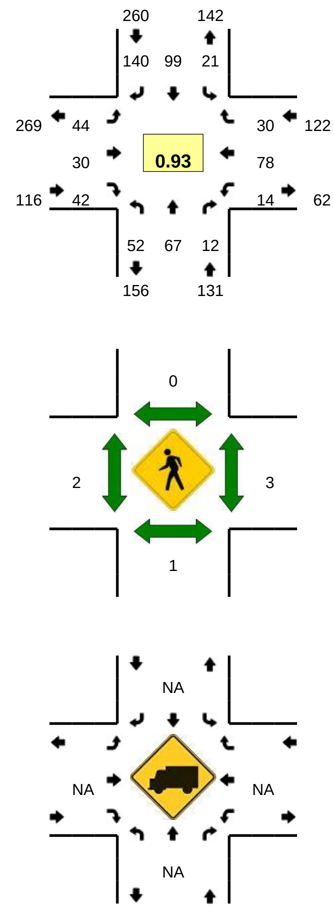
Comments:

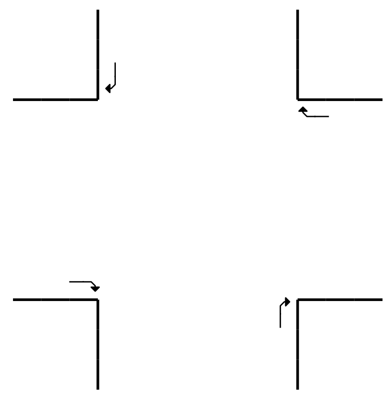
Report generated on 2/28/2017 2:22 PM — SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

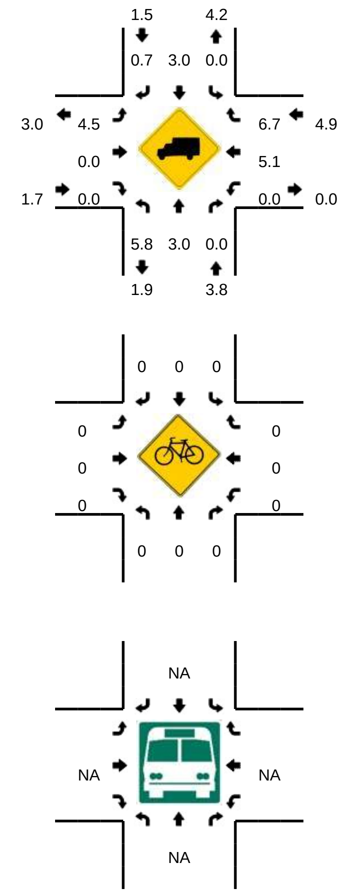
Type of peak hour being reported: Intersection Peak | Method for determining peak hour: Total Entering Volume

LOCATION: Brutscher St -- Hayes St | **QC JOB #:** 14233606
CITY/STATE: Newberg, OR | **DATE:** Tue, Feb 21 2017

Peak-Hour: 4:20 PM -- 5:20 PM
Peak 15-Min: 5:00 PM -- 5:15 PM







5-Min Count Period Beginning At	Brutscher St (Northbound) Left	Thru	Right	U	Brutscher St (Southbound) Left	Thru	Right	U	Hayes St (Eastbound) Left	Thru	Right	U	Hayes St (Westbound) Left	Thru	Right	U	Total	Hourly Totals
4:00 PM	4	3	0	0	2	10	7	0	2	2	3	0	3	7	4	0	47	
4:05 PM	8	7	1	0	0	4	12	1	2	4	4	0	0	9	1	0	53	
4:10 PM	5	4	1	0	4	10	5	0	3	3	1	0	0	5	4	0	45	
4:15 PM	4	5	1	0	4	5	10	0	3	2	2	0	1	5	0	0	42	
4:20 PM	3	4	1	0	5	6	13	0	4	2	2	0	2	9	4	0	55	
4:25 PM	2	8	0	0	7	9	10	0	2	2	1	0	0	4	3	0	48	
4:30 PM	5	7	1	0	0	12	16	0	7	0	2	0	0	4	2	0	56	
4:35 PM	5	5	0	0	2	5	11	0	4	1	2	0	2	9	3	0	49	
4:40 PM	4	7	2	0	1	4	7	0	3	3	4	0	0	6	1	0	42	
4:45 PM	8	5	0	0	0	15	11	0	6	4	1	0	2	7	3	0	62	
4:50 PM	8	5	0	1	1	5	16	0	2	2	5	0	1	3	3	0	52	
4:55 PM	5	3	2	0	0	5	13	0	3	1	4	0	1	7	1	0	45	596
5:00 PM	1	9	3	0	2	6	6	0	2	3	4	0	1	14	3	0	54	603
5:05 PM	4	3	1	0	2	8	19	0	4	4	9	0	1	7	3	0	65	615
5:10 PM	3	4	0	0	0	13	8	0	4	4	5	0	3	5	2	0	51	621
5:15 PM	3	7	2	0	0	11	10	1	3	4	3	0	1	3	2	0	50	629
5:20 PM	0	4	1	0	1	5	14	0	3	2	2	0	1	12	0	0	45	619
5:25 PM	8	6	0	0	1	4	9	0	1	1	6	0	1	9	1	0	47	618
5:30 PM	2	2	0	0	1	9	11	0	4	2	2	0	1	3	2	0	39	601
5:35 PM	6	6	0	0	1	12	10	1	4	1	4	0	0	6	1	0	52	604
5:40 PM	0	4	2	0	0	6	12	0	4	4	1	0	1	13	0	0	47	609
5:45 PM	0	10	0	0	0	15	10	0	2	2	4	1	1	3	2	0	50	597
5:50 PM	5	9	0	0	1	8	7	0	0	3	7	0	1	3	0	0	44	589
5:55 PM	7	10	1	0	1	4	6	0	0	2	3	0	2	2	0	0	38	582

Peak 15-Min Flowrates	Northbound Left	Thru	Right	U	Southbound Left	Thru	Right	U	Eastbound Left	Thru	Right	U	Westbound Left	Thru	Right	U	Total
All Vehicles	32	64	16	0	16	108	132	0	40	44	72	0	20	104	32	0	680
Heavy Trucks	0	4	0		0	4	0		4	0	0		0	0	0		12
Pedestrians		0				0				4				0			4
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0
Railroad																	
Stopped Buses																	

Comments:

OREGON DEPARTMENT OF TRANSPORTATION - TRANSPORTATION DEVELOPMENT DIVISION
TRANSPORTATION DATA SECTION - CRASH ANALYSIS AND REPORTING UNIT
CRASH SUMMARIES BY YEAR BY COLLISION TYPE

Providence Dr & 99W Pacific Highway (091)
January 1, 2010 through December 31, 2014

COLLISION TYPE	FATAL CRASHES	NON-FATAL CRASHES	PROPERTY DAMAGE ONLY	TOTAL CRASHES	PEOPLE KILLED	PEOPLE INJURED	TRUCKS	DRY SURF	WET SURF	DAY	DARK	INTER-SECTION	INTER-SECTION RELATED	OFF-ROAD
YEAR: 2014														
REAR-END	0	0	2	2	0	0	0	2	0	2	0	2	0	0
2014 TOTAL	0	0	2	2	0	0	0	2	0	2	0	2	0	0
YEAR: 2013														
REAR-END	0	0	1	1	0	0	0	1	0	1	0	1	0	0
2013 TOTAL	0	0	1	1	0	0	0	1	0	1	0	1	0	0
YEAR: 2012														
REAR-END	0	2	1	3	0	3	0	2	1	3	0	3	0	0
2012 TOTAL	0	2	1	3	0	3	0	2	1	3	0	3	0	0
YEAR: 2011														
REAR-END	0	0	1	1	0	0	0	0	1	1	0	1	0	0
2011 TOTAL	0	0	1	1	0	0	0	0	1	1	0	1	0	0
YEAR: 2010														
REAR-END	0	1	0	1	0	2	0	1	0	1	0	1	0	0
2010 TOTAL	0	1	0	1	0	2	0	1	0	1	0	1	0	0
FINAL TOTAL	0	3	5	8	0	5	0	6	2	8	0	8	0	0

Disclaimer: A higher number of crashes may be reported as of 2011 compared to prior years. This does not reflect an increase in annual crashes. The higher numbers result from a change to an internal departmental process that allows the Crash Analysis and Reporting Unit to add previously unavailable, non-fatal crash reports to the annual data file. Please be aware of this change when comparing pre-2011 crash statistics.

OREGON DEPARTMENT OF TRANSPORTATION - TRANSPORTATION DEVELOPMENT DIVISION
TRANSPORTATION DATA SECTION - CRASH ANALYSIS AND REPORTING UNIT
CRASH SUMMARIES BY YEAR BY COLLISION TYPE

Hayes St & Brutscher St
January 1, 2010 through December 31, 2014

COLLISION TYPE	FATAL CRASHES	NON-FATAL CRASHES	PROPERTY DAMAGE ONLY	TOTAL CRASHES	PEOPLE KILLED	PEOPLE INJURED	TRUCKS	DRY SURF	WET SURF	DAY	DARK	INTER-SECTION	INTER-SECTION RELATED	OFF-ROAD
YEAR: 2013														
NON-COLLISION	0	1	0	1	0	1	0	1	0	0	1	1	0	0
2013 TOTAL	0	1	0	1	0	1	0	1	0	0	1	1	0	0
FINAL TOTAL	0	1	0	1	0	1	0	1	0	0	1	1	0	0

Disclaimer: A higher number of crashes may be reported as of 2011 compared to prior years. This does not reflect an increase in annual crashes. The higher numbers result from a change to an internal departmental process that allows the Crash Analysis and Reporting Unit to add previously unavailable, non-fatal crash reports to the annual data file. Please be aware of this change when comparing pre-2011 crash statistics.

17-346 Newberg Surg. Ctr TIA

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Scenario 1 AM Existing 17-346

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3/2/2017

Intersection Analysis Summary

ID	Intersection Name	Control Type	Method	Worst Mvmt	V/C	Delay (s/veh)	LOS
1	Hwy 99W at Providence Dr	Signalized	HCM 6th Edition	NWB Right	0.652	5.0	A
3	Brutsher St at Hayes St	Roundabout	HCM 6th Edition	NB Thru		3.8	A
4	Hayes at Werth	Roundabout	HCM 6th Edition	EB Thru		3.2	A

V/C, Delay, LOS: For two-way stop, these values are taken from the movement with the worst (highest) delay value. for all other control types, they are taken for the whole intersection.

Intersection Level Of Service Report
Intersection 1: Hwy 99W at Providence Dr

Control Type:	Signalized	Delay (sec / veh):	5.0
Analysis Method:	HCM 6th Edition	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.652

Intersection Setup

Name	Hwy 99W		Hwy 99W		Providence Dr	
Approach	Northeastbound		Southwestbound		Northwestbound	
Lane Configuration						
Turning Movement	Thru	Right	Left	Thru	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	1	1	0	1	0
Pocket Length [ft]	100.00	75.00	100.00	100.00	150.00	100.00
Speed [mph]	45.00		45.00		25.00	
Grade [%]	0.00		0.00		0.00	
Curb Present	No		No		No	
Crosswalk	Yes		Yes		Yes	

Volumes

Name	Hwy 99W		Hwy 99W		Providence Dr	
Base Volume Input [veh/h]	1725	73	64	991	38	46
Base Volume Adjustment Factor	1.0850	1.0850	1.0850	1.0850	1.0850	1.0850
Heavy Vehicles Percentage [%]	4.50	4.50	4.50	4.50	4.50	4.50
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	1872	79	69	1075	41	50
Peak Hour Factor	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	482	20	18	277	11	13
Total Analysis Volume [veh/h]	1930	81	71	1108	42	52
Presence of On-Street Parking	No	No	No	No	No	No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0		0		0	
v_di, Inbound Pedestrian Volume crossing m	0		0		0	
v_co, Outbound Pedestrian Volume crossing	0		0		0	
v_ci, Inbound Pedestrian Volume crossing mi	0		0		0	
v_ab, Corner Pedestrian Volume [ped/h]	0		0		0	
Bicycle Volume [bicycles/h]	0		0		0	

Intersection Settings

Located in CBD	Yes
Signal Coordination Group	-
Cycle Length [s]	120
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	0.00

Phasing & Timing

Control Type	Permissive	Permissive	Permissive	Permissive	Permissive	Permissive
Signal group	8	0	0	4	5	0
Auxiliary Signal Groups						
Lead / Lag	-	-	-	-	Lead	-
Minimum Green [s]	5	0	0	5	5	0
Maximum Green [s]	30	0	0	30	30	0
Amber [s]	3.0	0.0	0.0	3.0	3.0	0.0
All red [s]	1.0	0.0	0.0	1.0	1.0	0.0
Split [s]	19	0	0	19	101	0
Vehicle Extension [s]	3.0	0.0	0.0	3.0	3.0	0.0
Walk [s]	5	0	0	5	5	0
Pedestrian Clearance [s]	10	0	0	10	10	0
Rest In Walk	No			No	No	
I1, Start-Up Lost Time [s]	2.0	0.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	0.0	0.0	2.0	2.0	0.0
Minimum Recall	No			No	No	
Maximum Recall	No			No	No	
Pedestrian Recall	No			No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	C	R	L	C	L	R
C, Cycle Length [s]	120	120	120	120	120	120
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	2.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	106	106	106	106	6	6
g / C, Green / Cycle	0.88	0.88	0.88	0.88	0.05	0.05
(v / s)_i Volume / Saturation Flow Rate	0.61	0.06	0.35	0.35	0.03	0.04
s, saturation flow rate [veh/h]	3140	1402	203	3140	1571	1402
c, Capacity [veh/h]	2765	1234	195	2765	83	74
d1, Uniform Delay [s]	2.22	0.91	10.29	1.32	55.27	55.86
k, delay calibration	0.50	0.50	0.50	0.50	0.11	0.11
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	1.49	0.10	5.16	0.43	4.72	11.46
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.70	0.07	0.36	0.40	0.51	0.70
d, Delay for Lane Group [s/veh]	3.71	1.01	15.45	1.76	59.99	67.32
Lane Group LOS	A	A	B	A	E	E
Critical Lane Group	Yes	No	No	No	No	Yes
50th-Percentile Queue Length [veh]	1.61	0.07	1.11	0.52	1.36	1.80
50th-Percentile Queue Length [ft]	40.21	1.77	27.64	13.03	33.90	44.91
95th-Percentile Queue Length [veh]	2.90	0.13	1.99	0.94	2.44	3.23
95th-Percentile Queue Length [ft]	72.38	3.18	49.75	23.46	61.02	80.84

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	3.71	1.01	15.45	1.76	59.99	67.32
Movement LOS	A	A	B	A	E	E
d_A, Approach Delay [s/veh]	3.60		2.58		64.04	
Approach LOS	A		A		E	
d_I, Intersection Delay [s/veh]	4.97					
Intersection LOS	A					
Intersection V/C	0.652					

Other Modes

g_Walk,mi, Effective Walk Time [s]	9.0	9.0	9.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	51.34	51.34	51.34
I_p,int, Pedestrian LOS Score for Intersection	3.299	3.240	2.123
Crosswalk LOS	C	C	B
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	0	0	0
d_b, Bicycle Delay [s]	60.00	60.00	60.00
I_b,int, Bicycle LOS Score for Intersection	5.791	5.105	4.132
Bicycle LOS	F	F	D

Sequence

Ring 1	-	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	8	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Intersection Level Of Service Report
Intersection 3: Brutsher St at Hayes St

Control Type:	Roundabout	Delay (sec / veh):	3.8
Analysis Method:	HCM 6th Edition	Level Of Service:	A
Analysis Period:	15 minutes		

Intersection Setup

Name	Brutscher St			Brutscher St			Hayes St			Hayes St		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration	+			+			+			+		
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	25.00			25.00			25.00			25.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Brutscher St			Brutscher St			Hayes St			Hayes St		
Base Volume Input [veh/h]	38	113	16	10	44	37	27	50	31	3	14	5
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	1.59	1.59	1.59	1.59	1.59	1.59	1.59	1.59	1.59	1.59	1.59	1.59
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	38	113	16	10	44	37	27	50	31	3	14	5
Peak Hour Factor	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	10	30	4	3	12	10	7	13	8	1	4	1
Total Analysis Volume [veh/h]	40	120	17	11	47	39	29	53	33	3	15	5
Pedestrian Volume [ped/h]	0			0			0			0		

Intersection Settings

Number of Conflicting Circulating Lanes	1			1			1			1		
Circulating Flow Rate [veh/h]	94			59			62			192		
Exiting Flow Rate [veh/h]	65			56			51			151		
Demand Flow Rate [veh/h]	38	113	16	10	44	37	27	50	31	3	14	5
Adjusted Demand Flow Rate [veh/h]	40	120	17	11	47	39	29	53	33	3	15	5

Lanes

Overwrite Calculated Critical Headway	No	No	No	No
User-Defined Critical Headway [s]	4.00	4.00	4.00	4.00
Overwrite Calculated Follow-Up Time	No	No	No	No
User-Defined Follow-Up Time [s]	3.00	3.00	3.00	3.00
A (intercept)	1380.00	1380.00	1380.00	1380.00
B (coefficient)	0.00102	0.00102	0.00102	0.00102
HV Adjustment Factor	0.98	0.98	0.98	0.98
Entry Flow Rate [veh/h]	180	99	117	24
Capacity of Entry and Bypass Lanes [veh/h]	1254	1300	1296	1135
Pedestrian Impedance	1.00	1.00	1.00	1.00
Capacity per Entry Lane [veh/h]	1234	1280	1276	1117
X, volume / capacity	0.14	0.08	0.09	0.02

Movement, Approach, & Intersection Results

Lane LOS	A	A	A	A
95th-Percentile Queue Length [veh]	0.50	0.25	0.30	0.06
95th-Percentile Queue Length [ft]	12.52	6.14	7.42	1.58
Approach Delay [s/veh]	4.12	3.42	3.55	3.39
Approach LOS	A	A	A	A
Intersection Delay [s/veh]	3.76			
Intersection LOS	A			

Intersection Level Of Service Report
Intersection 4: Hayes at Werth

Control Type:	Roundabout	Delay (sec / veh):	3.2
Analysis Method:	HCM 6th Edition	Level Of Service:	A
Analysis Period:	15 minutes		

Intersection Setup

Name	Werth			Werth			Hayes St			Providence Dr		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration	╋			╋			╋			╋		
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	25.00			25.00			25.00			25.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Werth			Werth			Hayes St			Providence Dr		
Base Volume Input [veh/h]	1	0	2	0	0	7	2	45	12	19	26	1
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	5.40	5.40	5.40	5.40	5.40	5.40	5.40	5.40	5.40	5.40	5.40	5.40
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	1	0	2	0	0	7	2	45	12	19	26	1
Peak Hour Factor	0.7800	0.7800	0.7800	0.7800	0.7800	0.7800	0.7800	0.7800	0.7800	0.7800	0.7800	0.7800
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	0	1	0	0	2	1	14	4	6	8	0
Total Analysis Volume [veh/h]	1	0	3	0	0	9	3	58	15	24	33	1
Pedestrian Volume [ped/h]	0			0			0			0		

Intersection Settings

Number of Conflicting Circulating Lanes	1			1			1			1		
Circulating Flow Rate [veh/h]	64			61			25			4		
Exiting Flow Rate [veh/h]	61			36			25			3		
Demand Flow Rate [veh/h]	1	0	2	0	0	7	2	45	12	19	26	1
Adjusted Demand Flow Rate [veh/h]	1	0	3	0	0	9	3	58	15	24	33	1

Lanes

Overwrite Calculated Critical Headway	No	No	No	No
User-Defined Critical Headway [s]	4.00	4.00	4.00	4.00
Overwrite Calculated Follow-Up Time	No	No	No	No
User-Defined Follow-Up Time [s]	3.00	3.00	3.00	3.00
A (intercept)	1380.00	1380.00	1380.00	1380.00
B (coefficient)	0.00102	0.00102	0.00102	0.00102
HV Adjustment Factor	0.95	0.95	0.95	0.95
Entry Flow Rate [veh/h]	5	10	81	62
Capacity of Entry and Bypass Lanes [veh/h]	1293	1297	1345	1375
Pedestrian Impedance	1.00	1.00	1.00	1.00
Capacity per Entry Lane [veh/h]	1227	1231	1276	1304
X, volume / capacity	0.00	0.01	0.06	0.04

Movement, Approach, & Intersection Results

Lane LOS	A	A	A	A
95th-Percentile Queue Length [veh]	0.01	0.02	0.19	0.14
95th-Percentile Queue Length [ft]	0.25	0.55	4.74	3.49
Approach Delay [s/veh]	2.96	2.98	3.30	3.11
Approach LOS	A	A	A	A
Intersection Delay [s/veh]	3.20			
Intersection LOS	A			

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Scenario 1 AM Existing 17-346

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3/2/2017

Turning Movement Volume: Summary

ID	Intersection Name	Northeastbound		Southwestbound		Northwestbound		Total Volume
		Thru	Right	Left	Thru	Left	Right	
1	Hwy 99W at Providence Dr	1872	79	69	1075	41	50	3186

ID	Intersection Name	Northbound			Southbound			Eastbound			Westbound			Total Volume
		Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
3	Brutsher St at Hayes St	38	113	16	10	44	37	27	50	31	3	14	5	388

ID	Intersection Name	Northbound			Southbound			Eastbound			Westbound			Total Volume
		Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
4	Hayes at Werth	1	0	2	0	0	7	2	45	12	19	26	1	115

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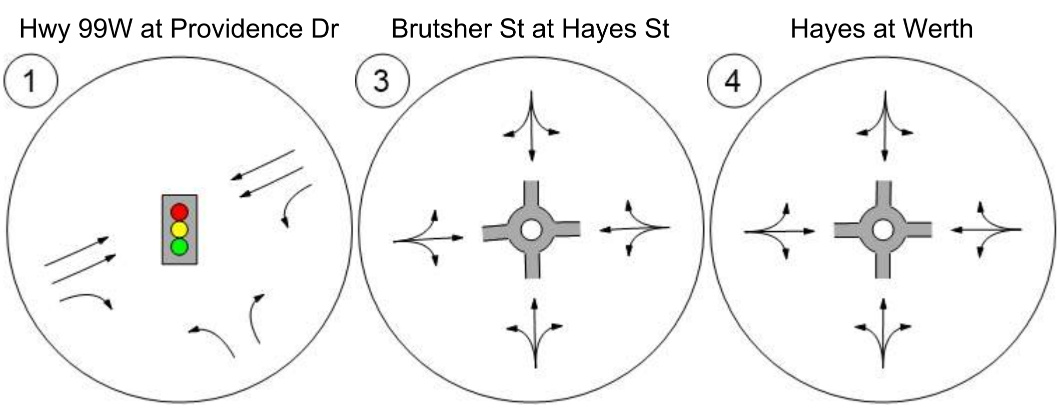
Turning Movement Volume: Detail

ID	Intersection Name	Volume Type	Northeastbound		Southwestbound		Northwestbound		Total Volume
			Thru	Right	Left	Thru	Left	Right	
1	Hwy 99W at Providence Dr	Final Base	1872	79	69	1075	41	50	3186
		Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	-
		In Process	0	0	0	0	0	0	0
		Net New Trips	0	0	0	0	0	0	0
		Other	0	0	0	0	0	0	0
		Future Total	**1872**	**79**	**69**	**1075**	**41**	**50**	**3186**

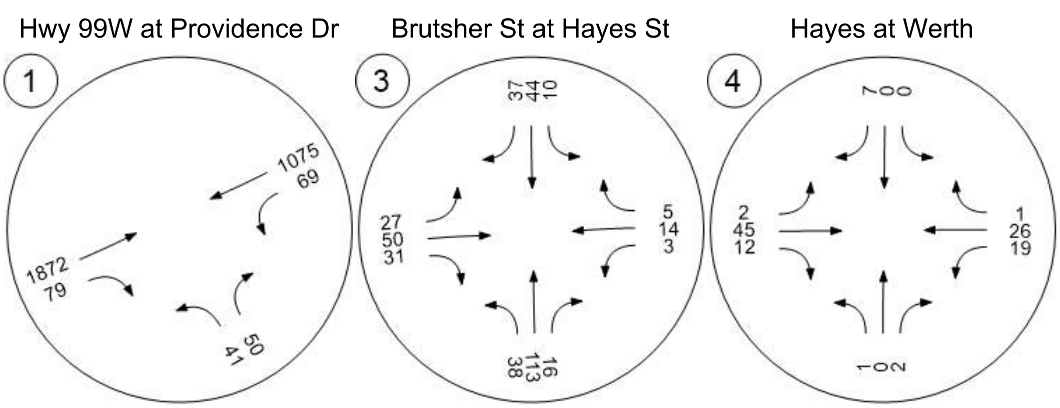
ID	Intersection Name	Volume Type	Northbound			Southbound			Eastbound			Westbound			Total Volume
			Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
3	Brutsher St at Hayes St	Final Base	38	113	16	10	44	37	27	50	31	3	14	5	388
		Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	-
		In Process	0	0	0	0	0	0	0	0	0	0	0	0	0
		Net New Trips	0	0	0	0	0	0	0	0	0	0	0	0	0
		Other	0	0	0	0	0	0	0	0	0	0	0	0	0
		Future Total	**38**	**113**	**16**	**10**	**44**	**37**	**27**	**50**	**31**	**3**	**14**	**5**	**388**

ID	Intersection Name	Volume Type	Northbound			Southbound			Eastbound			Westbound			Total Volume
			Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
4	Hayes at Werth	Final Base	1	0	2	0	0	7	2	45	12	19	26	1	115
		Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	-
		In Process	0	0	0	0	0	0	0	0	0	0	0	0	0
		Net New Trips	0	0	0	0	0	0	0	0	0	0	0	0	0
		Other	0	0	0	0	0	0	0	0	0	0	0	0	0
		Future Total	**1**	**0**	**2**	**0**	**0**	**7**	**2**	**45**	**12**	**19**	**26**	**1**	**115**

Report Figure 1: Lane Configuration and Traffic Control

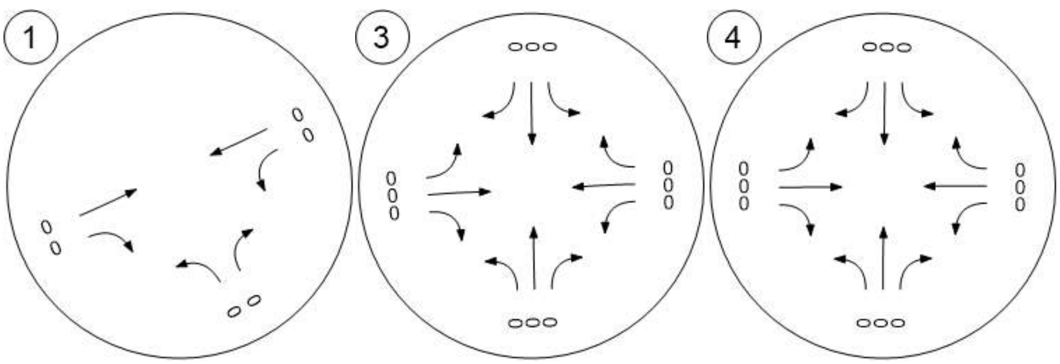


Report Figure 2a: Traffic Volume - Base Volume



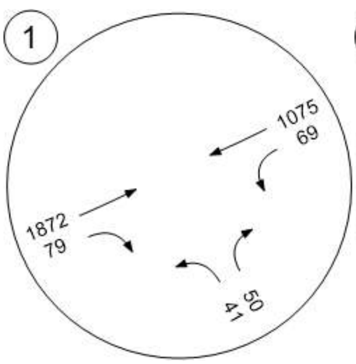
Report Figure 2c: Traffic Volume - Net New Site Trips

Hwy 99W at Providence Dr | Brutsher St at Hayes St | Hayes at Werth

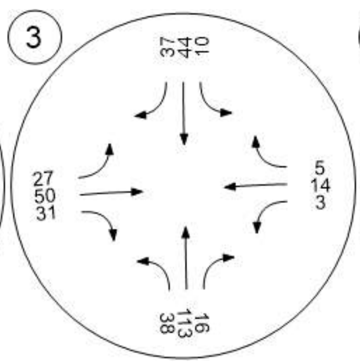


Report Figure 2e: Traffic Volume - Future Total Volume

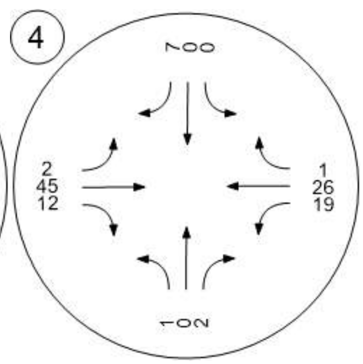
Hwy 99W at Providence Dr



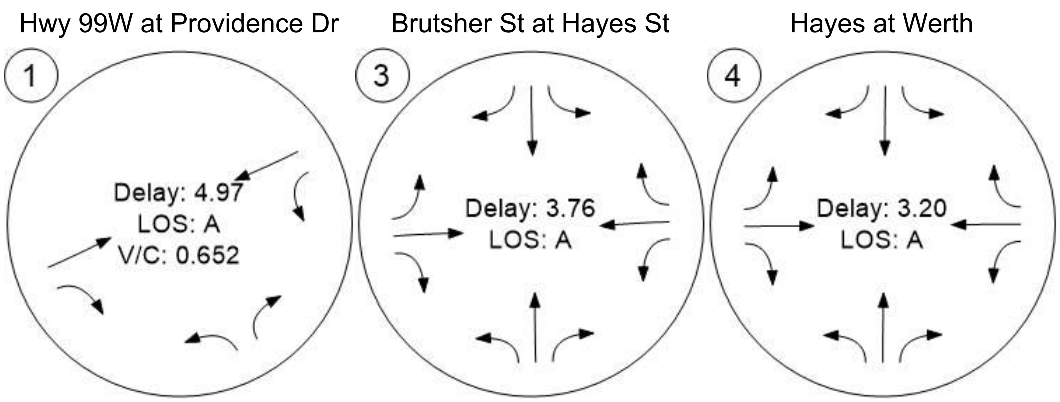
Brutsher St at Hayes St



Hayes at Werth



Report Figure 3: Traffic Conditions



17-346 Newberg Surg. Ctr TIA

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Intersection Analysis Summary

ID	Intersection Name	Control Type	Method	Worst Mvmt	V/C	Delay (s/veh)	LOS
1	Hwy 99W at Providence Dr	Signalized	HCM 6th Edition	SWB Left	0.714	10.7	B
3	Brutsher St at Hayes St	Roundabout	HCM 6th Edition	SB Right		4.6	A
4	Hayes at Werth	Roundabout	HCM 6th Edition	WB Thru		3.5	A

V/C, Delay, LOS: For two-way stop, these values are taken from the movement with the worst (highest) delay value. for all other control types, they are taken for the whole intersection.

Intersection Level Of Service Report
Intersection 1: Hwy 99W at Providence Dr

Control Type:	Signalized	Delay (sec / veh):	10.7
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.714

Intersection Setup

Name	Hwy 99W		Hwy 99W		Providence Dr	
Approach	Northeastbound		Southwestbound		Northwestbound	
Lane Configuration						
Turning Movement	Thru	Right	Left	Thru	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	1	1	0	1	0
Pocket Length [ft]	100.00	75.00	100.00	100.00	150.00	100.00
Speed [mph]	45.00		45.00		25.00	
Grade [%]	0.00		0.00		0.00	
Curb Present	No		No		No	
Crosswalk	Yes		Yes		Yes	

Volumes

Name	Hwy 99W		Hwy 99W		Providence Dr	
Base Volume Input [veh/h]	1207	31	79	1789	78	96
Base Volume Adjustment Factor	1.0850	1.0850	1.0850	1.0850	1.0850	1.0850
Heavy Vehicles Percentage [%]	3.27	3.27	3.27	3.27	3.27	3.27
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	1310	34	86	1941	85	104
Peak Hour Factor	0.9600	0.9600	0.9600	0.9600	0.9600	0.9600
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	341	9	22	505	22	27
Total Analysis Volume [veh/h]	1365	35	90	2022	89	108
Presence of On-Street Parking	No	No	No	No	No	No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0		0		0	
v_di, Inbound Pedestrian Volume crossing m	0		0		0	
v_co, Outbound Pedestrian Volume crossing	0		0		0	
v_ci, Inbound Pedestrian Volume crossing mi	0		0		0	
v_ab, Corner Pedestrian Volume [ped/h]	0		0		0	
Bicycle Volume [bicycles/h]	0		0		0	

Intersection Settings

Located in CBD	Yes
Signal Coordination Group	-
Cycle Length [s]	90
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	0.00

Phasing & Timing

Control Type	Permissive	Permissive	Protected	Permissive	Permissive	Permissive
Signal group	8	0	7	4	5	0
Auxiliary Signal Groups						
Lead / Lag	-	-	Lead	-	Lead	-
Minimum Green [s]	5	0	5	5	5	0
Maximum Green [s]	30	0	30	30	30	0
Amber [s]	3.0	0.0	3.0	3.0	3.0	0.0
All red [s]	1.0	0.0	1.0	1.0	1.0	0.0
Split [s]	27	0	44	71	19	0
Vehicle Extension [s]	3.0	0.0	3.0	3.0	3.0	0.0
Walk [s]	5	0	0	5	5	0
Pedestrian Clearance [s]	10	0	0	10	10	0
Rest In Walk	No			No	No	
I1, Start-Up Lost Time [s]	2.0	0.0	2.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	0.0	2.0	2.0	2.0	0.0
Minimum Recall	No		No	No	No	
Maximum Recall	No		No	No	No	
Pedestrian Recall	No		No	No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	C	R	L	C	L	R
C, Cycle Length [s]	90	90	90	90	90	90
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	63	63	6	73	9	9
g / C, Green / Cycle	0.70	0.70	0.07	0.81	0.10	0.10
(v / s)_i Volume / Saturation Flow Rate	0.43	0.02	0.06	0.64	0.06	0.08
s, saturation flow rate [veh/h]	3172	1416	1587	3172	1587	1416
c, Capacity [veh/h]	2204	984	115	2575	158	141
d1, Uniform Delay [s]	7.35	4.29	41.06	4.40	38.70	39.54
k, delay calibration	0.50	0.50	0.11	0.50	0.11	0.11
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	1.32	0.07	10.96	2.49	3.16	8.48
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.62	0.04	0.78	0.79	0.57	0.77
d, Delay for Lane Group [s/veh]	8.67	4.36	52.02	6.89	41.86	48.03
Lane Group LOS	A	A	D	A	D	D
Critical Lane Group	No	No	No	Yes	No	Yes
50th-Percentile Queue Length [veh]	5.25	0.16	2.22	4.05	2.01	2.65
50th-Percentile Queue Length [ft]	131.22	4.09	55.60	101.13	50.30	66.37
95th-Percentile Queue Length [veh]	9.01	0.29	4.00	7.28	3.62	4.78
95th-Percentile Queue Length [ft]	225.15	7.36	100.08	182.04	90.54	119.47

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	8.67	4.36	52.02	6.89	41.86	48.03
Movement LOS	A	A	D	A	D	D
d_A, Approach Delay [s/veh]	8.56		8.81		45.24	
Approach LOS	A		A		D	
d_I, Intersection Delay [s/veh]	10.65					
Intersection LOS	B					
Intersection V/C	0.714					

Other Modes

g_Walk,mi, Effective Walk Time [s]	9.0	9.0	9.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	36.45	36.45	36.45
I_p,int, Pedestrian LOS Score for Intersection	3.455	3.350	2.029
Crosswalk LOS	C	C	B
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	0	0	0
d_b, Bicycle Delay [s]	45.00	45.00	45.00
I_b,int, Bicycle LOS Score for Intersection	5.287	5.875	4.132
Bicycle LOS	F	F	D

Sequence

Ring 1	-	-	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	7	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Intersection Level Of Service Report
Intersection 3: Brutsher St at Hayes St

Control Type:	Roundabout	Delay (sec / veh):	4.6
Analysis Method:	HCM 6th Edition	Level Of Service:	A
Analysis Period:	15 minutes		

Intersection Setup

Name	Brutscher St			Brutscher St			Hayes St			Hayes St		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	25.00			25.00			25.00			25.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Brutscher St			Brutscher St			Hayes St			Hayes St		
Base Volume Input [veh/h]	52	67	12	21	99	140	44	30	42	14	78	30
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	1.76	1.76	1.76	1.76	1.76	1.76	1.76	1.76	1.76	1.76	1.76	1.76
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	52	67	12	21	99	140	44	30	42	14	78	30
Peak Hour Factor	0.9300	0.9300	0.9300	0.9300	0.9300	0.9300	0.9300	0.9300	0.9300	0.9300	0.9300	0.9300
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	14	18	3	6	27	38	12	8	11	4	21	8
Total Analysis Volume [veh/h]	56	72	13	23	106	151	47	32	45	15	84	32
Pedestrian Volume [ped/h]	0			0			0			0		

Intersection Settings

Number of Conflicting Circulating Lanes	1			1			1			1		
Circulating Flow Rate [veh/h]	104			158			147			178		
Exiting Flow Rate [veh/h]	56			142			123			121		
Demand Flow Rate [veh/h]	52	67	12	21	99	140	44	30	42	14	78	30
Adjusted Demand Flow Rate [veh/h]	56	72	13	23	106	151	47	32	45	15	84	32

Lanes

Overwrite Calculated Critical Headway	No	No	No	No
User-Defined Critical Headway [s]	4.00	4.00	4.00	4.00
Overwrite Calculated Follow-Up Time	No	No	No	No
User-Defined Follow-Up Time [s]	3.00	3.00	3.00	3.00
A (intercept)	1380.00	1380.00	1380.00	1380.00
B (coefficient)	0.00102	0.00102	0.00102	0.00102
HV Adjustment Factor	0.98	0.98	0.98	0.98
Entry Flow Rate [veh/h]	144	285	127	134
Capacity of Entry and Bypass Lanes [veh/h]	1242	1175	1189	1151
Pedestrian Impedance	1.00	1.00	1.00	1.00
Capacity per Entry Lane [veh/h]	1220	1155	1168	1131
X, volume / capacity	0.12	0.24	0.11	0.12

Movement, Approach, & Intersection Results

Lane LOS	A	A	A	A
95th-Percentile Queue Length [veh]	0.39	0.95	0.36	0.39
95th-Percentile Queue Length [ft]	9.77	23.80	8.89	9.80
Approach Delay [s/veh]	3.91	5.33	3.98	4.18
Approach LOS	A	A	A	A
Intersection Delay [s/veh]	4.56			
Intersection LOS	A			

Intersection Level Of Service Report
Intersection 4: Hayes at Werth

Control Type:	Roundabout	Delay (sec / veh):	3.5
Analysis Method:	HCM 6th Edition	Level Of Service:	A
Analysis Period:	15 minutes		

Intersection Setup

Name	Werth			Werth			Hayes St			Providence Dr		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration	+			+			+			+		
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	25.00			25.00			25.00			25.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Werth			Werth			Hayes St			Providence Dr		
Base Volume Input [veh/h]	10	0	7	2	0	3	17	30	9	11	105	6
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	1.59	1.59	1.59	1.59	1.59	1.59	1.59	1.59	1.59	1.59	1.59	1.59
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	10	0	7	2	0	3	17	30	9	11	105	6
Peak Hour Factor	0.7900	0.7900	0.7900	0.7900	0.7900	0.7900	0.7900	0.7900	0.7900	0.7900	0.7900	0.7900
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	3	0	2	1	0	1	5	9	3	3	33	2
Total Analysis Volume [veh/h]	13	0	9	3	0	4	22	38	11	14	133	8
Pedestrian Volume [ped/h]	0			0			0			0		

Intersection Settings

Number of Conflicting Circulating Lanes	1			1			1			1		
Circulating Flow Rate [veh/h]	64			163			17			36		
Exiting Flow Rate [veh/h]	42			148			14			22		
Demand Flow Rate [veh/h]	10	0	7	2	0	3	17	30	9	11	105	6
Adjusted Demand Flow Rate [veh/h]	13	0	9	3	0	4	22	38	11	14	133	8

Lanes

Overwrite Calculated Critical Headway	No	No	No	No
User-Defined Critical Headway [s]	4.00	4.00	4.00	4.00
Overwrite Calculated Follow-Up Time	No	No	No	No
User-Defined Follow-Up Time [s]	3.00	3.00	3.00	3.00
A (intercept)	1380.00	1380.00	1380.00	1380.00
B (coefficient)	0.00102	0.00102	0.00102	0.00102
HV Adjustment Factor	0.98	0.98	0.98	0.98
Entry Flow Rate [veh/h]	23	8	73	158
Capacity of Entry and Bypass Lanes [veh/h]	1293	1170	1356	1331
Pedestrian Impedance	1.00	1.00	1.00	1.00
Capacity per Entry Lane [veh/h]	1273	1151	1335	1311
X, volume / capacity	0.02	0.01	0.05	0.12

Movement, Approach, & Intersection Results

Lane LOS	A	A	A	A
95th-Percentile Queue Length [veh]	0.05	0.02	0.17	0.40
95th-Percentile Queue Length [ft]	1.32	0.46	4.21	10.04
Approach Delay [s/veh]	2.97	3.18	3.11	3.71
Approach LOS	A	A	A	A
Intersection Delay [s/veh]	3.46			
Intersection LOS	A			

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Turning Movement Volume: Summary

ID	Intersection Name	Northeastbound		Southwestbound		Northwestbound		Total Volume
		Thru	Right	Left	Thru	Left	Right	
1	Hwy 99W at Providence Dr	1310	34	86	1941	85	104	3560

ID	Intersection Name	Northbound			Southbound			Eastbound			Westbound			Total Volume
		Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
3	Brutsher St at Hayes St	52	67	12	21	99	140	44	30	42	14	78	30	629

ID	Intersection Name	Northbound			Southbound			Eastbound			Westbound			Total Volume
		Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
4	Hayes at Werth	10	0	7	2	0	3	17	30	9	11	105	6	200

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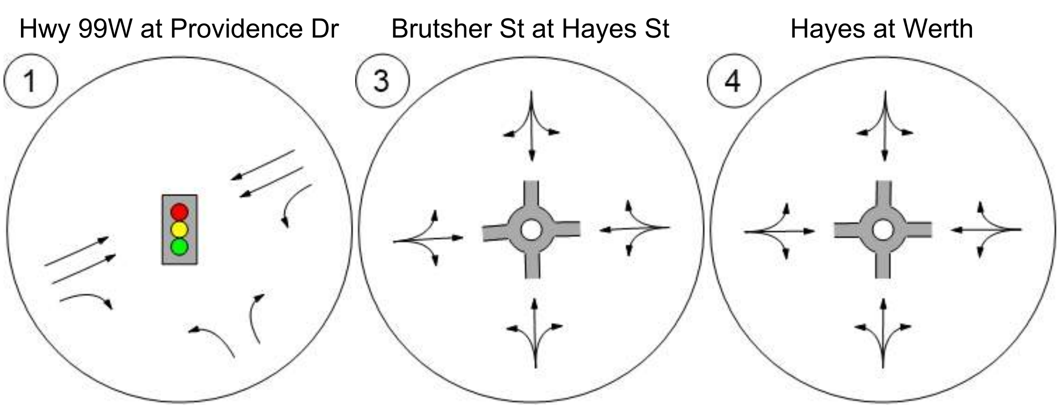
Turning Movement Volume: Detail

ID	Intersection Name	Volume Type	Northeastbound		Southwestbound		Northwestbound		Total Volume
			Thru	Right	Left	Thru	Left	Right	
1	Hwy 99W at Providence Dr	Final Base	1310	34	86	1941	85	104	3560
		Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	-
		In Process	0	0	0	0	0	0	0
		Net New Trips	0	0	0	0	0	0	0
		Other	0	0	0	0	0	0	0
		Future Total	**1310**	**34**	**86**	**1941**	**85**	**104**	**3560**

ID	Intersection Name	Volume Type	Northbound			Southbound			Eastbound			Westbound			Total Volume
			Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
3	Brutsher St at Hayes St	Final Base	52	67	12	21	99	140	44	30	42	14	78	30	629
		Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	-
		In Process	0	0	0	0	0	0	0	0	0	0	0	0	0
		Net New Trips	0	0	0	0	0	0	0	0	0	0	0	0	0
		Other	0	0	0	0	0	0	0	0	0	0	0	0	0
		Future Total	**52**	**67**	**12**	**21**	**99**	**140**	**44**	**30**	**42**	**14**	**78**	**30**	**629**

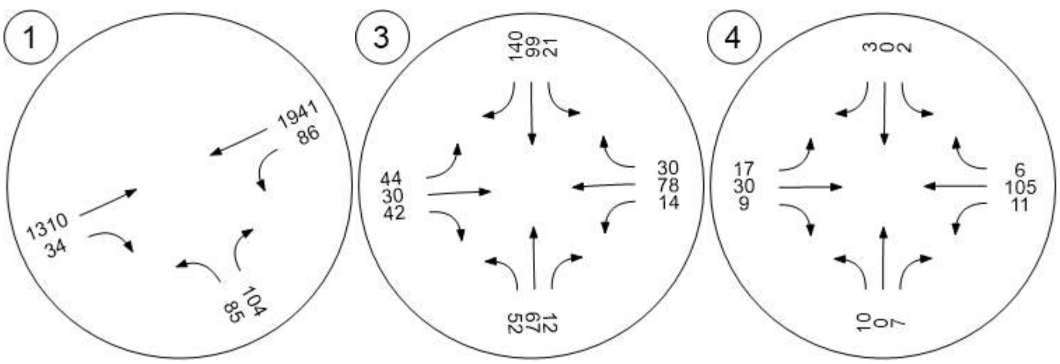
ID	Intersection Name	Volume Type	Northbound			Southbound			Eastbound			Westbound			Total Volume
			Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
4	Hayes at Werth	Final Base	10	0	7	2	0	3	17	30	9	11	105	6	200
		Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	-
		In Process	0	0	0	0	0	0	0	0	0	0	0	0	0
		Net New Trips	0	0	0	0	0	0	0	0	0	0	0	0	0
		Other	0	0	0	0	0	0	0	0	0	0	0	0	0
		Future Total	**10**	**0**	**7**	**2**	**0**	**3**	**17**	**30**	**9**	**11**	**105**	**6**	**200**

Report Figure 1: Lane Configuration and Traffic Control



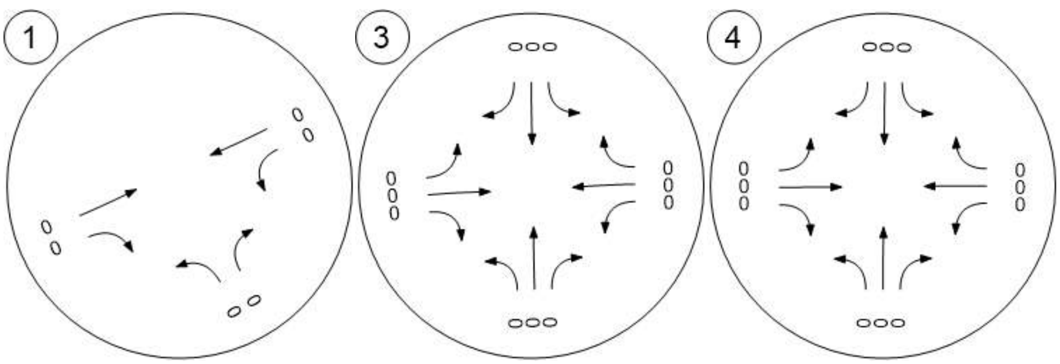
Report Figure 2a: Traffic Volume - Base Volume

Hwy 99W at Providence Dr | Brutsher St at Hayes St | Hayes at Werth



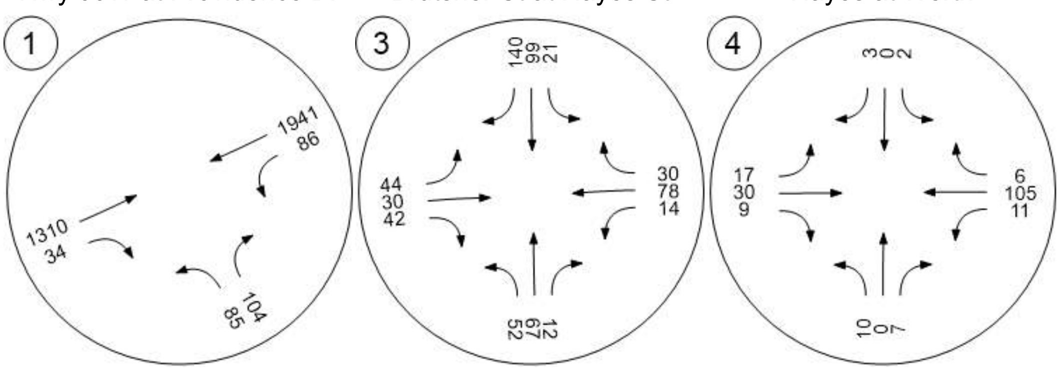
Report Figure 2c: Traffic Volume - Net New Site Trips

Hwy 99W at Providence Dr   Brutsher St at Hayes St   Hayes at Werth



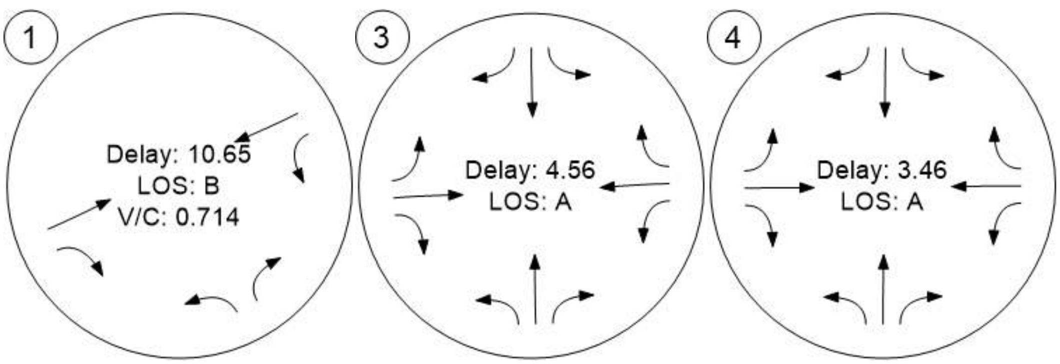
Report Figure 2e: Traffic Volume - Future Total Volume

Hwy 99W at Providence Dr | Brutsher St at Hayes St | Hayes at Werth



Report Figure 3: Traffic Conditions

Hwy 99W at Providence Dr | Brutsher St at Hayes St | Hayes at Werth



17-346 Newberg Surg. Ctr TIA

Vistro File: J:\...\17-346 Newberg Ambulatory Surgery TIA.vistro

Scenario 4 AM Developed 17-346

Report File: J:\...\17-346 Developed AM.pdf

3/6/2017

Intersection Analysis Summary

ID	Intersection Name	Control Type	Method	Worst Mvmt	V/C	Delay (s/veh)	LOS
1	Hwy 99W at Providence Dr	Signalized	HCM 6th Edition	NWB Right	0.661	5.4	A
3	Brutsher St at Hayes St	Roundabout	HCM 6th Edition	NB Thru		3.8	A
4	Hayes at Werth	Roundabout	HCM 6th Edition	EB Thru		3.2	A
5	Site Access at Providence Dr.	Two-way stop	HCM 6th Edition	EB Left	0.012	9.3	A

V/C, Delay, LOS: For two-way stop, these values are taken from the movement with the worst (highest) delay value. for all other control types, they are taken for the whole intersection.

Intersection Level Of Service Report
Intersection 1: Hwy 99W at Providence Dr

Control Type:	Signalized	Delay (sec / veh):	5.4
Analysis Method:	HCM 6th Edition	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.661

Intersection Setup

Name	Hwy 99W		Hwy 99W		Providence Dr	
Approach	Northeastbound		Southwestbound		Northwestbound	
Lane Configuration						
Turning Movement	Thru	Right	Left	Thru	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	1	1	0	1	0
Pocket Length [ft]	100.00	75.00	100.00	100.00	150.00	100.00
Speed [mph]	45.00		45.00		25.00	
Grade [%]	0.00		0.00		0.00	
Curb Present	No		No		No	
Crosswalk	Yes		Yes		Yes	

Volumes

Name	Hwy 99W		Hwy 99W		Providence Dr	
Base Volume Input [veh/h]	1725	73	64	991	38	46
Base Volume Adjustment Factor	1.0850	1.0850	1.0850	1.0850	1.0850	1.0850
Heavy Vehicles Percentage [%]	4.50	4.50	4.50	4.50	4.50	4.50
Growth Rate	1.01	1.01	1.01	1.01	1.01	1.01
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	20	10	0	5	3
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	1891	100	80	1086	46	54
Peak Hour Factor	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	487	26	21	280	12	14
Total Analysis Volume [veh/h]	1949	103	82	1120	47	56
Presence of On-Street Parking	No	No	No	No	No	No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0		0		0	
v_di, Inbound Pedestrian Volume crossing m	0		0		0	
v_co, Outbound Pedestrian Volume crossing	0		0		0	
v_ci, Inbound Pedestrian Volume crossing mi	0		0		0	
v_ab, Corner Pedestrian Volume [ped/h]	0		0		0	
Bicycle Volume [bicycles/h]	0		0		0	

Intersection Settings

Located in CBD	Yes
Signal Coordination Group	-
Cycle Length [s]	120
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	0.00

Phasing & Timing

Control Type	Permissive	Permissive	Permissive	Permissive	Permissive	Permissive
Signal group	8	0	0	4	5	0
Auxiliary Signal Groups						
Lead / Lag	-	-	-	-	Lead	-
Minimum Green [s]	5	0	0	5	5	0
Maximum Green [s]	30	0	0	30	30	0
Amber [s]	3.0	0.0	0.0	3.0	3.0	0.0
All red [s]	1.0	0.0	0.0	1.0	1.0	0.0
Split [s]	19	0	0	19	101	0
Vehicle Extension [s]	3.0	0.0	0.0	3.0	3.0	0.0
Walk [s]	5	0	0	5	5	0
Pedestrian Clearance [s]	10	0	0	10	10	0
Rest In Walk	No			No	No	
I1, Start-Up Lost Time [s]	2.0	0.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	0.0	0.0	2.0	2.0	0.0
Minimum Recall	No			No	No	
Maximum Recall	No			No	No	
Pedestrian Recall	No			No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	C	R	L	C	L	R
C, Cycle Length [s]	120	120	120	120	120	120
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	2.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	105	105	105	105	7	7
g / C, Green / Cycle	0.88	0.88	0.88	0.88	0.06	0.06
(v / s)_i Volume / Saturation Flow Rate	0.62	0.07	0.41	0.36	0.03	0.04
s, saturation flow rate [veh/h]	3140	1402	200	3140	1571	1402
c, Capacity [veh/h]	2754	1229	190	2754	88	79
d1, Uniform Delay [s]	2.39	0.98	12.32	1.41	55.04	55.62
k, delay calibration	0.50	0.50	0.50	0.50	0.11	0.11
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	1.56	0.13	6.98	0.45	4.89	11.14
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.71	0.08	0.43	0.41	0.53	0.71
d, Delay for Lane Group [s/veh]	3.95	1.11	19.31	1.86	59.93	66.76
Lane Group LOS	A	A	B	A	E	E
Critical Lane Group	Yes	No	No	No	No	Yes
50th-Percentile Queue Length [veh]	1.96	0.10	1.49	0.63	1.51	1.92
50th-Percentile Queue Length [ft]	49.00	2.62	37.15	15.81	37.87	48.08
95th-Percentile Queue Length [veh]	3.53	0.19	2.67	1.14	2.73	3.46
95th-Percentile Queue Length [ft]	88.20	4.71	66.86	28.46	68.17	86.55

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	3.95	1.11	19.31	1.86	59.93	66.76
Movement LOS	A	A	B	A	E	E
d_A, Approach Delay [s/veh]	3.81		3.05		63.65	
Approach LOS	A		A		E	
d_I, Intersection Delay [s/veh]	5.37					
Intersection LOS	A					
Intersection V/C	0.661					

Other Modes

g_Walk,mi, Effective Walk Time [s]	9.0	9.0	9.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	51.34	51.34	51.34
I_p,int, Pedestrian LOS Score for Intersection	3.324	3.253	2.150
Crosswalk LOS	C	C	B
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	0	0	0
d_b, Bicycle Delay [s]	60.00	60.00	60.00
I_b,int, Bicycle LOS Score for Intersection	5.825	5.124	4.132
Bicycle LOS	F	F	D

Sequence

Ring 1	-	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	8	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Intersection Level Of Service Report
Intersection 3: Brutsher St at Hayes St

Control Type:	Roundabout	Delay (sec / veh):	3.8
Analysis Method:	HCM 6th Edition	Level Of Service:	A
Analysis Period:	15 minutes		

Intersection Setup

Name	Brutscher St			Brutscher St			Hayes St			Hayes St		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	25.00			25.00			25.00			25.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Brutscher St			Brutscher St			Hayes St			Hayes St		
Base Volume Input [veh/h]	38	113	16	10	44	37	27	50	31	3	14	5
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	1.59	1.59	1.59	1.59	1.59	1.59	1.59	1.59	1.59	1.59	1.59	1.59
Growth Rate	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	3	0	0	1	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	38	114	16	10	44	37	27	54	31	3	15	5
Peak Hour Factor	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	10	30	4	3	12	10	7	14	8	1	4	1
Total Analysis Volume [veh/h]	40	121	17	11	47	39	29	57	33	3	16	5
Pedestrian Volume [ped/h]	0			0			0			0		

Intersection Settings

Number of Conflicting Circulating Lanes	1			1			1			1		
Circulating Flow Rate [veh/h]	99			60			62			193		
Exiting Flow Rate [veh/h]	69			57			51			152		
Demand Flow Rate [veh/h]	38	114	16	10	44	37	27	54	31	3	15	5
Adjusted Demand Flow Rate [veh/h]	40	121	17	11	47	39	29	57	33	3	16	5

Lanes

Overwrite Calculated Critical Headway	No	No	No	No
User-Defined Critical Headway [s]	4.00	4.00	4.00	4.00
Overwrite Calculated Follow-Up Time	No	No	No	No
User-Defined Follow-Up Time [s]	3.00	3.00	3.00	3.00
A (intercept)	1380.00	1380.00	1380.00	1380.00
B (coefficient)	0.00102	0.00102	0.00102	0.00102
HV Adjustment Factor	0.98	0.98	0.98	0.98
Entry Flow Rate [veh/h]	181	99	121	25
Capacity of Entry and Bypass Lanes [veh/h]	1249	1299	1296	1134
Pedestrian Impedance	1.00	1.00	1.00	1.00
Capacity per Entry Lane [veh/h]	1229	1278	1276	1116
X, volume / capacity	0.14	0.08	0.09	0.02

Movement, Approach, & Intersection Results

Lane LOS	A	A	A	A
95th-Percentile Queue Length [veh]	0.51	0.25	0.31	0.07
95th-Percentile Queue Length [ft]	12.66	6.15	7.70	1.65
Approach Delay [s/veh]	4.15	3.43	3.58	3.41
Approach LOS	A	A	A	A
Intersection Delay [s/veh]	3.78			
Intersection LOS	A			

Intersection Level Of Service Report
Intersection 4: Hayes at Werth

Control Type:	Roundabout	Delay (sec / veh):	3.2
Analysis Method:	HCM 6th Edition	Level Of Service:	A
Analysis Period:	15 minutes		

Intersection Setup

Name	Werth			Werth			Hayes St			Providence Dr		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration	╋			╋			╋			╋		
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	25.00			25.00			25.00			25.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Werth			Werth			Hayes St			Providence Dr		
Base Volume Input [veh/h]	1	0	2	0	0	7	2	45	12	19	26	1
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	5.40	5.40	5.40	5.40	5.40	5.40	5.40	5.40	5.40	5.40	5.40	5.40
Growth Rate	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	3	0	0	1	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	1	0	2	0	0	7	2	48	12	19	27	1
Peak Hour Factor	0.7800	0.7800	0.7800	0.7800	0.7800	0.7800	0.7800	0.7800	0.7800	0.7800	0.7800	0.7800
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	0	1	0	0	2	1	15	4	6	9	0
Total Analysis Volume [veh/h]	1	0	3	0	0	9	3	62	15	24	35	1
Pedestrian Volume [ped/h]	0			0			0			0		

Intersection Settings

Number of Conflicting Circulating Lanes	1			1			1			1		
Circulating Flow Rate [veh/h]	69			63			25			4		
Exiting Flow Rate [veh/h]	65			38			25			3		
Demand Flow Rate [veh/h]	1	0	2	0	0	7	2	48	12	19	27	1
Adjusted Demand Flow Rate [veh/h]	1	0	3	0	0	9	3	62	15	24	35	1

Lanes

Overwrite Calculated Critical Headway	No	No	No	No
User-Defined Critical Headway [s]	4.00	4.00	4.00	4.00
Overwrite Calculated Follow-Up Time	No	No	No	No
User-Defined Follow-Up Time [s]	3.00	3.00	3.00	3.00
A (intercept)	1380.00	1380.00	1380.00	1380.00
B (coefficient)	0.00102	0.00102	0.00102	0.00102
HV Adjustment Factor	0.95	0.95	0.95	0.95
Entry Flow Rate [veh/h]	5	10	85	64
Capacity of Entry and Bypass Lanes [veh/h]	1287	1294	1345	1375
Pedestrian Impedance	1.00	1.00	1.00	1.00
Capacity per Entry Lane [veh/h]	1221	1228	1276	1304
X, volume / capacity	0.00	0.01	0.06	0.05

Movement, Approach, & Intersection Results

Lane LOS	A	A	A	A
95th-Percentile Queue Length [veh]	0.01	0.02	0.20	0.14
95th-Percentile Queue Length [ft]	0.25	0.55	5.01	3.61
Approach Delay [s/veh]	2.97	2.99	3.32	3.12
Approach LOS	A	A	A	A
Intersection Delay [s/veh]	3.22			
Intersection LOS	A			

Intersection Level Of Service Report
Intersection 5: Site Access at Providence Dr.

Control Type:	Two-way stop	Delay (sec / veh):	9.3
Analysis Method:	HCM 6th Edition	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.012

Intersection Setup

Name	Providence Dr		Providence Dr		Site Access	
Approach	Northbound		Southbound		Eastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	25.00		25.00		25.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	Yes		Yes		Yes	

Volumes

Name	Providence Dr		Providence Dr		Site Access	
Base Volume Input [veh/h]	0	47	46	0	0	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.54	0.54	0.54	0.54	0.54	0.54
Growth Rate	1.01	1.01	1.01	1.01	1.01	1.01
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	3	0	0	30	8	1
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	3	47	46	30	8	1
Peak Hour Factor	0.7800	0.7800	0.7800	0.7800	0.7800	0.7800
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	1	15	15	10	3	0
Total Analysis Volume [veh/h]	4	60	59	38	10	1
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Priority Scheme	Free	Free	Stop
Flared Lane			No
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance			No
Number of Storage Spaces in Median	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.00	0.00	0.00	0.00	0.01	0.00
d_M, Delay for Movement [s/veh]	7.40	0.00	0.00	0.00	9.30	8.70
Movement LOS	A	A	A	A	A	A
95th-Percentile Queue Length [veh]	0.13	0.13	0.00	0.00	0.04	0.04
95th-Percentile Queue Length [ft]	3.33	3.33	0.00	0.00	0.97	0.97
d_A, Approach Delay [s/veh]	0.46		0.00		9.25	
Approach LOS	A		A		A	
d_I, Intersection Delay [s/veh]	0.76					
Intersection LOS	A					

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Scenario 4 AM Developed 17-346

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Turning Movement Volume: Summary

ID	Intersection Name	Northeastbound		Southwestbound		Northwestbound		Total Volume
		Thru	Right	Left	Thru	Left	Right	
1	Hwy 99W at Providence Dr	1891	100	80	1086	46	54	3257

ID	Intersection Name	Northbound			Southbound			Eastbound			Westbound			Total Volume
		Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
3	Brutsher St at Hayes St	38	114	16	10	44	37	27	54	31	3	15	5	394

ID	Intersection Name	Northbound			Southbound			Eastbound			Westbound			Total Volume
		Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
4	Hayes at Werth	1	0	2	0	0	7	2	48	12	19	27	1	119

ID	Intersection Name	Northbound		Southbound		Eastbound		Total Volume
		Left	Thru	Thru	Right	Left	Right	
5	Site Access at Providence Dr.	3	47	46	30	8	1	135

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Turning Movement Volume: Detail

ID	Intersection Name	Volume Type	Northeastbound		Southwestbound		Northwestbound		Total Volume
			Thru	Right	Left	Thru	Left	Right	
1	Hwy 99W at Providence Dr	Final Base	1872	79	69	1075	41	50	3186
		Growth Rate	1.01	1.01	1.01	1.01	1.01	1.01	-
		In Process	0	0	0	0	0	0	0
		Net New Trips	0	20	10	0	5	3	38
		Other	0	0	0	0	0	0	0
		Future Total	**1891**	**100**	**80**	**1086**	**46**	**54**	**3257**

ID	Intersection Name	Volume Type	Northbound			Southbound			Eastbound			Westbound			Total Volume
			Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
3	Brutsher St at Hayes St	Final Base	38	113	16	10	44	37	27	50	31	3	14	5	388
		Growth Rate	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	-
		In Process	0	0	0	0	0	0	0	0	0	0	0	0	0
		Net New Trips	0	0	0	0	0	0	0	3	0	0	1	0	4
		Other	0	0	0	0	0	0	0	0	0	0	0	0	0
		Future Total	**38**	**114**	**16**	**10**	**44**	**37**	**27**	**54**	**31**	**3**	**15**	**5**	**394**

ID	Intersection Name	Volume Type	Northbound			Southbound			Eastbound			Westbound			Total Volume
			Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
4	Hayes at Werth	Final Base	1	0	2	0	0	7	2	45	12	19	26	1	115
		Growth Rate	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	-
		In Process	0	0	0	0	0	0	0	0	0	0	0	0	0
		Net New Trips	0	0	0	0	0	0	0	3	0	0	1	0	4
		Other	0	0	0	0	0	0	0	0	0	0	0	0	0
		Future Total	**1**	**0**	**2**	**0**	**0**	**7**	**2**	**48**	**12**	**19**	**27**	**1**	**119**

ID	Intersection Name	Volume Type	Northbound		Southbound		Eastbound		Total Volume
			Left	Thru	Thru	Right	Left	Right	
5	Site Access at Providence Dr.	Final Base	0	47	46	0	0	0	93
		Growth Rate	1.01	1.01	1.01	1.01	1.01	1.01	-
		In Process	0	0	0	0	0	0	0
		Net New Trips	3	0	0	30	8	1	42
		Other	0	0	0	0	0	0	0
		Future Total	**3**	**47**	**46**	**30**	**8**	**1**	**135**

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Trip Generation summary

Added Trips

Zone ID: Name	Land Use variables	Code	Ind. Var.	Rate	Quantity	% In	% Out	Trips In	Trips Out	Total Trips	% of Total Trips
7: Newberg Surgery Ctr	Med/Dental Office Bldg	ITE 720	ksf	2.390	17.500	79.00	21.00	33	9	42	100.00
					Added Trips Total			**33**	**9**	**42**	**100.00**

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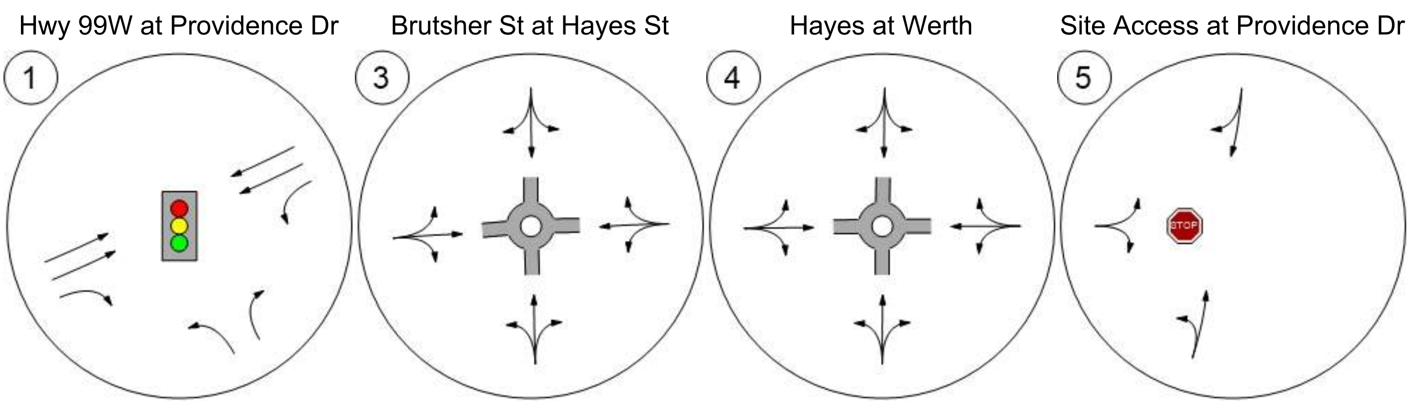
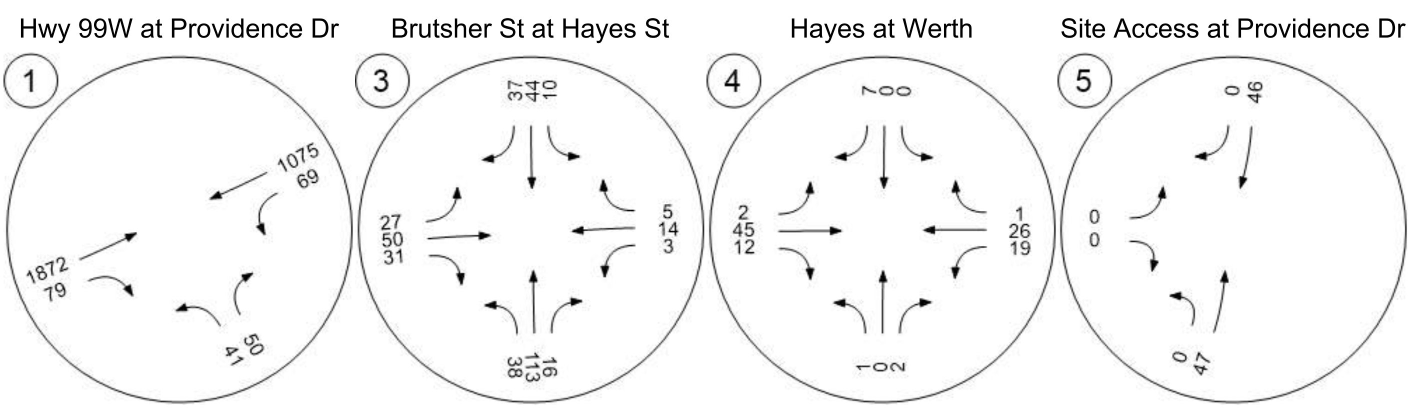
Trip Distribution summary

Zone / Gate	Zone 7: Newberg Surgery Ctr			
	To Newberg Surgery Ctr:		From Newberg Surgery Ctr:	
	Share %	Trips	Share %	Trips
1: Gate	60.00	20	60.00	5
2: Gate	30.00	10	30.00	3
3: Gate	10.00	3	10.00	1
4: Gate	0.00	0	0.00	0
5: Gate	0.00	0	0.00	0
6: Gate	0.00	0	0.00	0
8: Gate	0.00	0	0.00	0
9: Gate	0.00	0	0.00	0
Total	**100.00**	**33**	**100.00**	**9**

Report Figure 1: Lane Configuration and Traffic Control

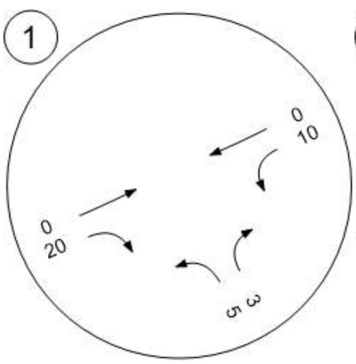


Report Figure 2a: Traffic Volume - Base Volume

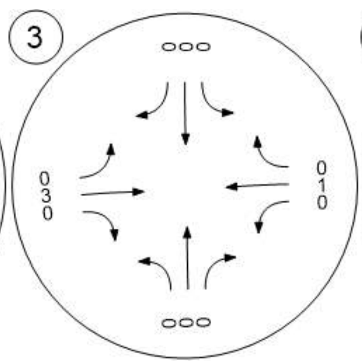


Report Figure 2c: Traffic Volume - Net New Site Trips

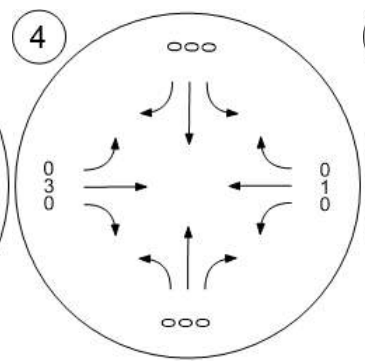
Hwy 99W at Providence Dr



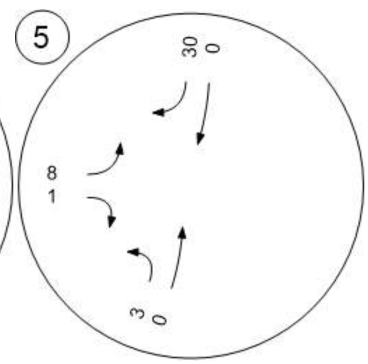
Brutsher St at Hayes St



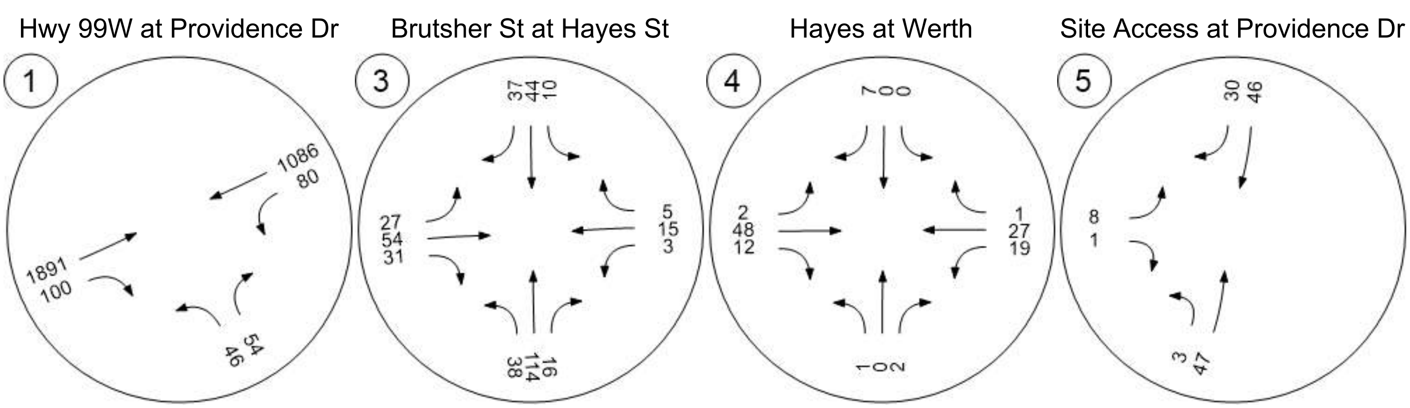
Hayes at Werth



Site Access at Providence Dr

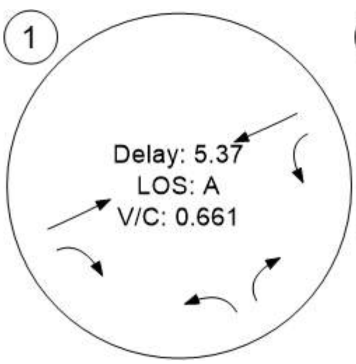


Report Figure 2e: Traffic Volume - Future Total Volume

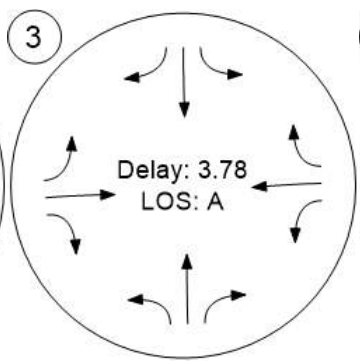


Report Figure 3: Traffic Conditions

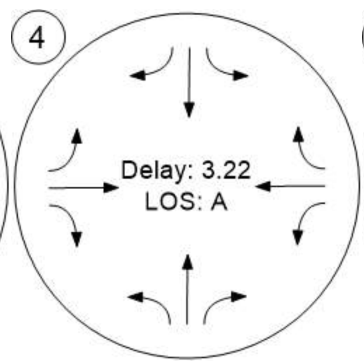
Hwy 99W at Providence Dr



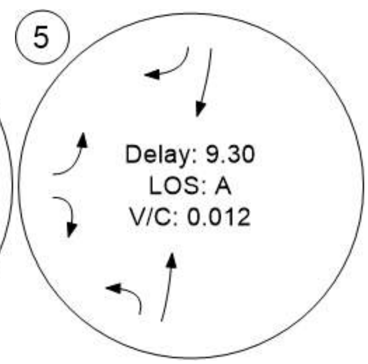
Brutsher St at Hayes St



Hayes at Werth



Site Access at Providence Dr



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Scenario 3 PM Developed 17-346

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Intersection Analysis Summary

ID	Intersection Name	Control Type	Method	Worst Mvmt	V/C	Delay (s/veh)	LOS
1	Hwy 99W at Providence Dr	Signalized	HCM 6th Edition	SWB Left	0.731	12.0	B
3	Brutsher St at Hayes St	Roundabout	HCM 6th Edition	SB Right		4.6	A
4	Hayes at Werth	Roundabout	HCM 6th Edition	WB Thru		3.5	A
5	Site Access at Providence Dr.	Two-way stop	HCM 6th Edition	EB Left	0.067	10.1	B

V/C, Delay, LOS: For two-way stop, these values are taken from the movement with the worst (highest) delay value. for all other control types, they are taken for the whole intersection.

Intersection Level Of Service Report
Intersection 1: Hwy 99W at Providence Dr

Control Type:	Signalized	Delay (sec / veh):	12.0
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.731

Intersection Setup

Name	Hwy 99W		Hwy 99W		Providence Dr	
Approach	Northeastbound		Southwestbound		Northwestbound	
Lane Configuration						
Turning Movement	Thru	Right	Left	Thru	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	1	1	0	1	0
Pocket Length [ft]	100.00	75.00	100.00	100.00	150.00	100.00
Speed [mph]	45.00		45.00		25.00	
Grade [%]	0.00		0.00		0.00	
Curb Present	No		No		No	
Crosswalk	Yes		Yes		Yes	

Volumes

Name	Hwy 99W		Hwy 99W		Providence Dr	
Base Volume Input [veh/h]	1207	31	79	1789	78	96
Base Volume Adjustment Factor	1.0850	1.0850	1.0850	1.0850	1.0850	1.0850
Heavy Vehicles Percentage [%]	3.27	3.27	3.27	3.27	3.27	3.27
Growth Rate	1.01	1.01	1.01	1.01	1.01	1.01
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	10	5	0	26	14
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	1323	44	92	1960	112	119
Peak Hour Factor	0.9600	0.9600	0.9600	0.9600	0.9600	0.9600
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	345	11	24	510	29	31
Total Analysis Volume [veh/h]	1378	46	96	2042	117	124
Presence of On-Street Parking	No	No	No	No	No	No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0		0		0	
v_di, Inbound Pedestrian Volume crossing m	0		0		0	
v_co, Outbound Pedestrian Volume crossing	0		0		0	
v_ci, Inbound Pedestrian Volume crossing mi	0		0		0	
v_ab, Corner Pedestrian Volume [ped/h]	0		0		0	
Bicycle Volume [bicycles/h]	0		0		0	

Intersection Settings

Located in CBD	Yes
Signal Coordination Group	-
Cycle Length [s]	90
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	0.00

Phasing & Timing

Control Type	Permissive	Permissive	Protected	Permissive	Permissive	Permissive
Signal group	8	0	7	4	5	0
Auxiliary Signal Groups						
Lead / Lag	-	-	Lead	-	Lead	-
Minimum Green [s]	5	0	5	5	5	0
Maximum Green [s]	30	0	30	30	30	0
Amber [s]	3.0	0.0	3.0	3.0	3.0	0.0
All red [s]	1.0	0.0	1.0	1.0	1.0	0.0
Split [s]	27	0	44	71	19	0
Vehicle Extension [s]	3.0	0.0	3.0	3.0	3.0	0.0
Walk [s]	5	0	0	5	5	0
Pedestrian Clearance [s]	10	0	0	10	10	0
Rest In Walk	No			No	No	
I1, Start-Up Lost Time [s]	2.0	0.0	2.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	0.0	2.0	2.0	2.0	0.0
Minimum Recall	No		No	No	No	
Maximum Recall	No		No	No	No	
Pedestrian Recall	No		No	No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	C	R	L	C	L	R
C, Cycle Length [s]	90	90	90	90	90	90
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	61	61	7	72	10	10
g / C, Green / Cycle	0.68	0.68	0.08	0.80	0.11	0.11
(v / s)_i Volume / Saturation Flow Rate	0.43	0.03	0.06	0.64	0.07	0.09
s, saturation flow rate [veh/h]	3172	1416	1587	3172	1587	1416
c, Capacity [veh/h]	2152	961	122	2538	176	157
d1, Uniform Delay [s]	8.22	4.81	40.82	5.05	38.41	38.99
k, delay calibration	0.50	0.50	0.11	0.50	0.11	0.11
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	1.47	0.09	10.48	2.83	4.24	8.47
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.64	0.05	0.79	0.80	0.66	0.79
d, Delay for Lane Group [s/veh]	9.70	4.90	51.30	7.88	42.65	47.46
Lane Group LOS	A	A	D	A	D	D
Critical Lane Group	No	No	No	Yes	No	Yes
50th-Percentile Queue Length [veh]	5.87	0.24	2.35	5.09	2.68	3.03
50th-Percentile Queue Length [ft]	146.70	5.92	58.78	127.16	67.02	75.77
95th-Percentile Queue Length [veh]	9.84	0.43	4.23	8.78	4.83	5.46
95th-Percentile Queue Length [ft]	246.02	10.66	105.80	219.62	120.64	136.38

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	9.70	4.90	51.30	7.88	42.65	47.46
Movement LOS	A	A	D	A	D	D
d_A, Approach Delay [s/veh]	9.54		9.83		45.13	
Approach LOS	A		A		D	
d_I, Intersection Delay [s/veh]	11.96					
Intersection LOS	B					
Intersection V/C	0.731					

Other Modes

g_Walk,mi, Effective Walk Time [s]	9.0	9.0	9.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	36.45	36.45	36.45
I_p,int, Pedestrian LOS Score for Intersection	3.516	3.366	2.045
Crosswalk LOS	D	C	B
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	0	0	0
d_b, Bicycle Delay [s]	45.00	45.00	45.00
I_b,int, Bicycle LOS Score for Intersection	5.307	5.896	4.132
Bicycle LOS	F	F	D

Sequence

Ring 1	-	-	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	7	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Intersection Level Of Service Report
Intersection 3: Brutsher St at Hayes St

Control Type:	Roundabout	Delay (sec / veh):	4.6
Analysis Method:	HCM 6th Edition	Level Of Service:	A
Analysis Period:	15 minutes		

Intersection Setup

Name	Brutscher St			Brutscher St			Hayes St			Hayes St		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	25.00			25.00			25.00			25.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Brutscher St			Brutscher St			Hayes St			Hayes St		
Base Volume Input [veh/h]	52	67	12	21	99	140	44	30	42	14	78	30
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	1.76	1.76	1.76	1.76	1.76	1.76	1.76	1.76	1.76	1.76	1.76	1.76
Growth Rate	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	2	0	0	5	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	53	68	12	21	100	141	44	32	42	14	84	30
Peak Hour Factor	0.9300	0.9300	0.9300	0.9300	0.9300	0.9300	0.9300	0.9300	0.9300	0.9300	0.9300	0.9300
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	14	18	3	6	27	38	12	9	11	4	23	8
Total Analysis Volume [veh/h]	57	73	13	23	108	152	47	34	45	15	90	32
Pedestrian Volume [ped/h]	0			0			0			0		

Intersection Settings

Number of Conflicting Circulating Lanes	1			1			1			1		
Circulating Flow Rate [veh/h]	106			165			149			180		
Exiting Flow Rate [veh/h]	58			150			125			122		
Demand Flow Rate [veh/h]	53	68	12	21	100	141	44	32	42	14	84	30
Adjusted Demand Flow Rate [veh/h]	57	73	13	23	108	152	47	34	45	15	90	32

Lanes

Overwrite Calculated Critical Headway	No	No	No	No
User-Defined Critical Headway [s]	4.00	4.00	4.00	4.00
Overwrite Calculated Follow-Up Time	No	No	No	No
User-Defined Follow-Up Time [s]	3.00	3.00	3.00	3.00
A (intercept)	1380.00	1380.00	1380.00	1380.00
B (coefficient)	0.00102	0.00102	0.00102	0.00102
HV Adjustment Factor	0.98	0.98	0.98	0.98
Entry Flow Rate [veh/h]	146	288	129	140
Capacity of Entry and Bypass Lanes [veh/h]	1239	1167	1186	1149
Pedestrian Impedance	1.00	1.00	1.00	1.00
Capacity per Entry Lane [veh/h]	1218	1147	1166	1129
X, volume / capacity	0.12	0.25	0.11	0.12

Movement, Approach, & Intersection Results

Lane LOS	A	A	A	A
95th-Percentile Queue Length [veh]	0.40	0.97	0.36	0.41
95th-Percentile Queue Length [ft]	9.95	24.37	9.07	10.33
Approach Delay [s/veh]	3.94	5.40	4.00	4.24
Approach LOS	A	A	A	A
Intersection Delay [s/veh]	4.61			
Intersection LOS	A			

Intersection Level Of Service Report
Intersection 4: Hayes at Werth

Control Type:	Roundabout	Delay (sec / veh):	3.5
Analysis Method:	HCM 6th Edition	Level Of Service:	A
Analysis Period:	15 minutes		

Intersection Setup

Name	Werth			Werth			Hayes St			Providence Dr		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration	+			+			+			+		
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	25.00			25.00			25.00			25.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Werth			Werth			Hayes St			Providence Dr		
Base Volume Input [veh/h]	10	0	7	2	0	3	17	30	9	11	105	6
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	1.59	1.59	1.59	1.59	1.59	1.59	1.59	1.59	1.59	1.59	1.59	1.59
Growth Rate	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	2	0	0	5	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	10	0	7	2	0	3	17	32	9	11	111	6
Peak Hour Factor	0.7900	0.7900	0.7900	0.7900	0.7900	0.7900	0.7900	0.7900	0.7900	0.7900	0.7900	0.7900
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	3	0	2	1	0	1	5	10	3	3	35	2
Total Analysis Volume [veh/h]	13	0	9	3	0	4	22	41	11	14	141	8
Pedestrian Volume [ped/h]	0			0			0			0		

Intersection Settings

Number of Conflicting Circulating Lanes	1			1			1			1		
Circulating Flow Rate [veh/h]	67			171			17			36		
Exiting Flow Rate [veh/h]	45			156			14			22		
Demand Flow Rate [veh/h]	10	0	7	2	0	3	17	32	9	11	111	6
Adjusted Demand Flow Rate [veh/h]	13	0	9	3	0	4	22	41	11	14	141	8

Lanes

Overwrite Calculated Critical Headway	No	No	No	No
User-Defined Critical Headway [s]	4.00	4.00	4.00	4.00
Overwrite Calculated Follow-Up Time	No	No	No	No
User-Defined Follow-Up Time [s]	3.00	3.00	3.00	3.00
A (intercept)	1380.00	1380.00	1380.00	1380.00
B (coefficient)	0.00102	0.00102	0.00102	0.00102
HV Adjustment Factor	0.98	0.98	0.98	0.98
Entry Flow Rate [veh/h]	23	8	76	166
Capacity of Entry and Bypass Lanes [veh/h]	1289	1160	1356	1331
Pedestrian Impedance	1.00	1.00	1.00	1.00
Capacity per Entry Lane [veh/h]	1269	1142	1335	1311
X, volume / capacity	0.02	0.01	0.06	0.12

Movement, Approach, & Intersection Results

Lane LOS	A	A	A	A
95th-Percentile Queue Length [veh]	0.05	0.02	0.18	0.43
95th-Percentile Queue Length [ft]	1.32	0.46	4.40	10.63
Approach Delay [s/veh]	2.97	3.20	3.13	3.76
Approach LOS	A	A	A	A
Intersection Delay [s/veh]	3.51			
Intersection LOS	A			

Intersection Level Of Service Report
Intersection 5: Site Access at Providence Dr.

Control Type:	Two-way stop	Delay (sec / veh):	10.1
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.067

Intersection Setup

Name	Providence Dr		Providence Dr		Site Access	
Approach	Northbound		Southbound		Eastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	25.00		25.00		25.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	Yes		Yes		Yes	

Volumes

Name	Providence Dr		Providence Dr		Site Access	
Base Volume Input [veh/h]	0	40	122	0	0	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	1.59	1.59	1.59	1.59	1.59	1.59
Growth Rate	1.01	1.01	1.01	1.01	1.01	1.01
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	2	0	0	15	40	5
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	2	40	123	15	40	5
Peak Hour Factor	0.7900	0.7900	0.7900	0.7900	0.7900	0.7900
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	1	13	39	5	13	2
Total Analysis Volume [veh/h]	3	51	156	19	51	6
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Priority Scheme	Free	Free	Stop
Flared Lane			No
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance			No
Number of Storage Spaces in Median	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.00	0.00	0.00	0.00	0.07	0.01
d_M, Delay for Movement [s/veh]	7.57	0.00	0.00	0.00	10.07	9.46
Movement LOS	A	A	A	A	B	A
95th-Percentile Queue Length [veh]	0.12	0.12	0.00	0.00	0.24	0.24
95th-Percentile Queue Length [ft]	3.00	3.00	0.00	0.00	5.93	5.93
d_A, Approach Delay [s/veh]	0.42		0.00		10.01	
Approach LOS	A		A		B	
d_I, Intersection Delay [s/veh]	2.07					
Intersection LOS	B					

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Turning Movement Volume: Summary

ID	Intersection Name	Northeastbound		Southwestbound		Northwestbound		Total Volume
		Thru	Right	Left	Thru	Left	Right	
1	Hwy 99W at Providence Dr	1323	44	92	1960	112	119	3650

ID	Intersection Name	Northbound			Southbound			Eastbound			Westbound			Total Volume
		Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
3	Brutsher St at Hayes St	53	68	12	21	100	141	44	32	42	14	84	30	641

ID	Intersection Name	Northbound			Southbound			Eastbound			Westbound			Total Volume
		Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
4	Hayes at Werth	10	0	7	2	0	3	17	32	9	11	111	6	208

ID	Intersection Name	Northbound		Southbound		Eastbound		Total Volume
		Left	Thru	Thru	Right	Left	Right	
5	Site Access at Providence Dr.	2	40	123	15	40	5	225

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Turning Movement Volume: Detail

ID	Intersection Name	Volume Type	Northeastbound		Southwestbound		Northwestbound		Total Volume
			Thru	Right	Left	Thru	Left	Right	
1	Hwy 99W at Providence Dr	Final Base	1310	34	86	1941	85	104	3560
		Growth Rate	1.01	1.01	1.01	1.01	1.01	1.01	-
		In Process	0	0	0	0	0	0	0
		Net New Trips	0	10	5	0	26	14	55
		Other	0	0	0	0	0	0	0
		Future Total	**1323**	**44**	**92**	**1960**	**112**	**119**	**3650**

ID	Intersection Name	Volume Type	Northbound			Southbound			Eastbound			Westbound			Total Volume
			Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
3	Brutsher St at Hayes St	Final Base	52	67	12	21	99	140	44	30	42	14	78	30	629
		Growth Rate	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	-
		In Process	0	0	0	0	0	0	0	0	0	0	0	0	0
		Net New Trips	0	0	0	0	0	0	0	2	0	0	5	0	7
		Other	0	0	0	0	0	0	0	0	0	0	0	0	0
		Future Total	**53**	**68**	**12**	**21**	**100**	**141**	**44**	**32**	**42**	**14**	**84**	**30**	**641**

ID	Intersection Name	Volume Type	Northbound			Southbound			Eastbound			Westbound			Total Volume
			Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
4	Hayes at Werth	Final Base	10	0	7	2	0	3	17	30	9	11	105	6	200
		Growth Rate	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	-
		In Process	0	0	0	0	0	0	0	0	0	0	0	0	0
		Net New Trips	0	0	0	0	0	0	0	2	0	0	5	0	7
		Other	0	0	0	0	0	0	0	0	0	0	0	0	0
		Future Total	**10**	**0**	**7**	**2**	**0**	**3**	**17**	**32**	**9**	**11**	**111**	**6**	**208**

ID	Intersection Name	Volume Type	Northbound		Southbound		Eastbound		Total Volume
			Left	Thru	Thru	Right	Left	Right	
5	Site Access at Providence Dr.	Final Base	0	40	122	0	0	0	162
		Growth Rate	1.01	1.01	1.01	1.01	1.01	1.01	-
		In Process	0	0	0	0	0	0	0
		Net New Trips	2	0	0	15	40	5	62
		Other	0	0	0	0	0	0	0
		Future Total	**2**	**40**	**123**	**15**	**40**	**5**	**225**

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Trip Generation summary

Added Trips

Zone ID: Name	Land Use variables	Code	Ind. Var.	Rate	Quantity	% In	% Out	Trips In	Trips Out	Total Trips	% of Total Trips
7: Newberg Sugery Ctr	Med/Dental Office	ITE 720	ksf	3.570	17.500	28.00	72.00	17	45	62	100.00
					Added Trips Total			**17**	**45**	**62**	**100.00**

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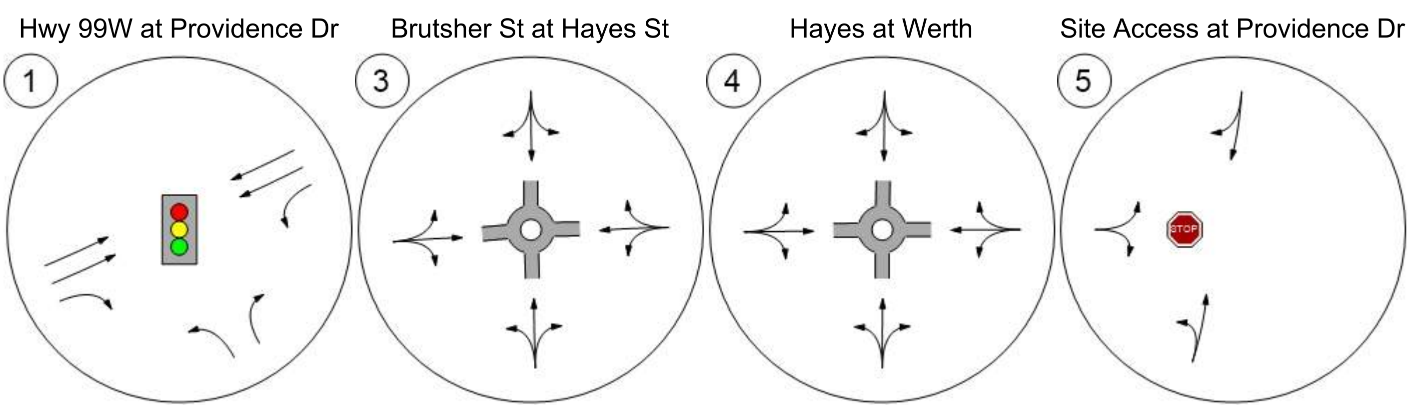
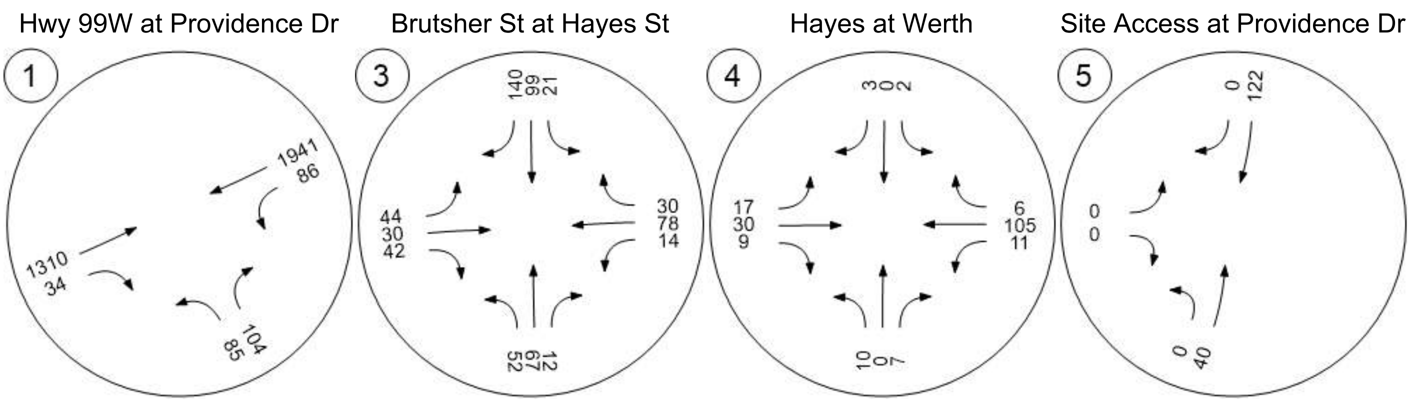
Trip Distribution summary

Zone / Gate	Zone 7: Newberg Sugery Ctr			
	To Newberg Sugery Ctr:		From Newberg Sugery Ctr:	
	Share %	Trips	Share %	Trips
1: Gate	60.00	10	60.00	26
2: Gate	30.00	5	30.00	14
3: Gate	10.00	2	10.00	5
4: Gate	0.00	0	0.00	0
5: Gate	0.00	0	0.00	0
6: Gate	0.00	0	0.00	0
8: Gate	0.00	0	0.00	0
9: Gate	0.00	0	0.00	0
Total	**100.00**	**17**	**100.00**	**45**

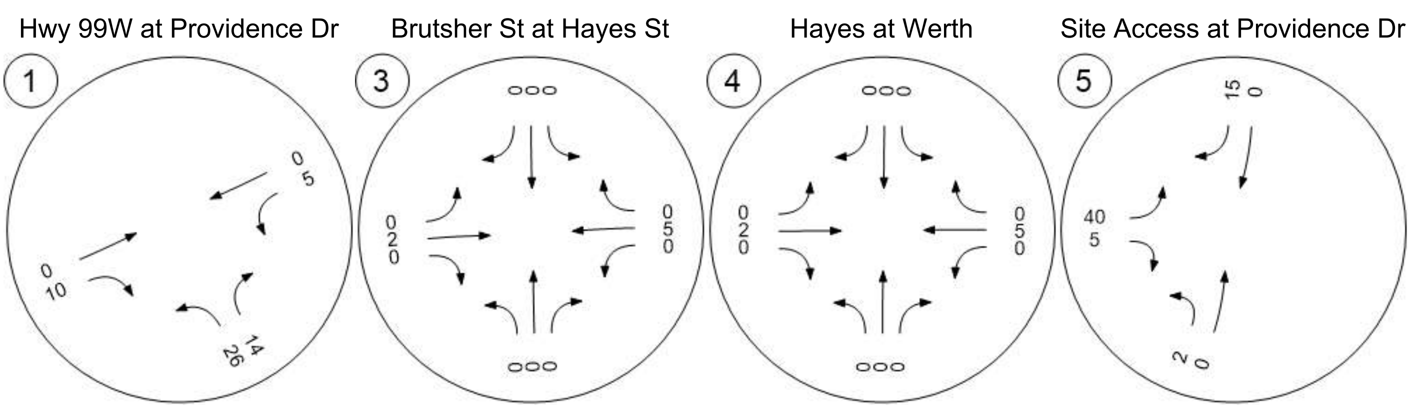
Report Figure 1: Lane Configuration and Traffic Control



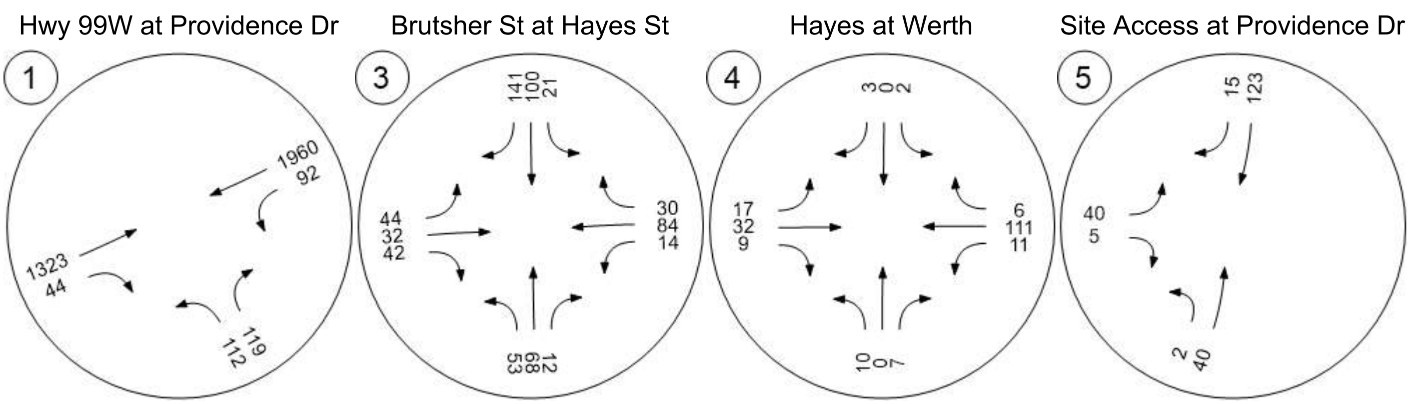
Report Figure 2a: Traffic Volume - Base Volume



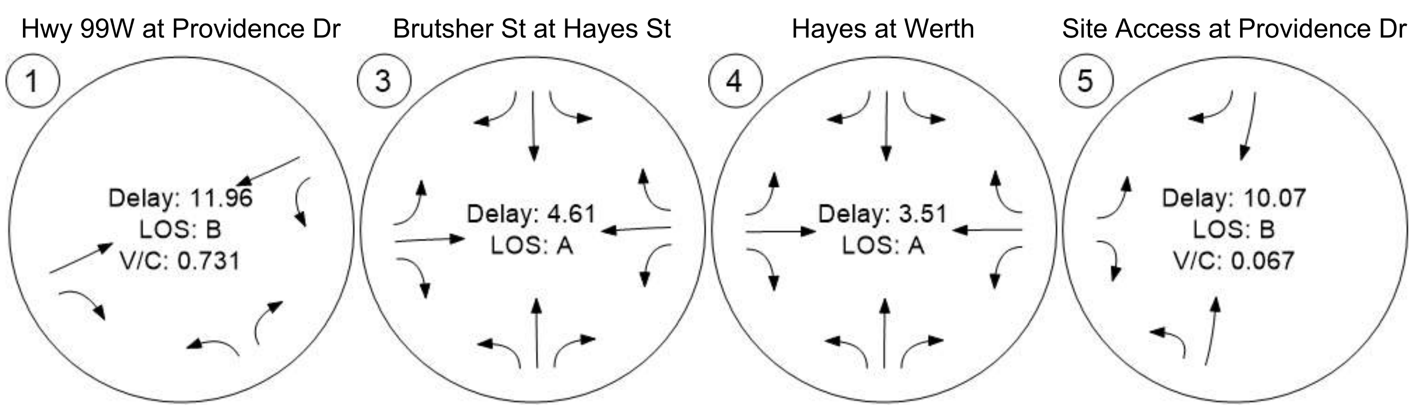
Report Figure 2c: Traffic Volume - Net New Site Trips



Report Figure 2e: Traffic Volume - Future Total Volume



Report Figure 3: Traffic Conditions



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Scenario 6 AM Future 17-346

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Intersection Analysis Summary

ID	Intersection Name	Control Type	Method	Worst Mvmt	V/C	Delay (s/veh)	LOS
1	Hwy 99W at Providence Dr	Signalized	HCM 6th Edition	NWB Right	0.758	7.7	A
3	Brutsher St at Hayes St	Roundabout	HCM 6th Edition	NB Thru		4.0	A
4	Hayes at Werth	Roundabout	HCM 6th Edition	EB Thru		3.3	A
5	Site Access at Providence Dr.	Two-way stop	HCM 6th Edition	EB Left	0.012	9.4	A

V/C, Delay, LOS: For two-way stop, these values are taken from the movement with the worst (highest) delay value. for all other control types, they are taken for the whole intersection.

Intersection Level Of Service Report
Intersection 1: Hwy 99W at Providence Dr

Control Type:	Signalized	Delay (sec / veh):	7.7
Analysis Method:	HCM 6th Edition	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.758

Intersection Setup

Name	Hwy 99W		Hwy 99W		Providence Dr	
Approach	Northeastbound		Southwestbound		Northwestbound	
Lane Configuration						
Turning Movement	Thru	Right	Left	Thru	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	1	1	0	1	0
Pocket Length [ft]	100.00	75.00	100.00	100.00	150.00	100.00
Speed [mph]	45.00		45.00		25.00	
Grade [%]	0.00		0.00		0.00	
Curb Present	No		No		No	
Crosswalk	Yes		Yes		Yes	

Volumes

Name	Hwy 99W		Hwy 99W		Providence Dr	
Base Volume Input [veh/h]	1725	73	64	991	38	46
Base Volume Adjustment Factor	1.0850	1.0850	1.0850	1.0850	1.0850	1.0850
Heavy Vehicles Percentage [%]	4.50	4.50	4.50	4.50	4.50	4.50
Growth Rate	1.16	1.16	1.16	1.16	1.16	1.16
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	20	10	0	5	3
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	2172	112	90	1247	53	61
Peak Hour Factor	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	560	29	23	321	14	16
Total Analysis Volume [veh/h]	2239	115	93	1286	55	63
Presence of On-Street Parking	No	No	No	No	No	No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0		0		0	
v_di, Inbound Pedestrian Volume crossing m	0		0		0	
v_co, Outbound Pedestrian Volume crossing	0		0		0	
v_ci, Inbound Pedestrian Volume crossing mi	0		0		0	
v_ab, Corner Pedestrian Volume [ped/h]	0		0		0	
Bicycle Volume [bicycles/h]	0		0		0	

Intersection Settings

Located in CBD	Yes
Signal Coordination Group	-
Cycle Length [s]	120
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	0.00

Phasing & Timing

Control Type	Permissive	Permissive	Permissive	Permissive	Permissive	Permissive
Signal group	8	0	0	4	5	0
Auxiliary Signal Groups						
Lead / Lag	-	-	-	-	Lead	-
Minimum Green [s]	5	0	0	5	5	0
Maximum Green [s]	30	0	0	30	30	0
Amber [s]	3.0	0.0	0.0	3.0	3.0	0.0
All red [s]	1.0	0.0	0.0	1.0	1.0	0.0
Split [s]	19	0	0	19	101	0
Vehicle Extension [s]	3.0	0.0	0.0	3.0	3.0	0.0
Walk [s]	5	0	0	5	5	0
Pedestrian Clearance [s]	10	0	0	10	10	0
Rest In Walk	No			No	No	
I1, Start-Up Lost Time [s]	2.0	0.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	0.0	0.0	2.0	2.0	0.0
Minimum Recall	No			No	No	
Maximum Recall	No			No	No	
Pedestrian Recall	No			No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	C	R	L	C	L	R
C, Cycle Length [s]	120	120	120	120	120	120
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	2.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	105	105	105	105	7	7
g / C, Green / Cycle	0.87	0.87	0.87	0.87	0.06	0.06
(v / s)_i Volume / Saturation Flow Rate	0.71	0.08	0.62	0.41	0.04	0.04
s, saturation flow rate [veh/h]	3140	1402	150	3140	1571	1402
c, Capacity [veh/h]	2736	1221	139	2736	97	87
d1, Uniform Delay [s]	3.46	1.08	33.04	1.68	54.66	55.23
k, delay calibration	0.50	0.50	0.50	0.50	0.11	0.11
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	2.86	0.15	22.61	0.58	5.05	10.83
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.82	0.09	0.67	0.47	0.56	0.72
d, Delay for Lane Group [s/veh]	6.33	1.24	55.65	2.26	59.71	66.05
Lane Group LOS	A	A	E	A	E	E
Critical Lane Group	Yes	No	No	No	No	Yes
50th-Percentile Queue Length [veh]	3.91	0.14	3.64	1.01	1.77	2.15
50th-Percentile Queue Length [ft]	97.75	3.56	91.04	25.22	44.16	53.69
95th-Percentile Queue Length [veh]	7.04	0.26	6.55	1.82	3.18	3.87
95th-Percentile Queue Length [ft]	175.95	6.42	163.87	45.40	79.49	96.65

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	6.33	1.24	55.65	2.26	59.71	66.05
Movement LOS	A	A	E	A	E	E
d_A, Approach Delay [s/veh]	6.08		5.87		63.09	
Approach LOS	A		A		E	
d_I, Intersection Delay [s/veh]	7.75					
Intersection LOS	A					
Intersection V/C	0.758					

Other Modes

g_Walk,mi, Effective Walk Time [s]	9.0	9.0	9.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	51.34	51.34	51.34
I_p,int, Pedestrian LOS Score for Intersection	3.474	3.392	2.176
Crosswalk LOS	C	C	B
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	0	0	0
d_b, Bicycle Delay [s]	60.00	60.00	60.00
I_b,int, Bicycle LOS Score for Intersection	6.074	5.270	4.132
Bicycle LOS	F	F	D

Sequence

Ring 1	-	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	8	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Intersection Level Of Service Report
Intersection 3: Brutsher St at Hayes St

Control Type:	Roundabout	Delay (sec / veh):	4.0
Analysis Method:	HCM 6th Edition	Level Of Service:	A
Analysis Period:	15 minutes		

Intersection Setup

Name	Brutscher St			Brutscher St			Hayes St			Hayes St		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration	┼			┼			┼			┼		
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	25.00			25.00			25.00			25.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Brutscher St			Brutscher St			Hayes St			Hayes St		
Base Volume Input [veh/h]	38	113	16	10	44	37	27	50	31	3	14	5
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	1.59	1.59	1.59	1.59	1.59	1.59	1.59	1.59	1.59	1.59	1.59	1.59
Growth Rate	1.15	1.15	1.15	1.15	1.15	1.15	1.15	1.15	1.15	1.15	1.15	1.15
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	3	0	0	1	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	44	130	18	12	51	43	31	60	36	3	17	6
Peak Hour Factor	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	12	35	5	3	14	11	8	16	10	1	5	2
Total Analysis Volume [veh/h]	47	138	19	13	54	46	33	64	38	3	18	6
Pedestrian Volume [ped/h]	0			0			0			0		

Intersection Settings

Number of Conflicting Circulating Lanes	1			1			1			1		
Circulating Flow Rate [veh/h]	112			69			71			221		
Exiting Flow Rate [veh/h]	78			66			58			174		
Demand Flow Rate [veh/h]	44	130	18	12	51	43	31	60	36	3	17	6
Adjusted Demand Flow Rate [veh/h]	47	138	19	13	54	46	33	64	38	3	18	6

Lanes

Overwrite Calculated Critical Headway	No	No	No	No
User-Defined Critical Headway [s]	4.00	4.00	4.00	4.00
Overwrite Calculated Follow-Up Time	No	No	No	No
User-Defined Follow-Up Time [s]	3.00	3.00	3.00	3.00
A (intercept)	1380.00	1380.00	1380.00	1380.00
B (coefficient)	0.00102	0.00102	0.00102	0.00102
HV Adjustment Factor	0.98	0.98	0.98	0.98
Entry Flow Rate [veh/h]	208	115	138	28
Capacity of Entry and Bypass Lanes [veh/h]	1232	1287	1284	1101
Pedestrian Impedance	1.00	1.00	1.00	1.00
Capacity per Entry Lane [veh/h]	1213	1266	1264	1084
X, volume / capacity	0.17	0.09	0.11	0.02

Movement, Approach, & Intersection Results

Lane LOS	A	A	A	A
95th-Percentile Queue Length [veh]	0.60	0.29	0.36	0.08
95th-Percentile Queue Length [ft]	15.11	7.34	8.95	1.92
Approach Delay [s/veh]	4.41	3.57	3.72	3.53
Approach LOS	A	A	A	A
Intersection Delay [s/veh]	3.97			
Intersection LOS	A			

Intersection Level Of Service Report
Intersection 4: Hayes at Werth

Control Type:	Roundabout	Delay (sec / veh):	3.3
Analysis Method:	HCM 6th Edition	Level Of Service:	A
Analysis Period:	15 minutes		

Intersection Setup

Name	Werth			Werth			Hayes St			Providence Dr		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration	╋			╋			╋			╋		
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	25.00			25.00			25.00			25.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Werth			Werth			Hayes St			Providence Dr		
Base Volume Input [veh/h]	1	0	2	0	0	7	2	45	12	19	26	1
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	5.40	5.40	5.40	5.40	5.40	5.40	5.40	5.40	5.40	5.40	5.40	5.40
Growth Rate	1.16	1.16	1.16	1.16	1.16	1.16	1.16	1.16	1.16	1.16	1.16	1.16
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	3	0	0	1	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	1	0	2	0	0	8	2	55	14	22	31	1
Peak Hour Factor	0.7800	0.7800	0.7800	0.7800	0.7800	0.7800	0.7800	0.7800	0.7800	0.7800	0.7800	0.7800
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	0	1	0	0	3	1	18	4	7	10	0
Total Analysis Volume [veh/h]	1	0	3	0	0	10	3	71	18	28	40	1
Pedestrian Volume [ped/h]	0			0			0			0		

Intersection Settings

Number of Conflicting Circulating Lanes	1			1			1			1		
Circulating Flow Rate [veh/h]	78			73			30			4		
Exiting Flow Rate [veh/h]	75			43			30			3		
Demand Flow Rate [veh/h]	1	0	2	0	0	8	2	55	14	22	31	1
Adjusted Demand Flow Rate [veh/h]	1	0	3	0	0	10	3	71	18	28	40	1

Lanes

Overwrite Calculated Critical Headway	No	No	No	No
User-Defined Critical Headway [s]	4.00	4.00	4.00	4.00
Overwrite Calculated Follow-Up Time	No	No	No	No
User-Defined Follow-Up Time [s]	3.00	3.00	3.00	3.00
A (intercept)	1380.00	1380.00	1380.00	1380.00
B (coefficient)	0.00102	0.00102	0.00102	0.00102
HV Adjustment Factor	0.95	0.95	0.95	0.95
Entry Flow Rate [veh/h]	5	11	97	73
Capacity of Entry and Bypass Lanes [veh/h]	1275	1282	1340	1375
Pedestrian Impedance	1.00	1.00	1.00	1.00
Capacity per Entry Lane [veh/h]	1210	1216	1271	1304
X, volume / capacity	0.00	0.01	0.07	0.05

Movement, Approach, & Intersection Results

Lane LOS	A	A	A	A
95th-Percentile Queue Length [veh]	0.01	0.02	0.23	0.17
95th-Percentile Queue Length [ft]	0.25	0.62	5.85	4.19
Approach Delay [s/veh]	3.00	3.03	3.42	3.18
Approach LOS	A	A	A	A
Intersection Delay [s/veh]	3.29			
Intersection LOS	A			

Intersection Level Of Service Report
Intersection 5: Site Access at Providence Dr.

Control Type:	Two-way stop	Delay (sec / veh):	9.4
Analysis Method:	HCM 6th Edition	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.012

Intersection Setup

Name	Providence Dr		Providence Dr		Site Access	
Approach	Northbound		Southbound		Eastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	25.00		25.00		25.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	Yes		Yes		Yes	

Volumes

Name	Providence Dr		Providence Dr		Site Access	
Base Volume Input [veh/h]	0	47	46	0	0	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.54	0.54	0.54	0.54	0.54	0.54
Growth Rate	1.16	1.16	1.16	1.16	1.16	1.16
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	3	0	0	30	8	1
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	3	55	53	30	8	1
Peak Hour Factor	0.7800	0.7800	0.7800	0.7800	0.7800	0.7800
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	1	18	17	10	3	0
Total Analysis Volume [veh/h]	4	71	68	38	10	1
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Priority Scheme	Free	Free	Stop
Flared Lane			No
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance			No
Number of Storage Spaces in Median	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.00	0.00	0.00	0.00	0.01	0.00
d_M, Delay for Movement [s/veh]	7.42	0.00	0.00	0.00	9.42	8.75
Movement LOS	A	A	A	A	A	A
95th-Percentile Queue Length [veh]	0.16	0.16	0.00	0.00	0.04	0.04
95th-Percentile Queue Length [ft]	3.96	3.96	0.00	0.00	1.00	1.00
d_A, Approach Delay [s/veh]	0.40		0.00		9.36	
Approach LOS	A		A		A	
d_I, Intersection Delay [s/veh]	0.69					
Intersection LOS	A					

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Turning Movement Volume: Summary

ID	Intersection Name	Northeastbound		Southwestbound		Northwestbound		Total Volume
		Thru	Right	Left	Thru	Left	Right	
1	Hwy 99W at Providence Dr	2172	112	90	1247	53	61	3735

ID	Intersection Name	Northbound			Southbound			Eastbound			Westbound			Total Volume
		Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
3	Brutsher St at Hayes St	44	130	18	12	51	43	31	60	36	3	17	6	451

ID	Intersection Name	Northbound			Southbound			Eastbound			Westbound			Total Volume
		Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
4	Hayes at Werth	1	0	2	0	0	8	2	55	14	22	31	1	136

ID	Intersection Name	Northbound		Southbound		Eastbound		Total Volume
		Left	Thru	Thru	Right	Left	Right	
5	Site Access at Providence Dr.	3	55	53	30	8	1	150

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Turning Movement Volume: Detail

ID	Intersection Name	Volume Type	Northeastbound		Southwestbound		Northwestbound		Total Volume
			Thru	Right	Left	Thru	Left	Right	
1	Hwy 99W at Providence Dr	Final Base	1872	79	69	1075	41	50	3186
		Growth Rate	1.16	1.16	1.16	1.16	1.16	1.16	-
		In Process	0	0	0	0	0	0	0
		Net New Trips	0	20	10	0	5	3	38
		Other	0	0	0	0	0	0	0
		Future Total	**2172**	**112**	**90**	**1247**	**53**	**61**	**3735**

ID	Intersection Name	Volume Type	Northbound			Southbound			Eastbound			Westbound			Total Volume
			Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
3	Brutsher St at Hayes St	Final Base	38	113	16	10	44	37	27	50	31	3	14	5	388
		Growth Rate	1.15	1.15	1.15	1.15	1.15	1.15	1.15	1.15	1.15	1.15	1.15	1.15	-
		In Process	0	0	0	0	0	0	0	0	0	0	0	0	0
		Net New Trips	0	0	0	0	0	0	0	3	0	0	1	0	4
		Other	0	0	0	0	0	0	0	0	0	0	0	0	0
		Future Total	**44**	**130**	**18**	**12**	**51**	**43**	**31**	**60**	**36**	**3**	**17**	**6**	**451**

ID	Intersection Name	Volume Type	Northbound			Southbound			Eastbound			Westbound			Total Volume
			Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
4	Hayes at Werth	Final Base	1	0	2	0	0	7	2	45	12	19	26	1	115
		Growth Rate	1.16	1.16	1.16	1.16	1.16	1.16	1.16	1.16	1.16	1.16	1.16	1.16	-
		In Process	0	0	0	0	0	0	0	0	0	0	0	0	0
		Net New Trips	0	0	0	0	0	0	0	3	0	0	1	0	4
		Other	0	0	0	0	0	0	0	0	0	0	0	0	0
		Future Total	**1**	**0**	**2**	**0**	**0**	**8**	**2**	**55**	**14**	**22**	**31**	**1**	**136**

ID	Intersection Name	Volume Type	Northbound		Southbound		Eastbound		Total Volume
			Left	Thru	Thru	Right	Left	Right	
5	Site Access at Providence Dr.	Final Base	0	47	46	0	0	0	93
		Growth Rate	1.16	1.16	1.16	1.16	1.16	1.16	-
		In Process	0	0	0	0	0	0	0
		Net New Trips	3	0	0	30	8	1	42
		Other	0	0	0	0	0	0	0
		Future Total	**3**	**55**	**53**	**30**	**8**	**1**	**150**

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Trip Generation summary

Added Trips

Zone ID: Name	Land Use variables	Code	Ind. Var.	Rate	Quantity	% In	% Out	Trips In	Trips Out	Total Trips	% of Total Trips
7: Newberg Surgery Ctr	Med/Dental Office Bldg	ITE 720	ksf	2.390	17.500	79.00	21.00	33	9	42	100.00
					Added Trips Total			**33**	**9**	**42**	**100.00**

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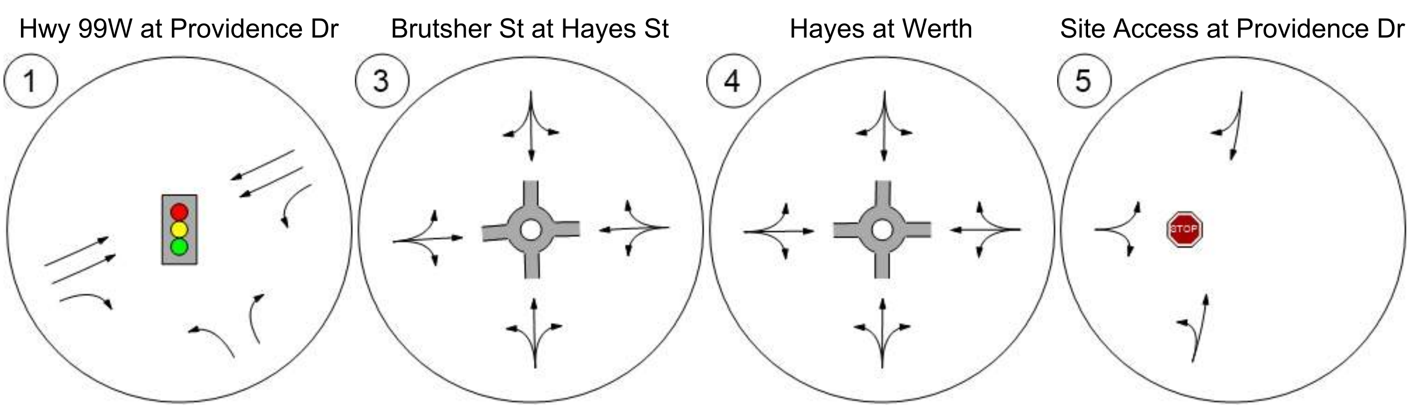
Trip Distribution summary

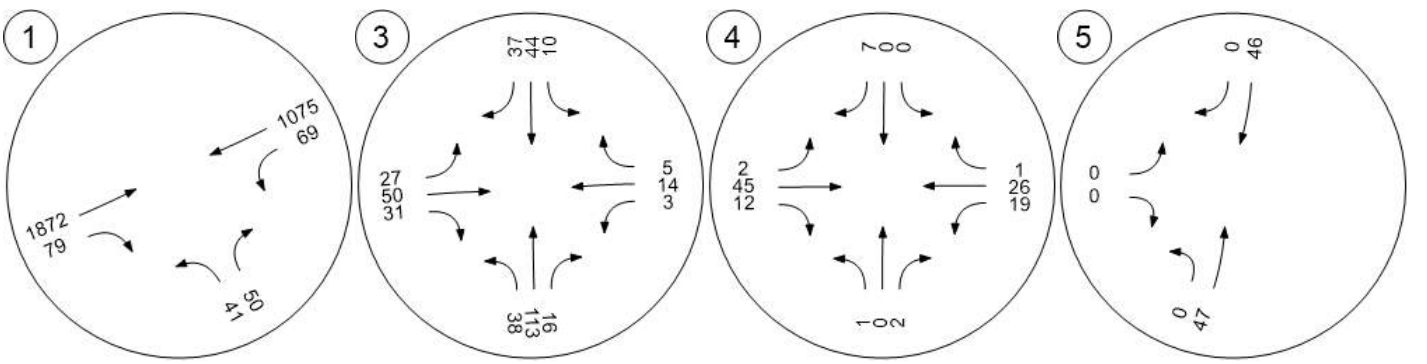
Zone / Gate	Zone 7: Newberg Surgery Ctr			
	To Newberg Surgery Ctr:		From Newberg Surgery Ctr:	
	Share %	**Trips**	**Share %**	**Trips**
1: Gate	60.00	20	60.00	5
2: Gate	30.00	10	30.00	3
3: Gate	10.00	3	10.00	1
4: Gate	0.00	0	0.00	0
5: Gate	0.00	0	0.00	0
6: Gate	0.00	0	0.00	0
8: Gate	0.00	0	0.00	0
9: Gate	0.00	0	0.00	0
Total	**100.00**	**33**	**100.00**	**9**

Report Figure 1: Lane Configuration and Traffic Control



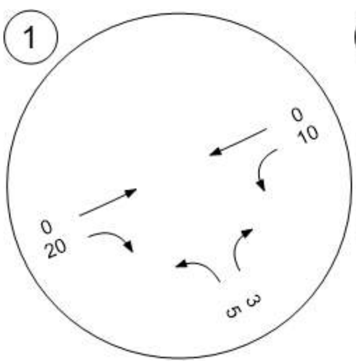
Report Figure 2a: Traffic Volume - Base Volume

Hwy 99W at Providence Dr | Brutsher St at Hayes St | Hayes at Werth | Site Access at Providence Dr

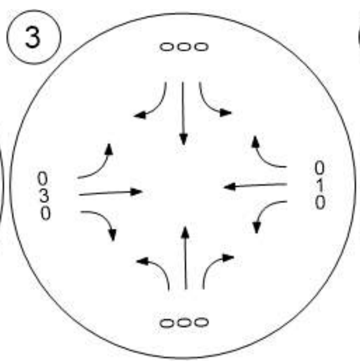


Report Figure 2c: Traffic Volume - Net New Site Trips

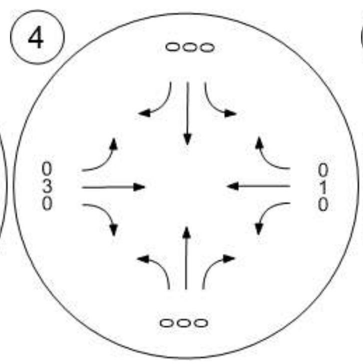
Hwy 99W at Providence Dr



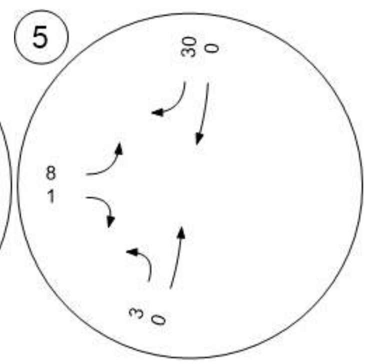
Brutsher St at Hayes St



Hayes at Werth

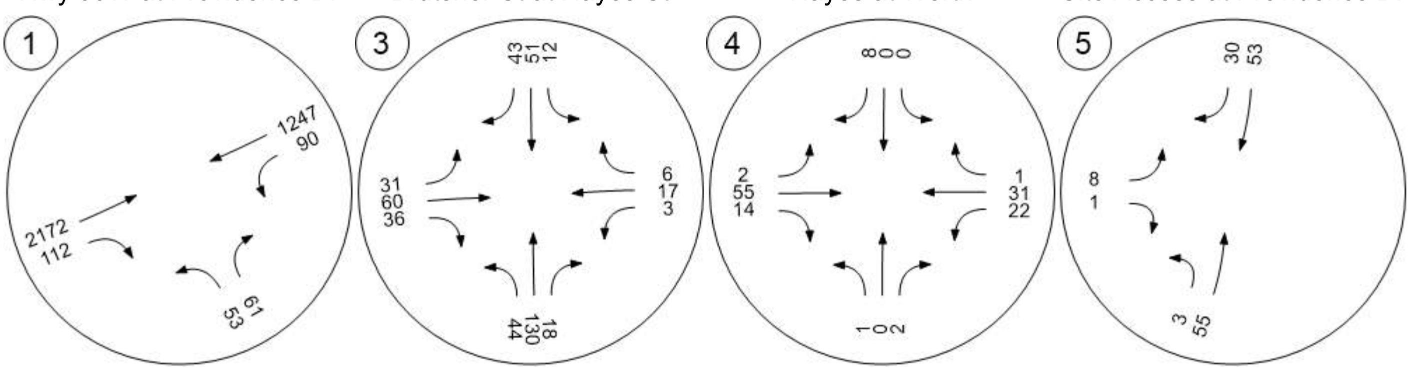


Site Access at Providence Dr

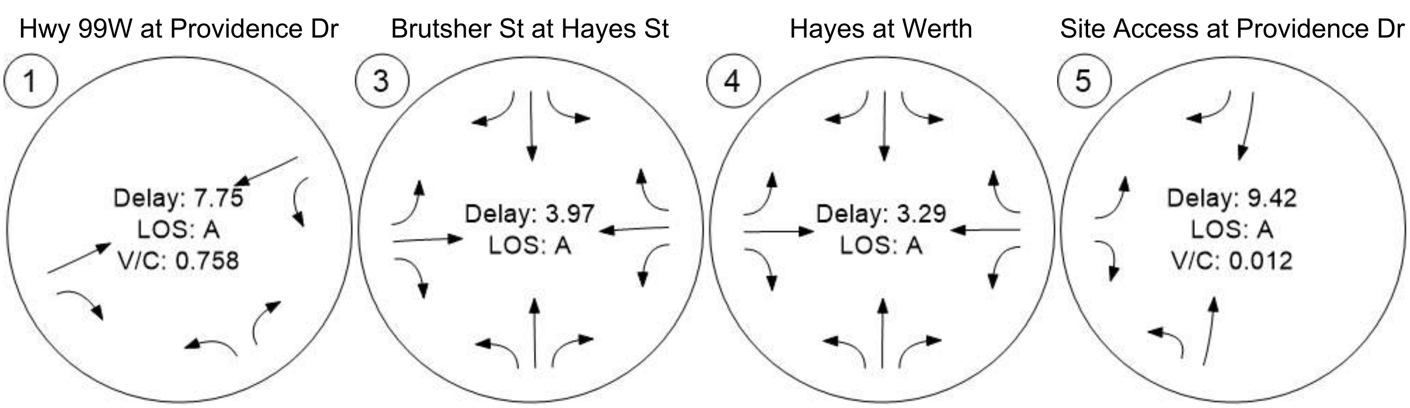


Report Figure 2e: Traffic Volume - Future Total Volume

Hwy 99W at Providence Dr | Brutsher St at Hayes St | Hayes at Werth | Site Access at Providence Dr



Report Figure 3: Traffic Conditions



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Scenario 5 PM Future 17-346

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Intersection Analysis Summary

ID	Intersection Name	Control Type	Method	Worst Mvmt	V/C	Delay (s/veh)	LOS
1	Hwy 99W at Providence Dr	Signalized	HCM 6th Edition	SWB Left	0.839	17.6	B
3	Brutsher St at Hayes St	Roundabout	HCM 6th Edition	SB Right		5.0	A
4	Hayes at Werth	Roundabout	HCM 6th Edition	WB Thru		3.6	A
5	Site Access at Providence Dr.	Two-way stop	HCM 6th Edition	EB Left	0.069	10.3	B

V/C, Delay, LOS: For two-way stop, these values are taken from the movement with the worst (highest) delay value. for all other control types, they are taken for the whole intersection.

Intersection Level Of Service Report
Intersection 1: Hwy 99W at Providence Dr

Control Type:	Signalized	Delay (sec / veh):	17.6
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.839

Intersection Setup

Name	Hwy 99W		Hwy 99W		Providence Dr	
Approach	Northeastbound		Southwestbound		Northwestbound	
Lane Configuration						
Turning Movement	Thru	Right	Left	Thru	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	1	1	0	1	0
Pocket Length [ft]	100.00	75.00	100.00	100.00	150.00	100.00
Speed [mph]	45.00		45.00		25.00	
Grade [%]	0.00		0.00		0.00	
Curb Present	No		No		No	
Crosswalk	Yes		Yes		Yes	

Volumes

Name	Hwy 99W		Hwy 99W		Providence Dr	
Base Volume Input [veh/h]	1207	31	79	1789	78	96
Base Volume Adjustment Factor	1.0850	1.0850	1.0850	1.0850	1.0850	1.0850
Heavy Vehicles Percentage [%]	3.27	3.27	3.27	3.27	3.27	3.27
Growth Rate	1.16	1.16	1.16	1.16	1.16	1.16
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	10	5	0	26	14
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	1520	49	105	2252	125	135
Peak Hour Factor	0.9600	0.9600	0.9600	0.9600	0.9600	0.9600
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	396	13	27	586	33	35
Total Analysis Volume [veh/h]	1583	51	109	2346	130	141
Presence of On-Street Parking	No	No	No	No	No	No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0		0		0	
v_di, Inbound Pedestrian Volume crossing m	0		0		0	
v_co, Outbound Pedestrian Volume crossing	0		0		0	
v_ci, Inbound Pedestrian Volume crossing mi	0		0		0	
v_ab, Corner Pedestrian Volume [ped/h]	0		0		0	
Bicycle Volume [bicycles/h]	0		0		0	

Intersection Settings

Located in CBD	Yes
Signal Coordination Group	-
Cycle Length [s]	90
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	0.00

Phasing & Timing

Control Type	Permissive	Permissive	Protected	Permissive	Permissive	Permissive
Signal group	8	0	7	4	5	0
Auxiliary Signal Groups						
Lead / Lag	-	-	Lead	-	Lead	-
Minimum Green [s]	5	0	5	5	5	0
Maximum Green [s]	30	0	30	30	30	0
Amber [s]	3.0	0.0	3.0	3.0	3.0	0.0
All red [s]	1.0	0.0	1.0	1.0	1.0	0.0
Split [s]	27	0	44	71	19	0
Vehicle Extension [s]	3.0	0.0	3.0	3.0	3.0	0.0
Walk [s]	5	0	0	5	5	0
Pedestrian Clearance [s]	10	0	0	10	10	0
Rest In Walk	No			No	No	
I1, Start-Up Lost Time [s]	2.0	0.0	2.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	0.0	2.0	2.0	2.0	0.0
Minimum Recall	No		No	No	No	
Maximum Recall	No		No	No	No	
Pedestrian Recall	No		No	No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	C	R	L	C	L	R
C, Cycle Length [s]	90	90	90	90	90	90
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	59	59	8	71	11	11
g / C, Green / Cycle	0.66	0.66	0.09	0.79	0.12	0.12
(v / s)_i Volume / Saturation Flow Rate	0.50	0.04	0.07	0.74	0.08	0.10
s, saturation flow rate [veh/h]	3172	1416	1587	3172	1587	1416
c, Capacity [veh/h]	2084	930	138	2500	195	174
d1, Uniform Delay [s]	10.57	5.49	40.31	7.75	37.73	38.47
k, delay calibration	0.50	0.50	0.11	0.50	0.11	0.11
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	2.66	0.11	9.70	8.40	3.90	8.69
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.76	0.05	0.79	0.94	0.67	0.81
d, Delay for Lane Group [s/veh]	13.23	5.60	50.01	16.15	41.63	47.16
Lane Group LOS	B	A	D	B	D	D
Critical Lane Group	No	No	No	Yes	No	Yes
50th-Percentile Queue Length [veh]	8.66	0.29	2.63	10.67	2.94	3.44
50th-Percentile Queue Length [ft]	216.56	7.33	65.69	266.81	73.54	85.99
95th-Percentile Queue Length [veh]	13.49	0.53	4.73	16.03	5.30	6.19
95th-Percentile Queue Length [ft]	337.24	13.19	118.25	400.75	132.38	154.78

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	13.23	5.60	50.01	16.15	41.63	47.16
Movement LOS	B	A	D	B	D	D
d_A, Approach Delay [s/veh]	13.00		17.65		44.51	
Approach LOS	B		B		D	
d_I, Intersection Delay [s/veh]	17.58					
Intersection LOS	B					
Intersection V/C	0.839					

Other Modes

g_Walk,mi, Effective Walk Time [s]	9.0	9.0	9.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	36.45	36.45	36.45
I_p,int, Pedestrian LOS Score for Intersection	3.688	3.524	2.058
Crosswalk LOS	D	D	B
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	0	0	0
d_b, Bicycle Delay [s]	45.00	45.00	45.00
I_b,int, Bicycle LOS Score for Intersection	5.480	6.158	4.132
Bicycle LOS	F	F	D

Sequence

Ring 1	-	-	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	7	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Intersection Level Of Service Report
Intersection 3: Brutsher St at Hayes St

Control Type:	Roundabout	Delay (sec / veh):	5.0
Analysis Method:	HCM 6th Edition	Level Of Service:	A
Analysis Period:	15 minutes		

Intersection Setup

Name	Brutscher St			Brutscher St			Hayes St			Hayes St		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	25.00			25.00			25.00			25.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Brutscher St			Brutscher St			Hayes St			Hayes St		
Base Volume Input [veh/h]	52	67	12	21	99	140	44	30	42	14	78	30
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	1.76	1.76	1.76	1.76	1.76	1.76	1.76	1.76	1.76	1.76	1.76	1.76
Growth Rate	1.16	1.16	1.16	1.16	1.16	1.16	1.16	1.16	1.16	1.16	1.16	1.16
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	2	0	0	5	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	60	78	14	24	115	162	51	37	49	16	95	35
Peak Hour Factor	0.9300	0.9300	0.9300	0.9300	0.9300	0.9300	0.9300	0.9300	0.9300	0.9300	0.9300	0.9300
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	16	21	4	6	31	44	14	10	13	4	26	9
Total Analysis Volume [veh/h]	65	84	15	26	124	174	55	40	53	17	102	38
Pedestrian Volume [ped/h]	0			0			0			0		

Intersection Settings

Number of Conflicting Circulating Lanes	1			1			1			1		
Circulating Flow Rate [veh/h]	123			187			170			208		
Exiting Flow Rate [veh/h]	67			170			143			141		
Demand Flow Rate [veh/h]	60	78	14	24	115	162	51	37	49	16	95	35
Adjusted Demand Flow Rate [veh/h]	65	84	15	26	124	174	55	40	53	17	102	38

Lanes

Overwrite Calculated Critical Headway	No	No	No	No
User-Defined Critical Headway [s]	4.00	4.00	4.00	4.00
Overwrite Calculated Follow-Up Time	No	No	No	No
User-Defined Follow-Up Time [s]	3.00	3.00	3.00	3.00
A (intercept)	1380.00	1380.00	1380.00	1380.00
B (coefficient)	0.00102	0.00102	0.00102	0.00102
HV Adjustment Factor	0.98	0.98	0.98	0.98
Entry Flow Rate [veh/h]	167	330	151	160
Capacity of Entry and Bypass Lanes [veh/h]	1218	1141	1161	1117
Pedestrian Impedance	1.00	1.00	1.00	1.00
Capacity per Entry Lane [veh/h]	1197	1121	1141	1098
X, volume / capacity	0.14	0.29	0.13	0.14

Movement, Approach, & Intersection Results

Lane LOS	A	A	A	A
95th-Percentile Queue Length [veh]	0.47	1.21	0.45	0.50
95th-Percentile Queue Length [ft]	11.87	30.15	11.15	12.47
Approach Delay [s/veh]	4.17	5.96	4.28	4.54
Approach LOS	A	A	A	A
Intersection Delay [s/veh]	5.00			
Intersection LOS	A			

Intersection Level Of Service Report
Intersection 4: Hayes at Werth

Control Type:	Roundabout	Delay (sec / veh):	3.6
Analysis Method:	HCM 6th Edition	Level Of Service:	A
Analysis Period:	15 minutes		

Intersection Setup

Name	Werth			Werth			Hayes St			Providence Dr		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	25.00			25.00			25.00			25.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Werth			Werth			Hayes St			Providence Dr		
Base Volume Input [veh/h]	10	0	7	2	0	3	17	30	9	11	105	6
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	1.59	1.59	1.59	1.59	1.59	1.59	1.59	1.59	1.59	1.59	1.59	1.59
Growth Rate	1.16	1.16	1.16	1.16	1.16	1.16	1.16	1.16	1.16	1.16	1.16	1.16
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	2	0	0	5	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	12	0	8	2	0	3	20	37	10	13	127	7
Peak Hour Factor	0.7900	0.7900	0.7900	0.7900	0.7900	0.7900	0.7900	0.7900	0.7900	0.7900	0.7900	0.7900
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	4	0	3	1	0	1	6	12	3	4	40	2
Total Analysis Volume [veh/h]	15	0	10	3	0	4	25	47	13	16	161	9
Pedestrian Volume [ped/h]	0			0			0			0		

Intersection Settings

Number of Conflicting Circulating Lanes	1			1			1			1		
Circulating Flow Rate [veh/h]	76			195			19			41		
Exiting Flow Rate [veh/h]	51			179			16			25		
Demand Flow Rate [veh/h]	12	0	8	2	0	3	20	37	10	13	127	7
Adjusted Demand Flow Rate [veh/h]	15	0	10	3	0	4	25	47	13	16	161	9

Lanes

Overwrite Calculated Critical Headway	No	No	No	No
User-Defined Critical Headway [s]	4.00	4.00	4.00	4.00
Overwrite Calculated Follow-Up Time	No	No	No	No
User-Defined Follow-Up Time [s]	3.00	3.00	3.00	3.00
A (intercept)	1380.00	1380.00	1380.00	1380.00
B (coefficient)	0.00102	0.00102	0.00102	0.00102
HV Adjustment Factor	0.98	0.98	0.98	0.98
Entry Flow Rate [veh/h]	26	8	87	189
Capacity of Entry and Bypass Lanes [veh/h]	1277	1132	1354	1324
Pedestrian Impedance	1.00	1.00	1.00	1.00
Capacity per Entry Lane [veh/h]	1257	1114	1332	1304
X, volume / capacity	0.02	0.01	0.06	0.14

Movement, Approach, & Intersection Results

Lane LOS	A	A	A	A
95th-Percentile Queue Length [veh]	0.06	0.02	0.20	0.50
95th-Percentile Queue Length [ft]	1.52	0.47	5.11	12.44
Approach Delay [s/veh]	3.02	3.29	3.21	3.94
Approach LOS	A	A	A	A
Intersection Delay [s/veh]	3.64			
Intersection LOS	A			

Intersection Level Of Service Report
Intersection 5: Site Access at Providence Dr.

Control Type:	Two-way stop	Delay (sec / veh):	10.3
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.069

Intersection Setup

Name	Providence Dr		Providence Dr		Site Access	
Approach	Northbound		Southbound		Eastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	25.00		25.00		25.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	Yes		Yes		Yes	

Volumes

Name	Providence Dr		Providence Dr		Site Access	
Base Volume Input [veh/h]	0	40	122	0	0	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	1.59	1.59	1.59	1.59	1.59	1.59
Growth Rate	1.16	1.16	1.16	1.16	1.16	1.16
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	2	0	0	15	40	5
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	2	46	142	15	40	5
Peak Hour Factor	0.7900	0.7900	0.7900	0.7900	0.7900	0.7900
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	1	15	45	5	13	2
Total Analysis Volume [veh/h]	3	58	180	19	51	6
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Priority Scheme	Free	Free	Stop
Flared Lane			No
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance			No
Number of Storage Spaces in Median	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.00	0.00	0.00	0.00	0.07	0.01
d_M, Delay for Movement [s/veh]	7.62	0.00	0.00	0.00	10.30	9.62
Movement LOS	A	A	A	A	B	A
95th-Percentile Queue Length [veh]	0.14	0.14	0.00	0.00	0.25	0.25
95th-Percentile Queue Length [ft]	3.48	3.48	0.00	0.00	6.19	6.19
d_A, Approach Delay [s/veh]	0.37		0.00		10.23	
Approach LOS	A		A		B	
d_I, Intersection Delay [s/veh]	1.91					
Intersection LOS	B					

17-346 Newberg Surg. Ctr TIA

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Scenario 5 PM Future 17-346

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Turning Movement Volume: Summary

ID	Intersection Name	Northeastbound		Southwestbound		Northwestbound		Total Volume
		Thru	Right	Left	Thru	Left	Right	
1	Hwy 99W at Providence Dr	1520	49	105	2252	125	135	4186

ID	Intersection Name	Northbound			Southbound			Eastbound			Westbound			Total Volume
		Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
3	Brutsher St at Hayes St	60	78	14	24	115	162	51	37	49	16	95	35	736

ID	Intersection Name	Northbound			Southbound			Eastbound			Westbound			Total Volume
		Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
4	Hayes at Werth	12	0	8	2	0	3	20	37	10	13	127	7	239

ID	Intersection Name	Northbound		Southbound		Eastbound		Total Volume
		Left	Thru	Thru	Right	Left	Right	
5	Site Access at Providence Dr.	2	46	142	15	40	5	250

17-346 Newberg Surg. Ctr TIA

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Scenario 5 PM Future 17-346

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3/6/2017

Turning Movement Volume: Detail

ID	Intersection Name	Volume Type	Northeastbound		Southwestbound		Northwestbound		Total Volume
			Thru	Right	Left	Thru	Left	Right	
1	Hwy 99W at Providence Dr	Final Base	1310	34	86	1941	85	104	3560
		Growth Rate	1.16	1.16	1.16	1.16	1.16	1.16	-
		In Process	0	0	0	0	0	0	0
		Net New Trips	0	10	5	0	26	14	55
		Other	0	0	0	0	0	0	0
		Future Total	**1520**	**49**	**105**	**2252**	**125**	**135**	**4186**

ID	Intersection Name	Volume Type	Northbound			Southbound			Eastbound			Westbound			Total Volume
			Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
3	Brutsher St at Hayes St	Final Base	52	67	12	21	99	140	44	30	42	14	78	30	629
		Growth Rate	1.16	1.16	1.16	1.16	1.16	1.16	1.16	1.16	1.16	1.16	1.16	1.16	-
		In Process	0	0	0	0	0	0	0	0	0	0	0	0	0
		Net New Trips	0	0	0	0	0	0	0	2	0	0	5	0	7
		Other	0	0	0	0	0	0	0	0	0	0	0	0	0
		Future Total	**60**	**78**	**14**	**24**	**115**	**162**	**51**	**37**	**49**	**16**	**95**	**35**	**736**

ID	Intersection Name	Volume Type	Northbound			Southbound			Eastbound			Westbound			Total Volume
			Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
4	Hayes at Werth	Final Base	10	0	7	2	0	3	17	30	9	11	105	6	200
		Growth Rate	1.16	1.16	1.16	1.16	1.16	1.16	1.16	1.16	1.16	1.16	1.16	1.16	-
		In Process	0	0	0	0	0	0	0	0	0	0	0	0	0
		Net New Trips	0	0	0	0	0	0	0	2	0	0	5	0	7
		Other	0	0	0	0	0	0	0	0	0	0	0	0	0
		Future Total	**12**	**0**	**8**	**2**	**0**	**3**	**20**	**37**	**10**	**13**	**127**	**7**	**239**

ID	Intersection Name	Volume Type	Northbound		Southbound		Eastbound		Total Volume
			Left	Thru	Thru	Right	Left	Right	
5	Site Access at Providence Dr.	Final Base	0	40	122	0	0	0	162
		Growth Rate	1.16	1.16	1.16	1.16	1.16	1.16	-
		In Process	0	0	0	0	0	0	0
		Net New Trips	2	0	0	15	40	5	62
		Other	0	0	0	0	0	0	0
		Future Total	**2**	**46**	**142**	**15**	**40**	**5**	**250**

17-346 Newberg Surg. Ctr TIA

Vistro File: J:\...\17-346 Newberg Ambulatory Surgery TIA.vistro

Scenario 5 PM Future 17-346

Report File: J:\...\17-346 Future 2032 PM.pdf

3/6/2017

Trip Generation summary

Added Trips

Zone ID: Name	Land Use variables	Code	Ind. Var.	Rate	Quantity	% In	% Out	Trips In	Trips Out	Total Trips	% of Total Trips
7: Newberg Sugery Ctr	Med/Dental Office	ITE 720	ksf	3.570	17.500	28.00	72.00	17	45	62	100.00
					Added Trips Total			**17**	**45**	**62**	**100.00**

17-346 Newberg Surg. Ctr TIA

Vistro File: J:\...\17-346 Newberg Ambulatory Surgery TIA.vistro

Scenario 5 PM Future 17-346

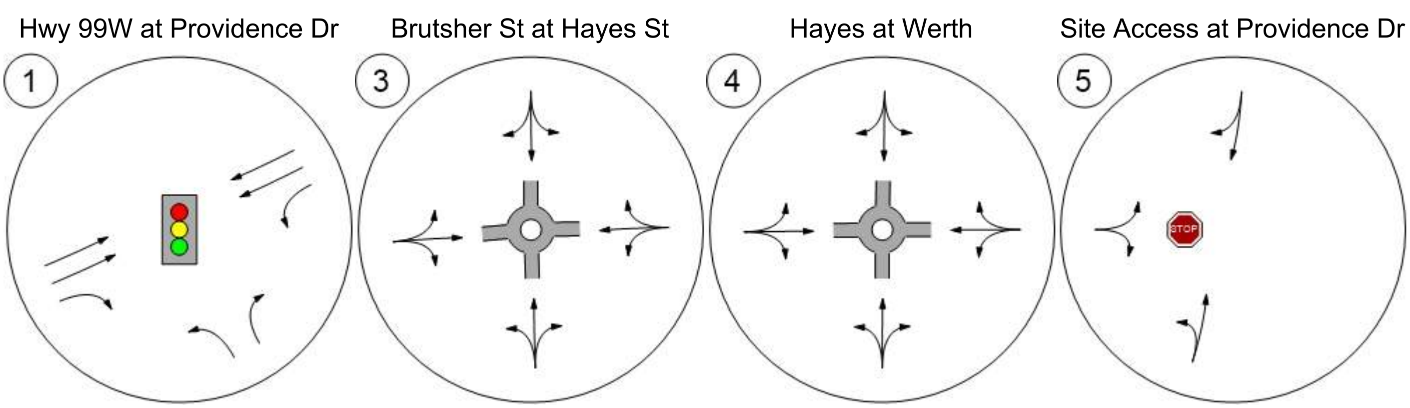
Report File: J:\...\17-346 Future 2032 PM.pdf

3/6/2017

Trip Distribution summary

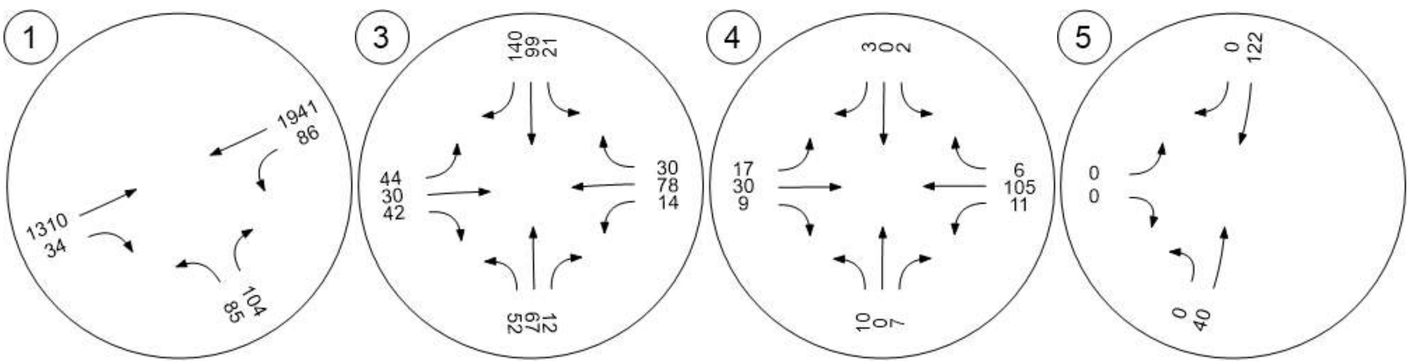
Zone / Gate	Zone 7: Newberg Sugery Ctr			
	To Newberg Sugery Ctr:		From Newberg Sugery Ctr:	
	Share %	Trips	Share %	Trips
1: Gate	60.00	10	60.00	26
2: Gate	30.00	5	30.00	14
3: Gate	10.00	2	10.00	5
4: Gate	0.00	0	0.00	0
5: Gate	0.00	0	0.00	0
6: Gate	0.00	0	0.00	0
8: Gate	0.00	0	0.00	0
9: Gate	0.00	0	0.00	0
Total	**100.00**	**17**	**100.00**	**45**

Report Figure 1: Lane Configuration and Traffic Control



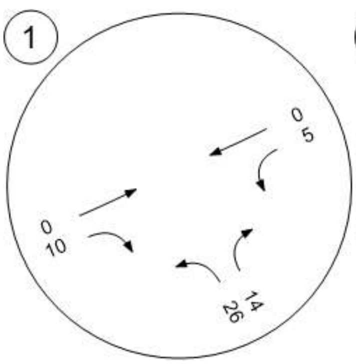
Report Figure 2a: Traffic Volume - Base Volume

Hwy 99W at Providence Dr | Brutsher St at Hayes St | Hayes at Werth | Site Access at Providence Dr

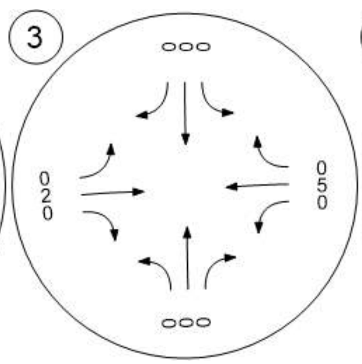


Report Figure 2c: Traffic Volume - Net New Site Trips

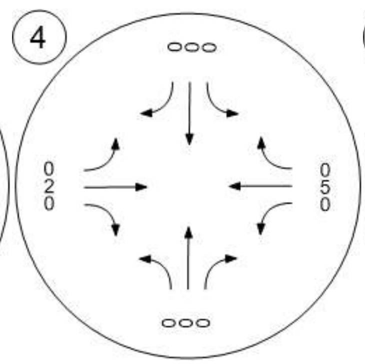
Hwy 99W at Providence Dr



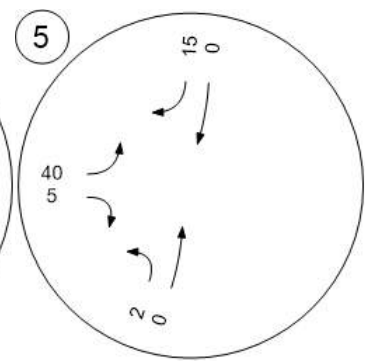
Brutsher St at Hayes St



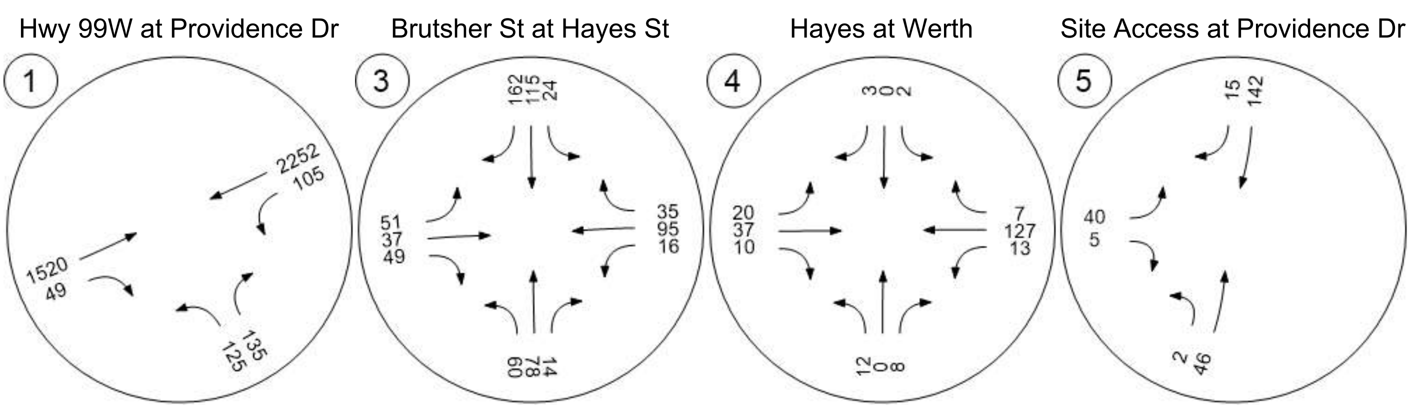
Hayes at Werth



Site Access at Providence Dr

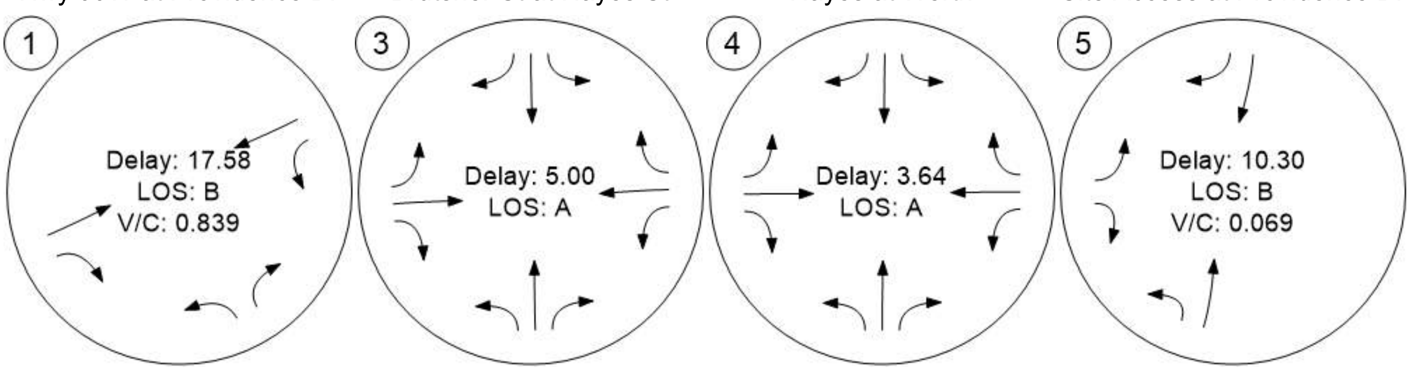


Report Figure 2e: Traffic Volume - Future Total Volume



Report Figure 3: Traffic Conditions

Hwy 99W at Providence Dr | Brutsher St at Hayes St | Hayes at Werth | Site Access at Providence Dr



Appendix F
Year 2020 Background with
Reassigned Traffic Conditions
Level of Service Worksheets

HCS 2010 Roundabouts Report

General Information		Site Information	
Analyst	ZHB	Intersection	Springbrook/Crestview
Agency or Co.	KAI	E/W Street Name	Crestview Dr
Date Performed	10/21/2017	N/S Street Name	Springbrook Rd
Analysis Year	2020	Analysis Time Period (hrs)	0.25
Time Period	Background with Reassigned Traffic AM	Peak Hour Factor	0.66
Project Description	Crestview Crossing	Jurisdiction	

Volume Adjustments and Site Characteristics

Approach	EB				WB				NB				SB			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Number of Lanes (N)	0	0	1	0	0	0	1	0	0	0	1	0	0	0	1	0
Lane Assignment			LTR				LTR				LTR				LTR	
Volume (V), veh/h	2	54	23	54	0	4	24	67	2	49	254	3	1	211	145	135
Percent Heavy Vehicles, %	9	9	13	3	0	0	0	0	2	2	4	0	25	25	4	7
Flow Rate (v_{PCE}), pc/h	3	89	39	84	0	6	36	102	3	76	400	5	2	400	228	219
Right-Turn Bypass	None				None				None				None			
Conflicting Lanes	1				1				1				1			
Pedestrians Crossing, p/h	0				0				0				0			

Critical and Follow-Up Headway Adjustment

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Critical Headway (s)		4.9734			4.9734			4.9734			4.9734	
Follow-Up Headway (s)		2.6087			2.6087			2.6087			2.6087	

Flow Computations, Capacity and v/c Ratios

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Entry Flow (v_e), pc/h		215			144			484			849	
Entry Volume veh/h		200			144			467			746	
Circulating Flow (v_c), pc/h	639			573			533			124		
Exiting Flow (v_{ex}), pc/h	444			334			593			321		
Capacity (c_{pce}), pc/h		720			770			802			1216	
Capacity (c), veh/h		671			770			774			1068	
v/c Ratio (x)		0.30			0.19			0.60			0.70	

Delay and Level of Service

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Lane Control Delay (d), s/veh		9.1			6.7			14.5			14.3	
Lane LOS		A			A			B			B	
95% Queue, veh		1.3			0.7			4.1			6.0	
Approach Delay, s/veh	9.1			6.7			14.5			14.3		
Approach LOS	A			A			B			B		
Intersection Delay, s/veh | LOS	13.0						B					

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	222	5	8	86	6	5
Future Volume (Veh/h)	222	5	8	86	6	5
Sign Control	Free			Free	Stop	
Grade	0%			0%	2%	
Peak Hour Factor	0.68	0.68	0.68	0.68	0.68	0.68
Hourly flow rate (vph)	326	7	12	126	9	7
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			333		480	330
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			333		480	330
tC, single (s)			4.1		6.6	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.7	3.3
p0 queue free %			99		98	99
cM capacity (veh/h)			1238		513	716

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	333	138	16
Volume Left	0	12	9
Volume Right	7	0	7
cSH	1700	1238	586
Volume to Capacity	0.20	0.01	0.03
Queue Length 95th (ft)	0	1	2
Control Delay (s)	0.0	0.8	11.3
Lane LOS		A	B
Approach Delay (s)	0.0	0.8	11.3
Approach LOS			B

Intersection Summary			
Average Delay	0.6		
Intersection Capacity Utilization	22.0%	ICU Level of Service	A
Analysis Period (min)	15		

HCM Unsignalized Intersection Capacity Analysis
3: Springbrook Rd & Haworth Ave/Shopping Center

02/15/2018

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	61	27	174	37	13	15	66	155	5	16	117	69
Future Volume (vph)	61	27	174	37	13	15	66	155	5	16	117	69
Peak Hour Factor	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83
Hourly flow rate (vph)	73	33	210	45	16	18	80	187	6	19	141	83

Direction, Lane #	EB 1	EB 2	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total (vph)	106	210	79	80	193	19	224
Volume Left (vph)	73	0	45	80	0	19	0
Volume Right (vph)	0	210	18	0	6	0	83
Hadj (s)	0.42	-0.65	0.05	0.58	0.09	0.72	-0.16
Departure Headway (s)	6.5	5.4	6.4	6.6	6.1	6.8	5.9
Degree Utilization, x	0.19	0.32	0.14	0.15	0.33	0.04	0.37
Capacity (veh/h)	521	624	510	520	564	501	581
Control Delay (s)	9.8	9.7	10.5	9.5	10.8	8.8	11.0
Approach Delay (s)	9.7		10.5	10.4		10.8	
Approach LOS	A		B	B		B	

Intersection Summary			
Delay	10.3		
Level of Service	B		
Intersection Capacity Utilization	36.6%	ICU Level of Service	A
Analysis Period (min)	15		

HCM Signalized Intersection Capacity Analysis
4: Springbrook Rd & OR 99W

02/15/2018

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	43	1338	75	81	804	75	179	140	99	206	120	70
Future Volume (vph)	43	1338	75	81	804	75	179	140	99	206	120	70
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Grade (%)		0%			0%			3%			0%	
Total Lost time (s)	4.0	4.5	4.5	4.0	4.5	4.5	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	0.95	1.00	0.97	0.95	1.00	0.97	1.00	1.00	0.97	1.00	1.00
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.98
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1583	3197	1430	2906	3050	1403	2997	1642	1423	3101	1577	1408
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1583	3197	1430	2906	3050	1403	2997	1642	1423	3101	1577	1408
Peak-hour factor, PHF	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Adj. Flow (vph)	48	1503	84	91	903	84	201	157	111	231	135	79
RTOR Reduction (vph)	0	0	37	0	0	38	0	0	96	0	0	69
Lane Group Flow (vph)	48	1503	47	91	903	46	201	157	15	231	135	10
Confl. Peds. (#/hr)							3					3
Heavy Vehicles (%)	5%	4%	4%	11%	9%	6%	6%	5%	3%	4%	11%	4%
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			2			6			8			4
Actuated Green, G (s)	6.9	67.1	67.1	6.2	66.4	66.4	15.2	16.1	16.1	14.1	15.0	15.0
Effective Green, g (s)	6.9	67.1	67.1	6.2	66.4	66.4	15.2	16.1	16.1	14.1	15.0	15.0
Actuated g/C Ratio	0.06	0.56	0.56	0.05	0.55	0.55	0.13	0.13	0.13	0.12	0.12	0.12
Clearance Time (s)	4.0	4.5	4.5	4.0	4.5	4.5	4.0	4.0	4.0	4.0	4.0	4.0
Vehicle Extension (s)	2.3	4.2	4.2	2.3	4.0	4.0	2.3	2.3	2.3	2.3	2.3	2.3
Lane Grp Cap (vph)	91	1787	799	150	1687	776	379	220	190	364	197	176
v/s Ratio Prot	0.03	c0.47		0.03	c0.30		0.07	c0.10		c0.07	0.09	
v/s Ratio Perm			0.03			0.03			0.01			0.01
v/c Ratio	0.53	0.84	0.06	0.61	0.54	0.06	0.53	0.71	0.08	0.63	0.69	0.06
Uniform Delay, d1	55.0	22.0	12.1	55.7	17.0	12.4	49.1	49.7	45.5	50.5	50.2	46.3
Progression Factor	1.00	1.00	1.00	0.84	0.55	0.11	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	3.5	5.0	0.1	5.0	1.1	0.1	1.0	9.4	0.1	3.0	8.3	0.1
Delay (s)	58.5	27.0	12.2	52.0	10.6	1.5	50.0	59.1	45.6	53.4	58.5	46.3
Level of Service	E	C	B	D	B	A	D	E	D	D	E	D
Approach Delay (s)		27.2			13.4			52.0			53.7	
Approach LOS		C			B			D			D	

Intersection Summary			
HCM 2000 Control Delay	29.5	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.78		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	16.5
Intersection Capacity Utilization	65.0%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	19	1499	43	70	907	28	58	3	87	11	5	27
Future Volume (vph)	19	1499	43	70	907	28	58	3	87	11	5	27
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Grade (%)		2%			0%			0%			-2%	
Total Lost time (s)	4.0	4.5	4.5	4.0	4.5	4.5	4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00		1.00	1.00	
Frpb, ped/bikes	1.00	1.00	0.98	1.00	1.00	0.98	1.00	0.99		1.00	0.99	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.85		1.00	0.87	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1567	3165	1265	1568	3079	1273	1433	1408		1678	1361	
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.73	1.00		0.56	1.00	
Satd. Flow (perm)	1567	3165	1265	1568	3079	1273	1109	1408		991	1361	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	21	1629	47	76	986	30	63	3	95	12	5	29
RTOR Reduction (vph)	0	0	13	0	0	7	0	86	0	0	26	0
Lane Group Flow (vph)	21	1629	34	76	986	23	63	12	0	12	8	0
Confl. Peds. (#/hr)	2					2			1	1		
Confl. Bikes (#/hr)			1									1
Heavy Vehicles (%)	5%	4%	14%	6%	8%	14%	16%	0%	5%	0%	40%	7%
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Perm	NA		Perm	NA	
Protected Phases	5	2		1	6			4			8	
Permitted Phases			2			6	4			8		
Actuated Green, G (s)	3.2	86.6	86.6	9.2	92.6	92.6	11.7	11.7		11.7	11.7	
Effective Green, g (s)	3.2	86.6	86.6	9.2	92.6	92.6	11.7	11.7		11.7	11.7	
Actuated g/C Ratio	0.03	0.72	0.72	0.08	0.77	0.77	0.10	0.10		0.10	0.10	
Clearance Time (s)	4.0	4.5	4.5	4.0	4.5	4.5	4.0	4.0		4.0	4.0	
Vehicle Extension (s)	2.3	4.8	4.8	2.3	4.8	4.8	2.5	2.5		2.5	2.5	
Lane Grp Cap (vph)	41	2284	912	120	2375	982	108	137		96	132	
v/s Ratio Prot	0.01	c0.51		c0.05	0.32			0.01			0.01	
v/s Ratio Perm			0.03			0.02	c0.06			0.01		
v/c Ratio	0.51	0.71	0.04	0.63	0.42	0.02	0.58	0.09		0.12	0.06	
Uniform Delay, d1	57.6	9.6	4.8	53.8	4.6	3.2	51.8	49.3		49.5	49.2	
Progression Factor	1.14	0.14	0.03	1.28	0.47	0.60	1.00	1.00		1.00	1.00	
Incremental Delay, d2	4.0	1.2	0.0	7.5	0.5	0.0	6.5	0.2		0.4	0.1	
Delay (s)	69.6	2.5	0.2	76.4	2.6	1.9	58.3	49.5		49.9	49.3	
Level of Service	E	A	A	E	A	A	E	D		D	D	
Approach Delay (s)		3.3			7.8			53.0			49.5	
Approach LOS		A			A			D			D	

Intersection Summary			
HCM 2000 Control Delay	8.3	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.69		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	12.5
Intersection Capacity Utilization	70.3%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	4	1551	1033	21	52	24
Future Volume (Veh/h)	4	1551	1033	21	52	24
Sign Control		Free	Free		Stop	
Grade		-2%	2%		0%	
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93
Hourly flow rate (vph)	4	1668	1111	23	56	26
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		TWLTL	TWLTL			
Median storage veh)		2	2			
Upstream signal (ft)			521			
pX, platoon unblocked	0.82				0.82	0.82
vC, conflicting volume	1134				1964	567
vC1, stage 1 conf vol					1122	
vC2, stage 2 conf vol					842	
vCu, unblocked vol	729				1740	39
tC, single (s)	4.1				6.8	6.9
tC, 2 stage (s)					5.8	
tF (s)	2.2				3.5	3.3
p0 queue free %	99				79	97
cM capacity (veh/h)	726				267	847

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	SB 1
Volume Total	4	834	834	741	393	82
Volume Left	4	0	0	0	0	56
Volume Right	0	0	0	0	23	26
cSH	726	1700	1700	1700	1700	341
Volume to Capacity	0.01	0.49	0.49	0.44	0.23	0.24
Queue Length 95th (ft)	0	0	0	0	0	23
Control Delay (s)	10.0	0.0	0.0	0.0	0.0	18.9
Lane LOS	A					C
Approach Delay (s)	0.0			0.0		18.9
Approach LOS						C

Intersection Summary			
Average Delay	0.5		
Intersection Capacity Utilization	57.9%	ICU Level of Service	B
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	1536	67	73	1019	69	35	6	63	214	5	0
Future Volume (vph)	0	1536	67	73	1019	69	35	6	63	214	5	0
Ideal Flow (vphpl)	1750	1750	1750	1750	1800	1750	1750	1750	1750	1750	1750	1750
Grade (%)		-3%			2%			3%			2%	
Total Lost time (s)		6.0	6.0	4.5	4.5			4.5	4.5		4.5	
Lane Util. Factor		0.95	1.00	1.00	0.95			1.00	1.00		1.00	
Frt		1.00	0.85	1.00	0.99			1.00	0.85		1.00	
Flt Protected		1.00	1.00	0.95	1.00			0.96	1.00		0.95	
Satd. Flow (prot)		3214	1480	1614	3111			1601	1465		1573	
Flt Permitted		1.00	1.00	0.95	1.00			0.79	1.00		0.70	
Satd. Flow (perm)		3214	1480	1614	3111			1324	1465		1151	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	1670	73	79	1108	75	38	7	68	233	5	0
RTOR Reduction (vph)	0	0	29	0	3	0	0	0	52	0	0	0
Lane Group Flow (vph)	0	1670	44	79	1180	0	0	45	16	0	238	0
Heavy Vehicles (%)	5%	5%	2%	2%	8%	5%	3%	5%	0%	5%	5%	5%
Turn Type	Prot	NA	Perm	Prot	NA		Perm	NA	Perm	Perm	NA	
Protected Phases	5	2		1	6			8			4	
Permitted Phases			2				8		8	4		
Actuated Green, G (s)		68.9	68.9	8.2	83.1			27.9	27.9		27.9	
Effective Green, g (s)		68.9	68.9	8.2	83.1			27.9	27.9		27.9	
Actuated g/C Ratio		0.57	0.57	0.07	0.69			0.23	0.23		0.23	
Clearance Time (s)		6.0	6.0	4.5	4.5			4.5	4.5		4.5	
Vehicle Extension (s)		5.0	5.0	4.0	4.0			4.0	4.0		4.0	
Lane Grp Cap (vph)		1845	849	110	2154			307	340		267	
v/s Ratio Prot		c0.52		c0.05	0.38							
v/s Ratio Perm			0.03					0.03	0.01		c0.21	
v/c Ratio		0.91	0.05	0.72	0.55			0.15	0.05		0.89	
Uniform Delay, d1		22.7	11.2	54.8	9.1			36.6	35.7		44.6	
Progression Factor		1.54	2.47	1.00	1.00			1.00	1.00		1.00	
Incremental Delay, d2		6.1	0.1	21.2	1.0			0.3	0.1		29.3	
Delay (s)		41.1	27.8	76.0	10.1			36.9	35.8		73.9	
Level of Service		D	C	E	B			D	D		E	
Approach Delay (s)		40.6			14.3			36.2			73.9	
Approach LOS		D			B			D			E	

Intersection Summary			
HCM 2000 Control Delay	32.9	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.89		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	15.0
Intersection Capacity Utilization	82.8%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Intersection						
Int Delay, s/veh	0.9					

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	3	1808	1153	29	62	6
Future Vol, veh/h	3	1808	1153	29	62	6
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	250	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	-2	-
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	33	4	7	7	3	0
Mvmt Flow	3	1903	1214	31	65	6

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	1244	0	-	0	2187	622
Stage 1	-	-	-	-	1229	-
Stage 2	-	-	-	-	958	-
Critical Hdwy	4.76	-	-	-	6.46	6.7
Critical Hdwy Stg 1	-	-	-	-	5.46	-
Critical Hdwy Stg 2	-	-	-	-	5.46	-
Follow-up Hdwy	2.53	-	-	-	3.53	3.3
Pot Cap-1 Maneuver	412	-	-	-	~ 49	450
Stage 1	-	-	-	-	272	-
Stage 2	-	-	-	-	368	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	412	-	-	-	~ 49	450
Mov Cap-2 Maneuver	-	-	-	-	164	-
Stage 1	-	-	-	-	272	-
Stage 2	-	-	-	-	365	-

Approach	EB	WB	SB
HCM Control Delay, s	0	0	39.4
HCM LOS			E

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	412	-	-	-	174
HCM Lane V/C Ratio	0.008	-	-	-	0.411
HCM Control Delay (s)	13.8	-	-	-	39.4
HCM Lane LOS	B	-	-	-	E
HCM 95th %tile Q(veh)	0	-	-	-	1.8

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

HCS 2010 Roundabouts Report

General Information		Site Information	
Analyst	ZHB	Intersection	Springbrook/Crestview
Agency or Co.	KAI	E/W Street Name	Crestview Dr
Date Performed	10/21/2017	N/S Street Name	Springbrook Rd
Analysis Year	2020	Analysis Time Period (hrs)	0.25
Time Period	Background with Reassigned Traffic PM	Peak Hour Factor	0.93
Project Description	Crestview Crossing	Jurisdiction	

Volume Adjustments and Site Characteristics

Approach	EB				WB				NB				SB			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Number of Lanes (N)	0	0	1	0	0	0	1	0	0	0	1	0	0	0	1	0
Lane Assignment			LTR				LTR				LTR				LTR	
Volume (V), veh/h	0	53	2	13	0	5	2	162	0	7	374	13	2	182	263	49
Percent Heavy Vehicles, %	0	0	0	0	20	20	0	0	0	0	3	0	0	0	2	0
Flow Rate (v_{PCE}), pc/h	0	57	2	14	0	6	2	174	0	8	414	14	2	196	288	53
Right-Turn Bypass	None				None				None				None			
Conflicting Lanes	1				1				1				1			
Pedestrians Crossing, p/h	0				0				0				0			

Critical and Follow-Up Headway Adjustment

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Critical Headway (s)		4.9734			4.9734			4.9734			4.9734	
Follow-Up Headway (s)		2.6087			2.6087			2.6087			2.6087	

Flow Computations, Capacity and v/c Ratios

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Entry Flow (v_e), pc/h		73			182			436			539	
Entry Volume veh/h		73			181			424			533	
Circulating Flow (v_c), pc/h	492			481			257			16		
Exiting Flow (v_{ex}), pc/h	212			63			647			308		
Capacity (c_{pce}), pc/h		836			845			1062			1358	
Capacity (c), veh/h		836			841			1033			1343	
v/c Ratio (x)		0.09			0.22			0.41			0.40	

Delay and Level of Service

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Lane Control Delay (d), s/veh		5.2			6.5			7.9			6.4	
Lane LOS		A			A			A			A	
95% Queue, veh		0.3			0.8			2.0			1.9	
Approach Delay, s/veh	5.2			6.5			7.9			6.4		
Approach LOS	A			A			A			A		
Intersection Delay, s/veh | LOS	6.9						A					

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	185	5	9	163	8	14
Future Volume (Veh/h)	185	5	9	163	8	14
Sign Control	Free			Free	Stop	
Grade	0%			0%	2%	
Peak Hour Factor	0.79	0.79	0.79	0.79	0.79	0.79
Hourly flow rate (vph)	234	6	11	206	10	18
Pedestrians					2	
Lane Width (ft)					12.0	
Walking Speed (ft/s)					3.5	
Percent Blockage					0	
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			242		467	239
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			242		467	239
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			99		98	98
cM capacity (veh/h)			1334		552	803

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	240	217	28
Volume Left	0	11	10
Volume Right	6	0	18
cSH	1700	1334	691
Volume to Capacity	0.14	0.01	0.04
Queue Length 95th (ft)	0	1	3
Control Delay (s)	0.0	0.5	10.4
Lane LOS		A	B
Approach Delay (s)	0.0	0.5	10.4
Approach LOS			B

Intersection Summary			
Average Delay	0.8		
Intersection Capacity Utilization	27.3%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	83	63	219	91	68	86	136	208	5	67	183	40
Future Volume (vph)	83	63	219	91	68	86	136	208	5	67	183	40
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Hourly flow rate (vph)	86	66	228	95	71	90	142	217	5	70	191	42

Direction, Lane #	EB 1	EB 2	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total (vph)	152	228	256	142	222	70	233
Volume Left (vph)	86	0	95	142	0	70	0
Volume Right (vph)	0	228	90	0	5	0	42
Hadj (s)	0.30	-0.68	-0.12	0.53	0.03	0.53	-0.06
Departure Headway (s)	7.5	6.5	7.1	7.8	7.2	7.9	7.3
Degree Utilization, x	0.32	0.41	0.51	0.31	0.45	0.15	0.47
Capacity (veh/h)	453	522	467	432	463	429	461
Control Delay (s)	12.8	12.8	17.2	12.9	14.8	11.1	15.3
Approach Delay (s)	12.8		17.2	14.1		14.4	
Approach LOS	B		C	B		B	

Intersection Summary			
Delay	14.4		
Level of Service	B		
Intersection Capacity Utilization	53.3%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	104	1144	124	141	1458	150	374	179	124	217	212	86
Future Volume (vph)	104	1144	124	141	1458	150	374	179	124	217	212	86
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Grade (%)		0%			0%			3%			0%	
Total Lost time (s)	4.0	4.5	4.5	4.0	4.5	4.5	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	0.95	1.00	0.97	0.95	1.00	0.97	1.00	1.00	0.97	1.00	1.00
Frpb, ped/bikes	1.00	1.00	0.98	1.00	1.00	0.98	1.00	1.00	0.98	1.00	1.00	0.97
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1583	3137	1440	2854	3197	1423	3177	1674	1361	3193	1699	1438
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1583	3137	1440	2854	3197	1423	3177	1674	1361	3193	1699	1438
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	106	1167	127	144	1488	153	382	183	127	221	216	88
RTOR Reduction (vph)	0	0	63	0	0	76	0	0	109	0	0	69
Lane Group Flow (vph)	106	1167	64	144	1488	77	382	183	18	221	216	19
Confl. Peds. (#/hr)	2		9	9		2	14					14
Confl. Bikes (#/hr)									2			1
Heavy Vehicles (%)	5%	6%	1%	13%	4%	2%	0%	3%	6%	1%	3%	0%
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			2			6			8			4
Actuated Green, G (s)	11.5	71.0	71.0	9.9	69.4	69.4	20.5	19.9	19.9	22.7	22.1	22.1
Effective Green, g (s)	11.5	71.0	71.0	9.9	69.4	69.4	20.5	19.9	19.9	22.7	22.1	22.1
Actuated g/C Ratio	0.08	0.51	0.51	0.07	0.50	0.50	0.15	0.14	0.14	0.16	0.16	0.16
Clearance Time (s)	4.0	4.5	4.5	4.0	4.5	4.5	4.0	4.0	4.0	4.0	4.0	4.0
Vehicle Extension (s)	2.3	4.2	4.2	2.3	4.0	4.0	2.3	2.3	2.3	2.3	2.3	2.3
Lane Grp Cap (vph)	130	1590	730	201	1584	705	465	237	193	517	268	226
v/s Ratio Prot	c0.07	0.37		0.05	c0.47		c0.12	0.11		0.07	c0.13	
v/s Ratio Perm			0.04			0.05			0.01			0.01
v/c Ratio	0.82	0.73	0.09	0.72	0.94	0.11	0.82	0.77	0.09	0.43	0.81	0.08
Uniform Delay, d1	63.2	27.1	17.8	63.7	33.3	18.8	58.0	57.9	52.2	52.8	56.9	50.3
Progression Factor	1.00	1.00	1.00	0.94	1.05	1.70	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	30.1	3.0	0.2	7.0	8.8	0.2	10.8	13.6	0.1	0.3	15.5	0.1
Delay (s)	93.3	30.1	18.0	66.6	43.8	32.2	68.8	71.5	52.3	53.1	72.3	50.4
Level of Service	F	C	B	E	D	C	E	E	D	D	E	D
Approach Delay (s)		33.8			44.6			66.5			60.6	
Approach LOS		C			D			E			E	

Intersection Summary			
HCM 2000 Control Delay	46.5	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.88		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	16.5
Intersection Capacity Utilization	92.0%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	32	1023	101	220	1477	41	243	16	134	21	10	51
Future Volume (vph)	32	1023	101	220	1477	41	243	16	134	21	10	51
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Grade (%)		2%			0%			0%			-2%	
Total Lost time (s)	4.0	4.5	4.5	4.0	4.5	4.5	4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00		1.00	1.00	
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.98		1.00	0.98	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	0.99	1.00		1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.87		1.00	0.87	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1646	3105	1402	1646	3197	1352	1620	1442		1674	1471	
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.72	1.00		0.52	1.00	
Satd. Flow (perm)	1646	3105	1402	1646	3197	1352	1221	1442		911	1471	
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	33	1066	105	229	1539	43	253	17	140	22	10	53
RTOR Reduction (vph)	0	0	44	0	0	13	0	110	0	0	42	0
Lane Group Flow (vph)	33	1066	61	229	1539	30	253	47	0	22	21	0
Confl. Peds. (#/hr)							5		3	3		5
Confl. Bikes (#/hr)									1			
Heavy Vehicles (%)	0%	6%	5%	1%	4%	10%	2%	0%	4%	0%	0%	4%
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Perm	NA		Perm	NA	
Protected Phases	5	2		1	6			4			8	
Permitted Phases			2			6	4			8		
Actuated Green, G (s)	5.4	74.9	74.9	22.3	91.8	91.8	30.3	30.3		30.3	30.3	
Effective Green, g (s)	5.4	74.9	74.9	22.3	91.8	91.8	30.3	30.3		30.3	30.3	
Actuated g/C Ratio	0.04	0.54	0.54	0.16	0.66	0.66	0.22	0.22		0.22	0.22	
Clearance Time (s)	4.0	4.5	4.5	4.0	4.5	4.5	4.0	4.0		4.0	4.0	
Vehicle Extension (s)	2.3	4.8	4.8	2.3	4.8	4.8	2.5	2.5		2.5	2.5	
Lane Grp Cap (vph)	63	1661	750	262	2096	886	264	312		197	318	
v/s Ratio Prot	0.02	c0.34		c0.14	c0.48			0.03			0.01	
v/s Ratio Perm			0.04			0.02	c0.21			0.02		
v/c Ratio	0.52	0.64	0.08	0.87	0.73	0.03	0.96	0.15		0.11	0.07	
Uniform Delay, d1	66.0	23.1	15.8	57.5	16.0	8.5	54.2	44.4		44.0	43.6	
Progression Factor	0.72	1.26	2.01	0.83	0.48	0.29	1.00	1.00		1.00	1.00	
Incremental Delay, d2	3.7	1.4	0.2	15.7	1.3	0.0	43.5	0.2		0.2	0.1	
Delay (s)	51.2	30.5	32.0	63.2	9.0	2.5	97.7	44.6		44.2	43.7	
Level of Service	D	C	C	E	A	A	F	D		D	D	
Approach Delay (s)		31.2			15.7			77.4			43.8	
Approach LOS		C			B			E			D	

Intersection Summary			
HCM 2000 Control Delay	28.9	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.80		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	12.5
Intersection Capacity Utilization	79.9%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	32	1161	1760	128	26	18
Future Volume (Veh/h)	32	1161	1760	128	26	18
Sign Control		Free	Free		Stop	
Grade		-2%	2%		0%	
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93
Hourly flow rate (vph)	34	1248	1892	138	28	19
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		TWLTL	TWLTL			
Median storage veh)		2	2			
Upstream signal (ft)			522			
pX, platoon unblocked	0.52				0.52	0.52
vC, conflicting volume	2030				2653	1015
vC1, stage 1 conf vol					1961	
vC2, stage 2 conf vol					692	
vCu, unblocked vol	1121				2328	0
tC, single (s)	4.2				7.0	6.9
tC, 2 stage (s)					6.0	
tF (s)	2.2				3.6	3.3
p0 queue free %	89				80	97
cM capacity (veh/h)	316				142	563

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	SB 1
Volume Total	34	624	624	1261	769	47
Volume Left	34	0	0	0	0	28
Volume Right	0	0	0	0	138	19
cSH	316	1700	1700	1700	1700	203
Volume to Capacity	0.11	0.37	0.37	0.74	0.45	0.23
Queue Length 95th (ft)	9	0	0	0	0	22
Control Delay (s)	17.7	0.0	0.0	0.0	0.0	28.0
Lane LOS	C					D
Approach Delay (s)	0.5			0.0		28.0
Approach LOS						D

Intersection Summary			
Average Delay	0.6		
Intersection Capacity Utilization	67.2%	ICU Level of Service	C
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	1155	15	79	1774	140	114	10	116	174	0	0
Future Volume (vph)	0	1155	15	79	1774	140	114	10	116	174	0	0
Ideal Flow (vphpl)	1750	1750	1750	1750	1800	1750	1750	1750	1750	1750	1750	1750
Grade (%)		-3%			2%			3%			2%	
Total Lost time (s)		6.0	6.0	4.5	4.5			4.5	4.5		4.5	
Lane Util. Factor		0.95	1.00	1.00	0.95			1.00	1.00		1.00	
Frpb, ped/bikes		1.00	0.98	1.00	1.00			1.00	1.00		1.00	
Flpb, ped/bikes		1.00	1.00	1.00	1.00			1.00	1.00		1.00	
Frt		1.00	0.85	1.00	0.99			1.00	0.85		1.00	
Flt Protected		1.00	1.00	0.95	1.00			0.96	1.00		0.95	
Satd. Flow (prot)		3184	1479	1646	3224			1631	1465		1614	
Flt Permitted		1.00	1.00	0.95	1.00			0.79	1.00		0.57	
Satd. Flow (perm)		3184	1479	1646	3224			1347	1465		972	
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	0	1229	16	84	1887	149	121	11	123	185	0	0
RTOR Reduction (vph)	0	0	6	0	3	0	0	0	98	0	0	0
Lane Group Flow (vph)	0	1229	10	84	2033	0	0	132	25	0	185	0
Confl. Bikes (#/hr)			1									
Heavy Vehicles (%)	2%	6%	0%	0%	4%	2%	1%	2%	0%	2%	2%	2%
Turn Type	Prot	NA	Perm	Prot	NA		Perm	NA	Perm	Perm	NA	
Protected Phases	5	2		1	6			8			4	
Permitted Phases			2				8		8	4		
Actuated Green, G (s)		83.9	83.9	12.3	102.2			28.8	28.8		28.8	
Effective Green, g (s)		83.9	83.9	12.3	102.2			28.8	28.8		28.8	
Actuated g/C Ratio		0.60	0.60	0.09	0.73			0.21	0.21		0.21	
Clearance Time (s)		6.0	6.0	4.5	4.5			4.5	4.5		4.5	
Vehicle Extension (s)		5.0	5.0	4.0	4.0			4.0	4.0		4.0	
Lane Grp Cap (vph)		1908	886	144	2353			277	301		199	
v/s Ratio Prot		0.39		0.05	c0.63							
v/s Ratio Perm			0.01					0.10	0.02		c0.19	
v/c Ratio		0.64	0.01	0.58	0.86			0.48	0.08		0.93	
Uniform Delay, d1		18.3	11.3	61.4	13.8			49.0	44.9		54.6	
Progression Factor		0.42	1.00	1.00	1.00			1.00	1.00		1.00	
Incremental Delay, d2		1.4	0.0	7.0	4.5			1.8	0.2		44.3	
Delay (s)		9.1	11.3	68.3	18.3			50.7	45.1		98.9	
Level of Service		A	B	E	B			D	D		F	
Approach Delay (s)		9.1			20.3			48.0			98.9	
Approach LOS		A			C			D			F	

Intersection Summary			
HCM 2000 Control Delay	22.3	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.92		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	15.0
Intersection Capacity Utilization	90.3%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Intersection	
Int Delay, s/veh	4.4

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	31	1441	1991	75	61	17
Future Vol, veh/h	31	1441	1991	75	61	17
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	250	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	-2	-
Peak Hour Factor	93	93	93	93	93	93
Heavy Vehicles, %	0	5	4	0	2	0
Mvmt Flow	33	1549	2141	81	66	18

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	2222	0	-	0	3022	1111
Stage 1	-	-	-	-	2181	-
Stage 2	-	-	-	-	841	-
Critical Hdwy	4.1	-	-	-	6.44	6.7
Critical Hdwy Stg 1	-	-	-	-	5.44	-
Critical Hdwy Stg 2	-	-	-	-	5.44	-
Follow-up Hdwy	2.2	-	-	-	3.52	3.3
Pot Cap-1 Maneuver	238	-	-	-	~ 14	220
Stage 1	-	-	-	-	92	-
Stage 2	-	-	-	-	421	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	238	-	-	-	~ 12	220
Mov Cap-2 Maneuver	-	-	-	-	70	-
Stage 1	-	-	-	-	92	-
Stage 2	-	-	-	-	363	-

Approach	EB	WB	SB
HCM Control Delay, s	0.5	0	196.3
HCM LOS			F

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	238	-	-	-	82
HCM Lane V/C Ratio	0.14	-	-	-	1.023
HCM Control Delay (s)	22.6	-	-	-	196.3
HCM Lane LOS	C	-	-	-	F
HCM 95th %tile Q(veh)	0.5	-	-	-	5.7

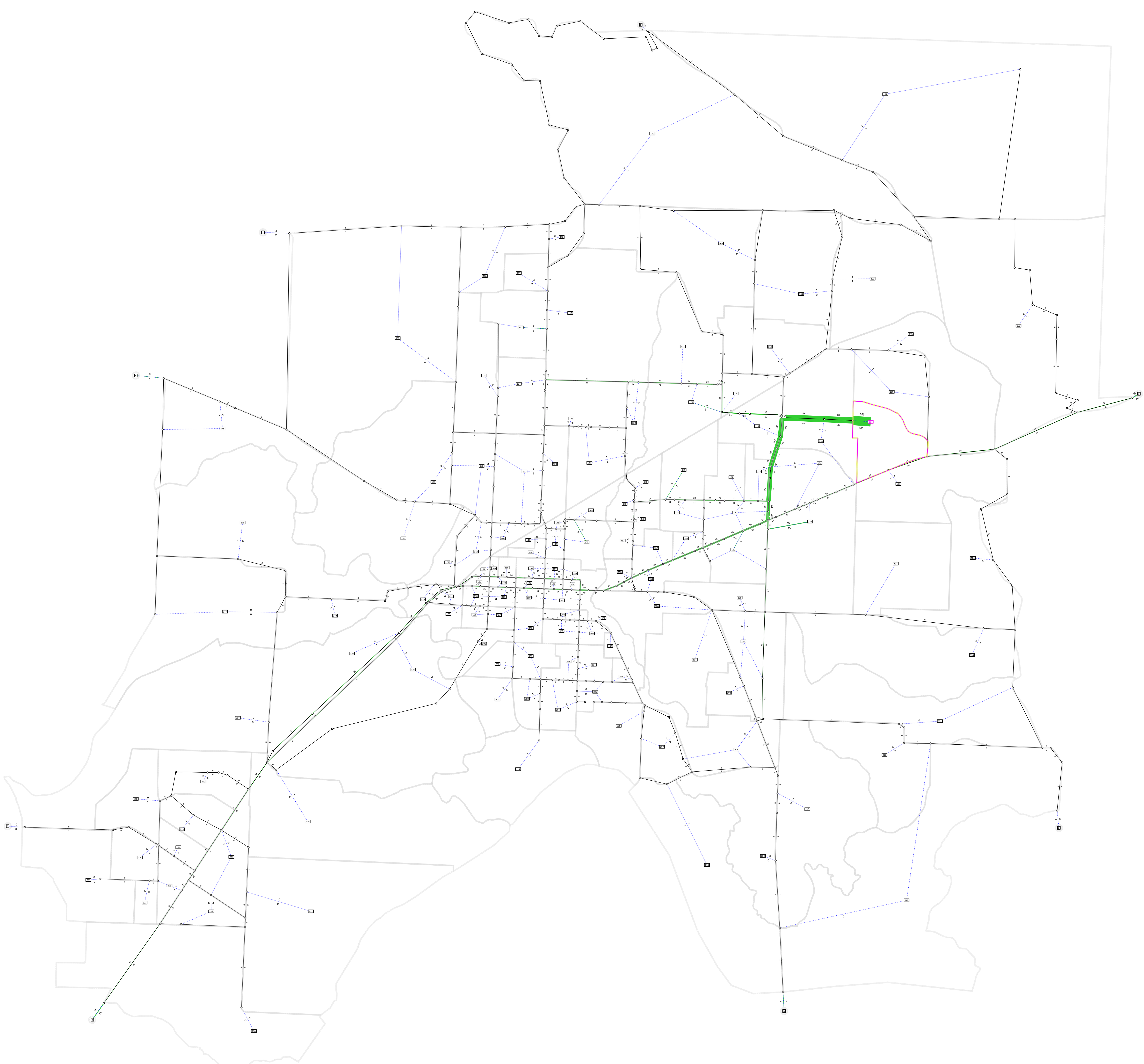
Notes

~: Volume exceeds capacity $: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

Appendix G
Select Zone Analysis Results

Newberg Transportation Model 2000

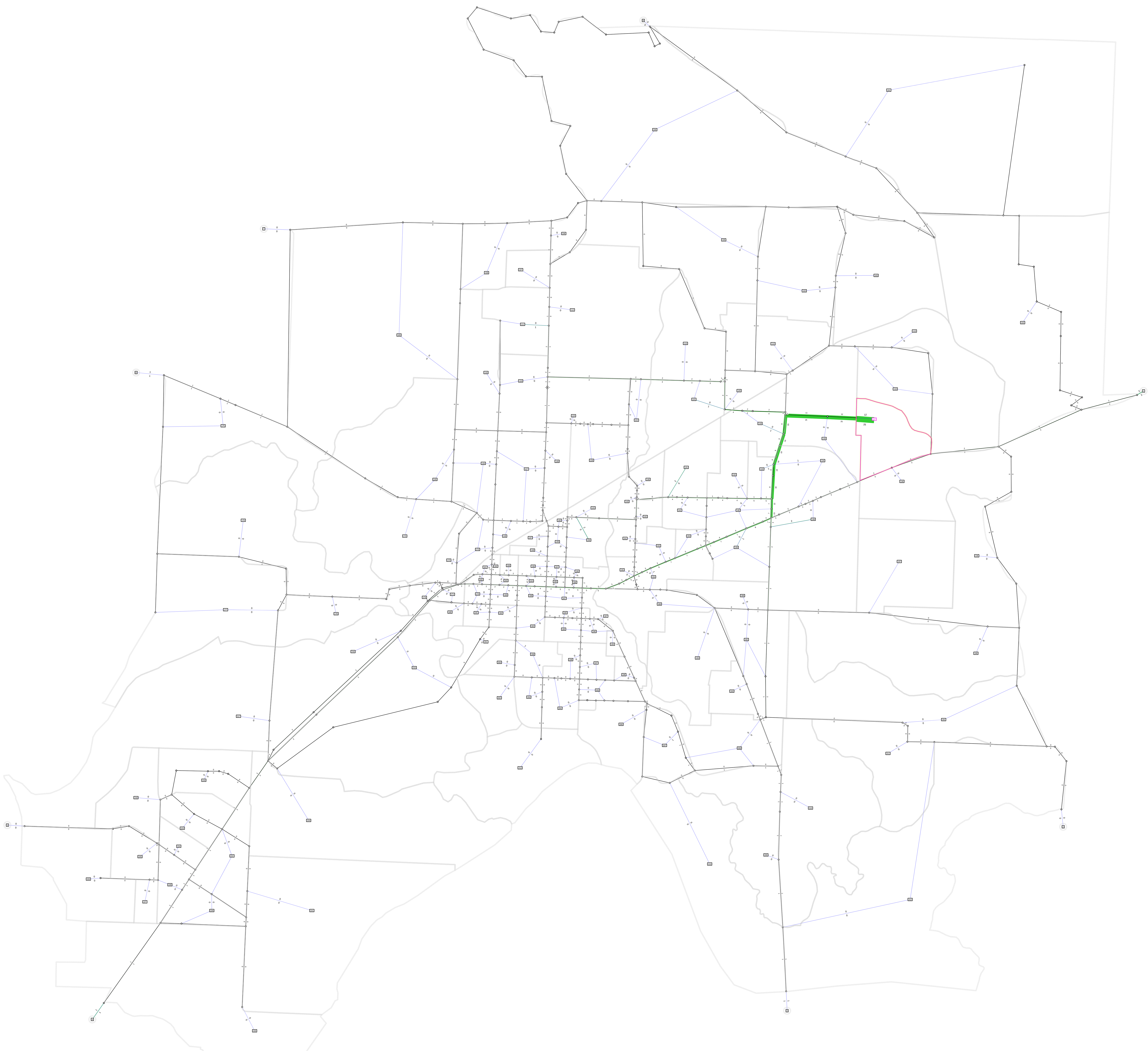
Select Zone 117 Daily Volumes



VISUM 16.01 PTV AG	beth.a.pickman@odot.state.or.us	Newberg_V2_2000.ver
Created on: 31.10.2017		ODOT Request 001

Newberg Transportation Model 2025

Select Zone 117 PM Peak Volumes

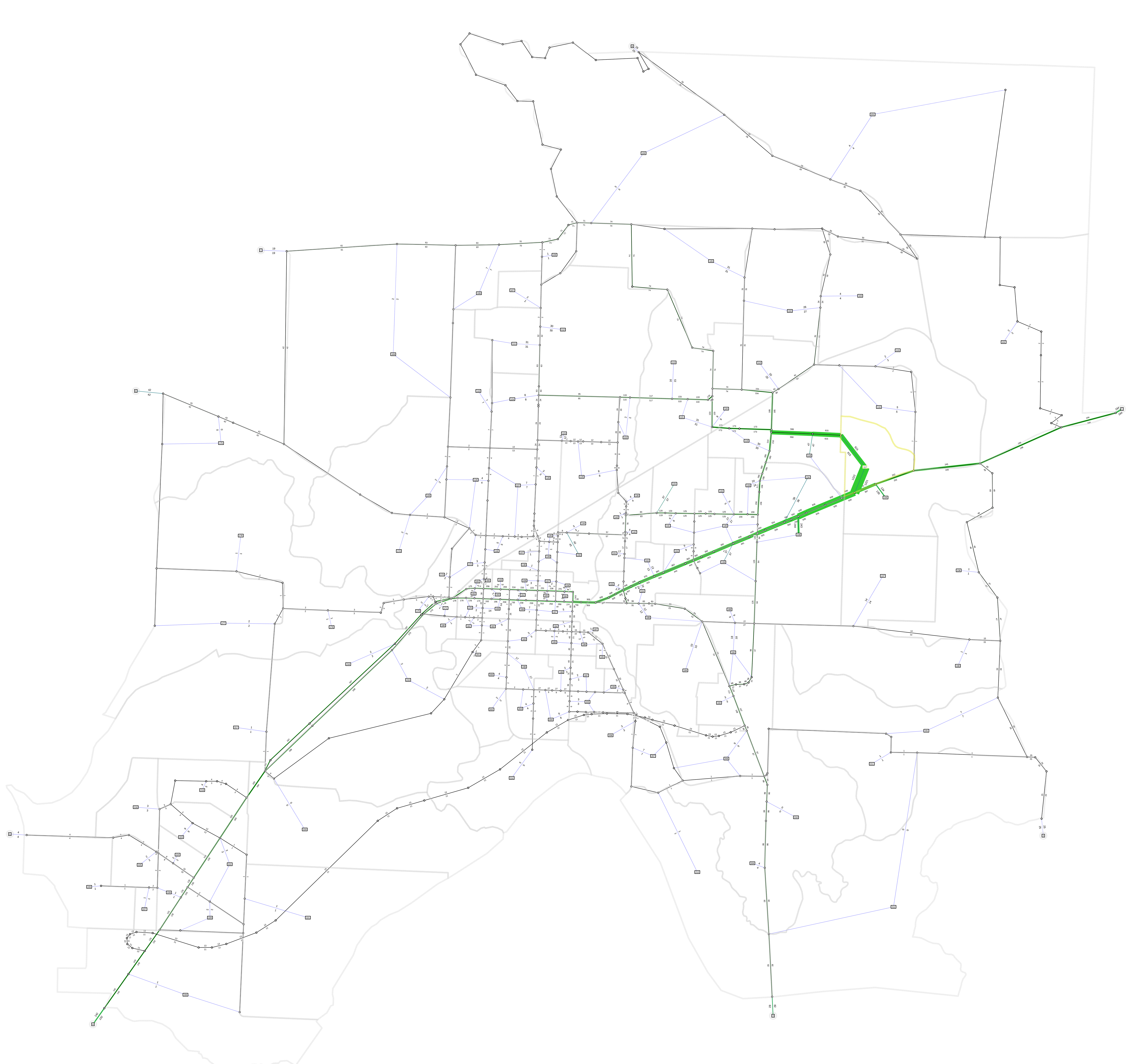


VISUM 16.01 PTV AG	beth.a.pickman@odot.state.or.us	Newberg_V2_2000.ver
Created on: 31.10.2017		ODOT Request 001

Newberg Transportation Model 2025

ODOT Request 001

Select Zone 117 Daily Volumes

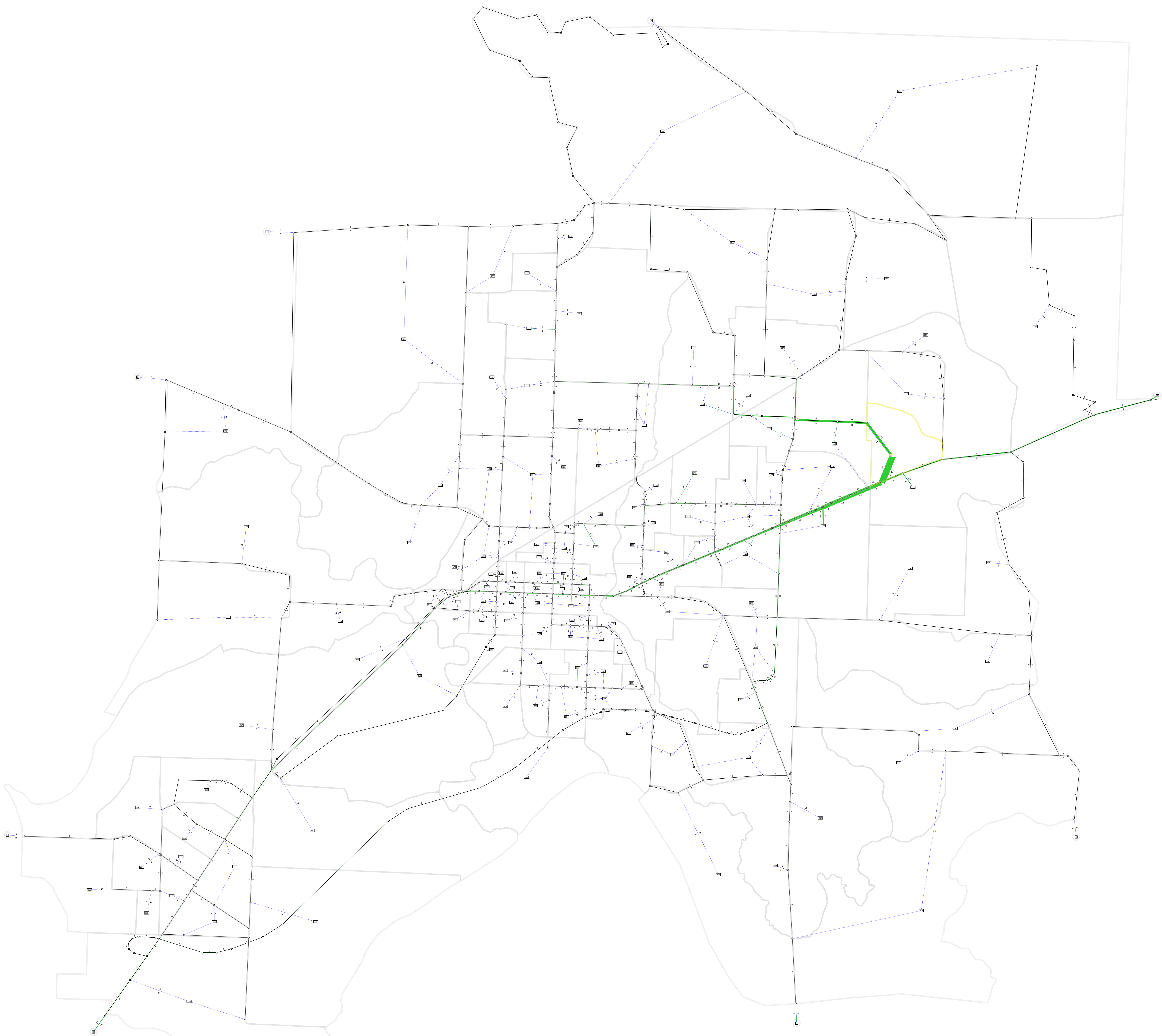


VISUM 16.01 PTV AG	beth.a.pickman@odot.state.or.us	Newberg_V2_2025_Req001_w_Bypass.ver
Created on: 31.10.2017		ODOT Request 001

Newberg Transportation Model 2025

ODOT Request 001

Select Zone 117 PM Peak Volumes



VISUM 16.01 PTV AG	beth.a.pickman@odot.state.or.us	Newberg_V2_2025_Req001_w_Bypass.ver
Created on: 31.10.2017		ODOT Request 001

Appendix H

Year 2020 Total Conditions

Level of Service Worksheets

HCS 2010 Roundabouts Report

General Information		Site Information	
Analyst	ZHB	Intersection	Springbrook/Crestview
Agency or Co.	KAI	E/W Street Name	Crestview Dr
Date Performed	10/21/2017	N/S Street Name	Springbrook Rd
Analysis Year	2020	Analysis Time Period (hrs)	0.25
Time Period	Total AM	Peak Hour Factor	0.66
Project Description	Crestview Crossing	Jurisdiction	

Volume Adjustments and Site Characteristics

Approach	EB				WB				NB				SB			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Number of Lanes (N)	0	0	1	0	0	0	1	0	0	0	1	0	0	0	1	0
Lane Assignment			LTR				LTR				LTR				LTR	
Volume (V), veh/h	2	54	29	54	0	20	40	83	2	49	254	8	1	216	145	135
Percent Heavy Vehicles, %	9	9	13	3	0	0	0	0	2	2	4	0	25	25	4	7
Flow Rate (v_{PCE}), pc/h	3	89	50	84	0	30	61	126	3	76	400	12	2	409	228	219
Right-Turn Bypass	None				None				None				None			
Conflicting Lanes	1				1				1				1			
Pedestrians Crossing, p/h	0				0				0				0			

Critical and Follow-Up Headway Adjustment

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Critical Headway (s)		4.9734			4.9734			4.9734			4.9734	
Follow-Up Headway (s)		2.6087			2.6087			2.6087			2.6087	

Flow Computations, Capacity and v/c Ratios

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Entry Flow (v_e), pc/h		226			217			491			858	
Entry Volume veh/h		210			217			474			753	
Circulating Flow (v_c), pc/h	672			573			553			173		
Exiting Flow (v_{ex}), pc/h	471			359			617			345		
Capacity (c_{pce}), pc/h		696			770			785			1157	
Capacity (c), veh/h		647			770			758			1015	
v/c Ratio (x)		0.32			0.28			0.63			0.74	

Delay and Level of Service

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Lane Control Delay (d), s/veh		9.8			7.9			15.4			16.7	
Lane LOS		A			A			C			C	
95% Queue, veh		1.4			1.2			4.4			7.1	
Approach Delay, s/veh	9.8			7.9			15.4			16.7		
Approach LOS	A			A			C			C		
Intersection Delay, s/veh | LOS	14.3						B					

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	238	5	8	134	6	5
Future Volume (Veh/h)	238	5	8	134	6	5
Sign Control	Free			Free	Stop	
Grade	0%			0%	2%	
Peak Hour Factor	0.68	0.68	0.68	0.68	0.68	0.68
Hourly flow rate (vph)	350	7	12	197	9	7
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			357		574	354
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			357		574	354
tC, single (s)			4.1		6.6	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.7	3.3
p0 queue free %			99		98	99
cM capacity (veh/h)			1213		451	695

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	357	209	16
Volume Left	0	12	9
Volume Right	7	0	7
cSH	1700	1213	533
Volume to Capacity	0.21	0.01	0.03
Queue Length 95th (ft)	0	1	2
Control Delay (s)	0.0	0.5	12.0
Lane LOS		A	B
Approach Delay (s)	0.0	0.5	12.0
Approach LOS			B

Intersection Summary			
Average Delay	0.5		
Intersection Capacity Utilization	23.6%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	61	27	179	37	13	15	82	155	5	16	117	69
Future Volume (vph)	61	27	179	37	13	15	82	155	5	16	117	69
Peak Hour Factor	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83
Hourly flow rate (vph)	73	33	216	45	16	18	99	187	6	19	141	83

Direction, Lane #	EB 1	EB 2	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total (vph)	106	216	79	99	193	19	224
Volume Left (vph)	73	0	45	99	0	19	0
Volume Right (vph)	0	216	18	0	6	0	83
Hadj (s)	0.42	-0.65	0.05	0.58	0.09	0.72	-0.16
Departure Headway (s)	6.5	5.5	6.5	6.6	6.1	6.8	5.9
Degree Utilization, x	0.19	0.33	0.14	0.18	0.33	0.04	0.37
Capacity (veh/h)	517	618	504	519	561	496	576
Control Delay (s)	9.9	9.9	10.6	9.8	10.8	8.9	11.2
Approach Delay (s)	9.9		10.6	10.5		11.0	
Approach LOS	A		B	B		B	

Intersection Summary			
Delay	10.4		
Level of Service	B		
Intersection Capacity Utilization	36.9%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	43	1349	75	89	836	91	179	140	102	211	120	70
Future Volume (vph)	43	1349	75	89	836	91	179	140	102	211	120	70
Ideal Flow (vphpl)	1750	1750	1750	1750	1800	1750	1750	1750	1750	1750	1750	1750
Grade (%)		0%			0%			3%			0%	
Total Lost time (s)	4.0	4.5	4.5	4.0	4.5	4.5	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	0.95	1.00	0.97	0.95	1.00	0.97	1.00	1.00	0.97	1.00	1.00
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.98
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1583	3197	1430	2906	3138	1403	2997	1642	1423	3101	1577	1408
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1583	3197	1430	2906	3138	1403	2997	1642	1423	3101	1577	1408
Peak-hour factor, PHF	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Adj. Flow (vph)	48	1516	84	100	939	102	201	157	115	237	135	79
RTOR Reduction (vph)	0	0	37	0	0	46	0	0	100	0	0	69
Lane Group Flow (vph)	48	1516	47	100	939	56	201	157	15	237	135	10
Confl. Peds. (#/hr)							3					3
Heavy Vehicles (%)	5%	4%	4%	11%	9%	6%	6%	5%	3%	4%	11%	4%
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			2			6			8			4
Actuated Green, G (s)	6.9	66.7	66.7	6.3	66.1	66.1	15.5	16.1	16.1	14.4	15.0	15.0
Effective Green, g (s)	6.9	66.7	66.7	6.3	66.1	66.1	15.5	16.1	16.1	14.4	15.0	15.0
Actuated g/C Ratio	0.06	0.56	0.56	0.05	0.55	0.55	0.13	0.13	0.13	0.12	0.12	0.12
Clearance Time (s)	4.0	4.5	4.5	4.0	4.5	4.5	4.0	4.0	4.0	4.0	4.0	4.0
Vehicle Extension (s)	2.3	4.2	4.2	2.3	4.0	4.0	2.3	2.3	2.3	2.3	2.3	2.3
Lane Grp Cap (vph)	91	1776	794	152	1728	772	387	220	190	372	197	176
v/s Ratio Prot	0.03	c0.47		0.03	c0.30		0.07	c0.10		c0.08	0.09	
v/s Ratio Perm			0.03			0.04			0.01			0.01
v/c Ratio	0.53	0.85	0.06	0.66	0.54	0.07	0.52	0.71	0.08	0.64	0.69	0.06
Uniform Delay, d1	55.0	22.5	12.2	55.8	17.3	12.6	48.8	49.7	45.5	50.3	50.2	46.3
Progression Factor	1.00	1.00	1.00	0.77	0.45	0.06	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	3.5	5.5	0.1	7.7	1.1	0.2	0.7	9.4	0.1	2.9	8.3	0.1
Delay (s)	58.5	28.0	12.4	50.8	8.9	0.9	49.5	59.1	45.6	53.2	58.5	46.3
Level of Service	E	C	B	D	A	A	D	E	D	D	E	D
Approach Delay (s)		28.1			11.8			51.7			53.6	
Approach LOS		C			B			D			D	

Intersection Summary			
HCM 2000 Control Delay	29.2	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.79		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	16.5
Intersection Capacity Utilization	66.3%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	19	1518	43	86	963	28	58	3	92	11	5	27
Future Volume (vph)	19	1518	43	86	963	28	58	3	92	11	5	27
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Grade (%)		2%			0%			0%			-2%	
Total Lost time (s)	4.0	4.5	4.5	4.0	4.5	4.5	4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00		1.00	1.00	
Frpb, ped/bikes	1.00	1.00	0.98	1.00	1.00	0.98	1.00	0.99		1.00	0.99	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.85		1.00	0.87	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1567	3165	1265	1568	3079	1273	1433	1408		1678	1361	
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.73	1.00		0.54	1.00	
Satd. Flow (perm)	1567	3165	1265	1568	3079	1273	1109	1408		951	1361	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	21	1650	47	93	1047	30	63	3	100	12	5	29
RTOR Reduction (vph)	0	0	13	0	0	7	0	90	0	0	26	0
Lane Group Flow (vph)	21	1650	34	93	1047	23	63	13	0	12	8	0
Confl. Peds. (#/hr)	2					2			1	1		
Confl. Bikes (#/hr)			1									1
Heavy Vehicles (%)	5%	4%	14%	6%	8%	14%	16%	0%	5%	0%	40%	7%
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Perm	NA		Perm	NA	
Protected Phases	5	2		1	6			4			8	
Permitted Phases			2			6	4			8		
Actuated Green, G (s)	3.2	84.6	84.6	11.2	92.6	92.6	11.7	11.7		11.7	11.7	
Effective Green, g (s)	3.2	84.6	84.6	11.2	92.6	92.6	11.7	11.7		11.7	11.7	
Actuated g/C Ratio	0.03	0.70	0.70	0.09	0.77	0.77	0.10	0.10		0.10	0.10	
Clearance Time (s)	4.0	4.5	4.5	4.0	4.5	4.5	4.0	4.0		4.0	4.0	
Vehicle Extension (s)	2.3	4.8	4.8	2.3	4.8	4.8	2.5	2.5		2.5	2.5	
Lane Grp Cap (vph)	41	2231	891	146	2375	982	108	137		92	132	
v/s Ratio Prot	0.01	c0.52		c0.06	0.34			0.01			0.01	
v/s Ratio Perm			0.03			0.02	c0.06			0.01		
v/c Ratio	0.51	0.74	0.04	0.64	0.44	0.02	0.58	0.09		0.13	0.06	
Uniform Delay, d1	57.6	10.9	5.4	52.4	4.7	3.2	51.8	49.3		49.5	49.2	
Progression Factor	1.14	0.15	0.02	1.46	0.18	0.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	3.9	1.4	0.0	5.5	0.4	0.0	6.5	0.2		0.5	0.1	
Delay (s)	69.5	3.0	0.2	82.2	1.3	0.0	58.3	49.5		50.0	49.3	
Level of Service	E	A	A	F	A	A	E	D		D	D	
Approach Delay (s)		3.8			7.7			52.9			49.5	
Approach LOS		A			A			D			D	

Intersection Summary			
HCM 2000 Control Delay	8.6	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.71		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	12.5
Intersection Capacity Utilization	71.8%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

HCM Unsignalized Intersection Capacity Analysis
6: OR 99W & Vittoria Way

06/05/2018

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	4	1575	1105	21	52	24
Future Volume (Veh/h)	4	1575	1105	21	52	24
Sign Control		Free	Free		Stop	
Grade		-2%	2%		0%	
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93
Hourly flow rate (vph)	4	1694	1188	23	56	26
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		TWLTL	TWLTL			
Median storage veh)		2	2			
Upstream signal (ft)			521			
pX, platoon unblocked	0.74				0.74	0.74
vC, conflicting volume	1211				2054	606
vC1, stage 1 conf vol					1200	
vC2, stage 2 conf vol					855	
vCu, unblocked vol	569				1715	0
tC, single (s)	4.1				6.8	6.9
tC, 2 stage (s)					5.8	
tF (s)	2.2				3.5	3.3
p0 queue free %	99				80	97
cM capacity (veh/h)	746				274	803

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	SB 1
Volume Total	4	847	847	792	419	82
Volume Left	4	0	0	0	0	56
Volume Right	0	0	0	0	23	26
cSH	746	1700	1700	1700	1700	346
Volume to Capacity	0.01	0.50	0.50	0.47	0.25	0.24
Queue Length 95th (ft)	0	0	0	0	0	23
Control Delay (s)	9.9	0.0	0.0	0.0	0.0	18.6
Lane LOS	A					C
Approach Delay (s)	0.0			0.0		18.6
Approach LOS						C

Intersection Summary			
Average Delay	0.5		
Intersection Capacity Utilization	58.7%	ICU Level of Service	B
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	24	1536	67	73	1019	77	35	11	63	238	21	72
Future Volume (vph)	24	1536	67	73	1019	77	35	11	63	238	21	72
Ideal Flow (vphpl)	1750	1750	1750	1750	1800	1750	1750	1750	1750	1750	1750	1750
Grade (%)		-3%			2%			3%			2%	
Total Lost time (s)	6.0	6.0	6.0	4.5	4.5			4.5	4.5		4.5	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95			1.00	1.00		1.00	
Frt	1.00	1.00	0.85	1.00	0.99			1.00	0.85		0.97	
Flt Protected	0.95	1.00	1.00	0.95	1.00			0.96	1.00		0.97	
Satd. Flow (prot)	1607	3214	1480	1614	3108			1605	1465		1546	
Flt Permitted	0.95	1.00	1.00	0.95	1.00			0.73	1.00		0.76	
Satd. Flow (perm)	1607	3214	1480	1614	3108			1218	1465		1209	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	26	1670	73	79	1108	84	38	12	68	259	23	78
RTOR Reduction (vph)	0	0	26	0	4	0	0	0	48	0	9	0
Lane Group Flow (vph)	26	1670	47	79	1188	0	0	50	20	0	351	0
Heavy Vehicles (%)	5%	5%	2%	2%	8%	5%	3%	5%	0%	5%	5%	5%
Turn Type	Prot	NA	Perm	Prot	NA		Perm	NA	Perm	Perm	NA	
Protected Phases	5	2		1	6			8			4	
Permitted Phases			2				8		8	4		
Actuated Green, G (s)	3.6	63.7	63.7	6.8	66.9			34.5	34.5		34.5	
Effective Green, g (s)	3.6	63.7	63.7	6.8	66.9			34.5	34.5		34.5	
Actuated g/C Ratio	0.03	0.53	0.53	0.06	0.56			0.29	0.29		0.29	
Clearance Time (s)	6.0	6.0	6.0	4.5	4.5			4.5	4.5		4.5	
Vehicle Extension (s)	4.0	5.0	5.0	4.0	4.0			4.0	4.0		4.0	
Lane Grp Cap (vph)	48	1706	785	91	1732			350	421		347	
v/s Ratio Prot	0.02	c0.52		c0.05	0.38							
v/s Ratio Perm			0.03					0.04	0.01		c0.29	
v/c Ratio	0.54	0.98	0.06	0.87	0.69			0.14	0.05		1.01	
Uniform Delay, d1	57.4	27.5	13.6	56.2	19.0			31.8	30.9		42.8	
Progression Factor	0.88	1.52	2.08	1.00	1.00			1.00	1.00		1.00	
Incremental Delay, d2	10.8	14.2	0.1	54.6	2.2			0.3	0.1		51.6	
Delay (s)	61.3	55.8	28.4	110.7	21.3			32.0	30.9		94.3	
Level of Service	E	E	C	F	C			C	C		F	
Approach Delay (s)		54.8			26.8			31.4			94.3	
Approach LOS		D			C			C			F	

Intersection Summary			
HCM 2000 Control Delay	47.9	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.98		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	15.0
Intersection Capacity Utilization	89.9%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Intersection	
Int Delay, s/veh	0.9

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	3	1832	1161	29	62	6
Future Vol, veh/h	3	1832	1161	29	62	6
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	250	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	1	-
Grade, %	-	0	0	-	-2	-
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	33	4	7	7	3	0
Mvmt Flow	3	1928	1222	31	65	6

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	1253	0	-	0	2208	626
Stage 1	-	-	-	-	1237	-
Stage 2	-	-	-	-	971	-
Critical Hdwy	4.76	-	-	-	6.46	6.7
Critical Hdwy Stg 1	-	-	-	-	5.46	-
Critical Hdwy Stg 2	-	-	-	-	5.46	-
Follow-up Hdwy	2.53	-	-	-	3.53	3.3
Pot Cap-1 Maneuver	408	-	-	-	~ 47	447
Stage 1	-	-	-	-	270	-
Stage 2	-	-	-	-	363	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	408	-	-	-	~ 47	447
Mov Cap-2 Maneuver	-	-	-	-	162	-
Stage 1	-	-	-	-	270	-
Stage 2	-	-	-	-	360	-

Approach	EB	WB	SB
HCM Control Delay, s	0	0	40.1
HCM LOS			E

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	408	-	-	-	172
HCM Lane V/C Ratio	0.008	-	-	-	0.416
HCM Control Delay (s)	13.9	-	-	-	40.1
HCM Lane LOS	B	-	-	-	E
HCM 95th %tile Q(veh)	0	-	-	-	1.9

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

HCS 2010 Roundabouts Report

General Information		Site Information	
Analyst	ZHB	Intersection	Crestview/East-West Connector
Agency or Co.	KAI	E/W Street Name	East-West Connector
Date Performed	10/21/2017	N/S Street Name	Crestview Dr
Analysis Year	2020	Analysis Time Period (hrs)	0.25
Time Period	Total AM	Peak Hour Factor	0.92
Project Description	Crestview Crossing	Jurisdiction	

Volume Adjustments and Site Characteristics

Approach	EB				WB				NB				SB			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Number of Lanes (N)	0	0	1	0	0	0	1	0	0	0	1	0	0	0	1	0
Lane Assignment			LTR				LTR				LTR				LTR	
Volume (V), veh/h	0	14	0	32	0	39	0	17	0	11	89	13	0	5	260	5
Percent Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	5	0	0	0	5	0
Flow Rate (v_{PCE}), pc/h	0	15	0	35	0	42	0	18	0	12	102	14	0	5	297	5
Right-Turn Bypass	None				None				None				None			
Conflicting Lanes	1				1				1				1			
Pedestrians Crossing, p/h	0				0				0				0			

Critical and Follow-Up Headway Adjustment

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Critical Headway (s)		4.9734			4.9734			4.9734			4.9734	
Follow-Up Headway (s)		2.6087			2.6087			2.6087			2.6087	

Flow Computations, Capacity and v/c Ratios

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Entry Flow (v_e), pc/h		50			60			128			307	
Entry Volume veh/h		50			60			123			293	
Circulating Flow (v_c), pc/h	344			129			20			54		
Exiting Flow (v_{ex}), pc/h	19			17			135			374		
Capacity (c_{pce}), pc/h		972			1210			1352			1306	
Capacity (c), veh/h		972			1210			1301			1246	
v/c Ratio (x)		0.05			0.05			0.09			0.24	

Delay and Level of Service

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Lane Control Delay (d), s/veh		4.2			3.4			3.5			5.0	
Lane LOS		A			A			A			A	
95% Queue, veh		0.2			0.2			0.3			0.9	
Approach Delay, s/veh	4.2			3.4			3.5			5.0		
Approach LOS	A			A			A			A		
Intersection Delay, s/veh | LOS	4.4						A					

HCS 2010 Roundabouts Report

General Information / Site Information

Analyst	ZHB	Intersection	Springbrook/Crestview
Agency or Co.	KAI	E/W Street Name	Crestview Dr
Date Performed	10/21/2017	N/S Street Name	Springbrook Rd
Analysis Year	2020	Analysis Time Period (hrs)	0.25
Time Period	Total PM	Peak Hour Factor	0.93
Project Description	Crestview Crossing	Jurisdiction	

Volume Adjustments and Site Characteristics

Approach	EB				WB				NB				SB			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Number of Lanes (N)	0	0	1	0	0	0	1	0	0	0	1	0	0	0	1	0
Lane Assignment			LTR				LTR				LTR				LTR	
Volume (V), veh/h	0	53	20	13	0	16	13	172	0	7	374	31	2	200	263	49
Percent Heavy Vehicles, %	0	0	0	0	20	20	0	0	0	0	3	0	0	0	2	0
Flow Rate (v_{PCE}), pc/h	0	57	22	14	0	21	14	185	0	8	414	33	2	215	288	53
Right-Turn Bypass	None				None				None				None			
Conflicting Lanes	1				1				1				1			
Pedestrians Crossing, p/h	0				0				0				0			

Critical and Follow-Up Headway Adjustment

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Critical Headway (s)		4.9734			4.9734			4.9734			4.9734	
Follow-Up Headway (s)		2.6087			2.6087			2.6087			2.6087	

Flow Computations, Capacity and v/c Ratios

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Entry Flow (v_e), pc/h		93			220			455			558	
Entry Volume veh/h		93			217			443			552	
Circulating Flow (v_c), pc/h	526			481			296			43		
Exiting Flow (v_{ex}), pc/h	270			75			658			323		
Capacity (c_{pce}), pc/h		807			845			1021			1321	
Capacity (c), veh/h		807			832			994			1307	
v/c Ratio (x)		0.12			0.26			0.45			0.42	

Delay and Level of Service

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Lane Control Delay (d), s/veh		5.6			7.1			8.7			6.9	
Lane LOS		A			A			A			A	
95% Queue, veh		0.4			1.0			2.3			2.1	
Approach Delay, s/veh	5.6			7.1			8.7			6.9		
Approach LOS	A			A			A			A		
Intersection Delay, s/veh | LOS	7.5						A					

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	239	5	9	195	8	14
Future Volume (Veh/h)	239	5	9	195	8	14
Sign Control	Free			Free	Stop	
Grade	0%			0%	2%	
Peak Hour Factor	0.79	0.79	0.79	0.79	0.79	0.79
Hourly flow rate (vph)	303	6	11	247	10	18
Pedestrians					2	
Lane Width (ft)					12.0	
Walking Speed (ft/s)					3.5	
Percent Blockage					0	
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			311		577	308
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			311		577	308
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			99		98	98
cM capacity (veh/h)			1258		476	735

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	309	258	28
Volume Left	0	11	10
Volume Right	6	0	18
cSH	1700	1258	616
Volume to Capacity	0.18	0.01	0.05
Queue Length 95th (ft)	0	1	4
Control Delay (s)	0.0	0.4	11.1
Lane LOS		A	B
Approach Delay (s)	0.0	0.4	11.1
Approach LOS			B

Intersection Summary			
Average Delay	0.7		
Intersection Capacity Utilization	27.6%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	83	63	226	91	68	86	141	208	5	67	183	40
Future Volume (vph)	83	63	226	91	68	86	141	208	5	67	183	40
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Hourly flow rate (vph)	86	66	235	95	71	90	147	217	5	70	191	42

Direction, Lane #	EB 1	EB 2	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total (vph)	152	235	256	147	222	70	233
Volume Left (vph)	86	0	95	147	0	70	0
Volume Right (vph)	0	235	90	0	5	0	42
Hadj (s)	0.30	-0.68	-0.12	0.53	0.03	0.53	-0.06
Departure Headway (s)	7.5	6.5	7.2	7.8	7.3	7.9	7.3
Degree Utilization, x	0.32	0.43	0.51	0.32	0.45	0.15	0.47
Capacity (veh/h)	452	521	466	431	462	427	458
Control Delay (s)	12.8	13.1	17.4	13.2	14.9	11.1	15.5
Approach Delay (s)	13.0		17.4	14.2		14.5	
Approach LOS	B		C	B		B	

Intersection Summary			
Delay	14.5		
Level of Service	B		
Intersection Capacity Utilization	50.8%	ICU Level of Service	A
Analysis Period (min)	15		

HCM Signalized Intersection Capacity Analysis
4: Springbrook Rd & OR 99W

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	94	1182	124	151	1478	155	374	179	142	224	212	81
Future Volume (vph)	94	1182	124	151	1478	155	374	179	142	224	212	81
Ideal Flow (vphpl)	1750	1750	1750	1750	1800	1750	1750	1750	1750	1750	1750	1750
Grade (%)		0%			0%			3%			0%	
Total Lost time (s)	4.0	4.5	4.5	4.0	4.5	4.5	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	0.95	1.00	0.97	0.95	1.00	0.97	1.00	1.00	0.97	1.00	1.00
Frpb, ped/bikes	1.00	1.00	0.98	1.00	1.00	0.98	1.00	1.00	0.98	1.00	1.00	0.97
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1583	3137	1440	2854	3288	1423	3177	1674	1361	3193	1699	1438
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1583	3137	1440	2854	3288	1423	3177	1674	1361	3193	1699	1438
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	96	1206	127	154	1508	158	382	183	145	229	216	83
RTOR Reduction (vph)	0	0	63	0	0	77	0	0	124	0	0	65
Lane Group Flow (vph)	96	1206	64	154	1508	81	382	183	21	229	216	18
Confl. Peds. (#/hr)	2		9	9		2	14					14
Confl. Bikes (#/hr)									2			1
Heavy Vehicles (%)	5%	6%	1%	13%	4%	2%	0%	3%	6%	1%	3%	0%
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			2			6			8			4
Actuated Green, G (s)	10.7	70.6	70.6	10.4	70.3	70.3	20.4	19.9	19.9	22.6	22.1	22.1
Effective Green, g (s)	10.7	70.6	70.6	10.4	70.3	70.3	20.4	19.9	19.9	22.6	22.1	22.1
Actuated g/C Ratio	0.08	0.50	0.50	0.07	0.50	0.50	0.15	0.14	0.14	0.16	0.16	0.16
Clearance Time (s)	4.0	4.5	4.5	4.0	4.5	4.5	4.0	4.0	4.0	4.0	4.0	4.0
Vehicle Extension (s)	2.3	4.2	4.2	2.3	4.0	4.0	2.3	2.3	2.3	2.3	2.3	2.3
Lane Grp Cap (vph)	120	1581	726	212	1651	714	462	237	193	515	268	226
v/s Ratio Prot	c0.06	0.38		0.05	c0.46		c0.12	0.11		0.07	c0.13	
v/s Ratio Perm			0.04			0.06			0.02			0.01
v/c Ratio	0.80	0.76	0.09	0.73	0.91	0.11	0.83	0.77	0.11	0.44	0.81	0.08
Uniform Delay, d1	63.6	28.0	18.0	63.4	32.1	18.4	58.1	57.9	52.3	53.0	56.9	50.3
Progression Factor	1.00	1.00	1.00	1.02	0.95	1.43	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	29.5	3.5	0.2	7.2	6.5	0.2	11.2	13.6	0.1	0.4	15.5	0.1
Delay (s)	93.1	31.5	18.2	71.8	36.9	26.6	69.3	71.5	52.5	53.4	72.3	50.4
Level of Service	F	C	B	E	D	C	E	E	D	D	E	D
Approach Delay (s)		34.5			39.0			66.4			60.7	
Approach LOS		C			D			E			E	

Intersection Summary			
HCM 2000 Control Delay	44.4	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.86		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	16.5
Intersection Capacity Utilization	90.7%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	32	1086	101	231	1512	41	243	16	152	21	10	51
Future Volume (vph)	32	1086	101	231	1512	41	243	16	152	21	10	51
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Grade (%)		2%			0%			0%			-2%	
Total Lost time (s)	4.0	4.5	4.5	4.0	4.5	4.5	4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00		1.00	1.00	
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.98		1.00	0.98	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	0.99	1.00		1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.86		1.00	0.87	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1646	3105	1402	1646	3197	1352	1620	1438		1675	1471	
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.72	1.00		0.50	1.00	
Satd. Flow (perm)	1646	3105	1402	1646	3197	1352	1221	1438		875	1471	
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	33	1131	105	241	1575	43	253	17	158	22	10	53
RTOR Reduction (vph)	0	0	37	0	0	14	0	121	0	0	41	0
Lane Group Flow (vph)	33	1131	68	241	1575	29	253	54	0	22	22	0
Confl. Peds. (#/hr)							5		3	3		5
Confl. Bikes (#/hr)									1			
Heavy Vehicles (%)	0%	6%	5%	1%	4%	10%	2%	0%	4%	0%	0%	4%
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Perm	NA		Perm	NA	
Protected Phases	5	2		1	6			4			8	
Permitted Phases			2			6	4			8		
Actuated Green, G (s)	3.9	69.3	69.3	25.6	91.0	91.0	32.6	32.6		32.6	32.6	
Effective Green, g (s)	3.9	69.3	69.3	25.6	91.0	91.0	32.6	32.6		32.6	32.6	
Actuated g/C Ratio	0.03	0.49	0.49	0.18	0.65	0.65	0.23	0.23		0.23	0.23	
Clearance Time (s)	4.0	4.5	4.5	4.0	4.5	4.5	4.0	4.0		4.0	4.0	
Vehicle Extension (s)	2.3	4.8	4.8	2.3	4.8	4.8	2.5	2.5		2.5	2.5	
Lane Grp Cap (vph)	45	1536	693	300	2078	878	284	334		203	342	
v/s Ratio Prot	0.02	c0.36		0.15	c0.49			0.04			0.02	
v/s Ratio Perm			0.05			0.02	c0.21			0.03		
v/c Ratio	0.73	0.74	0.10	0.80	0.76	0.03	0.89	0.16		0.11	0.07	
Uniform Delay, d1	67.5	28.1	18.8	54.8	16.9	8.8	52.0	42.8		42.3	41.8	
Progression Factor	0.75	1.09	1.19	0.72	0.49	0.37	1.00	1.00		1.00	1.00	
Incremental Delay, d2	33.1	2.3	0.2	1.4	0.2	0.0	27.3	0.2		0.2	0.1	
Delay (s)	83.4	32.9	22.5	41.1	8.6	3.3	79.3	43.0		42.4	41.9	
Level of Service	F	C	C	D	A	A	E	D		D	D	
Approach Delay (s)		33.3			12.7			64.4			42.0	
Approach LOS		C			B			E			D	

Intersection Summary			
HCM 2000 Control Delay	26.6	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.80		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	12.5
Intersection Capacity Utilization	80.9%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	32	1242	1806	128	26	18
Future Volume (Veh/h)	32	1242	1806	128	26	18
Sign Control		Free	Free		Stop	
Grade		-2%	2%		0%	
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93
Hourly flow rate (vph)	34	1335	1942	138	28	19
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		TWLTL	TWLTL			
Median storage veh)		2	2			
Upstream signal (ft)			522			
pX, platoon unblocked	0.42				0.42	0.42
vC, conflicting volume	2080				2746	1040
vC1, stage 1 conf vol					2011	
vC2, stage 2 conf vol					736	
vCu, unblocked vol	788				2391	0
tC, single (s)	4.2				7.0	6.9
tC, 2 stage (s)					6.0	
tF (s)	2.2				3.6	3.3
p0 queue free %	90				83	96
cM capacity (veh/h)	341				168	454

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	SB 1
Volume Total	34	668	668	1295	785	47
Volume Left	34	0	0	0	0	28
Volume Right	0	0	0	0	138	19
cSH	341	1700	1700	1700	1700	225
Volume to Capacity	0.10	0.39	0.39	0.76	0.46	0.21
Queue Length 95th (ft)	8	0	0	0	0	19
Control Delay (s)	16.7	0.0	0.0	0.0	0.0	25.2
Lane LOS	C					D
Approach Delay (s)	0.4			0.0		25.2
Approach LOS						D

Intersection Summary			
Average Delay	0.5		
Intersection Capacity Utilization	68.6%	ICU Level of Service	C
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	81	1155	32	79	1774	167	114	28	116	190	11	51
Future Volume (vph)	81	1155	32	79	1774	167	114	28	116	190	11	51
Ideal Flow (vphpl)	1750	1750	1750	1750	1800	1750	1750	1750	1750	1750	1750	1750
Grade (%)		-3%			2%			3%			2%	
Total Lost time (s)	6.0	6.0	6.0	4.5	4.5			4.5	4.5		4.5	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95			1.00	1.00		1.00	
Frpb, ped/bikes	1.00	1.00	0.98	1.00	1.00			1.00	1.00		1.00	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00			1.00	1.00		1.00	
Frt	1.00	1.00	0.85	1.00	0.99			1.00	0.85		0.97	
Flt Protected	0.95	1.00	1.00	0.95	1.00			0.96	1.00		0.96	
Satd. Flow (prot)	1654	3184	1479	1646	3219			1638	1465		1592	
Flt Permitted	0.95	1.00	1.00	0.95	1.00			0.70	1.00		0.58	
Satd. Flow (perm)	1654	3184	1479	1646	3219			1187	1465		964	
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	86	1229	34	84	1887	178	121	30	123	202	12	54
RTOR Reduction (vph)	0	0	15	0	5	0	0	0	92	0	7	0
Lane Group Flow (vph)	86	1229	19	84	2060	0	0	151	31	0	261	0
Confl. Bikes (#/hr)			1									
Heavy Vehicles (%)	2%	6%	0%	0%	4%	2%	1%	2%	0%	2%	2%	2%
Turn Type	Prot	NA	Perm	Prot	NA		Perm	NA	Perm	Perm	NA	
Protected Phases	5	2		1	6			8			4	
Permitted Phases			2				8		8	4		
Actuated Green, G (s)	7.0	77.8	77.8	12.3	83.1			34.9	34.9		34.9	
Effective Green, g (s)	7.0	77.8	77.8	12.3	83.1			34.9	34.9		34.9	
Actuated g/C Ratio	0.05	0.56	0.56	0.09	0.59			0.25	0.25		0.25	
Clearance Time (s)	6.0	6.0	6.0	4.5	4.5			4.5	4.5		4.5	
Vehicle Extension (s)	4.0	5.0	5.0	4.0	4.0			4.0	4.0		4.0	
Lane Grp Cap (vph)	82	1769	821	144	1910			295	365		240	
v/s Ratio Prot	c0.05	0.39		0.05	c0.64							
v/s Ratio Perm			0.01					0.13	0.02		c0.27	
v/c Ratio	1.05	0.69	0.02	0.58	1.08			0.51	0.08		1.09	
Uniform Delay, d1	66.5	22.5	14.0	61.4	28.5			45.2	40.3		52.5	
Progression Factor	1.09	0.53	1.00	1.00	1.00			1.00	1.00		1.00	
Incremental Delay, d2	101.6	1.8	0.0	7.0	45.4			2.0	0.1		83.7	
Delay (s)	173.8	13.7	14.0	68.3	73.9			47.2	40.4		136.3	
Level of Service	F	B	B	E	E			D	D		F	
Approach Delay (s)		23.9			73.7			44.2			136.3	
Approach LOS		C			E			D			F	

Intersection Summary			
HCM 2000 Control Delay	59.2	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	1.08		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	15.0
Intersection Capacity Utilization	96.8%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

Intersection	
Int Delay, s/veh	4.5

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	31	1430	2018	75	61	17
Future Vol, veh/h	31	1430	2018	75	61	17
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	250	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	1	-
Grade, %	-	0	0	-	-2	-
Peak Hour Factor	93	93	93	93	93	93
Heavy Vehicles, %	0	5	4	0	2	0
Mvmt Flow	33	1538	2170	81	66	18

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	2251	0	-	0	3045	1125
Stage 1	-	-	-	-	2210	-
Stage 2	-	-	-	-	835	-
Critical Hdwy	4.1	-	-	-	6.44	6.7
Critical Hdwy Stg 1	-	-	-	-	5.44	-
Critical Hdwy Stg 2	-	-	-	-	5.44	-
Follow-up Hdwy	2.2	-	-	-	3.52	3.3
Pot Cap-1 Maneuver	232	-	-	-	~ 14	215
Stage 1	-	-	-	-	89	-
Stage 2	-	-	-	-	424	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	232	-	-	-	~ 12	215
Mov Cap-2 Maneuver	-	-	-	-	69	-
Stage 1	-	-	-	-	89	-
Stage 2	-	-	-	-	364	-

Approach	EB	WB	SB
HCM Control Delay, s	0.5	0	201.5
HCM LOS			F

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	232	-	-	-	81
HCM Lane V/C Ratio	0.144	-	-	-	1.035
HCM Control Delay (s)	23.1	-	-	-	201.5
HCM Lane LOS	C	-	-	-	F
HCM 95th %tile Q(veh)	0.5	-	-	-	5.8

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

HCS 2010 Roundabouts Report

General Information		Site Information	
Analyst	ZHB	Intersection	Crestview/East-West Connector
Agency or Co.	KAI	E/W Street Name	East-West Connector
Date Performed	10/21/2017	N/S Street Name	Crestview Dr
Analysis Year	2020	Analysis Time Period (hrs)	0.25
Time Period	Total PM	Peak Hour Factor	0.94
Project Description	Crestview Crossing	Jurisdiction	

Volume Adjustments and Site Characteristics

Approach	EB				WB				NB				SB			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Number of Lanes (N)	0	0	1	0	0	0	1	0	0	0	1	0	0	0	1	0
Lane Assignment			LTR				LTR				LTR				LTR	
Volume (V), veh/h	0	9	0	21	0	25	0	11	0	36	197	43	0	19	201	15
Percent Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	2	0	0	0	2	0
Flow Rate (v_{PCE}), pc/h	0	10	0	22	0	27	0	12	0	38	214	46	0	20	218	16
Right-Turn Bypass	None				None				None				None			
Conflicting Lanes	1				1				1				1			
Pedestrians Crossing, p/h	0				0				0				0			

Critical and Follow-Up Headway Adjustment

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Critical Headway (s)		4.9734			4.9734			4.9734			4.9734	
Follow-Up Headway (s)		2.6087			2.6087			2.6087			2.6087	

Flow Computations, Capacity and v/c Ratios

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Entry Flow (v_e), pc/h		32			39			298			254	
Entry Volume veh/h		32			39			294			250	
Circulating Flow (v_c), pc/h	265			262			30			65		
Exiting Flow (v_{ex}), pc/h	66			54			236			267		
Capacity (c_{pce}), pc/h		1053			1057			1338			1292	
Capacity (c), veh/h		1053			1057			1320			1270	
v/c Ratio (x)		0.03			0.04			0.22			0.20	

Delay and Level of Service

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Lane Control Delay (d), s/veh		3.7			3.7			4.6			4.5	
Lane LOS		A			A			A			A	
95% Queue, veh		0.1			0.1			0.9			0.7	
Approach Delay, s/veh	3.7			3.7			4.6			4.5		
Approach LOS	A			A			A			A		
Intersection Delay, s/veh | LOS	4.5						A					

Appendix I
Year 2020 Total Conditions with Mitigation Level of Service Worksheets

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	24	1536	67	73	1019	77	35	11	63	238	21	72
Future Volume (vph)	24	1536	67	73	1019	77	35	11	63	238	21	72
Ideal Flow (vphpl)	1750	1750	1750	1750	1800	1750	1750	1750	1750	1750	1750	1750
Grade (%)		-3%			2%			3%			2%	
Total Lost time (s)	6.0	6.0	6.0	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1607	3214	1480	1614	3135	1402	1590	1642	1465	1567	1650	1402
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.74	1.00	1.00	0.75	1.00	1.00
Satd. Flow (perm)	1607	3214	1480	1614	3135	1402	1242	1642	1465	1237	1650	1402
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	26	1670	73	79	1108	84	38	12	68	259	23	78
RTOR Reduction (vph)	0	0	29	0	0	33	0	0	52	0	0	60
Lane Group Flow (vph)	26	1670	44	79	1108	51	38	12	16	259	23	18
Heavy Vehicles (%)	5%	5%	2%	2%	8%	5%	3%	5%	0%	5%	5%	5%
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Perm	NA	Perm	Perm	NA	Perm
Protected Phases	5	2		1	6			8			4	
Permitted Phases			2			6	8		8	4		4
Actuated Green, G (s)	3.6	68.8	68.8	8.1	73.3	73.3	28.1	28.1	28.1	28.1	28.1	28.1
Effective Green, g (s)	3.6	68.8	68.8	8.1	73.3	73.3	28.1	28.1	28.1	28.1	28.1	28.1
Actuated g/C Ratio	0.03	0.57	0.57	0.07	0.61	0.61	0.23	0.23	0.23	0.23	0.23	0.23
Clearance Time (s)	6.0	6.0	6.0	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Vehicle Extension (s)	4.0	5.0	5.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Grp Cap (vph)	48	1842	848	108	1914	856	290	384	343	289	386	328
v/s Ratio Prot	0.02	c0.52		c0.05	c0.35			0.01			0.01	
v/s Ratio Perm			0.03			0.04	0.03		0.01	c0.21		0.01
v/c Ratio	0.54	0.91	0.05	0.73	0.58	0.06	0.13	0.03	0.05	0.90	0.06	0.06
Uniform Delay, d1	57.4	22.7	11.3	54.9	14.1	9.4	36.3	35.4	35.6	44.5	35.7	35.7
Progression Factor	0.89	1.57	2.47	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	10.8	6.0	0.1	23.6	1.3	0.1	0.3	0.0	0.1	28.3	0.1	0.1
Delay (s)	61.7	41.6	27.9	78.5	15.3	9.6	36.6	35.5	35.7	72.9	35.8	35.8
Level of Service	E	D	C	E	B	A	D	D	D	E	D	D
Approach Delay (s)		41.3			18.9			35.9			62.4	
Approach LOS		D			B			D			E	

Intersection Summary			
HCM 2000 Control Delay	35.2	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.88		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	15.0
Intersection Capacity Utilization	84.0%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	81	1155	32	79	1774	167	114	28	116	190	11	46
Future Volume (vph)	81	1155	32	79	1774	167	114	28	116	190	11	46
Ideal Flow (vphpl)	1750	1750	1750	1750	1800	1750	1750	1750	1750	1750	1750	1750
Grade (%)		-3%			2%			3%			2%	
Total Lost time (s)	6.0	6.0	6.0	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00	0.98	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1654	3184	1479	1646	3256	1444	1621	1690	1465	1614	1699	1444
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.75	1.00	1.00	0.74	1.00	1.00
Satd. Flow (perm)	1654	3184	1479	1646	3256	1444	1280	1690	1465	1253	1699	1444
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	86	1229	34	84	1887	178	121	30	123	202	12	49
RTOR Reduction (vph)	0	0	13	0	0	46	0	0	100	0	0	40
Lane Group Flow (vph)	86	1229	21	84	1887	132	121	30	23	202	12	9
Confl. Bikes (#/hr)			1									
Heavy Vehicles (%)	2%	6%	0%	0%	4%	2%	1%	2%	0%	2%	2%	2%
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Perm	NA	Perm	Perm	NA	Perm
Protected Phases	5	2		1	6			8			4	
Permitted Phases			2			6	8		8	4		4
Actuated Green, G (s)	9.8	86.0	86.0	12.3	88.5	88.5	26.7	26.7	26.7	26.7	26.7	26.7
Effective Green, g (s)	9.8	86.0	86.0	12.3	88.5	88.5	26.7	26.7	26.7	26.7	26.7	26.7
Actuated g/C Ratio	0.07	0.61	0.61	0.09	0.63	0.63	0.19	0.19	0.19	0.19	0.19	0.19
Clearance Time (s)	6.0	6.0	6.0	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Vehicle Extension (s)	4.0	5.0	5.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Grp Cap (vph)	115	1955	908	144	2058	912	244	322	279	238	324	275
v/s Ratio Prot	c0.05	0.39		0.05	c0.58			0.02			0.01	
v/s Ratio Perm			0.01			0.09	0.09		0.02	c0.16		0.01
v/c Ratio	0.75	0.63	0.02	0.58	0.92	0.15	0.50	0.09	0.08	0.85	0.04	0.03
Uniform Delay, d1	63.9	17.0	10.6	61.4	22.5	10.4	50.6	46.7	46.6	54.7	46.2	46.1
Progression Factor	1.26	0.14	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	19.5	1.2	0.0	7.0	8.0	0.3	2.2	0.2	0.2	24.3	0.1	0.1
Delay (s)	100.0	3.6	10.6	68.3	30.5	10.8	52.8	46.8	46.8	79.0	46.2	46.2
Level of Service	F	A	B	E	C	B	D	D	D	E	D	D
Approach Delay (s)		10.0			30.3			49.4			71.4	
Approach LOS		A			C			D			E	

Intersection Summary			
HCM 2000 Control Delay	27.5	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.89		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	15.0
Intersection Capacity Utilization	87.2%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Appendix J

SimTraffic Queuing Worksheets

Intersection: 2: Libra St & Crestview Dr

Movement	NB
Directions Served	LR
Maximum Queue (ft)	44
Average Queue (ft)	9
95th Queue (ft)	34
Link Distance (ft)	217
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 3: Springbrook Rd & Haworth Ave/Shopping Center

Movement	EB	EB	WB	NB	NB	SB	SB
Directions Served	LT	R	LTR	L	TR	L	TR
Maximum Queue (ft)	95	168	66	95	158	114	210
Average Queue (ft)	38	56	31	31	58	18	108
95th Queue (ft)	67	125	57	69	109	69	190
Link Distance (ft)		420	165		443		183
Upstream Blk Time (%)							6
Queuing Penalty (veh)							0
Storage Bay Dist (ft)	90			90		90	
Storage Blk Time (%)	0	2		0	2	0	16
Queuing Penalty (veh)	0	2		0	1	0	3

Intersection: 4: Springbrook Rd & OR 99W

Movement	EB	EB	EB	EB	WB	WB	WB	WB	WB	NB	NB	NB
Directions Served	L	T	T	R	L	L	T	T	R	L	L	T
Maximum Queue (ft)	320	524	561	225	77	95	228	239	24	130	148	241
Average Queue (ft)	43	273	273	21	21	46	128	135	0	42	80	99
95th Queue (ft)	154	447	453	162	59	83	207	219	0	102	133	186
Link Distance (ft)		2053	2053				1271	1271				1159
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	350			350	430	430			370	320	320	
Storage Blk Time (%)		4	4	0								
Queuing Penalty (veh)		2	3	0								

Intersection: 4: Springbrook Rd & OR 99W

Movement	NB	SB	SB	SB	SB
Directions Served	R	L	L	T	R
Maximum Queue (ft)	106	182	194	417	155
Average Queue (ft)	47	143	165	159	37
95th Queue (ft)	95	212	220	353	108
Link Distance (ft)				443	
Upstream Blk Time (%)				1	
Queuing Penalty (veh)				3	
Storage Bay Dist (ft)	320	170	170		130
Storage Blk Time (%)		2	12	7	0
Queuing Penalty (veh)		3	22	33	0

Intersection: 5: Brutscher St & OR 99W

Movement	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	SB	SB
Directions Served	L	T	T	R	L	T	T	R	L	TR	L	TR
Maximum Queue (ft)	53	140	162	35	128	138	174	75	145	137	53	62
Average Queue (ft)	11	35	43	4	44	36	52	5	53	45	8	16
95th Queue (ft)	38	99	115	21	101	101	130	32	118	103	34	44
Link Distance (ft)		1271	1271			1266	1266			345		357
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	260			200	350			80	220		50	
Storage Blk Time (%)			0				2	0			1	1
Queuing Penalty (veh)			0				1	0			0	0

Intersection: 6: OR 99W & Vittoria Way

Movement	EB	SB
Directions Served	L	LR
Maximum Queue (ft)	23	163
Average Queue (ft)	2	62
95th Queue (ft)	15	126
Link Distance (ft)		204
Upstream Blk Time (%)		0
Queuing Penalty (veh)		0
Storage Bay Dist (ft)	100	
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 7: Providence Dr & OR 99W

Movement	EB	EB	EB	WB	WB	WB	NB	NB
Directions Served	T	T	R	L	T	T	L	R
Maximum Queue (ft)	219	230	125	128	90	98	78	105
Average Queue (ft)	91	104	16	61	34	30	28	35
95th Queue (ft)	191	216	76	117	83	82	66	77
Link Distance (ft)	447	447			1785	1785	301	
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (ft)			100	230				160
Storage Blk Time (%)		6	0					0
Queuing Penalty (veh)		3	0					0

Intersection: 8: OR 99W & Benjamin Rd

Movement	EB	SB
Directions Served	L	LR
Maximum Queue (ft)	38	297
Average Queue (ft)	2	158
95th Queue (ft)	17	349
Link Distance (ft)		526
Upstream Blk Time (%)		1
Queuing Penalty (veh)		0
Storage Bay Dist (ft)	250	
Storage Blk Time (%)		
Queuing Penalty (veh)		

Network Summary

Network wide Queuing Penalty: 77

Intersection: 2: Libra St & Crestview Dr

Movement	WB	NB
Directions Served	LT	LR
Maximum Queue (ft)	6	35
Average Queue (ft)	0	15
95th Queue (ft)	0	40
Link Distance (ft)	476	243
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 3: Springbrook Rd & Haworth Ave/Shopping Center

Movement	EB	EB	WB	NB	NB	SB	SB
Directions Served	LT	R	LTR	L	TR	L	TR
Maximum Queue (ft)	115	485	220	115	296	115	326
Average Queue (ft)	86	351	171	68	114	72	289
95th Queue (ft)	156	600	263	131	224	163	314
Link Distance (ft)		441	194		432		267
Upstream Blk Time (%)		48	55				99
Queuing Penalty (veh)		0	0				0
Storage Bay Dist (ft)	90			90		90	
Storage Blk Time (%)	7	73		1	18	0	99
Queuing Penalty (veh)	14	106		4	25	0	67

Intersection: 4: Springbrook Rd & OR 99W

Movement	EB	EB	EB	EB	WB	WB	WB	WB	WB	NB	NB	NB
Directions Served	L	T	T	R	L	L	T	T	R	L	L	T
Maximum Queue (ft)	328	465	475	148	214	410	571	589	395	332	345	1699
Average Queue (ft)	201	213	217	5	79	111	254	266	87	303	335	1616
95th Queue (ft)	385	475	455	76	174	257	530	553	352	394	383	1901
Link Distance (ft)		3631	3631				1270	1270				1649
Upstream Blk Time (%)												77
Queuing Penalty (veh)												0
Storage Bay Dist (ft)	350			350	430	430			370	320	320	
Storage Blk Time (%)	14	0	1	0			2	4	0	9	65	12
Queuing Penalty (veh)	76	0	1	0			2	11	0	26	197	62

Intersection: 4: Springbrook Rd & OR 99W

Movement	NB	SB	SB	SB	SB
Directions Served	R	L	L	T	R
Maximum Queue (ft)	276	182	195	451	155
Average Queue (ft)	91	144	171	427	69
95th Queue (ft)	259	229	247	482	175
Link Distance (ft)				432	
Upstream Blk Time (%)				40	
Queuing Penalty (veh)				265	
Storage Bay Dist (ft)	320	170	170		130
Storage Blk Time (%)	0	11	30	60	1
Queuing Penalty (veh)	0	33	89	286	5

Intersection: 5: Brutscher St & OR 99W

Movement	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	SB	SB
Directions Served	L	T	T	R	L	T	T	R	L	TR	L	TR
Maximum Queue (ft)	211	409	375	225	374	984	979	105	245	388	61	123
Average Queue (ft)	27	180	188	70	313	571	565	10	214	250	12	33
95th Queue (ft)	109	360	364	216	453	1383	1382	55	295	487	41	87
Link Distance (ft)		1270	1270			1264	1264			345		357
Upstream Blk Time (%)						6	6			41		
Queuing Penalty (veh)						54	56			0		
Storage Bay Dist (ft)	260			200	350			80	220		50	
Storage Blk Time (%)		3	7	0	39	2	18	0	50	3	2	7
Queuing Penalty (veh)		1	7	0	297	4	8	0	74	8	1	2

Intersection: 6: OR 99W & Vittoria Way

Movement	EB	WB	WB	SB
Directions Served	L	T	TR	LR
Maximum Queue (ft)	72	204	208	158
Average Queue (ft)	20	94	95	88
95th Queue (ft)	52	382	384	200
Link Distance (ft)		449	449	209
Upstream Blk Time (%)		4	5	10
Queuing Penalty (veh)		42	45	0
Storage Bay Dist (ft)	100			
Storage Blk Time (%)	0			
Queuing Penalty (veh)	2			

Intersection: 7: Providence Dr & OR 99W

Movement	EB	EB	EB	WB	WB	WB	NB	NB
Directions Served	T	T	R	L	T	T	L	R
Maximum Queue (ft)	259	285	106	189	768	748	218	131
Average Queue (ft)	118	128	7	92	303	305	90	46
95th Queue (ft)	214	228	51	196	1174	1169	177	106
Link Distance (ft)	449	449			1785	1785	301	
Upstream Blk Time (%)					1	1	0	
Queuing Penalty (veh)					11	13	0	
Storage Bay Dist (ft)			100	230				160
Storage Blk Time (%)		10	0	0	12		2	0
Queuing Penalty (veh)		2	0	0	8		2	0

Intersection: 8: OR 99W & Benjamin Rd

Movement	EB	WB	WB	SB
Directions Served	L	T	TR	LR
Maximum Queue (ft)	95	158	164	541
Average Queue (ft)	28	52	51	510
95th Queue (ft)	73	354	347	607
Link Distance (ft)		746	746	526
Upstream Blk Time (%)		2	3	83
Queuing Penalty (veh)		0	0	0
Storage Bay Dist (ft)	250			
Storage Blk Time (%)				
Queuing Penalty (veh)				

Network Summary

Network wide Queuing Penalty: 1908

Intersection: 2: Libra St & Crestview Dr

Movement	WB	NB
Directions Served	LT	LR
Maximum Queue (ft)	30	54
Average Queue (ft)	3	10
95th Queue (ft)	17	37
Link Distance (ft)	400	217
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 3: Springbrook Rd & Haworth Ave/Shopping Center

Movement	EB	EB	WB	NB	NB	SB	SB
Directions Served	LT	R	LTR	L	TR	L	TR
Maximum Queue (ft)	80	90	75	90	119	56	101
Average Queue (ft)	34	48	33	30	48	13	51
95th Queue (ft)	60	75	60	62	91	41	84
Link Distance (ft)		420	165		443		183
Upstream Blk Time (%)							
Queuing Penalty (veh)							
Storage Bay Dist (ft)	90			90		90	
Storage Blk Time (%)	0	0		0	1	0	0
Queuing Penalty (veh)	0	0		0	1	0	0

Intersection: 4: Springbrook Rd & OR 99W

Movement	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	NB	NB
Directions Served	L	T	T	R	L	L	T	T	L	L	T	R
Maximum Queue (ft)	235	390	410	62	81	98	184	185	160	190	210	118
Average Queue (ft)	36	237	233	4	23	45	90	92	41	103	100	41
95th Queue (ft)	122	353	361	70	62	87	160	162	131	175	178	95
Link Distance (ft)		2012	2012				1271	1271			526	
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	350			350	430	430			320	320		320
Storage Blk Time (%)		1	1	0								
Queuing Penalty (veh)		0	1	0								

Intersection: 4: Springbrook Rd & OR 99W

Movement	SB	SB	SB	SB
Directions Served	L	L	T	R
Maximum Queue (ft)	164	194	319	154
Average Queue (ft)	67	104	105	45
95th Queue (ft)	141	176	240	119
Link Distance (ft)			443	
Upstream Blk Time (%)			0	
Queuing Penalty (veh)			0	
Storage Bay Dist (ft)	170	170		130
Storage Blk Time (%)	0	1	6	0
Queuing Penalty (veh)	0	1	16	1

Intersection: 5: Brutscher St & OR 99W

Movement	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	SB	SB
Directions Served	L	T	T	R	L	T	T	R	L	TR	L	TR
Maximum Queue (ft)	43	166	180	47	148	126	130	51	146	125	37	62
Average Queue (ft)	8	57	68	6	49	18	24	3	52	43	7	15
95th Queue (ft)	29	135	145	28	110	71	80	23	109	91	27	42
Link Distance (ft)		1271	1271			1266	1266			345		357
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	260			200	350			80	220		50	
Storage Blk Time (%)			0				1				0	1
Queuing Penalty (veh)			0				0				0	0

Intersection: 6: OR 99W & Vittoria Way

Movement	EB	EB	EB	WB	SB
Directions Served	L	T	T	TR	LR
Maximum Queue (ft)	25	30	56	4	197
Average Queue (ft)	2	1	2	0	88
95th Queue (ft)	15	13	23	3	174
Link Distance (ft)		1266	1266	458	204
Upstream Blk Time (%)					4
Queuing Penalty (veh)					0
Storage Bay Dist (ft)	100				
Storage Blk Time (%)		0			
Queuing Penalty (veh)		0			

Intersection: 7: Providence Dr/Crestview Dr & OR 99W

Movement	EB	EB	EB	WB	WB	WB	NB	NB	SB
Directions Served	T	T	R	L	T	TR	LT	R	LTR
Maximum Queue (ft)	435	450	125	133	174	197	99	94	314
Average Queue (ft)	240	257	36	57	70	75	32	29	167
95th Queue (ft)	400	408	119	109	138	152	77	67	263
Link Distance (ft)	458	458			1777	1777	1122		1218
Upstream Blk Time (%)	0	0							
Queuing Penalty (veh)	0	1							
Storage Bay Dist (ft)			100	230				160	
Storage Blk Time (%)	17	19	0		0		0		
Queuing Penalty (veh)	0	13	0		0		0		

Intersection: 8: OR 99W & Benjamin Rd

Movement	EB	SB
Directions Served	L	LR
Maximum Queue (ft)	34	454
Average Queue (ft)	2	290
95th Queue (ft)	15	541
Link Distance (ft)		526
Upstream Blk Time (%)		17
Queuing Penalty (veh)		0
Storage Bay Dist (ft)	250	
Storage Blk Time (%)		
Queuing Penalty (veh)		

Network Summary

Network wide Queuing Penalty: 35

Intersection: 2: Libra St & Crestview Dr

Movement	WB	NB
Directions Served	LT	LR
Maximum Queue (ft)	33	40
Average Queue (ft)	2	19
95th Queue (ft)	16	45
Link Distance (ft)	476	243
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 3: Springbrook Rd & Haworth Ave/Shopping Center

Movement	EB	EB	WB	NB	NB	SB	SB
Directions Served	LT	R	LTR	L	TR	L	TR
Maximum Queue (ft)	95	123	134	113	138	90	161
Average Queue (ft)	45	59	63	47	60	32	64
95th Queue (ft)	77	97	108	88	105	67	112
Link Distance (ft)		441	194		432		267
Upstream Blk Time (%)			0				
Queuing Penalty (veh)			0				
Storage Bay Dist (ft)	90			90		90	
Storage Blk Time (%)	0	1		1	2	0	3
Queuing Penalty (veh)	1	2		1	2	0	2

Intersection: 4: Springbrook Rd & OR 99W

Movement	EB	EB	EB	EB	WB	WB	WB	WB	WB	NB	NB	NB
Directions Served	L	T	T	R	L	L	T	T	R	L	L	T
Maximum Queue (ft)	344	444	450	299	146	454	900	896	395	268	307	271
Average Queue (ft)	131	284	273	15	52	140	492	505	198	166	209	137
95th Queue (ft)	267	406	392	137	113	384	851	861	523	258	296	231
Link Distance (ft)		1827	1827				1270	1270				526
Upstream Blk Time (%)							1	1				
Queuing Penalty (veh)							6	8				
Storage Bay Dist (ft)	350			350	430	430			370	320	320	
Storage Blk Time (%)	0	2	2	0		0	11	18	0		0	0
Queuing Penalty (veh)	0	2	3	0		0	15	27	1		1	0

Intersection: 4: Springbrook Rd & OR 99W

Movement	NB	SB	SB	SB	SB
Directions Served	R	L	L	T	R
Maximum Queue (ft)	124	180	195	427	155
Average Queue (ft)	46	67	121	199	76
95th Queue (ft)	94	142	214	384	170
Link Distance (ft)				432	
Upstream Blk Time (%)				1	
Queuing Penalty (veh)				3	
Storage Bay Dist (ft)	320	170	170		130
Storage Blk Time (%)		0	1	23	0
Queuing Penalty (veh)		1	2	68	2

Intersection: 5: Brutscher St & OR 99W

Movement	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	SB	SB
Directions Served	L	T	T	R	L	T	T	R	L	TR	L	TR
Maximum Queue (ft)	70	386	423	225	374	790	744	105	245	372	71	127
Average Queue (ft)	23	184	200	60	297	485	482	15	212	227	15	36
95th Queue (ft)	57	345	375	199	439	1292	1292	67	288	460	47	88
Link Distance (ft)		1270	1270			1264	1264			345		357
Upstream Blk Time (%)						3	3			28		
Queuing Penalty (veh)						23	27			0		
Storage Bay Dist (ft)	260			200	350			80	220		50	
Storage Blk Time (%)		2	7	0	29	4	19	0	42	0	1	9
Queuing Penalty (veh)		1	7	0	214	8	8	0	63	1	1	2

Intersection: 6: OR 99W & Vittoria Way

Movement	EB	WB	WB	SB
Directions Served	L	T	TR	LR
Maximum Queue (ft)	70	194	210	186
Average Queue (ft)	25	64	67	73
95th Queue (ft)	63	301	311	182
Link Distance (ft)		454	454	209
Upstream Blk Time (%)		1	2	7
Queuing Penalty (veh)		13	15	0
Storage Bay Dist (ft)	100			
Storage Blk Time (%)	0			
Queuing Penalty (veh)	0			

Intersection: 7: Providence Dr/Crestview Dr & OR 99W

Movement	EB	EB	EB	WB	WB	WB	NB	NB	SB
Directions Served	T	T	R	L	T	TR	LT	R	LTR
Maximum Queue (ft)	257	255	59	215	612	610	214	164	282
Average Queue (ft)	105	113	3	81	236	244	99	59	152
95th Queue (ft)	202	207	27	170	780	781	187	128	250
Link Distance (ft)	454	454			1780	1780	301		852
Upstream Blk Time (%)					0		0		
Queuing Penalty (veh)					0		0		
Storage Bay Dist (ft)			100	230				160	
Storage Blk Time (%)	8	10	0		5		3	0	
Queuing Penalty (veh)	0	1	0		4		3	0	

Intersection: 8: OR 99W & Benjamin Rd

Movement	EB	WB	WB	SB
Directions Served	L	T	TR	LR
Maximum Queue (ft)	100	16	43	541
Average Queue (ft)	32	1	3	512
95th Queue (ft)	74	12	21	594
Link Distance (ft)		746	746	526
Upstream Blk Time (%)				87
Queuing Penalty (veh)				0
Storage Bay Dist (ft)	250			
Storage Blk Time (%)				
Queuing Penalty (veh)				

Network Summary

Network wide Queuing Penalty: 538

Intersection: 2: Libra St & Crestview Dr

Movement	WB	NB
Directions Served	LT	LR
Maximum Queue (ft)	39	58
Average Queue (ft)	2	11
95th Queue (ft)	16	41
Link Distance (ft)	400	217
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 3: Springbrook Rd & Haworth Ave/Shopping Center

Movement	EB	EB	WB	NB	NB	SB	SB
Directions Served	LT	R	LTR	L	TR	L	TR
Maximum Queue (ft)	74	90	67	86	94	47	119
Average Queue (ft)	34	47	32	32	37	11	51
95th Queue (ft)	58	75	58	63	69	37	87
Link Distance (ft)		420	165		443		183
Upstream Blk Time (%)							
Queuing Penalty (veh)							
Storage Bay Dist (ft)	90			90		90	
Storage Blk Time (%)	0	0		0	0	0	1
Queuing Penalty (veh)	0	0		0	0	0	0

Intersection: 4: Springbrook Rd & OR 99W

Movement	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	NB	NB
Directions Served	L	T	T	R	L	L	T	T	L	L	T	R
Maximum Queue (ft)	152	526	518	150	82	102	192	187	157	204	208	146
Average Queue (ft)	33	270	267	13	26	50	91	92	44	112	94	44
95th Queue (ft)	96	456	459	126	67	88	159	156	136	183	171	103
Link Distance (ft)		2201	2201				1271	1271			526	
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	350			350	430	430			320	320		320
Storage Blk Time (%)		4	4	0								
Queuing Penalty (veh)		2	4	0								

Intersection: 4: Springbrook Rd & OR 99W

Movement	SB	SB	SB	SB
Directions Served	L	L	T	R
Maximum Queue (ft)	158	188	258	139
Average Queue (ft)	63	102	91	37
95th Queue (ft)	135	168	175	93
Link Distance (ft)			443	
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)	170	170		130
Storage Blk Time (%)	0	0	4	0
Queuing Penalty (veh)	0	0	13	0

Intersection: 5: Brutscher St & OR 99W

Movement	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	SB	SB
Directions Served	L	T	T	R	L	T	T	R	L	TR	L	TR
Maximum Queue (ft)	60	227	210	80	169	103	101	56	133	143	51	86
Average Queue (ft)	10	70	79	8	72	12	20	3	56	49	8	19
95th Queue (ft)	36	175	179	44	144	58	72	25	119	108	29	66
Link Distance (ft)		1271	1271			1266	1266			345		357
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	260			200	350			80	220		50	
Storage Blk Time (%)		0	1	0			1	0			0	2
Queuing Penalty (veh)		0	0	0			0	0			0	0

Intersection: 6: OR 99W & Vittoria Way

Movement	EB	EB	EB	SB
Directions Served	L	T	T	LR
Maximum Queue (ft)	18	108	129	194
Average Queue (ft)	1	9	11	125
95th Queue (ft)	12	59	68	239
Link Distance (ft)		1266	1266	204
Upstream Blk Time (%)				25
Queuing Penalty (veh)				0
Storage Bay Dist (ft)	100			
Storage Blk Time (%)		0		
Queuing Penalty (veh)		0		

Intersection: 7: Providence Dr & OR 99W

Movement	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	NB	SB
Directions Served	L	T	T	R	L	T	T	R	L	T	R	L
Maximum Queue (ft)	93	455	463	125	151	230	240	48	84	49	74	223
Average Queue (ft)	23	283	302	31	60	116	111	12	26	9	32	165
95th Queue (ft)	66	438	457	111	118	209	215	38	69	35	67	237
Link Distance (ft)		446	446			1773	1773			820		
Upstream Blk Time (%)		0	1									
Queuing Penalty (veh)		4	7									
Storage Bay Dist (ft)	100			100	230			230	160		160	200
Storage Blk Time (%)	0	21	23	0		0	0					9
Queuing Penalty (veh)	2	5	15	0		0	0					8

Intersection: 7: Providence Dr & OR 99W

Movement	SB	SB
Directions Served	T	R
Maximum Queue (ft)	318	102
Average Queue (ft)	56	25
95th Queue (ft)	236	66
Link Distance (ft)	1100	
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		200
Storage Blk Time (%)	0	
Queuing Penalty (veh)	0	

Intersection: 8: OR 99W & Benjamin Rd

Movement	EB	SB
Directions Served	L	LR
Maximum Queue (ft)	32	502
Average Queue (ft)	2	401
95th Queue (ft)	15	642
Link Distance (ft)		526
Upstream Blk Time (%)		33
Queuing Penalty (veh)		0
Storage Bay Dist (ft)	250	
Storage Blk Time (%)		
Queuing Penalty (veh)		

Network Summary

Network wide Queuing Penalty: 62

Intersection: 2: Libra St & Crestview Dr

Movement	WB	NB
Directions Served	LT	LR
Maximum Queue (ft)	42	40
Average Queue (ft)	3	15
95th Queue (ft)	20	41
Link Distance (ft)	476	243
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 3: Springbrook Rd & Haworth Ave/Shopping Center

Movement	EB	EB	WB	NB	NB	SB	SB
Directions Served	LT	R	LTR	L	TR	L	TR
Maximum Queue (ft)	95	122	113	93	94	58	104
Average Queue (ft)	42	57	60	50	41	30	56
95th Queue (ft)	72	97	93	86	75	53	88
Link Distance (ft)		441	194		432		267
Upstream Blk Time (%)							
Queuing Penalty (veh)							
Storage Bay Dist (ft)	90			90		90	
Storage Blk Time (%)	0	1		0	0	0	1
Queuing Penalty (veh)	0	2		1	0	0	0

Intersection: 4: Springbrook Rd & OR 99W

Movement	EB	EB	EB	EB	WB	WB	WB	WB	WB	NB	NB	NB
Directions Served	L	T	T	R	L	L	T	T	R	L	L	T
Maximum Queue (ft)	351	449	429	300	150	454	680	695	395	264	303	271
Average Queue (ft)	114	296	293	21	66	158	458	471	117	155	203	132
95th Queue (ft)	255	416	408	161	132	408	641	658	413	232	278	229
Link Distance (ft)		1902	1902				1270	1270				526
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	350			350	430	430			370	320	320	
Storage Blk Time (%)		3	3	0		0	9	19	0		0	
Queuing Penalty (veh)		3	3	0		0	14	15	0		0	

Intersection: 4: Springbrook Rd & OR 99W

Movement	NB	SB	SB	SB	SB
Directions Served	R	L	L	T	R
Maximum Queue (ft)	155	169	195	413	155
Average Queue (ft)	52	78	127	202	72
95th Queue (ft)	115	150	216	377	170
Link Distance (ft)				432	
Upstream Blk Time (%)				0	
Queuing Penalty (veh)				3	
Storage Bay Dist (ft)	320	170	170		130
Storage Blk Time (%)		0	0	25	0
Queuing Penalty (veh)		0	1	75	1

Intersection: 5: Brutscher St & OR 99W

Movement	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	SB	SB
Directions Served	L	T	T	R	L	T	T	R	L	TR	L	TR
Maximum Queue (ft)	192	369	394	225	340	550	548	105	244	364	47	82
Average Queue (ft)	26	179	193	53	212	300	306	19	176	112	12	25
95th Queue (ft)	103	339	353	177	369	529	512	76	265	279	37	61
Link Distance (ft)		1270	1270			1264	1264			345		357
Upstream Blk Time (%)										1		
Queuing Penalty (veh)										0		
Storage Bay Dist (ft)	260			200	350			80	220		50	
Storage Blk Time (%)		2	5	0	8	2	23	0	9		1	3
Queuing Penalty (veh)		1	6	0	59	5	9	0	14		1	1

Intersection: 6: OR 99W & Vittoria Way

Movement	EB	WB	WB	SB
Directions Served	L	T	TR	LR
Maximum Queue (ft)	83	5	72	146
Average Queue (ft)	30	0	2	48
95th Queue (ft)	69	3	43	115
Link Distance (ft)		447	447	209
Upstream Blk Time (%)				1
Queuing Penalty (veh)				0
Storage Bay Dist (ft)	100			
Storage Blk Time (%)	1			
Queuing Penalty (veh)	4			

Intersection: 7: Providence Dr/Crestview Dr & OR 99W

Movement	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	NB	SB
Directions Served	L	T	T	R	L	T	T	R	L	T	R	L
Maximum Queue (ft)	123	180	170	84	255	571	582	255	182	196	119	224
Average Queue (ft)	78	63	60	6	94	319	323	100	95	32	54	160
95th Queue (ft)	131	148	134	41	212	535	543	279	163	98	103	241
Link Distance (ft)		447	447			1773	1773			1329		
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	100			100	230			230	160		160	200
Storage Blk Time (%)	14	2	2	0		13	13	0	3			11
Queuing Penalty (veh)	83	2	1	0		11	22	0	4			6

Intersection: 7: Providence Dr/Crestview Dr & OR 99W

Movement	SB	SB
Directions Served	T	R
Maximum Queue (ft)	376	108
Average Queue (ft)	54	25
95th Queue (ft)	237	71
Link Distance (ft)	1119	
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		200
Storage Blk Time (%)	0	
Queuing Penalty (veh)	0	

Intersection: 8: OR 99W & Benjamin Rd

Movement	EB	WB	SB
Directions Served	L	TR	LR
Maximum Queue (ft)	78	14	545
Average Queue (ft)	26	1	523
95th Queue (ft)	68	7	589
Link Distance (ft)		746	526
Upstream Blk Time (%)			90
Queuing Penalty (veh)			0
Storage Bay Dist (ft)	250		
Storage Blk Time (%)			
Queuing Penalty (veh)			

Network Summary

Network wide Queuing Penalty: 348

Intersection: 7: Providence Dr & OR 99W

Movement	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	NB	SB
Directions Served	L	T	T	R	L	T	T	R	L	T	R	L
Maximum Queue (ft)	125	461	466	125	159	288	276	207	91	62	103	224
Average Queue (ft)	71	296	313	27	62	151	150	24	31	19	38	176
95th Queue (ft)	130	479	491	99	120	252	257	99	74	49	79	244
Link Distance (ft)		445	445			1774	1774			1117		
Upstream Blk Time (%)		1	1									
Queuing Penalty (veh)		6	10									
Storage Bay Dist (ft)	100			100	230			230	160		160	200
Storage Blk Time (%)	8	21	24	0		1	1	0				11
Queuing Penalty (veh)	64	15	16	0		1	1	0				14

Intersection: 7: Providence Dr & OR 99W

Movement	SB	SB
Directions Served	T	R
Maximum Queue (ft)	419	146
Average Queue (ft)	83	35
95th Queue (ft)	308	90
Link Distance (ft)	1221	
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		200
Storage Blk Time (%)		0
Queuing Penalty (veh)		0

Intersection: 7: Providence Dr/Crestview Dr & OR 99W

Movement	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	NB	SB
Directions Served	L	T	T	R	L	T	T	R	L	T	R	L
Maximum Queue (ft)	124	302	273	83	254	894	891	255	160	125	146	225
Average Queue (ft)	102	111	95	6	111	470	473	131	81	31	53	174
95th Queue (ft)	147	245	204	36	248	965	968	312	140	84	106	253
Link Distance (ft)		446	446			1774	1774			951		
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	100			100	230			230	160		160	200
Storage Blk Time (%)	32	3	5	0	0	20	20	0	1		0	17
Queuing Penalty (veh)	181	4	2	0	0	16	41	1	1		0	23

Intersection: 7: Providence Dr/Crestview Dr & OR 99W

Movement	SB	SB
Directions Served	T	R
Maximum Queue (ft)	464	183
Average Queue (ft)	108	65
95th Queue (ft)	362	134
Link Distance (ft)	980	
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		200
Storage Blk Time (%)		
Queuing Penalty (veh)		

Appendix K
Year 2020 Phase II Sensitivity Analysis Level of Service Worksheets

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	69	1536	67	73	1019	92	35	22	63	246	27	96
Future Volume (vph)	69	1536	67	73	1019	92	35	22	63	246	27	96
Ideal Flow (vphpl)	1750	1750	1750	1750	1800	1750	1750	1750	1750	1750	1750	1750
Grade (%)		-3%			2%			3%			2%	
Total Lost time (s)	6.0	6.0	6.0	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1607	3214	1480	1614	3135	1402	1590	1642	1465	1567	1650	1402
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.74	1.00	1.00	0.74	1.00	1.00
Satd. Flow (perm)	1607	3214	1480	1614	3135	1402	1236	1642	1465	1224	1650	1402
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	75	1670	73	79	1108	100	38	24	68	267	29	104
RTOR Reduction (vph)	0	0	24	0	0	44	0	0	52	0	0	79
Lane Group Flow (vph)	75	1670	49	79	1108	56	38	24	16	267	29	25
Heavy Vehicles (%)	5%	5%	2%	2%	8%	5%	3%	5%	0%	5%	5%	5%
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Perm	NA	Perm	Perm	NA	Perm
Protected Phases	5	2		1	6			8			4	
Permitted Phases			2			6	8		8	4		4
Actuated Green, G (s)	9.2	68.2	68.2	7.9	66.9	66.9	28.9	28.9	28.9	28.9	28.9	28.9
Effective Green, g (s)	9.2	68.2	68.2	7.9	66.9	66.9	28.9	28.9	28.9	28.9	28.9	28.9
Actuated g/C Ratio	0.08	0.57	0.57	0.07	0.56	0.56	0.24	0.24	0.24	0.24	0.24	0.24
Clearance Time (s)	6.0	6.0	6.0	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Vehicle Extension (s)	4.0	5.0	5.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Grp Cap (vph)	123	1826	841	106	1747	781	297	395	352	294	397	337
v/s Ratio Prot	0.05	c0.52		c0.05	0.35			0.01			0.02	
v/s Ratio Perm			0.03			0.04	0.03		0.01	c0.22		0.02
v/c Ratio	0.61	0.91	0.06	0.75	0.63	0.07	0.13	0.06	0.05	0.91	0.07	0.07
Uniform Delay, d1	53.7	23.3	11.6	55.1	18.2	12.2	35.7	35.1	35.0	44.3	35.2	35.2
Progression Factor	0.86	1.55	1.93	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	7.2	6.7	0.1	25.8	1.8	0.2	0.3	0.1	0.1	30.1	0.1	0.1
Delay (s)	53.2	42.9	22.4	80.9	19.9	12.4	35.9	35.2	35.0	74.4	35.3	35.3
Level of Service	D	D	C	F	B	B	D	D	D	E	D	D
Approach Delay (s)		42.5			23.1			35.3			61.4	
Approach LOS		D			C			D			E	

Intersection Summary			
HCM 2000 Control Delay	37.4	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.90		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	15.0
Intersection Capacity Utilization	84.5%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

HCS 2010 Roundabouts Report

General Information		Site Information	
Analyst	ZHB	Intersection	Crestview/East-West Connector
Agency or Co.	KAI	E/W Street Name	East-West Connector
Date Performed	10/21/2017	N/S Street Name	Crestview Dr
Analysis Year	2020	Analysis Time Period (hrs)	0.25
Time Period	Total AM Phase II Sensitivity Analysis	Peak Hour Factor	0.92
Project Description	Crestview Crossing	Jurisdiction	

Volume Adjustments and Site Characteristics

Approach	EB				WB				NB				SB			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Number of Lanes (N)	0	0	1	0	0	0	1	0	0	0	1	0	0	0	1	0
Lane Assignment			LTR				LTR				LTR				LTR	
Volume (V), veh/h	0	14	0	32	0	77	0	35	0	11	89	83	0	37	260	5
Percent Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	5	0	0	0	5	0
Flow Rate (v_{PCE}), pc/h	0	15	0	35	0	84	0	38	0	12	102	90	0	40	297	5
Right-Turn Bypass	None				None				None				None			
Conflicting Lanes	1				1				1				1			
Pedestrians Crossing, p/h	0				0				0				0			

Critical and Follow-Up Headway Adjustment

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Critical Headway (s)		4.9734			4.9734			4.9734			4.9734	
Follow-Up Headway (s)		2.6087			2.6087			2.6087			2.6087	

Flow Computations, Capacity and v/c Ratios

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Entry Flow (v_e), pc/h		50			122			204			342	
Entry Volume veh/h		50			122			199			328	
Circulating Flow (v_c), pc/h	421			129			55			96		
Exiting Flow (v_{ex}), pc/h	130			17			155			416		
Capacity (c_{pce}), pc/h		899			1210			1305			1251	
Capacity (c), veh/h		899			1210			1274			1200	
v/c Ratio (x)		0.06			0.10			0.16			0.27	

Delay and Level of Service

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Lane Control Delay (d), s/veh		4.5			3.8			4.1			5.5	
Lane LOS		A			A			A			A	
95% Queue, veh		0.2			0.3			0.6			1.1	
Approach Delay, s/veh	4.5			3.8			4.1			5.5		
Approach LOS	A			A			A			A		
Intersection Delay, s/veh | LOS	4.7						A					

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	130	1136	32	79	1745	206	114	35	116	222	19	116
Future Volume (vph)	130	1136	32	79	1745	206	114	35	116	222	19	116
Ideal Flow (vphpl)	1750	1750	1750	1750	1800	1750	1750	1750	1750	1750	1750	1750
Grade (%)		-3%			2%			3%			2%	
Total Lost time (s)	6.0	6.0	6.0	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00	0.98	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1654	3184	1479	1646	3256	1444	1621	1690	1465	1614	1699	1444
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.74	1.00	1.00	0.73	1.00	1.00
Satd. Flow (perm)	1654	3184	1479	1646	3256	1444	1270	1690	1465	1245	1699	1444
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	138	1209	34	84	1856	219	121	37	123	236	20	123
RTOR Reduction (vph)	0	0	14	0	0	59	0	0	98	0	0	98
Lane Group Flow (vph)	138	1209	20	84	1856	160	121	37	25	236	20	25
Confl. Bikes (#/hr)			1									
Heavy Vehicles (%)	2%	6%	0%	0%	4%	2%	1%	2%	0%	2%	2%	2%
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Perm	NA	Perm	Perm	NA	Perm
Protected Phases	5	2		1	6			8			4	
Permitted Phases			2			6	8		8	4		4
Actuated Green, G (s)	13.0	83.8	83.8	12.3	83.1	83.1	28.9	28.9	28.9	28.9	28.9	28.9
Effective Green, g (s)	13.0	83.8	83.8	12.3	83.1	83.1	28.9	28.9	28.9	28.9	28.9	28.9
Actuated g/C Ratio	0.09	0.60	0.60	0.09	0.59	0.59	0.21	0.21	0.21	0.21	0.21	0.21
Clearance Time (s)	6.0	6.0	6.0	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Vehicle Extension (s)	4.0	5.0	5.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Grp Cap (vph)	153	1905	885	144	1932	857	262	348	302	257	350	298
v/s Ratio Prot	c0.08	0.38		0.05	c0.57			0.02			0.01	
v/s Ratio Perm			0.01			0.11	0.10		0.02	c0.19		0.02
v/c Ratio	0.90	0.63	0.02	0.58	0.96	0.19	0.46	0.11	0.08	0.92	0.06	0.09
Uniform Delay, d1	62.9	18.2	11.4	61.4	26.9	13.0	48.7	45.1	44.9	54.4	44.6	44.9
Progression Factor	1.29	0.13	0.01	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	37.7	1.2	0.0	7.0	13.1	0.5	1.8	0.2	0.2	35.2	0.1	0.2
Delay (s)	118.6	3.6	0.2	68.3	40.0	13.5	50.5	45.3	45.0	89.6	44.7	45.0
Level of Service	F	A	A	E	D	B	D	D	D	F	D	D
Approach Delay (s)		15.0			38.4			47.4			72.7	
Approach LOS		B			D			D			E	

Intersection Summary			
HCM 2000 Control Delay	34.4	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.94		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	15.0
Intersection Capacity Utilization	91.3%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

HCS 2010 Roundabouts Report

General Information		Site Information	
Analyst	ZHB	Intersection	Crestview/East-West Connector
Agency or Co.	KAI	E/W Street Name	East-West Connector
Date Performed	10/21/2017	N/S Street Name	Crestview Dr
Analysis Year	2020	Analysis Time Period (hrs)	0.25
Time Period	Total PM Phase II Sensitivity Analysis	Peak Hour Factor	0.94
Project Description	Crestview Crossing	Jurisdiction	

Volume Adjustments and Site Characteristics

Approach	EB				WB				NB				SB			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Number of Lanes (N)	0	0	1	0	0	0	1	0	0	0	1	0	0	0	1	0
Lane Assignment			LTR				LTR				LTR				LTR	
Volume (V), veh/h	0	6	10	14	0	142	10	39	0	29	197	145	0	43	201	12
Percent Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	2	0	0	0	2	0
Flow Rate (v_{PCE}), pc/h	0	6	11	15	0	151	11	41	0	31	214	154	0	46	218	13
Right-Turn Bypass	None				None				None				None			
Conflicting Lanes	1				1				1				1			
Pedestrians Crossing, p/h	0				0				0				0			

Critical and Follow-Up Headway Adjustment

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Critical Headway (s)		4.9734			4.9734			4.9734			4.9734	
Follow-Up Headway (s)		2.6087			2.6087			2.6087			2.6087	

Flow Computations, Capacity and v/c Ratios

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Entry Flow (v_e), pc/h		32			203			399			277	
Entry Volume veh/h		32			203			395			273	
Circulating Flow (v_c), pc/h	415			251			63			193		
Exiting Flow (v_{ex}), pc/h	211			55			261			384		
Capacity (c_{pce}), pc/h		904			1069			1294			1134	
Capacity (c), veh/h		904			1069			1281			1116	
v/c Ratio (x)		0.04			0.19			0.31			0.24	

Delay and Level of Service

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Lane Control Delay (d), s/veh		4.3			5.1			5.6			5.5	
Lane LOS		A			A			A			A	
95% Queue, veh		0.1			0.7			1.3			1.0	
Approach Delay, s/veh	4.3			5.1			5.6			5.5		
Approach LOS	A			A			A			A		
Intersection Delay, s/veh | LOS	5.4						A					

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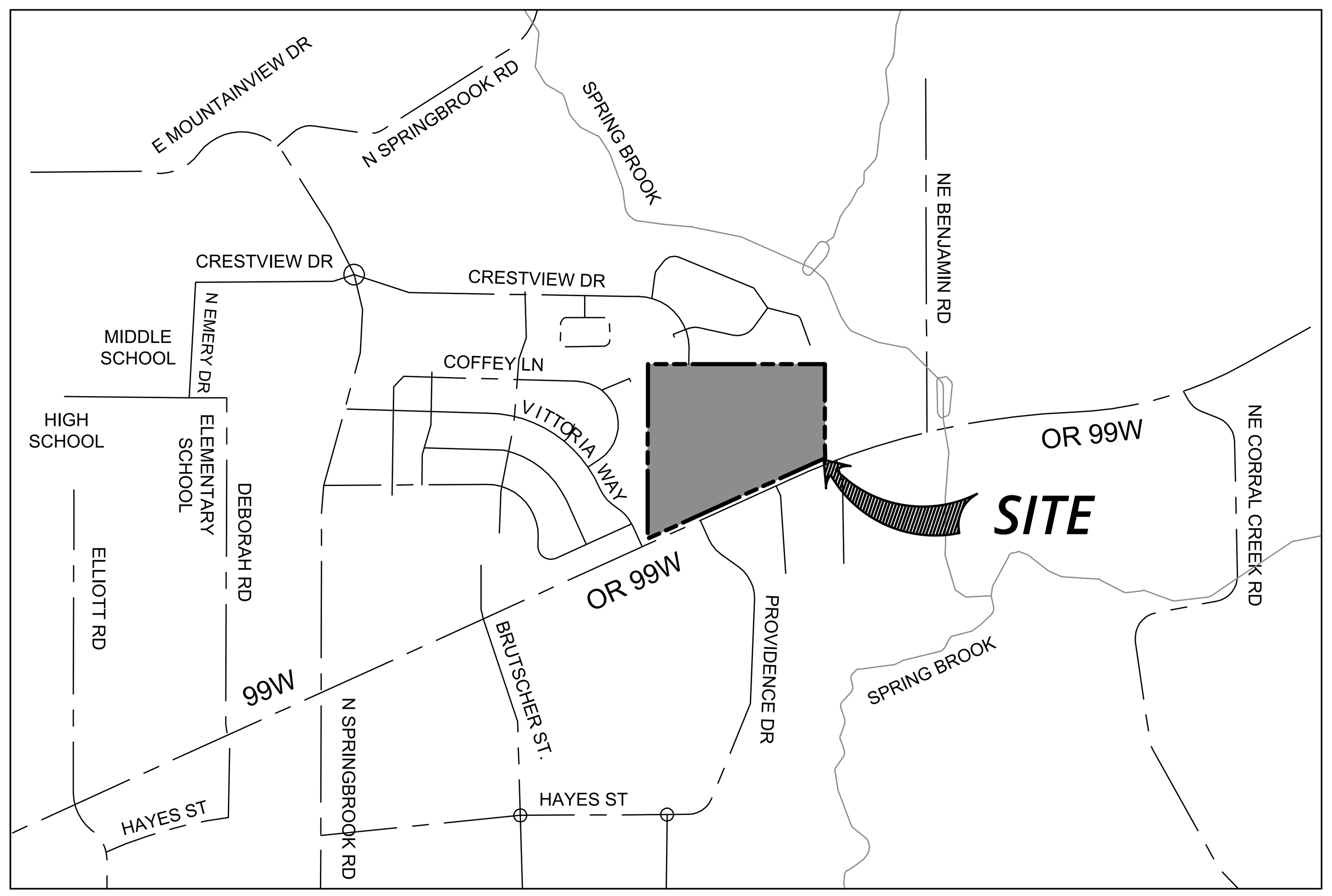
LAND USE DOCUMENTS

FOR

CRESTVIEW CROSSING PLANNED UNIT DEVELOPMENT

PREPARED FOR

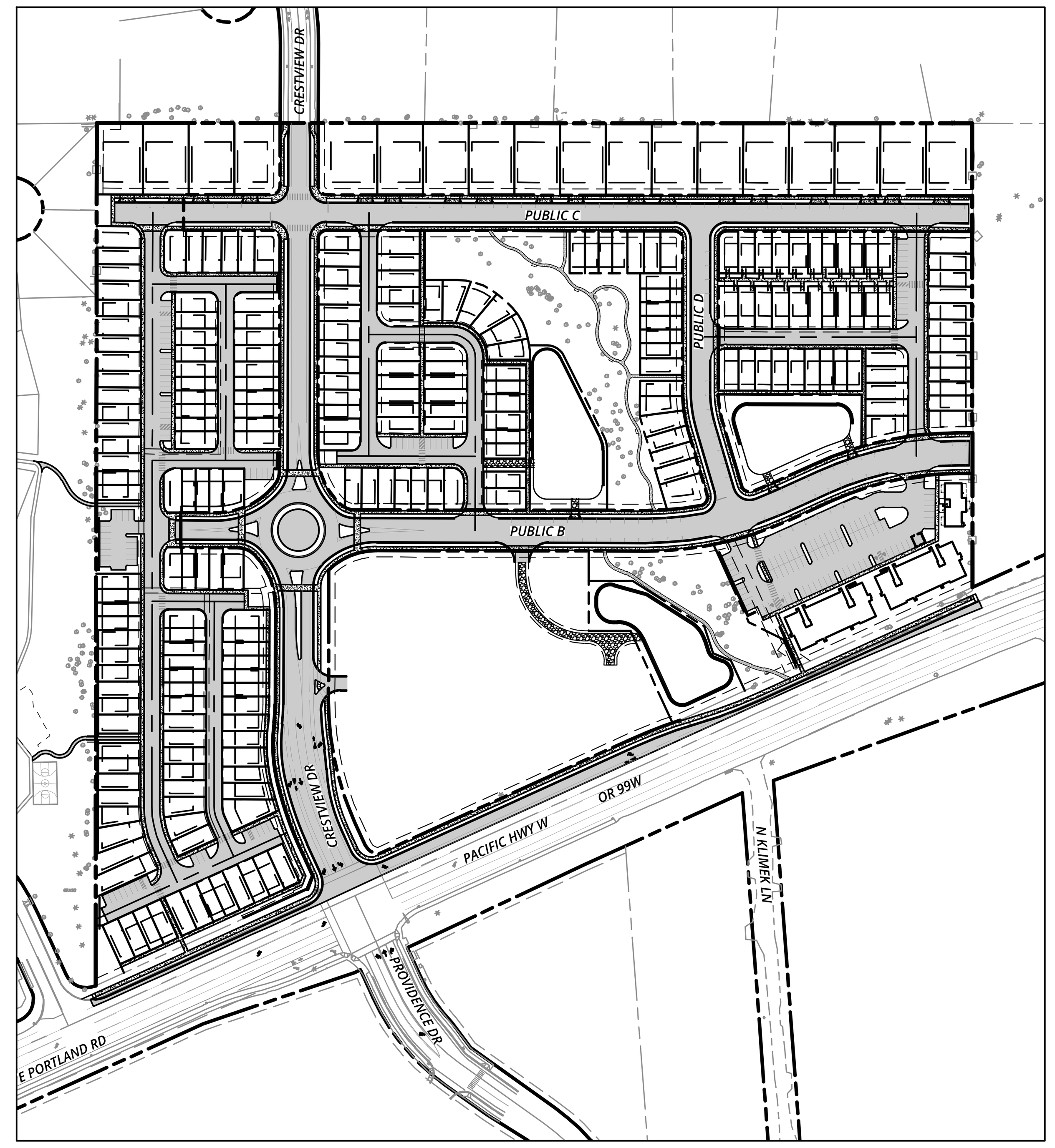
JT SMITH COMPANIES



VICINITY MAP

NOT TO SCALE

N W E S



SITE MAP

SCALE: 1" = 200'

0 200 400

N W E S

PROJECT TEAM

OWNER/APPLICANT
JT SMITH COMPANIES
5285 MEADOWS ROAD, SUITE 171
LAKE OSWEGO, OR 97035
CONTACT: JESSE NEMEC
PHONE: (503) 730-8620
EMAIL: jnemec@jtsmithco.com

CIVIL ENGINEER
3J CONSULTING, INC.
5075 SW GRIFFITH DRIVE, SUITE 150
BEAVERTON, OR 97005
CONTACT: ASHLEY SEAL, PE
PHONE: (503) 946-9365
EMAIL: ashley.seal@3j-consulting.com

PLANNING CONSULTANT
3J CONSULTING, INC
5075 SW GRIFFITH DRIVE, SUITE 150
BEAVERTON, OR 97005
CONTACT: ANDREW TULL
PHONE: (503) 946-9365
EMAIL: andrew.tull@3j-consulting.com

LANDSCAPE ARCHITECT
CARDNO, INC.
6720 SW MACADAM AVE, SUITE 200
PORTLAND, OR 97219
CONTACT: ANDREW HILL
PHONE: (503) 419-2500
EMAIL: andrew.hill@cardno.com

TAX LOTS 13800 AND 01100 LOCATED IN THE
NE 1/4 OF SECTION 16, T.3S., R.2W., W.M.
CITY OF NEWBURG, YAMHILL COUNTY, OREGON

SHEET LIST TABLE

SHEET NUMBER	SHEET TITLE
C000	COVER SHEET
C100	EXISTING CONDITIONS PLAN
C110	TREE REMOVAL AND PRESERVATION PLAN
C120	1200C COVER SHEET
C121	1200C CLEARING AND DEMOLITION ESCP I
C122	1200C GRADING AND STREET CONSTRUCTION ESCP I
C123	1200C DETAILS I
C124	1200C DETAILS II
C150	OVERALL TENTATIVE PLAT
C151	TENTATIVE PLAT I
C152	TENTATIVE PLAT II
C153	TENTATIVE PLAT III
C154	TENTATIVE PLAT IV
C200	TYPICAL SECTIONS I
C201	TYPICAL SECTIONS II
C210	OVERALL SITE PLAN
C215	MULTI-FAMILY SITE PLAN
C218	MULTI- FAMILY GRADING PLAN
C220	ACCESS, PARKING, AND CIRCULATION PLAN
C230	FIRE ACCESS PLAN
C290	PHOTOMETRICS PLAN
C291	MULTI-FAMILY PHOTOMETRICS PLAN
C300	COMPOSITE UTILITY PLAN
C301	OFFSITE SEWER CONNECTION
C302	PRELIMINARY STREET LIGHT CONDUIT ROUTING PLAN
C303	MULTI-FAMILY COMPOSITE UTILITY PLAN
LS 2.0	LS 2.0 STREET TREE PLAN
LS 2.1	LS 2.1 PLANTING PLAN
LS 2.2	LS 2.2 PLANTING PLAN
LS 2.3	LS 2.3 PLANTING PLAN
LS 2.4	LS 2.4 PLANTING PLAN

SITE INFORMATION

SITE ADDRESS
4505 E PORTLAND RD
NEWBERG, OR 97132

TAX LOT(S)
3S2W16 13800, 1100

FLOOD HAZARD
MAP NUMBER: 41071C0241D AND
41071C0235D ZONE X (UNSHADED)

JURISDICTION
CITY OF NEWBURG

ZONING
R-1, R-2, AND C-2

GROSS SITE AREA
33.13 ACRES

UTILITIES & SERVICES

STORM, SEWER
CITY OF NEWBERG

WATER
CITY OF NEWBERG

POWER
PGE

GAS
NORTHWEST NATURAL GAS

CABLE
COMCAST, VERIZON

FIRE
TUALATIN VALLEY FIRE & RESCUE

SCHOOLS
NEWBERG OREGON SCHOOL DISTRICT

PARKS
CHEHALEM

POLICE
NEWBERG POLICE DEPARTMENT

ROADS
CITY OF NEWBERG, ODOT

ALL WORK PERFORMED SHALL CONFORM TO ALL STANDARD SPECIFICATIONS FOUND WITHIN THE LATEST VERSION OF THE CITY OF NEWBURG'S PUBLIC WORKS DESIGN AND CONSTRUCTION STANDARDS,

811 Know what's below. Call before you dig.

REGISTERED PROFESSIONAL ENGINEER 87762PE OREGON ASHLEY ROCHELLE SEAL
PRELIMINARY
EXPIRES: 06/30/20

PUBLISH DATE
06.06.2018

ISSUED FOR
LAND USE DOCUMENTS

COVER SHEET
CRESTVIEW CROSSING PLANNED UNIT DEVELOPMENT
JT SMITH COMPANIES
NEWBERG, OR

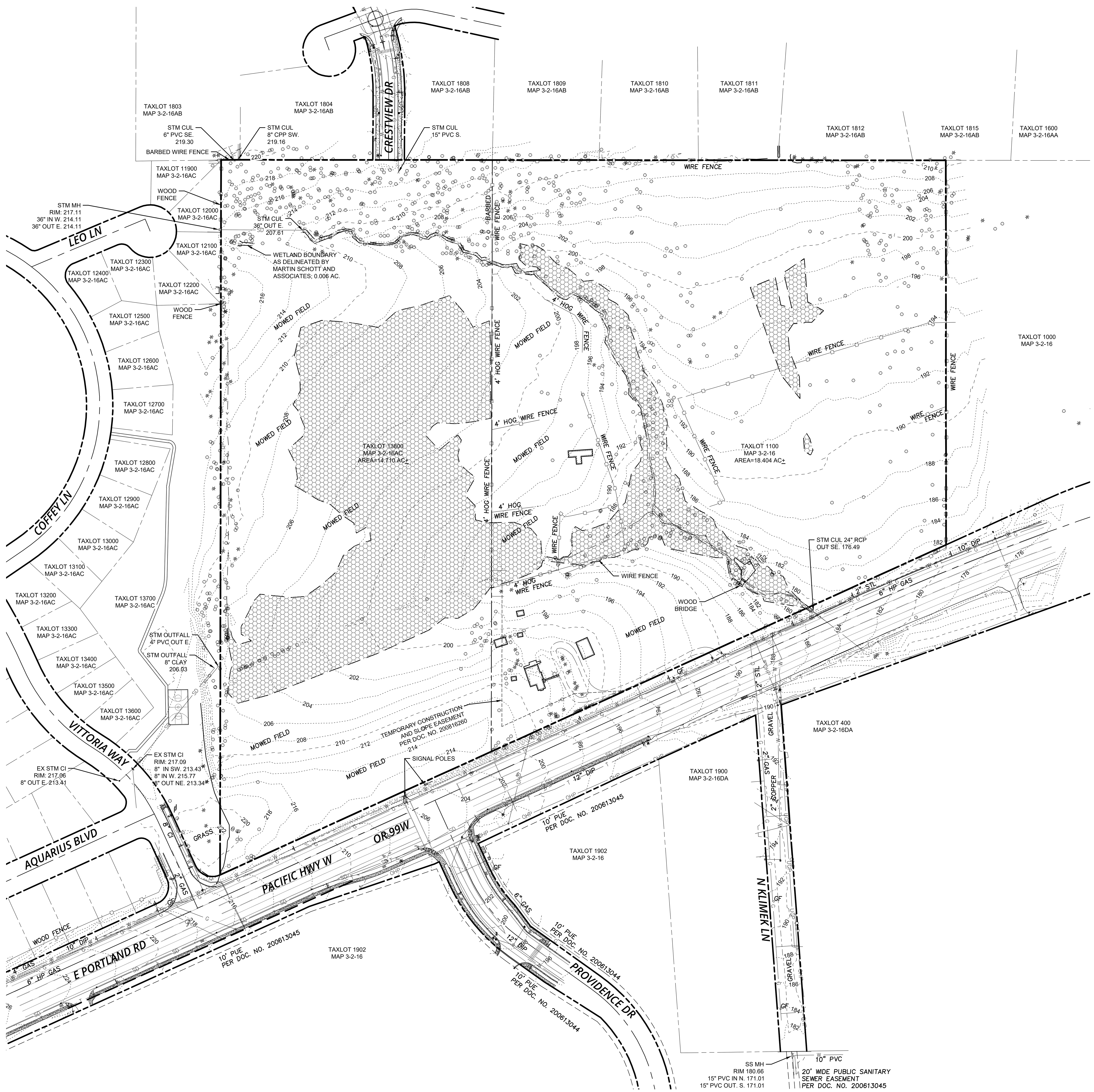
3J CONSULTING
CIVIL ENGINEERING
WATER RESOURCES
LAND USE PLANNING
5075 SW GRIFFITH DRIVE, SUITE 150; BEAVERTON, OR 97005

PROJECT INFORMATION

3J PROJECT #	17393
TAX LOT(S)	3S2W16 13800, 1100
LAND USE #	N/A
DESIGNED BY	ARS, JEJ, BMO
CHECKED BY	AJM, RGW

SHEET NUMBER
C000

P:\17393-JTS-CRESTVIEW CROSSING\CAD\DD\C000 COVER SHEET.DWG



EXISTING LEGEND

- EXISTING BUILDING
- PROJECT BOUNDARY
- RIGHT-OF-WAY LINE
- RIGHT-OF-WAY CENTERLINE
- EASEMENT LINE
- EXISTING LOT LINE
- EXISTING ADJACENT PROPERTY LINE
- EXISTING CONCRETE
- EXISTING WETLAND
- EXISTING CURB
- EXISTING FENCE LINE
- EXISTING STRIPING: WHITE
- EXISTING STRIPING: YELLOW
- EXISTING TELECOM. LINE
- EXISTING GAS LINE
- EXISTING OVERHEAD POWER
- EXISTING SANITARY SEWER
- EXISTING STORM SEWER
- EXISTING WATER MAIN
- EXISTING MAJOR CONTOUR
- EXISTING MINOR CONTOUR
- EXISTING INTERSECTION SIGNAL
- EXISTING MAILBOX
- EXISTING LIGHTPOLE
- EXISTING UTILITY POLE
- EXISTING CONIFEROUS TREE
- EXISTING DECIDUOUS TREE
- EXISTING SIGN
- EXISTING SANITARY MANHOLE
- EXISTING STORM MANHOLE
- EXISTING STORM INLET
- EXISTING POWER METER
- EXISTING GAS METER
- EXISTING TELEPHONE PEDESTAL

SURVEYOR'S NOTES:

1. WETLAND BOUNDARIES SHOWN WERE DELINEATED BY MARTIN SCHOTT AND ASSOCIATES AND WERE SURVEYED BY AKS ENGINEERING AND FORESTRY, LLC. THE WEEK OF 03/11/13 TO 03/14/13. FIELD WORK WAS CONDUCTED 03/07/13 TO 03/14/13.
2. UTILITIES SHOWN ARE BASED ON UNDERGROUND UTILITY LOCATE MARKINGS PER UTILITY LOCATE TICKET NUMBERS 13163881 AND 14165137. THERE IS NO GUARANTEE THAT THE UNDERGROUND LOCATES REPRESENT THE ONLY UTILITIES IN THE AREA. CONTRACTORS ARE RESPONSIBLE FOR VERIFYING ALL EXISTING CONDITIONS PRIOR TO BEGINNING CONSTRUCTION.
3. FIELD WORK WAS CONDUCTED 08/06/13 TO 08/12/13 AND 07/07/14 TO 07/18/14.
4. DATUM: CITY OF NEWBERG (ESTABLISHED OCTOBER OF 1984 AND REVISED IN 2001)
   BM NO. 111 ELEVATION = 230.11 (NGVD 29)
   BENCHMARK LOCATION: BRASS DISK IN THE TOP OF CURB, CENTER OF THE NORTHEAST CURB RETURN AT THE CORNER OF AQUARIUS BLVD. AND MADRONNA DRIVE.
5. CONTOUR INTERVAL IS 2 FEET.

EXISTING CONDITIONS PLAN

THIS PLAN HAS BEEN PREPARED FOR ILLUSTRATIVE PURPOSES ONLY. SITE BACKGROUND INFORMATION AND FEATURES HAVE BEEN GENERATED FROM A COMBINATION OF SITE SURVEY FROM AKS ENGINEERING (SENT 07-07-2017), PUBLIC GIS DATA SOURCES, AERIAL PHOTOS, TAX ASSESSOR MAPS AND PHYSICAL SITE OBSERVATIONS. PROPOSED SITE FEATURES ARE PRELIMINARY IN NATURE AND SUBJECT TO CHANGE. NO WARRANTY OR GUARANTEE IS EXPRESSED OR IMPLIED.

ZONE X (UN-SHADED) THE SITE IS LOCATED WITHIN ZONE X (UN-SHADED) PER FLOOD INSURANCE RATE MAP (FIRM) COMMUNITY-PANEL NUMBER **41071C0241D AND 41071C0235D** FEMA'S DEFINITION OF ZONE X (UN-SHADED) IS AN AREA OF MINIMAL FLOOD HAZARD, USUALLY DEPICTED ON FIRMS AS ABOVE THE 500-YEAR FLOOD LEVEL. ZONE X IS THE AREA DETERMINED TO BE OUTSIDE THE 500-YEAR FLOOD AND PROTECTED BY LEVEE FROM 100-YEAR FLOOD. IN COMMUNITIES THAT PARTICIPATE IN THE NFIP, FLOOD INSURANCE IS AVAILABLE TO ALL PROPERTY OWNERS AND RENTERS IN THESE ZONES.

GENERAL NOTES:

WETLAND BOUNDARY DELINEATED BY MARTIN SCHOTT AND ASSOCIATES; SURVEYED BY AKS WEEK OF 3/11/13 - 3/14/13

Know what's below. Call before you dig.

PRELIMINARY
REGISTERED PROFESSIONAL ENGINEER
OREGON
ASHLEY ROCHELLE SEAL
EXPIRES: 06/30/20

PUBLISH DATE
06.06.2018
ISSUED FOR
LAND USE DOCUMENTS

EXISTING CONDITIONS PLAN
CRESTVIEW CROSSING
PLANNED UNIT DEVELOPMENT
JT SMITH COMPANIES
NEWBERG, OR

3J CONSULTING
CIVIL ENGINEERING
WATER RESOURCES
LAND USE PLANNING
5075 SW GRIFFITH DRIVE, SUITE 150; BEAVERTON, OR 97005

PROJECT INFORMATION

3J PROJECT #	17393
TAX LOT(S)	3S2W16 13800, 1100
LAND USE #	N/A
DESIGNED BY	ARS, JEJ, BMO
CHECKED BY	AJM, RGW

SHEET NUMBER
C100

P:\17393-JTS-CRESTVIEW CROSSING\CAD\DD\C100 EXISTING CONDITIONS AND DEMOLITION PLAN.DWG

LEGEND

- EXISTING CONIFEROUS TREE
- EXISTING DECIDUOUS TREE
- TREE TO BE REMOVED (848 TOTAL)

GENERAL TREE INVENTORY STATISTICS

TOTAL TREE INVENTORY (IN PROJECT LIMITS):	1,042 EA
TOTAL TREES RETAINED:	119 EA
TOTAL TREES REMOVED:	923 EA

N
W E
S

SCALE: 1" = 100'
0 100' 200'

811
Know what's below.
Call before you dig.

REGISTERED PROFESSIONAL ENGINEER
87762PE
OREGON
ASHLEY ROCHELLE SEAL
PRELIMINARY
EXPIRES: 06/30/20

PUBLISH DATE
06.06.2018
ISSUED FOR
LAND USE DOCUMENTS

TREE REMOVAL AND PRESERVATION PLAN
CRESTVIEW CROSSING
PLANNED UNIT DEVELOPMENT
JT SMITH COMPANIES
NEWBERG, OR

3J CONSULTING
CIVIL ENGINEERING
WATER RESOURCES
LAND USE PLANNING
5075 SW GRIFFITH DRIVE, SUITE 150; BEAVERTON, OR 97005

PROJECT INFORMATION

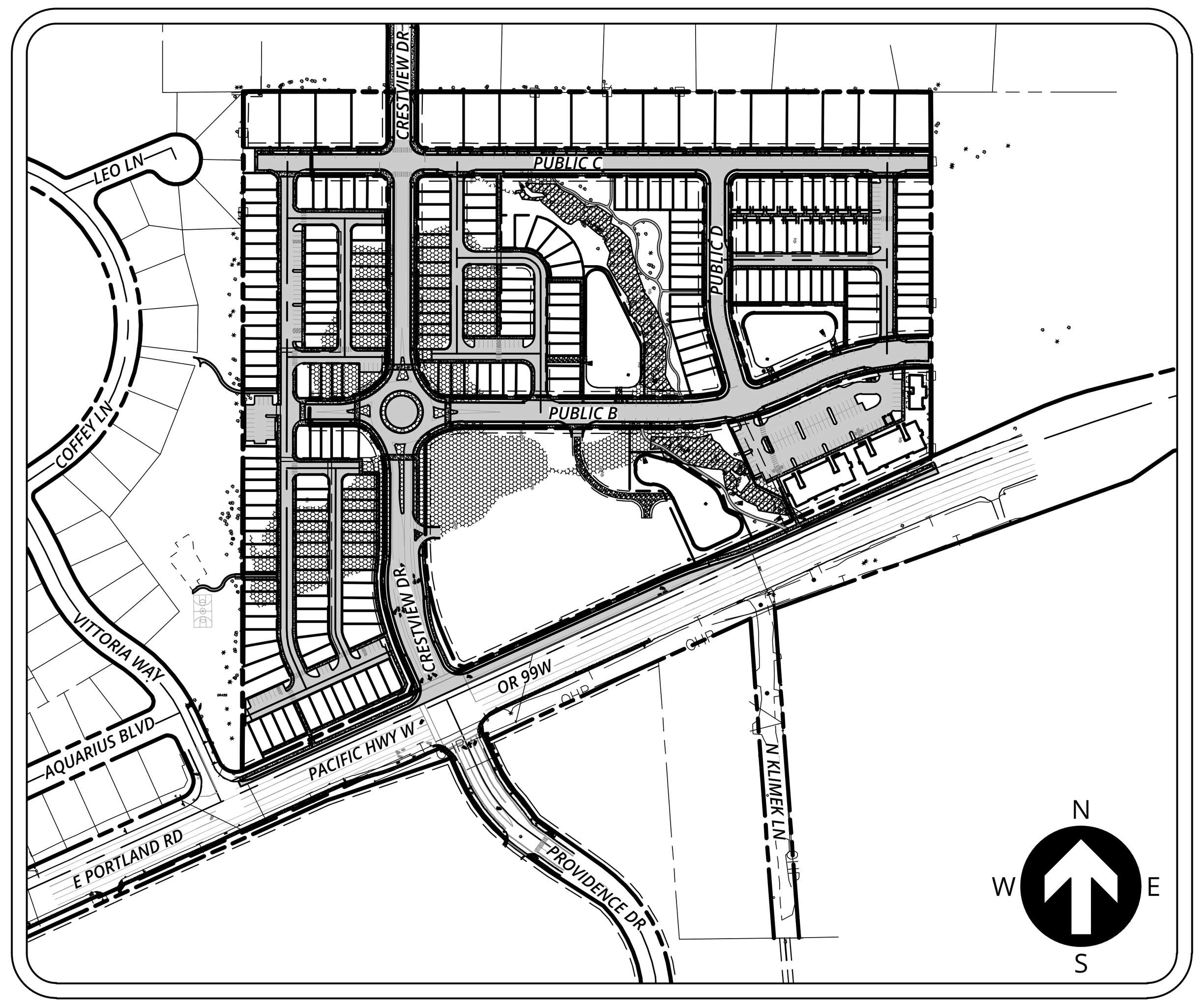
3J PROJECT #	17393
TAX LOT(S)	3S2W16 13800, 1100
LAND USE #	N/A
DESIGNED BY	ARS, JEJ, BMO
CHECKED BY	AJM, RGW

SHEET NUMBER
C110

P:\17393-JTS-CRESTVIEW CROSSING\CADD\C110 TREE REMOVAL AND PRESERVATION PLAN.DWG

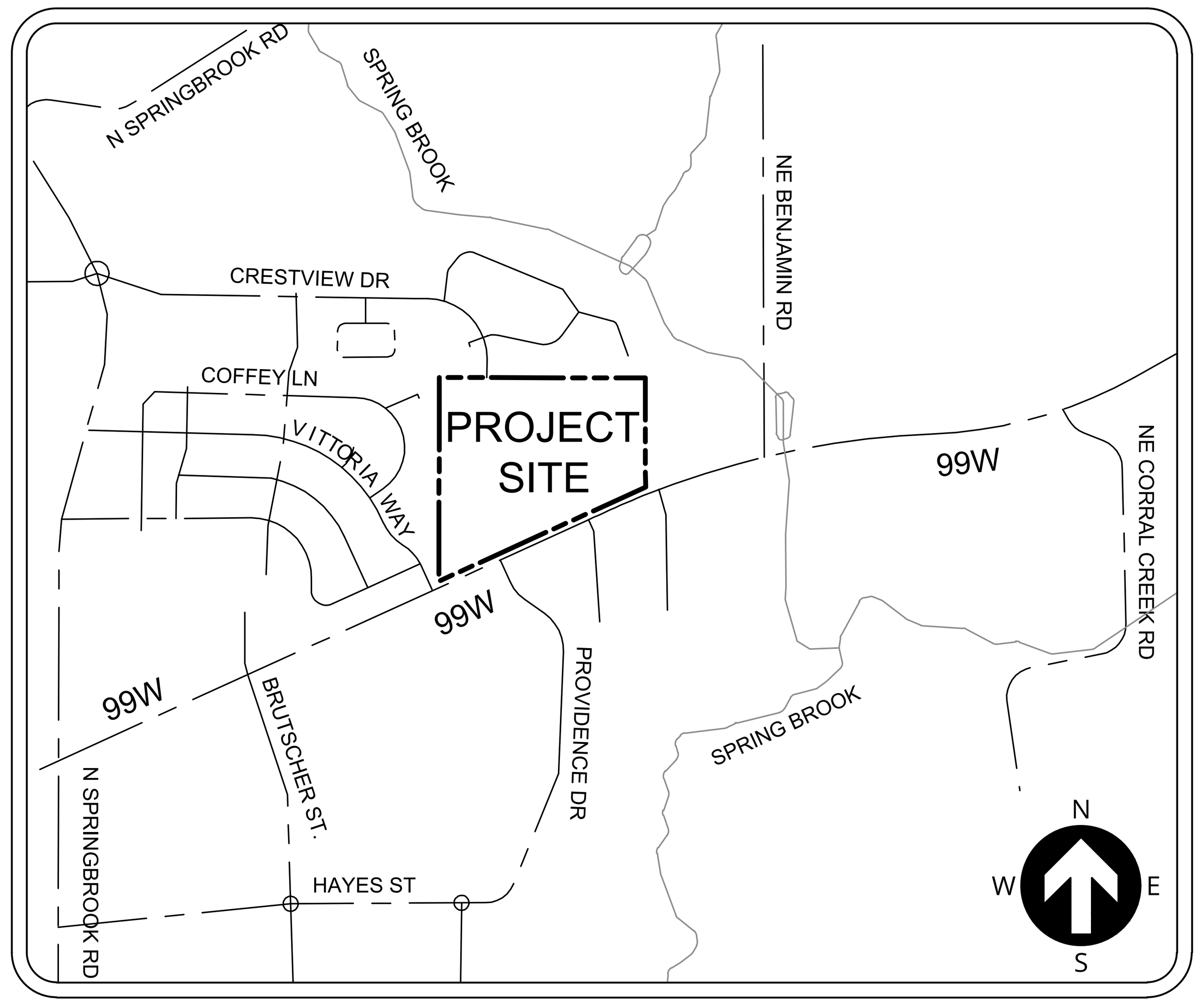
CRESTVIEW CROSSING SUBDIVISION

EROSION AND SEDIMENT CONTROL PLAN (ESCP) COVER SHEET



SITE MAP

SCALE: 1" = 300'



VICINITY MAP

SCALE: N.T.S.

INSPECTION FREQUENCY:

SITE CONDITION	MINIMUM FREQUENCY
1. ACTIVE PERIOD	DAILY WHEN STORMWATER RUNOFF, INCLUDING RUNOFF FROM SNOW MELT, IS OCCURRING. AT LEAST ONCE EVERY FOURTEEN (14) CALENDAR DAYS REGARDLESS OF WHETHER STORMWATER RUNOFF IS OCCURRING.
2. PRIOR TO THE SITE BECOMING INACTIVE OR IN ANTICIPATION OF SITE INACCESSIBILITY.	ONCE TO ENSURE THAT EROSION AND SEDIMENT CONTROL MEASURES ARE IN WORKING ORDER. ANY NECESSARY MAINTENANCE AND REPAIR MUST BE MADE PRIOR TO LEAVING THE SITE.
3. INACTIVE PERIODS GREATER THAN FOURTEEN (14) CONSECUTIVE CALENDAR DAYS.	ONCE EVERY MONTH.
4. PERIODS DURING WHICH THE SITE IS INACCESSIBLE DUE TO INCLEMENT WEATHER.	IF PRACTICAL, INSPECTIONS MUST OCCUR DAILY AT A RELEVANT AND ACCESSIBLE DISCHARGE POINT OR DOWNSTREAM LOCATION.
5. PERIODS DURING WHICH DISCHARGE IS UNLIKELY DUE TO FROZEN CONDITIONS.	MONTHLY. RESUME MONITORING IMMEDIATELY UPON MELT, OR WHEN WEATHER CONDITIONS MAKE DISCHARGES LIKELY.

ATTENTION EXCAVATORS:

OREGON LAW REQUIRES YOU TO FOLLOW RULES ADOPTED BY THE OREGON UTILITY NOTIFICATION CENTER. THOSE RULES ARE SET FORTH IN OAR 952-001-0010 THROUGH OAR 952-001-0090. YOU MAY OBTAIN COPIES OF THESE RULES FROM THE CENTER BY CALLING 503-232-1987. IF YOU HAVE ANY QUESTIONS ABOUT THE RULES, YOU MAY CONTACT THE CENTER. YOU MUST NOTIFY THE CENTER AT LEAST TWO BUSINESS DAYS, BEFORE COMMENCING AN EXCAVATION. CALL 503-246-6699.

811 Know what's below. Call before you dig.

P:\17393-JTS-CRESTVIEW CROSSING\CAD\DD\C120 1200C SET.DWG

PROPERTY DESCRIPTION:

TAX LOTS 13800 AND 01100 LOCATED IN THE NE 1/4 OF SECTION 16, T.3S., R.2W., W.M. CITY OF NEWBURG, YAMHILL COUNTY, OREGON

PROJECT LOCATION:

NEAR THE WASHINGTON COUNTY BENCHMARK #59, EL. 145.876, WASHINGTON COUNTY, OREGON
LATITUDE = 45°29'29.53" N, LONGITUDE = 122°55'58.33" W

OWNER/APPLICANT

JT SMITH COMPANIES
5285 MEADOWS ROAD, SUITE 171
LAKE OSWEGO, OR 97035
CONTACT: JESSE NEMEC
PHONE: (503) 730-8620
EMAIL: jnemec@jtsmithco.com

PLANNING CONSULTANT

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CIVIL ENGINEER

3J CONSULTING, INC.
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BEAVERTON, OR 97005
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LANDSCAPE ARCHITECT

CARDNO, INC.
6720 SW MACADAM AVE, SUITE 200
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NARRATIVE DESCRIPTIONS

EXISTING SITE CONDITIONS

ONE HOUSE WITH ACCESSORY STRUCTURES. REMAINDER OF SITE CONSISTS OF WETLANDS AND GRASSY FIELD, WITH SCATTERED TREES.

DEVELOPED CONDITIONS

SUBDIVIDE INTO 4.20 ACRE COMMERCIAL SPACE, 2 APARTMENT BUILDINGS WITH 48 TOTAL UNITS, 230 HIGH DENSITY LOTS AND 18 SINGLE FAMILY HOME LOTS.

NATURE OF CONSTRUCTION ACTIVITY AND ESTIMATED TIME TABLE

* CLEARING (JUNE 2019)
* MASS GRADING (JUNE-JULY 2019)
* UTILITY INSTALLATION (AUGUST-SEPTEMBER 2019)
* STREET CONSTRUCTION (MAY 2020)
* FINAL STABILIZATION (JUNE 2020)

TOTAL ON-SITE AREA = 1,442,521 SF = 33.13 ACRES

TOTAL OFF-SITE AREA = 50,990 SF = 1.17 ACRES

TOTAL AREA = 1,493,511 SF = 34.30 ACRES

SITE SOIL CLASSIFICATION:

* AMITY SILT LOAM, 0-3% SLOPE - 51.1%
* WOODBURN SILT LOAM, 0-3% SLOPE - 21.7%
* WOODBURN SILT LOAM, 3-12% SLOPE - 26.5%
* WOODBURN SILT LOAM, 12-20% SLOPE - 0.8%

ON-SITE SOILS HAVE A MODERATE TO HIGH EROSION POTENTIAL. ALL FILL MATERIAL SHALL BE GENERATED ON-SITE FROM GRADING EXCAVATION AND UTILITY TRENCH SPOILS.

RECEIVING WATER BODIES:

NEAREST WATER BODY: SPRING BROOK, A PART OF THE WILLAMETTE RIVER BASIN.

SITE IS ZONE X (UNSHADED) PER FEMA FIRM MAP NUMBER: 41071C0241D AND 41071C0235D. NO ELEVATED FLOOD RISK.

STANDARD EROSION AND SEDIMENT CONTROL PLAN DRAWING NOTES:

1. HOLD A PRE-CONSTRUCTION MEETING OF PROJECT CONSTRUCTION PERSONNEL THAT INCLUDES THE INSPECTOR TO DISCUSS EROSION AND SEDIMENT CONTROL MEASURES AND CONSTRUCTION LIMITS. (SCHEDULE A.8.C.I.(3))
2. ALL INSPECTIONS MUST BE MADE IN ACCORDANCE WITH DEQ 1200-C PERMIT REQUIREMENTS. (SCHEDULE A.12.B AND SCHEDULE B.1)
3. INSPECTION LOGS MUST BE KEPT IN ACCORDANCE WITH DEQ'S 1200-C PERMIT REQUIREMENTS. (SCHEDULE B.1.C AND B.2)
4. RETAIN A COPY OF THE ESCP AND ALL REVISIONS ON SITE AND MAKE IT AVAILABLE ON REQUEST TO DEQ, AGENT, OR THE LOCAL MUNICIPALITY. DURING INACTIVE PERIODS OF GREATER THAN SEVEN (7) CONSECUTIVE CALENDAR DAYS, THE ABOVE RECORDS MUST BE RETAINED BY THE PERMIT REGISTRANT BUT DO NOT NEED TO BE AT THE CONSTRUCTION SITE. (SCHEDULE B.2.C)
5. ALL PERMIT REGISTRANTS MUST IMPLEMENT THE ESCP. FAILURE TO IMPLEMENT ANY OF THE CONTROL MEASURES OR PRACTICES DESCRIBED IN THE ESCP IS A VIOLATION OF THE PERMIT. (SCHEDULE A 8.A)
6. THE ESCP MUST BE ACCURATE AND REFLECT SITE CONDITIONS. (SCHEDULE A.12.C.I)
7. SUBMISSION OF ALL ESCP REVISIONS IS NOT REQUIRED. SUBMITTAL OF THE ESCP REVISIONS IS ONLY UNDER SPECIFIC CONDITIONS. SUBMIT ALL NECESSARY REVISION TO DEQ OR AGENT WITHIN 10 DAYS. (SCHEDULE A.12.C.IV. AND V)
8. PHASE CLEARING AND GRADING TO THE MAXIMUM EXTENT PRACTICAL TO PREVENT EXPOSED INACTIVE AREAS FROM BECOMING A SOURCE OF EROSION. (SCHEDULE A.7.A.III)
9. IDENTIFY, MARK, AND PROTECT (BY CONSTRUCTION FENCING OR OTHER MEANS) CRITICAL RIPARIAN AREAS AND VEGETATION INCLUDING IMPORTANT TREES AND ASSOCIATED ROOTING ZONES, AND VEGETATION AREAS TO BE PRESERVED. IDENTIFY VEGETATIVE BUFFER ZONES BETWEEN THE SITE AND SENSITIVE AREAS (E.G., WETLANDS), AND OTHER AREAS TO BE PRESERVED, ESPECIALLY IN PERIMETER AREAS. (SCHEDULE A.8.C.I.(1) AND (2))
10. PRESERVE EXISTING VEGETATION WHEN PRACTICAL AND RE-VEGETATE OPEN AREAS. RE-VEGETATE OPEN AREAS WHEN PRACTICABLE BEFORE AND AFTER GRADING OR CONSTRUCTION. IDENTIFY THE TYPE OF VEGETATIVE SEED MIX USED. (SCHEDULE A.7.A.V)
11. MAINTAIN AND DELINEATE ANY EXISTING NATURAL BUFFER WITHIN THE 50-FEET OF WATERS OF THE STATE. (SCHEDULE A.7.B.I.AND (2(A)(B))
12. INSTALL PERIMETER SEDIMENT CONTROL, INCLUDING STORM DRAIN INLET PROTECTION AS WELL AS ALL SEDIMENT BASINS, TRAPS, AND BARRIERS PRIOR TO LAND DISTURBANCE. (SCHEDULE A.8.C.I.(5))
13. CONTROL BOTH PEAK FLOW RATES AND TOTAL STORMWATER VOLUME, TO MINIMIZE EROSION AT OUTLETS AND DOWNSTREAM CHANNELS AND STREAMBANKS. (SCHEDULE A.7.C)
14. CONTROL SEDIMENT AS NEEDED ALONG THE SITE PERIMETER AND AT ALL OPERATIONAL INTERNAL STORM DRAIN INLETS AT ALL TIMES DURING CONSTRUCTION, BOTH INTERNALLY AND AT THE SITE BOUNDARY. (SCHEDULE A.7.D.I)
15. ESTABLISH CONCRETE TRUCK AND OTHER CONCRETE EQUIPMENT WASHOUT AREAS BEFORE BEGINNING CONCRETE WORK. (SCHEDULE A.8.C.I.(6))
16. APPLY TEMPORARY AND/OR PERMANENT SOIL STABILIZATION MEASURES IMMEDIATELY ON ALL DISTURBED AREAS AS GRADING PROGRESSES. TEMPORARY OR PERMANENT STABILIZATIONS MEASURES ARE NOT REQUIRED FOR AREAS THAT ARE INTENDED TO BE LEFT UNVEGETATED, SUCH AS DIRT ACCESS ROADS OR UTILITY POLE PADS.(SCHEDULE A.8.C.II.(3))
17. ESTABLISH MATERIAL AND WASTE STORAGE AREAS, AND OTHER NON-STORMWATER CONTROLS. (SCHEDULE A.8.C.I.(7))
18. PREVENT TRACKING OF SEDIMENT ONTO PUBLIC OR PRIVATE ROADS USING BMPS SUCH AS: CONSTRUCTION ENTRANCE, GRAVELED (OR PAVED) EXITS AND PARKING AREAS, GRAVEL ALL UNPAVED ROADS LOCATED ONSITE, OR USE AN EXIT TIRE WASH. THESE BMPS MUST BE IN PLACE PRIOR TO LAND-DISTURBING ACTIVITIES. (SCHEDULE A 7.D.II AND A.8.C.I(4))
19. WHEN TRUCKING SATURATED SOILS FROM THE SITE, EITHER USE WATER-TIGHT TRUCKS OR DRAIN LOADS ON SITE. (SCHEDULE A.7.D.II.(5))
20. CONTROL PROHIBITED DISCHARGES FROM LEAVING THE CONSTRUCTION SITE, I.E., CONCRETE WASH-OUT, WASTEWATER FROM CLEANOUT OF STUCCO, PAINT AND CURING COMPOUNDS. (SCHEDULE A.6)
21. USE BMPS TO PREVENT OR MINIMIZE STORMWATER EXPOSURE TO POLLUTANTS FROM SPILLS; VEHICLE AND EQUIPMENT FUELING, MAINTENANCE, AND STORAGE; OTHER CLEANING AND MAINTENANCE ACTIVITIES; AND WASTE HANDLING ACTIVITIES. THESE POLLUTANTS INCLUDE FUEL, HYDRAULIC FLUID, AND OTHER OILS FROM VEHICLES AND MACHINERY, AS WELL AS DEBRIS, FERTILIZER, PESTICIDES AND HERBICIDES, PAINTS, SOLVENTS, CURING COMPOUNDS AND ADHESIVES FROM CONSTRUCTION OPERATIONS. (SCHEDULE A.7.E.I.(2))
22. IMPLEMENT THE FOLLOWING BMPS WHEN APPLICABLE: WRITTEN SPILL PREVENTION AND RESPONSE PROCEDURES, EMPLOYEE TRAINING ON SPILL PREVENTION AND PROPER DISPOSAL PROCEDURES, SPILL KITS IN ALL VEHICLES, REGULAR MAINTENANCE SCHEDULE FOR VEHICLES AND MACHINERY, MATERIAL DELIVERY AND STORAGE CONTROLS, TRAINING AND SIGNAGE, AND COVERED STORAGE AREAS FOR WASTE AND SUPPLIES. (SCHEDULE A. 7.E.III.)
23. USE WATER, SOIL-BINDING AGENT OR OTHER DUST CONTROL TECHNIQUE AS NEEDED TO AVOID WIND-BLOWN SOIL. (SCHEDULE A 7.A.IV)
24. THE APPLICATION RATE OF FERTILIZERS USED TO REESTABLISH VEGETATION MUST FOLLOW MANUFACTURER'S RECOMMENDATIONS TO MINIMIZE NUTRIENT RELEASES TO SURFACE WATERS. EXERCISE CAUTION WHEN USING TIME-RELEASE FERTILIZERS WITHIN ANY WATERWAY RIPARIAN ZONE. (SCHEDULE A.9.B.III)
25. IF AN ACTIVE TREATMENT SYSTEM (FOR EXAMPLE, ELECTRO-COAGULATION, FLOCCULATION, FILTRATION, ETC.) FOR SEDIMENT OR OTHER POLLUTANT REMOVAL IS EMPLOYED, SUBMIT AN OPERATION AND MAINTENANCE PLAN (INCLUDING SYSTEM SCHEMATIC, LOCATION OF SYSTEM, LOCATION OF INLET, LOCATION OF DISCHARGE, DISCHARGE DISPERSION DEVICE DESIGN, AND A SAMPLING PLAN AND FREQUENCY) BEFORE OPERATING THE TREATMENT SYSTEM. OBTAIN PLAN APPROVAL BEFORE OPERATING THE TREATMENT SYSTEM. OPERATE AND MAINTAIN THE TREATMENT SYSTEM ACCORDING TO MANUFACTURER'S SPECIFICATIONS. (SCHEDULE A.9.D)
26. TEMPORARILY STABILIZE SOILS AT THE END OF THE SHIFT BEFORE HOLIDAYS AND WEEKENDS, IF NEEDED. THE REGISTRANT IS RESPONSIBLE FOR ENSURING THAT SOILS ARE STABLE DURING RAIN EVENTS AT ALL TIMES OF THE YEAR. (SCHEDULE A 7.B)
27. AS NEEDED BASED ON WEATHER CONDITIONS, AT THE END OF EACH WORKDAY SOIL STOCKPILES MUST BE STABILIZED OR COVERED, OR OTHER BMPS MUST BE IMPLEMENTED TO PREVENT DISCHARGES TO SURFACE WATERS OR CONVEYANCE SYSTEMS LEADING TO SURFACE WATERS. (SCHEDULE A 7.E.II.(2))
28. CONSTRUCTION ACTIVITIES MUST AVOID OR MINIMIZE EXCAVATION AND BARE GROUND ACTIVITIES DURING WET WEATHER. (SCHEDULE A.7.A.I)
29. SEDIMENT FENCE: REMOVE TRAPPED SEDIMENT BEFORE IT REACHES ONE THIRD OF THE ABOVE GROUND FENCE HEIGHT AND BEFORE FENCE REMOVAL. (SCHEDULE A.9.C.I)
30. OTHER SEDIMENT BARRIERS (SUCH AS BIOBAGS): REMOVE SEDIMENT BEFORE IT REACHES TWO INCHES DEPTH ABOVE GROUND HEIGHT AND BEFORE BMP REMOVAL. (SCHEDULE A.9.C.I)
31. CATCH BASINS: CLEAN BEFORE RETENTION CAPACITY HAS BEEN REDUCED BY FIFTY PERCENT. SEDIMENT BASINS AND SEDIMENT TRAPS: REMOVE TRAPPED SEDIMENTS BEFORE DESIGN CAPACITY HAS BEEN REDUCED BY FIFTY PERCENT AND AT COMPLETION OF PROJECT. (SCHEDULE A.9.C.III& IV)
32. WITHIN 24 HOURS, SIGNIFICANT SEDIMENT THAT HAS LEFT THE CONSTRUCTION SITE, MUST BE REMEDIATED. INVESTIGATE THE CAUSE OF THE SEDIMENT RELEASE AND IMPLEMENT STEPS TO PREVENT A RECURRENCE OF THE DISCHARGE WITHIN THE SAME 24 HOURS. ANY IN-STREAM CLEAN-UP OF SEDIMENT SHALL BE PERFORMED ACCORDING TO THE OREGON DIVISION OF STATE LANDS REQUIRED TIMEFRAME. (SCHEDULE A.9.B.I)
33. THE INTENTIONAL WASHING OF SEDIMENT INTO STORM SEWERS OR DRAINAGE WAYS MUST NOT OCCUR. VACUUMING OR DRY SWEEPING AND MATERIAL PICKUP MUST BE USED TO CLEANUP RELEASED SEDIMENTS. (SCHEDULE A.9.B.II)
34. THE ENTIRE SITE MUST BE TEMPORARILY STABILIZED USING VEGETATION OR A HEAVY MULCH LAYER, TEMPORARY SEEDING, OR OTHER METHOD SHOULD ALL CONSTRUCTION ACTIVITIES CEASE FOR 30 DAYS OR MORE. (SCHEDULE A.7.F.I)
35. PROVIDE TEMPORARY STABILIZATION FOR THAT PORTION OF THE SITE WHERE CONSTRUCTION ACTIVITIES CEASE FOR 14 DAYS OR MORE WITH A COVERING OF BLOWN STRAW AND A TACKIFIER, LOOSE STRAW, OR AN ADEQUATE COVERING OF COMPOST MULCH UNTIL WORK RESUMES ON THAT PORTION OF THE SITE. (SCHEDULE A.7.F.II)
36. DO NOT REMOVE TEMPORARY SEDIMENT CONTROL PRACTICES UNTIL PERMANENT VEGETATION OR OTHER COVER OF EXPOSED AREAS IS ESTABLISHED. ONCE CONSTRUCTION IS COMPLETE AND THE SITE IS STABILIZED, ALL TEMPORARY EROSION CONTROLS AND RETAINED SOILS MUST BE REMOVED AND DISPOSED OF PROPERLY, UNLESS DOING SO CONFLICTS WITH LOCAL REQUIREMENTS. (SCHEDULE A.8.C.III(1) AND D.3.C.II AND III)

LOCAL AGENCY (CITY OF NEWBERG) SPECIFIC EROSION CONTROL NOTES:

1. THE IMPLEMENTATION OF THIS ESC PLAN AND THE CONSTRUCTION, MAINTENANCE, REPLACEMENT, AND UPGRADING OF THE ESC FACILITIES IS THE RESPONSIBILITY OF THE APPLICANT/CONTRACTOR UNTIL ALL CONSTRUCTION IS COMPLETED, APPROVED AND VEGETATION/LANDSCAPING IS ESTABLISHED.
2. THE ESC PLAN, ANY REVISIONS, AND INSPECTION LOGS SHALL BE KEPT ONSITE AT ALL TIMES.
3. THE ESC MEASURES SHOWN ON THE PLAN ARE THE MINIMUM REQUIREMENTS FOR THE PROJECT SITE AND SHALL BE UPGRADED AS NEEDED TO MAINTAIN COMPLIANCE WITH ALL REGULATIONS.
4. SEDIMENT MUST BE REMOVED FROM SUMPED STRUCTURES WHEN THE SEDIMENT RETENTION
5. CAPACITY HAS BEEN REDUCED BY 1/3RD AND WITHIN 30 DAYS OF PROJECT COMPLETION.
6. TOXIC AND HAZARDOUS MATERIALS MUST ALSO HAVE SECONDARY CONTAINMENT.
7. PAVING ACTIVITIES SHALL BE MINIMIZED BETWEEN OCTOBER 1ST AND MAY 31ST OF THE FOLLOWING YEAR TO AVOID POTENTIAL DISCHARGE OF PAVING CHEMICALS INTO THE STORM DRAINS, STREETS, WATERCOURSES, OR SENSITIVE AREAS.
8. ALL ESC MEASURES SHALL BE REMOVED FROM THE SITE 30 DAYS AFTER CONSTRUCTION IS COMPLETED AND APPROVED BY THE CITY.

THE PERMITTEE IS REQUIRED TO MEET ALL THE CONDITIONS OF THE 1200C PERMIT. THIS ESCP AND GENERAL CONDITIONS HAVE BEEN DEVELOPED TO FACILITATE COMPLIANCE WITH THE 1200C PERMIT REQUIREMENTS. IN CASES OF DISCREPANCIES OR OMISSIONS, THE 1200C PERMIT REQUIREMENTS SUPERCEDE REQUIREMENTS OF THIS PLAN.

BMP MATRIX FOR CONSTRUCTION PHASES

REFER TO DEQ GUIDANCE MANUAL FOR A COMPREHENSIVE LIST OF AVAILABLE BMP'S.

	CLEARING	MASS GRADING	UTILITY INSTALLATION	STREET CONSTRUCTION	FINAL STABILIZATION	WET WEATHER (OCT. 1 - MAY 31ST)
EROSION PREVENTION						
PRESERVE NATURAL VEGETATION	** X	X	X	X	X	X
GROUND COVER					X	X
HYDRAULIC APPLICATIONS					X	
PLASTIC SHEETING						X
MATTING					X	X
DUST CONTROL	X	X	X	X	X	X
TEMPORARY/ PERMANENT SEEDING					X	X
BUFFER ZONE						
OTHER:						
SEDIMENT CONTROL						
SEDIMENT FENCE (PERIMETER)	** X	X	X	X	X	X
SEDIMENT FENCE (INTERIOR)			X	X	X	X
STRAW WATTLES						
FILTER BERM						
INLET PROTECTION	** X	X	X	X	X	X
DEWATERING						
SEDIMENT TRAP						
NATURAL BUFFER ENCROACHMENT	*X	*X	*X	*X	*X	*X
OTHER:						
RUN OFF CONTROL						
CONSTRUCTION ENTRANCE	** X	X	X	X	X	
WHEEL WASH	** X	X	X	X	X	
PIPE SLOPE DRAIN						
OUTLET PROTECTION		X	X	X	X	
SURFACE ROUGHENING						
CHECK DAMS	** X	X	X	X	X	
OTHER:						
POLLUTION PREVENTION						
PROPER SIGNAGE	X	X	X	X	X	X
HAZ WASTE MGMT	X	X	X	X	X	X
SPILL KIT ON-SITE	X	X	X	X	X	X
CONCRETE WASHOUT AREA	X	X	X	X	X	X
OTHER:						

* SIGNIFIES ADDITIONAL BMP'S REQUIRED FOR WORK WITHIN 50' OF WATER OF THE STATE.
** SIGNIFIES BMP THAT WILL BE INSTALLED PRIOR TO ANY GROUND DISTURBING ACTIVITY.

RATIONALE STATEMENT

A COMPREHENSIVE LIST OF AVAILABLE BEST MANAGEMENT PRACTICES (BMP) OPTIONS BASED ON DEQ's GUIDANCE MANUAL HAS BEEN REVIEWED TO COMPLETE THIS EROSION AND SEDIMENT CONTROL PLAN. SOME OF THE ABOVE LISTED BMP's WERE NOT CHOSEN BECAUSE THEY WERE DETERMINED TO NOT EFFECTIVELY MANAGE EROSION PREVENTION AND SEDIMENT CONTROL FOR THIS PROJECT BASED ON SPECIFIC SITE CONDITIONS, INCLUDING SOIL CONDITIONS TOPOGRAPHIC CONSTRAINTS, ACCESSIBILITY TO THE SITE, AND OTHER RELATED CONDITIONS. AS THE PROJECT PROGRESSES AND THERE IS A NEED TO REVISE THE ESC PLAN, AN ACTION PLAN WILL BE SUBMITTED.

INITIAL

PERMITTEE'S SITE INSPECTOR:

COMPANY/AGENCY: Sevin Simpson, 3J Consulting
PHONE: (503) 946.9365 x229 - WORK
(541) 508.9159 - CELL
E-MAIL: sevin.simpson@3j-consulting.com
DESCRIPTION OF EXPERIENCE: ATTENDED A TWO-DAY TRAINING COURSE ON THE PRINCIPLES AND PRACTICES OF EROSION CONTROL
CESCL #ECO-3-4131801

SHEET INDEX

EROSION AND SEDIMENT CONTROL PLANS

REGISTERED PROFESSIONAL ENGINEER
87762PE
OREGON
ASHLEY ROCHELLE SEAL
PRELIMINARY
EXPIRES: 06/30/20

PUBLISH DATE
06.06.2018

ISSUED FOR
LAND USE DOCUMENTS

1200C COVER SHEET

CRESTVIEW CROSSING PLANNED UNIT DEVELOPMENT

JT SMITH COMPANIES
NEWBERG, OR

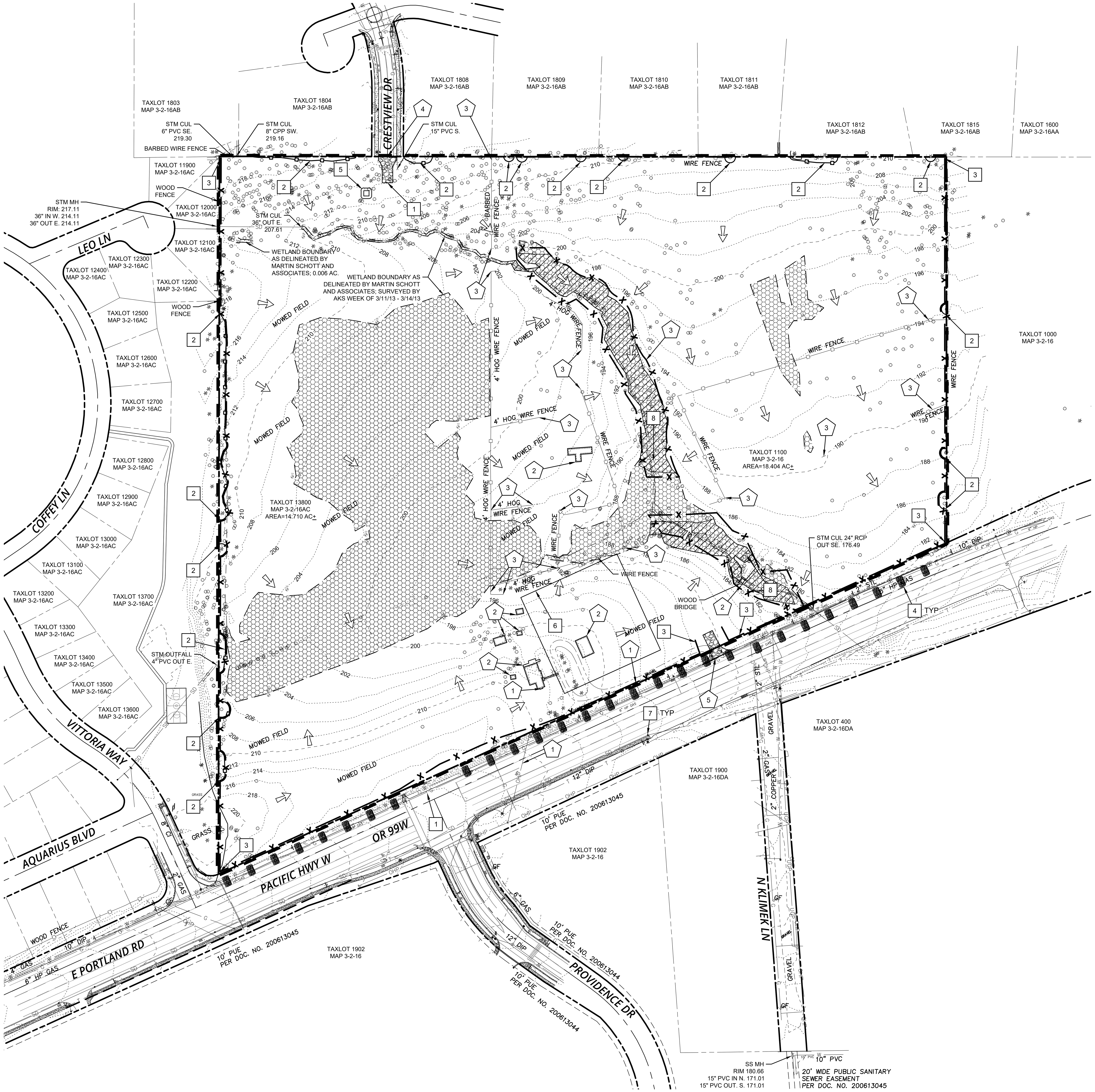
3J CONSULTING
CIVIL ENGINEERING
WATER RESOURCES
LAND USE PLANNING
5075 SW GRIFFITH DRIVE, SUITE 150; BEAVERTON, OR 97005

PROJECT INFORMATION

3J PROJECT #	17393
TAX LOT(S)	3S2W16 13800, 1100
LAND USE #	N/A
DESIGNED BY	ARS, JEJ, BMO
CHECKED BY	AJM, RGW

SHEET NUMBER

C120



EROSION CONTROL KEY NOTES

1. CONSTRUCT CONSTRUCTION ENTRANCE PER NEWBERG STANDARD DRAWING 601 ON SHEET C123. MAINTAIN THROUGHOUT CONSTRUCTION.
2. INSTALL TREE PROTECTION FENCING PER DETAIL T-1 ON SHEET C124. MAINTAIN THROUGHOUT CONSTRUCTION. ALL RELOCATION OF TREE PROTECTION FENCING AND WORK WITHIN THE STANDARD TREE PROTECTION ZONE SHALL BE PERFORMED UNDER THE SUPERVISION OF AN ARBORIST OR THE CITY'S URBAN FORESTER. FENCING SHALL BE REPLACED TO 5' BEYOND THE TREE DRIPLINE ONCE WORK WITHIN THE TREE PROTECTION ZONE IS COMPLETED.
3. INSTALL SILT FENCING PER NEWBERG STANDARD DRAWING 602 ON SHEET C123. MAINTAIN THROUGHOUT CONSTRUCTION.
4. INSTALL BIO-FILTER BAG CHECK DAMS AT 50' O.C. SPACING PER NEWBERG STANDARD DRAWING 605 ON SHEET C123. MAINTAIN THROUGHOUT CONSTRUCTION.
5. CONSTRUCT CONCRETE WASHOUT BASIN PER NEWBERG STANDARD DRAWING 607 ON SHEET C124. MAINTAIN THROUGHOUT CONSTRUCTION.
6. PROVIDE CONSTRUCTION STAGING AND PARKING AREA FOR SITE ACCESS MANAGEMENT AND JOBSITE ADMINISTRATION.
7. INSTALL INLET PROTECTION PER NEWBERG STANDARD DRAWING 605 ON SHEET C123. MAINTAIN THROUGHOUT CONSTRUCTION.

DEMOLITION KEY NOTES

1. SHUT OFF, DISCONNECT, AND REMOVE UTILITY LINES AND DISPOSE OFF-SITE.
2. REMOVE EXISTING STRUCTURE AND FOUNDATION AND DISPOSE OFF-SITE AFTER ALL UTILITY LINES ARE PROPERLY SHUT OFF AND DISCONNECTED.
3. REMOVE EXISTING FENCING AND ASSOCIATED APPURTENANCES AND DISPOSE OFF-SITE.
4. SAWCUT AND REMOVE LAST 2' OF AC AT TIME OF ROAD CONSTRUCTION, AND DISPOSE OFF-SITE.
5. REMOVE EXISTING CULVERT AND ENTRANCE, CLEAR DITCH OF DEBRIS, AND DISPOSE OFF-SITE.

GENERAL DEMOLITION NOTES

1. SEE TREE REMOVAL AND PRESERVATION PLAN (SHEET C110) FOR ALL TREE REMOVAL INFORMATION.
2. SEE GEOTECHNICAL REPORT FOR SURFACE GRUBBING AND STRIPPING INFORMATION.
3. NO UNAUTHORIZED GROUND DISTURBANCE MAY OCCUR WITHIN VEGETATED CORRIDOR AND SENSITIVE AREA.

PRE-CONSTRUCTION, CLEARING, AND DEMOLITION NOTES

1. ALL BASE ESC MEASURES (INLET PROTECTION, PERIMETER SEDIMENT CONTROL, GRAVEL CONSTRUCTION ENTRANCES, ETC.) MUST BE IN PLACE, FUNCTIONAL, AND APPROVED IN AN INITIAL INSPECTION, PRIOR TO COMMENCEMENT OF CONSTRUCTION ACTIVITIES.
2. SEDIMENT BARRIERS APPROVED FOR USE INCLUDE SEDIMENT FENCE, BERMS CONSTRUCTED OUT OF MULCH, CHIPPINGS, OR OTHER SUITABLE MATERIAL, STRAW WATTLES, OR OTHER APPROVED MATERIALS.
3. SENSITIVE RESOURCES INCLUDING, BUT NOT LIMITED TO, TREES, WETLANDS, AND RIPARIAN PROTECTION AREAS SHALL BE CLEARLY DELINEATED WITH ORANGE CONSTRUCTION FENCING OR CHAIN LINK FENCING IN A MANNER THAT IS CLEARLY VISIBLE TO ANYONE IN THE AREA. NO ACTIVITIES ARE PERMITTED TO OCCUR BEYOND THE CONSTRUCTION BARRIER.
4. CONSTRUCTION ENTRANCES SHALL BE INSTALLED AT THE BEGINNING OF CONSTRUCTION AND MAINTAINED FOR THE DURATION OF THE PROJECT. ADDITIONAL MEASURES INCLUDING, BUT NOT LIMITED TO, STREET SWEEPING, AND VACUUMING, MAY BE REQUIRED TO INSURE THAT ALL PAVED AREAS ARE KEPT CLEAN FOR THE DURATION OF THE PROJECT.
5. RUN-ON AND RUN-OFF CONTROLS SHALL BE IN PLACE AND FUNCTIONING PRIOR TO BEGINNING SUBSTANTIAL CONSTRUCTION ACTIVITIES. RUN-ON AND RUN-OFF CONTROL MEASURES INCLUDE: SLOPE DRAINS (WITH OUTLET PROTECTION), CHECK DAMS, SURFACE ROUGHENING, AND BANK STABILIZATION.

GENERAL EROSION CONTROL NOTES

1. THESE EROSION AND SEDIMENT CONTROL PLANS ASSUME "DRY WEATHER" CONSTRUCTION. "WET WEATHER" CONSTRUCTION MEASURES SHALL BE APPLIED BETWEEN OCTOBER 1ST AND MAY 31ST.

LEGEND

- EXISTING MAJOR CONTOUR
- EXISTING MINOR CONTOUR
- PROPOSED SILT FENCING
- PROPOSED TREE PROTECTING FENCING
- PROPOSED CONSTRUCTION ENTRANCE
- PROPOSED INLET PROTECTION
- PROPOSED BIO BAG CHECK DAM
- EXISTING SURFACE RUN-OFF FLOW ARROW
- PROPOSED LIMITS OF DISTURBANCE
- WETLAND TO REMAIN

811 Know what's below. Call before you dig.

N W E S

SCALE: 1" = 100'
0 100' 200'

PRELIMINARY
EXPIRES: 06/30/20

PUBLISH DATE
06.06.2018
ISSUED FOR
LAND USE DOCUMENTS

1200C CLEARING AND DEMOLITION ESCP I
CRESTVIEW CROSSING PLANNED UNIT DEVELOPMENT
JT SMITH COMPANIES
NEWBERG, OR

3J CONSULTING
CIVIL ENGINEERING
WATER RESOURCES
LAND USE PLANNING
5075 SW GRIFFITH DRIVE, SUITE 150; BEAVERTON, OR 97005

PROJECT INFORMATION

3J PROJECT #	17393
TAX LOT(S)	3S2W16 13800, 1100
LAND USE #	N/A
DESIGNED BY	ARS, JEJ, BMO
CHECKED BY	AJM, RGW

SHEET NUMBER
C121

P:\17393-JTS-CRESTVIEW CROSSING\CAD\DD\C120 1200C SET.DWG

LEGEND

—100—	EXISTING MAJOR CONTOUR
—92—	EXISTING MINOR CONTOUR
—110—	PROPOSED MAJOR CONTOUR
—108—	PROPOSED MINOR CONTOUR
—X—	PROPOSED SILT FENCING
	PROPOSED TREE PROTECTING FENCING
	PROPOSED CONSTRUCTION ENTRANCE
	PROPOSED INLET PROTECTION
	PROPOSED BIO BAG CHECK DAM
	PROPOSED LIMITS OF DISTURBANCE
	WETLAND TO REMAIN

EROSION CONTROL KEY NOTES

1. INSTALL CONSTRUCTION ENTRANCE PER NEWBERG STANDARD DRAWING 601 ON SHEET C123. MAINTAIN THROUGHOUT CONSTRUCTION.
2. INSTALL TREE PROTECTION FENCING PER DETAIL T-1 ON SHEET C124. MAINTAIN THROUGHOUT CONSTRUCTION. ALL RELOCATION OF TREE PROTECTION FENCING AND WORK WITHIN THE STANDARD TREE PROTECTION ZONE SHALL BE PERFORMED UNDER THE SUPERVISION OF AN ARBORIST OR THE CITY'S URBAN FORESTER. FENCING SHALL BE REPLACED TO 5' BEYOND THE TREE DRIPLINE ONCE WORK WITHIN THE TREE PROTECTION ZONE IS COMPLETED.
3. INSTALL SILT FENCING PER NEWBERG STANDARD DRAWING 602 ON SHEET C123. MAINTAIN THROUGHOUT CONSTRUCTION.
4. INSTALL BIO-FILTER BAG CHECK DAMS AT 50' O.C. SPACING PER NEWBERG STANDARD DRAWING 605 ON SHEET C123. MAINTAIN THROUGHOUT CONSTRUCTION.
5. CONSTRUCT CONCRETE WASHOUT BASIN PER NEWBERG STANDARD DRAWING 607 ON SHEET C124. MAINTAIN THROUGHOUT CONSTRUCTION.
6. PROVIDE CONSTRUCTION STAGING AND PARKING AREA FOR SITE ACCESS MANAGEMENT AND JOBSITE ADMINISTRATION.
7. INSTALL INLET PROTECTION PER NEWBERG STANDARD DRAWING 605 ON SHEET C123. MAINTAIN THROUGHOUT CONSTRUCTION.
8. INSTALL OUTLET PROTECTION PER NEWBERG STANDARD DRAWING 606 ON SHEET C123. MAINTAIN THROUGHOUT CONSTRUCTION.

GRADING, STREET AND UTILITY EROSION AND SEDIMENT CONSTRUCTION NOTES:

1. SEED USED FOR TEMPORARY OR PERMANENT SEEDING SHALL BE COMPOSED OF ONE OF THE FOLLOWING MIXTURES, UNLESS OTHERWISE AUTHORIZED:
   - A. VEGETATED CORRIDOR AREAS REQUIRE NATIVE SEED MIXES. SEE RESTORATION PLAN FOR APPROPRIATE SEED MIX.
   - B. DWARF GRASS MIX (MIN. 100 LB./AC.)
     1. DWARF PERENNIAL RYEGRASS (80% BY WEIGHT)
     2. CREEPING RED FESCUE (20% BY WEIGHT)
   - C. STANDARD HEIGHT GRASS MIX (MIN. 100LB./AC.)
     1. ANNUAL RYEGRASS (40% BY WEIGHT)
     2. TURF-TYPE FESCUE (60% BY WEIGHT)

2. SLOPE TO RECEIVE TEMPORARY OR PERMANENT SEEDING SHALL HAVE THE SURFACE ROUGHENED BY MEANS OF TRACK-WALKING OR THE USE OF OTHER APPROVED IMPLEMENTS. SURFACE ROUGHENING IMPROVES SEED BEDDING AND REDUCES RUN-OFF VELOCITY.

3. LONG TERM SLOPE STABILIZATION MEASURES SHALL INCLUDE THE ESTABLISHMENT OF PERMANENT VEGETATIVE COVER VIA SEEDING WITH APPROVED MIX AND APPLICATION RATE.

4. TEMPORARY SLOPE STABILIZATION MEASURES SHALL INCLUDE: COVERING EXPOSED SOIL WITH PLASTIC SHEETING, STRAW MULCHING, WOOD CHIPS, OR OTHER APPROVED MEASURES.

5. STOCKPILED SOIL OR STRIPPINGS SHALL BE PLACED IN A STABLE LOCATION AND CONFIGURATION. DURING "WET WEATHER" PERIODS, STOCKPILES SHALL BE COVERED WITH PLASTIC SHEETING OR STRAW MULCH. SEDIMENT FENCE IS REQUIRED AROUND THE PERIMETER OF THE STOCKPILE.

6. EXPOSED CUT OR FILL AREAS SHALL BE STABILIZED THROUGH THE USE OF TEMPORARY SEEDING AND MULCHING, EROSION CONTROL BLANKETS OR MATS, MID-SLOPE SEDIMENT FENCES OR WATTLES, OR OTHER APPROPRIATE MEASURES. SLOPES EXCEEDING 25% MAY REQUIRE ADDITIONAL EROSION CONTROL MEASURES.

7. AREAS SUBJECT TO WIND EROSION SHALL USE APPROPRIATE DUST CONTROL MEASURES INCLUDING THE APPLICATION OF A FINE SPRAY OF WATER, PLASTIC SHEETING, STRAW MULCHING, OR OTHER APPROVED MEASURES.

8. CONSTRUCTION ENTRANCES SHALL BE INSTALLED AT THE BEGINNING OF CONSTRUCTION AND MAINTAINED FOR THE DURATION OF THE PROJECT. ADDITIONAL MEASURES INCLUDING, BUT NOT LIMITED TO, TIRE WASHES, STREET SWEEPING, AND VACUUMING MAY BE BE REQUIRED TO INSURE THAT ALL PAVED AREAS ARE KEPT CLEAN FOR THE DURATION OF THE PROJECT.

9. ACTIVE INLETS TO STORM WATER SYSTEMS SHALL BE PROTECTED THROUGH THE USE OF APPROVED INLET PROTECTION MEASURES. ALL INLET PROTECTION MEASURES ARE TO BE REGULARLY INSPECTED AND MAINTAINED AS NEEDED.

10. SATURATED MATERIALS THAT ARE HAULED OFF-SITE MUST BE TRANSPORTED IN WATER-TIGHT TRUCKS TO ELIMINATE SPILLAGE OF SEDIMENT AND SEDIMENT-LADEN WATER.

11. AN AREA SHALL BE PROVIDED FOR THE WASHING OUT OF CONCRETE TRUCKS IN A LOCATION THAT DOES NOT PROVIDE RUN-OFF THAT CAN ENTER THE STORM WATER SYSTEM. IF THE CONCRETE WASH-OUT AREA CAN NOT BE CONSTRUCTED GREATER THAN 50' FROM ANY DISCHARGE POINT, SECONDARY MEASURES SUCH AS BERMS OR TEMPORARY SETTLING PITS MAY BE REQUIRED. THE WASH-OUT SHALL BE LOCATED WITHIN SIX FEET OF TRUCK ACCESS AND BE CLEANED WHEN IT REACHES 50% OF THE CAPACITY.

12. SWEEPINGS FROM EXPOSED AGGREGATE CONCRETE SHALL NOT BE TRANSFERRED TO THE STORM WATER SYSTEM. SWEEPINGS SHALL BE PICKED UP AND DISPOSED IN THE TRASH.

13. AVOID PAVING IN WET WEATHER WHEN PAVING CHEMICALS CAN RUN-OFF INTO THE STORM WATER SYSTEM.

14. USE BMPs SUCH AS CHECK-DAMS, BERMS, AND INLET PROTECTION TO PREVENT RUN-OFF FROM REACHING DISCHARGE POINTS.

15. COVER CATCH BASINS, MANHOLES, AND OTHER DISCHARGE POINTS WHEN APPLYING SEAL COAT, TACK COAT, ETC. TO PREVENT INTRODUCING THESE MATERIALS TO THE STORM WATER SYSTEM.

16. SEEDING SHALL BE PERFORMED NO LATER THAN SEPTEMBER 1ST FOR EACH PHASE OF CONSTRUCTION.

EROSION AND SEDIMENT CONTROL BMP IMPLEMENTATION

1. ALL BASE ESC MEASURES (INLET PROTECTION, PERIMETER SEDIMENT CONTROL, GRAVEL CONSTRUCTION ENTRANCES, ETC.) MUST BE IN PLACE, FUNCTIONAL, AND APPROVED IN AN INITIAL INSPECTION, PRIOR TO COMMENCEMENT OF CONSTRUCTION ACTIVITIES.

2. UTILIZATION OF STOCK PILE AREAS SHOULD TRANSITION FROM PRIMARY STOCK PILE AREA TO SECONDARY STOCK PILE AREAS ACCORDING TO CUT AND FILL ACTIVITY.

3. ALL SEDIMENT BARRIERS (TO BE INSTALLED AFTER GRADING) SHALL BE INSTALLED IMMEDIATELY FOLLOWING ESTABLISHMENT OF FINISHED GRADE AS SHOWN ON THESE PLANS.

4. LONG TERM SLOPE STABILIZATION MEASURES "INCLUDING MATTING" SHALL BE IN PLACE OVER ALL EXPOSED SOILS BY OCTOBER 1.

5. THE STORM WATER FACILITY SHALL BE CONSTRUCTED AND LANDSCAPED PRIOR TO THE STORM WATER SYSTEM FUNCTIONING AND SITE PACING.

6. INLET PROTECTION SHALL BE IN PLACE IMMEDIATELY FOLLOWING PAVING ACTIVITIES.

811 Know what's below. Call before you dig.

N W E S

SCALE: 1" = 100'
0 100' 200'

REGISTERED PROFESSIONAL ENGINEER 87762PE OREGON NOV. 14, 2017 ASHLEY ROCHELLE SEAL
PRELIMINARY
EXPIRES: 06/30/20

PUBLISH DATE
06.06.2018
ISSUED FOR
LAND USE DOCUMENTS

1200C GRADING AND STREET CONSTRUCTION ESCP I
CRESTVIEW CROSSING PLANNED UNIT DEVELOPMENT
JT SMITH COMPANIES
NEWBERG, OR

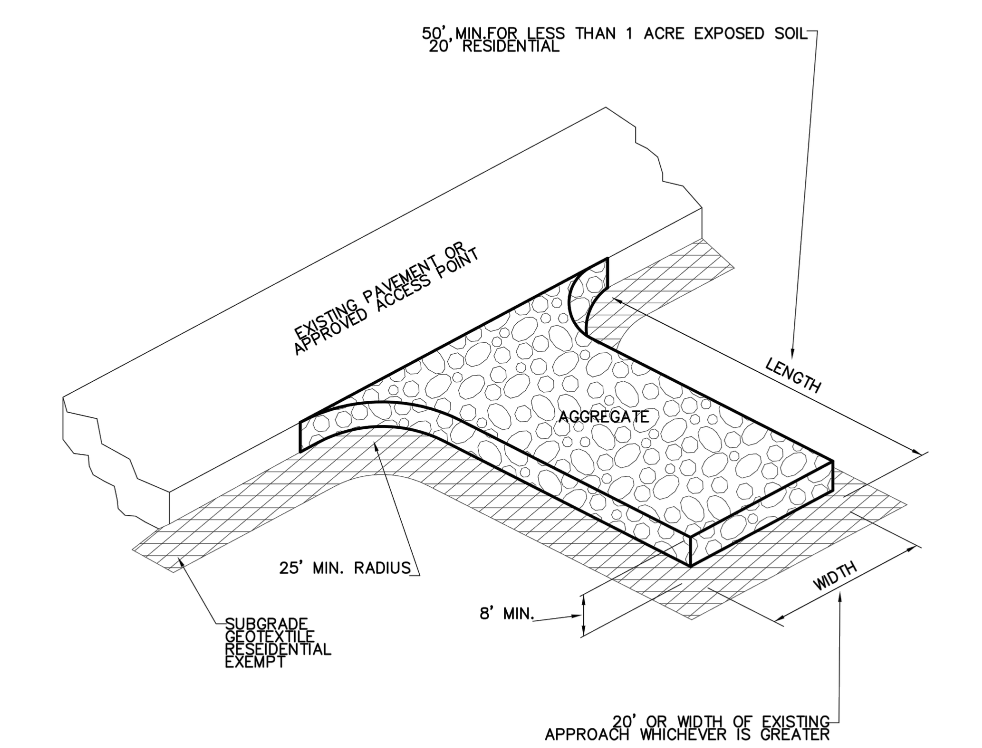
3J CONSULTING
CIVIL ENGINEERING
WATER RESOURCES
LAND USE PLANNING
5075 SW GRIFFITH DRIVE, SUITE 150; BEAVERTON, OR 97005

PROJECT INFORMATION

3J PROJECT #	17393
TAX LOT(S)	3S2W16 13800, 1100
LAND USE #	N/A
DESIGNED BY	ARS, JEJ, BMO
CHECKED BY	AJM, RGW

SHEET NUMBER
C122

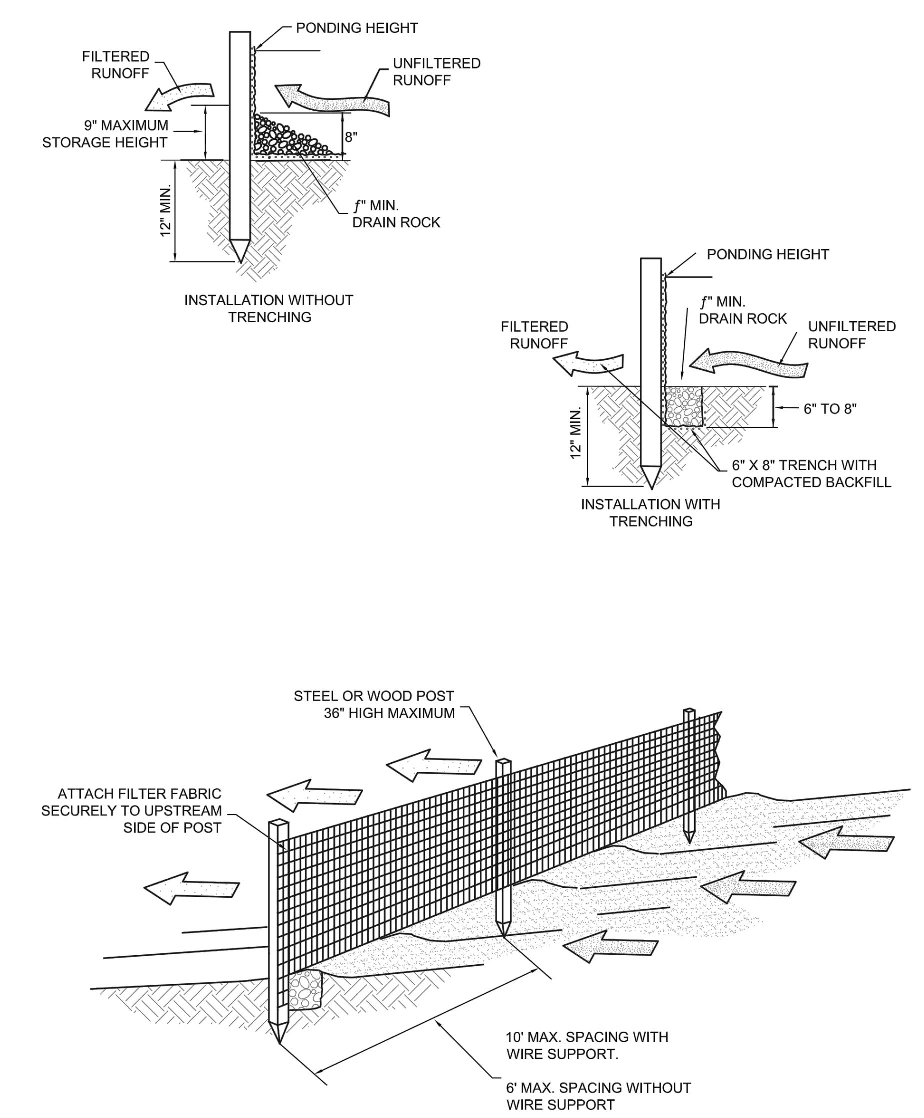
P:\17393-JTS-CRESTVIEW CROSSING\CAD\DD\C120 1200C SET.DWG



NOTES:
1. THE ENTRANCE SHALL BE MAINTAINED IN A CONDITION THAT WILL PREVENT TRACKING OR FLOWING OF SEDIMENT ONTO PUBLIC RIGHT-RIGH-OF WAYS. THIS MAY REQUIRE TOP DRESSING, REPAIR AND/OR CLEAN OUT OF ANY MEASURES USED TO TRAP SEDIMENT.
2. WHEN NECESSARY, WHEELS SHALL BE CLEANED PRIOR TO ENTRANCE ONTO PUBLIC RIGHT-OF-WAY.
3. WHEN WASHING IS REQUIRED, IT SHALL BE DONE ON AN AREA STABILIZED WITH CRUSHED STONE THAT DRAINS INTO AN APPROVED SEDIMENT TRAP OR SEDIMENT BASIN.
4. WHERE RUNOFF CONTAINING SEDIMENT-LADEN WATER IS LEAVING THE SITE VIA THE CONSTRUCTION ENTRANCE, OTHER MEASURES SHALL BE IMPLEMENTED TO DIVERT RUNOFF THROUGH AN APPROVED FILTERING SYSTEM.
5. DIMENSIONS
   SINGLE FAMILY AND DUPLEX
   20' LONG BY 20' WIDE, 8" DEEP OF 3/4 " MINUS CLEAN ROCK.
   COMMERCIAL
   50' LONG BY 20' WIDE, 3-6" DEEP CLEAN ROCK.
   GOVERNING AUTHORITY MAY REQUIRE GEOTEXTILE FABRIC TO PREVENT SUB-SOIL PUMPING.

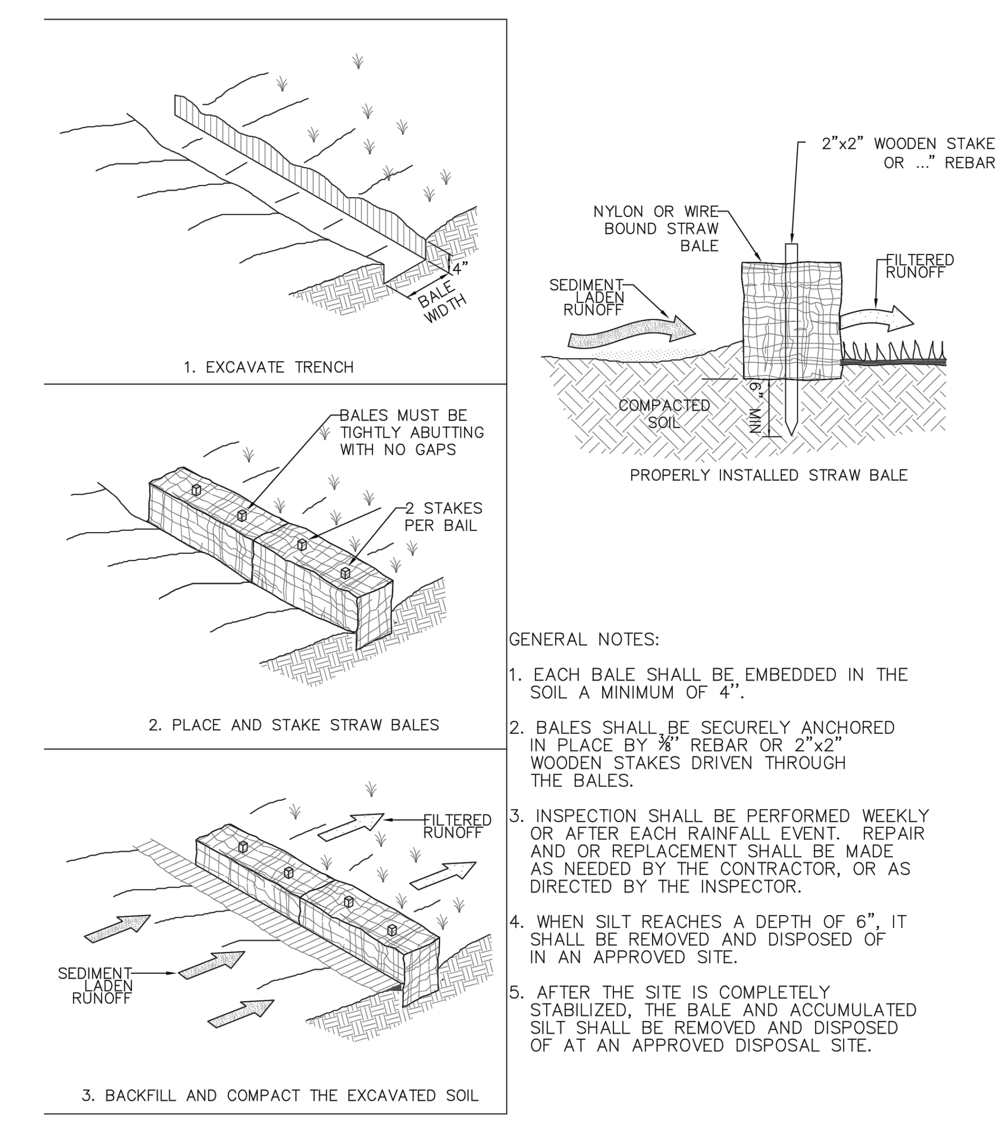
City of Newberg — PUBLIC WORKS ENGINEERING DIVISION, 414 E. FIRST STREET NEWBERG, OR 97132, PHONE: 503-537-1240, FAX: 503-537-1277

REVISIONS:	CONSTRUCTION ENTRANCE	SCALE: N.T.S
		DATE: May 2007
		APPROVED BY: D. Danicic
		STANDARD DRAWING 601



City of Newberg — PUBLIC WORKS ENGINEERING DIVISION, 414 E. FIRST STREET NEWBERG, OR 97132, PHONE: 503-537-1240, FAX: 503-537-1277

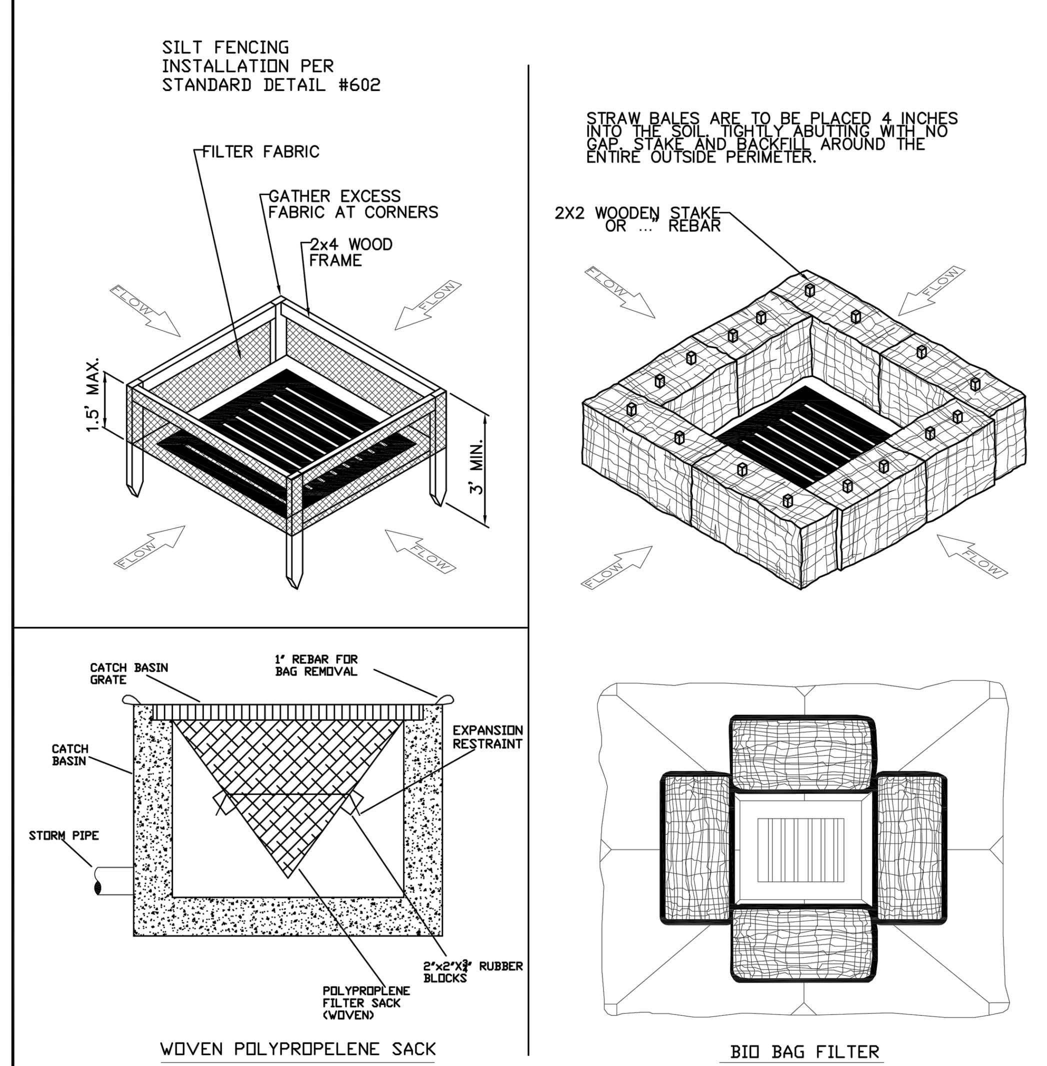
REVISIONS:	SILT FENCE	SCALE: N.T.S.
		DATE: MAY 2007
		APPROVED BY: D. DANICIC
		STANDARD DRAWING 602



GENERAL NOTES:
1. EACH BALE SHALL BE EMBEDDED IN THE SOIL A MINIMUM OF 4".
2. BALES SHALL BE SECURELY ANCHORED IN PLACE BY ⅜" REBAR OR 2"x2" WOODEN STAKES DRIVEN THROUGH THE BALES.
3. INSPECTION SHALL BE PERFORMED WEEKLY OR AFTER EACH RAINFALL EVENT. REPAIR AND OR REPLACEMENT SHALL BE MADE AS NEEDED BY THE CONTRACTOR, OR AS DIRECTED BY THE INSPECTOR.
4. WHEN SILT REACHES A DEPTH OF 6", IT SHALL BE REMOVED AND DISPOSED OF IN AN APPROVED SITE.
5. AFTER THE SITE IS COMPLETELY STABILIZED, THE BALE AND ACCUMULATED SILT SHALL BE REMOVED AND DISPOSED OF AT AN APPROVED DISPOSAL SITE.

City of Newberg — PUBLIC WORKS ENGINEERING DIVISION, 414 E. FIRST STREET NEWBERG, OR 97132, PHONE: 503-537-1240, FAX: 503-537-1277

REVISIONS:	STRAW BALE BARRIER	SCALE: N.T.S
		DATE: May 2007
		APPROVED BY: D. Danicic
		STANDARD DRAWING 603

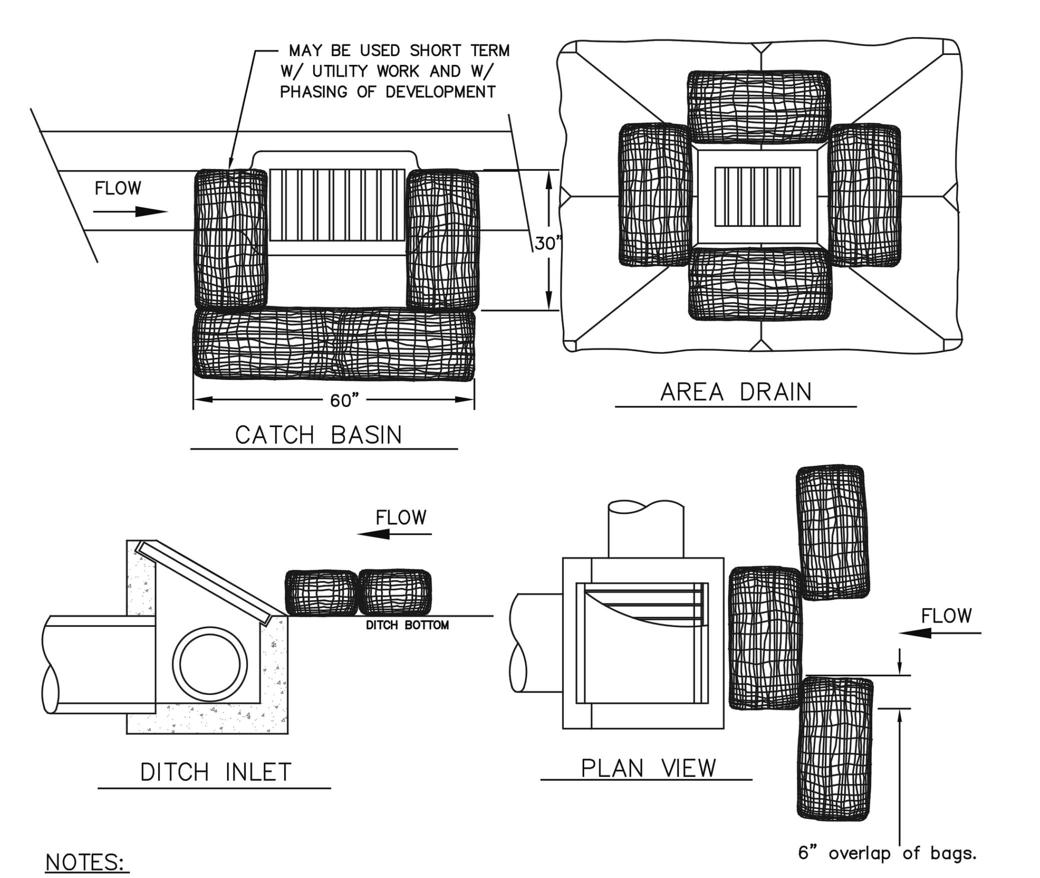


THIS METHOD OF INLET PROTECTION IS TO BE USED WHERE THE INLET DRAIN IS LOCATED IN A RELATIVELY FLAT UNPAVED AREA (SLOPE <5%).

THIS METHOD OF INLET PROTECTION SHALL NOT BE USED IN STREETS, TRAVELED AREAS, OR AREAS OF CONCENTRATED FLOW (DITCHES).

City of Newberg — PUBLIC WORKS ENGINEERING DIVISION, 414 E. FIRST STREET NEWBERG, OR 97132, PHONE: 503-537-1240, FAX: 503-537-1277

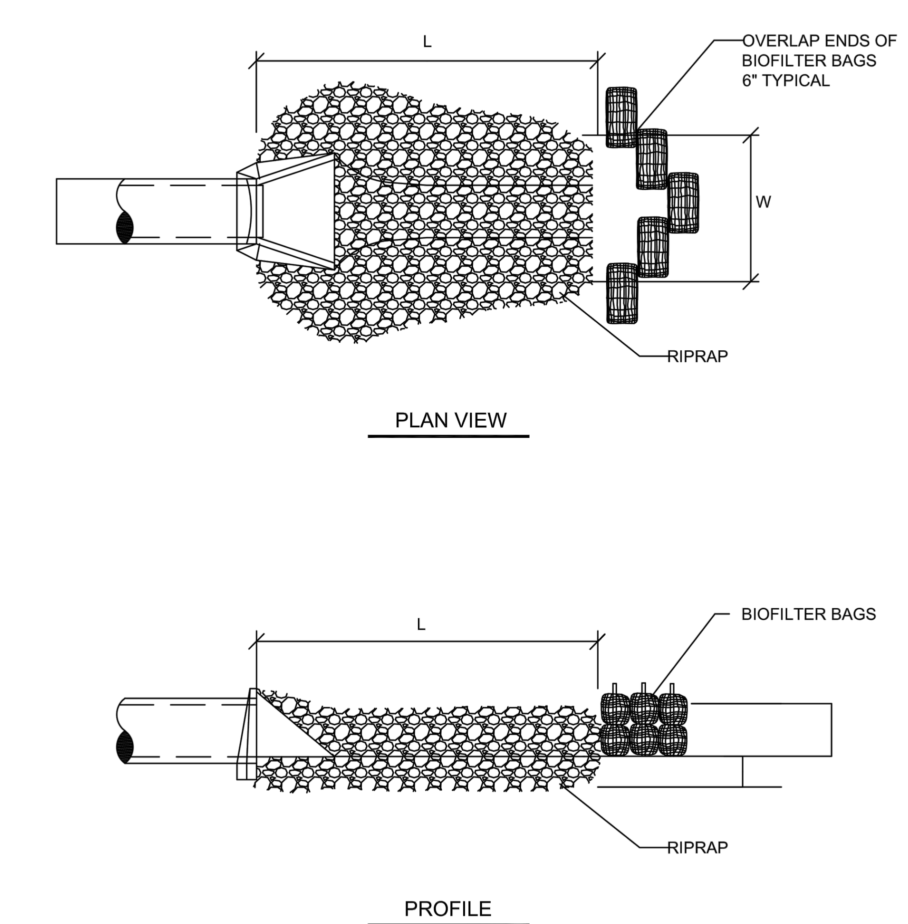
REVISIONS:	FIELD DRAIN INLET PROTECTION	SCALE: N.T.S.
12/10/2013		DATE: 12/10/2013
		APPROVED BY: PAUL CHIU
		STANDARD DRAWING 604



NOTES:
1. ADDITIONAL MEASURES MUST BE CONSIDERED DEPENDING ON SOIL TYPES.
2. BIO-FILTER BAGS SHOULD BE STAKED WHERE APPLICABLE USING (2) 1"x2"WOODEN STAKES OR APPROVED EQUAL PER BAG.
3. WHEN USING 30" BIO-BAGS TO PROTECT A CATCH BASIN YOU MUST HAVE 4 BAGS AND THEY SHALL BE OVERLAPPED BY 6".

City of Newberg — PUBLIC WORKS ENGINEERING DIVISION, 414 E. FIRST STREET NEWBERG, OR 97132, PHONE: 503-537-1240, FAX: 503-537-1277

REVISIONS:	INLET PROTECTION	SCALE: N.T.S.
12/10/2013		DATE: 04/04/2009
		APPROVED BY: PAUL CHIU
		STANDARD DRAWING 605



W = GREATER OF: DIAMETER + 6' OR 3x DIAMETER

L = GREATER OF: 12' OR 4x DIAMETER

NOTES:
1. BIOFILTER BAGS REQUIRED ONLY WHEN DISCHARGING SEDIMENT-LADEN WATER.
2. STAKING OF BIOFILTER BAGS REQUIRED USING (2) 1"x2" WOOD STAKES OR APPROVED EQUAL PER BAG.

City of Newberg — PUBLIC WORKS ENGINEERING DIVISION, 414 E. FIRST STREET NEWBERG, OR 97132, PHONE: 503-537-1240, FAX: 503-537-1277

REVISIONS:	OUTLET PROTECTION	SCALE: N.T.S
		DATE: 01/10/2014
		APPROVED BY:
		STANDARD DRAWING 606

P:\17393-JTS-CRESTVIEW CROSSING\CAD\DD\C120 1200C SET.DWG

REGISTERED PROFESSIONAL ENGINEER 87762PE OREGON ... ROCHELLE SEAL — PRELIMINARY — EXPIRES: 06/30/20

PUBLISH DATE
06.06.2018

ISSUED FOR
LAND USE DOCUMENTS

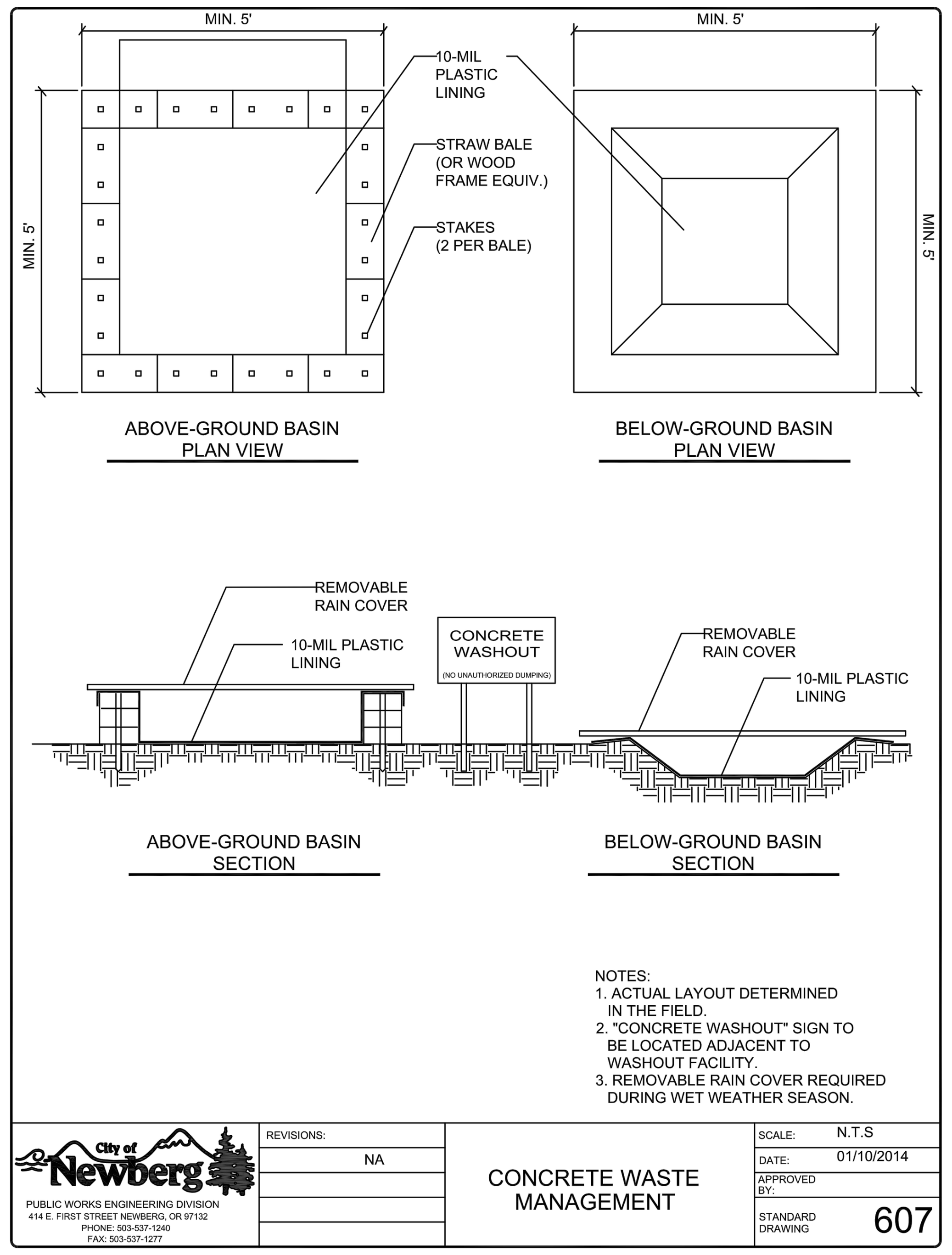
1200C DETAILS I
CRESTVIEW CROSSING PLANNED UNIT DEVELOPMENT
JT SMITH COMPANIES
NEWBERG, OR

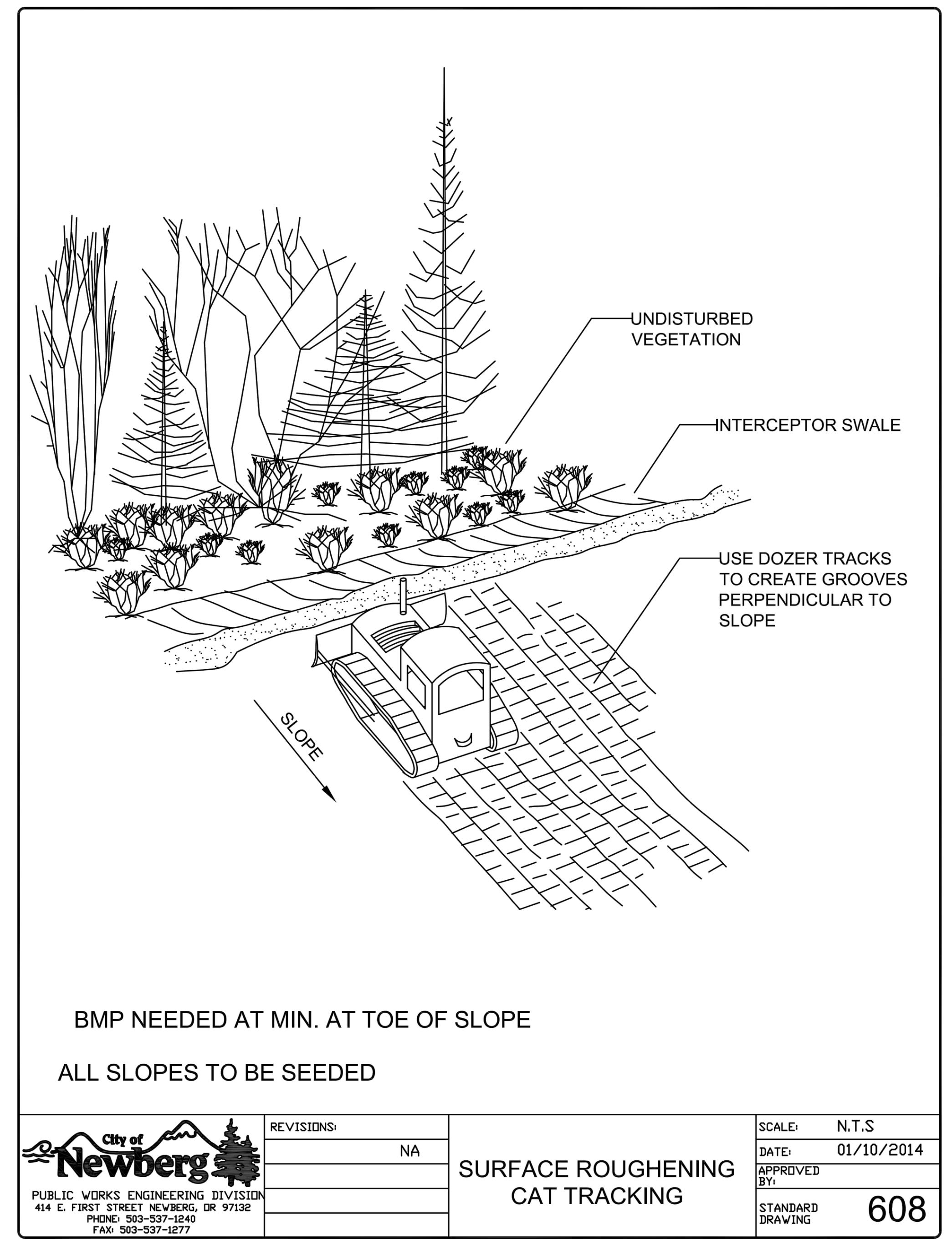
3J CONSULTING
CIVIL ENGINEERING
WATER RESOURCES
LAND USE PLANNING
5075 SW GRIFFITH DRIVE, SUITE 150; BEAVERTON, OR 97005

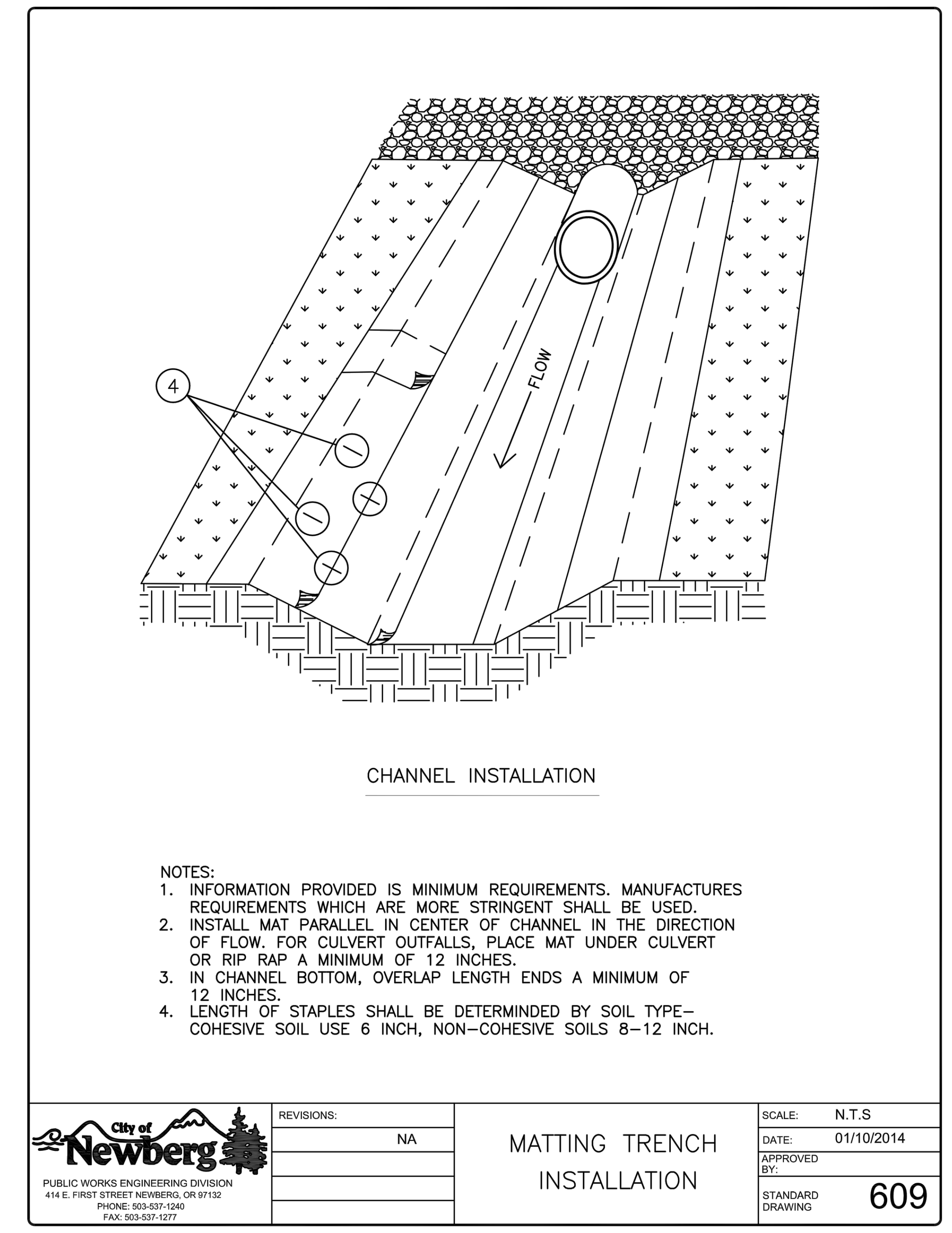
PROJECT INFORMATION

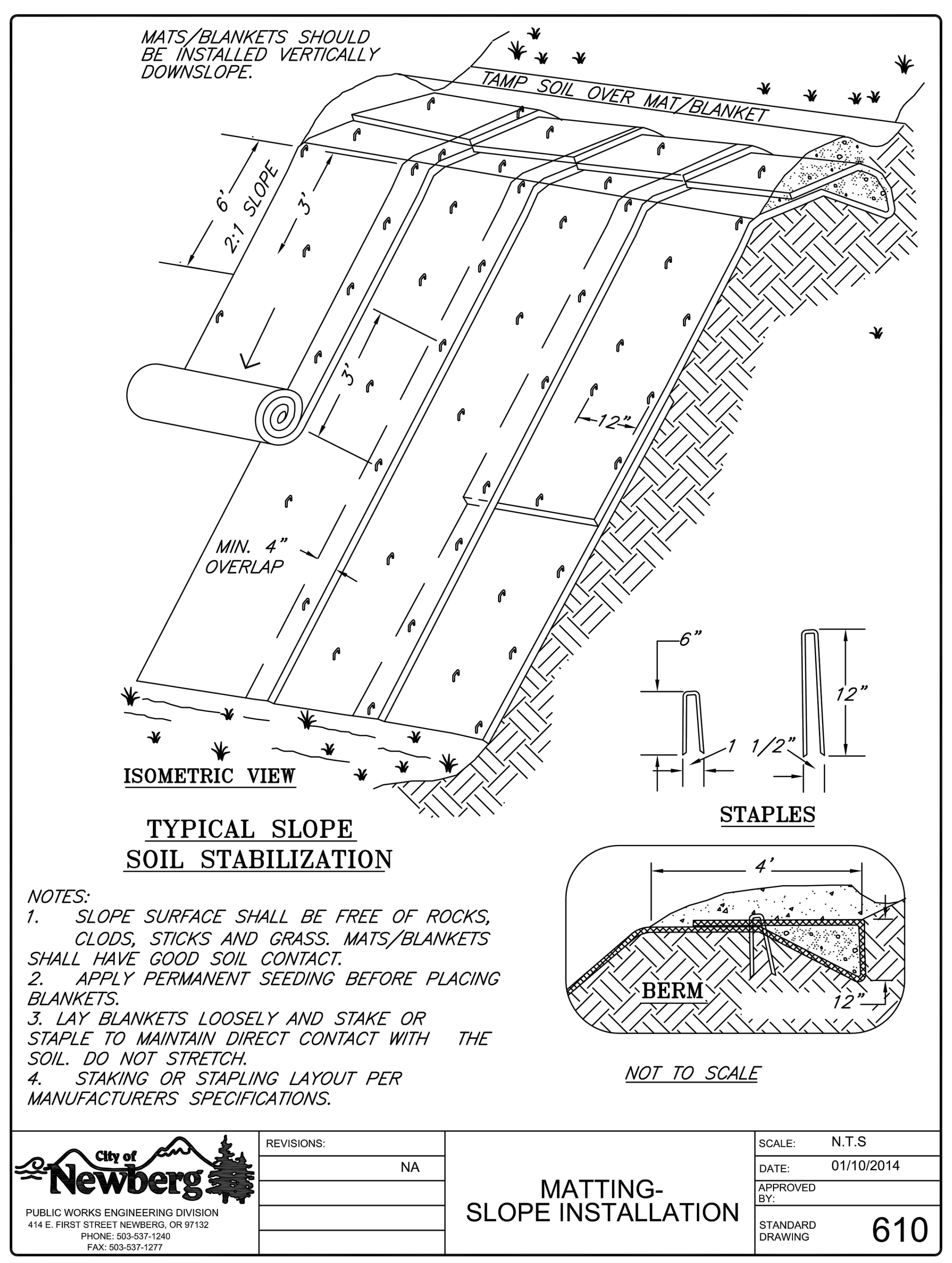
3J PROJECT #	17393
TAX LOT(S)	3S2W16 13800, 1100
LAND USE #	N/A
DESIGNED BY	ARS, JEJ, BMO
CHECKED BY	AJM, RGW

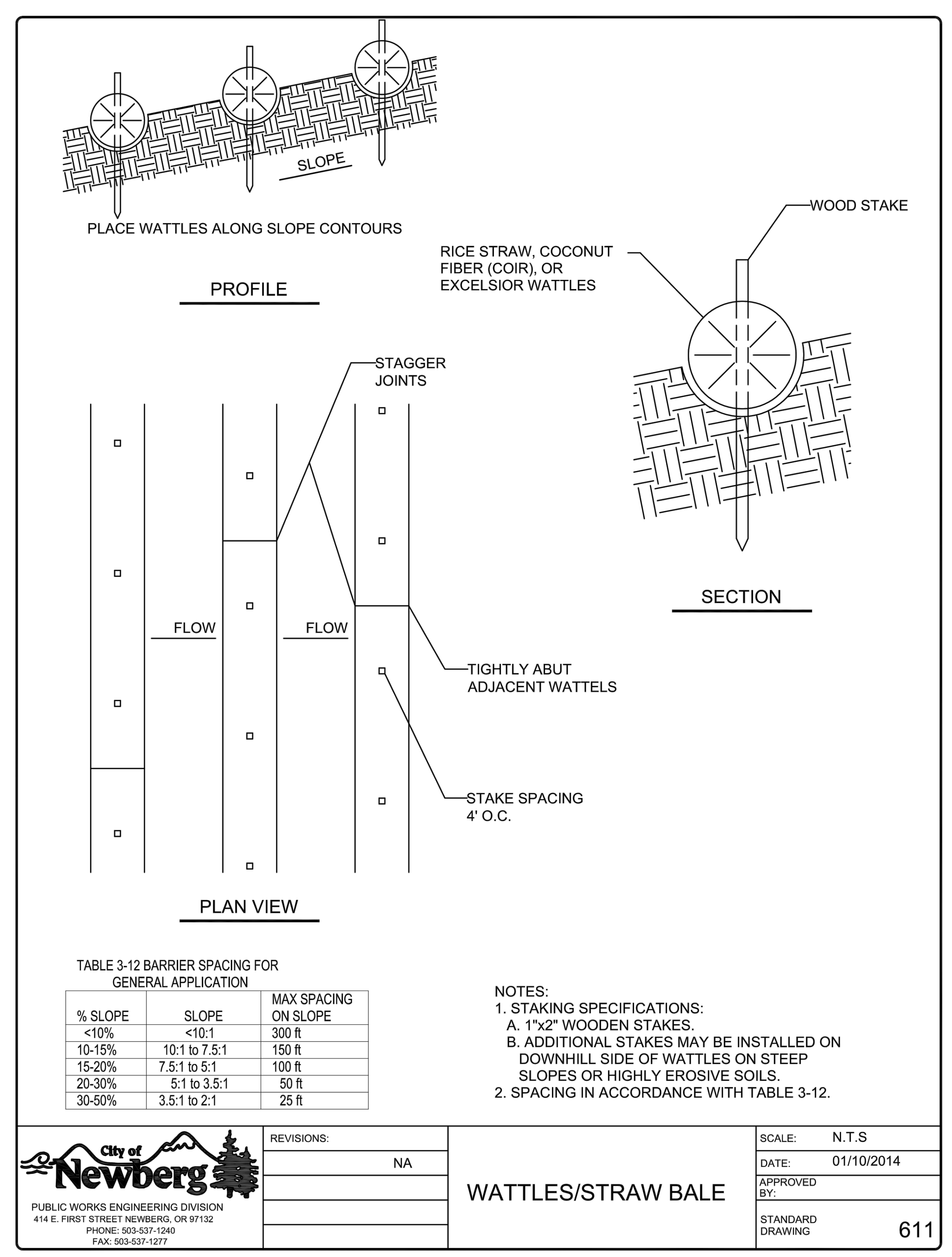
SHEET NUMBER
C123



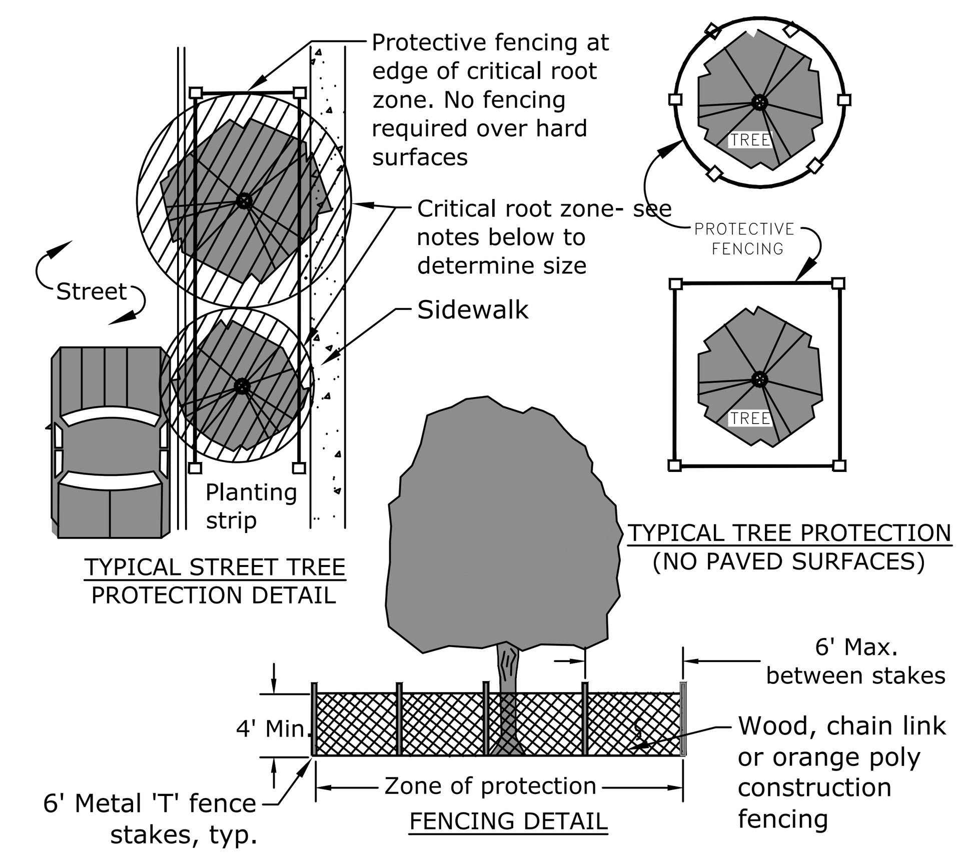








% SLOPE	SLOPE	MAX SPACING ON SLOPE
<10%	<10:1	300 ft
10-15%	10:1 to 7.5:1	150 ft
15-20%	7.5:1 to 5:1	100 ft
20-30%	5:1 to 3.5:1	50 ft
30-50%	3.5:1 to 2:1	25 ft



Notes:
1) The critical root zone (CRZ) shall be an area with a radius at least 5' from the edge of the tree dripline. 2) The CRZ shall be marked and protected by a construction fence placed around the perimeter prior to construction. 3) No soil grade changes or compaction shall take place within the CRZ except as directed. 4) No storage of material shall be allowed within the CRZ. 5) If work is done within the CRZ, care must be taken to minimize root disturbance. Special care shall be taken during excavation and removal of existing curb, gutter, and sidewalks to avoid damage to tree roots. Locate existing tree roots using hand tools or other approved methods such as an airspade. 6) Protective fencing is required when the work area is within the CRZ of trees, except where portions of the CRZ are covered with pavement such as streets or walks. 7) No root over 2" shall be cut without approval of the urban forester (or an approved arborist). Roots shall be cut with approved saws. No roots over 2" shall be cut or torn during trenching with power equipment such as backhoes and trenchers. Utility lines and irrigation or other pipes shall be installed by hand digging or tunneling under roots, as necessary, to avoid cutting roots 2" and larger.

TREE PROTECTION FENCING

T-1 / C124

N.T.S.

REGISTERED PROFESSIONAL ENGINEER 87762PE OREGON ... 14, 2017 ... ROCHELLE SEAL
PRELIMINARY
EXPIRES: 06/30/20

PUBLISH DATE
06.06.2018

ISSUED FOR
LAND USE DOCUMENTS

1200C DETAILS II

CRESTVIEW CROSSING PLANNED UNIT DEVELOPMENT

JT SMITH COMPANIES
NEWBERG, OR

3J CONSULTING
CIVIL ENGINEERING
WATER RESOURCES
LAND USE PLANNING
5075 SW GRIFFITH DRIVE, SUITE 150; BEAVERTON, OR 97005

PROJECT INFORMATION

3J PROJECT #	17393
TAX LOT(S)	3S2W16 13800, 1100
LAND USE #	N/A
DESIGNED BY	ARS, JEJ, BMO
CHECKED BY	AJM, RGW

SHEET NUMBER
C124

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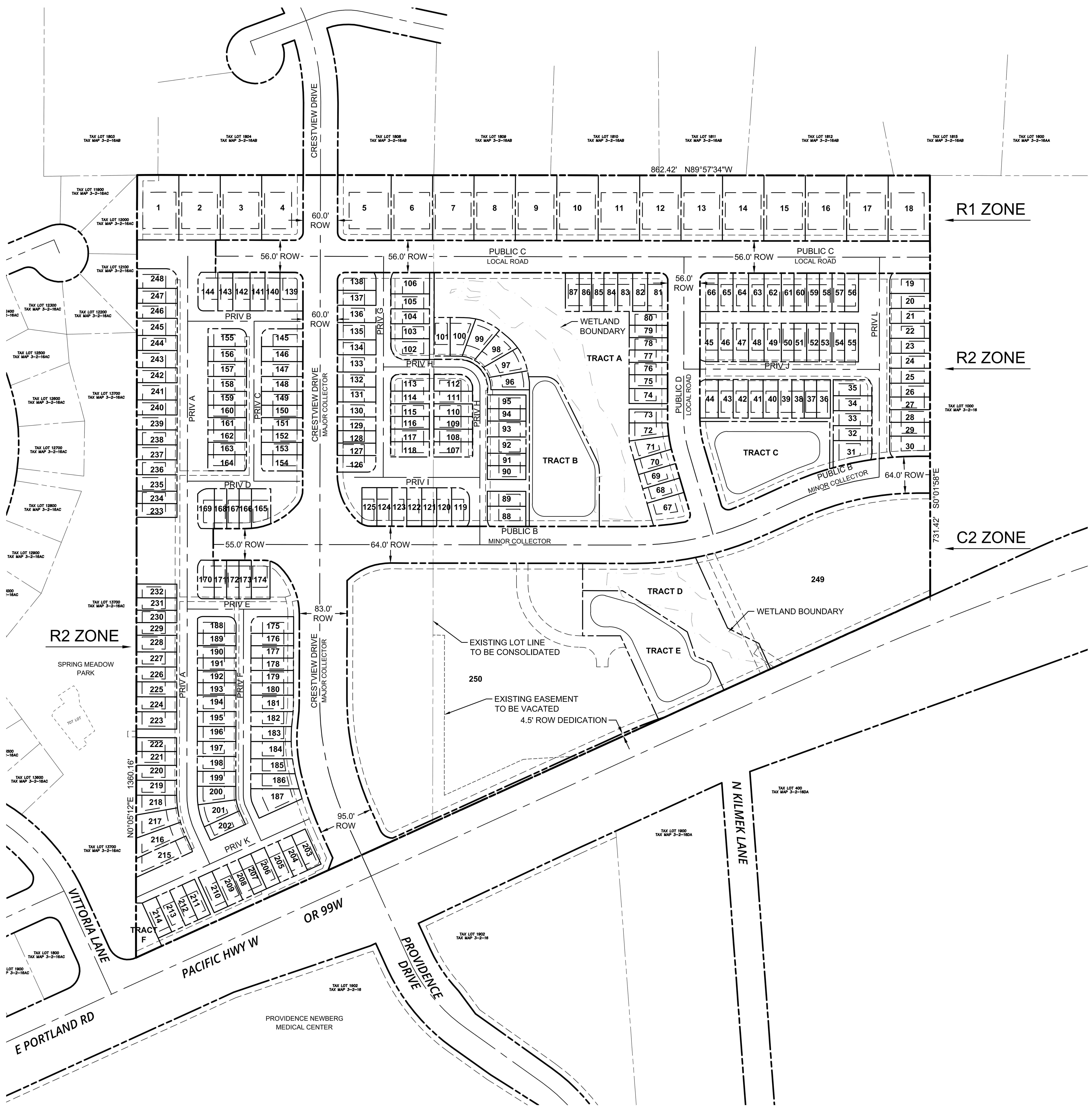


SITE STATISTICS

SITE ADDRESS	4505 E PORTLAND ROAD
TAX LOT / ALT. PARCEL NO.	3216AC 13800 & 1100
JURISDICTION	CITY OF NEWBERG
GROSS SITE AREA	33.13 ACRES
PROPERTY ZONING	R-1, R-2, C-2
FLOOD HAZARD MAP NUMBER	FIRM PANEL NUMBER: 41071C0241D - ZONE X (UN-SHADED) 41071C0235D - ZONE X (UN-SHADED)

SUBDIVISION STATISTICS

ZONING CODE CHAPTER 33.120	ZONE R-1	ZONE R-2	ZONE R-2 PUD* AS PROPOSED	ZONE C-2
ZONE AREA	4.31 ACRES	6.58 ACRES	6.58 ACRES	22.24 ACRES
MAXIMUM DENSITY*	175 DENSITY POINTS/ACRE	310 DENSITY POINTS/ACRE	310 DENSITY POINTS/ACRE	640 DENSITY POINTS/ACRE
MAXIMUM LOT SIZE	10,000 SF	5,000 SF	3,100 SF	N/A
MINIMUM LOT SIZE	5,000 SF	3,000 SF	1,440 SF	5,000 SF
MINIMUM LOT WIDTH	35 FT @ BL	35 FT @ BL	21.5 FT	N/A
MAXIMUM LOT COVERAGE	30%	50%	60%	N/A
MAXIMUM BUILDING HEIGHT	30 FT	30 FT	30 FT	N/A

SETBACKS

FRONT	15 FT	15 FT	10 FT	10 FT
INTERIOR	5 FT	5 FT	2.5 FT	0 FT/10FT

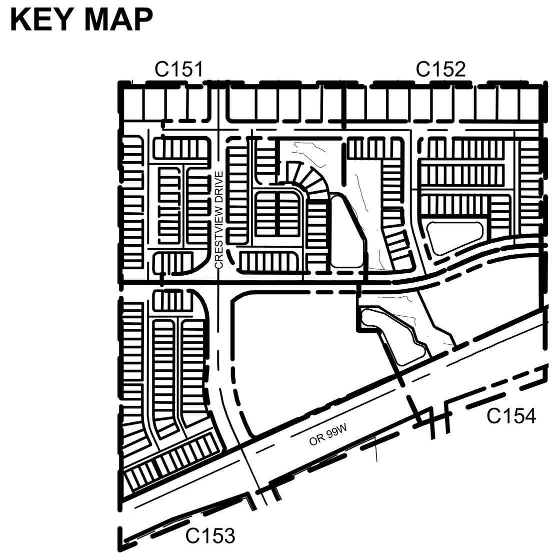
*THIS SUBDIVISION IS A PLANNED UNIT DEVELOPMENT (PUD) THAT PROPOSES REDUCED LOT OR DEVELOPMENT SITE AREA AND INSTEAD USES MAXIMUM DENSITY POINTS PER ACRE.

THIS PLAN HAS BEEN PREPARED FOR PLANNING AND ILLUSTRATIVE PURPOSES ONLY. THIS TENTATIVE PLAT SHOWS PROPOSED LOT CONSOLIDATION AND DIMENSIONS. THIS IS NOT AN OFFICIAL PLAT AND IS NOT TO BE USED FOR SURVEY OR RECORDING PURPOSES.

LEGEND

- PROJECT BOUNDARY
- EXISTING RIGHT-OF-WAY LINE
- EXISTING RIGHT-OF-WAY CENTERLINE
- EXISTING LOT LINE
- EXISTING ADJACENT PROPERTY LINE
- EXISTING EASEMENT
- PROPOSED RIGHT-OF-WAY LINE
- PROPOSED RIGHT-OF-WAY CENTERLINE
- PROPOSED LOT LINE
- PROPOSED SETBACK LINE
- PROPOSED EASEMENT

KEY MAP



811 Know what's below. Call before you dig.

SCALE: 1" = 100'

PRELIMINARY

EXPIRES: 06/30/20

PUBLISH DATE
06.06.2018

ISSUED FOR
LAND USE DOCUMENTS

OVERALL TENTATIVE PLAT
CRESTVIEW CROSSING PLANNED UNIT DEVELOPMENT

JT SMITH COMPANIES
NEWBERG, OR

3J CONSULTING
CIVIL ENGINEERING
WATER RESOURCES
LAND USE PLANNING
5075 SW GRIFFITH DRIVE, SUITE 150; BEAVERTON, OR 97005

PROJECT INFORMATION

3J PROJECT #	17393
TAX LOT(S)	3S2W16 13800, 1100
LAND USE #	N/A
DESIGNED BY	ARS, JEJ, BMO
CHECKED BY	AJM, RGW

SHEET NUMBER
C150

P:\17393-JTS-CRESTVIEW CROSSING\CAD\DD\C150 TENTATIVE PLAT.DWG

SITE STATISTICS

SITE ADDRESS	4505 E PORTLAND ROAD
TAX LOT / ALT. PARCEL NO.	3216AC 13800 & 1100
JURISDICTION	CITY OF NEWBERG
GROSS SITE AREA	33.13 ACRES
PROPERTY ZONING	R-1, R-2, C-2
FLOOD HAZARD MAP NUMBER	FIRM PANEL NUMBER: 41071C0241D - ZONE X (UN-SHADED) 41071C0235D - ZONE X (UN-SHADED)

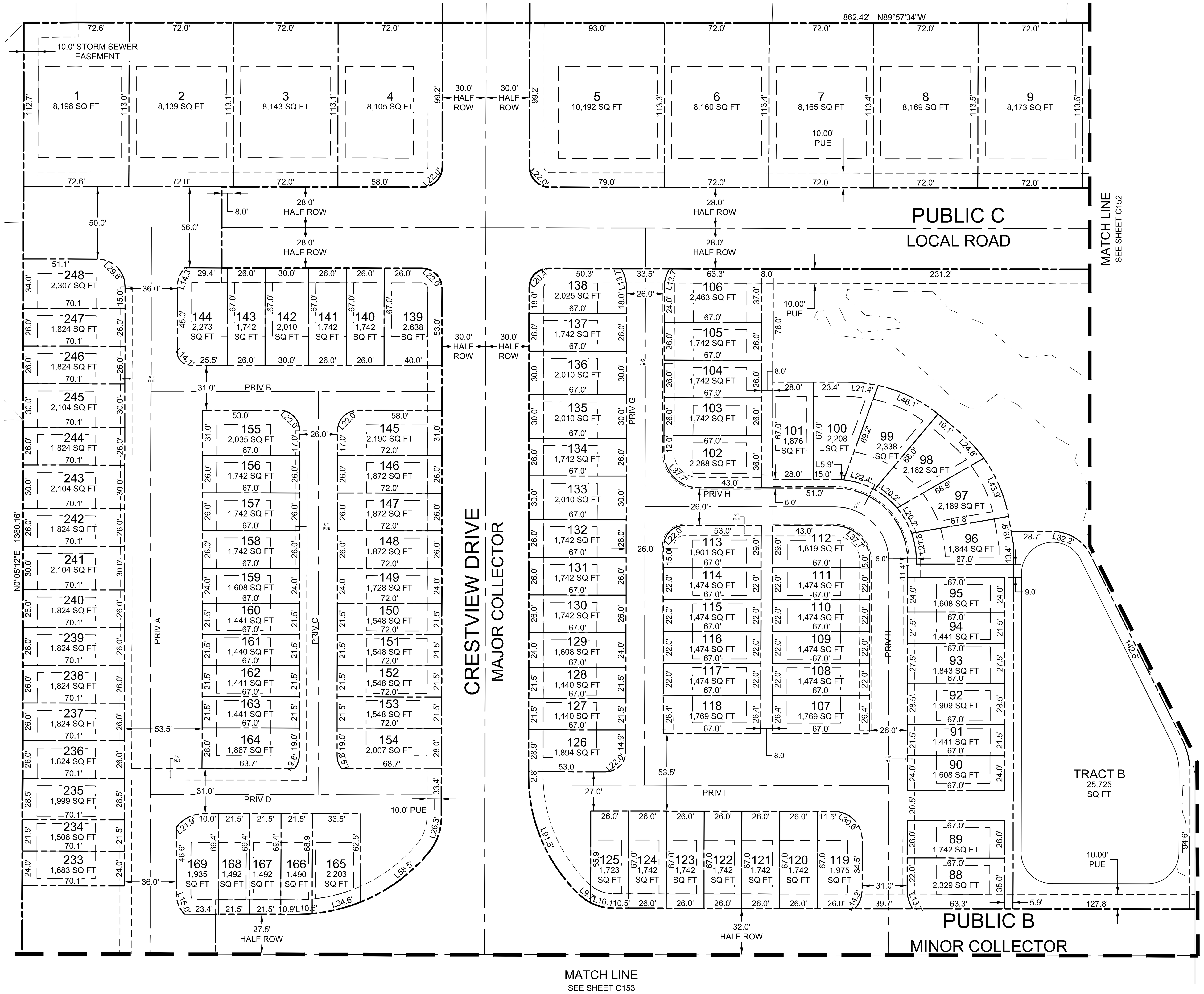
SUBDIVISION STATISTICS

ZONING CODE CHAPTER 33.120	ZONE R-1	ZONE R-2	ZONE R-2 PUD* AS PROPOSED	ZONE C-2
ZONE AREA	4.31 ACRES	6.58 ACRES	6.58 ACRES	22.24 ACRES
MAXIMUM DENSITY*	175 DENSITY POINTS/ACRE	310 DENSITY POINTS/ACRE	310 DENSITY POINTS/ACRE	640 DENSITY POINTS/ACRE
MAXIMUM LOT SIZE	10,000 SF	5,000 SF	3,100 SF	N/A
MINIMUM LOT SIZE	5,000 SF	3,000 SF	1,440 SF	5,000 SF
MINIMUM LOT WIDTH	35 FT @ BL	35 FT @ BL	21.5 FT	N/A
MAXIMUM LOT COVERAGE	30%	50%	60%	N/A
MAXIMUM BUILDING HEIGHT	30 FT	30 FT	30 FT	N/A

SETBACKS

FRONT	15 FT	15 FT	10 FT	10 FT
INTERIOR	5 FT	5 FT	2.5 FT	0 FT/10FT

*THIS SUBDIVISION IS A PLANNED UNIT DEVELOPMENT (PUD) THAT PROPOSES REDUCED LOT OR DEVELOPMENT SITE AREA AND INSTEAD USES MAXIMUM DENSITY POINTS PER ACRE.

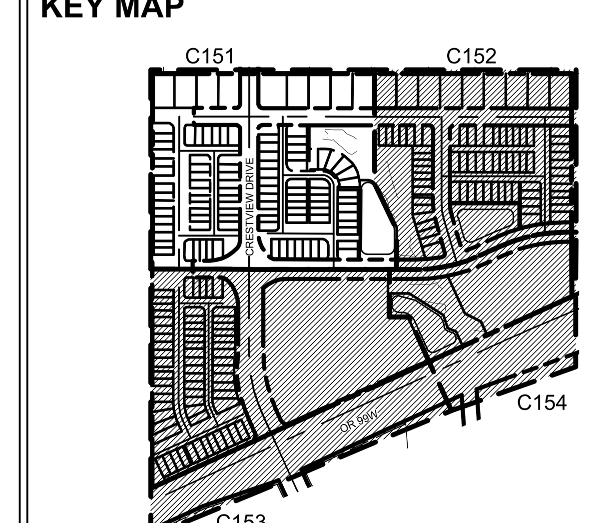


THIS PLAN HAS BEEN PREPARED FOR PLANNING AND ILLUSTRATIVE PURPOSES ONLY. THIS TENTATIVE PLAT SHOWS PROPOSED LOT CONSOLIDATION AND DIMENSIONS. THIS IS NOT AN OFFICIAL PLAT AND IS NOT TO BE USED FOR SURVEY OR RECORDING PURPOSES.

LEGEND

- PROJECT BOUNDARY
- EXISTING RIGHT-OF-WAY LINE
- EXISTING RIGHT-OF-WAY CENTERLINE
- EXISTING LOT LINE
- EXISTING ADJACENT PROPERTY LINE
- EXISTING EASEMENT
- PROPOSED RIGHT-OF-WAY LINE
- PROPOSED RIGHT-OF-WAY CENTERLINE
- PROPOSED LOT LINE
- PROPOSED SETBACK LINE
- PROPOSED EASEMENT
- PROPOSED WETLAND BOUNDARY

KEY MAP



811
Know what's below.
Call before you dig.

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W E
S

SCALE: 1" = 100'
0 100' 200'

P:\17393-JTS-CRESTVIEW CROSSING\CADD\C150 TENTATIVE PLAT.DWG

PRELIMINARY
EXPIRES: 06/30/20

PUBLISH DATE
06.06.2018
ISSUED FOR
LAND USE DOCUMENTS

TENTATIVE PLAT I
CRESTVIEW CROSSING
PLANNED UNIT DEVELOPMENT
JT SMITH COMPANIES
NEWBERG, OR

3J CONSULTING
CIVIL ENGINEERING
WATER RESOURCES
LAND USE PLANNING
5075 SW GRIFFITH DRIVE, SUITE 150; BEAVERTON, OR 97005

PROJECT INFORMATION

3J PROJECT #	17393
TAX LOT(S)	3S2W16 13800, 1100
LAND USE #	N/A
DESIGNED BY	ARS, JEJ, BMO
CHECKED BY	AJM, RGW

SHEET NUMBER
C151

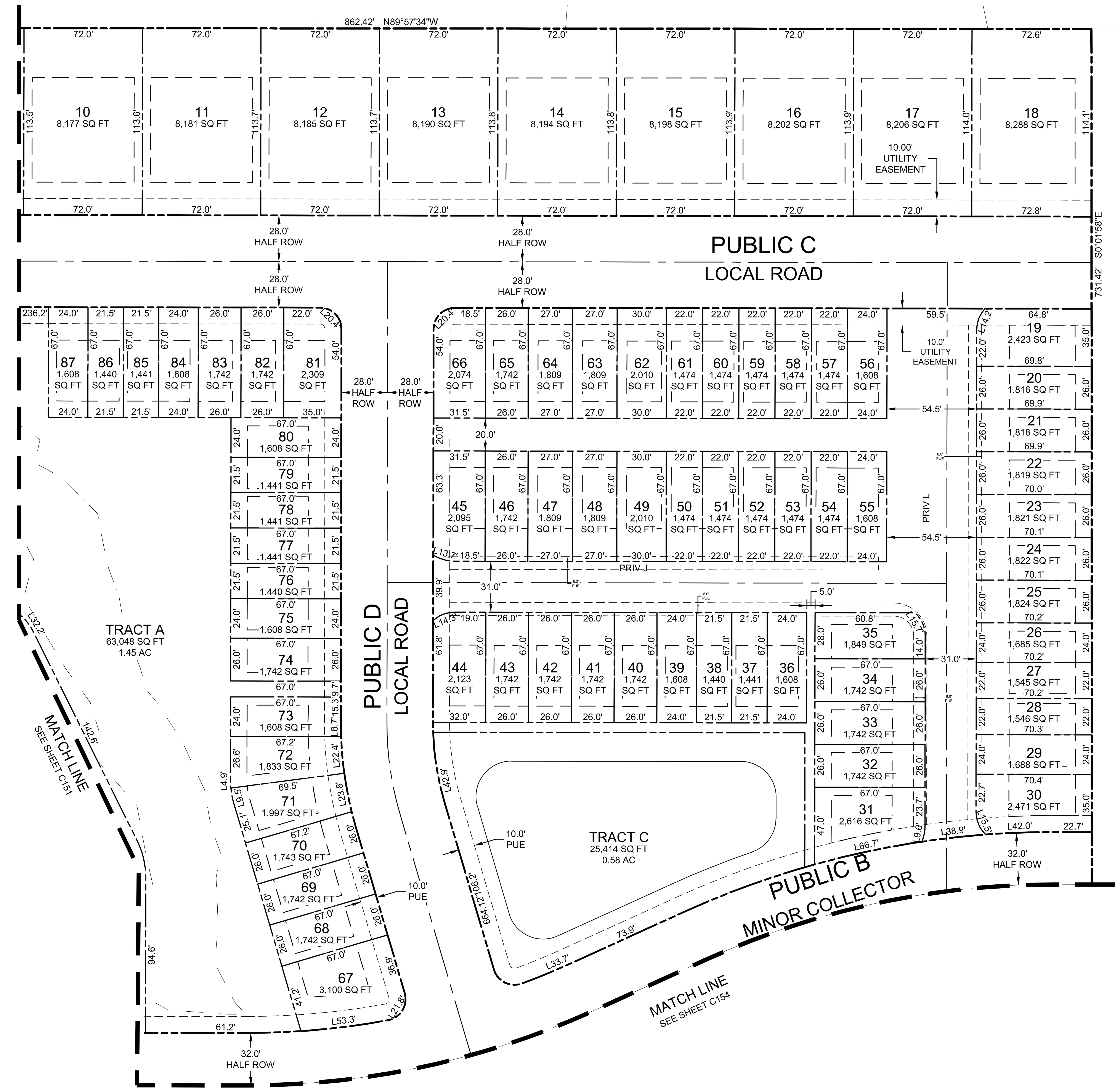
SITE STATISTICS

SITE ADDRESS	4505 E PORTLAND ROAD
TAX LOT / ALT. PARCEL NO.	3216AC 13800 & 1100
JURISDICTION	CITY OF NEWBERG
GROSS SITE AREA	33.13 ACRES
PROPERTY ZONING	R-1, R-2, C-2
FLOOD HAZARD MAP NUMBER	FIRM PANEL NUMBER: 41071C0241D - ZONE X (UN-SHADED) 41071C0235D - ZONE X (UN-SHADED)

SUBDIVISION STATISTICS

ZONING CODE CHAPTER 33.120	ZONE R-1	ZONE R-2	ZONE R-2 PUD* AS PROPOSED	ZONE C-2
ZONE AREA	4.31 ACRES	6.58 ACRES	6.58 ACRES	22.24 ACRES
MAXIMUM DENSITY*	175 DENSITY POINTS/ACRE	310 DENSITY POINTS/ACRE	310 DENSITY POINTS/ACRE	640 DENSITY POINTS/ACRE
MAXIMUM LOT SIZE	10,000 SF	5,000 SF	3,100 SF	N/A
MINIMUM LOT SIZE	5,000 SF	3,000 SF	1,440 SF	5,000 SF
MINIMUM LOT WIDTH	35 FT @ BL	35 FT @ BL	21.5 FT	N/A
MAXIMUM LOT COVERAGE	30%	50%	60%	N/A
MAXIMUM BUILDING HEIGHT	30 FT	30 FT	30 FT	N/A
SETBACKS				
FRONT	15 FT	15 FT	10 FT	10 FT
INTERIOR	5 FT	5 FT	2.5 FT	0 FT/10FT

*THIS SUBDIVISION IS A PLANNED UNIT DEVELOPMENT (PUD) THAT PROPOSES REDUCED LOT OR DEVELOPMENT SITE AREA AND INSTEAD USES MAXIMUM DENSITY POINTS PER ACRE.

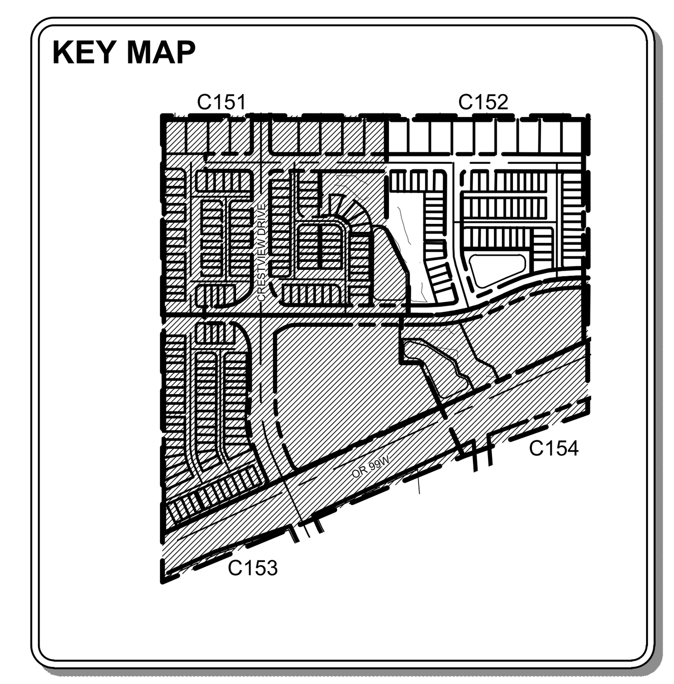


THIS PLAN HAS BEEN PREPARED FOR PLANNING AND ILLUSTRATIVE PURPOSES ONLY. THIS TENTATIVE PLAT SHOWS PROPOSED LOT CONSOLIDATION AND DIMENSIONS. THIS IS NOT AN OFFICIAL PLAT AND IS NOT TO BE USED FOR SURVEY OR RECORDING PURPOSES.

LEGEND

- PROJECT BOUNDARY
- EXISTING RIGHT-OF-WAY LINE
- EXISTING RIGHT-OF-WAY CENTERLINE
- EXISTING LOT LINE
- EXISTING ADJACENT PROPERTY LINE
- EXISTING EASEMENT
- PROPOSED RIGHT-OF-WAY LINE
- PROPOSED RIGHT-OF-WAY CENTERLINE
- PROPOSED LOT LINE
- PROPOSED SETBACK LINE
- PROPOSED EASEMENT
- PROPOSED WETLAND BOUNDARY

KEY MAP



Know what's below. Call before you dig.

N W E S

SCALE: 1" = 100'

0 100' 200'

REGISTERED PROFESSIONAL ENGINEER 87762PE OREGON ASHLEY ROCHELLE SEAL
PRELIMINARY
EXPIRES: 06/30/20

PUBLISH DATE
06.06.2018

ISSUED FOR
LAND USE DOCUMENTS

TENTATIVE PLAT II

CRESTVIEW CROSSING PLANNED UNIT DEVELOPMENT

JT SMITH COMPANIES
NEWBERG, OR

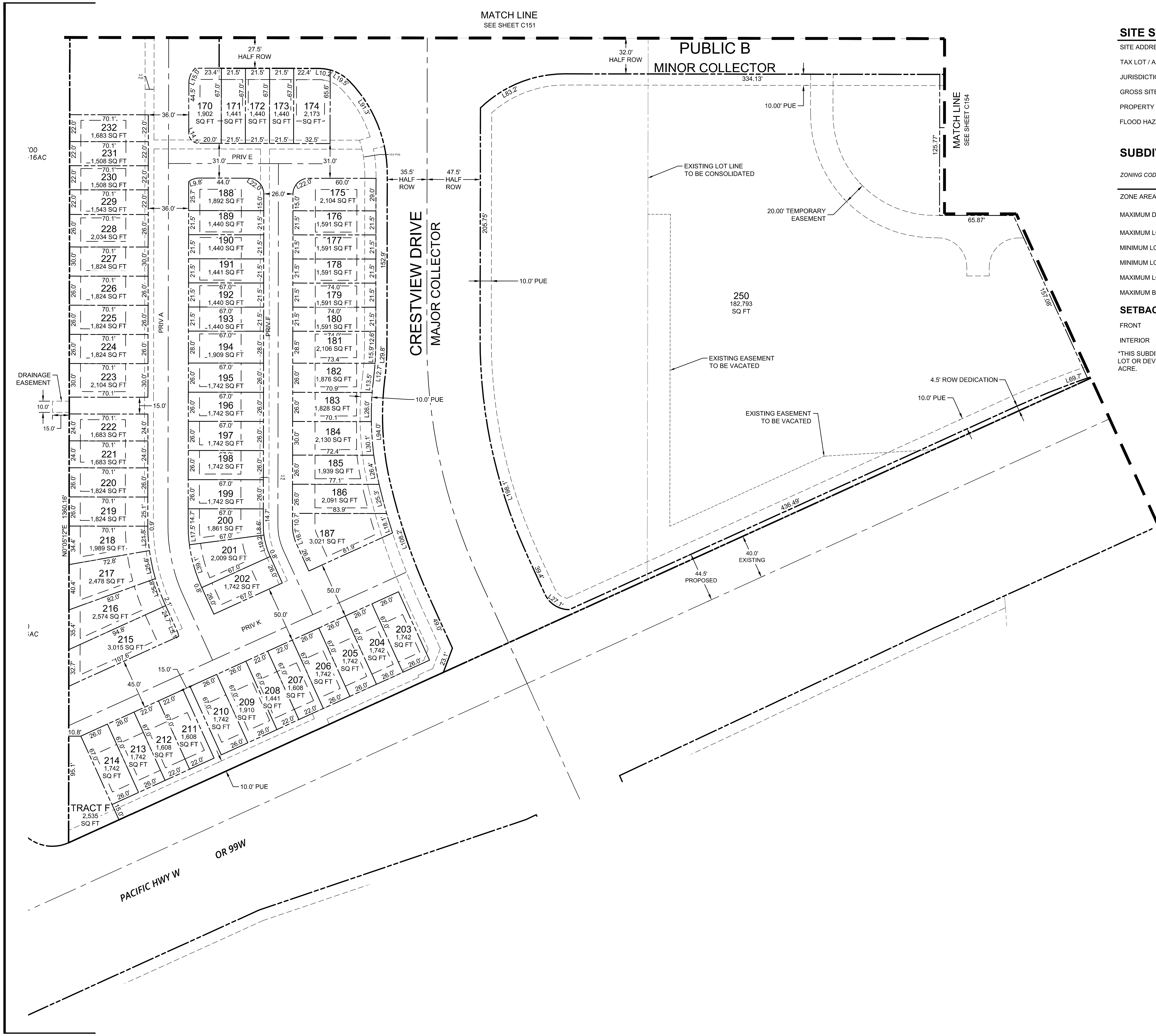
3J CONSULTING
CIVIL ENGINEERING
WATER RESOURCES
LAND USE PLANNING
5075 SW GRIFFITH DRIVE, SUITE 150; BEAVERTON, OR 97005

PROJECT INFORMATION

3J PROJECT #	17393
TAX LOT(S)	3S2W16 13800, 1100
LAND USE #	N/A
DESIGNED BY	ARS, JEJ, BMO
CHECKED BY	AJM, RGW

SHEET NUMBER
C152

P:\17393-JTS-CRESTVIEW CROSSING\CAD\DD\C150 TENTATIVE PLAT.DWG



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SITE STATISTICS

SITE ADDRESS	4505 E PORTLAND ROAD
TAX LOT / ALT. PARCEL NO.	3216AC 13800 & 1100
JURISDICTION	CITY OF NEWBERG
GROSS SITE AREA	33.13 ACRES
PROPERTY ZONING	R-1, R-2, C-2
FLOOD HAZARD MAP NUMBER	FIRM PANEL NUMBER: 41071C0241D - ZONE X (UN-SHADED) 41071C0235D - ZONE X (UN-SHADED)

SUBDIVISION STATISTICS

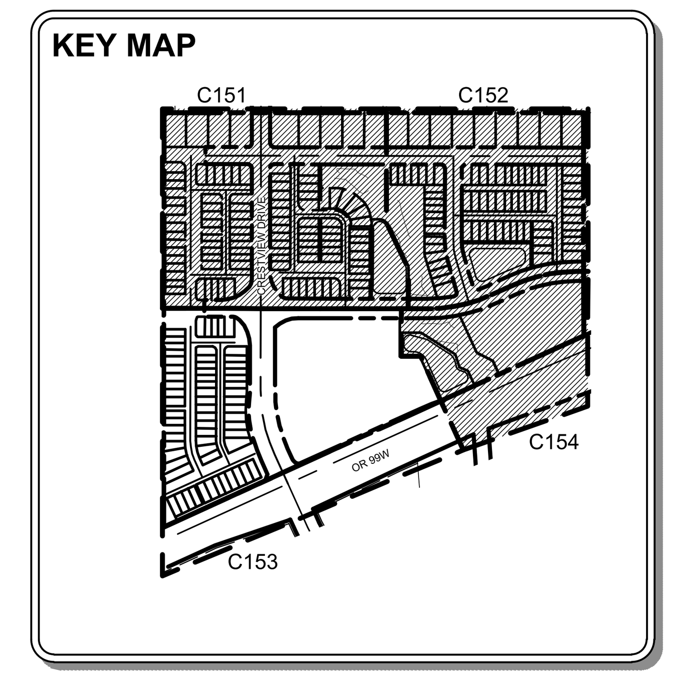
ZONING CODE CHAPTER 33.120	ZONE R-1	ZONE R-2	ZONE R-2 PUD* AS PROPOSED	ZONE C-2
ZONE AREA	4.31 ACRES	6.58 ACRES	6.58 ACRES	22.24 ACRES
MAXIMUM DENSITY*	175 DENSITY POINTS/ACRE	310 DENSITY POINTS/ACRE	310 DENSITY POINTS/ACRE	640 DENSITY POINTS/ACRE
MAXIMUM LOT SIZE	10,000 SF	5,000 SF	3,100 SF	N/A
MINIMUM LOT SIZE	5,000 SF	3,000 SF	1,440 SF	5,000 SF
MINIMUM LOT WIDTH	35 FT @ BL	35 FT @ BL	21.5 FT	N/A
MAXIMUM LOT COVERAGE	30%	50%	60%	N/A
MAXIMUM BUILDING HEIGHT	30 FT	30 FT	30 FT	N/A
SETBACKS				
FRONT	15 FT	15 FT	10 FT	10 FT
INTERIOR	5 FT	5 FT	2.5 FT	0 FT/10FT

*THIS SUBDIVISION IS A PLANNED UNIT DEVELOPMENT (PUD) THAT PROPOSES REDUCED LOT OR DEVELOPMENT SITE AREA AND INSTEAD USES MAXIMUM DENSITY POINTS PER ACRE.

LEGEND

- PROJECT BOUNDARY
- EXISTING RIGHT-OF-WAY LINE
- EXISTING RIGHT-OF-WAY CENTERLINE
- EXISTING LOT LINE
- EXISTING ADJACENT PROPERTY LINE
- EXISTING EASEMENT
- PROPOSED RIGHT-OF-WAY LINE
- PROPOSED RIGHT-OF-WAY CENTERLINE
- PROPOSED LOT LINE
- PROPOSED SETBACK LINE
- PROPOSED EASEMENT

KEY MAP



Know what's below. Call before you dig.

N W E S

SCALE: 1" = 100'
0 100' 200'

REGISTERED PROFESSIONAL ENGINEER 87762PE OREGON ASHLEY ROCHELLE SEAL PRELIMINARY
EXPIRES: 06/30/20

PUBLISH DATE
06.06.2018
ISSUED FOR
LAND USE DOCUMENTS

TENTATIVE PLAT III
CRESTVIEW CROSSING PLANNED UNIT DEVELOPMENT
JT SMITH COMPANIES
NEWBERG, OR

3J CONSULTING
CIVIL ENGINEERING
WATER RESOURCES
LAND USE PLANNING
5075 SW GRIFFITH DRIVE, SUITE 150; BEAVERTON, OR 97005

PROJECT INFORMATION

3J PROJECT #	17393
TAX LOT(S)	3S2W16 13800, 1100
LAND USE #	N/A
DESIGNED BY	ARS, JEJ, BMO
CHECKED BY	AJM, RGW

SHEET NUMBER
C153

P:\17393-JTS-CRESTVIEW CROSSING\CAD\DD\C150 TENTATIVE PLAT.DWG

SITE STATISTICS

SITE ADDRESS	4505 E PORTLAND ROAD
TAX LOT / ALT. PARCEL NO.	3216AC 13800 & 1100
JURISDICTION	CITY OF NEWBERG
GROSS SITE AREA	33.13 ACRES
PROPERTY ZONING	R-1, R-2, C-2
FLOOD HAZARD MAP NUMBER	FIRM PANEL NUMBER: 41071C0241D - ZONE X (UN-SHADED) 41071C0235D - ZONE X (UN-SHADED)

SUBDIVISION STATISTICS

ZONING CODE CHAPTER 33.120	ZONE R-1	ZONE R-2	ZONE R-2 PUD* AS PROPOSED	ZONE C-2
ZONE AREA	4.31 ACRES	6.58 ACRES	6.58 ACRES	22.24 ACRES
MAXIMUM DENSITY*	175 DENSITY POINTS/ACRE	310 DENSITY POINTS/ACRE	310 DENSITY POINTS/ACRE	640 DENSITY POINTS/ACRE
MAXIMUM LOT SIZE	10,000 SF	5,000 SF	3,100 SF	N/A
MINIMUM LOT SIZE	5,000 SF	3,000 SF	1,440 SF	5,000 SF
MINIMUM LOT WIDTH	35 FT @ BL	35 FT @ BL	21.5 FT	N/A
MAXIMUM LOT COVERAGE	30%	50%	60%	N/A
MAXIMUM BUILDING HEIGHT	30 FT	30 FT	30 FT	N/A
SETBACKS				
FRONT	15 FT	15 FT	10 FT	10 FT
INTERIOR	5 FT	5 FT	2.5 FT	0 FT/10FT

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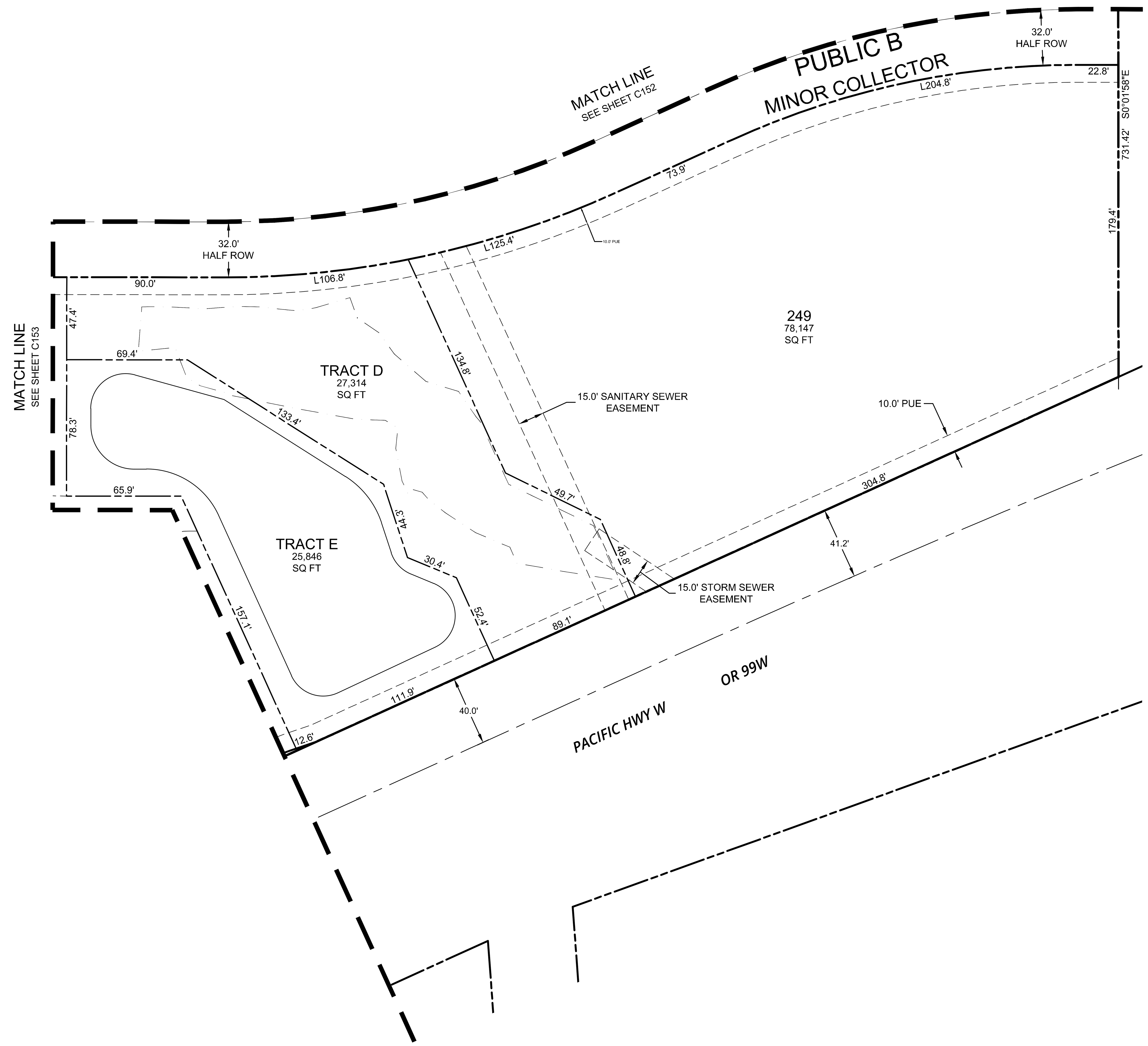

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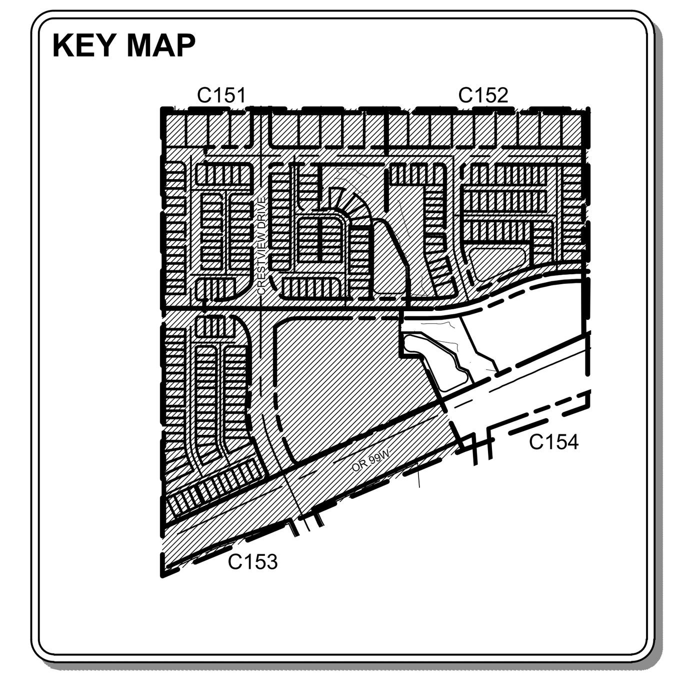
LEGEND

- PROJECT BOUNDARY
- EXISTING RIGHT-OF-WAY LINE
- EXISTING RIGHT-OF-WAY CENTERLINE
- EXISTING LOT LINE
- EXISTING ADJACENT PROPERTY LINE
- EXISTING EASEMENT
- PROPOSED RIGHT-OF-WAY LINE
- PROPOSED RIGHT-OF-WAY CENTERLINE
- PROPOSED LOT LINE
- PROPOSED SETBACK LINE
- PROPOSED EASEMENT
- PROPOSED WETLAND BOUNDARY

KEY MAP



811 Know what's below. Call before you dig.

N W E S

SCALE: 1" = 100'
0 100' 200'

REGISTERED PROFESSIONAL ENGINEER
OREGON
PRELIMINARY
EXPIRES: 06/30/20

PUBLISH DATE
06.06.2018
ISSUED FOR
LAND USE DOCUMENTS

TENTATIVE PLAT IV
CRESTVIEW CROSSING PLANNED UNIT DEVELOPMENT
JT SMITH COMPANIES
NEWBERG, OR

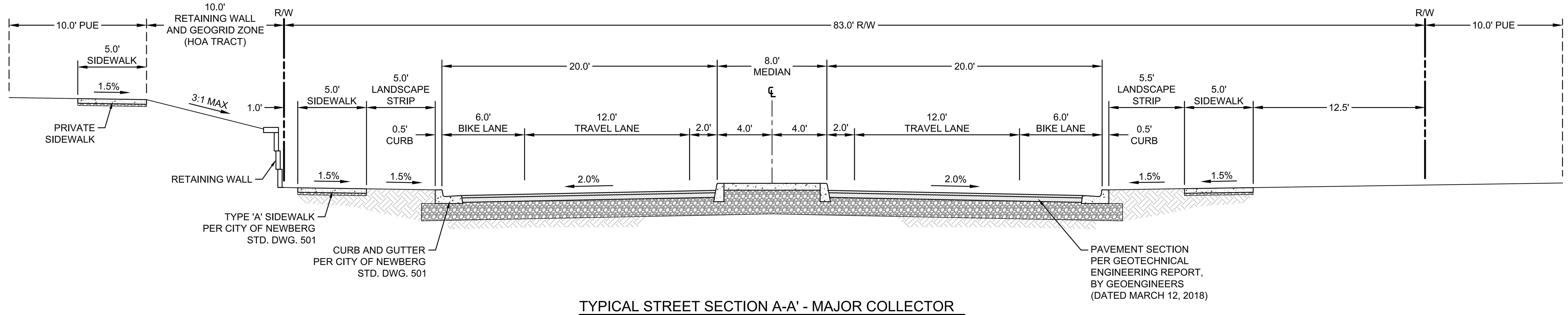
3J CONSULTING
CIVIL ENGINEERING
WATER RESOURCES
LAND USE PLANNING
5075 SW GRIFFITH DRIVE, SUITE 150; BEAVERTON, OR 97005

PROJECT INFORMATION

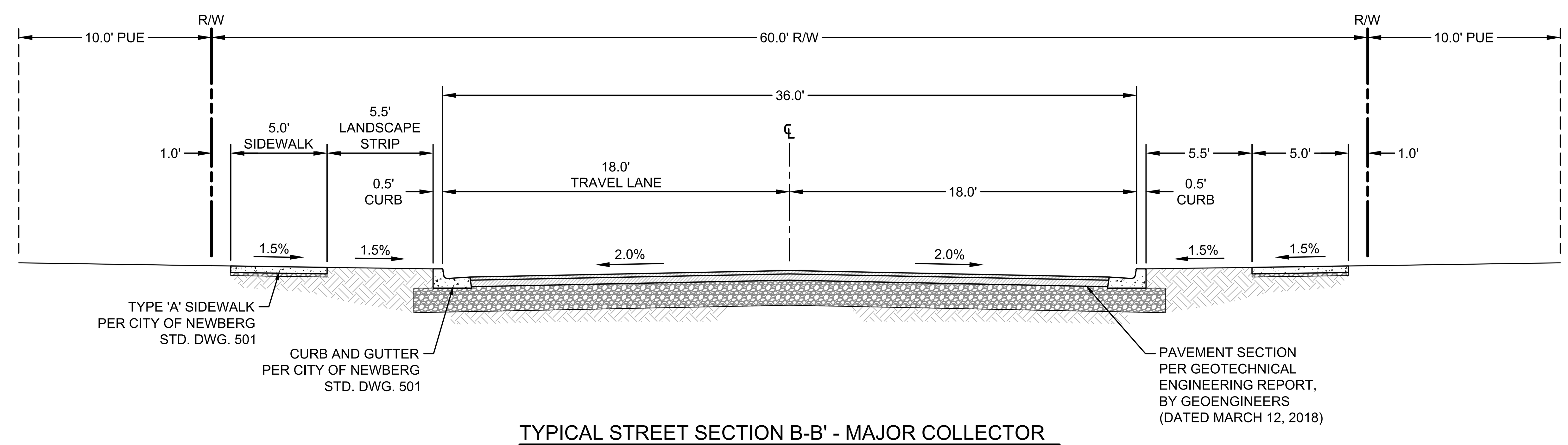
3J PROJECT #	17393
TAX LOT(S)	3S2W16 13800, 1100
LAND USE #	N/A
DESIGNED BY	ARS, JEJ, BMO
CHECKED BY	AJM, RGW

SHEET NUMBER
C154

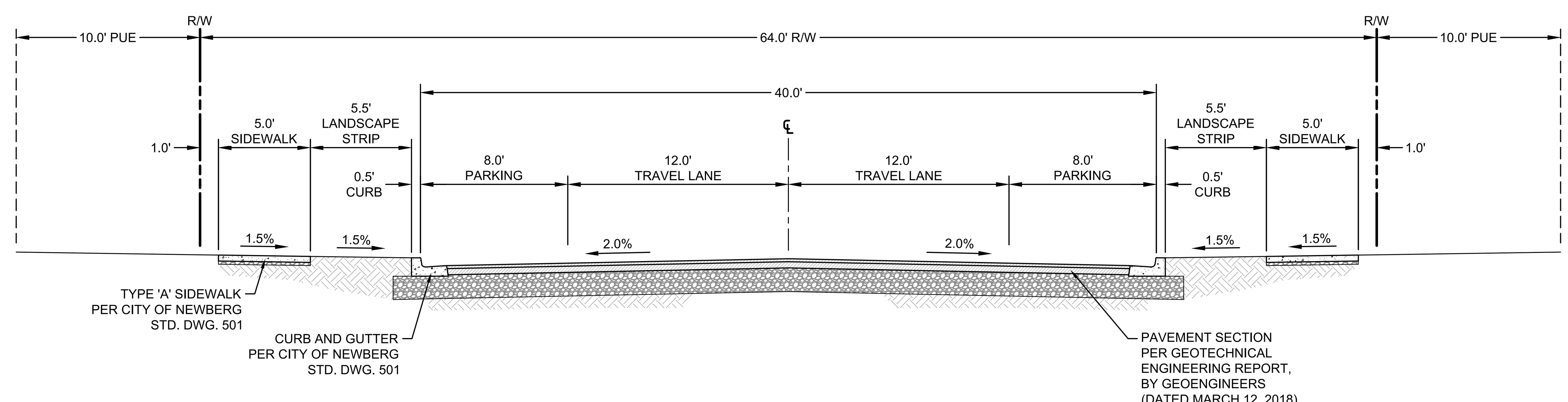
P:\17393-JTS-CRESTVIEW CROSSING\CAD\DD\C150 TENTATIVE PLAT.DWG



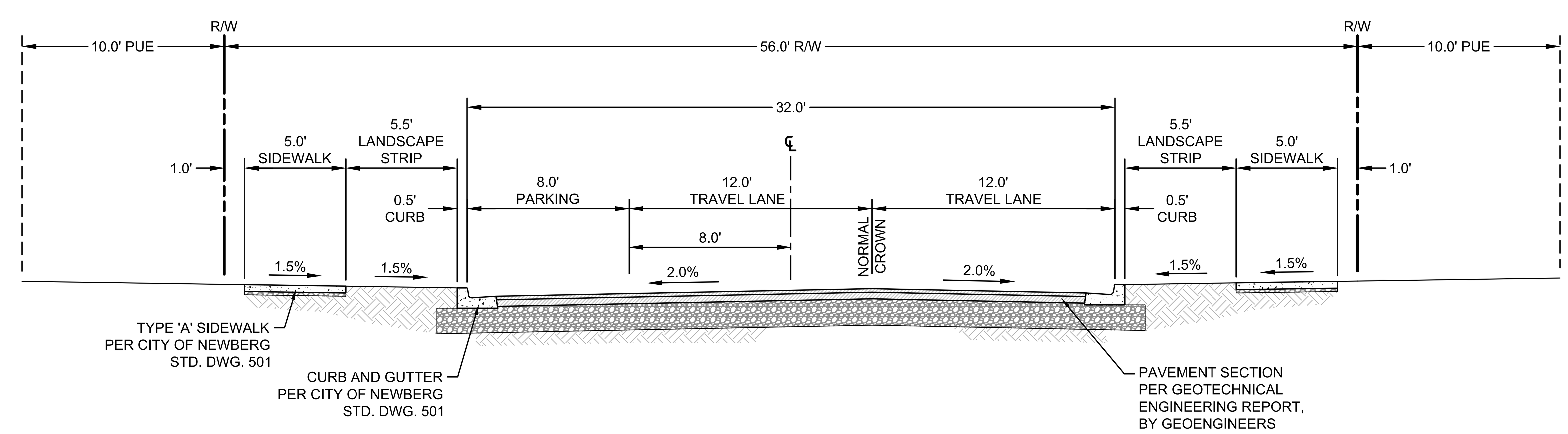
TYPICAL STREET SECTION A-A' - MAJOR COLLECTOR
CRESTVIEW DR
NTS



TYPICAL STREET SECTION B-B' - MAJOR COLLECTOR
CRESTVIEW DR
NTS



TYPICAL STREET SECTION C-C' - MINOR COLLECTOR
PUBLIC B
NTS



TYPICAL STREET SECTION D-D' - LOCAL ROAD
PUBLIC C
PUBLIC D
NTS

P:\17393--JTS-CRESTVIEW CROSSING\CAD\DD\C200 TYPICAL SECTIONS.DWG

REGISTERED PROFESSIONAL ENGINEER 87762PE OREGON ASHLEY ROCHELLE SEAL
PRELIMINARY
EXPIRES: 06/30/20

PUBLISH DATE
06.06.2018
ISSUED FOR
LAND USE DOCUMENTS

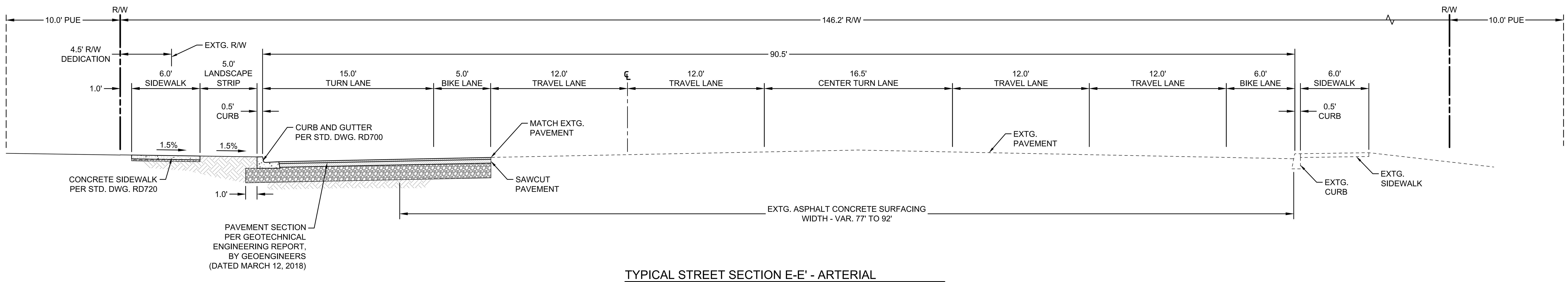
TYPICAL SECTIONS I
CRESTVIEW CROSSING
PLANNED UNIT DEVELOPMENT
JT SMITH COMPANIES
NEWBERG, OR

3J CONSULTING
CIVIL ENGINEERING
WATER RESOURCES
LAND USE PLANNING
5075 SW GRIFFITH DRIVE, SUITE 150; BEAVERTON, OR 97005

PROJECT INFORMATION

3J PROJECT #	17393
TAX LOT(S)	3S2W16 13800, 1100
LAND USE #	N/A
DESIGNED BY	ARS, JEJ, BMO
CHECKED BY	AJM, RGW

SHEET NUMBER
C200



TYPICAL STREET SECTION E-E' - ARTERIAL

HWY 99W (ODOT) NTS

REGISTERED PROFESSIONAL ENGINEER 87762PE OREGON ASHLEY ROCHELLE SEAL

PRELIMINARY

EXPIRES: 06/30/20

PUBLISH DATE
06.06.2018

ISSUED FOR
LAND USE DOCUMENTS

TYPICAL SECTIONS II

CRESTVIEW CROSSING PLANNED UNIT DEVELOPMENT

JT SMITH COMPANIES
NEWBERG, OR

3J CONSULTING

CIVIL ENGINEERING
WATER RESOURCES
LAND USE PLANNING

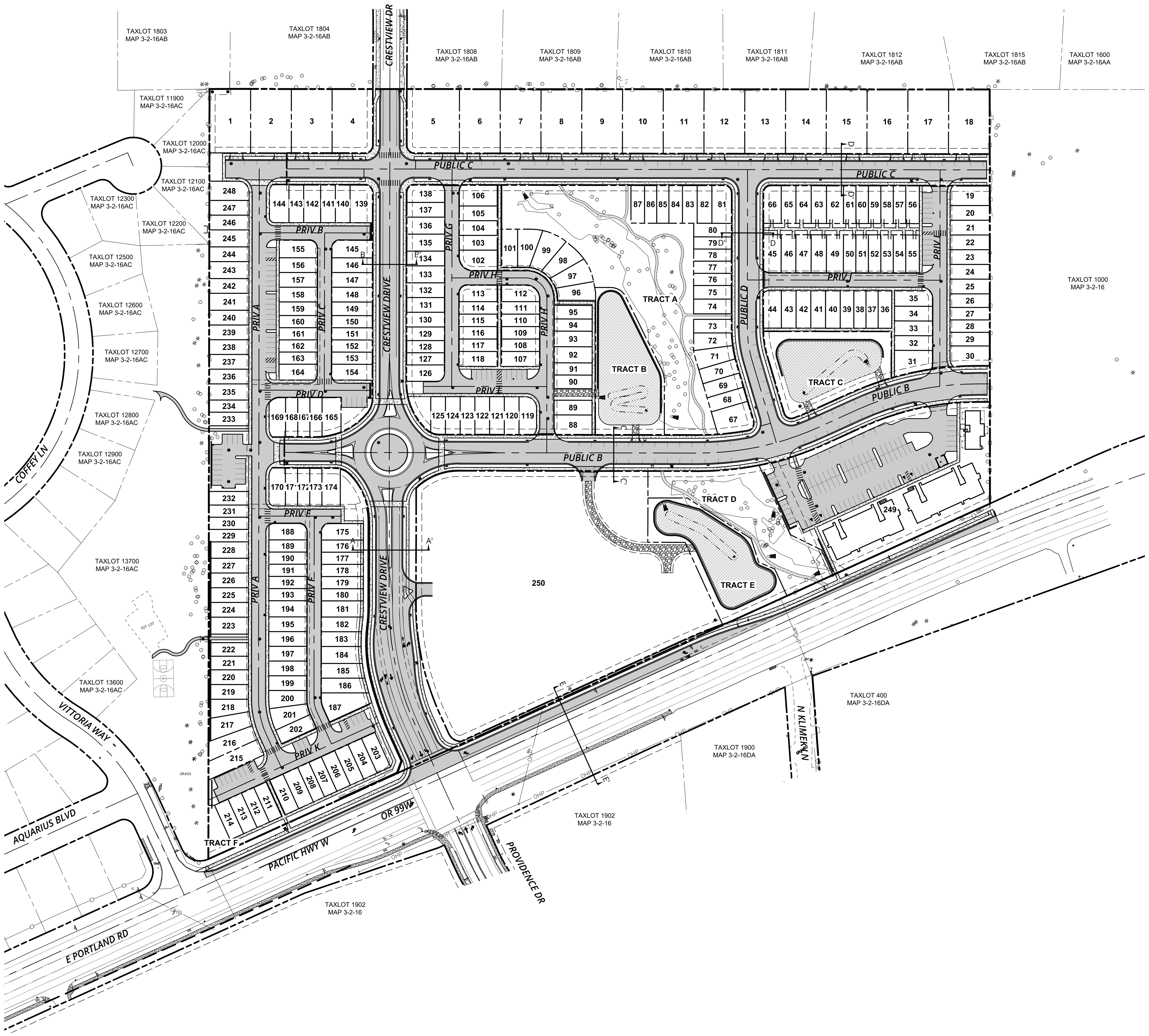
5075 SW GRIFFITH DRIVE, SUITE 150; BEAVERTON, OR 97005

PROJECT INFORMATION

3J PROJECT #	17393
TAX LOT(S)	3S2W16 13800, 1100
LAND USE #	N/A
DESIGNED BY	ARS, JEJ, BMO
CHECKED BY	AJM, RGW

SHEET NUMBER
C201

P:\17393-JTS-CRESTVIEW CROSSING\CAD\DD\C200 TYPICAL SECTIONS.DWG



LEGEND

- PROJECT BOUNDARY
- EXISTING RIGHT-OF-WAY LINE
- EXISTING RIGHT-OF-WAY CENTERLINE
- EXISTING ADJACENT PROPERTY LINE
- PROPOSED RIGHT-OF-WAY LINE
- PROPOSED RIGHT-OF-WAY CENTERLINE
- PROPOSED LOT LINE
- PROPOSED SETBACK LINE
- PROPOSED EASEMENT
- PROPOSED CURB FACE
- PROPOSED CURB BACK
- PROPOSED LIP OF GUTTER
- PROPOSED WHITE STRIPING
- PROPOSED CONCRETE
- PROPOSED ASPHALT
- PROPOSED STORM FACILITY
- PROPOSED SWALE
- PROPOSED GRAVEL
- PROPOSED WOODCHIP PATH
- PROPOSED RETAINING WALL
- PROPOSED DRIVEWAY
- PROPOSED PEDESTRIAN CROSSWALK STRIPING
- PROPOSED TYPICAL STREET SECTION SEE SHEETS C200 & C201

Know what's below. Call before you dig.

SCALE: 1" = 100'
0 100' 200'

REGISTERED PROFESSIONAL ENGINEER 87762PE OREGON ASHLEY ROCHELLE SEAL
PRELIMINARY
EXPIRES: 06/30/20

PUBLISH DATE
06.06.2018
ISSUED FOR
LAND USE DOCUMENTS

OVERALL SITE PLAN
CRESTVIEW CROSSING PLANNED UNIT DEVELOPMENT
JT SMITH COMPANIES
NEWBERG, OR

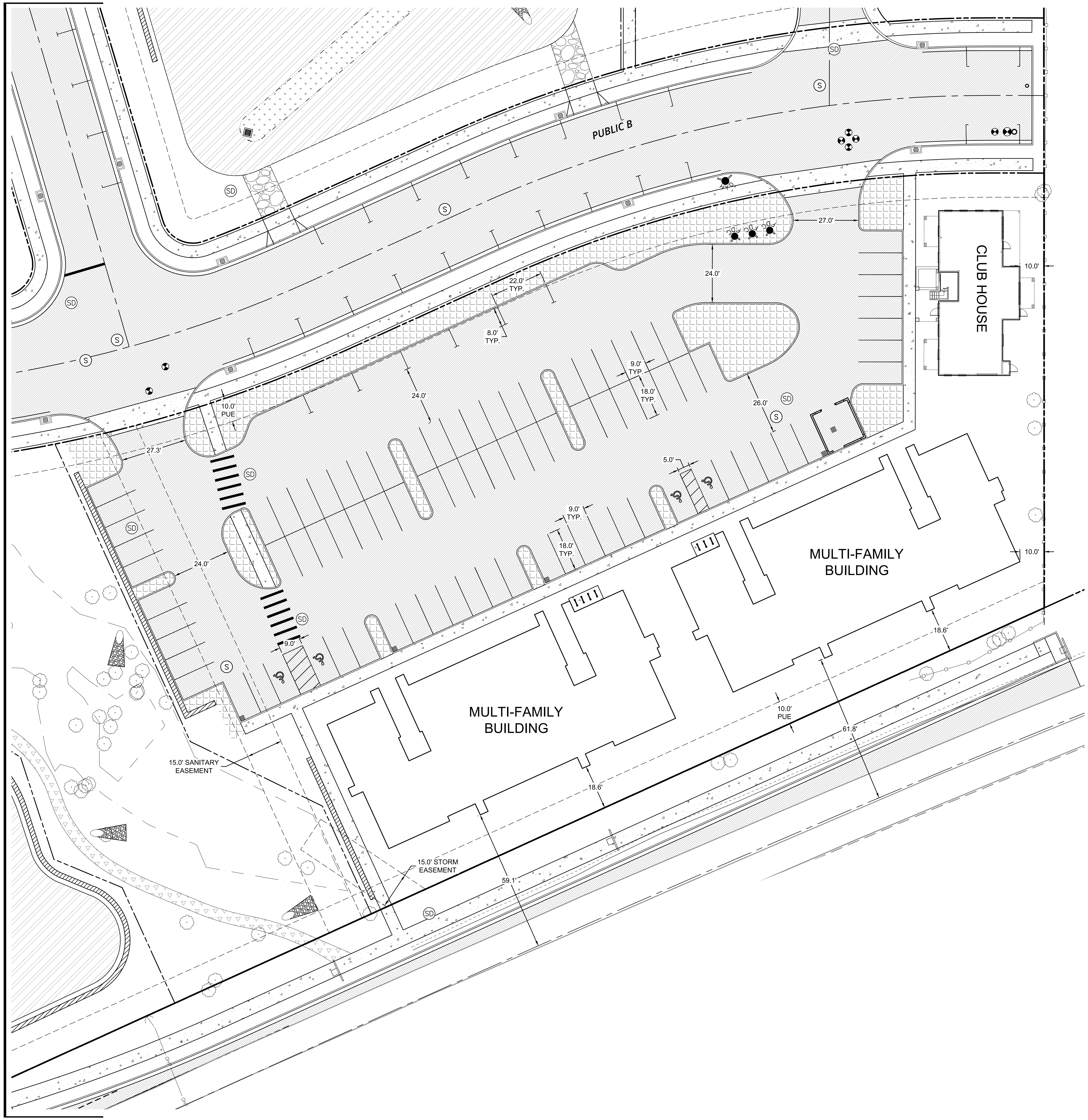
3J CONSULTING
CIVIL ENGINEERING
WATER RESOURCES
LAND USE PLANNING
5075 SW GRIFFITH DRIVE, SUITE 150; BEAVERTON, OR 97005

PROJECT INFORMATION

3J PROJECT #	17393
TAX LOT(S)	3S2W16 13800, 1100
LAND USE #	N/A
DESIGNED BY	ARS, JEJ, BMO
CHECKED BY	AJM, RGW

SHEET NUMBER
C210

P:\17393-JTS-CRESTVIEW CROSSING\CAD\DD\C210 SITE PLAN.DWG



P:\17393-JTS-CRESTVIEW CROSSING\CADD\C215 MULTI FAM - SITE PLAN.DWG

LEGEND

- PROJECT BOUNDARY
- EXISTING RIGHT-OF-WAY LINE
- EXISTING RIGHT-OF-WAY CENTERLINE
- EXISTING ADJACENT PROPERTY LINE
- PROPOSED RIGHT-OF-WAY LINE
- PROPOSED RIGHT-OF-WAY CENTERLINE
- PROPOSED LOT LINE
- PROPOSED SETBACK LINE
- PROPOSED EASEMENT
- PROPOSED CURB FACE
- PROPOSED CURB BACK
- PROPOSED LIP OF GUTTER
- PROPOSED WHITE STRIPING
- PROPOSED CONCRETE
- PROPOSED ASPHALT
- PROPOSED LANDSCAPING
- PROPOSED GRAVEL
- PROPOSED WOODCHIP PATH
- PROPOSED RETAINING WALL
- PROPOSED DRIVEWAY
- PROPOSED PEDESTRIAN CROSSWALK STRIPING
- PROPOSED BIKE PARKING
- PROPOSED ACCESSIBLE PARKING STALL
- PROPOSED HYDRANT
- PROPOSED VALVE
- PROPOSED BLOW-OFF / AIR RELEASE ASSY.
- PROPOSED FIRE DPT. CONNECTION
- S PROPOSED SEWER MANHOLE
- D PROPOSED STORM MANHOLE
- PROPOSED CATCH BASIN
- EXISTING DECIDUOUS TREE

PARKING STATISTICS - MULITFAMILY LOT

PROPOSED STALL COUNT & SUMMARY

TYPE = (WIDTH x DEPTH)	STANDARD 9' x 18'	PARALLEL 8' x 22'	ADA 9' x 18'	ADA - VAN 9' x 18'	TOTAL
MULTIPLE FAMILY APARTMENTS =	80	7	3	1	91
TOTAL =	80	7	3	1	91

VEHICLES

DEVELOPMENT CODE CHAPTER 15.440.30

MAXIMUM PARKING - MULTI-FAMILY	NONE
MINIMUM PARKING - MULTI-FAMILY	74
PROPOSED	91

BICYCLES

DEVELOPMENT CODE CHAPTER 15.440.90

	MINIMUM	PROPOSED
MINIMUM BICYCLE PARKING - MULTI-FAMILY	13	14

ACCESSIBLE

OSSC SECTION 1106.1

MULTI-FAMILY PARKING LOT (76 TO 100)	MINIMUM	PROPOSED
ACCESSIBLE SPACES	4	4
VAN ACCESSIBLE SPACES	1	1

LANDSCAPING

DEVELOPMENT CODE CHAPTER 15.420.010

	REQUIRED	PROPOSED
MULTI-FAMILY PARKING LOT (25 SF PER STALL)	2,275 SF	6,357 SF

SETBACKS

ZONE C3 - MULTI-FAMILY LOT

FRONT	10 FT
INTERIOR	0 FT/10 FT
STREET - EXPRESSWAY CENTERLINE	50 Ft

811 Know what's below. Call before you dig.

N W E S

SCALE: 1" = 20'
0 20 40

REGISTERED PROFESSIONAL ENGINEER 87762PE OREGON NOV. 14, 2017 ASHLEY ROCHELLE SEAL
PRELIMINARY
EXPIRES: 06/30/20

PUBLISH DATE
06.06.2018

ISSUED FOR
LAND USE DOCUMENTS

MULTI-FAMILY SITE PLAN

CRESTVIEW CROSSING PLANNED UNIT DEVELOPMENT

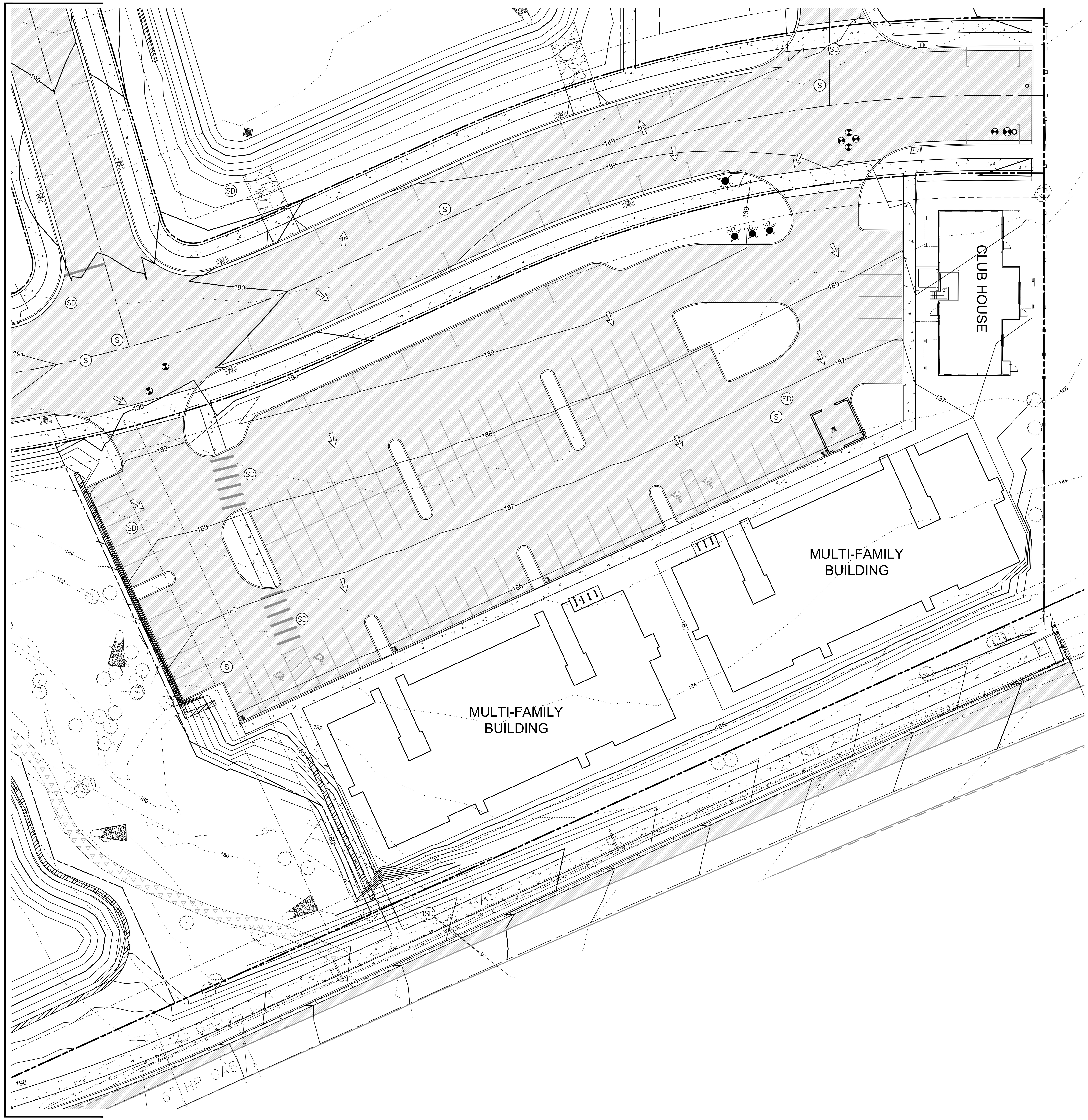
JT SMITH COMPANIES
NEWBERG, OR

3J CONSULTING
CIVIL ENGINEERING
WATER RESOURCES
LAND USE PLANNING
5075 SW GRIFFITH DRIVE, SUITE 150; BEAVERTON, OR 97005

PROJECT INFORMATION

3J PROJECT #	17393
TAX LOT(S)	3S2W16 13800, 1100
LAND USE #	N/A
DESIGNED BY	ARS, JEJ, BMO
CHECKED BY	AJM, RGW

SHEET NUMBER
C215



LEGEND

- PROJECT BOUNDARY
- EXISTING RIGHT-OF-WAY LINE
- EXISTING RIGHT-OF-WAY CENTERLINE
- EXISTING ADJACENT PROPERTY LINE
- PROPOSED RIGHT-OF-WAY LINE
- PROPOSED RIGHT-OF-WAY CENTERLINE
- PROPOSED LOT LINE
- PROPOSED SETBACK LINE
- PROPOSED EASEMENT
- 100 EXISTING MAJOR CONTOUR
- 92 EXISTING MINOR CONTOUR
- 110 PROPOSED MAJOR CONTOUR
- 108 PROPOSED MINOR CONTOUR
- PROPOSED SURFACE FLOW ARROW
- PROPOSED CURB FACE
- PROPOSED CURB BACK
- PROPOSED LIP OF GUTTER
- PROPOSED WHITE STRIPING
- PROPOSED CONCRETE
- PROPOSED ASPHALT
- PROPOSED GRAVEL
- PROPOSED WOODCHIP PATH
- PROPOSED RETAINING WALL
- PROPOSED PEDESTRIAN CROSSWALK STRIPING
- PROPOSED BIKE PARKING
- PROPOSED ACCESSIBLE PARKING STALL
- PROPOSED HYDRANT
- PROPOSED VALVE
- PROPOSED BLOW-OFF / AIR RELEASE ASSY.
- PROPOSED FIRE DPT. CONNECTION
- S PROPOSED SEWER MANHOLE
- D PROPOSED STORM MANHOLE
- PROPOSED CATCH BASIN
- EXISTING DECIDUOUS TREE

811 Know what's below. Call before you dig.

N E S W

SCALE: 1" = 100'
0 100' 200'

P:\17393-JTS-CRESTVIEW CROSSING\CAD\DD\C218 MULTI FAM - GRADING PLAN.DWG

REGISTERED PROFESSIONAL ENGINEER 87762PE OREGON ASHLEY ROCHELLE SEAL
PRELIMINARY
EXPIRES: 06/30/20

PUBLISH DATE
06.06.2018

ISSUED FOR
LAND USE DOCUMENTS

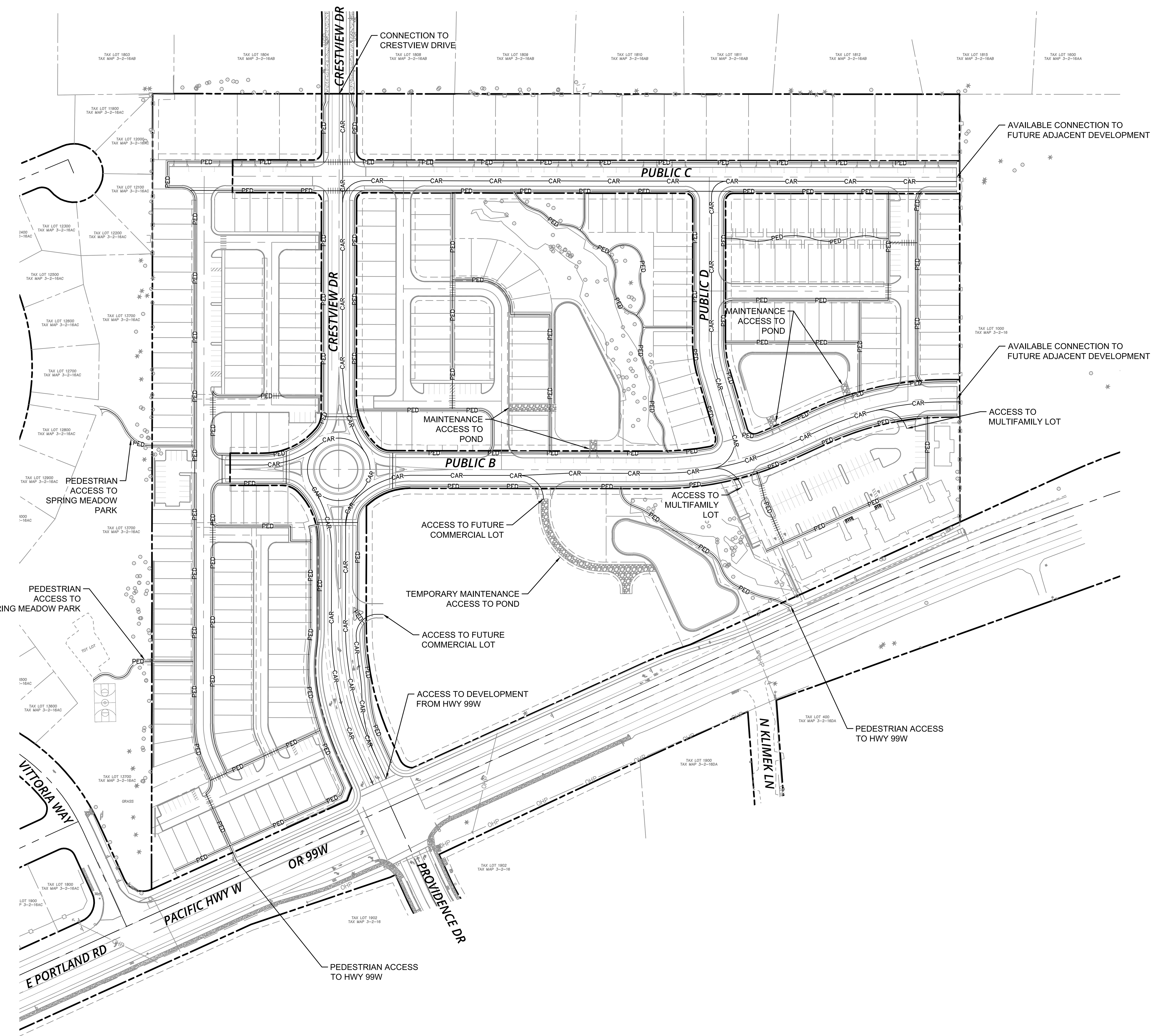
MULTI-FAMILY GRADING PLAN
CRESTVIEW CROSSING
PLANNED UNIT DEVELOPMENT
JT SMITH COMPANIES
NEWBERG, OR

3J CONSULTING
CIVIL ENGINEERING
WATER RESOURCES
LAND USE PLANNING
5075 SW GRIFFITH DRIVE, SUITE 150; BEAVERTON, OR 97005

PROJECT INFORMATION

3J PROJECT #	17393
TAX LOT(S)	3S2W16 13800, 1100
LAND USE #	N/A
DESIGNED BY	ARS, JEJ, BMO
CHECKED BY	AJM, RGW

SHEET NUMBER
C218



LEGEND

- PROPOSED CAR CIRCULATION
- PROPOSED PEDESTRIAN CIRCULATION
- PROPOSED STANDARD PARKING STALL
- PROPOSED PARALLEL PARKING STALL
- PROPOSED ADA PARKING STALLS

PARKING STATISTICS

PROPOSED STALL COUNT & SUMMARY

TYPE = (WIDTH x DEPTH)	STANDARD (9' x 18')	PARALLEL (8' x 22')	ADA (9' x 18')	ADA VAN (9' x 18')	TOTAL
PUBLIC ON-STREET =	0	72	0	0	72
PRIVATE =	71	0	10	2	83
MULTIFAMILY LOT =	80	7	3	1	91
TOTAL =	151	79	13	3	246

MULTIFAMILY LOT PARKING - ACCESSIBLE

(OSSC SECTION 1106.1)

PARKING FACILITY TOTAL = 76 TO 100 STALLS	MINIMUM REQUIRED	AS PROPOSED
ACCESSIBLE SPACES	4	4
VAN ACCESSIBLE SPACES	1	1

Know what's below. Call before you dig.

N W E S

SCALE: 1" = 100'
0 100' 200'

REGISTERED PROFESSIONAL ENGINEER 87762PE OREGON NOV. 14, 2017 ASHLEY ROCHELLE SEAL PRELIMINARY
EXPIRES: 06/30/20

PUBLISH DATE
06.06.2018
ISSUED FOR
LAND USE DOCUMENTS

ACCESS, PARKING, AND CIRCULATION PLAN
CRESTVIEW CROSSING PLANNED UNIT DEVELOPMENT
JT SMITH COMPANIES
NEWBERG, OR

3J CONSULTING
CIVIL ENGINEERING
WATER RESOURCES
LAND USE PLANNING
5075 SW GRIFFITH DRIVE, SUITE 150; BEAVERTON, OR 97005

PROJECT INFORMATION

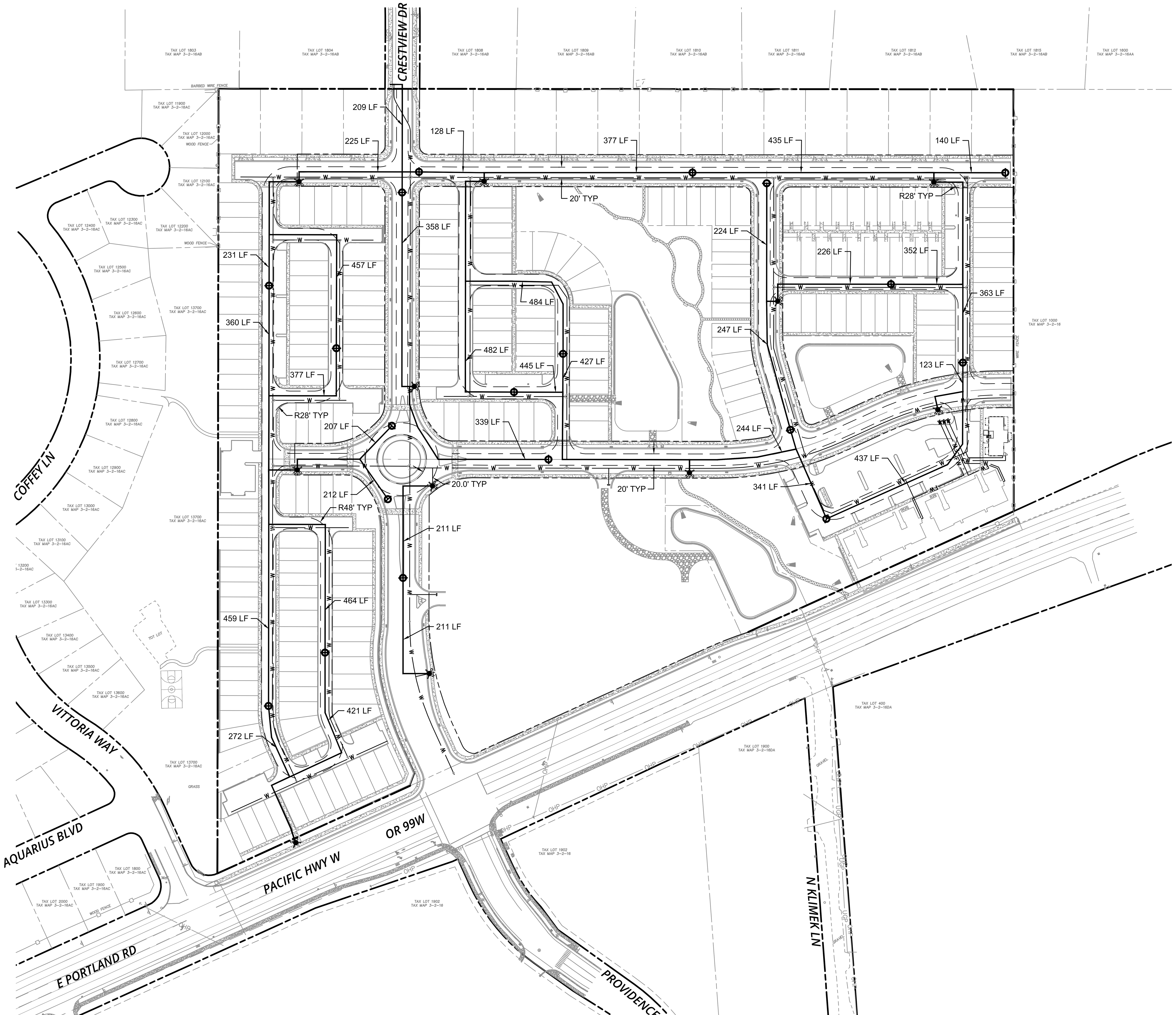
3J PROJECT #	17393
TAX LOT(S)	3S2W16 13800, 1100
LAND USE #	N/A
DESIGNED BY	ARS, JEJ, BMO
CHECKED BY	AJM, RGW

SHEET NUMBER
C220

P:\17393-JTS-CRESTVIEW CROSSING\CAD\DD\C220 CIRCULATION PLAN.DWG

LEGEND

— W —	PROPOSED WATER DOMESTIC SERVICE
— FW —	PROPOSED WATER FIRE SERVICE
	EXISTING FIRE HYDRANT
	PROPOSED HYDRANT
	PROPOSED HYDRANT
	PROPOSED VALVE
	FIRE HOSE LINE PULL EXTENTS FROM FIRE HYDRANT
R28'	CURVE RADIUS
20' DRIVE AISLE	PROPOSED FIRE ACCESS LANE



811 Know what's below. Call before you dig.

N W E S

SCALE: 1" = 100'
0 100' 200'

REGISTERED PROFESSIONAL ENGINEER 87762PE OREGON ASHLEY ROCHELLE SEAL
PRELIMINARY
EXPIRES: 06/30/20

PUBLISH DATE
06.06.2018

ISSUED FOR
LAND USE DOCUMENTS

FIRE ACCESS PLAN
CRESTVIEW CROSSING PLANNED UNIT DEVELOPMENT
JT SMITH COMPANIES
NEWBERG, OR

3J CONSULTING
CIVIL ENGINEERING
WATER RESOURCES
LAND USE PLANNING
5075 SW GRIFFITH DRIVE, SUITE 150; BEAVERTON, OR 97005

PROJECT INFORMATION

3J PROJECT #	17393
TAX LOT(S)	3S2W16 13800, 1100
LAND USE #	N/A
DESIGNED BY	ARS, JEJ, BMO
CHECKED BY	AJM, RGW

SHEET NUMBER
C230

LIGHTING ZONE CALCULATIONS

ACI 1: ARTERIAL COMMERCIAL INTERSECTION #1

	CITY STANDARD	CALCULATED
AVERAGE MAINTAINED ILLUMINANCE (FC)	4.0 MIN	4.27

ACR 1: ARTERIAL COMMERCIAL ROAD #1

	CITY STANDARD	CALCULATED
AVERAGE MAINTAINED ILLUMINANCE (FC)	2.0 MIN	2.49

ARI 1: ARTERIAL RESIDENTIAL INTERSECTION #1

	CITY STANDARD	CALCULATED
AVERAGE MAINTAINED ILLUMINANCE (FC)	2.0 MIN	2.46

ARR 1: ARTERIAL RESIDENTIAL ROAD #1

	CITY STANDARD	CALCULATED
AVERAGE MAINTAINED ILLUMINANCE (FC)	1.0 MIN	1.41

ARR 2: ARTERIAL RESIDENTIAL ROAD #2

	CITY STANDARD	CALCULATED
AVERAGE MAINTAINED ILLUMINANCE (FC)	1.0 MIN	1.45

CCI 1: COLLECTOR COMMERCIAL INTERSECTION #1

	CITY STANDARD	CALCULATED
AVERAGE MAINTAINED ILLUMINANCE (FC)	2.4 MIN	2.49

CCI 2: COLLECTOR COMMERCIAL INTERSECTION #2

	CITY STANDARD	CALCULATED
AVERAGE MAINTAINED ILLUMINANCE (FC)	2.4 MIN	2.83

CCI 3: COLLECTOR COMMERCIAL INTERSECTION #3

	CITY STANDARD	CALCULATED
AVERAGE MAINTAINED ILLUMINANCE (FC)	2.4 MIN	2.69

CCR 2: COLLECTOR COMMERCIAL ROAD #1

	CITY STANDARD	CALCULATED
AVERAGE MAINTAINED ILLUMINANCE (FC)	1.2 MIN	1.31

CCR 1: COLLECTOR COMMERCIAL ROAD #2

	CITY STANDARD	CALCULATED
AVERAGE MAINTAINED ILLUMINANCE (FC)	1.2 MIN	1.31

CCR 3: COLLECTOR COMMERCIAL ROAD #3

	CITY STANDARD	CALCULATED
AVERAGE MAINTAINED ILLUMINANCE (FC)	1.2 MIN	1.51

CCR 3: COLLECTOR COMMERCIAL ROAD #4

	CITY STANDARD	CALCULATED
AVERAGE MAINTAINED ILLUMINANCE (FC)	1.2 MIN	1.39

CRI 1: COLLECTOR RESIDENTIAL INTERSECTION #1

	CITY STANDARD	CALCULATED
AVERAGE MAINTAINED ILLUMINANCE (FC)	1.4 MIN	1.68

CRI 2: COLLECTOR RESIDENTIAL INTERSECTION #2

	CITY STANDARD	CALCULATED
AVERAGE MAINTAINED ILLUMINANCE (FC)	1.4 MIN	1.65

CRI 3: COLLECTOR RESIDENTIAL INTERSECTION #3

	CITY STANDARD	CALCULATED
AVERAGE MAINTAINED ILLUMINANCE (FC)	1.4 MIN	1.82

CRI 4: COLLECTOR RESIDENTIAL INTERSECTION #4

	CITY STANDARD	CALCULATED
AVERAGE MAINTAINED ILLUMINANCE (FC)	1.4 MIN	1.47

CRR 1: COLLECTOR RESIDENTIAL ROAD #1

	CITY STANDARD	CALCULATED
AVERAGE MAINTAINED ILLUMINANCE (FC)	0.7 MIN	1.51

CRR 2: COLLECTOR RESIDENTIAL ROAD #2

	CITY STANDARD	CALCULATED
AVERAGE MAINTAINED ILLUMINANCE (FC)	0.7 MIN	1.15

CRR 3: COLLECTOR RESIDENTIAL ROAD #3

	CITY STANDARD	CALCULATED
AVERAGE MAINTAINED ILLUMINANCE (FC)	0.7 MIN	0.96

CRR 4: COLLECTOR RESIDENTIAL ROAD #4

	CITY STANDARD	CALCULATED
AVERAGE MAINTAINED ILLUMINANCE (FC)	0.7 MIN	1.14

CRR 5: COLLECTOR RESIDENTIAL ROAD #5

	CITY STANDARD	CALCULATED
AVERAGE MAINTAINED ILLUMINANCE (FC)	0.7 MIN	0.84

CRR 6: COLLECTOR RESIDENTIAL ROAD #6

	CITY STANDARD	CALCULATED
AVERAGE MAINTAINED ILLUMINANCE (FC)	0.7 MIN	1.69

CRR 7: COLLECTOR RESIDENTIAL ROAD #7

	CITY STANDARD	CALCULATED
AVERAGE MAINTAINED ILLUMINANCE (FC)	0.7 MIN	0.97

LRR 1: LOCAL RESIDENTIAL ROAD #1 (PRIVATE)

	CITY STANDARD	CALCULATED
AVERAGE MAINTAINED ILLUMINANCE (FC)	0.5 MIN	1.01

LRR 2: LOCAL RESIDENTIAL ROAD #2 (PRIVATE)

	CITY STANDARD	CALCULATED
AVERAGE MAINTAINED ILLUMINANCE (FC)	0.5 MIN	1.15

LRR 3: LOCAL RESIDENTIAL ROAD #3 (PRIVATE)

	CITY STANDARD	CALCULATED
AVERAGE MAINTAINED ILLUMINANCE (FC)	0.5 MIN	1.10

APL 1: APARTMENTS PARKING LOT #1 (PRIVATE)

	CITY STANDARD	CALCULATED
AVERAGE MAINTAINED ILLUMINANCE (FC)	N/A	1.36

CONSTRUCTION KEY NOTES

1 INSTALL 180W LED LUMINAIRE, TYPE III, 30' POLE, 6' ARM, BACKLIGHT SHIELD (17700 LUMENS).
LUMINAIRE: LEOTEK GC1-80F-MV-NW-3-GY-700-HSS OR CITY APPROVED EQUIVALENT.
POLE: VALMONT 1MA0632S-270845805T4-DNA OR CITY APPROVED EQUIVALENT.

1A INSTALL 180W LED LUMINAIRE, TYPE III, 25' POLE, 6' ARM, (17700 LUMENS, 80 LEDS).
LUMINAIRE: LEOTEK GC1-80F-MV-NW-3-GY-700 OR CITY APPROVED EQUIVALENT.
POLE: VALMONT 1MA0632S-220845805T4-DNA OR CITY APPROVED EQUIVALENT.

2 INSTALL 133W LED LUMINAIRE, TYPE III, 30' POLE, 6' ARM, BACKLIGHT SHIELD (13400 LUMENS).
LUMINAIRE: LEOTEK GC1-60F-MV-NW-3-GY-700-HSS OR CITY APPROVED EQUIVALENT.
POLE: VALMONT 1MA0632S-270845805T4-DNA OR CITY APPROVED EQUIVALENT.

3 INSTALL 133W LED LUMINAIRE, TYPE III, 25' POLE, 6' ARM (13400 LUMENS, 60 LEDS).
LUMINAIRE: LEOTEK GC1-60F-MV-NW-3-GY-700 OR CITY APPROVED EQUIVALENT.
POLE: VALMONT 1MA0632S-220845805T4-DNA OR CITY APPROVED EQUIVALENT.

4 INSTALL 92W LED LUMINAIRE, TYPE III, 25' POLE, 6' ARM (9300 LUMENS, 40 LEDS).
LUMINAIRE: LEOTEK GC1-40F-MV-NW-3-GY-700 OR CITY APPROVED EQUIVALENT.
POLE: VALMONT 1MA0632S-220845805T4-DNA OR CITY APPROVED EQUIVALENT.

5 INSTALL 70W LED LUMINAIRE, TYPE III, 25' POLE, 6' ARM (7000 LUMENS, 30 LEDS).
LUMINAIRE: LEOTEK GC1-30F-MV-NW-2-GY-700 OR CITY APPROVED EQUIVALENT.
POLE: VALMONT 1MA0632S-220845805T4-DNA OR CITY APPROVED EQUIVALENT.

5A INSTALL TWO 70W LED LUMINAIRES, TYPE III, 25' POLE IN DOUBLE ARM ARRANGMENT, 6' ARMS
LUMINAIRE: TWO LEOTEK GC1-30F-MV-NW-2-GY-700 OR CITY APPROVED EQUIVALENT.
POLE: VALMONT 2MA0632S-220845805T4-DNA OR CITY APPROVED EQUIVALENT.

6 INSTALL 70W LED LUMINAIRE, TYPE II, 25' POLE, 6' ARM (7000 LUMENS, 30 LEDS).
LUMINAIRE: LEOTEK GC1-30F-MV-NW-2-GY-700 OR CITY APPROVED EQUIVALENT.
POLE: VALMONT 1MA0632S-220845805T4-DNA OR CITY APPROVED EQUIVALENT.

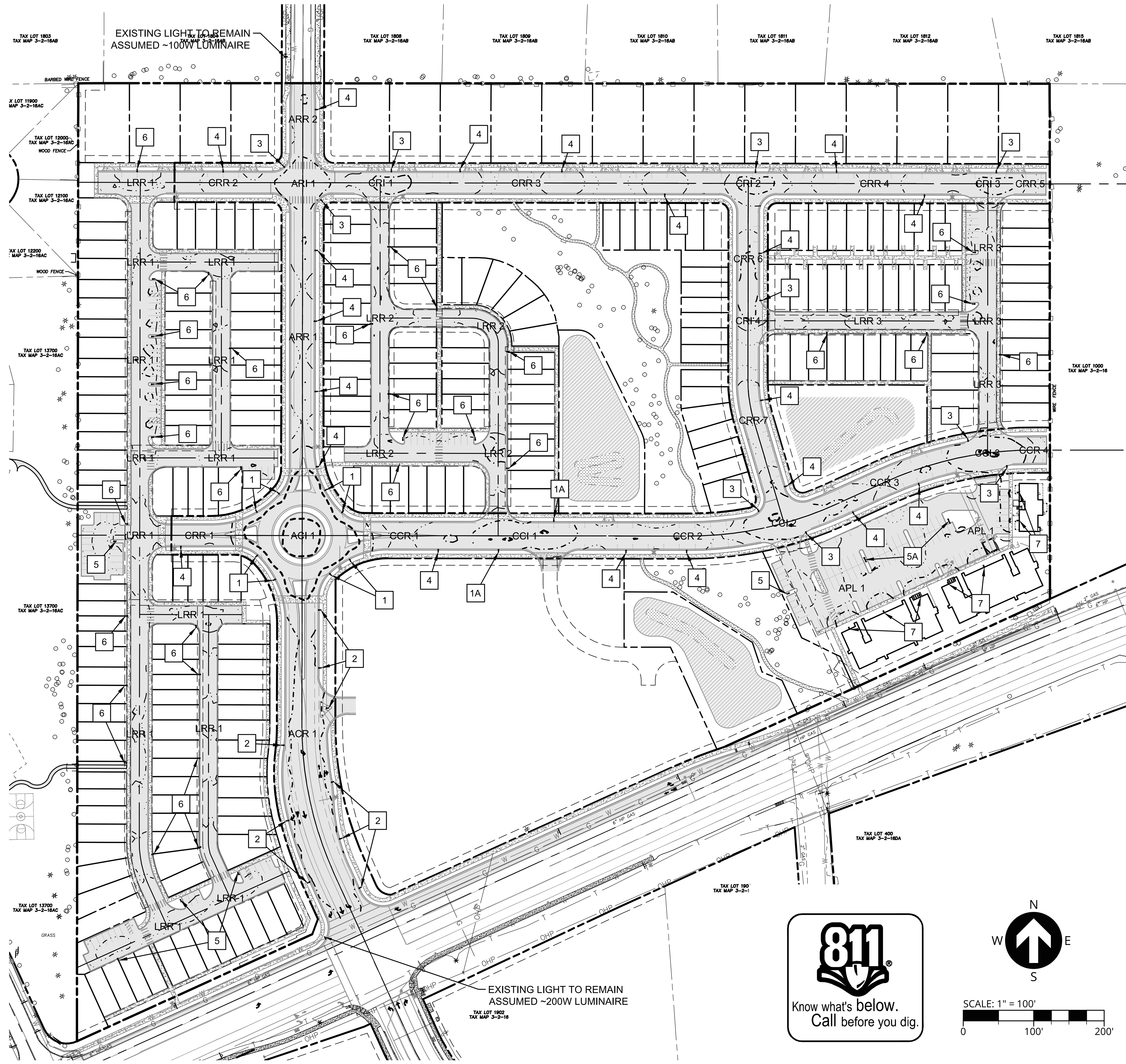
7 INSTALL 65W LED LUMINAIRE, TYPE III, WALL MOUNTED, NO ARM (7000 LUMENS, 30 LEDS MIN)
LUMINAIRE: LUMARK WPSQLED-65-UNV OR APPROVED EQUIVALENT.

LEGEND

- 4.0 FOOT-CANDLE ISOLINE
- 2.0 FOOT-CANDLE ISOLINE
- 1.0 FOOT-CANDLE ISOLINE
- 0.5 FOOT-CANDLE ISOLINE

ILLUMINATION GENERAL NOTES

1. ELECTRICAL BY OTHERS
2. TOTAL LIGHT LOSS FACTOR OF 0.855 ASSUMED FOR MAINTAINED LEVEL.
3. ALL ILLUMINATION CALCULATIONS AND ISOLINES DEVELOPED USING AGI32 V14.6.13 PHOTOMETRIC SOFTWARE BY LIGHTING ANALYSTS, INC.
4. LIGHT POLES SHALL BE ALUMINUM, NATURAL FINISH, AND ELLIPTICAL MAST ARMS.
5. LUMINARIES SHALL BE LED LIGHT SOURCE WITH NO LESS THAN 30 LEDS AND NO LESS THAN 7000 LUMENS, WITH GREY COLORED "COBRAHEAD" STYLE HOUSINGS.



REGISTERED PROFESSIONAL ENGINEER
87762PE
OREGON
NOV. 14, 2017
ASHLEY ROCHELLE SEAL
PRELIMINARY
EXPIRES: 06/30/20

PUBLISH DATE
06.06.2018

ISSUED FOR
LAND USE DOCUMENTS

PHOTOMETRICS PLAN
CRESTVIEW CROSSING PLANNED UNIT DEVELOPMENT
JT SMITH COMPANIES
NEWBERG, OR

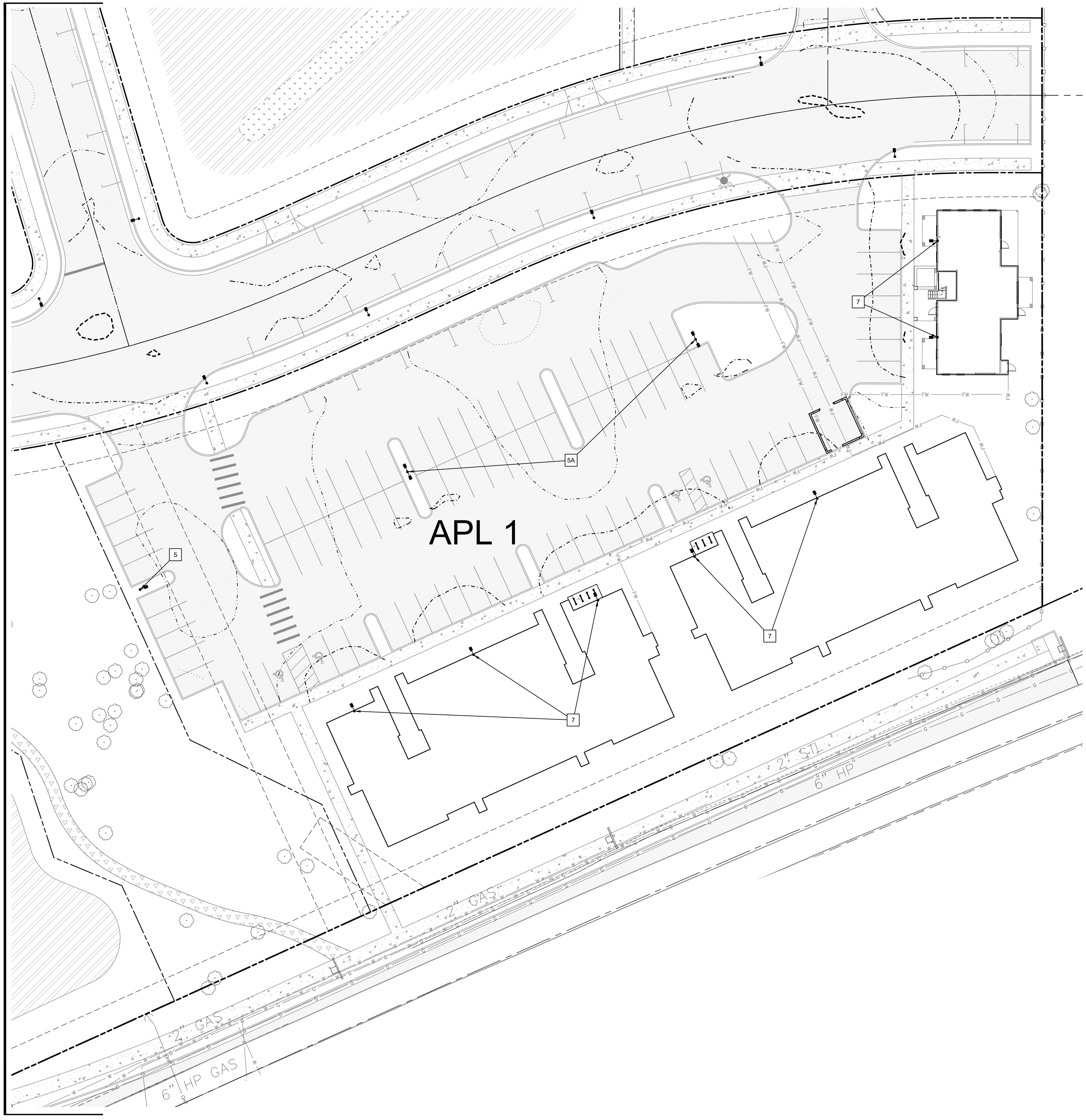
3J CONSULTING
CIVIL ENGINEERING
WATER RESOURCES
LAND USE PLANNING
5075 SW GRIFFITH DRIVE, SUITE 150; BEAVERTON, OR 97005

PROJECT INFORMATION

3J PROJECT #	17393
TAX LOT(S)	3S2W16 13800, 1100
LAND USE #	N/A
DESIGNED BY	ARS, JEJ, BMO
CHECKED BY	AJM, RGW

SHEET NUMBER
C290

P:\17393--JTS-CRESTVIEW CROSSING\CAD\DD\C290 PHOTOMETRICS PLAN.DWG



LEGEND

- 4.0 FOOT-CANDLE ISOLINE
- 2.0 FOOT-CANDLE ISOLINE
- 1.0 FOOT-CANDLE ISOLINE
- 0.5 FOOT-CANDLE ISOLINE

ILLUMINATION GENERAL NOTES

1. ELECTRICAL BY OTHERS
2. TOTAL LIGHT LOSS FACTOR OF 0.855 ASSUMED FOR MAINTAINED LEVEL.
3. ALL ILLUMINATION CALCULATIONS AND ISOLINES DEVELOPED USING AGI32 V14.6.13 PHOTOMETRIC SOFTWARE BY LIGHTING ANALYSTS, INC.
4. LIGHT POLES SHALL BE ALUMINUM, NATURAL FINISH, AND ELLIPTICAL MAST ARMS.
5. LUMINARIES SHALL BE LED LIGHT SOURCE WITH NO LESS THAN 30 LEDS AND NO LESS THAN 7000 LUMENS, WITH GREY COLORED "COBRAHEAD" STYLE HOUSINGS.

CONSTRUCTION KEY NOTES

5 INSTALL 70W LED LUMINAIRE, TYPE III, 25' POLE, 6' ARM (7000 LUMENS, 30 LEDS).
LUMINAIRE: LEOTEK GC1-30F-MV-NW-2-GY-700 OR CITY APPROVED EQUIVALENT.
POLE: VALMONT 1MA0632S-220845805T4-DNA OR CITY APPROVED EQUIVALENT.

5A INSTALL TWO 70W LED LUMINAIRES, TYPE III, 25' POLE IN DOUBLE ARM ARRANGMENT, 6' ARMS
LUMINAIRE: TWO LEOTEK GC1-30F-MV-NW-2-GY-700 OR CITY APPROVED EQUIVALENT.
POLE: VALMONT 2MA0632S-220845805T4-DNA OR CITY APPROVED EQUIVALENT.

7 INSTALL 65W LED LUMINAIRE, TYPE III, WALL MOUNTED, NO ARM (7000 LUMENS, 30 LEDS MIN)
LUMINAIRE: LUMARK WPSQLED-65-UNV OR APPROVED EQUIVALENT.

LIGHTING ZONE CALCULATIONS

APL 1: APARTMENTS PARKING LOT #1 (PRIVATE)		
	CITY STANDARD	CALCULATED
AVERAGE MAINTAINED ILLUMINANCE (FC)	N/A	1.36

811 Know what's below. Call before you dig.

N W E S

SCALE: 1" = 100'
0 100' 200'

REGISTERED PROFESSIONAL ENGINEER
87762PE
OREGON
ASHLEY ROCHELLE SEAL
PRELIMINARY
EXPIRES: 06/30/20

PUBLISH DATE
06.06.2018
ISSUED FOR
LAND USE DOCUMENTS

MULTI-FAMILY PHOTOMETRICS PLAN
CRESTVIEW CROSSING
PLANNED UNIT DEVELOPMENT
JT SMITH COMPANIES
NEWBERG, OR

3J CONSULTING
CIVIL ENGINEERING
WATER RESOURCES
LAND USE PLANNING
5075 SW GRIFFITH DRIVE, SUITE 150; BEAVERTON, OR 97005

PROJECT INFORMATION

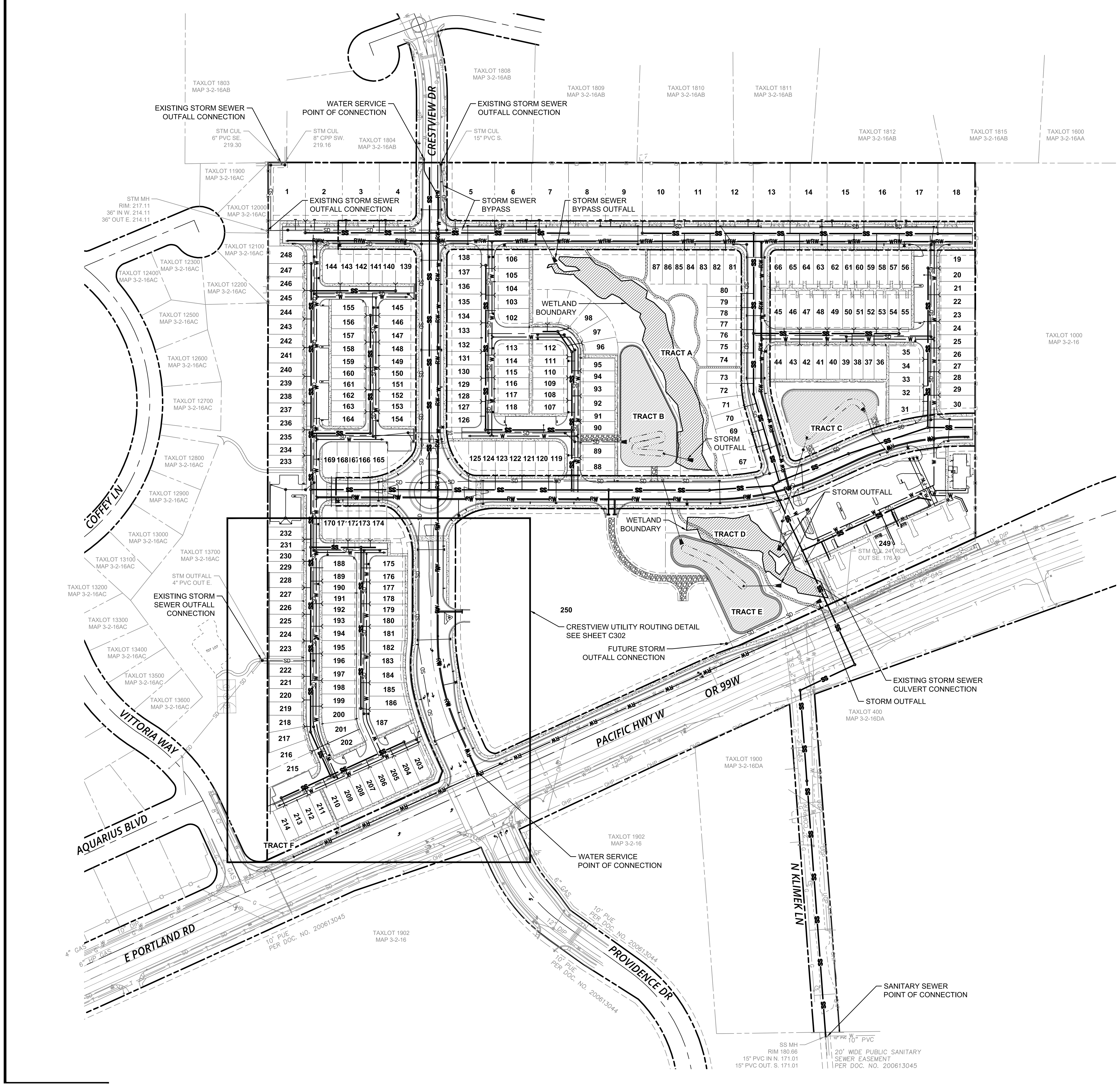
3J PROJECT #	17393
TAX LOT(S)	3S2W16 13800, 1100
LAND USE #	N/A
DESIGNED BY	ARS, JEJ, BMO
CHECKED BY	AJM, RGW

SHEET NUMBER
C291

P:\17393-JTS-CRESTVIEW CROSSING\CAD\DD\C291 MULTI FAM - PHOTOMETRICS PLAN.DWG

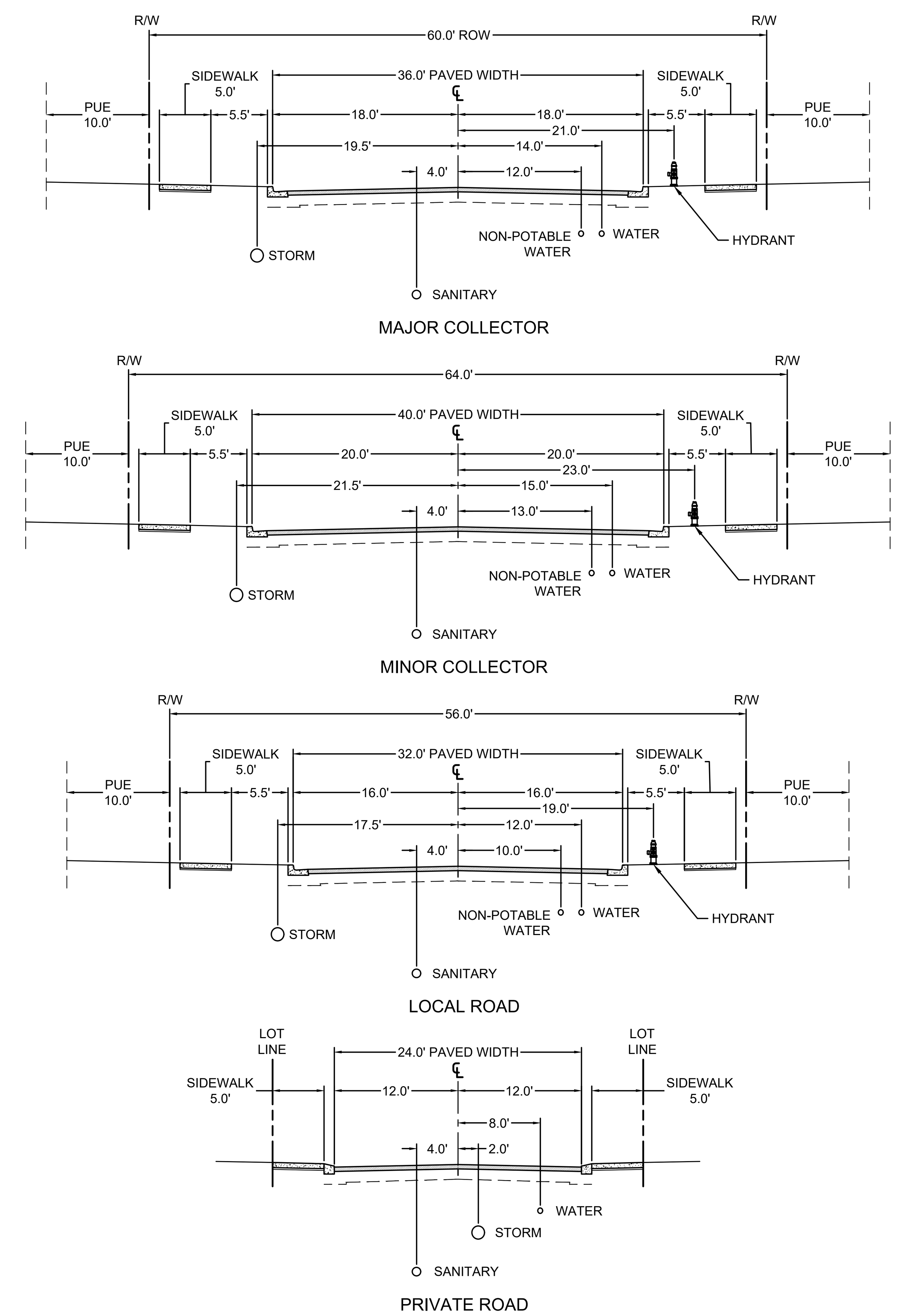
GENERAL NOTES

1. LOTS 1 THROUGH 7 SHALL HAVE STORMWATER QUALITY TREATMENT LOCATED WITHIN LOT BOUNDARIES. STORMWATER DISCHARGE FROM THESE LOTS SHALL CONNECT TO PROPOSED STORM SEWER BYPASS AND OUTFALL TO THE WETLAND.



LEGEND

SD	PROPOSED STORM PIPE	T	EXISTING TELECOM. LINE
SS	PROPOSED SANITARY MAIN	G	EXISTING GAS LINE
W	PROPOSED WATER MAIN	UGP	EXISTING UNDERGROUND POWER
RW	PROPOSED NON-POTABLE WATER MAIN	OHP	EXISTING OVERHEAD POWER
FW	PROPOSED WATER FIRE SERVICE	SS	EXISTING SANITARY SEWER
	PROPOSED DETENTION POND	SD	EXISTING STORM DRAIN
	PROPOSED WATER QUALITY SWALE	W	EXISTING WATER MAIN
	PIPE CAP / STUB		EXISTING HYDRANT
	PROPOSED HYDRANT		EXISTING WATER VALVE
	PROPOSED WATER VALVE		EXISTING SANITARY MANHOLE
	PROPOSED WATER PIPE BLOWOFF/ PROPOSED AIR RELEASE ASSEMBLY		EXISTING STORM MANHOLE
	PROPOSED FIRE DPT. CONNECTION		EXISTING STORM INLET
S	PROPOSED SANITARY MANHOLE		EXISTING POWER METER
	PROPOSED SANITARY SERVICE LATERAL WITH CLEANOUT		EXISTING GAS METER
SD	PROPOSED STORM MANHOLE		EXISTING TELEPHONE PEDESTAL
	PROPOSED STORM OUTFALL PROTECTION		EXISTING GUY ANCHOR
	PROPOSED STANDARD INLET MANHOLE		EXISTING LIGHT POLE
	PROPOSED SUPERSIZED INLET MANHOLE		EXISTING UTILITY POLE
	PROPOSED CATCH BASIN		EXISTING INTERSECTION SIGNAL
	PROPOSED DITCH INLET		EXISTING ELECTRICAL BOX
	PROPOSED STREET LIGHTING		



STREET UTILITIES TYPICAL SECTIONS

SCALE: NTS

811 Know what's below. Call before you dig.

SCALE: 1" = 100'

0 100' 200'

REGISTERED PROFESSIONAL ENGINEER 87762PE OREGON ASHLEY ROCHELLE SEAL PRELIMINARY

EXPIRES: 06/30/20

PUBLISH DATE
06.06.2018

ISSUED FOR
LAND USE DOCUMENTS

COMPOSITE UTILITY PLAN
CRESTVIEW CROSSING PLANNED UNIT DEVELOPMENT

JT SMITH COMPANIES
NEWBERG, OR

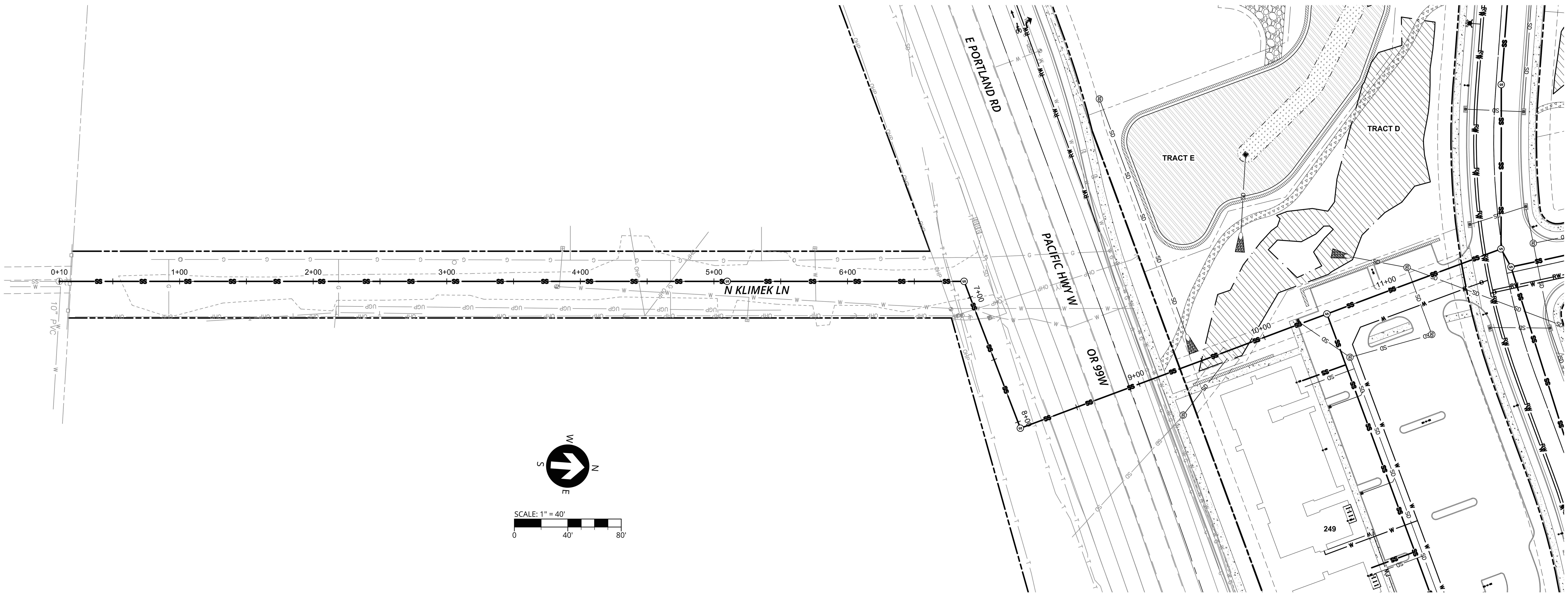
3J CONSULTING
CIVIL ENGINEERING
WATER RESOURCES
LAND USE PLANNING
5075 SW GRIFFITH DRIVE, SUITE 150; BEAVERTON, OR 97005

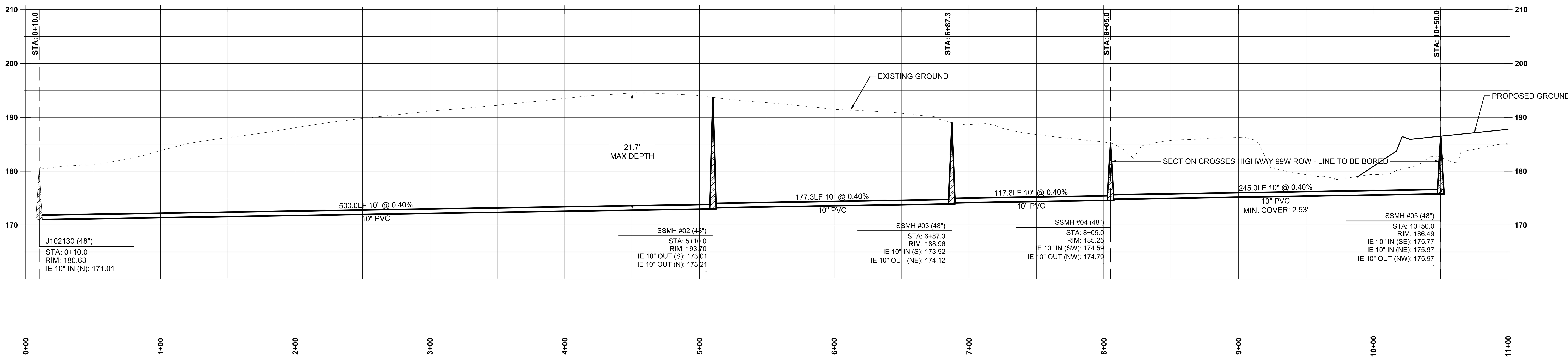
PROJECT INFORMATION

3J PROJECT #	17393
TAX LOT(S)	3S2W16 13800, 1100
LAND USE #	N/A
DESIGNED BY	ARS, JEJ, BMO
CHECKED BY	AJM, RGW

SHEET NUMBER
C300

P:\17393-JTS-CRESTVIEW CROSSING\CAD\DD\C300 COMPOSITE UTILITY PLAN.DWG





OFFSITE SEWER PROFILE

(STA: 0+00 - STA: 11+00)
SCALE: 1" = 40' H; 1" = 10' V

P:\17393--JTS-CRESTVIEW CROSSING\CAD\DD\C300 COMPOSITE UTILITY PLAN.DWG

REGISTERED PROFESSIONAL ENGINEER
OREGON
PRELIMINARY
EXPIRES: 06/30/20

PUBLISH DATE
06.06.2018
ISSUED FOR
LAND USE DOCUMENTS

OFFSITE SEWER CONNECTION
CRESTVIEW CROSSING
PLANNED UNIT DEVELOPMENT
JT SMITH COMPANIES
NEWBERG, OR

3J CONSULTING
CIVIL ENGINEERING
WATER RESOURCES
LAND USE PLANNING
5075 SW GRIFFITH DRIVE, SUITE 150; BEAVERTON, OR 97005

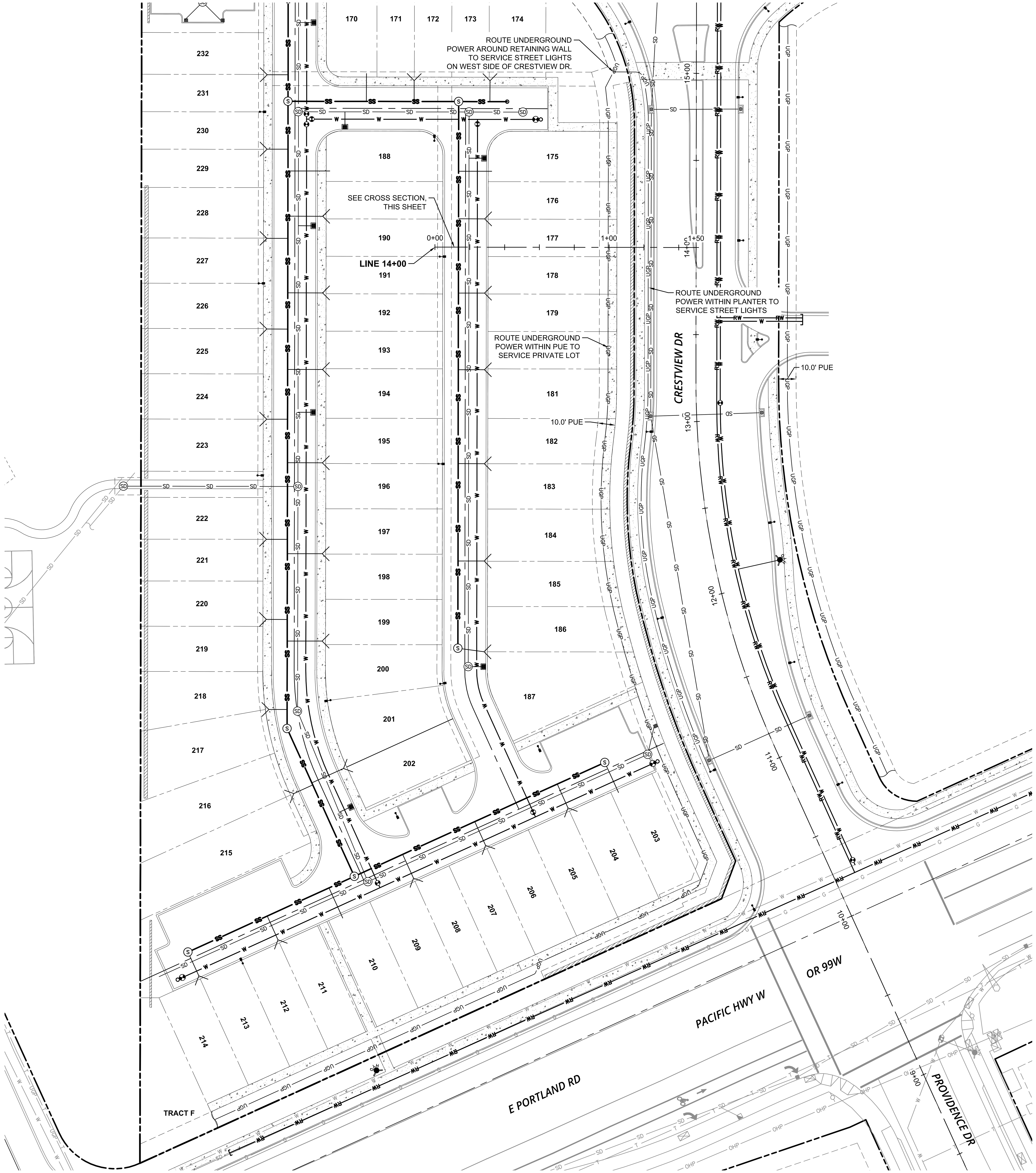
PROJECT INFORMATION

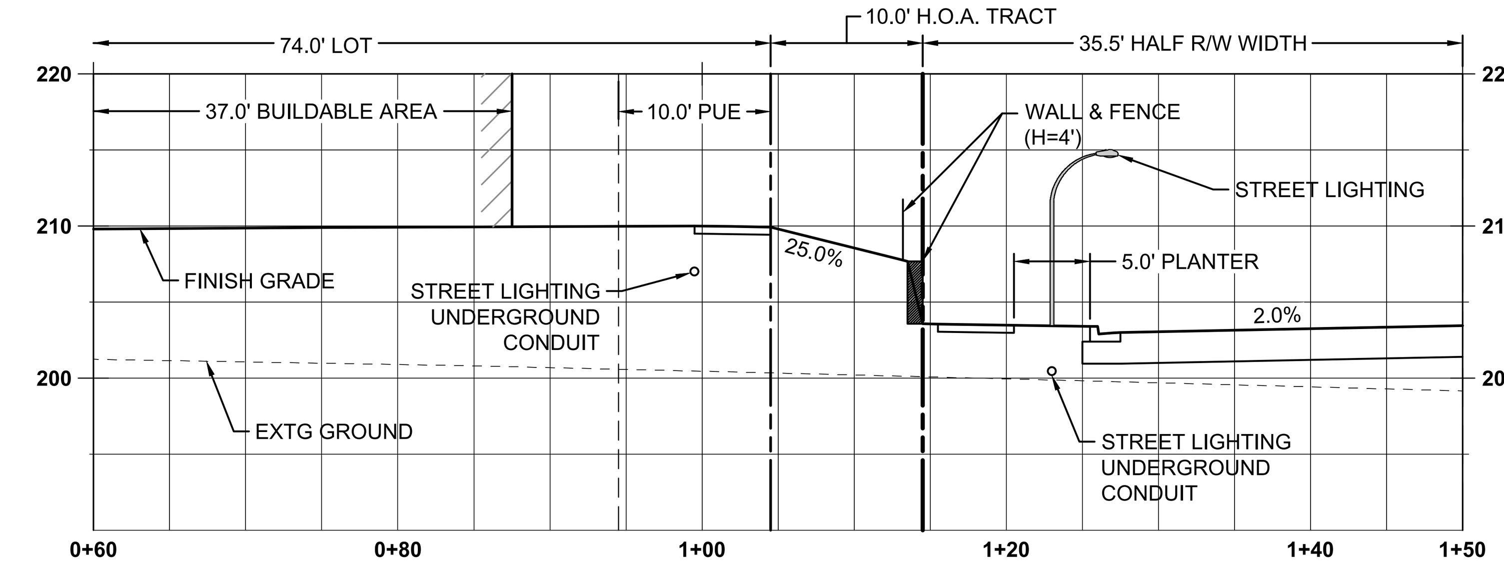
3J PROJECT #	17393
TAX LOT(S)	3S2W16 13800, 1100
LAND USE #	N/A
DESIGNED BY	ARS, JEJ, BMO
CHECKED BY	AJM, RGW

SHEET NUMBER
C301

LEGEND

SD	PROPOSED STORM PIPE
SS	PROPOSED SANITARY MAIN
SS	PROPOSED SANITARY SERVICE LATERAL
W	PROPOSED WATER PIPE
RW	PROPOSED RECLAIMED WATER MAIN
FW	PROPOSED WATER FIRE SERVICE
UGP	PROPOSED UNDERGROUND POWER CONDUIT
	PROPOSED STREET LIGHT





14+00 PROFILE
(STA: 0+60 - STA: 1+50)
SCALE: 1" = 100' H; 1" = 100' V

SCALE: 1" = 30'

Know what's below. Call before you dig.

REGISTERED PROFESSIONAL ENGINEER 87762PE OREGON ASHLEY ROCHELLE SEAL — PRELIMINARY — EXPIRES: 06/30/20

PUBLISH DATE
06.06.2018

ISSUED FOR
LAND USE DOCUMENTS

PRELIMINARY STREET LIGHT CONDUIT ROUTING PLAN
CRESTVIEW CROSSING PLANNED UNIT DEVELOPMENT
JT SMITH COMPANIES
NEWBERG, OR

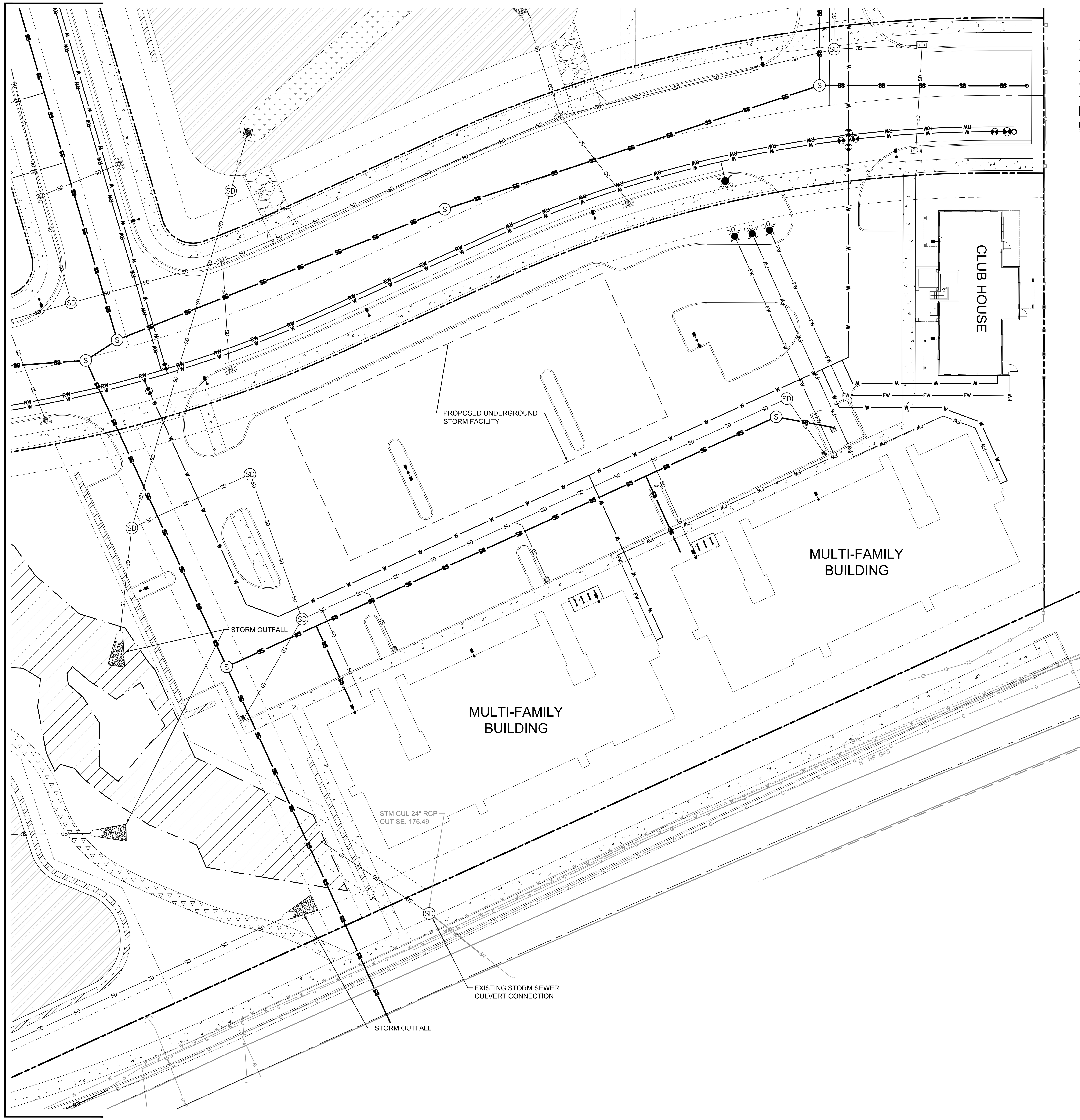
3J CONSULTING
CIVIL ENGINEERING
WATER RESOURCES
LAND USE PLANNING
5075 SW GRIFFITH DRIVE, SUITE 150; BEAVERTON, OR 97005

PROJECT INFORMATION

3J PROJECT #	17393
TAX LOT(S)	3S2W16 13800, 1100
LAND USE #	N/A
DESIGNED BY	ARS, JEJ, BMO
CHECKED BY	AJM, RGW

SHEET NUMBER
C302

P:\17393-JTS-CRESTVIEW CROSSING\CAD\DD\C300 COMPOSITE UTILITY PLAN.DWG



LEGEND

PROPOSED STORM PIPE	EXISTING TELECOM. LINE
PROPOSED SANITARY MAIN	EXISTING GAS LINE
PROPOSED WATER MAIN	EXISTING UNDERGROUND POWER
PROPOSED NON-POTABLE WATER MAIN	EXISTING OVERHEAD POWER
PROPOSED WATER FIRE SERVICE	EXISTING SANITARY SEWER
PROPOSED DETENTION POND	EXISTING STORM DRAIN
PROPOSED WATER QUALITY SWALE	EXISTING WATER MAIN
PIPE CAP / STUB	EXISTING HYDRANT
PROPOSED HYDRANT	EXISTING WATER VALVE
PROPOSED FIRE DEPARTMENT CONNECTION	EXISTING SANITARY MANHOLE
PROPOSED WATER VALVE	EXISTING STORM MANHOLE
PROPOSED WATER PIPE BLOWOFF/ AIR RELEASE ASSEMBLY	EXISTING STORM INLET
	EXISTING POWER METER
PROPOSED SANITARY MANHOLE	EXISTING GAS METER
PROPOSED SANITARY SERVICE LATERAL WITH CLEANOUT	EXISTING TELEPHONE PEDESTAL
	EXISTING GUY ANCHOR
PROPOSED STORM MANHOLE	EXISTING LIGHT POLE
PROPOSED STORM OUTFALL PROTECTION	EXISTING UTILITY POLE
PROPOSED STANDARD INLET MANHOLE	EXISTING INTERSECTION SIGNAL
PROPOSED SUPERSIZED INLET MANHOLE	EXISTING ELECTRICAL BOX
PROPOSED CATCH BASIN	
PROPOSED DITCH INLET	
PROPOSED STREET LIGHTING	

811
Know what's below. Call before you dig.

N W E S

SCALE: 1" = 100'
0 100' 200'

REGISTERED PROFESSIONAL ENGINEER
87762PE
OREGON
ASHLEY ROCHELLE SEAL
PRELIMINARY
EXPIRES: 06/30/20

PUBLISH DATE
06.06.2018

ISSUED FOR
LAND USE DOCUMENTS

MULTI-FAMILY COMPOSITE UTILITY PLAN

CRESTVIEW CROSSING PLANNED UNIT DEVELOPMENT

JT SMITH COMPANIES
NEWBERG, OR

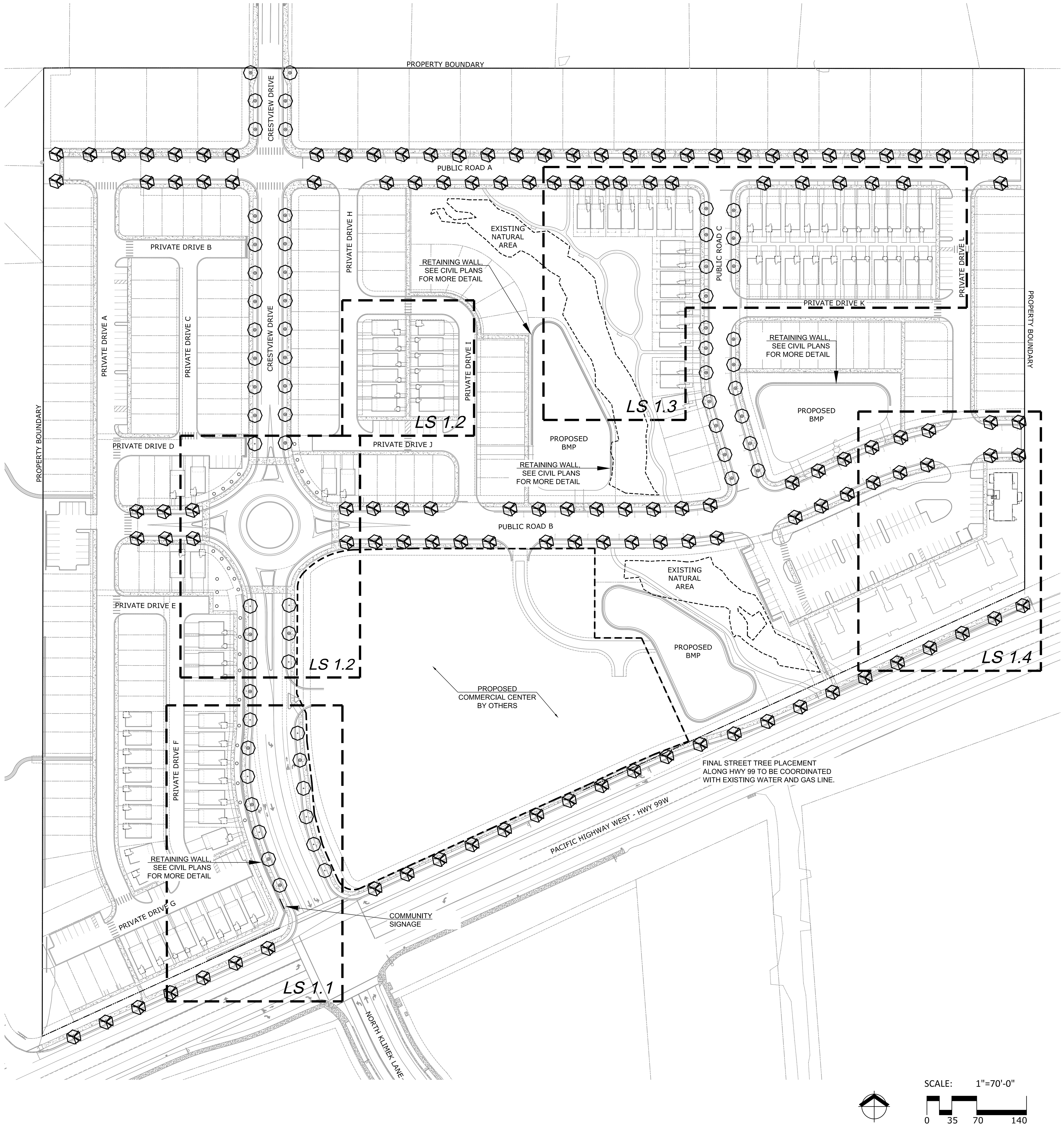
3J CONSULTING
CIVIL ENGINEERING
WATER RESOURCES
LAND USE PLANNING
5075 SW GRIFFITH DRIVE, SUITE 150; BEAVERTON, OR 97005

PROJECT INFORMATION

3J PROJECT #	17393
TAX LOT(S)	3S2W16 13800, 1100
LAND USE #	N/A
DESIGNED BY	ARS, JEJ, BMO
CHECKED BY	AJM, RGW

SHEET NUMBER
C303

P:\17393-JTS-CRESTVIEW CROSSING\CAD\DD\C303 MULTI FAM - COMPOSITE UTILITY PLAN.DWG



SCALE: 1"=70'-0"

0 35 70 140

STREET TREE PLANT MATERIAL SCHEDULE

SYMBOL	STREET TREES ITEM	SIZE
○	*ACER RUBRUM 'FRANKSRED'* RED SUNSET MAPLE	2" CAL.
⬡	*PLATANUS X ACERIFOLIA 'BLOODGOOD'* BLOODGOOD LONDON PLANE TREE	2" CAL.

NOTE: A STREET LIGHT LAYOUT PLAN HAS NOT YET BEEN GENERATED. STREET TREE LOCATIONS WILL BE COORDINATED WITH PROPOSED STREET LIGHT, DRIVEWAY, AND UTILITY LOCATIONS DURING CONSTRUCTION DOCUMENT PREPARATION.

GENERAL LANDSCAPE NOTES

1. LANDSCAPE PLANTING SHALL CONFORM TO THE STANDARDS ESTABLISHED UNDER THE CITY OF NEWBERG PLANNING DEPARTMENT.
2. ALL PLANT BEDS SHALL HAVE A 3" DEPTH OF BARK MULCH.
3. LANDSCAPE AREAS SHALL HAVE A COMPLETE UNDERGROUND AUTOMATIC IRRIGATION SYSTEM WITH FULL HEAD TO HEAD COVERAGE. WETLAND BUFFER SHALL HAVE A TEMPORARY IRRIGATION SYSTEM FOR THE TWO YEAR ESTABLISHMENT PERIOD.
4. ALL PLANT MATERIAL DELIVERED TO THIS SITE SHALL MEET THE AMERICAN STANDARD FOR NURSERY STOCK STANDARDS.
5. CONTRACTOR SHALL OBTAIN WRITTEN APPROVAL FOR ALL PLANT MATERIAL SUBSTITUTIONS FROM THE LANDSCAPE ARCHITECT PRIOR TO INSTALLATION. PLANT SUBSTITUTIONS WITHOUT PRIOR WRITTEN APPROVAL THAT DO NOT COMPLY WITH THE DRAWINGS AND SPECIFICATIONS MAY BE REJECTED BY THE LANDSCAPE ARCHITECT AT NO COST TO THE OWNER. THESE ITEMS MAY BE REQUIRED TO BE REPLACED WITH PLANT MATERIALS THAT ARE IN COMPLIANCE WITH THE DRAWINGS.

LS 1.4

DASHED BOX AND SHEET NUMBER REFLECT CORRESPONDING SHEET WITH DETAILED ENLARGEMENT.

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STREET TREE PLAN
CRESTVIEW CROSSING
JT SMITH COMPANIES
City of Newberg, Oregon

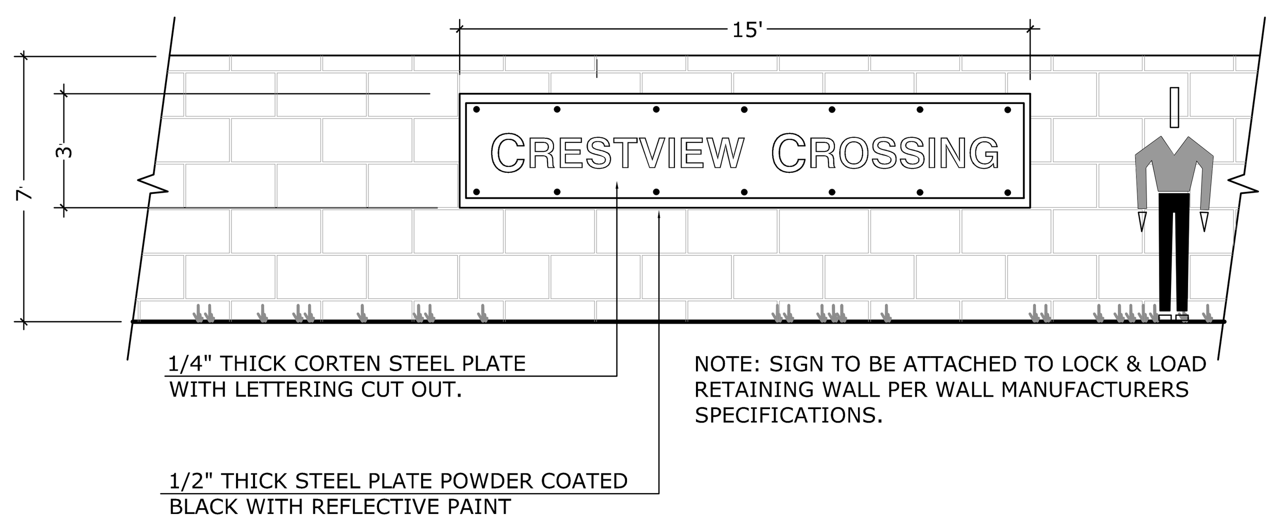
REGISTERED
LA907
ANDREW D. HILL
OREGON
10/19/16
LANDSCAPE ARCHITECT
EXPIRES 10/31/18

CLARB CERTIFIED LANDSCAPE ARCHITECT

PROJECT NO.:	
DATE:	06-06-2018
DESIGNED BY:	ADH
DRAWN BY:	KIW
CHECKED BY:	ADH

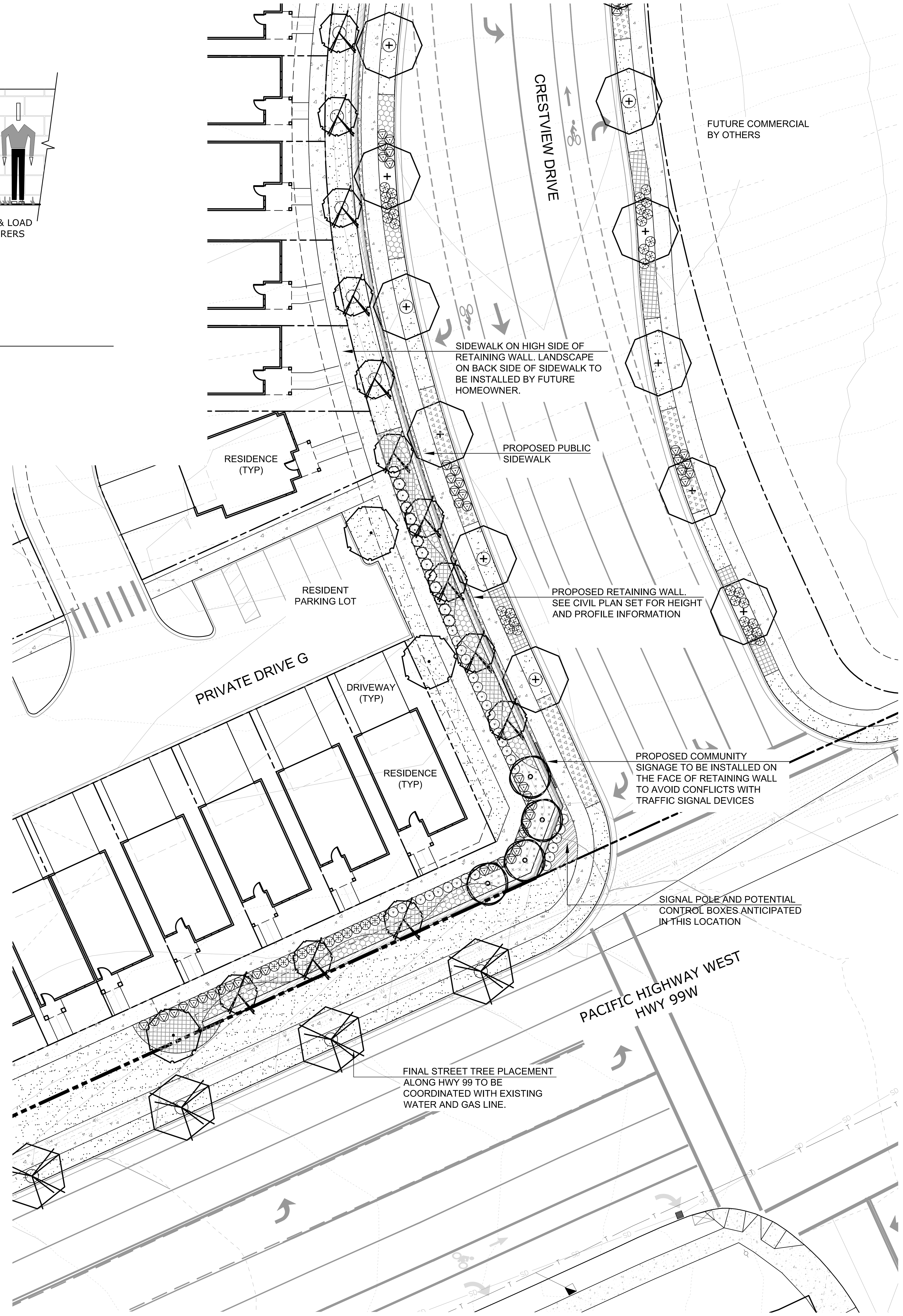
STREET TREE PLAN

LS 1.0



A MAIN ENTRY SIGNAGE

SCALE 1/4"= 1'-0"



B MAIN ENTRY AND CRESTVIEW DRIVE ENLARGEMENT

SCALE 1"=20'-0"

SCALE: 1"=20'-0"

0 10 20 40

LANDSCAPE PLANT MATERIAL SCHEDULE

SYMBOL	ITEM	SIZE
	STREET TREES	
	ACER RUBRUM 'FRANKSRED' RED SUNSET MAPLE	2" CAL.
	PLATANUS X ACERIFOLIA 'BLOODGOOD' BLOODGOOD LONDON PLANE TREE	2" CAL.
	TREES	
	ZELKOVA SERRATA 'GREEN VASE' GREEN VASE ZELKOVA	2" CAL.
	TILIA CORDATA 'GREENSPIRE' GREENSPIRE LINDEN	2" CAL.
	BETULA JACQUEMONTII HIMALAYAN BIRCH	2" CAL.
	CERCIS CANADENSIS EASTERN REDBUD	1.5" CAL.
	PRUNUS SARGENTII SARGENT CHERRY	1.5" CAL.
	STYRAX JAPONICUS JAPANESE SNOWBELL	1.5" CAL.
	ACER CIRCINATUM VINE MAPLE	7'-8' HT.
	TREES-EVERGREEN	
	PINUS STROBUS 'FASTIGIATA' FASTIGIATE WHITE PINE	6' HT. / B&B
	CHAMAECYPARIS OBTUSA 'GRACILIS' SLENDER HINOKI FALSE CYPRESS	6' HT. / B&B
	THUJA PLICATA 'HOGAN' HOGAN'S WESTERN REDCEDAR	6' HT. / B&B
	SHRUBS - DECIDUOUS	
	VIBURNUM P. TOMENTOSUM 'MARIESII' DOUBLEFILE VIBURNUM	7 GAL.
	HYDRANGEA QUERCIFOLIA 'SNOW QUEEN' SNOW QUEEN OAKLEAF HYDRANGEA	7 GAL.
	CORNUS STOLONIFERA 'FARROW' ARCTIC FIRE RED TWIG DOGWOOD	3 GAL.
	BERBERIS THUN. 'CHERRY BOMB' CHERRY BOMB BARBERRY	3 GAL.
	ROSA X 'RADRAZZ' KNOCK OUT SHRUB ROSE	3 GAL.
	SHRUBS - EVERGREEN	
	PRUNUS LAUROCERASUS 'NANA' DWARF ENGLISH LAUREL	7 GAL.
	CHOISYA TERNATA MEXICAN ORANGE	7 GAL.
	ABELIA X GRANDIFLORA GLOSSY ABELIA	7 GAL.
	OSMANTHUS FRAGRANS SWEET OLIVE	7 GAL.
	SARCOCOCCA HOOKERIANA VAR. HUMILIS HIMALAYAN SWEET BOX	3 GAL.
	DAPHNE ODORA 'AUREO-MARGINATA' VARIEGATED WINTER DAPHNE	3 GAL.
	NANDINA DOMESTICA 'COMPACTA' DWARF HEAVENLY BAMBOO	3 GAL.
	BUXUS SEMPERVIRENS 'SUFFRUTICOSA' EDGING BOXWOOD	3 GAL.
	VIBURNUM DAVIDII DAVID VIBURNUM	3 GAL.
	ESCALLONIA 'COMPAKTA' COMPACT ESCALLONIA	3 GAL.
	GRASSES & ACCENTS	
	LIRIOPE MUSCARI 'BIG BLUE' BIG BLUE LILYTURF	1 GAL.
	MISCANTHUS SINENSIS 'VARIEGATUS' VARIEGATED JAPANESE SILVER GRASS	3 GAL.
	MISCANTHUS SINENSIS 'LITTLE KITTEN' LITTLE KITTEN MAIDEN GRASS	3 GAL.
	CALAMAGROSTIS X ACUTIFLORA 'OVERDAM' OVERDAM FEATHER REED GRASS	3 GAL.
	GROUNDCOVERS	
	COTONEASTER DAMMERI 'LOWFAST' BEARBERRY COTONEASTER	1 GAL. 3' O.C.
	RUBUS CALY. 'EMERALD CARPET' EMERALD CARPET CREEPING BERRY	1 GAL. 3' O.C.
	ANNUALS	4" FLATS 8" O.C.
	PT 769 ROUGH & READY ECO-TURF MIX BY PRO TIME LAWN SEED	SEED 5-7 LBS. / 1,000 SF

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PLANTING PLAN
CRESTVIEW CROSSING
JT SMITH COMPANIES
City of Newberg, Oregon

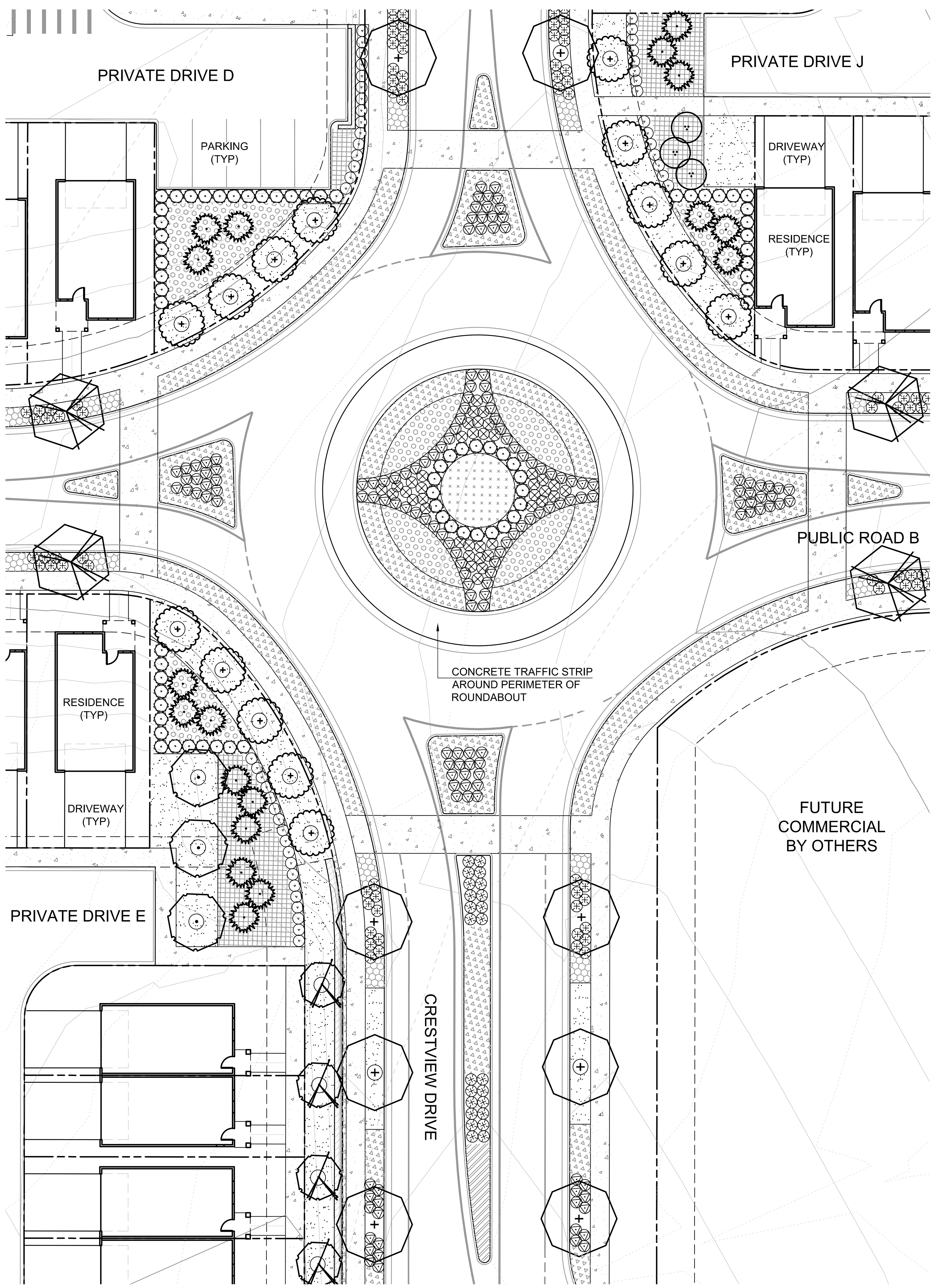
REGISTERED LA907 ANDREW D. HILL OREGON 10/19/16 LANDSCAPE ARCHITECT EXPIRES 10/31/18

CLARB CERTIFIED LANDSCAPE ARCHITECT

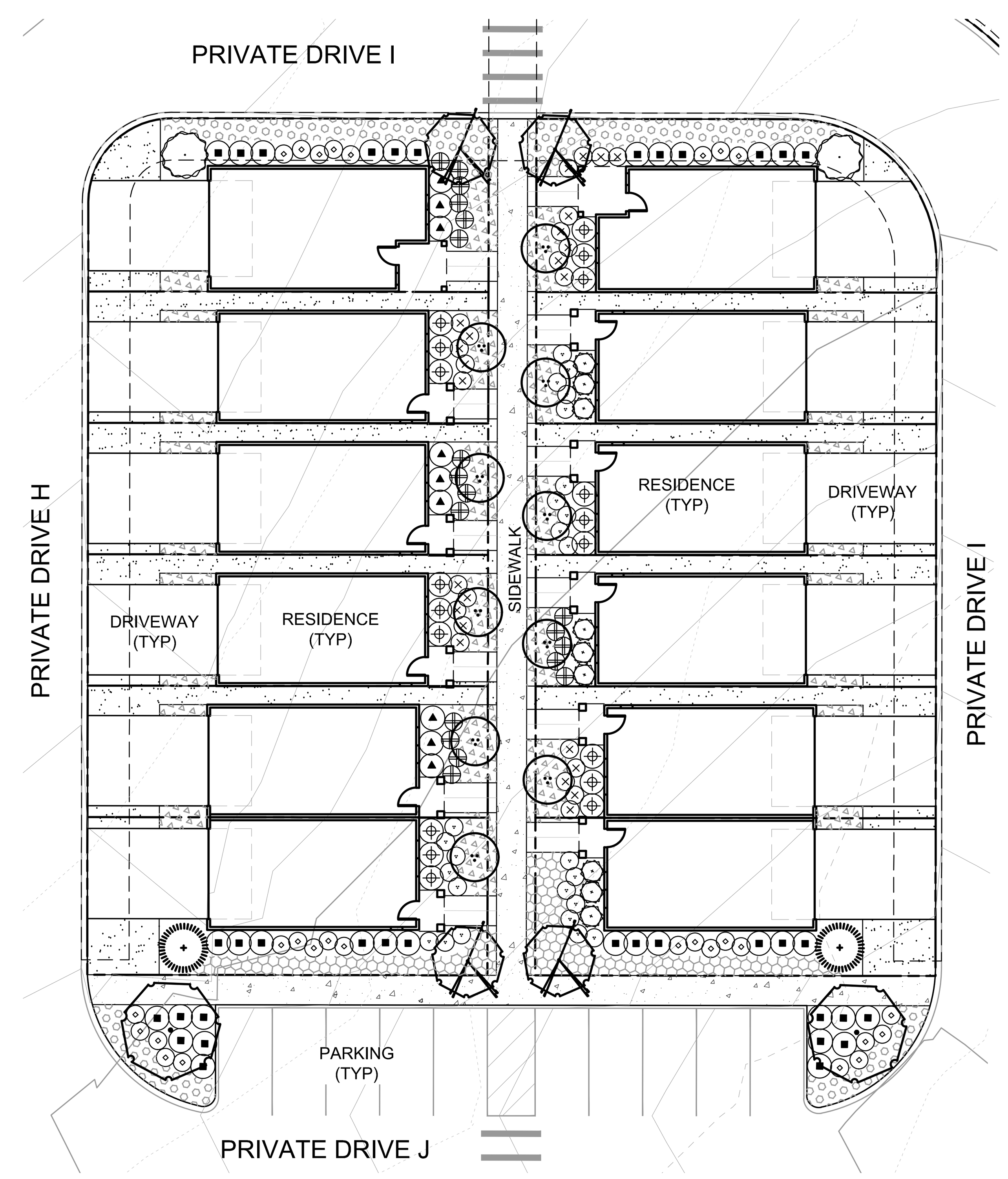
PROJECT NO.:	
DATE:	06-06-2018
DESIGNED BY:	ADH
DRAWN BY:	KIW
CHECKED BY:	ADH

PLANTING PLAN

LS 1.1



A CRESTVIEW DRIVE AND ROUNDABOUT ENLARGEMENT
SCALE 1"=20'-0"



B COURTYARD ENLARGEMENT
SCALE 1"=20'-0"

SCALE: 1"=20'-0"
0 10 20 40

LANDSCAPE PLANT MATERIAL SCHEDULE

SYMBOL	ITEM	SIZE
	STREET TREES	
	ACER RUBRUM 'FRANKSRED' RED SUNSET MAPLE	2" CAL.
	PLATANUS X ACERIFOLIA 'BLOODGOOD' BLOODGOOD LONDON PLANE TREE	2" CAL.
	TREES	
	ZELKOVA SERRATA 'GREEN VASE' GREEN VASE ZELKOVA	2" CAL.
	TILIA CORDATA 'GREENSPIRE' GREENSPIRE LINDEN	2" CAL.
	BETULA JACQUEMONTII HIMALAYAN BIRCH	2" CAL.
	CERCIS CANADENSIS EASTERN REDBUD	1.5" CAL.
	PRUNUS SARGENTII SARGENT CHERRY	1.5" CAL.
	STYRAX JAPONICUS JAPANESE SNOWBELL	1.5" CAL.
	ACER CIRCINATUM VINE MAPLE	7'-8' HT.
	TREES-EVERGREEN	
	PINUS STROBUS 'FASTIGIATA' FASTIGIATE WHITE PINE	6' HT. / B&B
	CHAMAECYPARIS OBTUSA 'GRACILIS' SLENDER HINOKI FALSE CYPRESS	6' HT. / B&B
	THUJA PLICATA 'HOGAN' HOGAN'S WESTERN REDCEDAR	6' HT. / B&B
	SHRUBS - DECIDUOUS	
	VIBURNUM P. TOMENTOSUM 'MARIESII' DOUBLEFILE VIBURNUM	7 GAL.
	HYDRANGEA QUERCIFOLIA 'SNOW QUEEN' SNOW QUEEN OAKLEAF HYDRANGEA	7 GAL.
	CORNUS STOLONIFERA 'FARROW' ARCTIC FIRE RED TWIG DOGWOOD	3 GAL.
	BERBERIS THUN. 'CHERRY BOMB' CHERRY BOMB BARBERRY	3 GAL.
	ROSA X 'RADRAZZ' KNOCK OUT SHRUB ROSE	3 GAL.
	SHRUBS - EVERGREEN	
	PRUNUS LAUROCERASUS 'NANA' DWARF ENGLISH LAUREL	7 GAL.
	CHOISYA TERNATA MEXICAN ORANGE	7 GAL.
	ABELIA X GRANDIFLORA GLOSSY ABELIA	7 GAL.
	OSMANTHUS FRAGRANS SWEET OLIVE	7 GAL.
	SARCOCOCCA HOOKERIANA VAR. HUMILIS HIMALAYAN SWEET BOX	3 GAL.
	DAPHNE ODORA 'AUREO-MARGINATA' VARIEGATED WINTER DAPHNE	3 GAL.
	NANDINA DOMESTICA 'COMPACTA' DWARF HEAVENLY BAMBOO	3 GAL.
	BUXUS SEMPERVIRENS 'SUFFRUTICOSA' EDGING BOXWOOD	3 GAL.
	VIBURNUM DAVIDII DAVID VIBURNUM	3 GAL.
	ESCALLONIA 'COMPAKTA' COMPACT ESCALLONIA	3 GAL.
	GRASSES & ACCENTS	
	LIRIOPE MUSCARI 'BIG BLUE' BIG BLUE LILYTURF	1 GAL.
	MISCANTHUS SINENSIS 'VARIEGATUS' VARIEGATED JAPANESE SILVER GRASS	3 GAL.
	MISCANTHUS SINENSIS 'LITTLE KITTEN' LITTLE KITTEN MAIDEN GRASS	3 GAL.
	CALAMAGROSTIS X ACUTIFLORA 'OVERDAM' OVERDAM FEATHER REED GRASS	3 GAL.
	GROUNDCOVERS	
	COTONEASTER DAMMERI 'LOWFAST' BEARBERRY COTONEASTER	1 GAL. 3' O.C.
	RUBUS CALY. 'EMERALD CARPET' EMERALD CARPET CREEPING BERRY	1 GAL. 3' O.C.
	ANNUALS	4" FLATS 8" O.C.
	PT 769 ROUGH & READY ECO-TURF MIX BY PRO TIME LAWN SEED	SEED 5-7 LBS. / 1,000 SF

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J.T. SMITH companies

PLANTING PLAN
CRESTVIEW CROSSING
JT SMITH COMPANIES
City of Newberg, Oregon

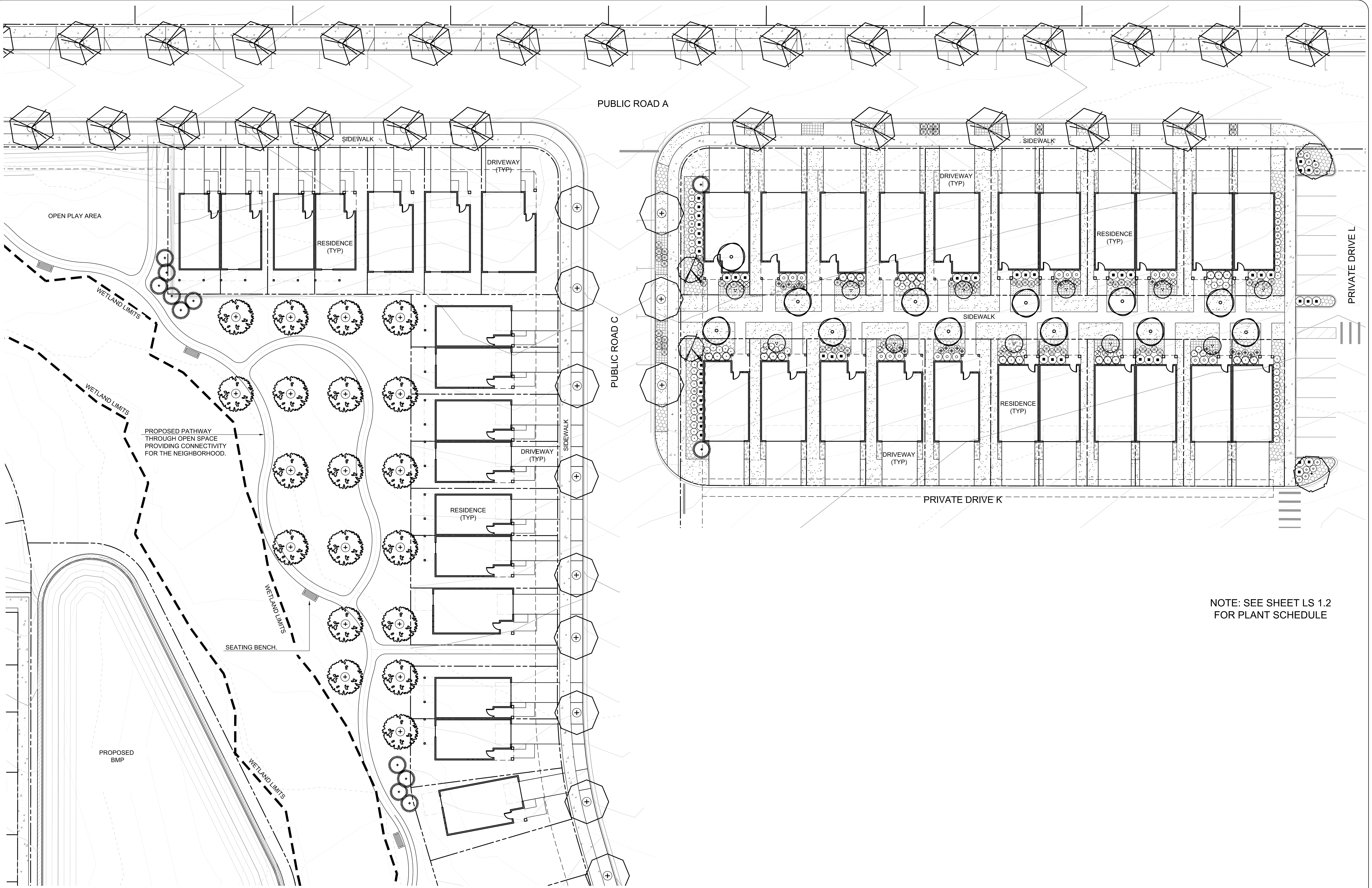
REGISTERED LA907 ANDREW D. HILL OREGON 10/19/16 LANDSCAPE ARCHITECT EXPIRES 10/31/18

CLARB CERTIFIED LANDSCAPE ARCHITECT

PROJECT NO.:	
DATE:	06-06-2018
DESIGNED BY:	ADH
DRAWN BY:	KIW
CHECKED BY:	ADH

PLANTING PLAN

LS 1.2



A WETLAND/ COMMON OPEN SPACE PATHWAY AND RESIDENTIAL COURTYARD ENLARGEMENT
SCALE 1"=20'-0"

NOTE: SEE SHEET LS 1.2 FOR PLANT SCHEDULE

SCALE: 1"=20'-0"

0 10 20 40

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ANDREW D. HILL
OREGON
10/19/16
LANDSCAPE ARCHITECT
EXPIRES 10/31/18

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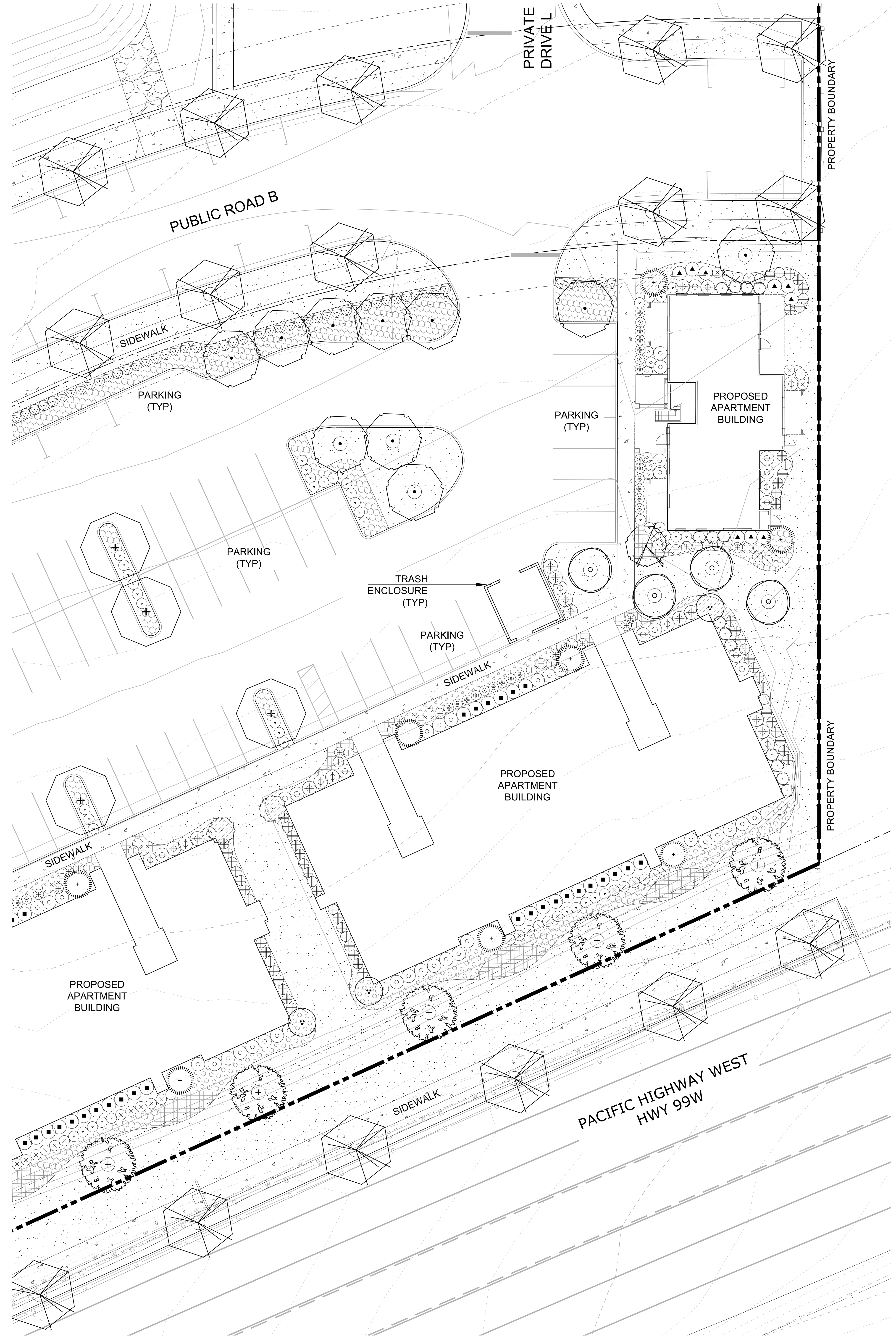
CHECKED BY:	ADH

PLANTING PLAN

LS 1.3



A APARTMENT COMPLEX AND HWY 99 FRONTAGE ENLARGEMENT
SCALE 1"=20'-0"

SCALE: 1"=20'-0"
0 10 20 40

LANDSCAPE PLANT MATERIAL SCHEDULE

SYMBOL	ITEM	SIZE
	STREET TREES	
	ACER RUBRUM 'FRANKSRED' RED SUNSET MAPLE	2" CAL.
	PLATANUS X ACERIFOLIA 'BLOODGOOD' BLOODGOOD LONDON PLANE TREE	2" CAL.
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	ZELKOVA SERRATA 'GREEN VASE' GREEN VASE ZELKOVA	2" CAL.
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	NANDINA DOMESTICA 'COMPACTA' DWARF HEAVENLY BAMBOO	3 GAL.
	BUXUS SEMPERVIRENS 'SUFFRUTICOSA' EDGING BOXWOOD	3 GAL.
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	CALAMAGROSTIS X ACUTIFLORA 'OVERDAM' OVERDAM FEATHER REED GRASS	3 GAL.
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	ANNUALS	4" FLATS 8" O.C.
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REGISTERED LA907 ANDREW D. HILL OREGON 10/19/16 LANDSCAPE ARCHITECT EXPIRES 10/31/18

CLARB CERTIFIED LANDSCAPE ARCHITECT

PROJECT NO.:	
DATE:	06-06-2018
DESIGNED BY:	ADH
DRAWN BY:	KIW
CHECKED BY:	ADH

PLANTING PLAN

LS 1.4

CRESTVIEW CROSSING PLANNED DEVELOPMENT

10. BUILDING TYPE A2 - TYPICAL END ELEVATION

SCALE: 1/8"=1'-0"

5. PERSPECTIVE

SCALE: NOT TO SCALE

11. BUILDING TYPE A2 - ENTRY ELEVATION

SCALE: 1/8"=1'-0"

12. BUILDING TYPE A2 - REAR ELEVATION

SCALE: 1/8"=1'-0"

LRS
ARCHITECTS
720 NW Davis 503.221.1121
Suite 300 503 221.2077
Portland OR 97209 www.lrsarchitects.com

PRELIMINARY
NOT FOR
CONSTRUCTION

CONSULTANT:

PROJECT NUMBER:

Crestview Crossing
NEWBERG, OR

SHEET TITLE:

BUILDING A2 EXTERIOR ELEVATIONS

DRAWN BY: JW
DATE ISSUED: 06/01/18

SHEET: **A102**

10. BUILDING TYPE A2 - TYPICAL END ELEVATION
SCALE: 1/8"=1'-0"

5. PERSPECTIVE
SCALE: NOT TO SCALE

11. BUILDING TYPE A2 - ENTRY ELEVATION
SCALE: 1/8"=1'-0"

12. BUILDING TYPE A2 - REAR ELEVATION
SCALE: 1/8"=1'-0"

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720 NW Davis 503.221.1121
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Portland OR 97209 www.lrsarchitects.com

PRELIMINARY
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CONSULTANT:

PROJECT NUMBER:

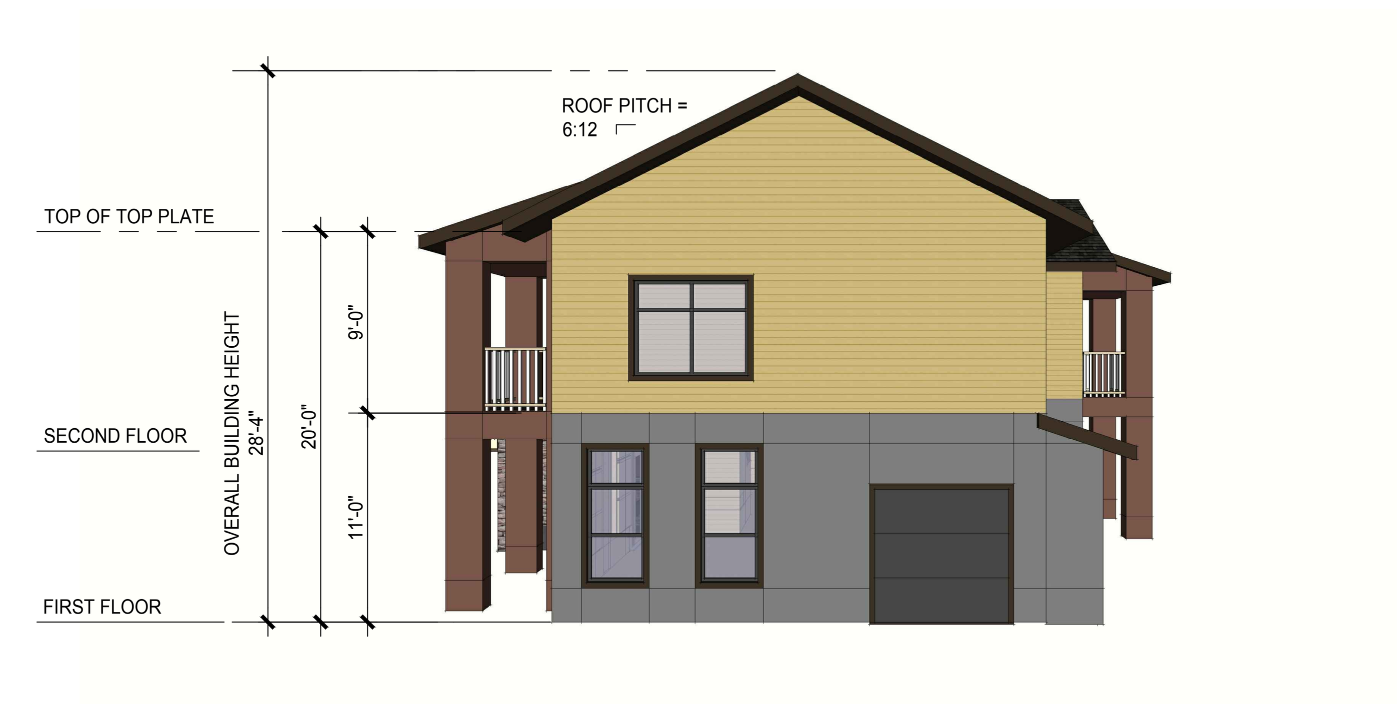
Crestview Crossing
NEWBERG, OR

SHEET TITLE:
BUILDING A2 EXTERIOR ELEVATIONS

DRAWN BY: JW
DATE ISSUED: 06/01/18

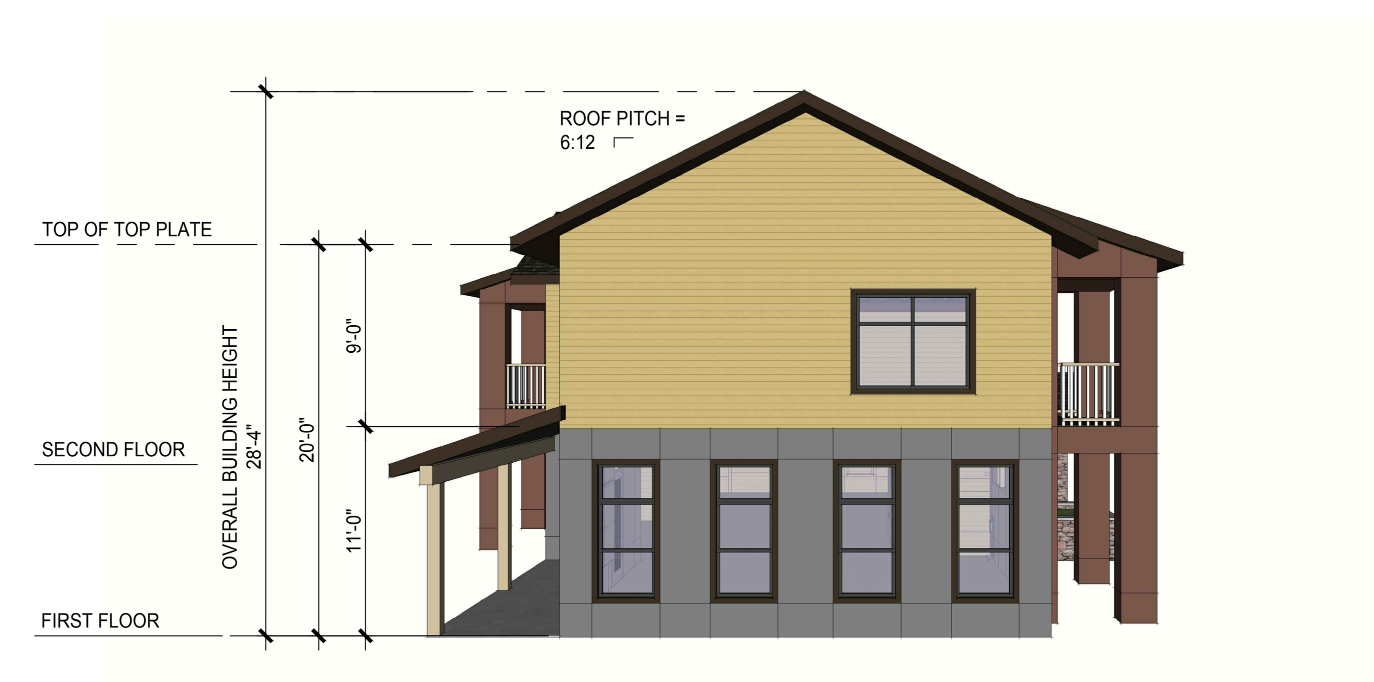
SHEET: **A102**

10. SOUTH ELEVATION
SCALE: 1/8"=1'-0"

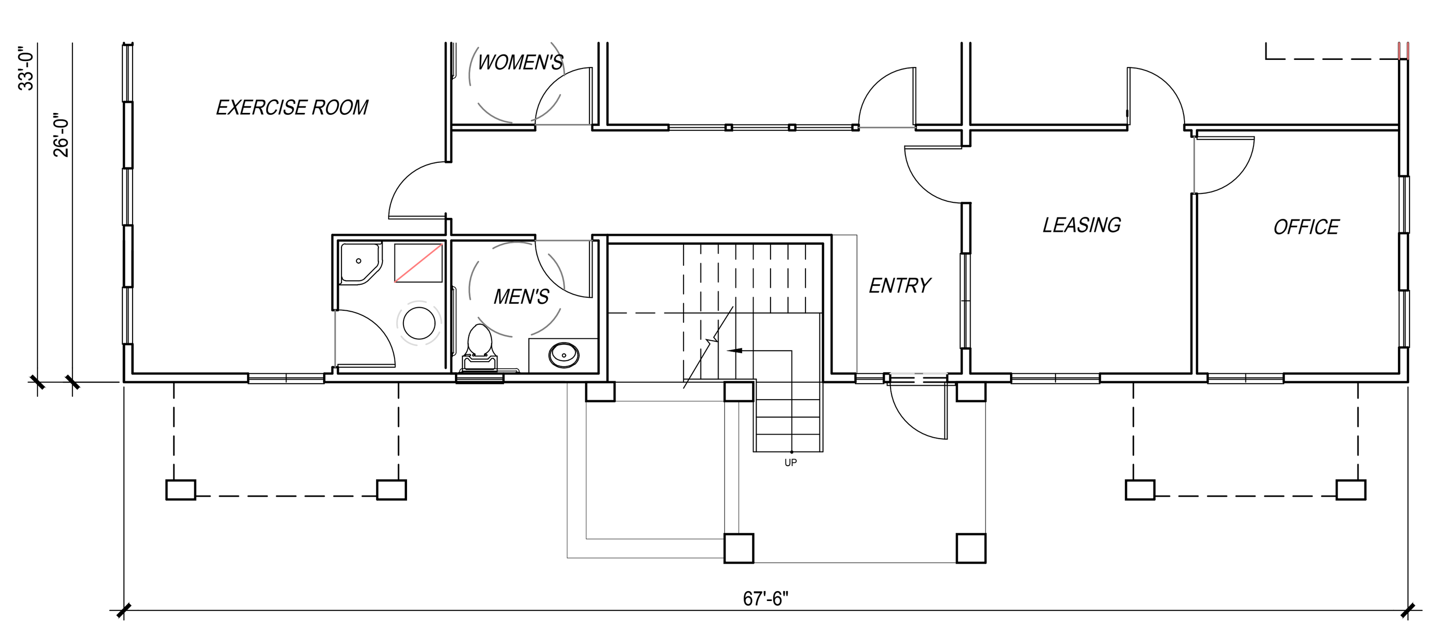


4. WEST ELEVATION
SCALE: NTS

11. NORTH ELEVATION
SCALE: 1/8"=1'-0"



5. EAST ELEVATION
SCALE: 1/8"=1'-0"



12. MAIN LEVEL PLAN VIEW
SCALE: 1/8"=1'-0"

6. PERSPECTIVE
SCALE: NTS

ARCHITECTS
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Suite 300 503 221.2077
Portland OR 97209 www.lrsarchitects.com

PRELIMINARY NOT FOR CONSTRUCTION

CONSULTANT:

PROJECT NUMBER:

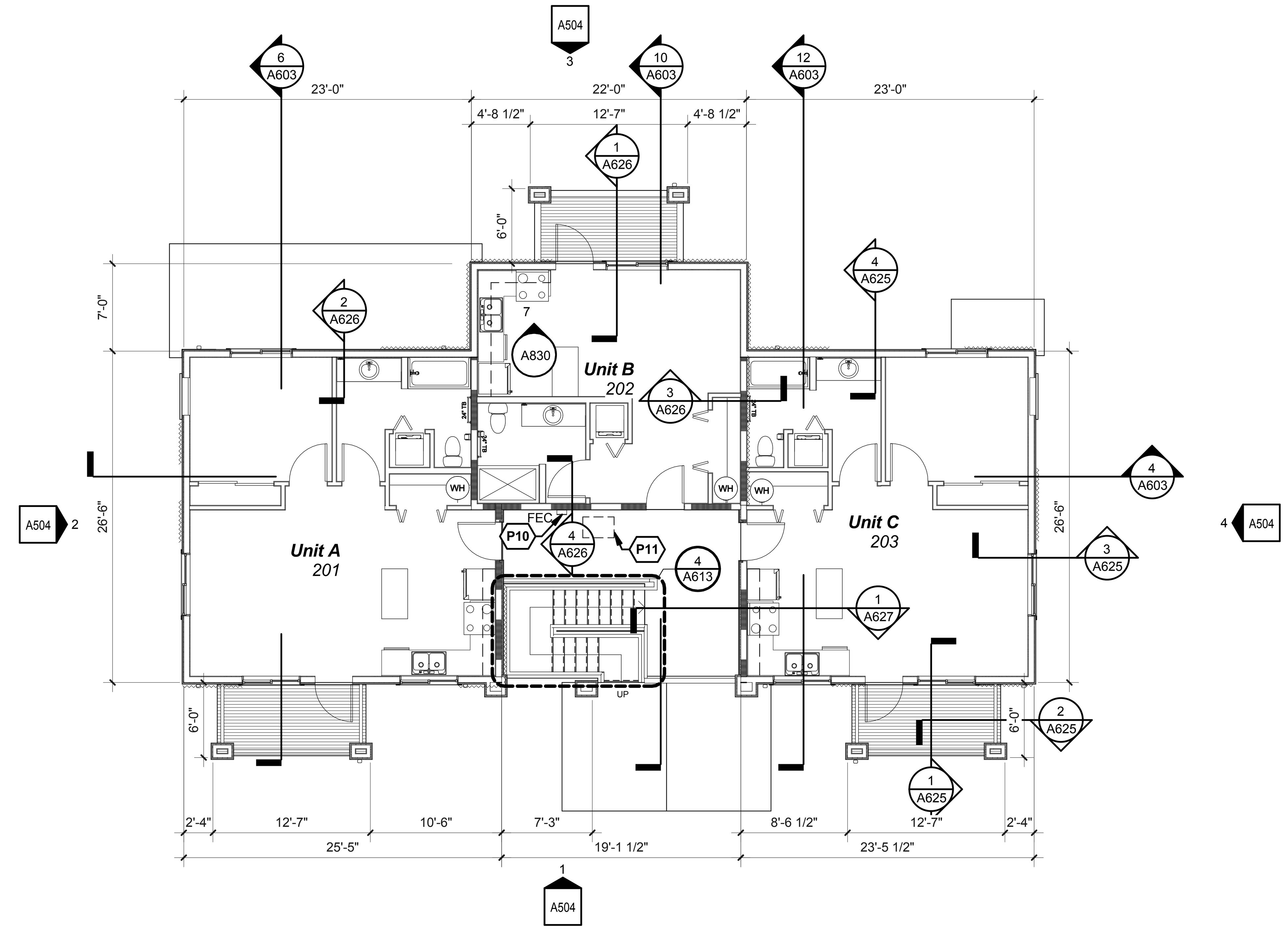
Crestview Crossing
NEWBERG, OR

SHEET TITLE:

CLUBHOUSE EXTERIOR ELEVATIONS

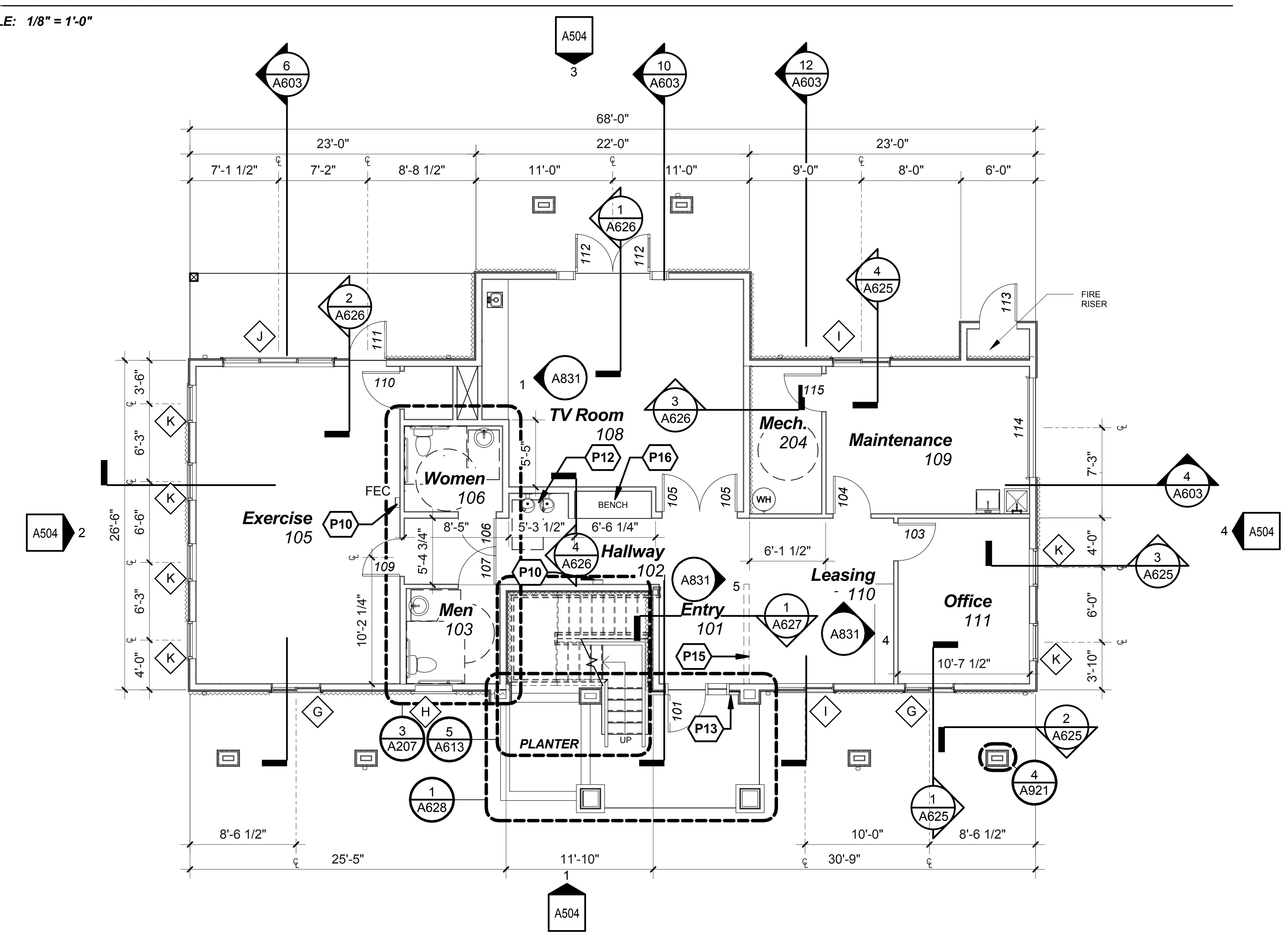
DRAWN BY: SD
DATE ISSUED: 5/06/01/18

SHEET: **A103**



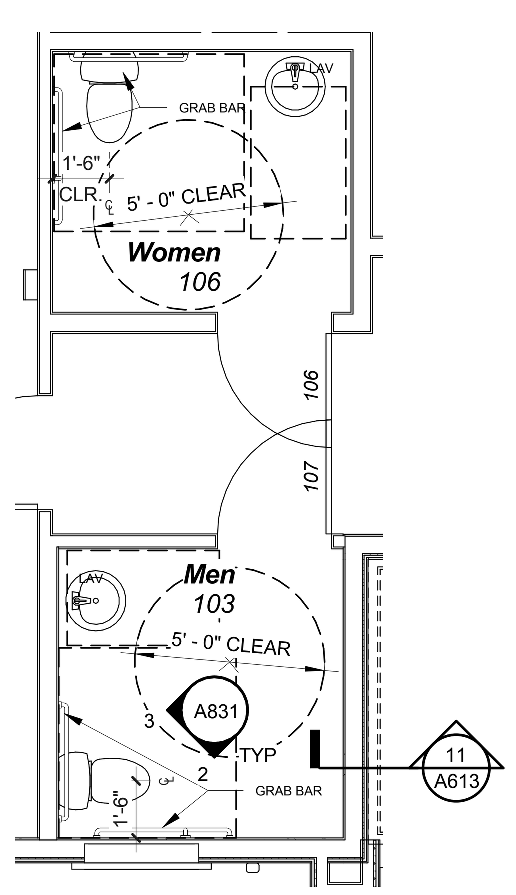
1 CLUBHOUSE - LEVEL 2

SCALE: 1/8" = 1'-0"



2 CLUBHOUSE - LEVEL 1

SCALE: 1/8" = 1'-0"



3 CLUBHOUSE - LEVEL 1 BATHROOMS

SCALE: 1/4" = 1'-0"

GENERAL NOTES:

A. ALL PLAN WALLS SHOW FRAMING ONLY UON. NO FINISHES ARE DRAWN. ALL DIMENSIONS ARE TO FACE OF FRAMING UON OR CENTER OF WINDOW OPENING, COLUMN, OR GRID. EXTERIOR DIMENSIONS ARE TO FACE OF FOUNDATION/ FACE OF FRAMING. DIMENSIONS INDICATED AS "CLEAR MINIMUM" ARE TO FACE OF FINISH.

B. ALL DOOR OPENINGS PERPENDICULAR TO A WALL ARE 5" TO THE WALL UON.

C. SEE Ai SHEET FOR STANDARD FIXTURE MOUNTING HEIGHTS AND REQUIREMENTS UON.

D. SEE SITE PLAN FOR BUILDING ORIENTATION

E. SQUARE CORNERS AT ALL GYPSUM BOARD CORNERS

F. SEE ENLARGED UNIT PLANS FOR INTERIOR WALL DIMENSIONS AT LEVEL 2

G. FOR ENLARGED UNIT PLANS SEE DRAWING SHEETS BEGINNING AT "A220"

KEYNOTES

P10	FIRE EXT. CABINET
P11	20" X 30" MINIMUM ATTIC ACCESS
P12	DRINKING FOUNDATION COMBO HIGH/LOW
P13	ALLOWABLE OCCUPANCY SIGN
P15	WOOD SLAT PARTITION - GREEN FURNITURE SOLUTIONS. TWO 4'-0" X 8'-0" PARTITIONS.
P16	DENALI LIVE EDGE WOOD BENCH

WALL TYPES

A. EXTERIOR WALLS:

EXTERIOR WALL TYPES VARY. SEE EXTERIOR ELEVATIONS AND WALL SECTIONS FOR LOCATIONS.

- TYPICAL WALL W/ SIDING SYSTEM IS TYPE 16 T / NE AT PANEL SIDING
- TYPICAL WALL W/ SIDING SYSTEM IS TYPE 26 T / NE AT LAP SIDING
- TYPICAL WALL IS TYPE 34 / NE .
- TYPICAL WALL W/ STONE IS TYPE 46 T / NP .

B. INTERIOR WALLS

- TYPICAL INTERIOR WALL IS TYPE A4 / NS .
- TYPICAL BATHRM WALL IS A4 A / NS .
- TYPICAL SHARED UNIT (PARTY) WALL IS TYPE B4 A / 1S

WALLS WITH WOOD SHEATHING:

- FOR STRUCTURAL SHEAR. LOCATE WOOD SHEATHING ON SIDE OF WALL WITH SAWTOOTH LINE AS INDICATED. SEE STRUCTURAL DRAWINGS FOR SIZE AND NAILING SCHEDULE.

HORIZONTAL ASSEMBLIES

SEE WALL SECTIONS AND CODE ANALYSIS DRAWINGS FOR TYPE, ALL WITH FIRE RESISTANCE OPENING PROTECTION BY SHAFTS, ASSEMBLIES, BY EXCEPTION FOR DUCTS AND PENETRATIONS.

LEGEND

1-HOUR FIRE PARTITION:

SEE CODE ANALYSIS PLANS FOR WALL DESIGNATIONS. FIRE RESISTIVE OPENING PROTECTION AT DOORS, WINDOWS, DUCTS (WITH EXCEPTIONS), PENETRATIONS, AND PROTECTION AT JOINTS. SEE WALL TYPES, DOOR AND WINDOW SCHEDULES, PENETRATION DETAILS, AND JOINT DETAILS WHERE APPLICABLE.

NONRATED WALL: AT NON-BEARING INTERIOR WALLS WITH NO OPENING PROTECTION REQUIRED AT DOORS, WINDOWS, DUCTS, PENETRATIONS, AND JOINTS UON. SEE WALL TYPES. SEE STRUCT.

AT NON-BEARING INTERIOR WALLS WITH NO OPENING PROTECTION REQURED AT DOORS, WINDOWS, DUCTS, PENETRATION AT JOINTS, UON. SEE WALL TYPES. SEE STRUCT.

FEC FIRE EXTINGUISHER CABINET

LRS ARCHITECTS

720 NW Davis 503.221.1121

Suite 300 503 221.2077

Portland OR 97209 www.lrsarchitects.com

7916 REGISTERED ARCHITECT

THOMAS PAUL FRANK, JR. STATE OF WASHINGTON

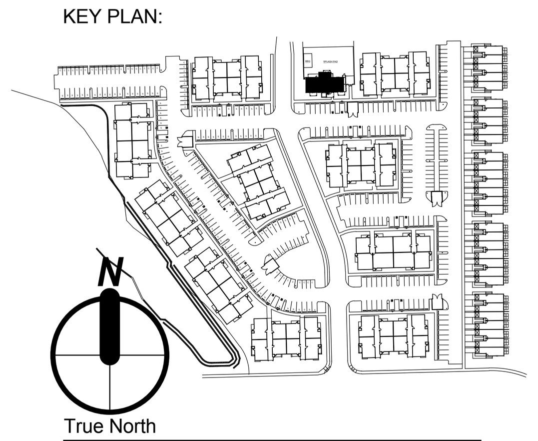
CONSULTANT:

PROJECT NUMBER: 216086

Alderbrook Apartments

Vancouver, WA

KEY PLAN:



SHEET TITLE:

CLUBHOUSE - OVERALL FLOOR PLANS

DRAWN BY: DM

DATE CREATED: 09/09/16

SHEET:

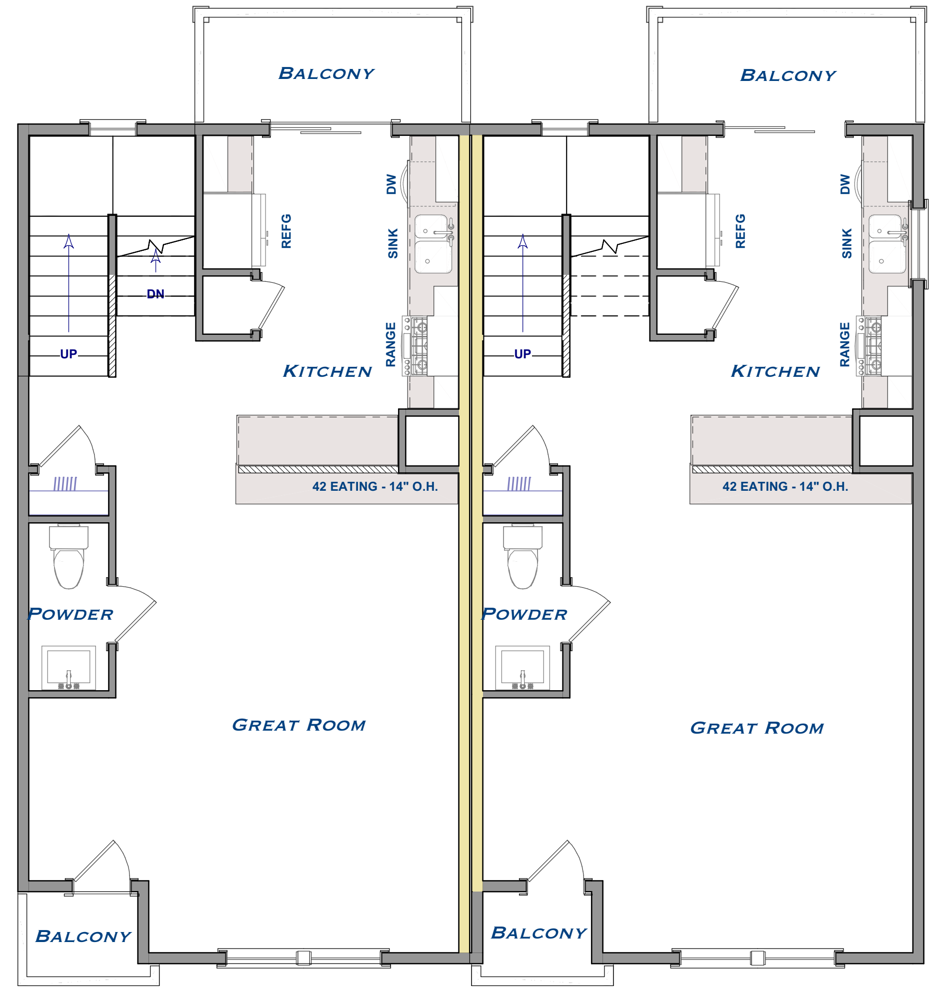
A207

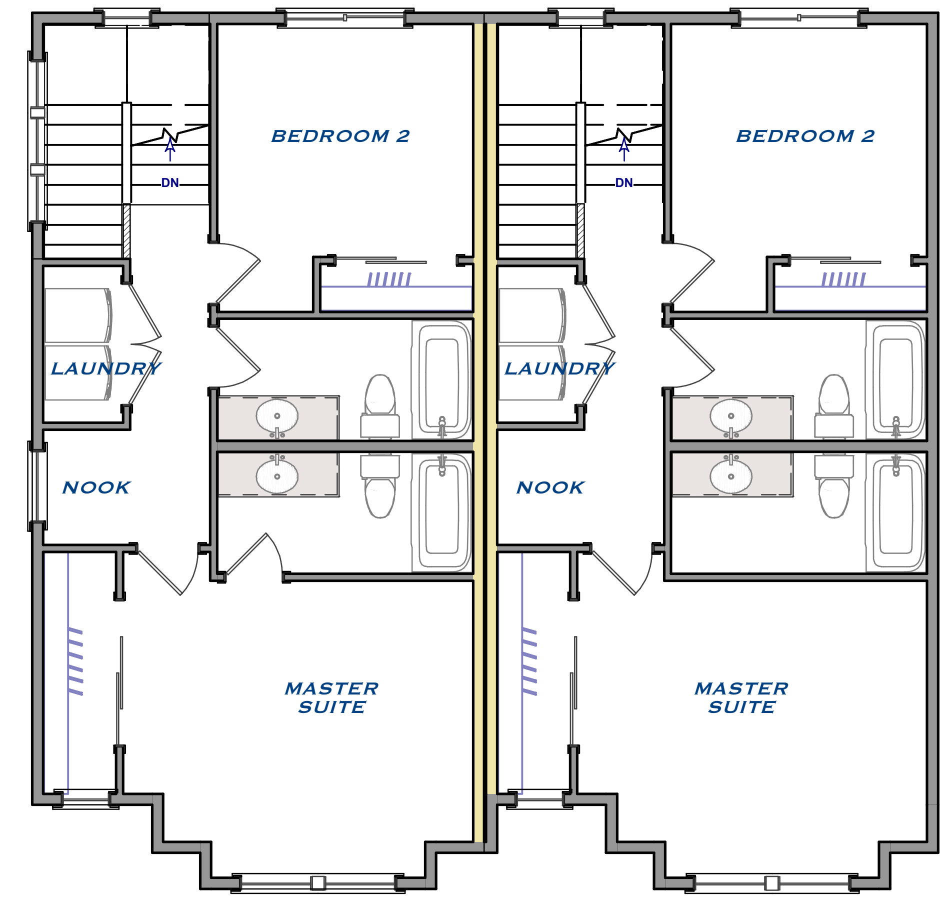
PHASE 1-PERMIT SET

September 09, 2016

C:\300 Revit Local Files\216086_ Alderbrook Apartments_Arch_R16_sdemonte.rvt

10/4/2016 10:56:41 AM





19ft front loaded townhome plan concept

ground floor	|	349 sq ft
main floor	|	575 sq ft
upper floor	|	596 sq ft
total	|	1,520 sq ft

twinline design llc
architectural design + documentation

Crestview Crossing 19ft wide front loaded townhome Concept Plan | 5/10/18

 | www.twinlinedesign.com | p. 971 235 5854

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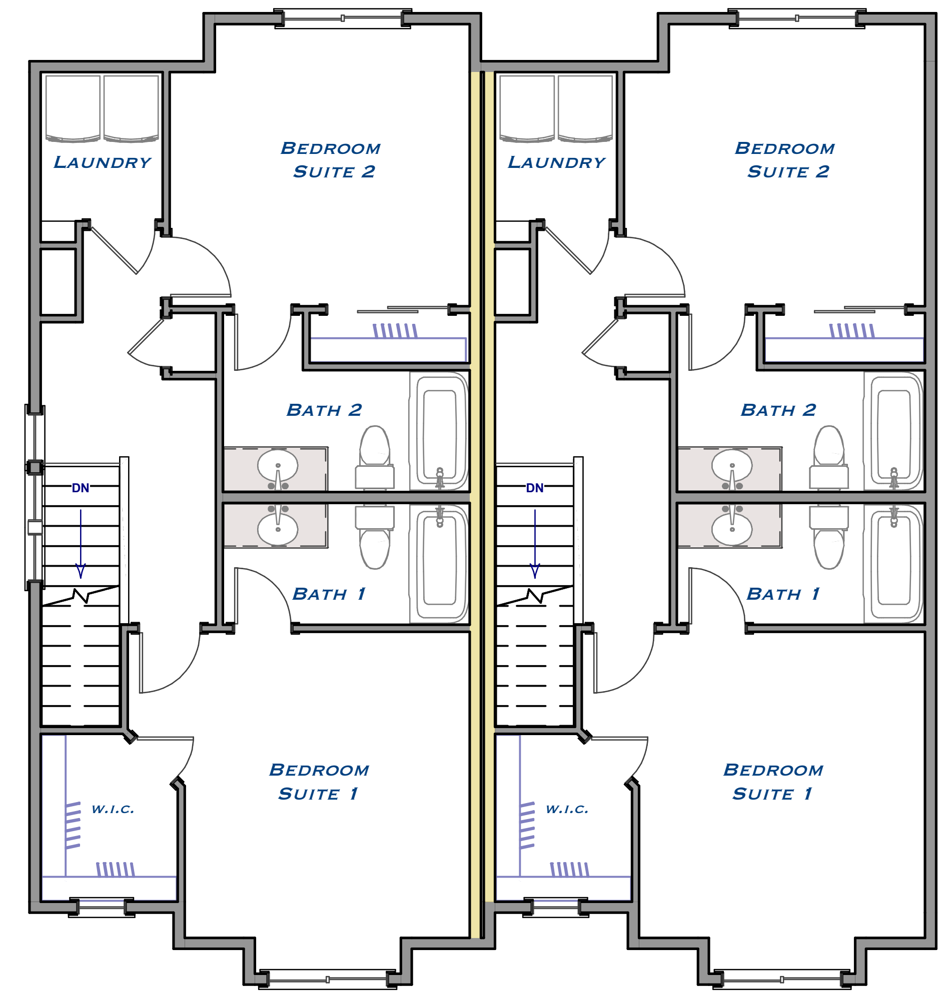

19ft rear loaded townhome plan concept

ground floor	|	293 sq ft
main floor	|	667 sq ft
upper floor	|	679 sq ft
total	|	1,639 sq ft

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Crestview Crossing 19ft wide rear loaded townhome | 5/14/18

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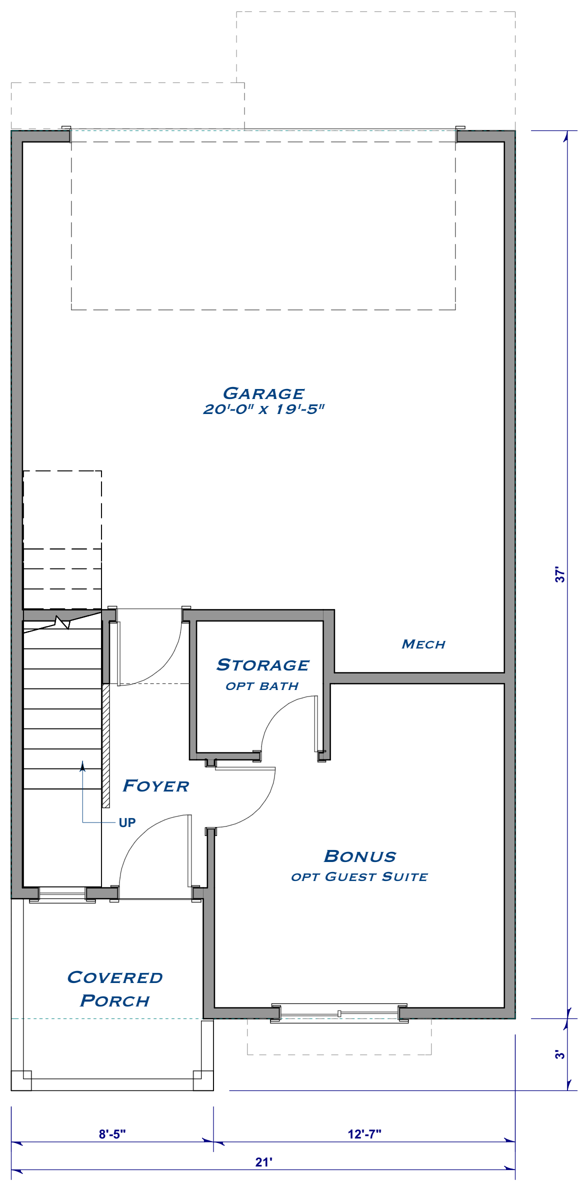

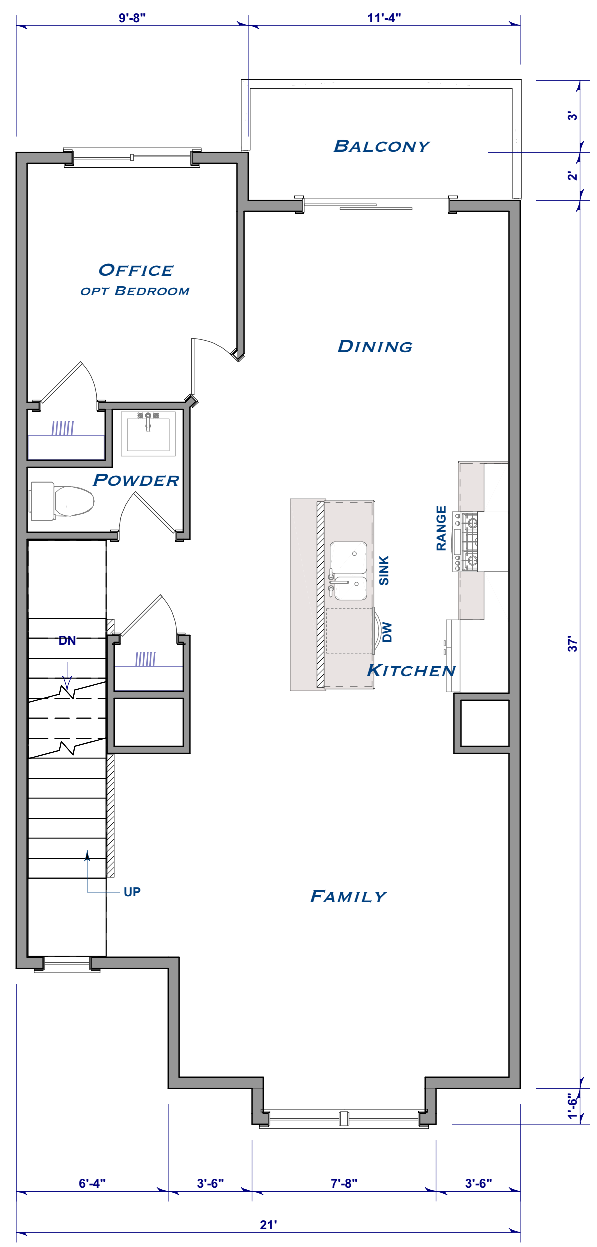

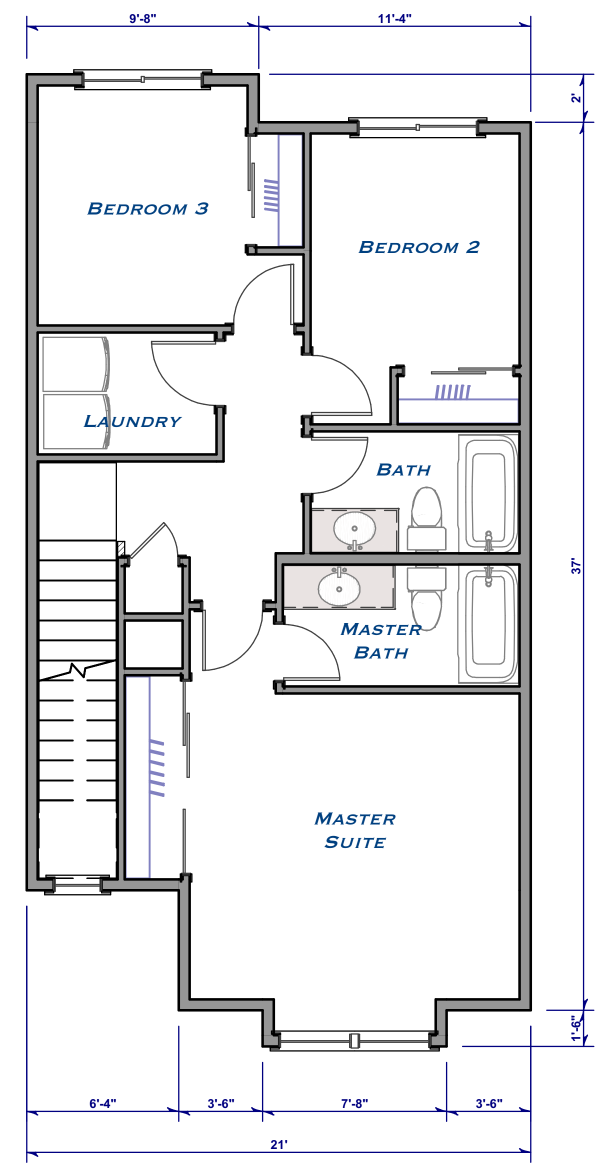

21ft rear loaded plan concept

ground floor	|	298 sq ft
main floor	|	721 sq ft
upper floor	|	721 sq ft
total	|	1,740 sq ft

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architectural design + documentation

Crestview Crossing 21ft wide alley loaded Concept Plan | 5/11/18

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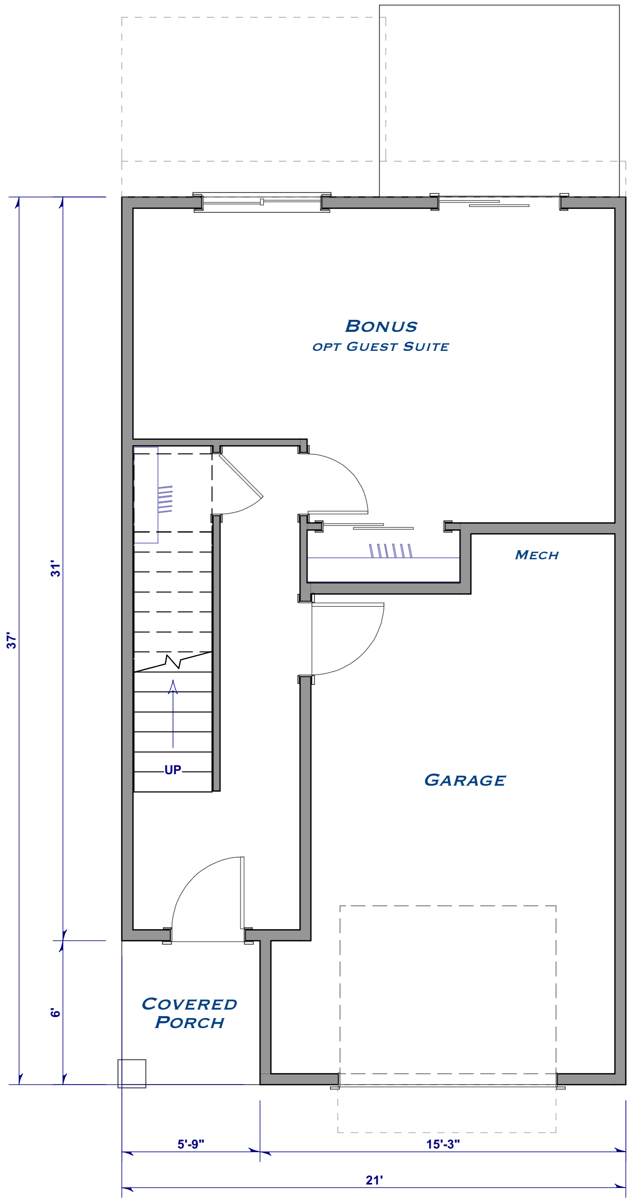

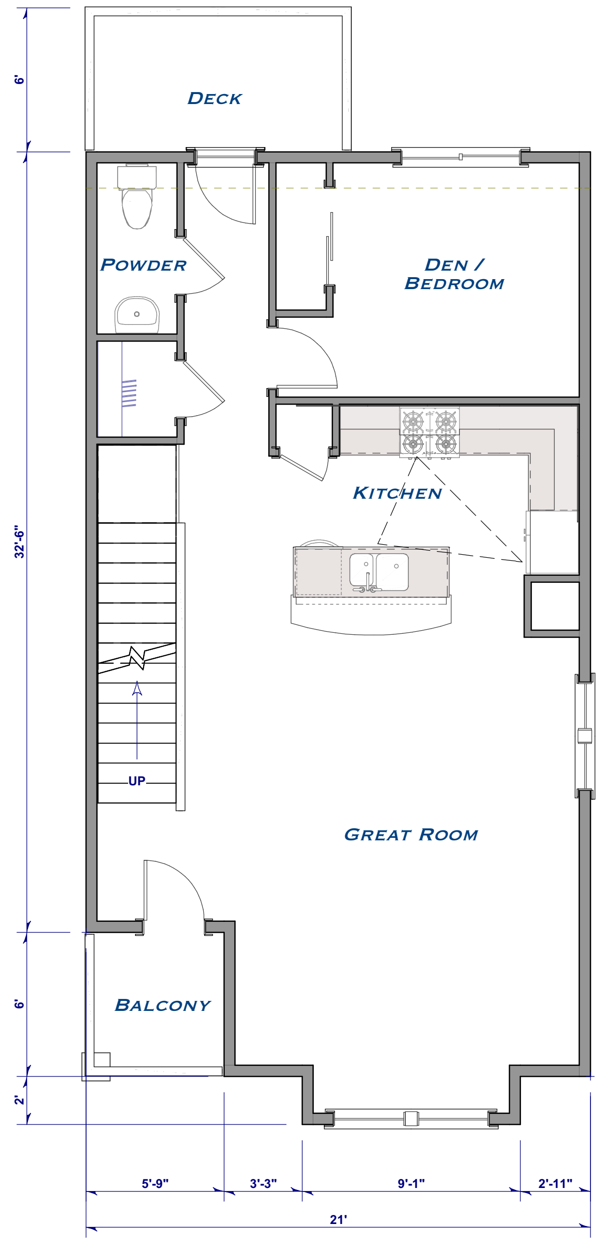

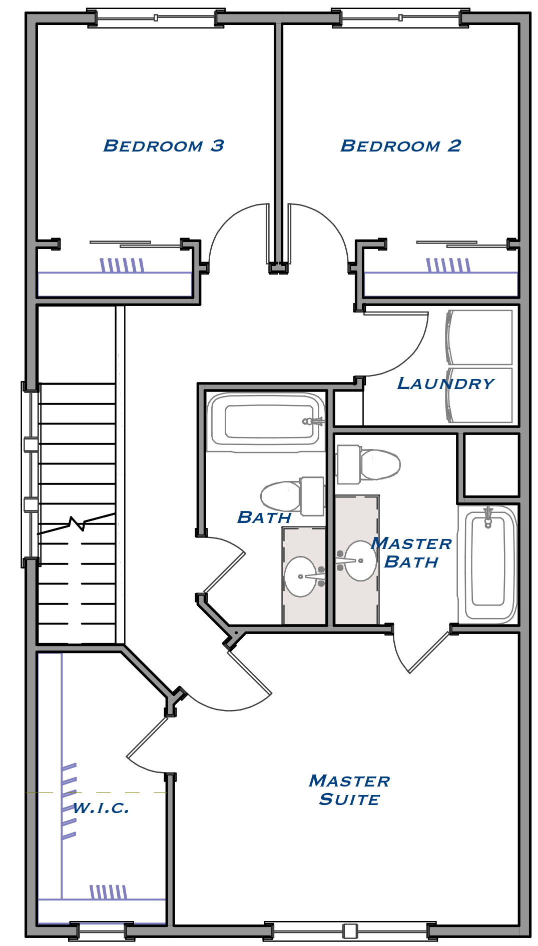

21ft front loaded plan concept

ground floor	|	445 sq ft
main floor	|	748 sq ft
upper floor	|	755 sq ft
total	|	1,948 sq ft

twinline design llc
architectural design + documentation

Crestview Crossing 21ft wide front loaded Concept Plan | 5/11/18

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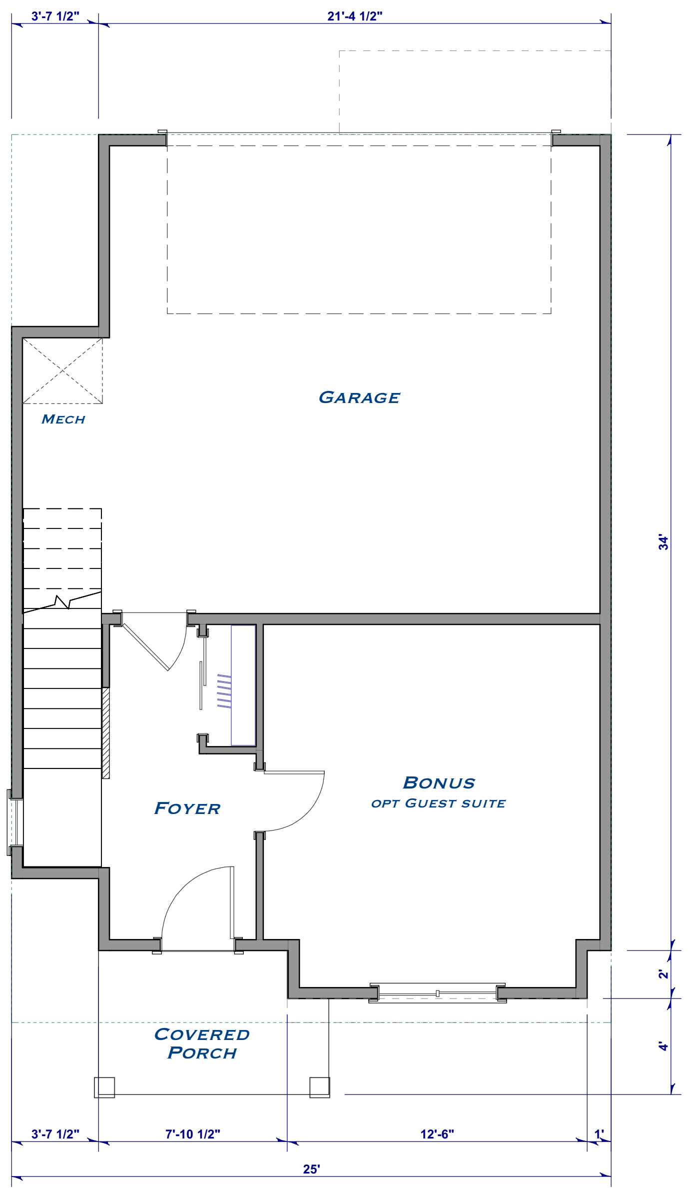

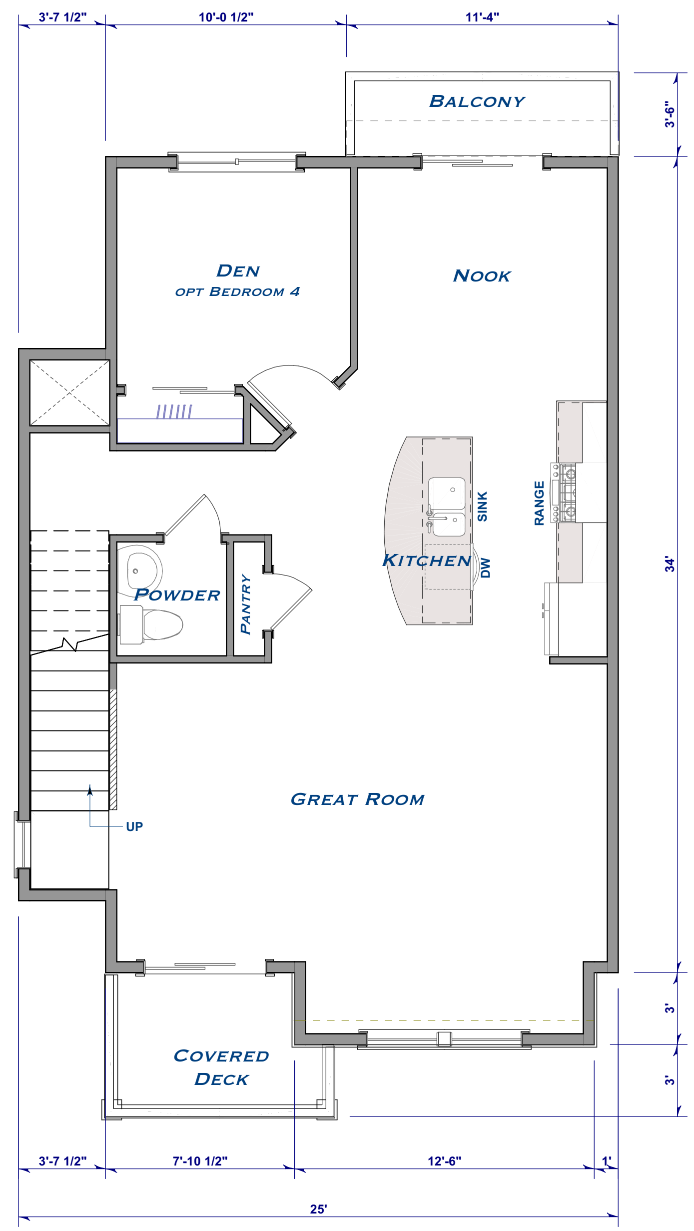

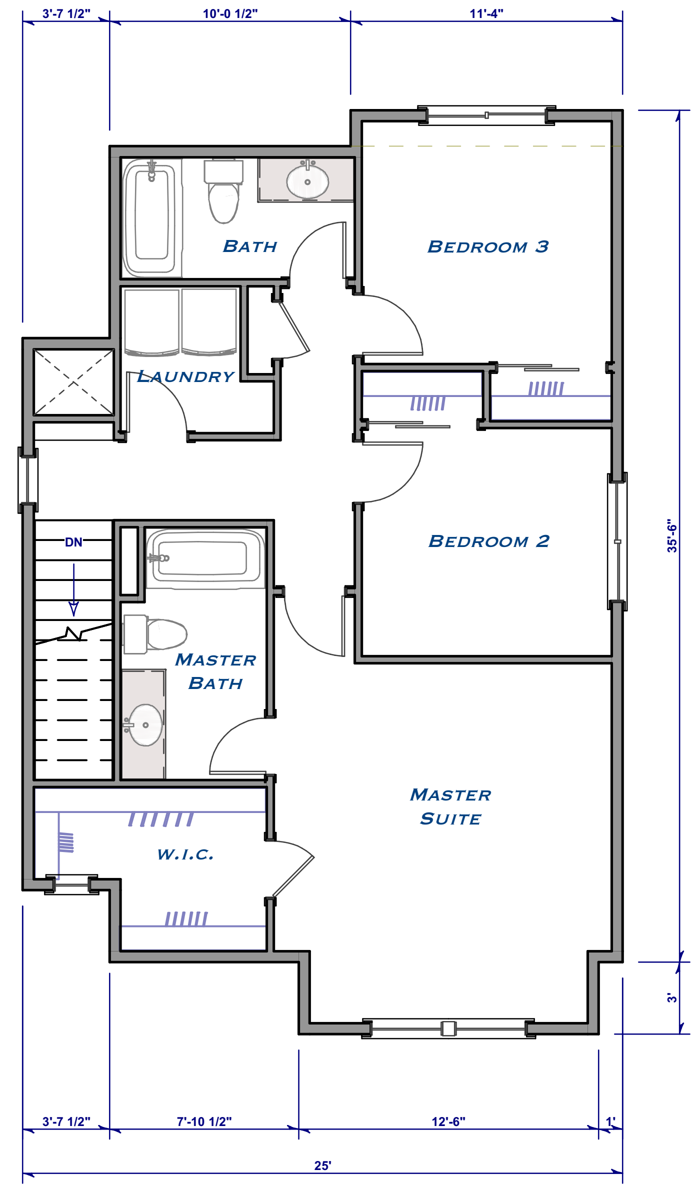

25ft rear loaded plan concept

ground floor	|	365 sq ft
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twinline design llc
architectural design + documentation

Crestview Crossing 25ft wide alley loaded Concept Plan | 5/10/18

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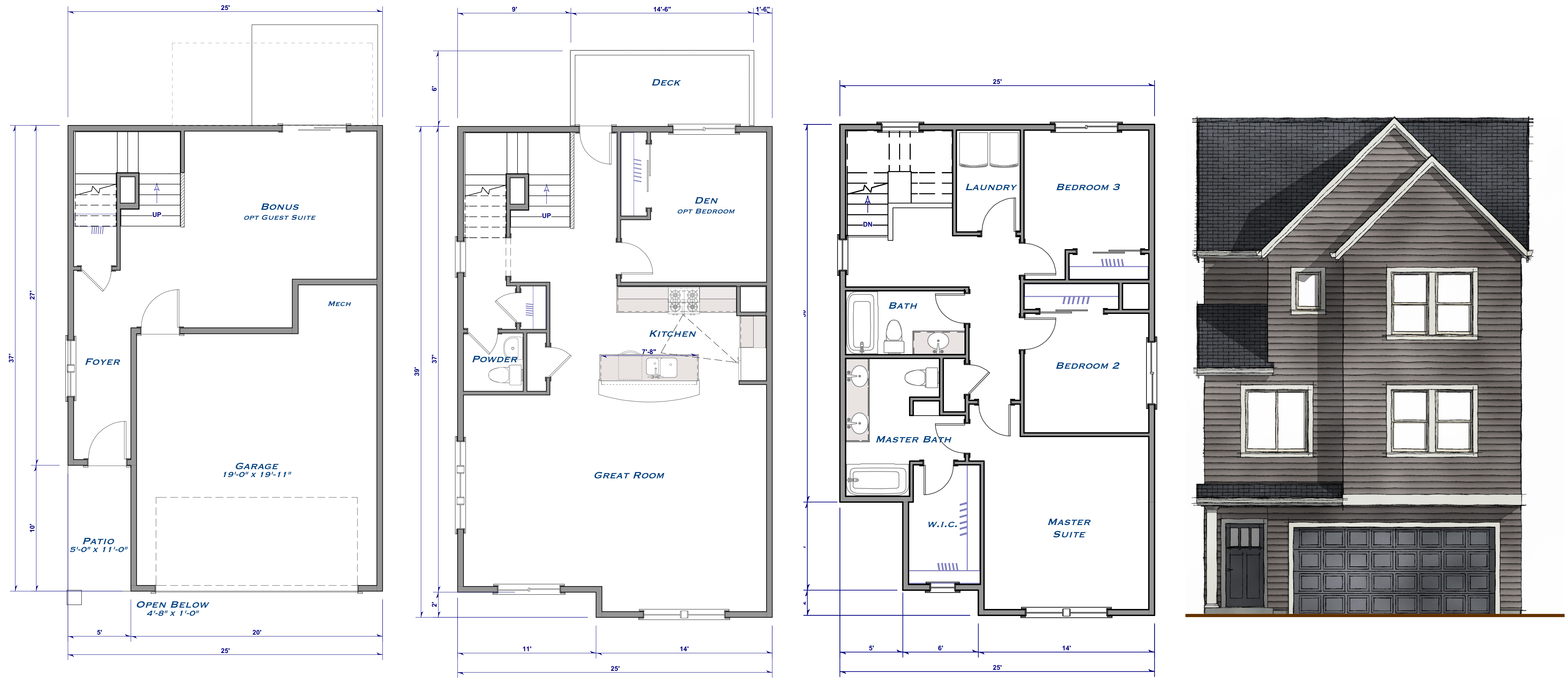

25ft front loaded plan concept

ground floor	|	445 sq ft
main floor	|	881 sq ft
upper floor	|	852 sq ft
total	|	2,178 sq ft

twinline design llc
architectural design + documentation

Crestview Crossing 25ft wide front loaded Concept Plan | 5/14/18

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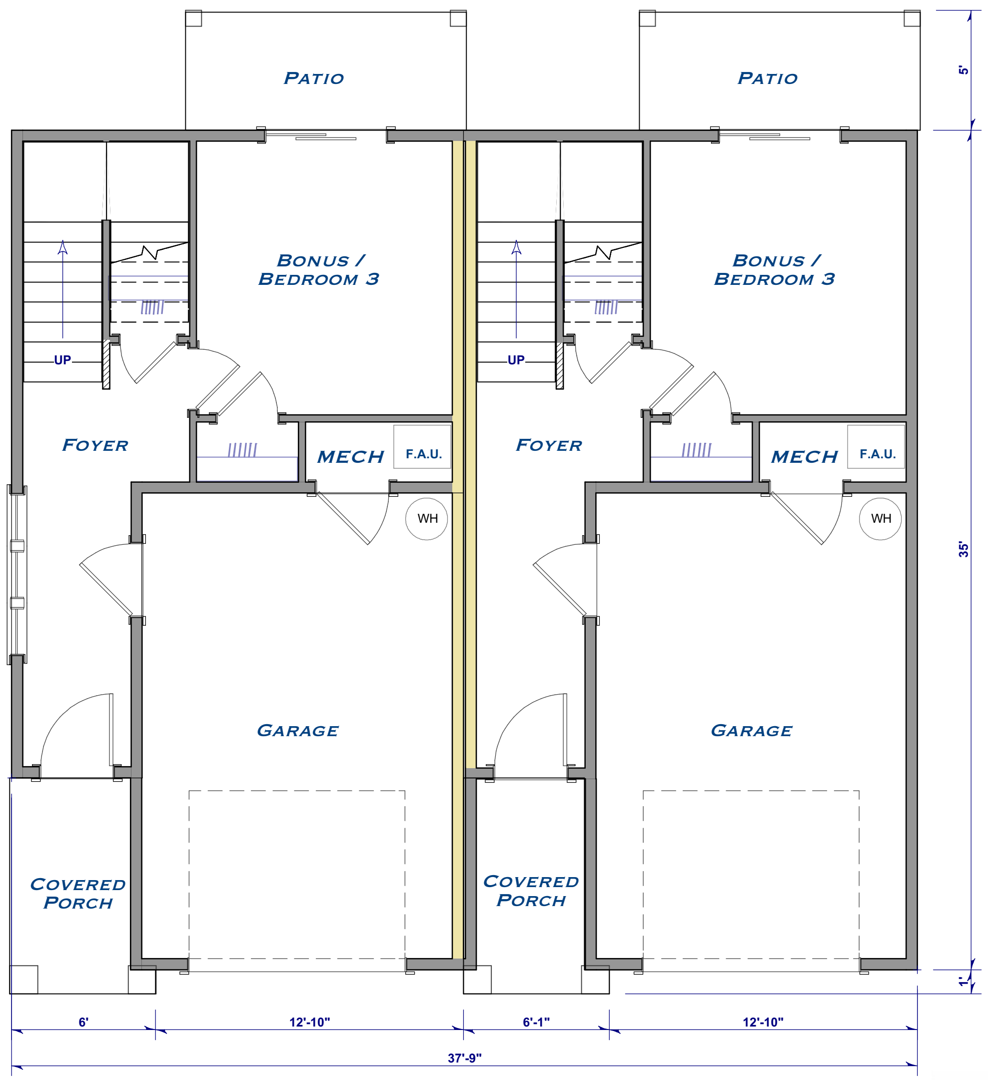

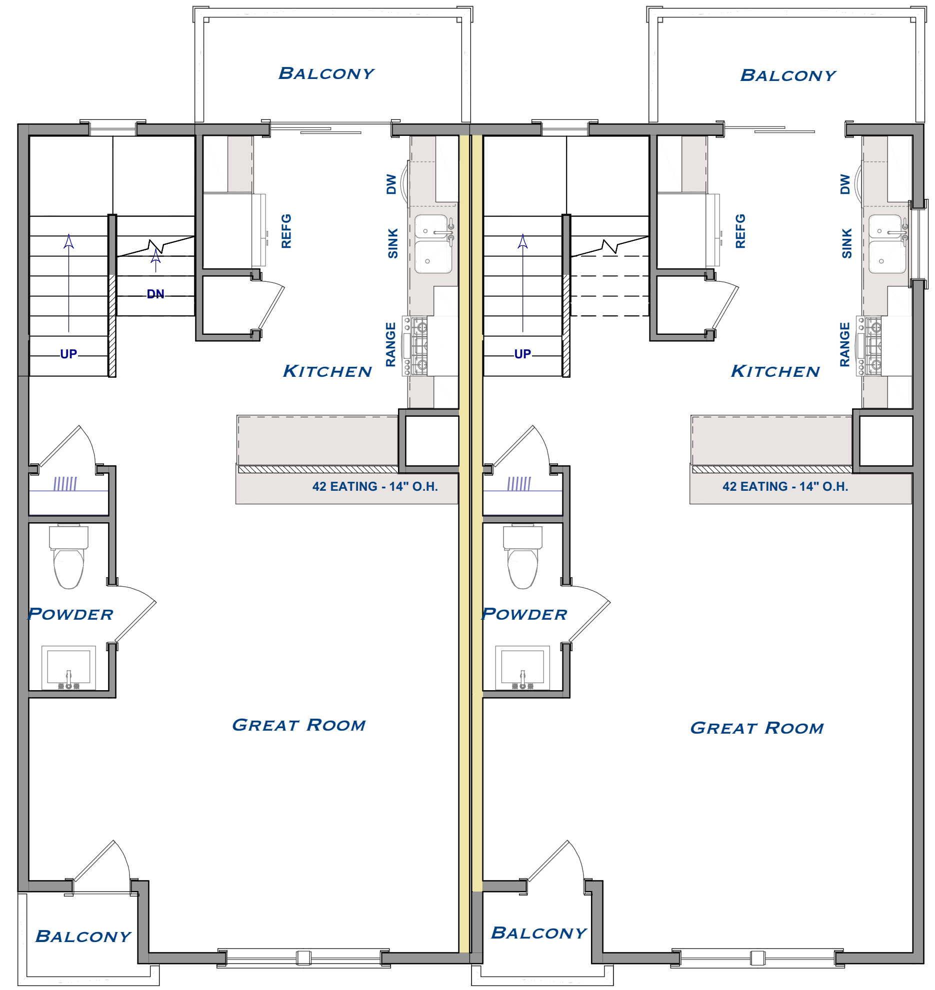

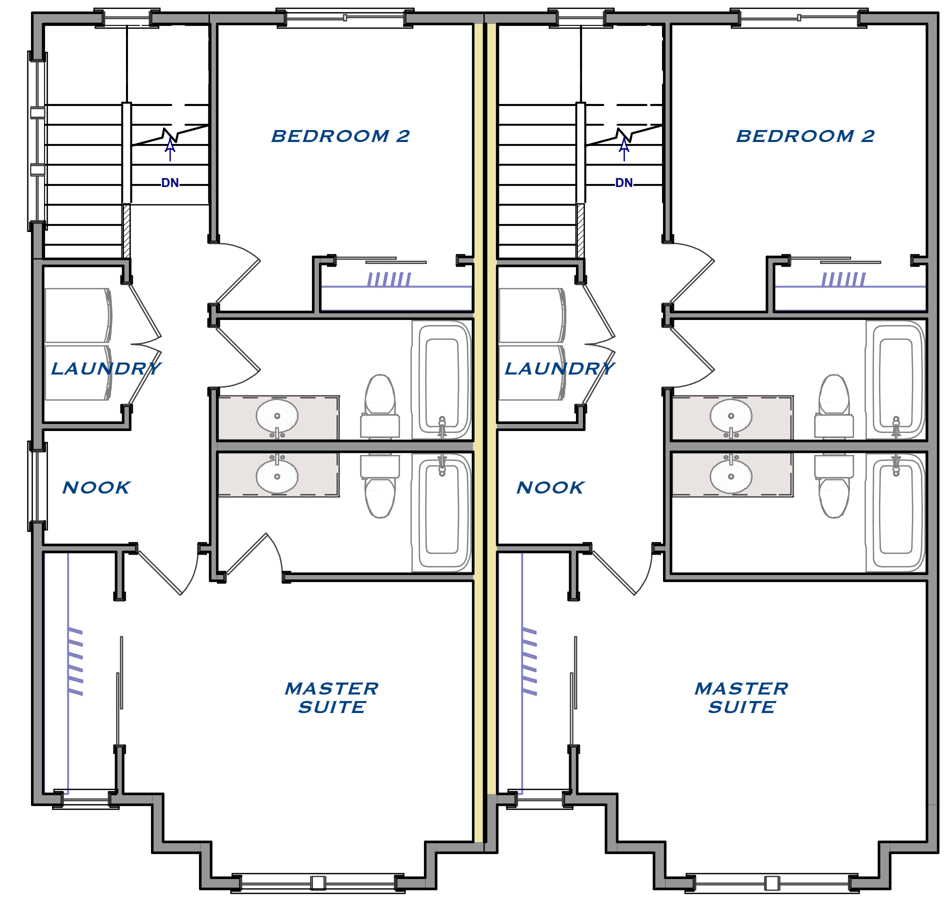

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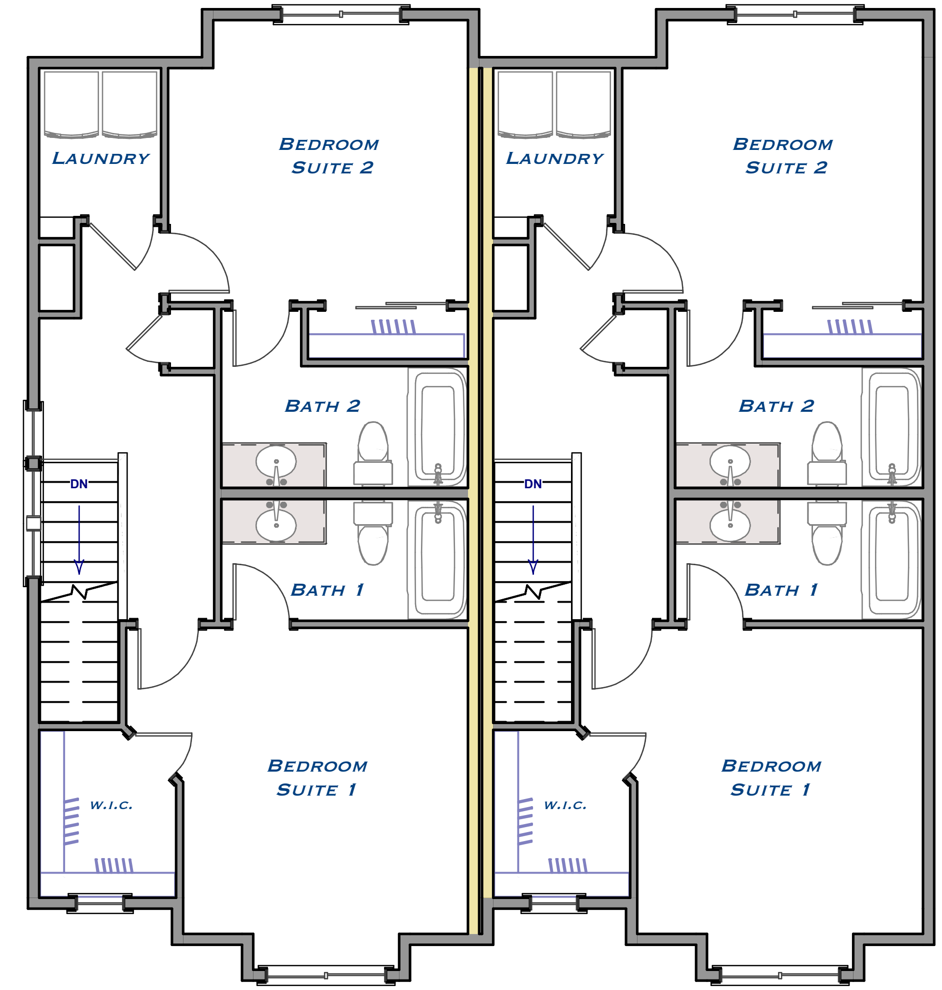

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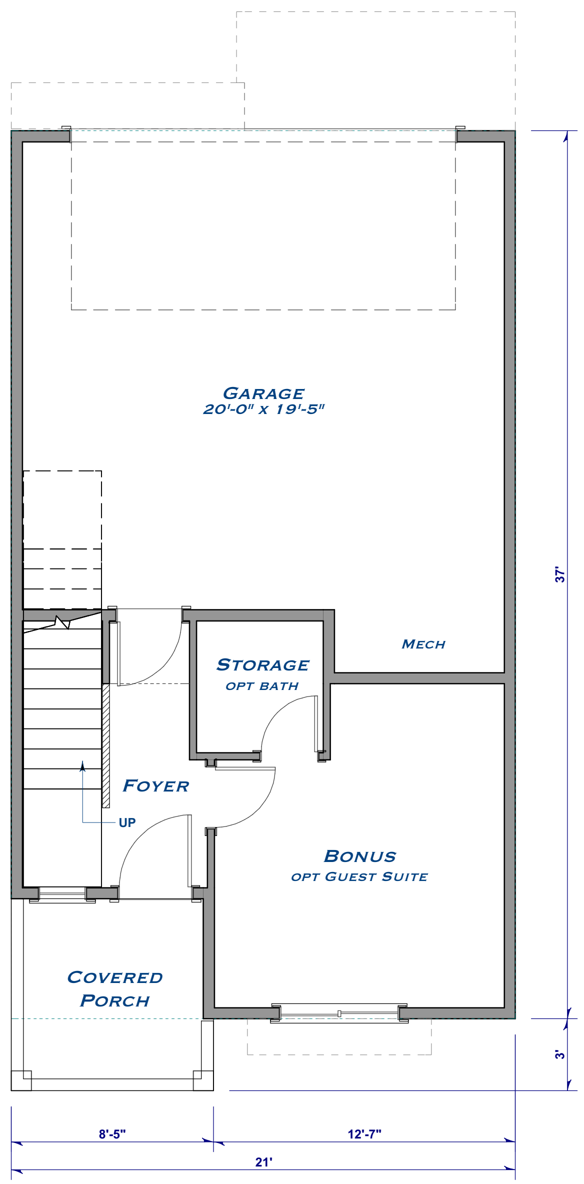

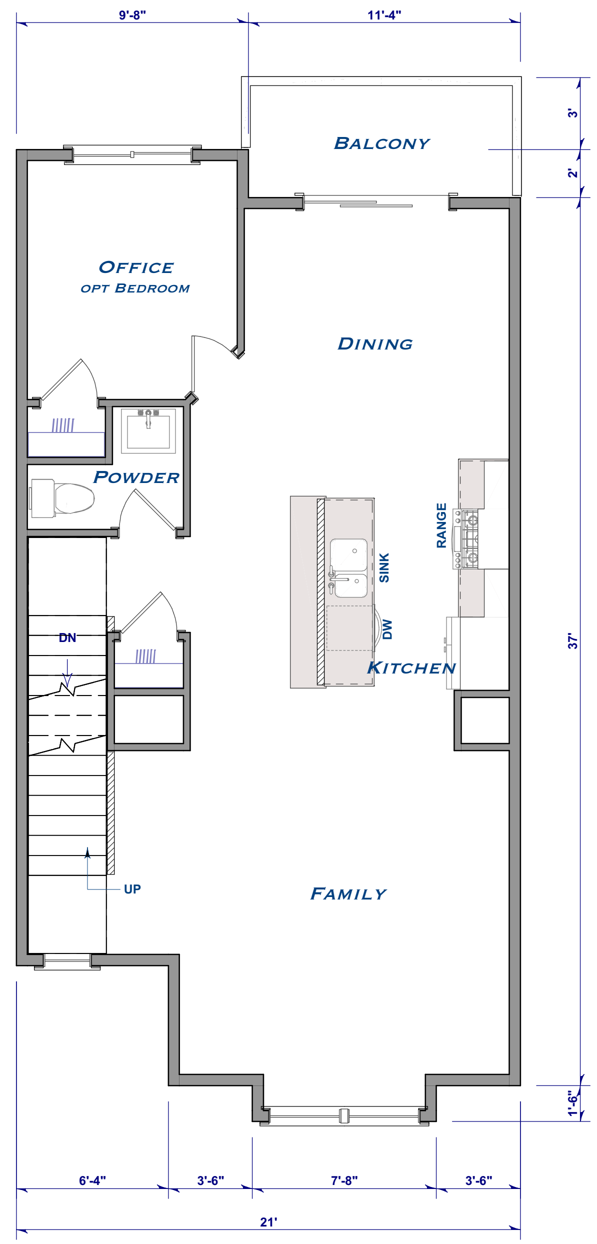

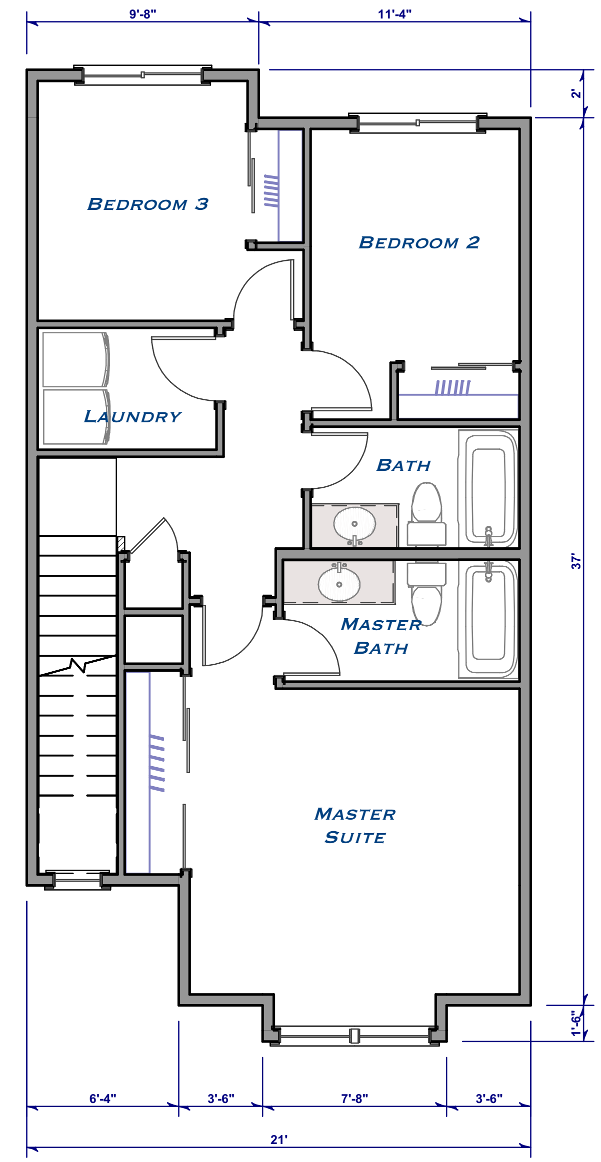

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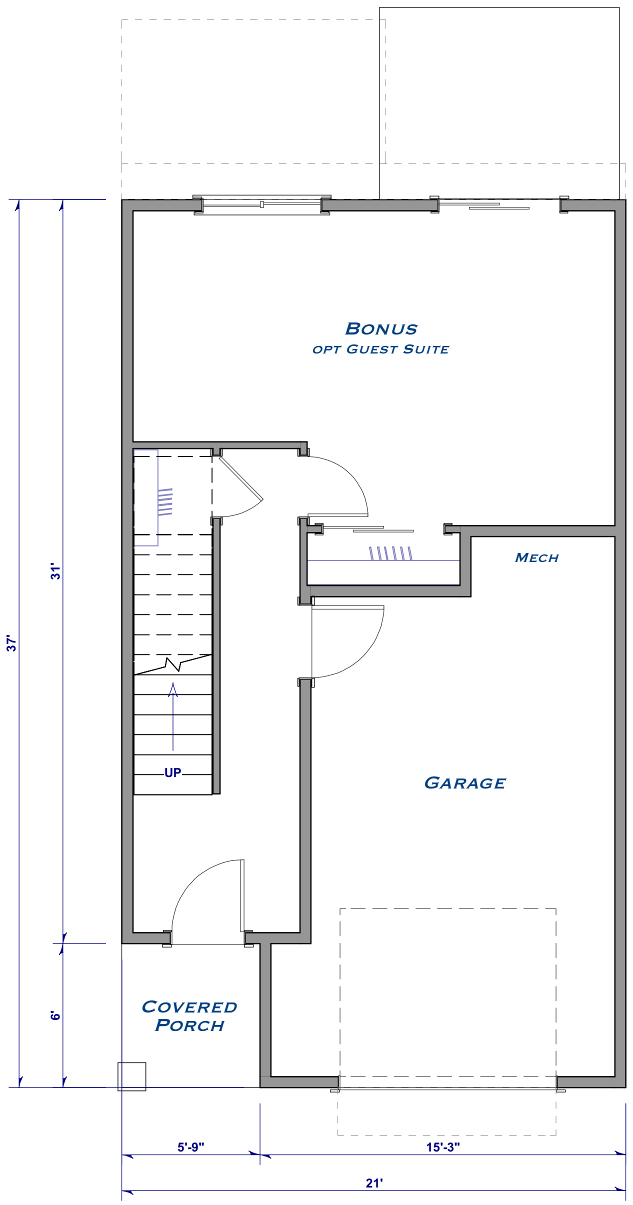

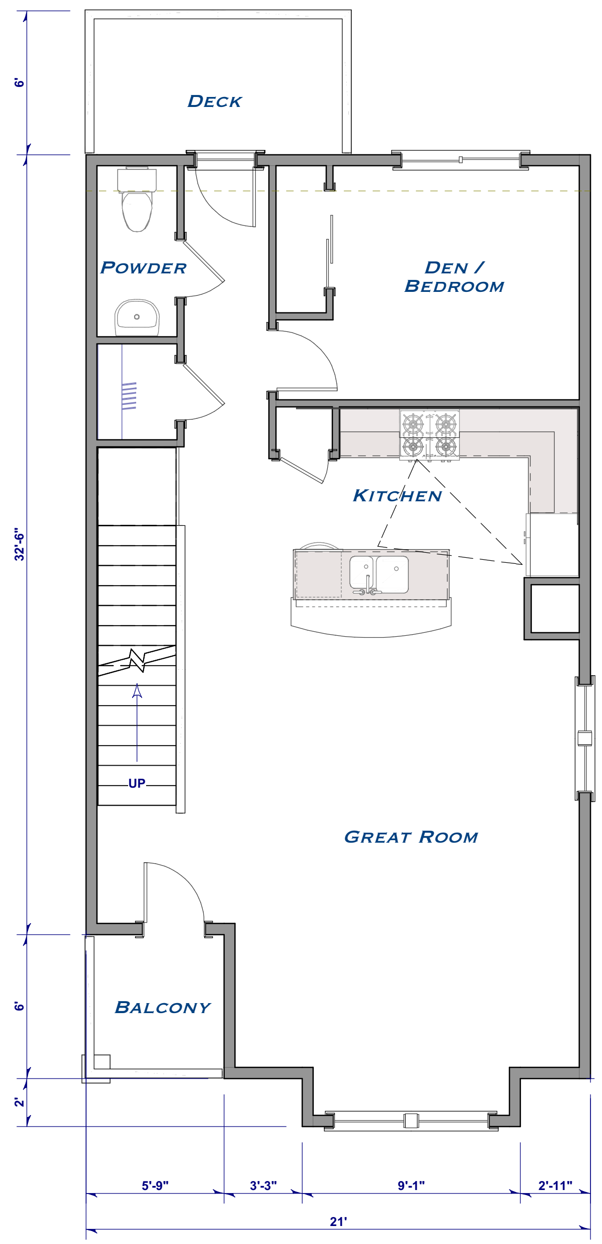

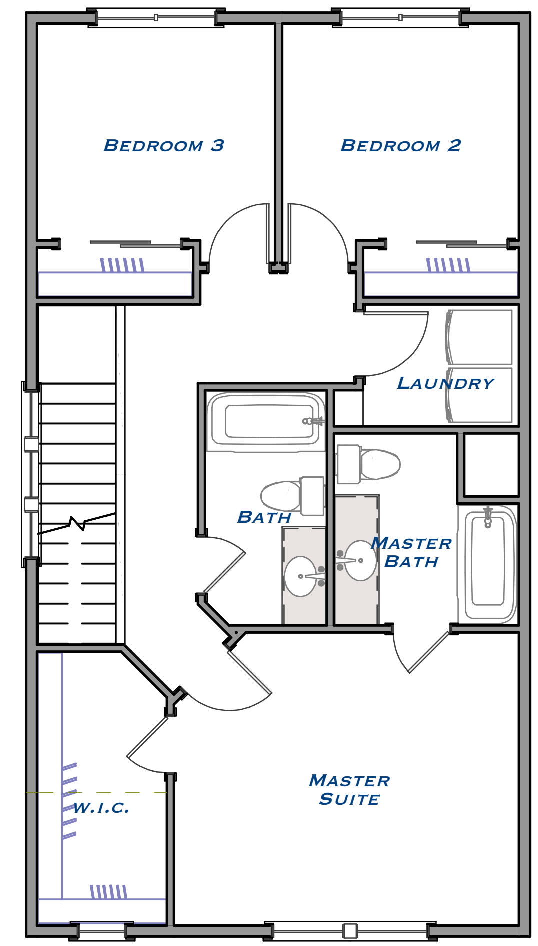

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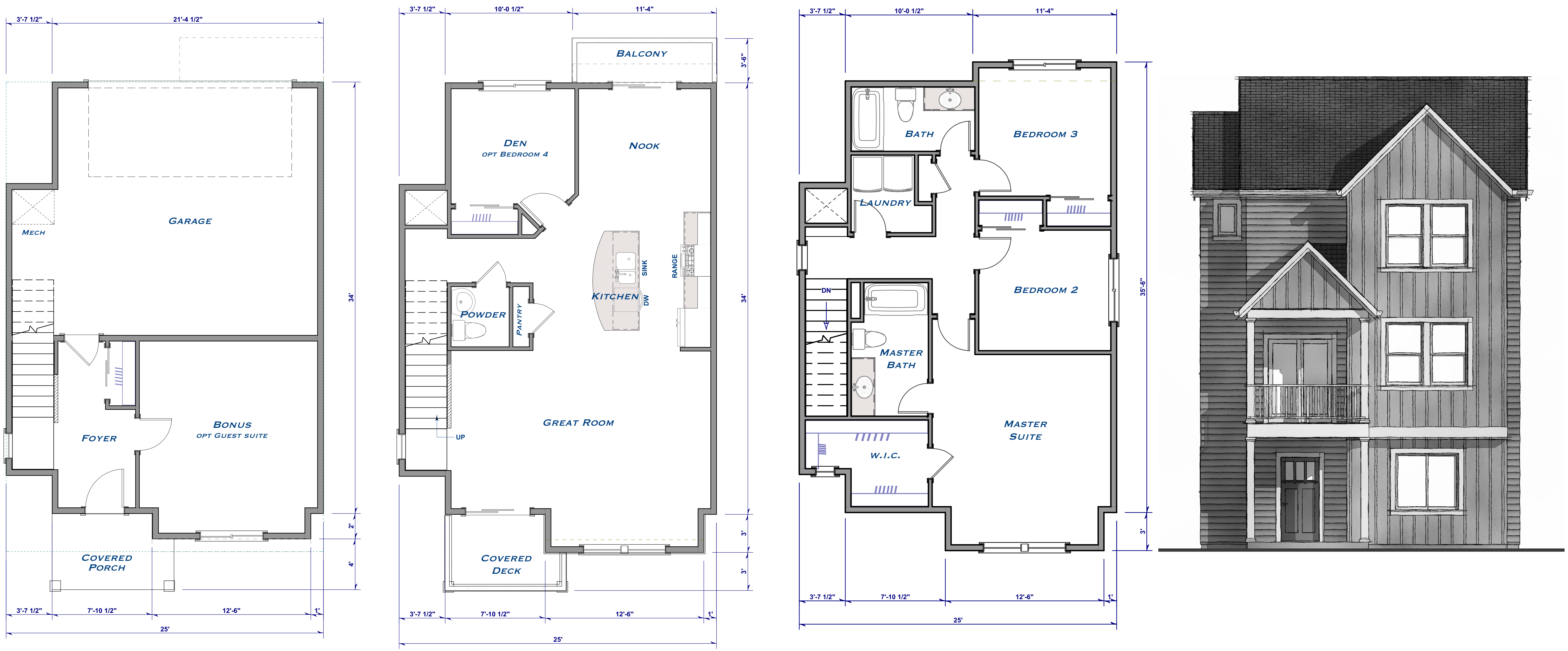

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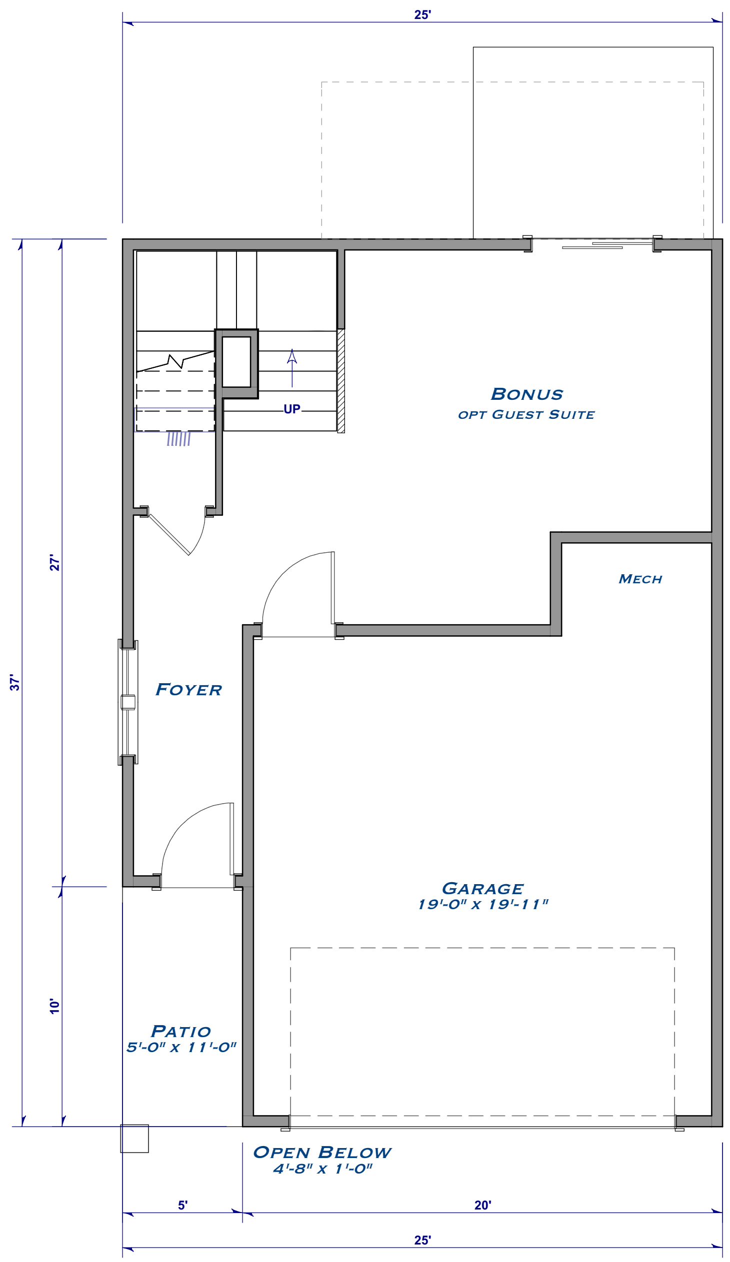

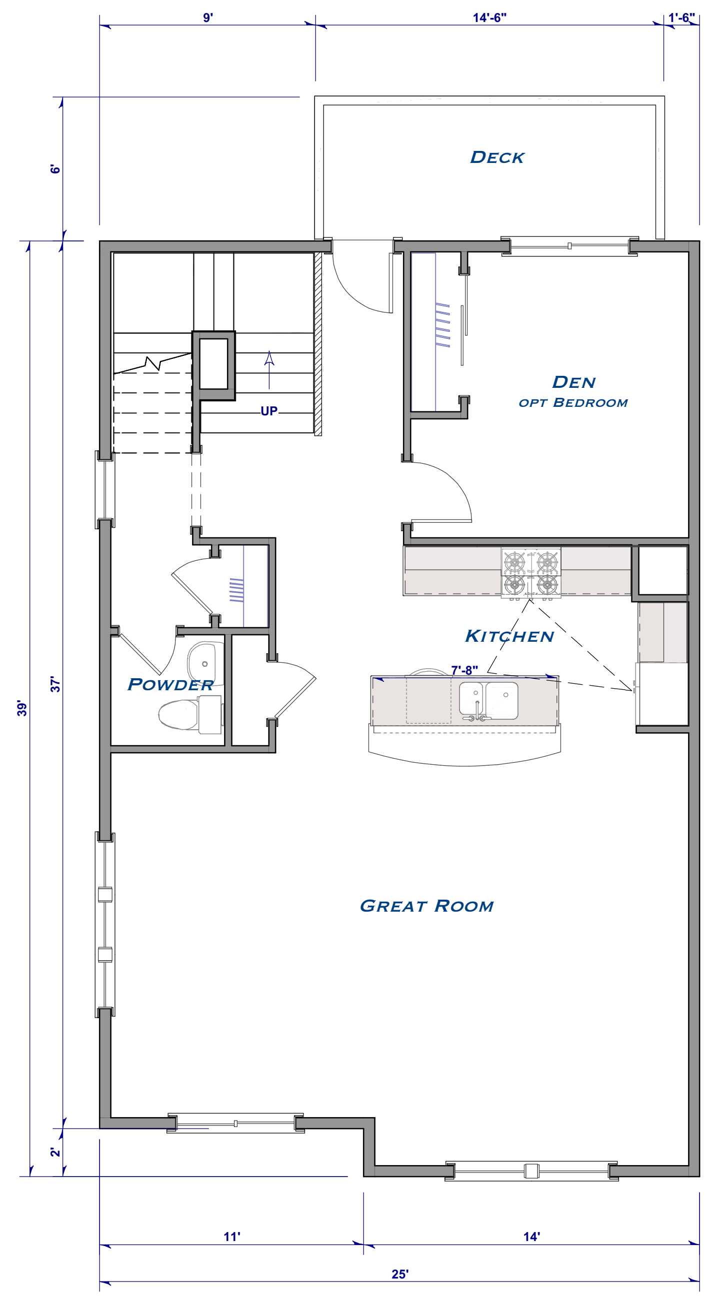

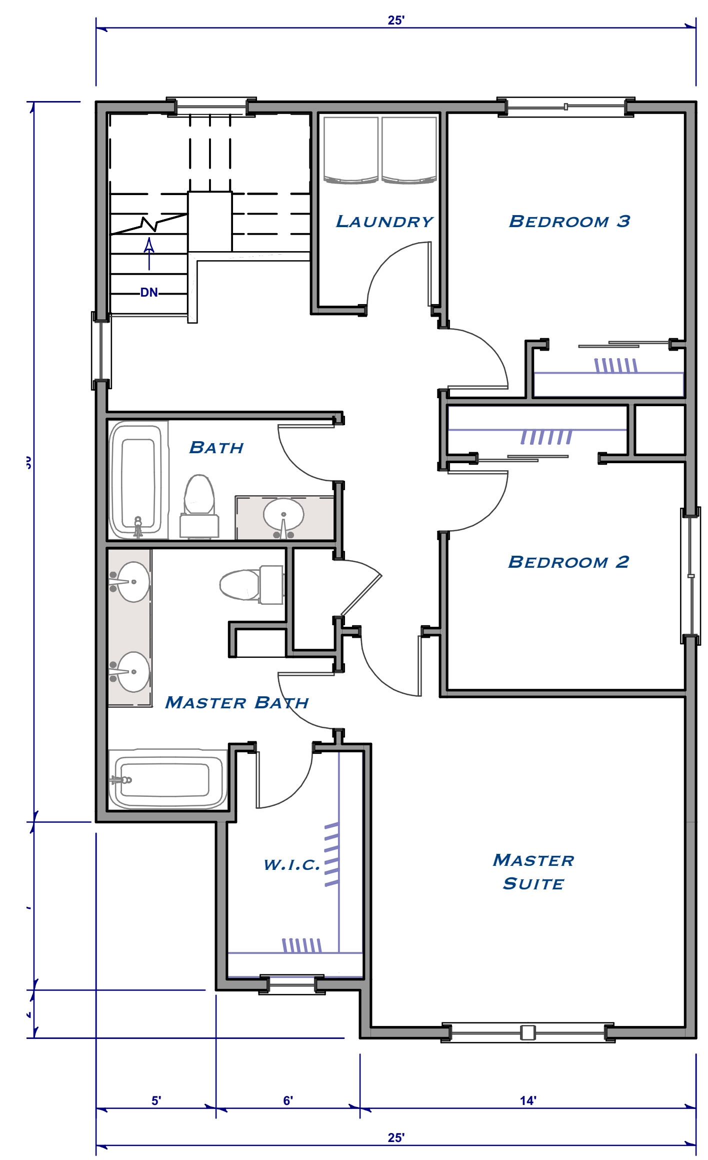

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architectural design + documentation

Crestview Crossing 25ft wide front loaded Concept Plan | 5/14/18

Attachment 2: Agency Comments

Keith Leonard

From: CARY Dan <dan.cary@state.or.us>
Sent: Monday, July 30, 2018 1:54 PM
To: Keith Leonard
Cc: Doug Rux; BROWN Jevra
Subject: RE: File No.PUD18-0001/CUP18-0004 Yamhill County Tax Map and Lot Numbers 3216-13800 & 3216-01100

Keith,

I am told by the applicant that there is a new revised application coming but I have not seen it. I am not reviewing any application at this time. They are in an extension of my permit decision deadline until August 31, 2018. They will likely need to request another extension to maintain this file number since I still haven't received a new application. From the informal plans I have seen the project has changed significantly and it will go back out for public review and restart the clock for the whole process when I get a complete application. That is all I have.

Dan

Dan Cary, PWS
Aquatic Resource Coordinator Columbia and Clatsop Counties
Aquatic Resource Management Program
Oregon Department of State Lands
775 Summer Street NE, Suite 100
Salem OR 97301-1279
Phone: (503) 986-5302
DSL websites: www.oregon.gov/dsl; www.statelandsonline.com

From: BROWN Jevra
Sent: Monday, July 30, 2018 12:11 PM
To: 'Keith Leonard'
Cc: CARY Dan ; Doug Rux
Subject: RE: File No.PUD18-0001/CUP18-0004 Yamhill County Tax Map and Lot Numbers 3216-13800 & 3216-01100

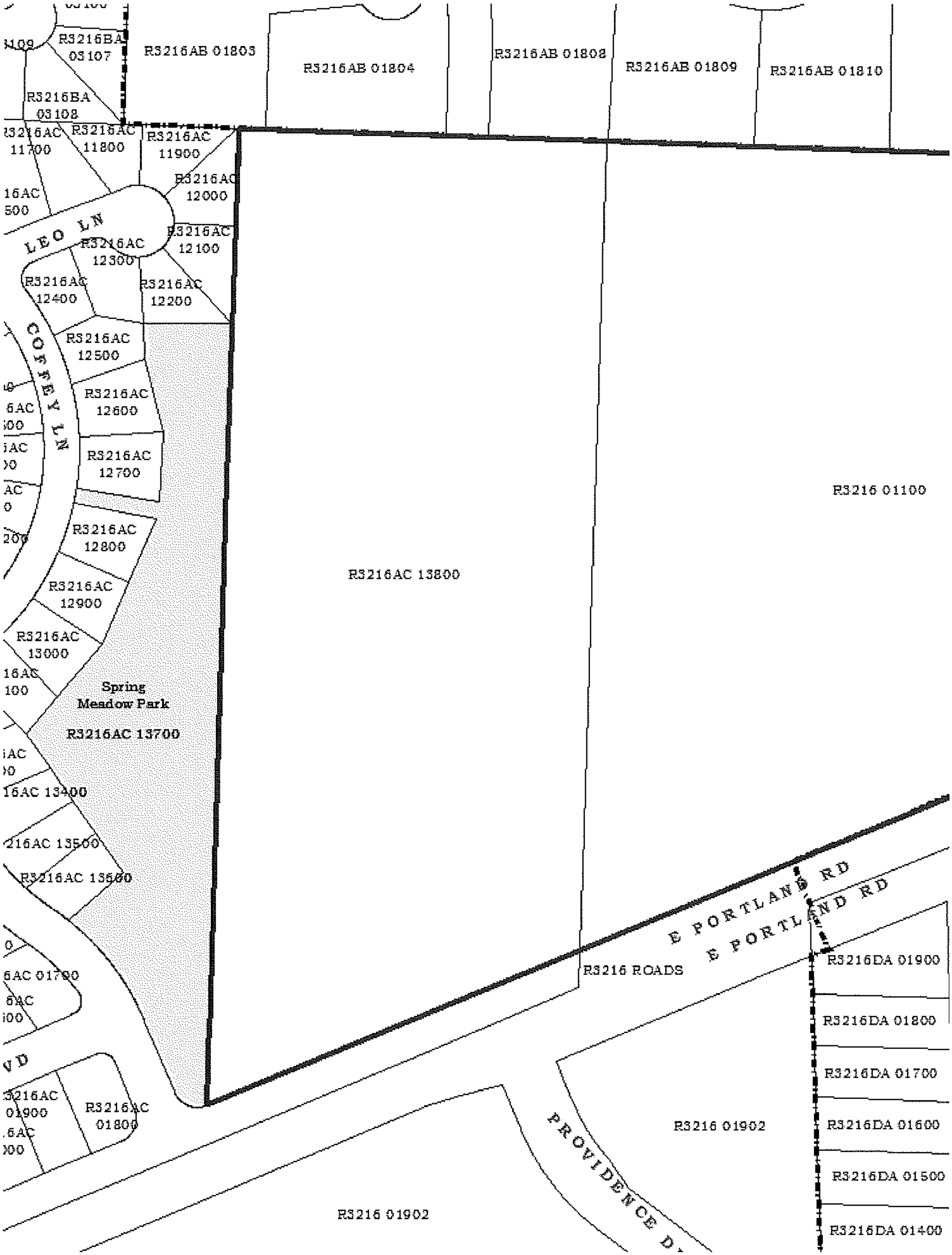
WD2013-0148, delineation, is for tax lots 1100 & 13800. This is still active for a few more months. Technically delineations expire after five years unless 1) there is a request for reissuance within one year of the expiration date (November 8, 2018) or 2) it is associated with an active authorization.
From there I leave it to Dan...

Jevra Brown, Aquatic Resource Planner
Department of State Lands
Office 503-986-5297 (M, T, W); cell: 503-580-3172 (Th, F); fax 503-378-4844
jevra.brown@state.or.us http://www.oregon.gov/DSL/pages/index.aspx

From: Keith Leonard <Keith.Leonard@newbergoregon.gov>
Sent: Friday, July 27, 2018 6:00 AM
To: BROWN Jevra <jevra.brown@dsl.state.or.us>
Cc: CARY Dan <dan.cary@dsl.state.or.us>; Doug Rux <Doug.Rux@newbergoregon.gov>
Subject: RE: File No.PUD18-0001/CUP18-0004 Yamhill County Tax Map and Lot Numbers 3216-13800 & 3216-01100

Hello,

To verify, the property owner does not have a wetlands delineation permit in review for either tax lots 1100 or 13800 due to expiration? Please let me know what time would be good to call Mr. Cary. I am in the office and would like to talk to you regarding this project. Thanks!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R3216AC 11900
R3216AC 12000
LEO LN
R3216AC 12300
R3216AC 12100
R3216AC 12400
R3216AC 12200
COFFEY LN
R3216AC 12500
R3216AC 12600
R3216AC 12700
R3216 01100
R3216AC 12800
R3216AC 13800
R3216AC 12900
R3216AC 13000
Spring Meadow Park
R3216AC 13700
E PORTLAND RD
R3216DA 01900
R3216 ROADS
R3216DA 01800
R3216DA 01700
R3216AC 01800
R3216 01902
R3216DA 01600
PROVIDENCE
R3216DA 01500
R3216 01902
R3216DA 01400

Keith Leonard, AICP |Associate Planner
City of Newberg
(503) 537-1215
keith.leonard@newbergoregon.gov

From: BROWN Jevra [mailto:jevra.brown@state.or.us]
Sent: Thursday, July 26, 2018 6:36 PM
To: Keith Leonard <Keith.Leonard@newbergoregon.gov>
Cc: CARY Dan <dan.cary@state.or.us>
Subject: File No.PUD18-0001/CUP18-0004 Yamhill County Tax Map and Lot Numbers 3216-13800 & 3216-01100

RE https://www.newbergoregon.gov/cd/page/crestview-crossing-planned-unit-development

Hi Keith,
A database search returned the following:
Expired delineation WD2000-0260 for tax lot 1100
Expired delineation WD2006-0698 associated with administratively closed permits 40337-RF and 48735-RF for Crestview Crossing – Part I.
Crestview Crossing – Part 2 WD2013-0148, administratively closed application 57027-RF, 58464-RF application on extension.
No Wetland Land Use Notices

Dan Cary is reviewing the permit, I have copied him if you have questions.
You may check the status of permits and delineations in review here:
http://www.statelandsonline.com/index.cfm?fuseaction=Home.home

Best,
Jevra Brown, Aquatic Resource Planner
Planning and Policy Unit, Aquatic Resource Management Program
Department of State Lands
775 Summer St. NE Suite 100, Salem, Oregon, 97301
Office (M-W) 503-986-5297; **cell** (Th-F) 503-580-3172; fax 503-378-4844
jevra.brown@state.or.us
http://www.oregon.gov/DSL/pages/index.aspx
Messages to and from this e-mail address may be available to the public under Oregon Public Record Law.

City of Newberg
414 E. First Street
P.O. Box 970
Newberg, OR 97132

City of Newberg

City Manager
(503) 538-9421
(503) 538-5013 Fax

Community Development Department - Planning Division

P.O. Box 970 - 414 E. First Street - Newberg, Oregon 97132 - (503) 537-1240 - Fax (503) 537-1272

REFERRAL TO: PGE, Service & Design

The enclosed material has been referred to you for your information and comment. Any comments you wish to make should be returned to the Community Development Department prior to July 20, 2018. Please refer questions and comments to Keith Leonard.

NOTE: Full size plans are available at the Community Development Department Office.

APPLICANT: 3J Consulting, Inc., Andrew Tull

REQUEST: Crestview Crossing Planned Unit Development & Conditional Use Permit

SITE ADDRESS: 4505 E Portland Rd

LOCATION: Newberg

TAX LOT: R3216 01100

FILE NO: PUD18-0001 / CUP18-0004

ZONE: COM, MDR, LDR

HEARING DATE: 08/09/2018

✓ Reviewed; no conflict.

_____ Reviewed; recommend denial for the following reasons:

_____ Require additional information to review. (Please list information required)

_____ Meeting requested.

_____ Comments. (Attach additional pages as needed)

Development cost per current tariff and service requirements. 10' PUE required on all front street lots.

Rim Schuller
Reviewed By:

7/19/18
Date:

Keith Leonard

From: Rick Schiedler <Rick.Schiedler@pgn.com>
Sent: Tuesday, July 24, 2018 12:58 PM
To: Keith Leonard
Subject: RE: Crestview Crossing-Newberg

Keith,

Tell them that they need 10 ft. PUEs along all street frontages.

Thanks Rick

From: Keith Leonard [mailto:Keith.Leonard@newbergoregon.gov]
Sent: Thursday, July 19, 2018 2:55 PM
To: Rick Schiedler
Subject: RE: Crestview Crossing-Newberg

Please take care when opening links, attachments or responding to this email as it originated outside of PGE.

Thank you! I have forwarded your comment to the applicant, I see they have 8' PUEs along internal streets.

Keith Leonard, AICP | Associate Planner
City of Newberg
(503) 537-1215
keith.leonard@newbergoregon.gov

From: Rick Schiedler [mailto:Rick.Schiedler@pgn.com]
Sent: Thursday, July 19, 2018 1:55 PM
To: Keith Leonard <Keith.Leonard@newbergoregon.gov>
Subject: Crestview Crossing-Newberg

Keith Leonard

From: FRICKE Daniel L <Daniel.L.FRICKE@odot.state.or.us>
Sent: Monday, July 23, 2018 8:21 AM
To: Keith Leonard
Cc: KNECHT Casey; EARL Robert
Subject: ODOT Comments on PUD 18-0001/CUP 18-0004 - Crestview Crossing
Attachments: Crestview Crossing (Newberg) - ODOT TIA Review Comments

Keith –
Thank you for providing the Oregon Department of Transportation (ODOT) with an opportunity to review and comment on the subject application. The project site fronts on OR 99W and proposes to connect a new city street (Crestview Drive) to the highway at the existing signalized intersection at Providence Drive. ODOT staff have reviewed the project plans and the transportation impact analysis that have been submitted to the city. Our comments and recommendations are as follows.

TIA Review
The TIA has been reviewed by Region 2 Traffic – comments and recommendations are in included in the attached document. Questions on the TIA comments should be directed to Fahad Alhajri (503-986-2996 or fahad.alhajri@odot.state.or.us). Note that ODOT supports all improvements identified in the TIA necessary to meet operational standards.

Roadway Improvements
The following roadway improvements have been identified

- Installation of a westbound right-turn deceleration lane on OR 99W approaching Crestview Drive
- At the northeast corner of the OR 99W/Crestview Drive intersection, the sidewalk will need to connect to the highway shoulder with an "End of Walk" ADA compliant connection (ODOT Standard Drawing RD 754).
- The crosswalk on the east leg of the intersection (across OR 99W) must be reinstalled along with appropriate modifications to the traffic signal (signal modifications are addressed in more detail below)
- The required roadway and signal improvements will trigger the need to assess all curb ramps and push buttons at OR 99W/Crestview Drive. Any non-compliant curb ramps shall be remediated to meet State ADA standards.

The following condition of approval is proposed to address required roadway improvements:

> *Prior to the issuance of the first grading or building permit, the applicant shall submit plans and specifications for all improvements/construction within ODOT right-of-way for review and approval by ODOT District 3 and issuance of a permit to construct within ODOT right-of-way. ODOT shall certify that all construction activities have been completed pursuant to the approved plans and specifications prior to the issuance of the first certificate of use and occupancy, or the city's equivalent.*

Signal Modifications
It is likely that the entire signal installation will need to be replaced to accommodate the Crestview Drive leg being added to the existing intersection. The following is a list of the minimum modifications that are anticipated to be necessary:

- The existing signal poles on the north side of the intersection will need to be replaced to accommodate the new Crestview Drive
- A new mast arm will be needed in the southwest quadrant of the intersection to signalize the new Crestview Drive leg.
- New pedestrian signal and push-button pedestal for the pedestrian crossing on the east leg of the intersection.

- New detection will be needed depending on how new ADA ramps affect crosswalk locations (note that Region 2 is using radar detection)

The following condition if approval is proposed to address the required signal modification:

> *Prior to issuance of the first grading or building permit, the applicant shall submit signal modification plans for the review of the ODOT Region 2 Traffic Engineer and the review and approval of the State Traffic Engineer. ODOT shall certify that all required signal modifications have been completed and the signal operational prior to the issuance of the first certificate of use and occupancy, or the city's equivalent.*

This should be included in the record as ODOT testimony. ODOT should be considered a party to the hearing and be entitled to notices of future hearings, or hearing continuances or extensions. Please provide me with a copy of the City's decision, including findings and conditions of approval.

Dan Fricke, Senior Transportation Planner
Oregon Department of Transportation
Region 2
455 Airport Road SE Building B
Salem, OR 97301-5395
Ph: 503-986-2663
e-mail: daniel.l.fricke@odot.state.or.us

Oregon
Kate Brown, Governor

Department of Transportation
Region 2 Tech Center
455 Airport Road SE, Building A
Salem, Oregon 97301-5397
Telephone (503) 986-2990
Fax (503) 986-2839

DATE: July 19, 2018

TO: Dan Fricke
Region 2 Senior Planner

FROM: Fahad Alhajri, E.I.T.
Region 2 Traffic Analyst

SUBJECT: Crestview Crossing (Newberg) – Outright Use
TIA Review Comments

ODOT Region 2 Traffic has completed our review of the submitted traffic impact analysis (dated June 2018) to address traffic impacts due to development of a 33.13-acre property consisting of 260 single family homes and 48 apartment units in Newberg. The property is located north of OR 99W between Vittoria Way and Benjamin Road. The TIA will be reviewed with respect to consistency and compliance with current versions of ODOT's *Analysis Procedures Manual* (*APM*). Both versions of the *APM* were most recently updated in January 2018. Current versions are consistently published online at: http://www.oregon.gov/ODOT/TD/TP/Pages/APM.aspx. As a result, we submit the following comments for the consideration of Region Development Review and the City:

Analysis items to note:

- This study has utilized Highway Capacity Software (HCS) 2010 version 6.9 for roundabout analysis. However, a newer version HCS 7 is available and utilizes the updated Highway Capacity Manual Methodology for roundabouts.
- Region Traffic assumes all land uses and densities offered under the current zones are consistent with the City's code as cited in the report.

Analysis items to be addressed:

1. *Page 16, Saturation Flow Rate* – The base saturation flow rate was calibrated to 1,800 pcphgl, a saturation flow rate study in compliance with the guidelines within the HCM was not provided to justify the use of a higher saturation rate.
2. *Page 19, In-process trips* – ODOT received a TIA for Providence Medical Office Building (63,000 square-feet) located just south of the OR 99W/Providence Dr.

intersection and is anticipated to be constructed/occupied by year 2019. Applicant should verify with the City of Newberg that no further developments have been approved at the time of application.

3. *Per Figure 5*, A two percent annual growth rate was not applied at intersection #7. This will unlikely have impact on conclusion of the study.

4. *Figure 7, intersection #7* - ODOT will not run analyses with zero vehicles making available permitted movements. Rather, if count data does not identify any vehicles within the peak hour making a movement, we recommend assuming a low volume (1 or 2) rather than zero. The algorithms within Synchro utilize different formulas if there are zero conflicting vehicles.

5. *Synchro, Benjamin Rd/OR 99W Background condition (year 2020)* – The PM peak hour eastbound through movement volume is 1414 rather than 1441.

6. *Page 25, Table 4* – per the *Institute of Transportation Engineers* (*ITE*), the proposed weekday trip generation for "Multifamily Housing" (ITE land use code 220) is 323 rather than 1,622.

7. *Figure 9*, The trip distribution pattern of 15 percent arriving/departing to the east of OR 99W appears to be significantly low when taken into account the reassigned traffic volumes in Figure 6.

   According to Figure 6, at Springbrook Rd/Crestview intersection nearly half of traffic (AM peak 204 of 349) was rerouted to Libra St/Crestview Dr., then to Crestview Dr./East-West Connector and finally east from OR 99W/Providence. It appears that there is a greater than 15 percent demand for travel to/from east on OR 99W.

8. *Pages 31-32, Table 5* – When reporting the queue lengths, the reported values should be conservatively rounded **up** to the next 25 feet.

   Additionally, the reported storage lengths in Table 5 should be consistent with the values modeled in SimTraffic.

9. *Per Development Review Guidelines (Chapter 3, Section 3.3),* the analysis should evaluate impacts 5 years out from opening year in addition to opening year. Therefore, the analysis shall evaluate impacts for year 2025.

Application for State Highway Approach comments:

10. *Per 2016 SPIS Report*, the intersection of OR 99W and Providence Road is no longer a top 5% SPIS site.

Proposed mitigation comments:

11. ODOT maintains jurisdiction of Pacific West Highway No. 91 (OR 99W) and ODOT approval shall be required for all proposed mitigation measures to this facility.

12. All proposed intersection and/or signal modifications (new installations or changes to existing phasing or timing), changes to lane configuration, and additional turn or

receiving lanes will require ODOT approval. Both the City and the applicant shall be aware no approval for any proposed mitigations have been issued at this time and proposed mitigations shall not be considered approved for installation until formal written approval has been issued. Approval request will need to be submitted to Region 2 Traffic and be accompanied by the appropriate analysis justifying such request. The approval process takes time and any approval could possibly have added features required to obtain such approval.

13. Reconfiguring the northbound Providence Drive approach to include an exclusive left, exclusive thru and exclusive right lanes, will likely not be accomplished by just restriping. Reconstructing the approach might be necessary to accommodate for adequate lane widths.

Thank you for the opportunity to review this traffic impact analysis. As the Synchro files were not provided, Region 2 Traffic has only reviewed the submitted report. The above comments will merit the need for reanalysis, we look forward to a second round of review at which time we will comment on any and all proposed mitigation measures affecting the state highway system. For any questions regarding these comments, please contact me at Fahad.Alhajri@odot.state.or.us or directly at (503) 986-2996.

Attachment 3: Public Comments

Keith Leonard

From: Kleinmanjl <kleinmanjl@aol.com>
Sent: Thursday, August 02, 2018 9:41 AM
To: Keith Leonard
Subject: Crestview Crossing, File No. PUD18-0001/CUP18-0004
Attachments: Six-Party Agreement (signed) 4-10-2006.pdf; Oxberg Source Water Assessment - April 2004_1of2.pdf; Oxberg Source Water Assessment-Appendices - April 2004_2of2.pdf

Hi Keith,

In order to avoid potential problems with oversized transmissions later, I am submitting the following exhibits for the above case file now. I will send one more large document separately, and will email my memorandum to the Planning Commission later this morning.

1. Six-Party Agreement dated April 10, 2006.
2. Source Water Assessment Report by the State of Oregon for the Oxberg Water System, April 2004.
3. Appendices to the above report.

Please confirm receipt of this message and the attachments. Thanks very much.

Jeffrey L. Kleinman
Attorney at Law
The Ambassador
1207 SW Sixth Avenue
Portland, OR 97204
Tel (503) 248-0808
Fax (503) 228-4529

NOTE: 1) The "Six Party Agreement dated April 10, 2006" can be found in Attachment 6 and is commonly referred to as the " Five Party Agreement.

Keith Leonard

From: Kleinmanjl <kleinmanjl@aol.com>
Sent: Thursday, August 02, 2018 9:47 AM
To: Keith Leonard
Subject: Crestview Crossing, File No. PUD18-0001/CUP18-0004
Attachments: DSL-Wetland Delineation Report 2-4-2008.pdf

Hi Keith,

Attached please find one more exhibit for the above case file, Wetland Delineation Report with DSL letter dated February 4, 2008.

Thanks again.

Jeffrey L. Kleinman
Attorney at Law
The Ambassador
1207 SW Sixth Avenue
Portland, OR 97204
Tel (503) 248-0808
Fax (503) 228-4529

Note: The Wetland Delineation Report with DSL letter dated February 4, 2008 was submitted by another commenter and is located in Attachment 3 Public Comments

JEFFREY L. KLEINMAN
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MEMORANDUM

To: **Newberg Planning Commission**

From: **Jeffrey L. Kleinman**

Date: **August 2, 2018**

Re: **Crestview Crossing, File No. PUD18-0001/CUP18-0004**

I. INTRODUCTION

I represent Oxberg Lake Homeowners Association (the "HOA"). The HOA objects to the above application on several grounds, as set out below. For each of the specified reasons, the applicant has failed to meet the requisite burden of proof under the city's approval criteria.

II. THE SIX-PARTY AGREEMENT

On April 10, 2006, the City of Newberg, Yamhill County, Oxberg Lake Homeowners Association, Ken and Joan Austin, JT Smith Companies, and MeadowWood Development, LLC entered into an agreement (the "Agreement"), regarding the Northerly Arterial designated in the city's Transportation System Plan. A copy of the Agreement is attached for reference. Initially, the Northern Arterial was to be Crestview Drive connecting to Highway 99W. Under the Agreement, the city agreed to amend its TSP to designate Springbrook Road as its Northern Arterial and to designate Crestview Drive as a Major Collector, instead. The general design and alignment of that road is depicted in Exhibit A to the Agreement. It was agreed that the Crestview Drive Major Collector will be posted as "no through trucks" and designed to encourage a 25 mph speed limit. To provide traffic calming for this purpose, it was agreed that a roundabout is to be placed on Crestview Drive directly south of its intersection with Robin Court, as shown on page two of Exhibit A.

The Agreement also includes as Exhibit B an engineering study completed by JRH Transportation Engineering, dated March 27, 2006. This study analyzes and supports the designation of Springbrook as the Northern Arterial and the conversion of Crestview to a Major Collector.

The Agreement is not time-limited. It is not dependent upon any particular development proposal. It remains binding upon all of the parties and their successors and assigns. Nonetheless, the within application appears to move the location of the designated roundabout on Crestview significantly further to the south. There, it may benefit traffic flow for the development itself but will not have the traffic-calming effects within Oxberg Lake for which it was duly negotiated and agreed by the parties.

Thus, approval of this development in its approved form would violate the Agreement and is simply impermissible. Moreover, Oxberg Lake Homeowners Association hereby gives notice that it intends to enforce its rights under the Agreement moderate overall water system sensitivity.

The report concludes that, "[u]nder a 'worst case' scenario, where it is assumed that nothing is being done to protect groundwater quality at the identified potential contaminant sources, the assessment results indicate that the water system would be highly susceptible to the identified moderate-risk potential contaminant sources." *Id.* at 12.

In 2008, the Oregon Department of State Lands ("DSL") reviewed a wetland delineation report prepared for an earlier development proposal on the site. A copy of this report has also been provided for reference. The report identifies two unnamed tributaries of Spring Brook Creek on the property and .32 acre of PEM wetland, 1.638 acre of PFO wetland, and .29 acre of PEM/PSS wetland. The larger perennial tributary of Spring Brook Creek enters the northwest corner of Tax Lot 1100 and exits on the south side.

In addition to failing to address impacts upon the Water System, the applicant's materials fail to properly take the above wetlands into account. More fundamentally, though, we understand that given the completely different nature of the development now proposed for the site, DSL will require an entirely new delineation for its review and approval or rejection. Given the prominence of wetlands on the property, we cannot now know what an approvable delineation would look like *vis-a-vis* the current proposal, and whether the development as proposed is feasible in the first place. LUBA has held:

> "[A]s the initial feasibility of the subdivision must be shown at the preliminary plat stage, the initial feasibility of the PUD project must be shown at the preliminary development plan stage. *See Van Volkinburg v Marion County*, 2 Or LUBA 112 (1980), and *Atwood v Portland*, 2 Or LUBA 397 (1981)."

Meyer v. City of Portland, 7 Or LUBA 184, 196, *aff'd* 67 Or App 274, 678 P2d 741 (1983), *rev den*, 297 Or 82, 679 P2d 1367 (1984).

On the face of the record before this Commission, no present finding of "initial feasibility" is possible. As a result, this application must be denied.

IV. CONDITIONAL USE CRITERIA

Newberg Development Code (NDC) 15.225.060 sets out the conditional use approval standards which apply to this application:

> **"15.225.060 General Conditional Use Permit Criteria -Type III.**
>
> A conditional use permit may be granted through a Type III procedure only if the proposal conforms to all the following criteria:
>
> A. The location, size, design and operating characteristics of the proposed development are such that it can be made reasonably compatible with and have minimal impact on the livability or appropriate development of abutting properties and the surrounding neighborhood, with consideration to be given to harmony in scale, bulk, coverage and density; to the availability of public facilities and utilities; to the generation of traffic and the capacity of surrounding streets, and to any other relevant impact of the development.
>
> B. The location, design, and site planning of the proposed development will provide a convenient and functional living, working, shopping or civic environment, and will be as attractive as the nature of the use and its location and setting warrants.
>
> C. The proposed development will be consistent with this code."

For the reasons set out above with respect to (1) the elimination of and failure to provide the agreed traffic-calming roundabout on Crestview Drive and (2) failure to show

how or whether the Water System will be protected and remain operable, the applicant has not met its burden of proving compliance with NDC 15.225.060.A. It has not demonstrated that its proposal "can be made reasonably compatible with and have minimal impact on the livability or appropriate development of abutting properties and the surrounding neighborhood, with consideration to be given to * * * the availability of public facilities and utilities; to the generation of traffic and the capacity of surrounding streets, and to any other relevant impact of the development."

V. PLANNED UNIT DEVELOPMENT CRITERIA

The applicant has failed to demonstrate compliance with the city's Planned Unit Development Criteria, set out in NDC Chapter 15.240. Section 15.240.030.C requires in material part that:

> "1. The proposed development is consistent with standards, plans, policies and ordinances adopted by the city; and
>
> 2. The proposed development's general design and character, including but not limited to anticipated building locations, bulk and height, location and distribution of recreation space, parking, roads, access and other uses, will be reasonably compatible with appropriate development of abutting properties and the surrounding neighborhood * * *"

For the reasons explained above, this application does not comply with the city's standards and ordinances. Beyond that, the applicant has failed to demonstrate compliance with the comprehensive plan goals and policies relevant to the development of so much commercially zoned land with residential uses instead.

Further, as we have set out, the proposed distribution of roads will be incompatible with development of the abutting properties and the Oxberg Lake neighborhood.

VI. STREET STANDARDS

NDC 15.505.030.R. governs "Vehicular Access Standards" and provides in material part:

> "9. ODOT or Yamhill County Right-of-Way. Where a property abuts an ODOT or Yamhill County right-of-way, the applicant for any development project shall obtain an access permit from ODOT or Yamhill County."

The applicant's proposal would provide ingress and egress via the existing portion of Crestview Drive which now abuts the site on the north. Based upon all information available to us, that portion of Crestview remains Yamhill County right-of-way. The applicant has not obtained an access permit from the county or demonstrated the feasibility of obtaining one. This, too, goes to the question of whether the initial feasibility of the proposal has been proven. One or more preexisting agreements make it unlikely that such a permit could be obtained. For this reason alone, the application must be denied.

VII. CONCLUSION

For all of the reasons set out above, the applicant has not met its burden of proof to show compliance with the relevant city approval standards herein. Accordingly, this application must be denied.

Dated: August 2, 2018.

Respectfully submitted,

Jeffrey L. Kleinman, OSB #743726
Attorney for Oxberg Lake Homeowners Association

SOURCE WATER ASSESSMENT REPORT

Summary of Analysis

Oxberg Water System
Newberg, Oregon
Yamhill County
PWS #4105308

April, 2004

Prepared By

Oregon Department of Human Services
Health Services
Drinking Water Program

And

Oregon Department of Environmental Quality
Water Quality Division
Drinking Water Protection

DHS
Oregon Department of Human Services

DEQ
State of Oregon Department of Environmental Quality

Available in Alternate Formats by contacting the DHS DWP at (541) 726-2587

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Oxberg Water System
Source Water Assessment Report
Summary of Analysis

1. Introduction

The Source Water Assessment Program, mandated by the 1996 Amendments to the Safe Drinking Water Act, requires that states provide the information needed by public water systems to develop drinking water protection plans if they choose. That information includes the identification of the area most critical to maintaining safe drinking water, i.e., the Drinking Water Protection Area, an inventory of potential sources of contamination within the Drinking Water Protection Area, and an assessment of the relative threat that these potential sources pose to the water system.

The intent of this report is to present our conclusions regarding the source water assessment analysis for your water system. It is our hope that this information will be used as a basis for reducing the risk of contamination to your water source through the development of a voluntary Drinking Water Protection Plan (DWPP). Should you decided to proceed with the development of a DWPP, this document can serve as the foundation for the plan. If, however, a more in depth analysis of the local hydrogeology, water system susceptibility, and/or the water system specific assumptions is needed to help promote the development of a DWPP, a more comprehensive assessment analysis can be made available to you by contacting either the DHS Project Manager or the DHS Drinking Water Program Groundwater Coordinator.

The methodology that the Source Water Assessment results are based on is included in Appendix I, "Source Water Assessment Methodology". Appendix I includes a discussion of the source water assessment project; groundwater basics; and the processes involved with conducting the delineation, sensitivity analysis, potential contaminant source inventory, and overall water system susceptibility. Therefore, it is our intention that the assessment results, identified in this portion of the report, be used in conjunction with the methodology and rational presented in Appendix I. For instance, if questions arise regarding our conclusions with respect to a specific element of the assessment (i.e. type of delineation used, aquifer sensitivity, well construction sensitivity, etc...), the methodology that lead to our conclusions can be reviewed in Appendix I for further clarification.

We believe public awareness is a powerful tool for protecting drinking water and that the information provided in this report will help you increase local awareness regarding land use activities and local drinking water quality. We have also included a groundwater fact sheet in Appendix E and a list of Oregon specific drinking water protection information and resources in Appendix H.

2. Water System Background

Oxberg Water System is located in Yamhill County and serves approximately 80 people through 27 connections. Drinking water is supplied by one well, commonly referred to as Well #2. According to DHS Drinking Water Program records, this well serves as the only permanent water source.

2.1 Location of the Drinking Water Source(s)

We have located your drinking water source(s) using a Trimble GeoExplorer II Global Positioning System (GPS) unit. The data has been differentially corrected to remove some of the common positioning errors. The location of the source(s), with the corresponding Drinking Water Protection Area, has been placed in a Geographic Information System (GIS) layer and projected onto a USGS 7.5 minute topographic map that is included within this report. In order to be consistent with the topographic map, the projection uses the NAD1927 datum. The latitude and longitude values given on the map and below, however, reflect a projection in the more commonly used WGS1984 datum.

Data collection specifics include:

- 150 individual measurements,
- linked to a minimum of four satellites,
- a PDOP of less than 6 (pertains to precision of measurement), and
- a signal to noise ratio of greater than 5.

The raw data was subjected to differential correction using the PATHFINDER software. The location data for your drinking water source(s) using the WGS84 datum is as follows:

Source	Latitude	Longitude
Well #2 - Source AA	45° 18' 53.679" N	122° 56' 00.350" W

2.2 Source Construction

The well was constructed in November and December 1986. A 12-inch diameter hole was drilled to a depth of 30 feet, with an eight-inch diameter hole continuing to 200 feet. Eight-inch diameter casing was installed from one foot above the surface to a depth of 162 feet and six-inch diameter liner was installed from 160 to 200 feet. Cement was placed between the casing and the outer wall of the hole from the surface to a depth of 30 feet to serve as a casing seal. This casing seal is considered adequate. In a sanitary survey conducted on 8/4/98, DHS Drinking Water Program staff determined that there are no visible well construction deficiencies pertaining to drinking water protection. A copy of the well report for this well is included in Appendix D.

2.3 Nature and Characteristics of the Aquifer

The aquifer supplying the drinking water to the Oxberg Water System well consists of layered basalt and sedimentary interbeds of the Columbia River Basalt Group. The well log identifies the first water-bearing zone at a depth of 50 feet.

Based on the well log and regional geologic maps, the aquifer supplying the well consists of interflow zones of layered volcanic rocks associated with the Columbia River Basalt Group. According to the well log, water was found from 50 to 200 feet and the static water level (water level when well is not being pumped) was reported as 29 feet below the surface. The aquifer is directly overlain by 48 feet of basalt and silt. Since the water level in the well has risen approximately 21 feet above the first water-bearing zone water in the aquifer is assumed to be under pressure. **Therefore, we consider the aquifer supplying the well to be a confined layered volcanic aquifer with a minimum depth to the first water-bearing zone of 50 feet.** Thickness of the water-bearing zone exploited in the aquifer is estimated to be 15 feet.

3. Delineation Results

The purpose of the Drinking Water Protection Area (DWPA) delineation is to identify the area at the surface which overlies the critical portion of the aquifer that's supplying groundwater to the water system's well(s) and/or spring(s). Therefore, DHS Drinking Water Program staff have collected and reviewed data for the purpose of delineating the DWPA for your water system. The area included in the DWPA is designed to approximate the next 10 or 15 years of groundwater supply for the water system, depending on delineation method, and is shown in Figure 1 (Appendix B). We have enhanced the usefulness of the DWPA map by identifying additional five-year, two-year, and one-year "Time-Of-Travel Zones" inside the DWPA.

The scope of work for this portion of the assessment included interviewing the water system operator, researching written reports, reviewing well logs, and establishing a base map of the delineated area. Based on the service population and the fact that only one well supplies the water system, the Calculated Fixed Radius Method was used to delineate the DWPA (See Appendix I for explanation of delineation process). The resulting DWPA for the Oxberg Water System Well is shown in Appendix B, Figure 1. Specific information regarding the parameters used in the delineation process including; the delineation method, estimated pump rate, and aquifer characteristics can be found in Appendix E.

4. Sensitivity Analysis Results

After the Drinking Water Protection Area (DWPA) has been identified, aquifer susceptibility to potential contaminant sources inside the DWPA can be evaluated. Aquifer susceptibility is dependent on two factors, the natural environment's characteristics that permit migration of a contaminant into the aquifer (i.e., aquifer sensitivity) and the presence, distribution, and nature of the potential contaminant sources within the DWPA. It should be understood that the public water system's drinking water source cannot be susceptible to contamination, even if potential contaminant sources are present, unless the aquifer or the constructed source water intake are sensitive to contamination. Therefore, the intent of the sensitivity analysis is to identify those areas within the DWPA where the aquifer is most sensitive to contamination. The analysis is based on data collected or generated during the DWPA delineation process and is designed to meet the needs of other existing or developing programs such as Monitoring Waivers and the Groundwater Rule.

The results of the sensitivity analysis are provided in the tables that follow. Information and sensitivity ratings regarding the aquifer and water quality are provided in Table 4.1 while information and sensitivity ratings regarding the well and its construction is provided in Table 4.2. Clarification of the ratings are provided as comments where appropriate.

Based on this analysis, both the well and the aquifer are not considered highly sensitive contamination. However, the moderate Infiltration Potential score for the aquifer, the close proximity of surface water to the well, and the presence of highly permeable soils within the DWPA contribute to a moderate overall water systems sensitivity. Sensitivity Analysis Tables follow, beginning on the next page.

Table 4.1 Aquifer Sensitivity Analysis.				
	Sensitivity			
Parameter	**H**	**M**	**L**	**Comments**
Depth to first water-bearing zone below casing seal.				50 feet.
Aquifer characteristics and hydraulic nature.			✔	Confined layered volcanic aquifer.
Overburden thickness and characteristics.			✔	~50 feet of silt and basalt
Highest soil sensitivity in Protection Area.	✔			Contributes to moderate aquifer sensitivity.
Traverse potential score (10 = High).			✔	Score = 1
Infiltration potential score (10 = High).		✔		Score = 4
Organic chemical detections.			✔	None detected.
Inorganic chemical detections.			✔	Copper, and barium <50% MCL; see paragraph following Table 4.1
Source related coliform detections.			✔	None detected.
Nitrate concentrations (Drinking Water Standard = 10 mg/L).			✔	Up to 0.10 mg/L; considered to come from natural sources.
Fractured bedrock near surface in Protection Area.			✔	None present.
Other wells score (Significant Risk = 400).			✔	Score = 83
Surface water within 500 feet of wellhead.		✔		Spring Brook ~315 feet from well; Oxberg Lake ~280 feet from well.
Other: Sodium Concentration > 20 mg/L		✔		Sodium concentrations have been as great as 63 mg/L (7/9/1998); see paragraphs following Table 4.1.

The presence of barium (see "Inorganic Chemical Detections" in Table 4.1) at a concentration less than 50% of the MCL is likely due to natural sources; however, be aware that the possibility of unnatural contributions exists. The detected copper is likely derived from pipes and/or plumbing fixtures.

Sodium was detected up to 63 mg/L (see "Sodium detection >20 mg/L" in the above Table). **Water systems having greater than 20 mg/L of sodium in their drinking water source are encouraged to inform their customers of the presence of this constituent so that those individuals on a physician-prescribed, low-sodium diet can inform their doctors of this source of sodium in their diet.**

Table 4.2. Well Construction Sensitivity Analysis.				
	Sensitivity			
Parameter	**H**	**M**	**L**	**Comments**
Casing depth.				162 feet
Casing seal depth.				30 feet
Well construction/setback deficiencies from site visit.			✔	None observed.
Well report information missing or unknown.			✔	No
Casing seal information missing or unknown.			✔	No
Casing seal material.			✔	Cement
Well open to multiple aquifers (commingling suspected).			✔	No
Casing seal construction.			✔	Adequate
Age of well.			✔	Constructed in 1986.

5. Potential Contaminant Source Inventory

An inventory of potential contamination sources was performed within the Drinking Water Protection Area and the results are shown in Figure 2, Appendix B. The primary intent of the inventory was to identify and locate significant potential contaminant sources of concern. This inventory was conducted by reviewing applicable state and federal regulatory databases and land use maps, interviewing persons knowledgeable of the area, and conducting a windshield survey by driving through the drinking water protection area to field locate and verify as many of the potential contaminant source activities as possible. It is important to remember the sites and areas identified are only potential sources of contamination to the drinking water. Environmental contamination is not likely to occur when contaminants are used and managed properly.

5.1 Potential Contaminant Sources within the Two-Year Time-of-Travel Zone for the Well

The delineated two-year time of travel zone is primarily dominated by residential land use. Two potential contaminant source locations (Reference Numbers one through two on Figure 2 and Appendix C, Table 2) were identified in the two-year time-of-travel zone and include rural homes and a fire protection well. The potential contaminant sources within the two-year time-of-travel all pose a relatively higher to moderate risk to the drinking water supply. The septic systems associated with the rural homes may have a risk of transmitting micro-organisms to the groundwater.

5.2 Potential Contaminant Sources within the Five-Year and Fifteen-Year Time-of-Travel Zones for the Well

The drinking water protection area within the five-year and fifteen-year time-of-travel zones is primarily occupied by residential and agricultural land uses. One potential contaminant source location was identified in this area which is detailed on Table 2 in Appendix C and includes irrigated crops. The potential contaminant sources within the five-year and fifteen-year time-of-travel all pose relatively higher to moderate risk to the drinking water supply. Area-wide potential sources such as the residential areas extend from the two-year time-of-travel zone into the fifteen-year time-of-travel zone. These land uses occur throughout the drinking water protection area and are shown on Figure 2 in the location nearest to the well.

6. Susceptibility of the Drinking Water Source

In general, Potential Contaminant Sources (PCSs) within the shorter time-of-travel zones pose a greater risk than those in the longer time-of-travel zones. Also of concern is the location and distribution of these sources with respect to high and moderately sensitive areas. Overlaying the PCS location map (Figure 2, Appendix B) on top of the sensitivity map for the water system provides a tool to determine the susceptibility of the community's drinking water supply to contamination from each PCS (see Figure 3, Appendix B).

6.1 Aquifer Susceptibility to Potential Contaminant Sources Inside the Drinking Water Protection Area.

Table 6.1, indicates the relationship between potential contaminant source risk, aquifer sensitivity, and estimated contaminant arrival time at the well, wellfield, and/or spring. The community can use the PCS location numbers on the inventory map in conjunction with the displayed aquifer sensitivity and relative risk rankings for each PCS from Table 2 (Appendix C) to identify the susceptibility of the drinking water source to contamination from each PCS and take steps to reduce the risk accordingly.

We have attempted to quantify the relative susceptibility of the water system with regard to the PCSs present in the Drinking Water Protection Area (DWPA) using Table 6.1. Across the top of the table, each Time-of-Travel (TOT) zone is subdivided to account for areas of high, moderate, and low sensitivity that may exist between each TOT. Potential contaminant source risk categories (high, moderate, and low) are listed down the left hand side of the table. The relative aquifer susceptibility to each PCS is demonstrated by the shading of each cell in the table. Cells that are shaded dark gray indicate a highly-susceptible condition, light gray shaded cells indicate a moderately-susceptible condition, and white cells indicate conditions of low susceptibility. The number in each cell indicates the number of potential contaminant sources that meet the conditions for that cell. Cells that do not contain a number indicate that there are no known potential contaminant sources that meet the conditions for the cell. Potential contaminant sources that meet the specific criteria for a cell in Table 6.1 can be identified by reviewing Table 2 in Appendix C. The number of potential contaminant sources is totaled across the bottom of the table.

Table 6.1. Oxberg Water System Susceptibility as a Function of PCS Risk, TOT Zone, and Aquifer Sensitivity.

	2-Yr TOT			2- to 5-Yr TOT			5- to 15-Yr TOT		
	High	Mod	Low	High	Mod	Low	High	Mod	Low
High Risk PCSs									
Moderate Risk PCSs	2			1			[illegible]		
Low Risk PCSs	1			1			1		
Total PCSs	3			2			3		

The distribution of high, moderate, and low sensitivity areas inside the Drinking Water Protection Area can be determined using either soil sensitivity or the mapped distribution of Traverse Potential (TP) or Infiltration Potential (IP). In the case of the Oxberg Water System, we have decided to rely upon the distribution of soil sensitivity throughout the DWPA. The soils overlying the aquifer represent the first line of natural protection for the aquifer.

During the potential contaminant source inventory, a total of three potential contaminant source locations and eight potential contaminant sources were identified inside the DWPA. If any of these potential contaminant sources have been identified as an area-wide source, they have been evaluated with respect to each time-of-travel zone in which they occur. As a result, the total number of potential contaminant sources evaluated in the above susceptibility table may exceed the number identified on the potential contaminant source inventory map (Figure 2, Appendix B).

As indicated in the above table, three potential contaminant sources occur inside the 2-year TOT, two sources fall between the 2- and 5-year TOTs, and three sources have been identified between the 5- and 15-year TOTs. Of the potential contaminant sources identified inside the 2-year TOT, two are of moderate-risk, and one is of low-risk. Based on the analysis results shown in the relative susceptibility table, we consider the Oxberg Water System to be highly susceptible to the moderate-risk potential contaminant sources identified inside the 2-year TOT (Potential contaminant Source Reference No. 1 and 2 on Figure 3, Appendix B). **Therefore we recommend that these potential contaminant sources not only be addressed in any Drinking Water Protection Plan but also in any Water System Emergency Response Plan.**

As a result of this analysis, we recommend that the water system develop a Drinking Water Protection Plan that addresses all high- and moderate-risk potential contaminant sources within the DWPA, beginning with those sources which represent the greatest susceptibility risk. At a minimum, the water system should work with representatives from those PCSs posing a moderate- to high-susceptibility risk within the DWPA to (1) determine the level of environmental protection employed in the day-to-day operations of the facility and (2) identify any reasonable Best Management Practices that will lead to an overall reduction of contamination risk.

6.2 Water System Susceptibility to Viral Contaminant Sources within the Two-Year Time-of-Travel Zone.

The area within the two-year TOT roughly identifies the next two years of groundwater supply for the water system. The two-year time frame is used as a conservative estimate of the survival time for some viruses. Viral contaminant sources (septic systems and a fire protection pipe connected to Oxberg Lake) were identified inside the two-year TOT. **However, based on the assessment results, neither the aquifer nor the well is considered sensitive to viral contamination. Therefore, we do not consider the Oxberg Water System water supply to be susceptible to viral contamination.** Regardless of the outcome of this assessment, it is in the water system's best interest to reduce the potential for future viral contamination through compliance with all Oregon Department of Human Services setback standards related to public drinking water supply sources.

7. Conclusions

The Oxberg Water System draws water from a confined layered volcanic aquifer associated with the Columbia River Basalt Group. Assessment results indicate that the water system would be moderately sensitive to a contamination event inside the identified Drinking Water Protection Area. The presence of a few moderate-risk potential contaminant sources within the protection area was confirmed through a potential contaminant source inventory. Under a "worst case" scenario, where it is assumed that nothing is being done to protect groundwater quality at the identified potential contaminant sources, the assessment results indicate that the water system would be highly susceptible to the identified moderate-risk potential contaminant sources. In addition, the assessment results indicate that, at this time, the water system is not considered susceptible to viral contamination.

8. Recommended Use of the Source Water Assessment Report

The costs associated with contaminated drinking water are high. Developing an approach to protect that resource, such as a Drinking Water Protection Plan, can reduce the potential for contamination of the local drinking water supply. This report contains a summary of the local geology and well construction issues as they pertain to the quality of your drinking water source. We have identified the area we believe to be most critical to preserving your water quality (the Drinking Water Protection Area) and have identified potential sources of contamination within that area. In addition, we provide you with recommendations, i.e., Best Management Practices, regarding the proper use and practices associated with some common potential contamination sources (Appendix G). We believe public awareness is a powerful tool for protecting drinking water and that the information provided in this report will help you increase local awareness regarding the relationship between land use activities and drinking water quality. To that end, the process for developing a Drinking Water Protection Plan can be summarized as follows:

Assessment Phase (Source Water Assessment Provided by DHS and DEQ)

- Delineate the area that serves as the source of the public water supply (Drinking Water Protection Area (DWPA))
- Inventory the potential risks or sources of contamination within the DWPA
- Determine the areas most susceptible to contamination

Protection Phase (performed by the water system or community)

- Assemble a local Drinking Water Protection Team
- Enhance the Source Water Assessment if necessary
- Develop a plan to reduce the risk of contamination (protect the resource)
- Develop a contingency plan to address the potential loss of the drinking water supply
- Certify (optional) and implement the Drinking Water Protection Plan

The assessment phase was funded by the federal Safe Drinking Water Act. Its purpose is to supply the water system with the information necessary to develop a Drinking Water Protection Plan. In Oregon, development of a protection plan is voluntary.

Prior to moving into the protection phase, DEQ recommends the inventory presented in this document be reviewed in detail to clarify the presence, location, operational practices, actual risks, etc., of the identified facilities and land use activities. The Source Water Assessment (SWA) inventory should be regarded as a preliminary review of potential sources of contamination within the drinking water protection area. Resources within the community should be used to do an "enhanced inventory" to refine this preliminary list of potential contaminant sources.

It is also important to remember that not all of the inventoried activities will need to be addressed if you choose to develop a Drinking Water Protection Plan. When developing a protection plan, potential contaminant sources which pose little or no threat to your drinking water supply can be screened out. For example, if any of the land use activities are conducted in a manner that already significantly reduces the risk of a contamination release, the facility would not need to re-evaluate their practices based on drinking water protection "management". One of the goals for developing a plan based on the inventory results is to address those land use activities that do pose high or moderate risks to your public water supply. The system should target these facilities with greater levels of education and technical assistance to minimize the risk of contamination.

Limited technical assistance is available through the DEQ and Drinking Water Program at DHS for water systems that choose to move beyond the assessments and voluntarily develop a Drinking Water Protection Plan. By using the results of the assessment, the water system/community can form a Drinking Water Protection Team comprised of individuals that have a stake in the plan's implementation.

Forming a local team to help with the development of a protection plan is very important. Oregon's drinking water protection approach relies upon the concept of "community based protection", as are many other water quality programs. This simply refers to the concept of allowing local control and decision-making to implement the water quality protection effort. Community-based protection is successful only with significant local citizen stakeholder involvement. Community-based protection can draw on the knowledge and successful adaptive practices within the area. Landowners generally know best how to achieve water resource restoration and protection as long as a thorough explanation of the problem is provided, the objectives to solve the problem are clearly defined, and technical assistance is available.

In community-based protection, citizens have more control and are therefore more likely to participate in the program and be more willing to assist with the educational and outreach effort which will make the plan successful. We recommend that the protection plan be developed so as to minimize any burdens on individual property owners, but maximize the equity in responsibility for reducing the risks of future contamination.

Protecting the drinking water supply in a community can also be a very effective way to encourage all citizens to participate in issues which directly affect everyone in that community. This often leads to more public involvement in other significant local decisions concerning future livability issues, e.g., land use planning. In communities already developing and implementing Drinking Water Protection Plans, the process has served to bring many diverse interests together on a common goal and strengthen the local rural and urban relationships through communication and increased understanding. The risks and sources of water quality problems are not only from industries, farmers, and managed forest, but every individual living, commuting, and working in that area.

Communities/water systems interested in developing Drinking Water Protection Plans may contact the Department of Environmental Quality (503-229-5413) or the DHS Drinking Water Program (541-726-2587) for further information.

Appendices

A. References

B. Figures

C. Inventory of Potential Contaminant Sources

D. Well Reports

E. Parameters Used in Delineation Model

F. Groundwater Fact Sheet

G. BMPs for Activities Commonly found in Drinking Water Protection Areas

H. Drinking Water Protection in Oregon

I. Source Water Assessment Methodology

Additional copies of the appendix materials are available upon written request to the following address:

Groundwater Coordinator
Drinking Water Program
Department of Human Services
442 A Street
Springfield, OR 97477

Appendix A: References

National Oceanic and Atmospheric Administration (NOAA), 1982. Monthly Normals of Temperature, Precipitation, and Heating and Cooling Degree Days 1951-80 Oregon, Climatography of the United States No. 81 (By State).

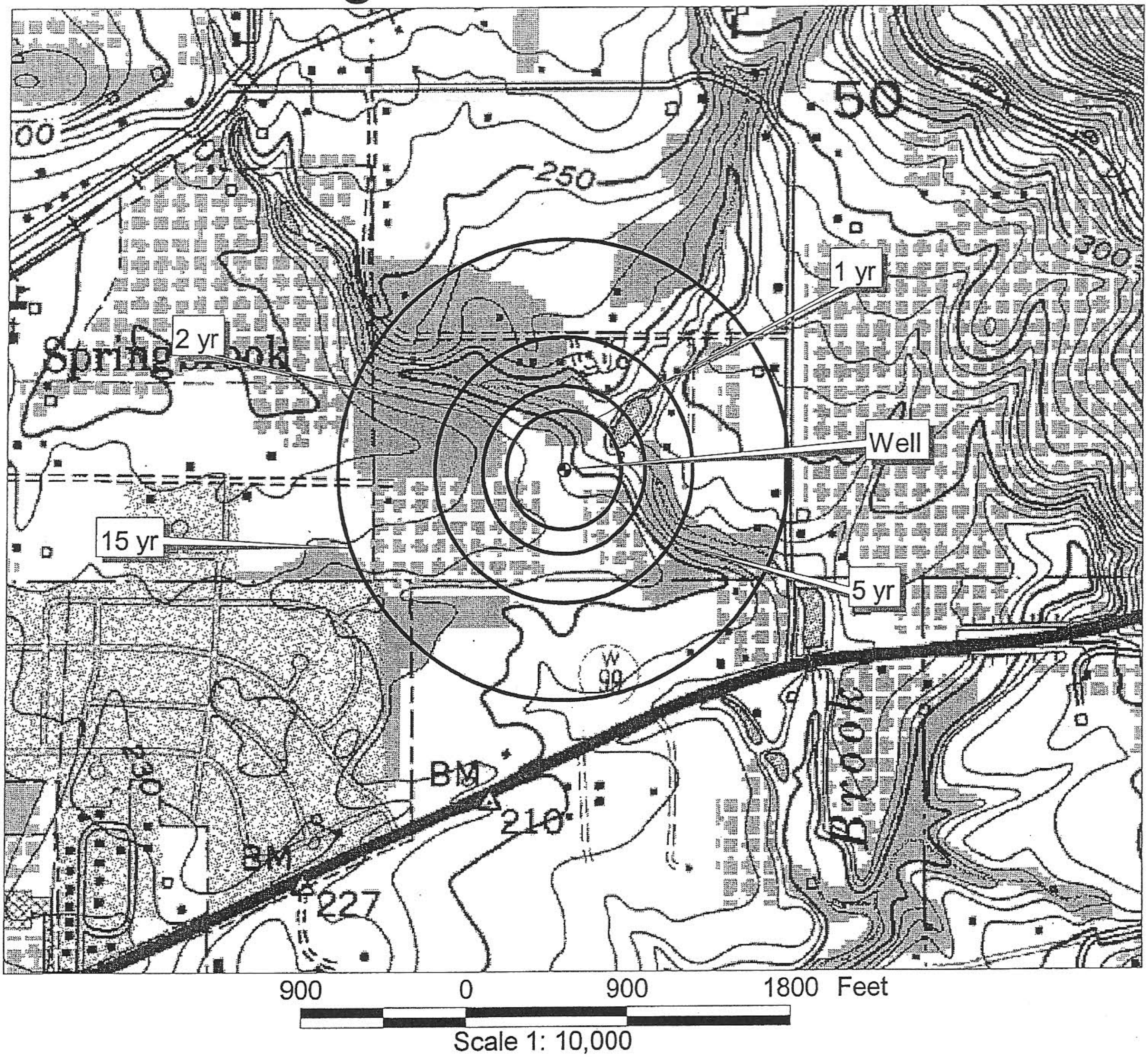
Stewart, S. and Nelson, D., 1996. Oregon Wellhead Protection Program Guidance Manual. Oregon Department of Environmental Quality (available at http://www.deq.state.or.us/wq/dwp/dwphome.htm).

Stewart, S. and Nelson, D., 1999. Oregon Source Water Assessment Plan. Oregon Department of Environmental Quality.

Walker, G.W. and MacLeod, N.S., 1991. Geologic Map of Oregon. U.S. Geological Survey.

Otte, G.E., Setness, D.K., Anderson, W.A., Herbert, F.J., and Knezevich, C.A., 1974. Soil Survey of Yamhill Area, Oregon. U.S. Department of Agriculture, Soil Conservation Service.

O..berg Water System
Drinking Water Protection Area



Drinking Water Protection Area (DWPA)
1, 2, 5, and 15 year Time-of-Travel (TOT)
Calculated Fixed Radius Method

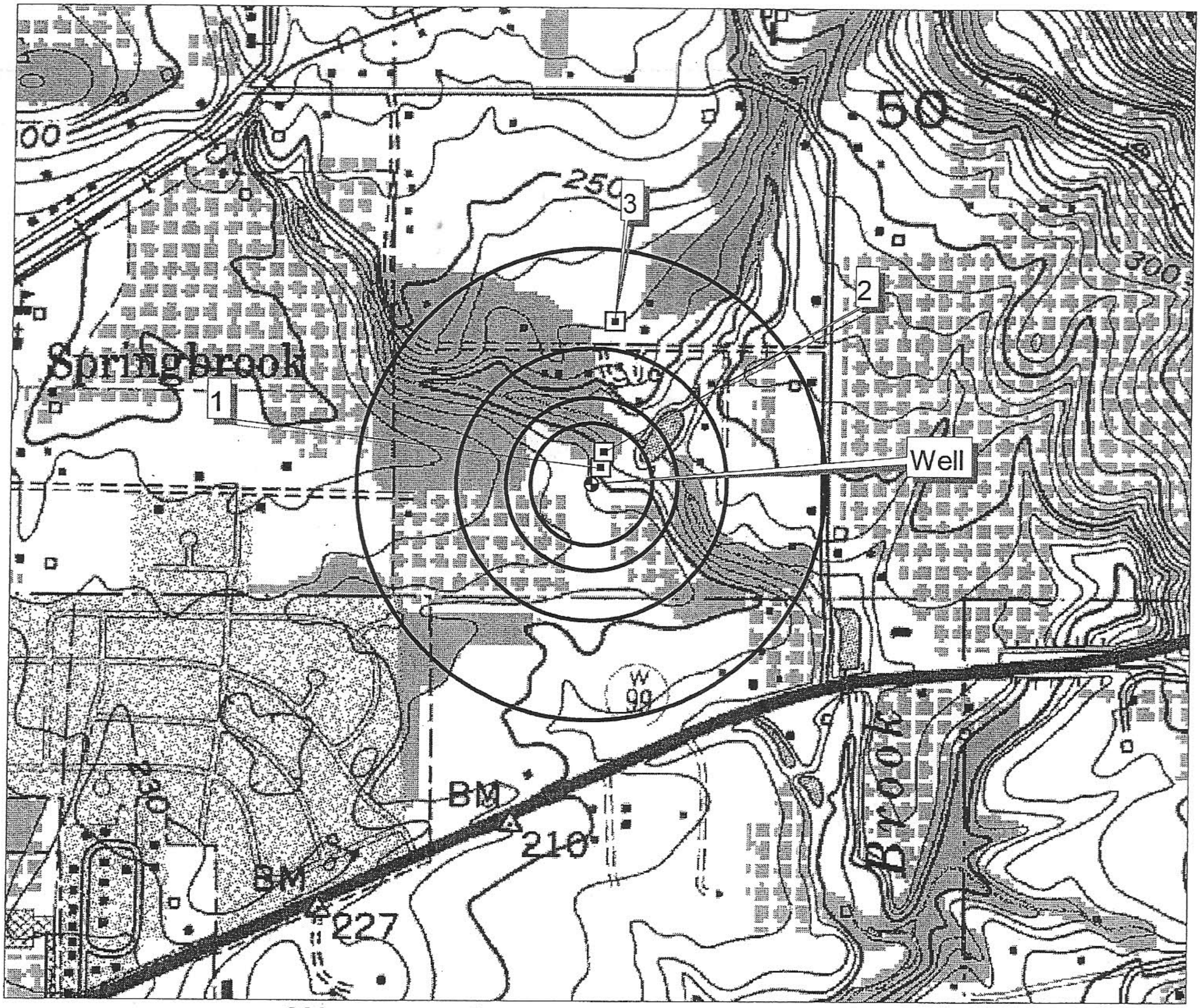
Model Parameters
Effective Porosity: 0.2
Water Use (gal/day): 20,000
Production Interval (ft): 15

Prepared by: KG Date: 4/16/04
Project Manager: AP
Reviewed by: DN RG#: 1224
File#: 4105308

Well Location:
WGS 1984 Datum
45°18'53.679" N 122°56'00.350" W
USGS Newberg 7.5-Minute
Quadrangle (topographic)
T: 3S R: 2W Sec: 16
Yamhill County

Fgure 2

Oxberg Water System
Potential Contaminant Sources



900 0 900 1800 Feet

Scale 1: 10,000

Drinking Water Protection Area (DWPA)
1, 2, 5, and 15 year Time of Travel (TOT)
Calculated Fixed Radius Method

Prepared by: KG 4/16/04
Project Manager: AP
Reviewed by: DN RG# 1224
File# 4105308

N

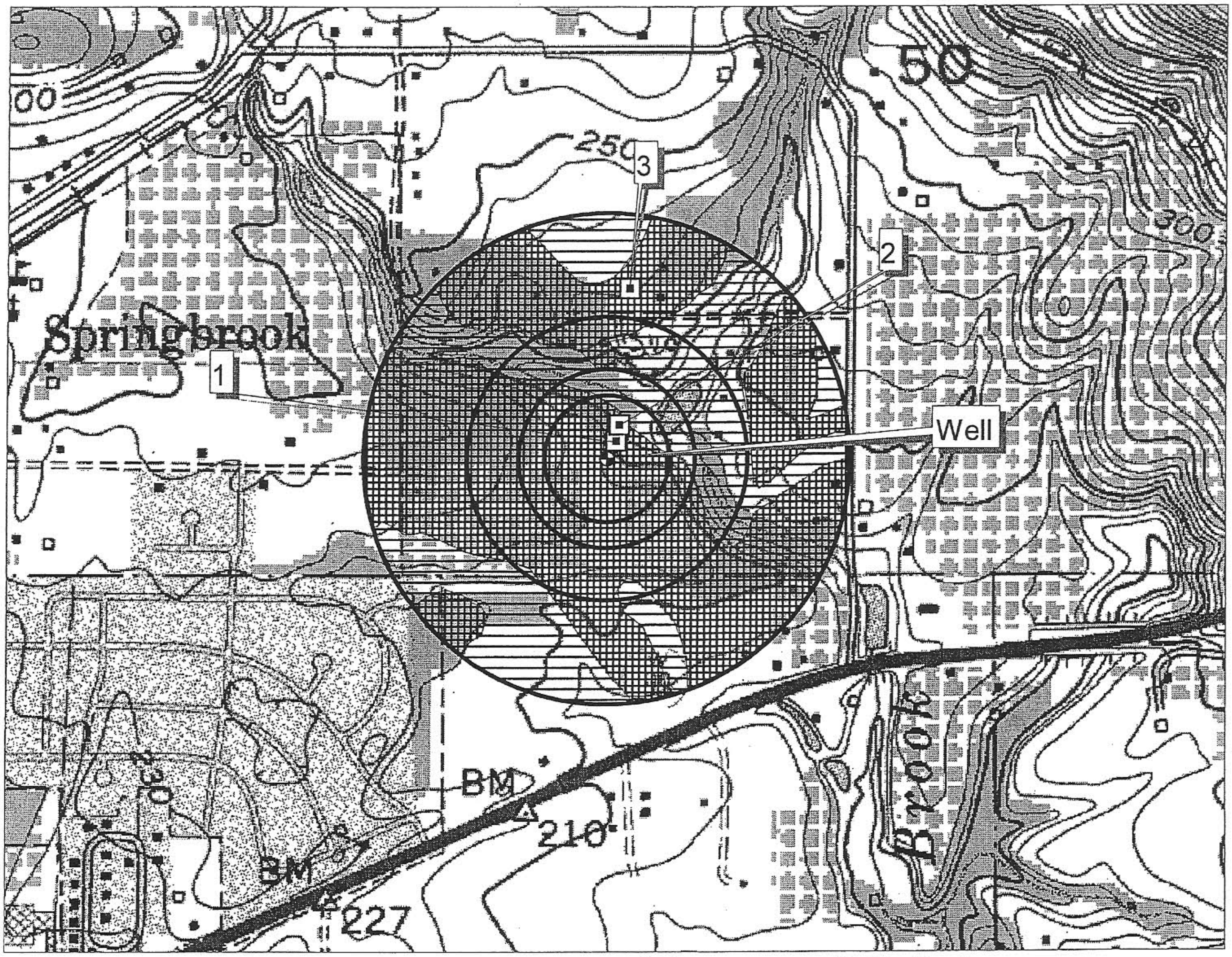
Potential Contaminant Sources
- ⊕ **Higher Relative Risk**
- ▣ **Moderate Relative Risk**
- △ **Low Relative Risk**

Note: Sites and areas noted in this figure are potential sources of contamination to the drinking water identified by Oregon drinking water protection staff. Environmental contamination is not likely to occur when chemicals are used and managed properly.

Numbers indicate potential contaminant sources which are explained in Appendix C, table 2.

QUADRANGLE LOCATION

Oxberg Water System
Drinking Water Source Susceptibility



1000 0 1000 2000 Feet

Scale 1: 10,000

Drinking Water Protection Area (DWPA)
1, 2, 5, and 15 Year Time of Travel (TOT)
Calculated Fixed Radius Method

Potential Contaminant Sources
- ⊕ **Higher Relative Risk**
- ▣ **Moderate Relative Risk**
- △ **Low Relative Risk**

Sensitivity Analysis
- **High Soil Sensitivity**
- **Medium Soil Sensitivity**
- **Low Soil Sensitivity**

Note: Sites and areas noted in this figure are potential sources of contamination to the drinking water as identified by Oregon Drinking Water Protection Staff.
Environmental contamination is not likely to occur when chemicals are used and managed properly.

Features or activities that are identified as high or moderate risk that occur within an area designated as high or moderate sensitivity pose a greater risk to drinking water quality than those in areas of low sensitivity.

Numbers indicate potential contaminant sources indexed to Appendix C, Table 2.

N

APPENDIX C - INVENTORY OF POTENTIAL CONTAMINANT SOURCES
OXBERG WATER SYSTEM - PWS # 4105308
OREGON SOURCE WATER ASSESSMENT

Inventory Results

Table 1. Summary of Potential Contaminant Sources by Land Use

Table 2. Inventory Results - List of Potential Contaminant Sources

Notes for Tables:

Sites and areas identified in these Tables are only potential sources of contamination to the drinking water. Environmental contamination is not likely to occur when contaminants are used and managed properly.

Total number of sources listed in Table 1 in the DWPA may not add up to the total number of potential contaminants sources in Table 2 because more than one type of potential contaminant source may be present at any given facility.

Data collected by Sue Gries Oregon DEQ on 6/17/2002.

Acronyms:

AST - Aboveground Storage Tank
DC - DEQ's Dry Cleaner database
DEQ - Oregon Department of Environmental Quality
DWPA - Drinking Water Protection Area
ECSI - DEQ's Environmental Cleanup Site Information database
HWIMSY - DEQ's Hazardous Waste Information Management System database
LUST - DEQ's Leaking Underground Storage Tank database
NPDES - National Pollution Discharge Elimination System
PCS - Potential Contaminant Source
PWS - Public Water System
SFM - State Fire Marshall's database of hazardous materials
SIS - DEQ's Source Information System database (includes WPCF & NPDES permits)
SWMS - DEQ's Solid Waste Management System database
UST - DEQ's Underground Storage Tank database or Underground Storage Tank
WPCF - Water Pollution Control Facility
WRD - Oregon Water Resources Division database for water rights information

TABLE 1. SUMMARY OF POTENTIAL CONTAMINANT SOURCES BY LAND USE

PWS # 4105308 OXBERG WATER SYSTEM

Residential/Municipal Land Uses

Potential Contamination Source	Note	Relative Risk Level	Total in DWPA
Airport - Maintenance/Fueling Area		Higher	0
Apartments and Condominiums		Lower	0
Campgrounds/RV Parks	(1)	Lower	0
Cemeteries - Pre-1945		Moderate	0
Drinking Water Treatment Plants		Moderate	0
Fire Station		Lower	0
Fire Training Facilities		Moderate	0
Golf Courses		Moderate	0
Housing - High Density (> 1 House/0.5 acres)		Moderate	0
Landfill/Dumps	(1)	Higher	0
Lawn Care - Highly Maintained Areas		Moderate	1
Motor Pools		Moderate	0
Parks		Moderate	0
Railroad Yards/Maintenance/Fueling Areas		Higher	0
Schools		Lower	0
Septic Systems - High Density (> 1 system/acre)	(1)	Higher	0
Sewer Lines - Close Proximity to PWS	(1)	Higher	0
Utility Stations - Maintenance Transformer Storage		Higher	0
Waste Transfer/Recycling Stations	(1)	Moderate	0
Wastewater Treatment Plants/Collection Stations	(1)	Moderate	0
Other			0

NOTES:
Sites and areas identified in this Table are only potential sources of contamination to the drinking water. Environmental contamination is not likely to occur when contaminants are used and managed properly.
(1) - Potential source of microbial contamination
(2) - Drip irrigated crops, such as vineyards and some vegetables, are considered lower risk than spray irrigation
(3) - For groundwater public water systems, septic systems located within the 2-year time-of-travel (TOT) are considered moderate risks.

TABLE 1. SUMMARY OF POTENTIAL CONTAMINANT SOURCES BY LAND USE

PWS # 4105308 OXBERG WATER SYSTEM

Commercial/Industrial Land Uses

Potential Contamination Source	Note	Relative Risk Level	Total in DWPA
Automobiles - Body Shops		Higher	0
Automobiles - Car Washes		Moderate	0
Automobiles - Gas Stations		Higher	0
Automobiles - Repair Shops		Higher	0
Boat Services/Repair/Refinishing		Higher	0
Cement/Concrete Plants		Moderate	0
Chemical/Petroleum Processing/Storage		Higher	0
Dry Cleaners		Higher	0
Electrical/Electronic Manufacturing		Higher	0
Fleet/Trucking/Bus Terminals		Higher	0
Food Processing		Moderate	0
Furniture/Lumber/Parts Stores		Moderate	0
Home Manufacturing		Higher	0
Junk/Scrap/Salvage Yards		Higher	0
Machine Shops		Higher	0
Medical/Vet Offices	(1)	Moderate	0
Metal Plating/Finishing/Fabrication		Higher	0
Mines/Gravel Pits		Higher	0
Office Buildings/Complexes		Lower	0
Parking Lots/Malls (> 50 Spaces)		Higher	0
Photo Processing/Printing		Higher	0
Plastics/Synthetics Producer		Higher	0
Research Laboratories		Higher	0
RV/Mini Storage		Lower	0
Wood Preserving/Treating		Higher	0
Wood/Pulp/Paper Processing and Mills		Higher	0
Other			0

NOTES:
Sites and areas identified in this Table are only potential sources of contamination to the drinking water. Environmental contamination is not likely to occur when contaminants are used and managed properly.
(1) - Potential source of microbial contamination
(2) - Drip irrigated crops, such as vineyards and some vegetables, are considered lower risk than spray irrigation
(3) - For groundwater public water systems, septic systems located within the 2-year time-of-travel (TOT) are considered moderate risks.

TABLE 1. SUMMARY OF POTENTIAL CONTAMINANT SOURCES BY LAND USE

PWS # 4105308 OXBERG WATER SYSTEM

Agricultural/Forest Land Uses

Potential Contamination Source	Note	Relative Risk Level	Total in DWPA
Auction Lots	(1)	Higher	0
Boarding Stables	(1)	Moderate	0
Confined Animal Feeding Operations (CAFOs)	(1)	Higher	0
Crops - Irrigated (inc. orchards, vineyards, nurseries, greenhouses)	(2)	Moderate	1
Crops - Nonirrigated (inc. Christmas trees, grains, grass seed, pasture)		Lower	0
Farm Machinery Repair		Higher	0
Grazing Animals (> 5 large animals or equivalent/acre)	(1)	Moderate	0
Lagoons/Liquid Wastes	(1)	Higher	0
Land Application Sites	(1)	Moderate	0
Managed Forest Land - Broadcast Fertilized Areas		Lower	0
Managed Forest Land - Clearcut Harvest (< 35 yrs.)		Moderate	0
Managed Forest Land - Partial Harvest (< 10 yrs.)		Moderate	0
Managed Forest Land - Road Density (> 2 mi./sq. mi.)		Moderate	0
Pesticide/Fertilizer/Petroleum Storage, Handling, Mixing, & Cleaning Ar		Higher	0
Recent Burn Areas (< 10 yrs.)		Lower	0
Managed Forest Lands - Status Unknown		Moderate	0
Other			0

NOTES:
Sites and areas identified in this Table are only potential sources of contamination to the drinking water.
Environmental contamination is not likely to occur when contaminants are used and managed properly.
(1) - Potential source of microbial contamination
(2) - Drip irrigated crops, such as vineyards and some vegetables, are considered lower risk than spray irrigation
(3) - For groundwater public water systems, septic systems located within the 2-year time-of-travel (TOT) are considered moderate risks.

TABLE 1. SUMMARY OF POTENTIAL CONTAMINANT SOURCES BY LAND USE

PWS # 4105308 OXBERG WATER SYSTEM

Miscellaneous Land Uses

Potential Contamination Source	Note	Relative Risk Level	Total in DWPA
Above Ground Storage Tanks - Excluding Water		Moderate	0
Channel Alterations - Heavy		Lower	0
Combined Sewer Outfalls	(1)	Lower	0
Stormwater Outfalls	(1)	Lower	0
Composting Facilities	(1)	Moderate	0
Historic Gas Stations		Higher	0
Historic Waste Dumps/Landfills	(1)	Higher	0
Homesteads - Rural - Machine Shops/Equipment Maintenance		Higher	0
Homesteads - Rural - Septic Systems (< 1/acre)	(1)(3)	Lower	1
Injection/Dry Wells, Sumps - Class V UICs	(1)	Higher	0
Kennels (> 20 Pens)	(1)	Lower	0
Military Installations		Higher	0
Random Dump Sites		Moderate	0
River Recreation - Heavy Use (inc. campgrounds)	(1)	Lower	0
Sludge Disposal Areas	(1)	Moderate	0
Stormwater Retention Basins	(1)	Moderate	0
Transmission Lines - Right-of-Ways		Lower	0
Transportation - Freeways/State Highways/Other Heavy Use Roads		Moderate	0
Transportation - Railroads		Moderate	0
Transportation - Right-Of-Ways - Herbicide Use Areas		Moderate	0
Transportation - River Traffic - Heavy		Lower	0
Transportation - Stream Crossing - Perennial		Lower	0
UST - Confirmed Leaking Tanks - DEQ List		Higher	0
UST - Decommissioned/Inactive		Lower	0
UST - Nonregulated Tanks (< 1,100 gals or Large Heating Oil Tanks)		Higher	0
UST - Not Upgraded and/or Registered Tanks		Higher	0
UST - Upgraded/Registered - Active		Lower	0
UST - Status Unknown		Higher	0
Upstream Reservoirs/Dams		Lower	0
Wells/Abandoned Wells		Higher	0
Large Capacity Septic Systems (serves > 20 people) - Class V UICs	(1)	Higher	0
Construction/Demolition Areas		Moderate	0
Other:		Moderate	1

NOTES:
Sites and areas identified in this Table are only potential sources of contamination to the drinking water. Environmental contamination is not likely to occur when contaminants are used and managed properly.
(1) - Potential source of microbial contamination
(2) - Drip irrigated crops, such as vineyards and some vegetables, are considered lower risk than spray irrigation
(3) - For groundwater public water systems, septic systems located within the 2-year time-of-travel (TOT) are considered moderate risks.

TABLE 2. INVENTORY RESULTS - LIST OF POTENTIAL CONTAMINANT SOURCES

PWS# 4105308 OXBERG WATER SYSTEM

Reference No. (See Figure)	Potential Contaminant Source Type	Name	Approximate Location	City	Method for Listing	Proximity to Sensitive Areas	Relative Risk Level (1)	Potential Impacts	Comments
1	Lawn Care - Highly Maintained Areas	Rural Homes	Throughout DWPA	Newberg	Field-Observation Interview	Within the 2-yr TOT.	Moderate	Over-application or improper handling of pesticides or fertilizers may impact drinking water. Excessive irrigation may cause transport of contaminants to groundwater or surface water through runoff.	Homes within the 2 year TOT do not have individual wells. Some of the homes outside the 2 year TOT do have wells. All houses are on septic. PWS contact indicates a 3 lane highway might be developed within 5 and 15 year TOT.
	Homesteads - Rural - Septic Systems (< 1/acre)						Lower	If not properly sited, designed, installed, and maintained, septic systems can impact drinking water. Use of drain cleaners and dumping household hazardous wastes can result in groundwater contamination.	Homes within the 2 year TOT do not have individual wells. Some of the homes outside the 2 year TOT do have wells. All houses are on septic. PWS contact indicates a 3 lane highway might be developed within 5 and 15 year TOT.
2	Other	Fire protection well	Next to well	Newberg	Interview	Within the 2-yr TOT.	Moderate	The impacts of this potential contaminant source will be addressed during the enhanced inventory.	PWS contact indicates a pipe from Oxberg Lake connects to a drywell used for fire protection. The pipe might be broken.
3	Crops - Irrigated (inc. orchards, vineyards, nurseries, greenhouses)	Non-irrigated crops	Northeast portion of DWPA	Newberg	Field-Observation	Between 5-yr and 15-yr TOT	Moderate	Over-application or improper handling of pesticides/fertilizers may impact drinking water. Excessive irrigation may transport contaminants or sediments to groundwater/surface water through runoff. Drip-irrigated crops are considered to be a low risk.	Nurseries are at intersection of Benjamin and Putnam Road, and north of Putnam Road.

Note: Sites and areas identified in this Table are only potential sources of contamination to the drinking water. Environmental contamination is not likely to occur when contaminants are used and managed properly.

(1) Where multiple potential contaminant sources exist at a site, the highest level of risk is used.

(2) See Table 3 for database listings (if necessary).

WELL #2 3/2W-16

.ATE OF OREGON
TER WELL REPORT
as required by ORS 537.765)

DEC 26 1986
WATER RESOURCES DEPT.
SALEM, OREGON

) OWNER:
Name OXBERG
Address P.O. BOX 467
City NEWBERG State OREG Zip 97132

(2) TYPE OF WORK:
☒ New Well ☐ Deepen ☐ Recondition ☐ Abandon

(3) DRILL METHOD
☐ Rotary Air ☐ Rotary Mud ☒ Cable
☐ Other

(4) PROPOSED USE:
☐ Domestic ☒ Community ☐ Industrial ☐ Irrigation
☐ Thermal ☐ Injection ☐ Other

(5) BORE HOLE CONSTRUCTION:
Special Construction approval Yes ☐ No ☐ Depth of Completed Well 200 ft.
Explosives used Yes ☐ No ☒ Type ______ Amount ______

HOLE Diameter	From	To	SEAL Material	From	To	Amount sacks or pounds
12	0	139	CEMENT	0	30	20
8	139	200				

How was seal placed: Method ☐ A ☐ B ☒ C ☐ D ☐ E
☐ Other
Backfill placed from ______ ft. to ______ ft. Material ______
Gravel placed from 30 ft. to 139 ft. Size of gravel 3/4" TO 1/4"

(6) CASING/LINER:

	Diameter	From	To	Gauge	Steel	Plastic	Welded	Threaded
Casing:	8	+1	162	.250"	☒	☐	☒	☐
					☐	☐	☐	☐
					☐	☐	☐	☐
					☐	☐	☐	☐
Liner:	6	160	200	160 LB	☐	☒	☐	☐
					☐	☐	☐	☐

Final location of shoe(s) ______

(7) PERFORATIONS/SCREENS:
☒ Perforations Method MILLS KNIFE
☐ Screens Type ______ Material ______

From	To	Slot size	Number	Diameter	Tele/pipe size	Casing	Liner
50	162		475	1/4"		☒	☐
162	200		160	1/4"		☐	☒
						☐	☐
						☐	☐
						☐	☐
						☐	☐

(8) WELL TESTS: Minimum testing time is 1 hour
☐ Pump ☒ Bailer ☐ Air ☐ Flowing Artesian

Yield gal/min	Drawdown	Drill stem at	Time
			1 hr.
45	50		1

Temperature of water ______ Depth Artesian Flow Found ______
Was a water analysis done? ☐ Yes By whom ______
Did any strata contain water not suitable for intended use? ☐ Too little
☐ Salty ☐ Muddy ☐ Odor ☐ Colored ☐ Other ______
Depth of strata: ______

(9) LOCATION OF WELL by legal description:
County YAMHILL Latitude ______ Longitude ______
Township 3S N or S, Range 2W E or W, WM.
Section 16 ______ 1/4 ______ 1/4
Tax Lot ______ Lot ______ Block ______ Subdivision ______
Street Address of Well (or nearest address) 4100 E. CRESTVIEW, NEWBERG, OREGON

(10) STATIC WATER LEVEL:
29 ft. below land surface. Date 12/11/86
Artesian pressure ______ lb. per square inch. Date ______

(11) WATER BEARING ZONES:
Depth at which water was first found ______

From	To	Estimated Flow Rate	SWL
50	200	45	29

(12) WELL LOG:
Ground elevation ______

Material	From	To	SWL
TOP SOIL	0	2	
BROWN CLAY	2	25	
SOFT DECOMPOSED BROWN ROCK WITH CLAY STREAKS	25	152	29
SOFT BROWN ROCK	152	172	29
BROWN CLAY	172	178	29
SOFT BROWN ROCK	178	200	29

Date started 11/26/86 Completed 12/11/86

(unbonded) Water Well Constructor Certification:
I certify that the work I performed on the construction, alteration, or abandonment of this well is in compliance with Oregon well construction standards. Materials used and information reported above are true to my best knowledge and belief.
WWC Number ______
Signed ______ Date ______

(bonded) Water Well Constructor Certification:
I accept responsibility for the construction, alteration, or abandonment work performed on this well during the construction dates reported above. all work performed during this time is in compliance with Oregon well construction standards. This report is true to the best of my knowledge and belief.
WWC Number 462
Signed O.E. Keller Date 12/24/86

PINK COPY - CUSTOMER 9809C 10/86

Appendix E: Parameters Used in Delineation Model

Delineation Method: ☐ Analytical ☒ Calculated Fixed Radius ☐ Enhanced CFR
☐ Numerical ☐ Hydrogeologic Mapping ☐ Analytic Element

Pump Rate (Q in gpm): **13.9 gpm**

Source: ☐ System ☐ Water Resources Dept ☐ Comparable Community
☐ Pump Capacity ☒ Population Estimate ☐ 90% of Safe Yield

Nature of the Aquifer: ☐ Unknown ☐ Unconfined
☐ Semi-confined ☒ Confined

Aquifer name: **Layered Basalt**
(Columbia River Basalt Group)

Confining Unit lithology: basalt/clay
Depth to Confining Unit: 2
Confining Unit thickness: 48
Depth to Aquifer: 50 feet

Aquifer Characteristics:

Lithology:

☐ Unknown ☐ Sandy Silt ☒ Layered Volcanic Rocks
☐ Sand ☐ Sand & Gravel ☐ Fractured Volcanic Rocks
☐ Gravel ☐ Cobbles/Gravel ☐ Fractured Sedimentary Rocks
☐ Other:________________

Thickness (b): 15 feet

Effective Porosity (n): 0.20

Hydraulic Conductivity (Permeability): ______ ft/day ☒ N/A
☐ Estimated from lithology ☐ Specific Capacity (Well Report)
☐ Published Report ☐ Aquifer Test

Hydraulic Gradient:_________ Flow Direction:__________ ☒ N/A
☐ Published Report ☐ Graphical Solution ☐ Estimate
☐ Field Measurements ☐ Model Results

Other High Capacity Wells Accounted for: None

DEVELOPMENT AGREEMENT

This Development Agreement ("DEVELOPMENT AGREEMENT") is made and executed this 16th day of June 2008, by and between GC Commercial, an Oregon Limited Liability Company ("**GC**"), and Terry Coss, Amelia Coss, Charles Alex Miller, Daniel Peek and Rebecca Peek the "**Homeowners**") GC and the Homeowners are collectively referred to herein as, the "**Parties**".

RECITALS:

A. GC owns and plans to develop the real property located in the City of Newberg, Yamhill County, Oregon, shown on the attached Exhibit "A" (the "**GC Development**").

B. GC, with respect to the GC Development, intends to develop the Property into one mixed-use commercial and residential development (collectively, the "**Project**"). A map of the Project is attached as Exhibit "B."

C. The Homeowners are owners of those certain parcels of residential real property located in the Oxberg Lakes Subdivision, Yamhill County, Oregon, the southern boundaries of which abut and are adjacent to the northern boundary of the GC Development (individually, each a "**Homeowner Parcel**" and collectively, the "**Homeowners' Parcels**").

D. The Homeowners anticipate significant negative impacts from the GC Development, including reduced security, increased noise, light pollution, increased traffic, and may experience problems with storm drainage and the Oxberg Lake Estates water system and aquifer.

E. GC desires to help mitigate any potential negative impacts to which the Project and the GC Development might subject the Homeowners.

AGREEMENT:

In consideration of the foregoing and of the mutual agreements, promises, covenants and restrictions set forth herein, GC and the Homeowners agree as follows:

1. Incorporation of Recitals. The parties agree that the foregoing Recitals are true and correct and that the Recitals are incorporated herein as if set forth in full.

2. Construction of the Sound Wall.

a. GC shall construct or cause to be constructed, at its sole cost and expense, a pre-cast concrete wall approximately six (6) feet in height along the boundary shared by the GC Development and the Homeowners' Parcels (the "**Sound Wall**). The approximate location and length of the Sound Wall are more particularly illustrated on the attached Exhibit "B." However, the exact location and length of the Sound Wall shall be determined by GC in compliance with applicable plans approved by the City of Newberg, or any other governmental agency having jurisdiction. The design style of the Sound Wall and its construction type shall be consistent with Exhibit "C" attached hereto.

b. GC shall construct and install the Sound Wall in such a manner as to preserve, to the best of GC's ability, those trees with trunks greater than twelve (12) inches in diameter that are located along the boundary shared by the GC Development and the Homeowners' Parcels.

c. GC shall provide the Homeowners with copies of any proposed designs and drawings of the Sound Wall, and consider, in good faith, all timely comments GC receives from the Homeowners with respect to the Sound Wall. However, the final design and specifications of the Sound Wall shall be in accordance with plans approved by the City of Newberg, or any other governmental agency having jurisdiction.

d. GC shall include a ten-foot (10') wide landscape buffer zone along the boundary shared by the GC Development and the Homeowners' Parcels (the "**Landscape Buffer Zone**"), and a 30-foot (30') setback (the "**Setback Zone**") between the Sound Wall and any buildings in any subdivision plat maps for its respective parcels submitted for approval to any governmental entity with jurisdiction over the GC Development. The Landscape Buffer Zone and Setback Zone shall be negative easements, binding GC and its successors in interest by encumbering the lots along the boundary shared by the GC Development and the Homeowners' Parcels.

e. GC shall complete the construction and installation of the Sound Wall on or before the date of final lift of asphalt concrete within the GC Development.

3. Construction of the Storm Water Drainage System

a. GC shall construct and install, at its sole cost and expense a storm water and surface water drainage system on a portion of the Homeowners' Parcels adjacent to the GC Development (the "**Storm Water Drainage System**").

b. GC shall provide the Homeowners with copies of any proposed designs and drawings of the Storm Water Drainage System and consider, in good faith, all timely comments GC receives from the Homeowners with respect to the Storm Water Drainage System. However, the final design and specifications of the Storm Water Drainage System shall be in accordance with plans approved by the City of Newberg, or any other governmental agency having jurisdiction.

c. GC shall complete the construction and installation of the Storm Water Drainage System on or before the date installation of the Sound Wall begins.

5. **Easements.**

a. The Homeowners shall grant to GC temporary easements across their respective Homeowner Parcels for the construction of the Storm Water Drainage System and the Sound Wall, and;

b. The Homeowners shall grant permanent easements to GC and its successors and assigns, where necessary pursuant to the approved design specifications, to permit encroachments of the Sound Wall onto the Homeowners' Parcels and placement of the Storm Water Drainage system and any catch basins or drain lines appurtenant thereto;

6. **Permitting.** GC shall begin construction of the Sound Wall and the Storm Water Drainage System after it has received all site design approvals, land use permits, entitlements and other permits required for the development of the Project, and has begun construction of the Project. If GC does not receive the aforementioned permits and entitlements it shall not be obligated to build either the Sound Wall or the Storm Water Drainage System.

7. **Maintenance.** The parties shall share in all costs and expenses related to the maintenance and general upkeep of the Sound Wall and Storm Water Drainage System after their respective completion. This maintenance obligation shall bind the Parties and their respective successors in interest and shall be made a part of any permanent easement granted by the Homeowners pursuant to paragraph 5.b., above. In addition to the encumbrances referenced in paragraph 2.d., above, GC shall encumber the lots along the boundary shared by the GC Development and the Homeowners' Parcels to the extent of the maintenance obligation contained herein.

8. **Assignability.** This DEVELOPMENT AGREEMENT is assignable and/or delegable with respect to the rights and duties of GC and the Homeowners, both jointly and severally, to any transferee or other successor in interest to the GC Development or the Project.

9. **Severability.** Should any provision of this DEVELOPMENT AGREEMENT be declared or determined by any forum of competent jurisdiction to be illegal, invalid, or unenforceable, the legality, validity and enforceability of the remaining parts, terms, or provisions shall not be affected thereby, and said illegal, unenforceable or invalid part, term or provision shall be deemed not to be part of this DEVELOPMENT AGREEMENT.

10. **Counterparts.** This DEVELOPMENT AGREEMENT may be executed in any number of counterparts and by each party on a separate counterpart page, each of which when so executed shall be deemed an original.

11. **Waiver.** No waiver of any provision of this DEVELOPMENT AGREEMENT shall be deemed, or shall constitute, a waiver of any other provisions, whether or not similar, not shall any waiver constitute a continuing waiver. No waiver shall be binding unless executed in writing by the party making the waiver.

12. **Binding Effect.** All rights, remedies and liabilities herein given to or imposed upon the parties shall extend to, inure to the benefit of and bind, as the circumstances may

require, the parties and their respective heirs, personal representatives, administrators, successors and permitted assigns and designees.

13. Notices. Any notice or other communication required or permitted under this DEVELOPMENT AGREEMENT shall be in writing and shall be deemed given on the date of transmission when sent by telex or facsimile transmission, or on the third business date after the date of mailing when mailed by certified mail, postage prepaid, return receipt requested, from within the United States, or on the date of actual delivery, whichever is the earliest, and shall be sent to the parties at the addresses shown provided below, or at such other address as either party may hereafter designate by written notice to the other.

To GC:	Jeffrey D. Smith 4386 SW Macadam Avenue Suite 305 Portland, OR 97239
With a copy to:	Jessica S. Cain Gunn & Cain, LLP P.O. Box 1046 Newberg, Oregon 97132
To Terry Coss and Amelia Coss:	Terry Coss and Amelia Coss 4304 Robin Court Newberg, OR 97132
To Alex Miller:	~~Alex Miller~~ Nikula + Warren Stone 4308 E. Robin Court Newberg, OR 97132
To Dan Peek and Rebecca Peek:	Dan Peek and Rebecca Peek 4402 Birdhaven Loop Newberg, OR 97132

14. Amendment. No supplement, modification or amendment of this DEVELOPMENT AGREEMENT shall be valid unless the same if in writing and signed by all of the Parties.

15. Attorney's Fees. In the event any suit, action or other legal proceeding shall be instituted to declare or enforce any right created by this DEVELOPMENT AGREEMENT, or by reason on any breach of this DEVELOPMENT AGREEMENT, both parties shall be individually responsible for their respective legal fees.

16. **Governing Law and Venue.** This DEVELOPMENT AGREEMENT and the rights of the parties hereunder shall be governed, construed and enforced in accordance with the law of the State of Oregon, without regard to its conflict of law principles. Venue for any such suit, action or other legal proceeding regarding this DEVELOPMENT AGREEMENT or the Real Property shall be brought in Yamhill County Circuit Court.

17. **Interpretation.** This DEVELOPMENT AGREEMENT shall be deemed to have been drafted jointly by the parties and shall be interpreted in accordance with the plain meaning of its terms and not strictly for or against any of the parties hereto.

18. **Indemnification.** GC hereby agrees to indemnify the Homeowners and hold them harmless from and against any and all claims, demands, liabilities, costs, expenses, penalties, damages and losses, including, without limitation, reasonable attorneys' fees before or at trial, on appeal, and on any petition for review, resulting from any injuries made by contractors performing work to satisfy this DEVELOPMENT AGREEMENT.

19. **Third-Party Beneficiaries.** Nothing in this DEVELOPMENT AGREEMENT, express or implied, is intended to confer on any person, other than the parties to this DEVELOPMENT AGREEMENT, any right or remedy of any nature whatsoever.

20. **Advice of Counsel.** Each of the parties also represent that they have read this DEVELOPMENT AGREEMENT and discussed it with an attorney of their choosing, that they understand each of the terms of this Agreement, and that they enter into and execute this DEVELOPMENT AGREEMENT voluntarily and willingly.

21. **Preparation by Gunn & Cain.** The Homeowners acknowledge that this DEVELOPMENT AGREEMENT has been prepared by Gunn & Cain LLP, attorneys for GC, and that the Homeowners have been advised to consult with their own respective legal counsel should they have any questions regarding the matter.

DEVELOPERS:

GC Commercial LLC, an Oregon Limited Liability Company

By: ______________________________
Name: Jeffery D. Smith
Title: Manager
Date: 6/16/08

On this 1st day of ~~June~~ July, 2008, personally appeared before me the above-named Charles Alex Miller who acknowledged the execution of the foregoing instrument to be his voluntary act and deed.

OFFICIAL SEAL
ROBERT L RENK
NOTARY PUBLIC - OREGON
COMMISSION NO. 407846
MY COMMISSION EXPIRES JUN. 29, 2010

Notary Public for Oregon
My commission expires: 6/29/2010

STATE OF OREGON)
) ss.
County of Yamhill)

On this ___________ day of June, 2008, personally appeared before me the above-named Daniel Peek who acknowledged the execution of the foregoing instrument to be his voluntary act and deed.

Notary Public for Oregon
My commission expires: _______________

STATE OF OREGON)
) ss.
County of Yamhill)

On this ___________ day of June, 2008, personally appeared before me the above-named Rebecca Peek who acknowledged the execution of the foregoing instrument to be her voluntary act and deed.

Notary Public for Oregon
My commission expires: _______________

THE HOMEOWNERS:

____
TERRY COSS

____
AMELIA COSS

Date: __________________________

Property Address:
4304 Robin Court
Newberg, OR 97132

Charles Alex Miller
CHARLES ALEX MILLER, a single man

Date: July 1, 2008

Property Address:
4308 E. Robin Court
Newberg, OR 97132

____
DANIEL PEEK

____
REBECCA PEEK

Date: __________________________

Property Address:
4402 Birdhaven Loop
Newberg, OR 97132

Keith Leonard

From: Doug Rux
Sent: Monday, July 23, 2018 8:25 AM
To: Keith Leonard
Subject: RE: Saving Healthy Trees

I already sent them on to Mike and Andrew over the weekend.

Doug Rux, AICP
Community Development Director
City of Newberg
503.537.1212
Doug.Rux@newbergoregon.gov

From: Keith Leonard
Sent: Monday, July 23, 2018 6:33 AM
To: Doug Rux
Subject: Re: Saving Healthy Trees

I'll get these out to Andrew.

From: Doug Rux
Sent: Saturday, July 21, 2018 5:17:48 PM
To: Keith Leonard
Cc: Andrew Tull; Michael Robinson
Subject: Fwd: Saving Healthy Trees

Here is another comment.

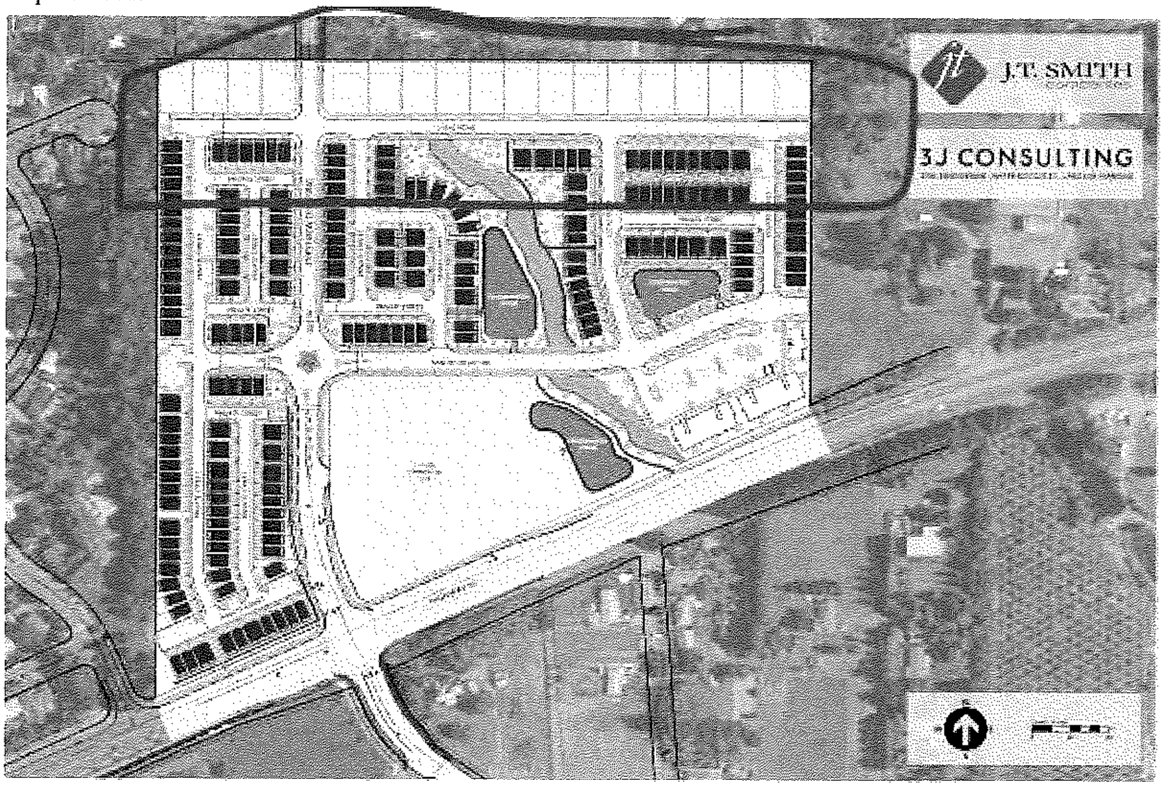
Doug Rux
Community Development Director
City of Newberg
503.537.1212
Doug.rux@newbergoregon.gov

Sent from my iPhone

Begin forwarded message:

> **From:** jessica poetzman <jepoet23@gmail.com>
> **Date:** July 21, 2018 at 4:28:13 PM PDT
> **To:** Doug Rux <Doug.Rux@newbergoregon.gov>
> **Subject: Saving Healthy Trees**
>
> Hello, I go to Newberg High School. I was looking at the planned houses after someone mentioned it and I felt the need to write with a few complaints. Recently a lot of trees have been taken down in town due to growth but I don't

think that should be the case anymore. We are lucky to live in an area with so much natural beauty and it should all be preserved.



CRESTVIEW CROSSING PLANNED DEVELOPMENT

This specific part is what I'm talking about. It looks to be only 18 homes which doesn't seem justifiable for a mini forest to be cut. Just wanted to put that out there!

Sent from my iPhone

Keith Leonard

From: Doug Rux
Sent: Saturday, July 21, 2018 3:49 PM
To: Keith Leonard
Cc: Andrew Tull; Michael Robinson
Subject: Fwd: Crestview Planned Housing

I revived this email Saturday on Crestview Crossing.

Doug Rux
Community Development Director
City of Newberg
503.537.1212
Doug.rux@newbergoregon.gov

Sent from my iPhone

Begin forwarded message:

> **From:** Cooper Foushee <cooperfoushee123@gmail.com>
> **Date:** July 21, 2018 at 1:41:09 PM PDT
> **To:** doug.rux@newbergoregon.gov
> **Subject: Crestview Planned Housing**
>
> Hi I just had a few ideas for the planned neighborhood because it's still in planning. I think the houses on the backend of the lot shouldn't be built and the natural trees should be kept and used for a walking trail possibly. The natural forest we still have left in town should be completely preserved because once it's gone it's gone. Houses can always be built somewhere else too. Hopefully this is taken into consideration because other people my age at the high school don't like the idea of more trees being torn down for houses. Thank you!
>
> Sent from Coopers iPhone

July 23, 2018

Community Development Department
P.O. Box 970
414 E. First Street
Newberg, Oregon 97132

To Whom It May Concern:

As long time residents of Oxberg Lake Estates we have several concerns about the proposed development to be located behind our property.

Our first concern is maintaining the wonderful livability of our neighborhood. We are isolated from transient vehicle and pedestrian traffic. Our neighborhood is a relaxing place to walk without concern for safety from cars. We know our neighbors and the many other people who use our streets from adjacent neighborhoods. We have a strong neighborhood watch program, but without a barrier and sound wall between our neighborhood and the new development our livability will be lowered by uncontrolled access through our properties. Trespassing and other crimes will increase without some form of restriction.

Our second, and most important concern, is protecting and maintaining our level and quality of water in our aquifer. The new development would eliminate wetlands and redirect water that normally filters into the aquifer that we use to supply our 30 homes through one well. The current wetlands and other water run-off from adjacent fields provide a critical source of water to our aquifer and must not be eliminated. This water issue must be addressed to the satisfaction of the Oxberg Water Company and the Oxberg Lake Estates Homeowner's Association.

We recognize Crestview Drive will be completed through to Highway 99, but the livability, safety, and water are critical components to our neighborhood.

Thank you,
Blake and Diane Williams
4500 NE Blue Heron Ct.
Newberg, Oregon 97132

July 28 2018

Attention Newberg City Planners   Re: Development @ 4504 E Portland Rd.

We are writing this in hopes you will consider the following items that are of considerable concern to us as we are directly abutting this development.

!. How this project will affect our water supply to the homes in Oxberg Lakes Estates if the wet lands are destroyed.

2. That the developer abide by the same standards set by the Springbrook Master Plan.

3. A roundabout be on Crestview at Northern part of the project.

4. The plan of the previous developer included a Wall on the Northern boundrary of the project.

Sincerely;

Dale Palmer Doris I. Palmer

Dale & Doris Palmer
4408 Birdhaven Loop

City of Newberg
Community Development Department
PO Box 970
Newberg, OR 97132

RECEIVED
AUG 01 2018
Initial:

7/28/2018

To the City Council:

Some ten years ago an exceptional City Manager, Jim Bennett, touched greatness. Under his leadership problems that had plagued Newberg for decades were resolved because all the involved parties agreed to work together to solve them. Thanks to mutual good faith and hard work, the result is what is now known as "The Five Party Team" agreement.

The Team had six official members, The City, The County, Oxberg Lakes Homeowners (OLHA), and three property developers. The State was not a member, but it made inputs and provided expertise that helped with road infrastructure and traffic issues. Experts and Attorneys helped.

At the time I was President of OLHA. I testified at some 35 hearings, some of which ran until 2 AM, each time speaking in favor of developing the high value properties adjacent to us and the infrastructure needed to support Newberg's future growth.

The result was a miracle, one that was precedent-setting for Newberg, the County, and the State. Rather than the typical staff-driven piecemeal approach to cram in some development, this time all the people involved and effected got involved and drove the plan (with assistance from city and county planners) to assure the best possible outcomes.

No one got everything they wanted, but we got a plan that we could live with. It was signed by all parties. The resultant plan was published in the Newberg Graphic. One good part was a transfer of Crestview from the County to the City that did not destroy our community and met or exceeded design standards.

Newberg got the road access it wanted and the right to run a waterline down our street. We got a road we could live with **AND THE BEST PRACTICES AGREEMENT to protect the aquifer for our water system**. The latter was a proud day for everyone. It was meaningful environmental protection and very much in the spirit of the old Oregon.

There is a lot of misunderstanding about our water system. Development in Newberg has, over the years, destroyed many private wells. That's irrelevant. Our system is a State Licensed commercial water system, one of three in the County. As such, we are required by law to protect our aquifer. In water law first is everything and our system predates the State of Oregon.

Perhaps best of all for Newberg, the Five Party Team plan was **affordable**. Having an integrated plan paid for infrastructure that allowed many developments, with many more to follow. The first phase paid for itself. Barely. The numbers were thin but workable.

Alas, what was planned never got built. Administrations changed, the economy collapsed, and except for some "shovel ready" money that built out a short section of road through OLHA, everything stopped.

It seems that now we are back to square one. I am concerned. It seems betrayal is afoot. OLHA has been forced to retain legal counsel. Several things were alarming.

Apparently, the current developer's interpretation of "Best Practices" (it was a signatory) is to fill the recharge zone for our aquifer with **dirt** (5 acres of fill, for 7 acres of wetlands!) and to divert as much of our water away as possible so they can cram in more development.

A strange off-the-record public (but not official) meeting was held by the developer in our local fire house on May 14th. This was not recorded, but the room was full, I was there, and names were taken.

You should invite all who attended to testify at length to the City Council. Suffice it to say that many issues were raised, credible answers were lacking, and the developer seems to be depending on grants of taxpayer money to generate profit and make their numbers work.

Most in the room expressed skepticism or opposition. The developer's response was that they were doing the pubic a favor by even having the meeting, and they were not required to tell us anything. In short, "We're going to do it anyway."

My comment at the meeting was that a piecemeal approach, like the one being pursued, would likely create more problems than it solved, and that the Five Party Team agreement and plan should be revisited. I also said that if the Best Practices Agreement was violated and our water system was threatened, my **guess** [as a private citizen and homeowner] was that OLHA would have to assert our legal rights.

Even more alarming is that when our board called our land use lawyer from a decade ago they didn't respond for a time. When they did, it was to report that a conflict existed. It seems that

OUR LAW FIRM HAS BEEN RETAINED BY **THIS DEVELOPER** TO REPRESENT **THEM** FOR **THE SAME PARCEL**.

What a remarkable coincidence. Such a conflict raises all sorts of legal red flags and demonstrates either monumental incompetence or bad intent.

In summary:

- The plan we heard on May 14th was not appealing. It raised concerns.
- The developer is desperate to get this plan approved. All the other developers have distanced themselves. Follow the money and look at the numbers.
- I strongly suggest the City Council and the County should get involved, become familiar with the Five Party Team agreement, and consider other options.
- Please do not leave this to staff. Getting the infrastructure right has been a major issue for Newberg for some 40 years. This issue should not be driven by one developer and one small parcel. Get broader opinions and plans. As before, this development could be one piece of a plan, given the use of BEST PRACTICES to protect our aquifer.
- Traffic calming on the border of OLHA was also part of the Five Party Team agreement. This was implemented on our section of the road, but it still needs to be put in place on the adjacent parcel.
- Whatever you do, please do not destroy our water system.

Thank you for your interest and attention.

Sincerely,

Pat Trudel

John and Pat Trudel
4303 NE Birdhaven Loop
Newberg, OR 97132

City of Newberg
Community Development Department
PO Box 970
Newberg, OR 97132

7/28/2018

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- Whatever you do, please do not destroy our water system.

Thank you for your interest and attention.

Sincerely,

Pat Trudel

John and Pat Trudel
4303 NE Birdhaven Loop
Newberg, OR 97132

RECEIVED

JUL 31 2018

Initial: ______

RE: File No.PUD18-0001/CUP18-0004

To Whom It May Concern,

I am a resident of Oxberg Lake Estates located just north of the planned development referenced above. I would like to state for the record my concerns regarding the development as it is currently proposed.

The most pressing issue as I see it is the planned fill of the existing wetland and rerouting of the water away from the recharge zone for our well system and the eventual drainage into the city's storm water system. The HOA for this community actually operates a state licensed water company and provides safe clean drinking water for residents both within the association as well as residences located nearby. It is my belief, based on previous testimony when a development was first planned for this property, that the activity currently proposed would significantly harm our water system and jeopardize our water company.

When looking at the 5 party agreement that was signed over a decade ago and which included city, current developers and this association - it was agreed to that "best practices" would be employed when deciding how to proceed with regards to the wetland and our water supply. Just recently, I spoke on behalf of the HOA at the Springbrook Master Plan meeting in front of the planning board and stated clearly that the developers for SMP had set the gold standard for what "best practices" meant - setting aside a full 1/3rd (150 acres) of the property for water resource preservation and as such, will be left undeveloped. I implored then as I do now that the planning board accept nothing less than that standard as it pertains to the Crestview Crossing project as well.

Furthermore, the other issues with this development as I see it pertains to the issue of "traffic calming measures". Again, everyone acknowledged in the 5 party agreement that roundabouts were needed to limit both size (large tractor trailers) and speed through our community as well as neighboring communities and the placement of the roundabouts was key to achieving this. In the current proposal, the planned roundabout to the northwest is not addressed (as I understand it, that is part of the SMP) but also in the current proposal, the roundabout which was supposed to be located "immediately to the south" of our community has been moved further south than what was previously agreed to - reducing or negating any benefit of traffic calming measures previously agreed to.

There is no question this as a direct violation of the 5 party agreement. It should be noted that the developers were made aware of the issues to both of my concerns when they unveiled the new improved proposal at a community meeting in May - and it's a shame to see neither were addressed in any meaningful manner. It's up to the planning board to seek the answers and remedies to both these issues.

Finally, the concern of a physical separation between the existing development (Oxberg) and the proposed development is still undefined. While this doesn't concern me directly, it does affect my neighbors and there needs to be specifics laid out in how the properties adjacent to the development will be separated - whether it be a wall, natural barrier or what have you.

I appreciate and applaud all the efforts by the planning board of Newberg. This is not an easy task- and while I'm sad to see we wont be getting the commercial development of prime commercial property as once was proposed - I do ask that they strongly consider rejecting the proposal as submitted. Newberg has a rich history of protecting the environment and putting the residents first and foremost ahead of any new developments.

As you look at this proposal, it doesn't meet the needs of Newberg's existing residents - some of which have called Newberg home for more than 60 years. Crestview Crossing is the gateway to the Allison and as such should be planned with the understanding that what we choose to do now will forever have an impact on the city and its long time residents. The decision to fill in wetlands with little consideration as to the impact on surrounding communities should not be taken lightly.

I ask that impartial experts review the wetland with an updated survey of the area and come to a clear understanding of the expected impact on our aquifer, positive consent from all adjacent homeowners and traffic calming measures as agreed to installed. I would also ask that should you proceed with the development as proposed, and should there be negative impact on our aquifer to the extent that it becomes no longer viable - there needs to be a compensation package or bond agreed to by both parties.

Again, thank you for your consideration in this matter and I ask that you do what's right for Newberg in the long run and not look at the short term gain exclusively.

Mark Wagner
4403 NE Birdhaven Loop
Newberg, OR 97132

RECEIVED

AUG 1 2018

Initial:

July 31, 2018
Written Comments: PUD 18-0001/CUP18-0004
City of Newberg
Community Development Department
PO Box 970
Newberg,OR 97132

To whom it may concern,

The people of Newberg need to decide what is to be built across the street from our hospital not a for profit developer from Lake Oswego. The new Springbrook road will be the gateway to the Allison Hotel & Spa and future businesses on North Springbrook. So it is important that the Crestview crossing be as aesthetically appealing as possible.

The highest and best use for a property located across the street from a hospital, would be a condominium type retirement village with common lawns to grace our new entry into the city of Newberg. The proposed high density housing project for the Crestview crossing seems to be one that could be located elsewhere in the city, not at the gateway, perhaps along the new bypass.

In the case of an economic downturn, which is always a possibility, some of the new owners of the proposed high density housing project may default on their loans which would in turn create an absentee landlord neighborhood thus sending the gateway to Newberg into a decline and setting the tone for future developments and the economic status of Newberg.

The Lake Oswego developer proposes filling in and paving over our Newberg wetlands to make the development more profitable. A viable option would be for the city to trade a portion of the park on Vittoria for the wetlands and in turn create a park on the wetlands. Given the nature of wetlands the park need not be a conventional park with little more than grass and a basketball half court. The alternative wetland park could be a Japanese style garden with paths, bridges, benches, rock gardens, sculptured trees, tall grasses, and, of course water. This style park would be a source of beauty for the community at large.

In summary, the Lake Oswego developers should not determine the future composition of our Newberg community. The highest and best use would be a retirement community accented by an adjoining Japanese garden with the high density housing to be located along the bypass.

Sincerely,
Terry Coss

Terry Coss

City of Newberg
Community Development Department
File NO: PUD 18-0001/cup 18-0004
August 1, 2018

Newberg Planning Commissioners,

I have concerns with the filling in of wetlands on the proposed development. There are 7 acres of wetlands on this property I understand that 5 of those acres will be filled in as the land is developed.

I have enclosed for the records a wetlands study of tax lot number 1100. This study was in the hands of the Department of State Lands for many years. Janet Morlan, Wetlands Program Manager for the State of Oregon had questions regarding this application, it is as important today as it ever was. This file is one of the reasons this land has been on hold for development for many years. Unfortunately for the developer the previous land owner had denied there were 7 acres of wetlands in public testimony.

This wetland is a tributary to Springbrook Creek. Springbrook Creek flows the entire length of our property at 30230 NE Benjamin Road, it flows under our driveway into the 1 acre pond that is part of the National Historic Wetlands. It then flows under 99W into the ponds located on the South side of 99W continuing to flow into the Willamette River. Any disturbance to the wetlands on this developed property could impact the surrounding tributary, creeks and properties. The filling in should not be allowed for this development, the wetlands should be preserved.

Also the filling of the wetlands will affect the aquifer that provides water to the Oxberg Water Company and the 39 residents that rely on the well. The cost if damaged will ultimately need to be borne by the City of Newberg and the developer.

The water impact to Oxberg's water rights, neighbors, streams corridors and creeks must be protected. Any damage could be very costly to the city.

Respectfully submitted,

Vicki Shepherd
30230 NE Benjamin Rd
Newberg, OR 97132

RECEIVED
JUL 31 2018
Initial:

Enclosed: 52 page report

Oregon
Theodore R. Kulongoski, Governor

Department of State Lands
775 Summer Street NE, Suite 100
Salem, OR 97301-1279
(503) 378-3805
FAX (503) 378-4844
www.oregonstatelands.us.

RECEIVED

JUL 31 2018

Initial: ____________

February 4, 2008

Tim Speakman
New B. Properties, LLC
3401 SW Huber Street
Portland, OR 97219

Re: Wetland Delineation Report for 4505 E Portland Rd, Newberg; Yamhill County; T 3S R 2W Sec. 16 Tax Lots 900, 1000 & 1100; WD #07-0345

Dear Mr. Speakman:

The Department of State Lands has reviewed the wetland delineation report prepared by Schott and Associates for the site referenced above. Based upon the information presented in the report, we concur with the wetland and waterway boundaries as mapped in Wetland Map Pages 1 of 3 and 3 of 3 of the report. Within the study area, three wetlands (totaling approximately 2.24 acres) and two waterways within the mapped wetlands were identified. The wetlands and waterways are subject to the permit requirements of the state Removal-Fill Law. A state permit is required for cumulative fill or annual excavation of 50 cubic yards or more in the wetlands or below the ordinary high water line (OHWL) of a waterway (or the 2 year recurrence interval flood elevation if OHWL cannot be determined).

This concurrence is for purposes of the state Removal-Fill Law only. Federal or local permit requirements may apply as well. The Army Corps of Engineers will review the report and make a determination of jurisdiction for purposes of the Clean Water Act at the time that a permit application is submitted. We recommend that you attach a copy of this concurrence letter to both copies of any subsequent joint permit application to speed application review.

Please be advised that state law establishes a preference for avoidance of wetland impacts. Because measures to avoid and minimize wetland impacts may include reconfiguring parcel layout and size or development design, we recommend that you work with Department staff on appropriate site design before completing the city or county land use approval process.

This concurrence is based on information provided to the agency. The jurisdictional determination is valid for five years from the date of this letter, unless new information necessitates a revision. Circumstances under which the Department may change a determination and procedures for renewal of an expired determination are found in OAR 141-090-0045 (available on our web site or upon request). The applicant, landowner, or agent may submit a request for reconsideration of this determination in writing within 60 calendar days of the date of this letter.

Thank you for having the site evaluated. Please phone me at 503-986-5236 if you have any questions.

Sincerely,

Janet C. Morlan

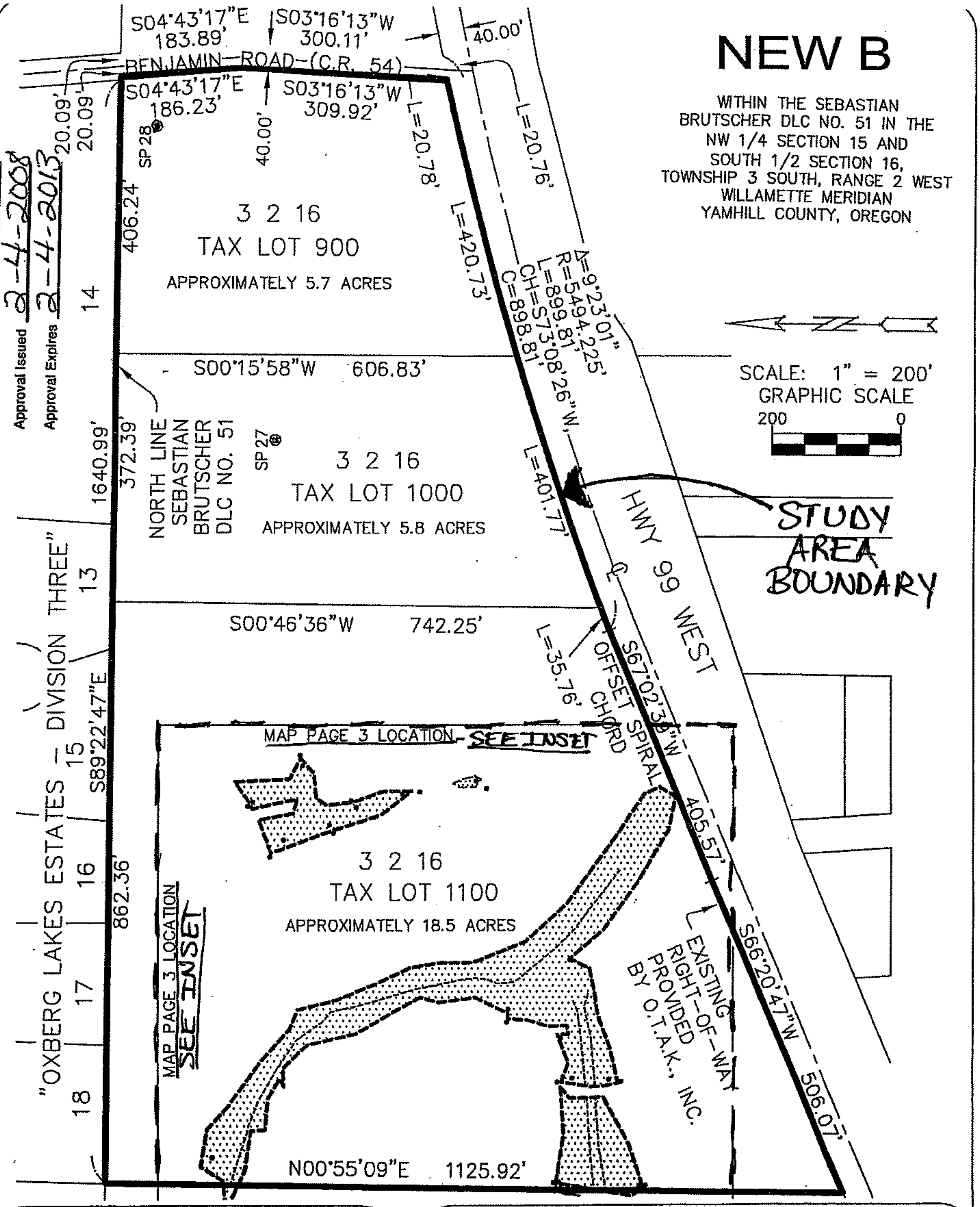
Janet C. Morlan, PWS
Wetlands Program Manager

Enclosures

cc: Claudia Steinkoenig, Schott and Associates
City of Newberg, Planning Department
Tina Teed, Corps of Engineers
Carrie Landrum, DSL

NEW B

WITHIN THE SEBASTIAN BRUTSCHER DLC NO. 51 IN THE NW 1/4 SECTION 15 AND SOUTH 1/2 SECTION 16, TOWNSHIP 3 SOUTH, RANGE 2 WEST WILLAMETTE MERIDIAN YAMHILL COUNTY, OREGON

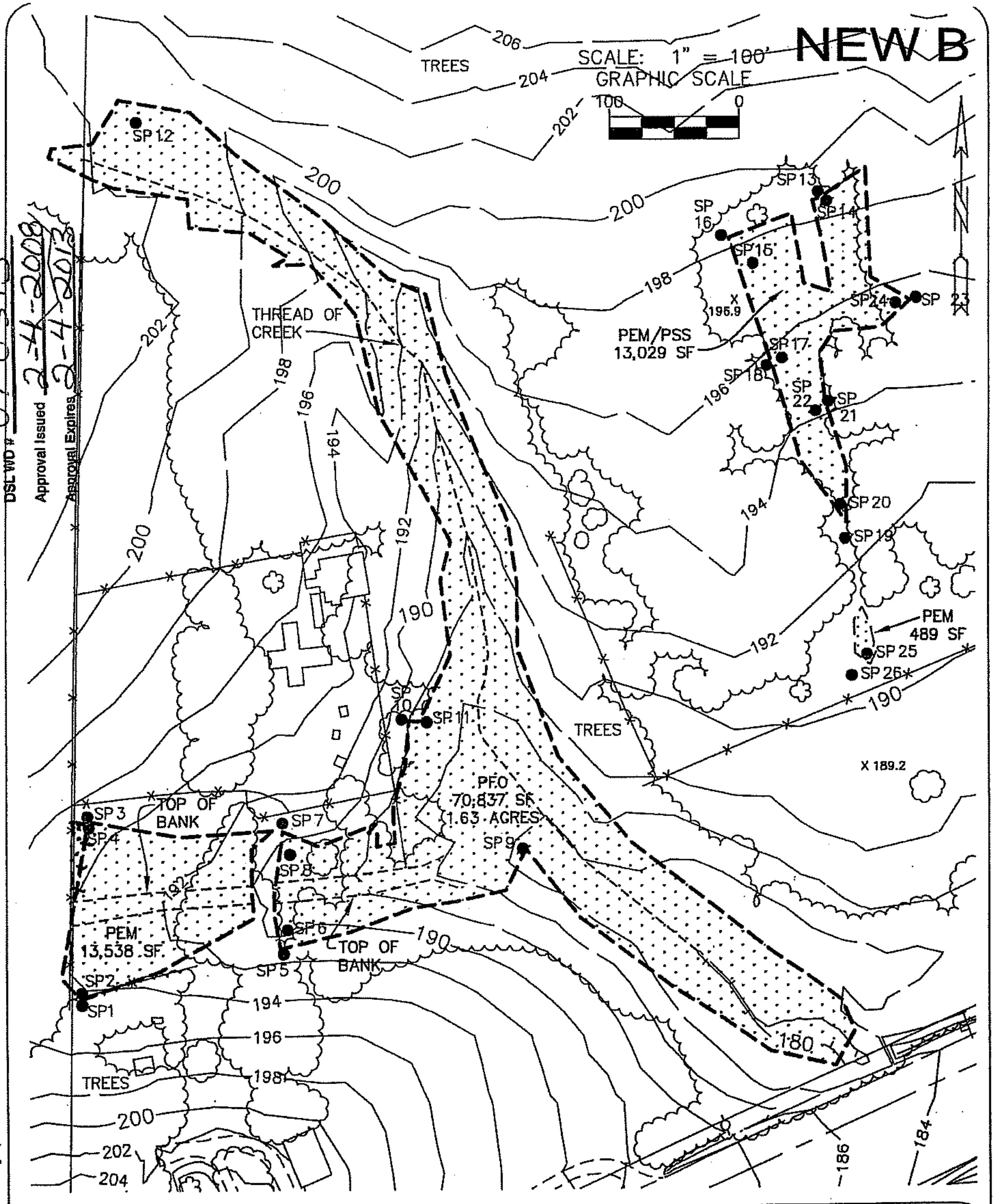


DSL WD # 07-0345
Approval Issued 2-4-2008
Approval Expires 2-4-2013

DRAWN BY: MEM DATE: 4-12-07
REVIEWED BY: MRG DATE: 4-12-07
PROJECT NO.: 0428-0005
SCALE: 1"=200'
WETLAND MAP PAGE 1 OF 3

alpha
COMMUNITY DEVELOPMENT

N:\proj\428-005\dwg\Survey\428-005 WETLAND.dwg – SHEET: 8x11 Apr 23, 2007 – 1:00pm mem



DSL WD # 07-0345
Approval Issued 2-4-2008
Approval Expires 2-4-2013

N:\proj\428-005\dwg\Survey\428-005 WETLAND.dwg - SHEET: 8x11 Apr 23, 2007 - 1:00pm mem

DRAWN BY: MEM DATE: 4-12-07
REVIEWED BY: MRG DATE: 4-12-07
PROJECT NO.: 0428-0005
SCALE: 1"=100'
WETLAND MAP PAGE 3 OF 3

alpha
COMMUNITY DEVELOPMENT

Site Data Sheet

Project Name:	New B.
Project Number:	1985
Date of Site Visit:	February 21 & 28, 2007
Applicant:	Tim Speakman
Applicant's Address:	3401 SW Huber Street Portland, Oregon 97219
Owner(s):	Same
Owner(s) Address:	
State:	Oregon
County:	Yamhill
Site Location:	East of Victoria Way, North of 99W
USGS Quadrangle:	Newberg
Latitude/Longitude:	45°18.738'N / 122°55.870'W
Tax Map Information:	3S2W Sect.16 TL 1100, 1000, 900
Watershed:	Willamette River
Adjacent Waterbody:	Tributary of Spring Brook Creek
In the Floodplain:	Yes
Topography:	Gentle to moderate slopes
Site Zoning:	Agriculture/Forestry Small Holding (AF-10)
Proposed Use:	Residential/Commercial
Present/Past Use:	Rural/farmed
Surrounding Usage:	residential to the north and west/ rural to the east
Determination:	2 unnamed tributaries of Spring Brook Creek, 0.32 acre PEM wetland, 1.63 acre PFO wetland, 0.29 acre PEM/PSS wetland
Days Since Last Rain:	0
Mapping accuracy:	Alpha Community Development, PLS

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(A) Site Description

The 30-acre project area is located on the eastern edge of Newberg in Yamhill County, Oregon (SW1/4,NE1/4 Sec. 16, T3S, R2W TL#900,1000, 1100)(Figure 1) just outside of the city limits. The southern boundary abuts city limits. The study area is west of Benjamin Road and east of Victoria Way. Hwy 99W forms the southern property boundary. The new Providence Hospital (zoned I- Institutional) is to the southwest. The three tax lots that comprise the study area are designated as Agricultural/Forestry Small Holdings (AF-10).

For the purposes of this report, the project area will be described by tax lot. Tax lot 900 is located west of Benjamin Road and north of Highway 99 West. The lot is approximately 5.7 acres and has two homes and two large barns on it. The topography has gentle to moderate slopes to the east. The majority of the property consists of horse pasture comprised of grasses and forbs that include colonial bentgrass (*Agrostis stolonifera*), Kentucky bluegrass (*Poa pratensis*), tall fescue (*Festuca arundinacea*) and white clover (*Trifolium repens*) as dominants. Ornamental species were observed around the homes.

Tax Lot 1000 is located west of tax lot 900. It is 5.8 acres and has a vet clinic and associated buildings in the center of it. The topography slopes gently to the south, southeast. Fenced pastures are located on the south and north end of the property. Dominant vegetation includes bentgrass, Kentucky bluegrass, tall fescue and orchard grass (*Dactylis glomerata*). Groupings of Oregon Oak (*Quercus garryana*) and Douglas fir (*Pseudotsuga menziesii*) were scattered along the northern and western property perimeter.

Tax lot 1100 is 18.5 acres and located on the west end of the study area. Topography on the west end slopes gently east to two unnamed tributaries. The mid and east section of the tax lot slopes predominantly south. There is an existing residential home on the southwest end of the property and some outbuilding north of the home. A small drainage located behind the home flows to the east and joins a larger tributary of Spring Brook Creek which flows south to the Willamette River. Three meadow communities were identified on site. The first is along the western property boundary. The second is located southeast of the residence and the third is on the south end of the tax lot. The vegetation in the meadow communities consisted of grasses and forbs that included tall fescue, Kentucky bluegrass, bentgrass, orchard grass (*Dactylis glomerata*), and white clover, queen Anne's lace (*Daucus carota*) and cat's ear (*Hypochoeris radicata*) as subdominants. An upland forest community was located on the northern property boundary and included Oregon oak, Douglas fir, and bigleaf maple (*Acer macrophyllum*).

The dominant species found in the shrub layer included Service berry (*Amelanchier alnifolia*), Indian plum (*Oemleria cerasiformis*), beaked hazelnut (*Corylus cornuta*) and common snowberry (*Symphoricarpos albus)*. Sword fern (*Polystichum munitum*) and English ivy (*Hedera helix*) were the dominants in the herbaceous layer.

A forested riparian area was located adjacent to the largest tributary. The tree species in the riparian forest include Oregon ash (*Fraxinus latifolia*) and willow (*Salix sp.*) Shrub communities varied from area to area along the drainage. Portions of the shrub layer consisted of a dense layer of Himalayan blackberry interspersed with dense patches of Nookta rose (*Rosa nutkana*) and Douglas spiraea (*Spiraea douglasii*). Species identified in the herbaceous layer included slough sedge (*Carex obnupta*), water parsley (*Oenanthe sarmentosa*) and bentgrass.

The National Wetland Inventory (NWI) map for Newberg shows a tributary of Spring Brook Creek on the west end of the study area. There is no Local Wetland Inventory (LWI) for the area. The Yamhill County Soil Survey indicated two mapping units on the property that include Woodburn silt loam and Amity silt loam. The topographic map shows a site gently sloping north, northeast.

Project purpose

The site is proposed for commercial development to service the new hospital across the street and the adjacent residential areas. The developer of the site is currently applying for annexation into the city of Newberg and rezoning designation to Community Commercial.

(B) Wetland Description

Based on soil, hydrology and vegetation data taken on site two unnamed tributaries of Spring Brook Creek, and four wetlands were delineated. Two of the wetlands are adjacent to the tributaries. A 0.31 acres palustrine emergent/RFT wetland is located along a short portion of the smaller tributary on the west end of the property. The second wetland is 1.63 acres palustrine forested/RFT wetland adjacent to the remaining portion of the smaller tributary and the entire length of the larger tributary. The other two wetlands are isolated and located in the north mid-section of the property. The larger wetland is 0.29 acre and classified as palustrine emergent/scrub-shrub/slope wetland. The smaller one is 0.011 acres classified as a palustrine emergent/slope wetland.

A small seasonal drainage channel enters on the southwest end of tax lot 1100. It is the extension of a drainage located on the adjoining property to the west. The hydrology of the channel is associated with stormwater runoff from the neighborhood to the west. The drainage channel is u-shaped with a varying width of 2 to 3 feet and depth of approximately 3.5 feet. It has a mud and small cobble substrate bottom. The drainage flows east and drains into a larger tributary of Spring Brook Creek. Duckweed (*Lemna* *minor*) was observed growing in portions of the drainage. The drainage has a defined channel for approximately 250 feet and then flattens out, draining as surface and subsurface lateral flow into the tributary of Spring Brook Creek.

A larger, unnamed perennial tributary of Spring Brook Creek enters the northwest corner of tax lot 1100 and exits the property on the south side. It flows to the south joining Spring Brook Creek on the south side of Hwy 99W. Portions of the creek are confined to a single channel while other portions of the channel are braided.

Two wetlands were identified adjacent to the two tributaries. The first is a 0.31 acre palustrine emergent (PEM/RFT) wetland. It was located on the west end of the study site where the smaller drainage entered the site. The plant community in this area is a meadow comprised of grasses and forbs. The dominant species are tall fescue and bentgrass. Hydrology for the wetland on the north and south side of the drainage is associated with precipitation, a seasonal high water table and overflow from the drainage during winter high water.

The second wetland is 1.63 acres and forested (PFO/RFT). The dominant tree in the canopy is Oregon ash (*Fraxinus latifolia*). The shrub layer consists of large dense patches of Douglas spirea (*Spiraea douglasii*) and nootka rose (*Rosa nutkana*). The herbaceous layer includes large patches of slough sedge (*Carex obnupta*) and water parsley (*Oenanthe sarmentosa*). Hydrology of the wetland is associated with precipitation, a seasonal high water table and overflow from the drainage during winter high water. The southern end of the drainage is fed by a perennial spring.

The other two wetlands are isolated and located in the north mid-section of the property. The larger wetland is 0.29 acres and classified as palustrine emergent/scrub-shrub/slope wetland. The dominant vegetation in the emergent portion is meadow foxtail (*Alopecurus pratensis*) and bentgrass (*Agrostis stolonifera*). The shrubs in the scrub shrub communities were nootka rose (*Rosa nutkana*) with scattered patches of hawthorn (*Crataegus sp*). The second isolated wetland is immediately below the first. It consists of a small depressional area with colonial bentgrass and meadow foxtail as the dominants.

The analysis of wetlands conducted on this site was based on published methods for implementing Section 404 of the Clean Water Act. The 1987 manual was used to satisfy the requirements of the COE on non-agricultural land. The manual requires three parameters to be examined: vegetation, soils, and hydrology. According to the 1987 manual, independent evidence of hydrophytic vegetation, hydric soils, and wetland hydrology must be present for an area to be declared a wetland. The analysis of wetlands on the project site was conducted by reviewing and analyzing existing site-specific literature and by field investigation.

(C) Site Analysis

The three tax lots that comprise the study area are designated as Agricultural/Forestry Small Holdings (AF-10). There was no evidence of alterations to the drainages observed onsite. The hydrology associated with the smaller drainage is stormwater runoff from the neighborhood to the west.

(D) Site Specific Methods

The Routine Onsite Determination Method (1987 manual, pp. 52-69) was used to determine the State of Oregon wetland boundaries and the Federal jurisdictional wetlands. The entire study area was walked and observed for wetland characteristics. Sample plots were dug and placed in areas determined to meet all wetland criteria. Adjacent plots were placed in the upland.

The first area investigated was located on the west end of the study site. A drainage swale located on the adjacent property to the west extended east into the study area. A delineation for the property to the west was conducted a year ago and is pending review by DSL. The area consists of a grazed meadow community with dominant grasses of bentgrass and fescue. Areas with wetland characteristics extend north and south of the drainage by approximately 30-40 feet. The source of hydrology for the wetland on the north and south side of the drainage is associated with precipitation, a seasonal high water table and overflow from the drainage during winter high water. The area had recently received days of heavy rain so that the ground water table was exceptionally high.

Along the north side of the swale the wetland boundary was determined predominantly by soil and hydrology since the vegetation in both wetland and upland were the same. On the south side of the swale the vegetation was the determining factor. The soil matrix color in the wetland varied between 10YR3/1 with redox concentrations of 10YR3/4 in sample plot 2 and 10YR3/2 with redox concentrations of 10YR3/6 in sample plot 4. Both sample plots had a depth to free water between 6 and 8 inches.

The upland area on the south side of the swale was determined by the vegetation. The topography was slightly higher and Himalayan blackberry formed a dense hedge. Some Douglas fir trees were planted in this area as well. On the north side of the swale the upland area did not have hydric soil or wetland hydrology.

Approximately 130 feet east of the property line a small berm built for vehicle access to the back barn area crosses the drainage and wetland area. The berm has been in place on the property well over fifty years. The drainage crosses the berm via a small culvert. It flows an additional 120 feet before it becomes an undefined channel and flows as broad sheet flow into the other tributary.

The wetland continues past the berm and is located adjacent to the tributaries. The plant community on the east side of the berm slowly transitions from a meadow into a forested community that joins the riparian community along the main tributary. Soils in this portion of the wetland (Sample plot, 8, 9 & 11) predominantly have a matrix value of 10YR3/2 with redox concentrations of 10YR3/6.

The upland edge was obvious by topography as well as vegetation and hydrology. The overstory transitioned from Oregon ash into Oregon oak and Douglas fir on the north end. Further south the vegetation in the upland riparian area had Oregon ash mixed with common snowberry (*Symphoricarpos alba*), beaked hazelnut (*Corylus cornuta*) and Himalayan blackberry. Upland soils observed along the tributaries included matrix colors of 10YR3/3 (sample plot 5), from 0 to 12 inches, 10YR4/2 (sample plot 7) and (10YR3/2) (sample plot 10). No redox concentration were observed within 10 inches and no evidence of wetland hydrology was observed.

The wetland identified in the middle of tax lot 1100 consists of an emergent and scrub shrub wetland. The majority of it is located in a clearing surrounded by dense thickets of English hawthorn, Himalayan blackberry and various overgrown fruit trees. The vegetation in the northern portion of the wetland consisted of scattered dense thickets of nootka rose (*Rosa nutkana*). Meadow foxtail was the dominant grass. The soil matrix color varied between 10YR3/2 and 10YR4/2 with redox concentrations that varied in color. The hydrology of the wetland was associated with overland sheet flow and a seasonal high water table. The wetland was hummocky with slight shift in topography along the upland edge.

The vegetation in the upland area was similar to the wetland vegetation. The upland area had a predominant soil color of 10YR3/2 with no redox concentrations (sample plot 13, 16, 18, 19, 23, 26) and no wetland hydrology.

(E) Deviation

No deviations were observed. The National Wetland Inventory (NWI) map for Newberg did not show any wetlands in the project area. It did show the tributary of Spring Brook Creek on the western portion of the study area. There is no Local Wetland Inventory (LWI) for the area.

(F) Methods of Determining Other Waters of the State

No other waters of the state were observed onsite. The top of bank was defined for the smaller tributary that flow west to east. The larger tributary had the center line mapped for the main branch of the creek, because the mid section is braided.

(G) Additional Info

None.

(H) Statement of Mapping Accuracy

The wetland boundaries were flagged and the flags were surveyed by Alpha Community Development, PLS.

(I) Date of Investigation

The site was visited on February 21 and 28, 2007.

(J) Weather

The weather on the day of the February 21 site visit was cold and rainy. The day before 0.67 inches of rain were recorded at the Forest Grove weather station. 2.48 inches of rain were recorded for the past two weeks.

The weather on the day of the February 28 site visit was cold interspersed with periods of hail, rain and sun. There was 0.26 inches of rain the day prior to the site visit. 3.21 inches of rain were recorded for the past two weeks. This is 52 percent of the average for the entire month. A total of 36.56 inches were recorded since October 1, 2006. This is 115 percent of the water year average.

(K) Results and Conclusions

The National Wetland Inventory (NWI) map did not show any onsite wetlands however it did show a tributary of Spring Brook Creek on the west end of the site. There is no Local Wetland Inventory for the Newberg area. The Yamhill County Soil Survey mapped two soil series on the subject property: Amity silt loam and Woodburn silt loam 0 to 7 percent slopes and 7 to 12 percent slopes. The Amity series is somewhat poorly drained. This soil series is not listed as hydric however it does have hydric inclusions. Some of the soil observed on site matched the Amity series.

Based on soil, hydrology and vegetation data taken on site two unnamed tributaries of Spring Brook Creek, and four wetlands were delineated. The smaller drainage is seasonal, the larger has recently developed a perennial flow. Two of the wetlands are adjacent to the tributaries. A 0.31 acres palustrine emergent/RFT wetland is located along a short portion of the smaller tributary on the west end of the property. The second wetland is 1.63 acres palustrine forested/RFT wetland adjacent to the tributaries. The other two wetlands are isolated and located in the north mid-section of the property. The larger wetland is 0.29 acre and classified as palustrine emergent/scrub-shrub/slope wetland. The smaller one is 0.011 acres classified as a palustrine emergent/slope wetland.

(L) Required Disclaimer

This report documents the investigation, best professional judgment and the conclusions of the investigator. It is correct and complete to the best of my knowledge. It should be considered a Preliminary Jurisdictional Determination of wetlands and other waters and used at your own risk unless it has been reviewed and approved in writing by the Oregon Department of State lands in accordance with OAR 141-090-0005 through 141-090-0055.

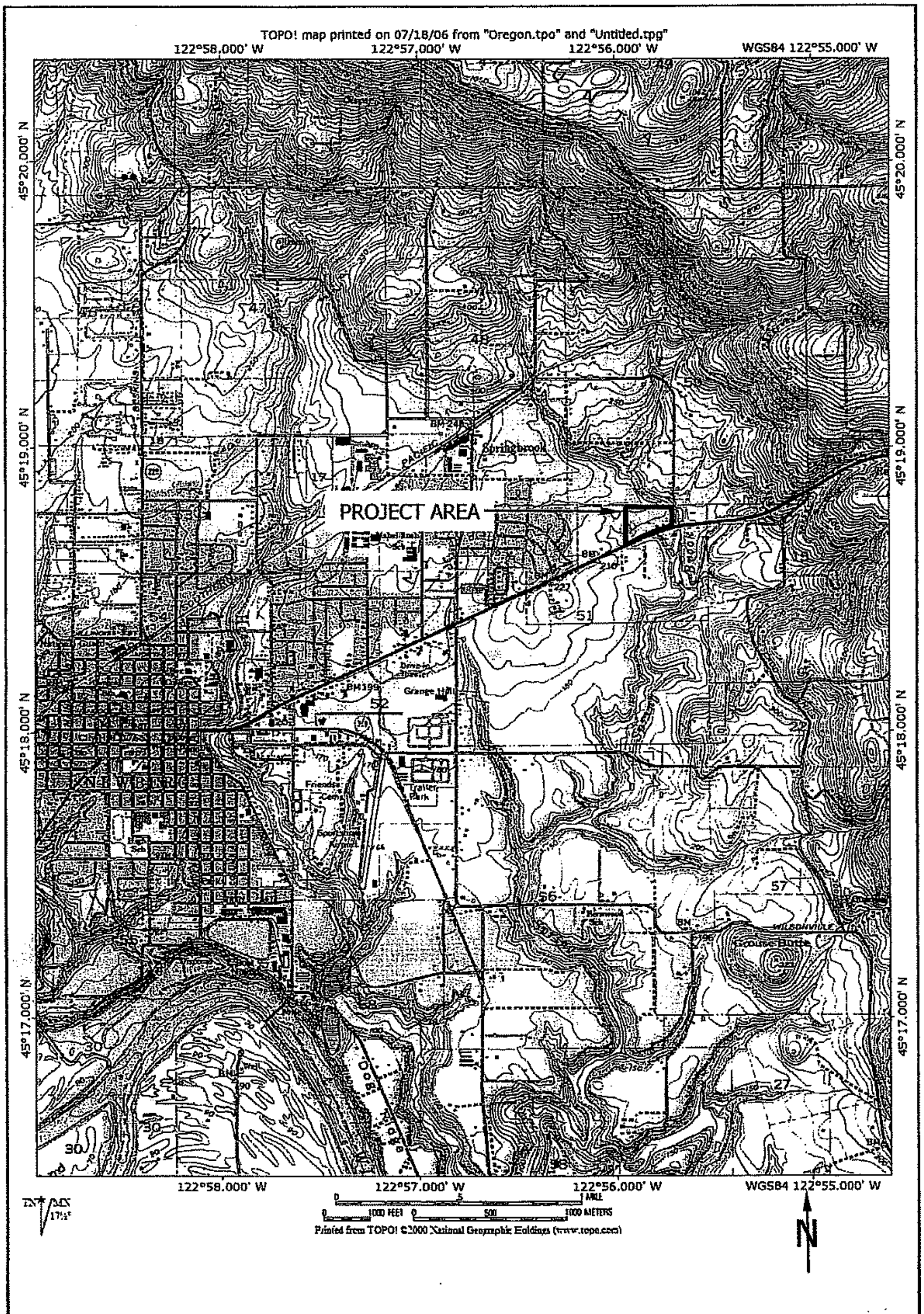

FIGURE 1. SITE VICINITY MAP
S&A #1985

Schott & Associates
P.O. Box 589
Aurora, OR. 97002
503.678.6007

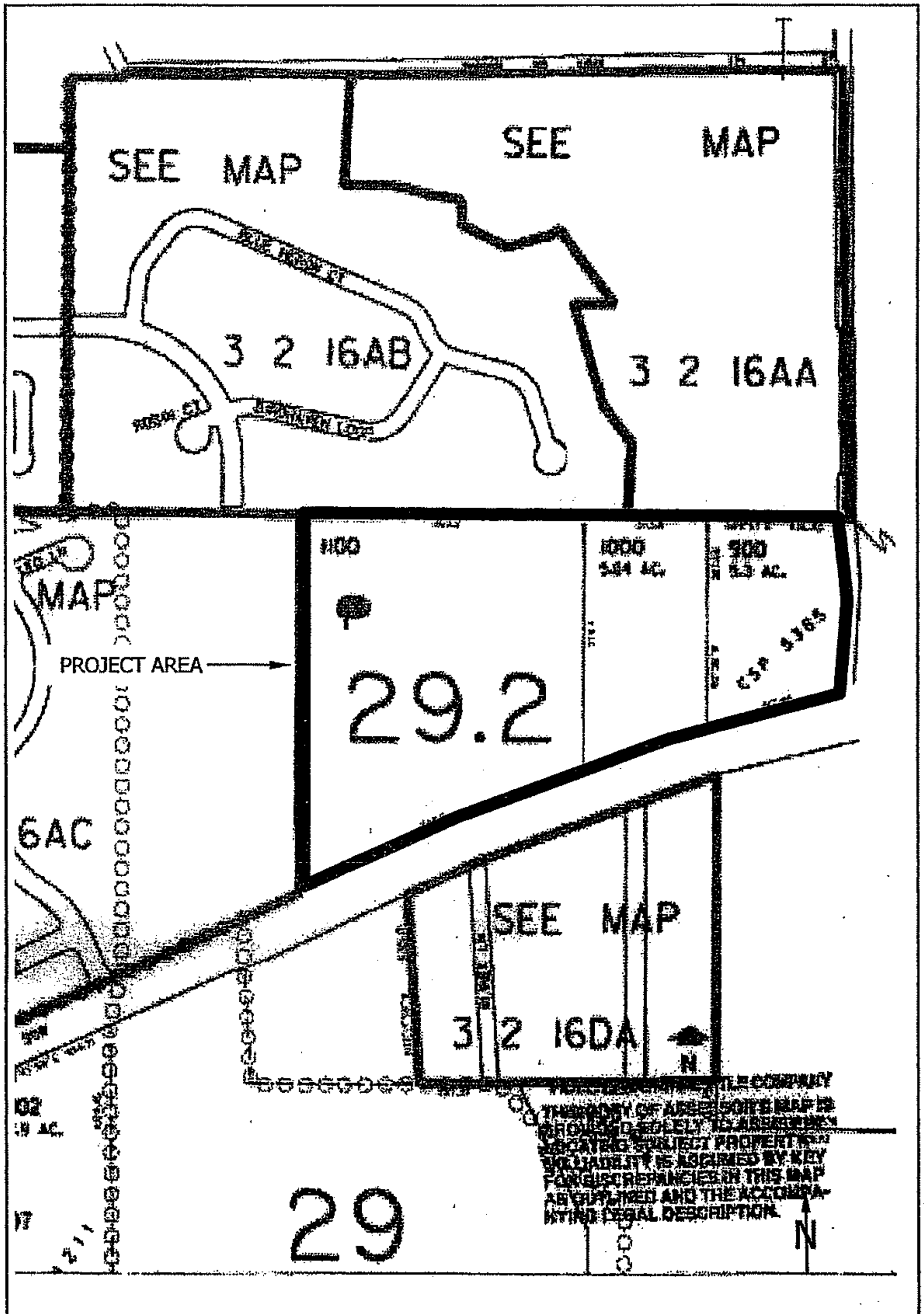

FIGURE 2. TAX MAP
S&A #1985

Schott & Associates
P.O. Box 589
Aurora, OR. 97002
503.678.6007

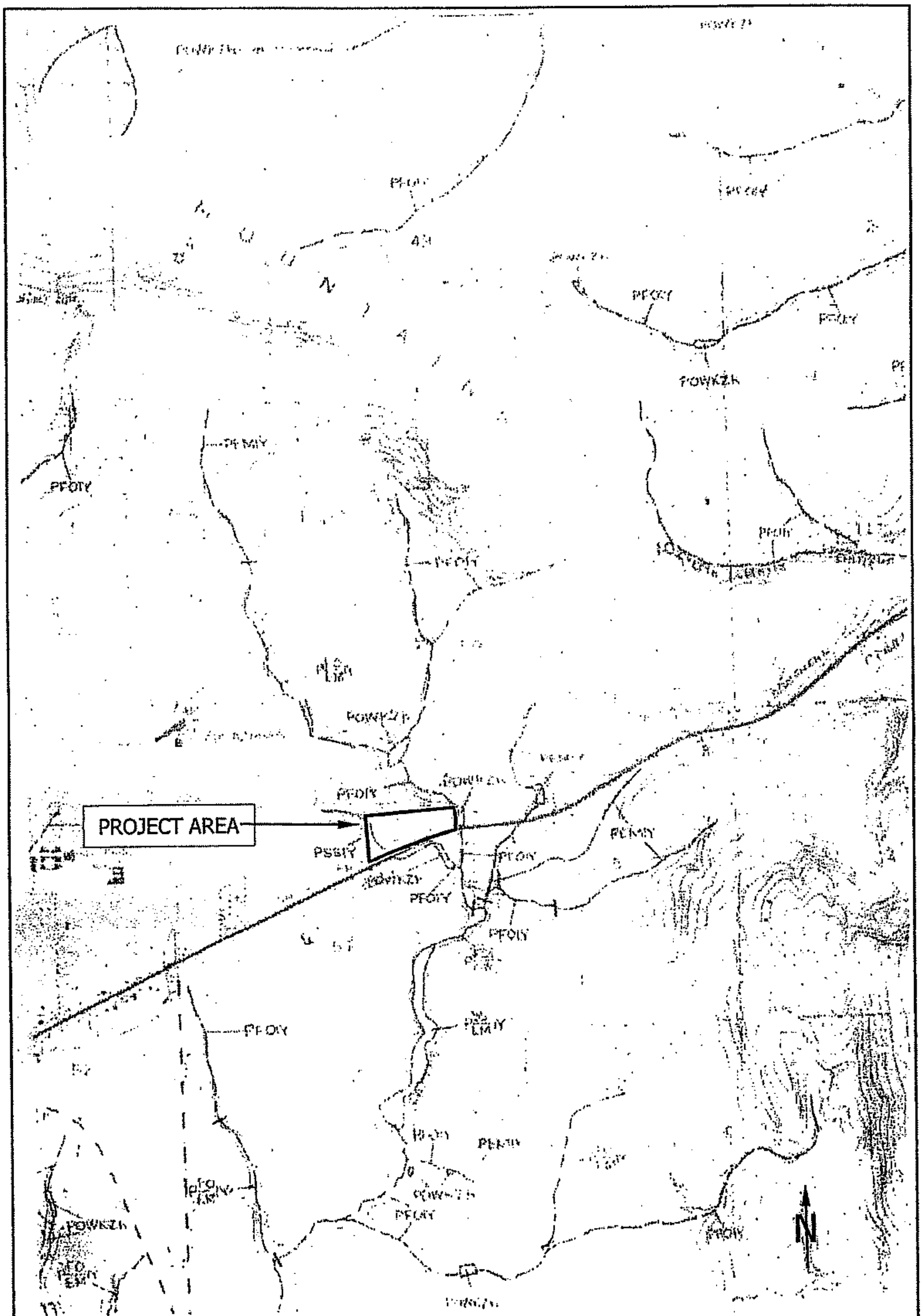

FIGURE 3. NEWBERG NWI
S&A #1985

Schott & Associates
P.O. Box 589
Aurora, OR. 97002
503.678.6007

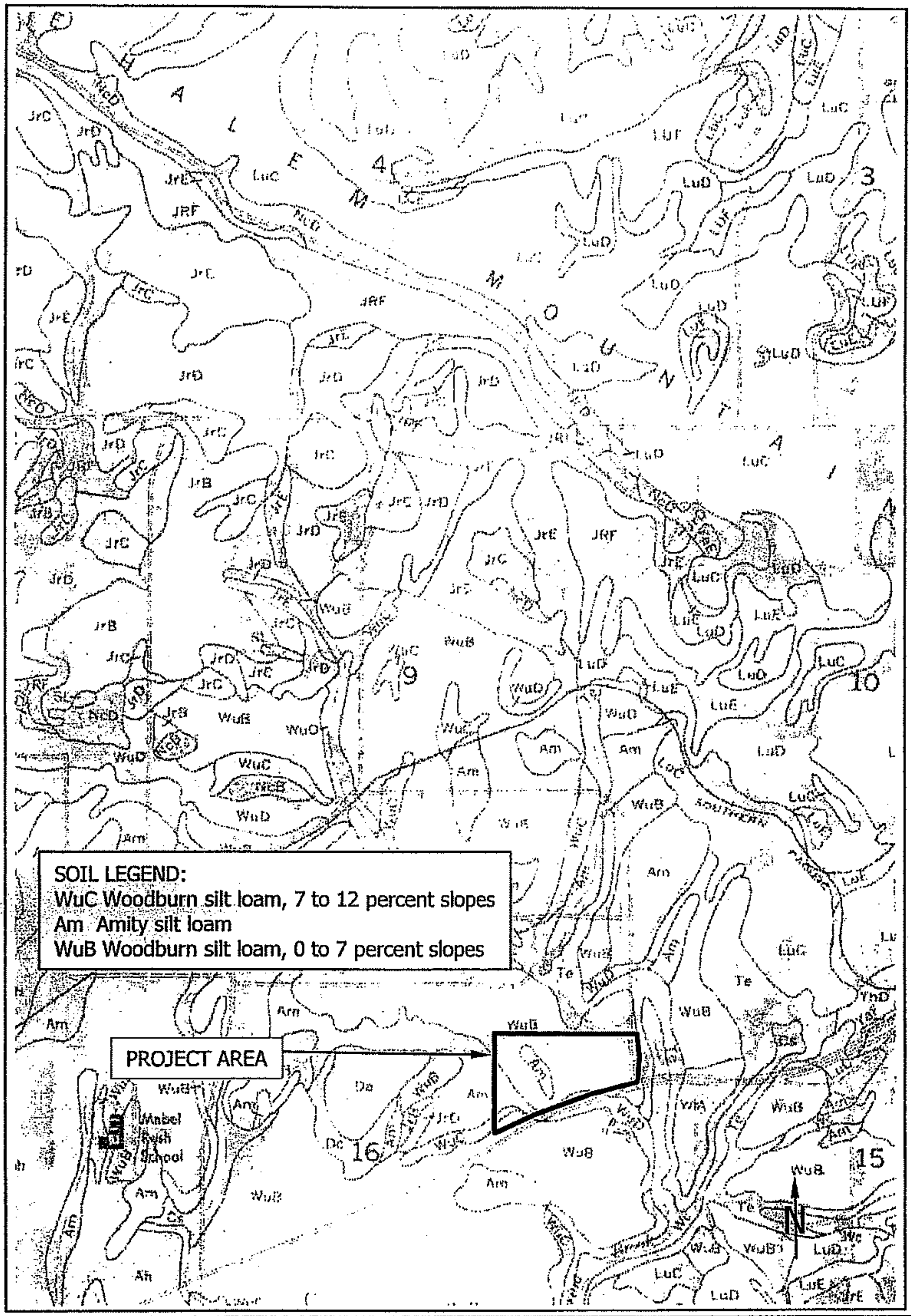

FIGURE 4. YAMHILL COUNTY SOIL SURVEY, SHEET 16
S&A #1985

Schott & Associates
P.O. Box 589
Aurora, OR. 97002
503.678.6007

Data Forms

DEPARTMENT OF STATE LANDS WETLAND DETERMINATION DATA FORM – Quick Method

County: Yamhill	Date: 2/21	City: Newberg	File #:1985

Project/Contact: NewB./CS
Plant Community: meadow
Plot Location: south side of swale
Recent Weather: rainy and cold

Det. By: C. Steinkoenig
Plot #:1

Do normal environmental conditions exist? Y☒ N☐ If no, explain:
Has Vegetation ☐ Soil☐ Hydrology ☐ been significantly disturbed?
Explain:

VEGETATION

Tree Stratum

Total Plot Cover:5	2.5 = 50%	1. = 20%
		Status/Raw % Cover
1. *Pseudotsuga menziesii*		FACU 5*
2.		
3.		
4.		
5.		

Sapling/Shrub Stratum

Total Plot Cover:20	10= 50%	4= 20%	Status/Raw % Cover
1. *Rubus discolor*			FACU- 20*
2.			
3.			
4.			
5.			

Herb Stratum

Total Plot Cover:100	50 = 50%	20 = 20%
		Status/Raw % Cover
1. *Festuca arundinacea*		FAC- 100*
2.		
3.		
4.		
5.		
6.		
7.		
8.		
9.		
10.		
11.		
12.		

Hydrophytic Vegetation Indicators:
☐ > 50% of dominants are OBL, FACW or FAC Percent of Dominant <u>Species</u> that are OBL, FACW, FAC (not FAC-):50
Other hydrophytic vegetation indicators:
Criteria Met? ☐Yes ☒ No **Comments:** Hydrophytic veg. not exceeding 50 percent.

SOILS

Map Unit Name: Amity silt loam
On Hydric Soil List? ☐ Yes ☒ No
Drainage Class: Somewhat poorly drained
Has Hydric Inclusions? ☒ Yes ☐ No

Depth Range of Horizon	Matrix Color	Redox Concentrations	Redox Depletions	Texture
0-8	10YR3/1	10YR3/4 FFD		S CL
8-16	10YR3/1	10YR3/4 CMP		CL

Hydric Soil Indicators:
☐Histosol
☐Histic Epipedon
☐Sulfidic Odor
☐Reducing Conditions (tests positive)
☐Gleyed or low chroma colors
☐Redox features within 10" (e.g., concentrations)
☐Concretions/Nodules (w/in 3", > 2mm)
☐High organic content in surface (in Sandy Soils)
☐Organic streaking (in Sandy Soils)
☐Organic pan (in Sandy Soils)
☐ Listed on Hydric Soils List (and soil profile matches)
☐ Meets hydric soil criteria 3 or 4 (ponded or flooded for long duration)
☐ Supplemental indicator (e.g., NRCS field indicator)

Criteria Met? ☒ Yes ☐ No

HYDROLOGY

<u>Recorded Data:</u>
☐Recorded Data Available ☐Aerial Photos ☐Stream Gauge ☐ Other ☒ No Recorded Data Available

<u>Field Data</u>
Depth of inundation: Depth to Saturation:10" Depth to Free Water:

<u>Primary Hydrology Indicators:</u>
☐Inundated
☒Saturated in upper 12 inches
☐Water Marks
☐Drift Lines
☐Sediment Deposits

Criteria Met? ☒Yes ☐ No

Secondary Hydrology Indicators (2 or more required):
☐Oxidized Root Channels (upper 12")
☐Water-stained leaves
☐Local Soil Survey Data
☐FAC – Neutral Test
☐Other:

Comments: Recent heavy rains and high water table.

DETERMINATION

WETLAND? ☐YES ☒NO **Comments: Area adjacent blackberry thicket and higher topography.**

DEPARTMENT OF STATE LANDS WETLAND DETERMINATION DATA FORM – Quick Method

County: Yamhill	Date: 2/21	City: Newberg	File #:1985

Project/Contact: NewB./CS
Plant Community: meadow
Plot Location: paired with sample plot 1
Recent Weather: rainy and cold
Do normal environmental conditions exist? Y☒ N☐ If no, explain:
Has Vegetation ☐ Soil☐ Hydrology ☐ been significantly disturbed?
Explain:

Det. By: C. Steinkoenig
Plot #:2

VEGETATION

Tree Stratum			
Total Plot Cover:0	0 = 50%	0 = 20%	
			Status/Raw % Cover
1.			
2.			
3.			
4.			
5.			
Sapling/Shrub Stratum			
Total Plot Cover:	= 50%	= 20%	Status/Raw % Cover
1.			
2.			
3.			
4.			
5.			

Herb Stratum			
Total Plot Cover:100	50 = 50%	20 = 20%	
			Status/Raw % Cover
1.*Agrostis stolonifera*			FAC 25*
2.*Poa pratensis*			FAC 10
3.*MOSS*			65
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			

Hydrophytic Vegetation Indicators:
☒ > 50% of dominants are OBL, FACW or FAC Percent of Dominant Species that are OBL, FACW, FAC (not FAC-):100
Other hydrophytic vegetation indicators:
Criteria Met? ☒Yes ☐ No **Comments:** Hydrophytic veg. exceeds 50 percent.

SOILS

Map Unit Name: Amity silt loam Drainage Class: Somewhat poorly drained
On Hydric Soil List? ☐ Yes ☒ No Has Hydric Inclusions? ☒ Yes ☐ No

Depth Range of Horizon	Matrix Color	Redox Concentrations	Redox Depletions	Texture
0-7	10YR3/1	10YR3/4 FFF		Si CL
7-16	10YR3/1	10YR3/4 CFD		CL

Hydric Soil Indicators:
☐Histosol
☐Histic Epipedon
☐Sulfidic Odor
☐Reducing Conditions (tests positive)
☒Gleyed or low chroma colors
☒Redox features within 10" (e.g., concentrations)
☐Concretions/Nodules (w/in 3", > 2mm)
☐High organic content in surface (in Sandy Soils)
☐Organic streaking (in Sandy Soils)
☐Organic pan (in Sandy Soils)
☐ Listed on Hydric Soils List (and soil profile matches)
☐ Meets hydric soil criteria 3 or 4 (ponded or flooded for long duration)
☐ Supplemental indicator (e.g., NRCS field indicator)

Criteria Met? ☒ Yes ☐ No

HYDROLOGY

Recorded Data:
☐Recorded Data Available ☐Aerial Photos ☐Stream Gauge ☐ Other ☒ No Recorded Data Available
Field Data
Depth of inundation: Depth to Saturation:2" Depth to Free Water:6"

Primary Hydrology Indicators:
☐Inundated
☒Saturated in upper 12 inches
☐Water Marks
☐Drift Lines
☐Sediment Deposits

Secondary Hydrology Indicators (2 or more required):
☒Oxidized Root Channels (upper 12")
☐Water-stained leaves
☐Local Soil Survey Data
☐FAC – Neutral Test
☐Other:

Criteria Met? ☒Yes ☐ No **Comments: A lot of moss growing on ground.**

DETERMINATION

WETLAND? ☒YES ☐NO **Comments: Wetland criteia is met.**

DEPARTMENT OF STATE LANDS WETLAND DETERMINATION DATA FORM – Quick Method

County: Yamhill	Date: 2/21	City: Newberg	File #:1985

Project/Contact: NewB./CS
Plant Community: meadow
Plot Location: North side of swale
Recent Weather: rainy and cold
Det. By: C. Steinkoenig
Plot #:3

Do normal environmental conditions exist? Y☒ N☐ If no, explain:
Has Vegetation ☐ Soil☐ Hydrology ☐ been significantly disturbed?
Explain:

VEGETATION

Tree Stratum			
Total Plot Cover:0	0 = 50%	0 = 20%	Status/Raw % Cover
1.			
2.			
3.			
4.			
5.			

Sapling/Shrub Stratum			
Total Plot Cover:	= 50%	= 20%	Status/Raw % Cover
1.			
2.			
3.			
4.			
5.			

Herb Stratum			
Total Plot Cover:100	50 = 50%	20 = 20%	Status/Raw % Cover
1.*Agrostis stolonifera*			FAC 80*
2.*Festuca arundinacea*			FAC- 15
3.*Trifolium repens*			FACU+ 5
4.*Daucus carota*			NOL trace
5.*Geranium richardsonii*			trace
6.*Hypochoeris radicata*			trace
7.			
8.			
9.			
10.			
11.			
12.			

Hydrophytic Vegetation Indicators:
☒ > 50% of dominants are OBL, FACW or FAC Percent of Dominant Species that are OBL, FACW, FAC (not FAC-):100
Other hydrophytic vegetation indicators:
Criteria Met? ☒Yes ☐ No **Comments:** Hydrophytic veg. exceeds 50 percent.

SOILS

Map Unit Name: Amity silt loam
On Hydric Soil List? ☐ Yes ☒ No
Drainage Class: Somewhat poorly drained
Has Hydric Inclusions? ☒ Yes ☐ No

Depth Range of Horizon	Matrix Color	Redox Concentrations	Redox Depletions	Texture
0-12	10YR3/2	None		CL L
12-16	10YR4/2	10YR4/4 CCP		Sl Cl

Hydric Soil Indicators:
☐Histosol
☐Histic Epipedon
☐Sulfidic Odor
☐Reducing Conditions (tests positive)
☐Gleyed or low chroma colors
☐Redox features within 10" (e.g., concentrations)
☐Concretions/Nodules (w/in 3", > 2mm)
☐High organic content in surface (in Sandy Soils)
☐Organic streaking (in Sandy Soils)
☐Organic pan (in Sandy Soils)
☐ Listed on Hydric Soils List (and soil profile matches)
☐ Meets hydric soil criteria 3 or 4 (ponded or flooded for long duration)
☐ Supplemental indicator (e.g., NRCS field indicator)

Criteria Met? ☐ Yes ☒ No

HYDROLOGY

Recorded Data:
☐Recorded Data Available ☐Aerial Photos ☐Stream Gauge ☐ Other ☒ No Recorded Data Available

Field Data
Depth of inundation: Depth to Saturation: Depth to Free Water:

Primary Hydrology Indicators:
☐Inundated
☐Saturated in upper 12 inches
☐Water Marks
☐Drift Lines
☐Sediment Deposits

Secondary Hydrology Indicators (2 or more required):
☐Oxidized Root Channels (upper 12")
☐Water-stained leaves
☐Local Soil Survey Data
☐FAC – Neutral Test
☐Other:

Criteria Met? ☐Yes ☒ No
Comments: .

DETERMINATION

WETLAND? ☐YES ☒NO **Comments: No wetland soils or hydrology.**

DEPARTMENT OF STATE LANDS WETLAND DETERMINATION DATA FORM – Quick Method

County: Yamhill	Date: 2/21	City: Newberg	File #:1985

Project/Contact: NewB./CS
Plant Community: meadow
Plot Location: Paired with sample plot 3
Recent Weather: rainy and cold

Det. By: C. Steinkoenig
Plot #:4

Do normal environmental conditions exist? Y☒ N☐ If no, explain:
Has Vegetation ☐ Soil☐ Hydrology ☐ been significantly disturbed?
Explain:

VEGETATION

Tree Stratum			
Total Plot Cover:0	0 = 50%	0 = 20%	
			Status/Raw % Cover
1.			
2.			
3.			
4.			
5.			

Sapling/Shrub Stratum			
Total Plot Cover:	= 50%	= 20%	Status/Raw % Cover
1.			
2.			
3.			
4.			
5.			

Herb Stratum		
Total Plot Cover:100	50 = 50%	20 = 20%
		Status/Raw % Cover
1.*Agrostis stolonifera*		FAC 80*
2.*Festuca arundinacea*		FAC- 15
3.*Moss*		NI 20
4.*Daucus carota*		NOL trace
5.*Geranium richardsonii*		trace
6.		
7.		
8.		
9.		
10.		
11.		
12.		

Hydrophytic Vegetation Indicators:
☒ > 50% of dominants are OBL, FACW or FAC Percent of Dominant Species that are OBL, FACW, FAC (not FAC-):100
Other hydrophytic vegetation indicators:
Criteria Met? ☒Yes ☐ No **Comments:** Hydrophytic veg. exceeds 50 percent.

SOILS

Map Unit Name: Amity silt loam
On Hydric Soil List? ☐ Yes ☒ No
Drainage Class: Somewhat poorly drained
Has Hydric Inclusions? ☒ Yes ☐ No

Depth Range of Horizon	Matrix Color	Redox Concentrations	Redox Depletions	Texture
0-12	10YR3/2	10YR3/6 FFF		CL L
12-18	10YR4/2	10YR4/6 CMD		Sl Cl

Hydric Soil Indicators:
☐Histosol
☐Histic Epipedon
☐Sulfidic Odor
☐Reducing Conditions (tests positive)
☐Gleyed or low chroma colors
☒Redox features within 10" (e.g., concentrations)
☐Concretions/Nodules (w/in 3", > 2mm)
☐High organic content in surface (in Sandy Soils)
☐Organic streaking (in Sandy Soils)
☐Organic pan (in Sandy Soils)
☐ Listed on Hydric Soils List (and soil profile matches)
☐ Meets hydric soil criteria 3 or 4 (ponded or flooded for long duration)
☐ Supplemental indicator (e.g., NRCS field indicator)

Criteria Met? ☒ Yes ☐ No

HYDROLOGY

Recorded Data:
☐Recorded Data Available ☐Aerial Photos ☐Stream Gauge ☐ Other ☒ No Recorded Data Available
Field Data
Depth of inundation: Depth to Saturation:5" Depth to Free Water:8"

Primary Hydrology Indicators:
☐Inundated
☒Saturated in upper 12 inches
☐Water Marks
☐Drift Lines
☐Sediment Deposits
Criteria Met? ☒Yes ☐ No

Secondary Hydrology Indicators (2 or more required):
☐Oxidized Root Channels (upper 12")
☐Water-stained leaves
☐Local Soil Survey Data
☐FAC – Neutral Test
☐Other:
Comments: .

DETERMINATION

WETLAND? ☒**YES** ☐**NO** **Comments: Wetland Criteria met.**

DEPARTMENT OF STATE LANDS WETLAND DETERMINATION DATA FORM – Quick Method

County: Yamhill	Date: 2/21	City: Newberg	File #:1985

Project/Contact: NewB./CS Det. By: C. Steinkoenig
Plant Community: Scrub-shrub Plot #:5
Plot Location: South side of tributary.
Recent Weather: rainy and cold
Do normal environmental conditions exist? Y☒ N☐ If no, explain:
Has Vegetation ☐ Soil☐ Hydrology ☐ been significantly disturbed?
Explain:

VEGETATION

Tree Stratum			Herb Stratum		
Total Plot Cover:45	22.5 = 50%	9 = 20%	Total Plot Cover:100	50 = 50%	20 = 20%
		Status/Raw % Cover			Status/Raw % Cover
1.*Malus sp.*		NOL 30*	1.*Agrostis stolonifera*		FAC 25*
2.*Crataegus monogyna*		FACU+ 15*	2.*Festuca arundinacea*		FAC- 50*
3.			3.*Dactylis glomerata*		FACU 25*
4.			4.		
5.			5.		
Sapling/Shrub Stratum			6.		
Total Plot Cover:20	10= 50%	4= 20% Status/Raw % Cover	7.		
1.*Rubus discolor*		FACU- 20*	8.		
2.			9.		
3.			10.		
4.			11.		
5.			12.		

Hydrophytic Vegetation Indicators:
☐ > 50% of dominants are OBL, FACW or FAC Percent of Dominant Species that are OBL, FACW, FAC (not FAC-):40
Other hydrophytic vegetation indicators:
Criteria Met? ☐Yes ☒ No **Comments:** Hydrophytic veg does not exceed 50%. FEAR used as FAC veg.

SOILS

Map Unit Name: Amity silt loam Drainage Class: Somewhat poorly drained
On Hydric Soil List? ☐ Yes ☒ No Has Hydric Inclusions? ☒ Yes ☐ No

Depth Range of Horizon	Matrix Color	Redox Concentrations	Redox Depletions	Texture
0-12	10YR3/3	None		CL L
12-16	10YR3/4			Sl Cl

Hydric Soil Indicators:

☐Histosol
☐Histic Epipedon
☐Sulfidic Odor
☐Reducing Conditions (tests positive)
☐Gleyed or low chroma colors
☐Redox features within 10" (e.g., concentrations)
☐Concretions/Nodules (w/in 3", > 2mm)
☐High organic content in surface (in Sandy Soils)
☐Organic streaking (in Sandy Soils)
☐Organic pan (in Sandy Soils)
☐ Listed on Hydric Soils List (and soil profile matches)
☐ Meets hydric soil criteria 3 or 4 (ponded or flooded for long duration)
☐ Supplemental indicator (e.g., NRCS field indicator)

Criteria Met? ☐ Yes ☒ No

HYDROLOGY

Recorded Data:
☐Recorded Data Available ☐Aerial Photos ☐Stream Gauge ☐ Other ☒ No Recorded Data Available

Field Data
Depth of inundation: Depth to Saturation: Depth to Free Water:14"

Primary Hydrology Indicators:
☐Inundated
☐Saturated in upper 12 inches
☐Water Marks
☐Drift Lines
☐Sediment Deposits

Secondary Hydrology Indicators (2 or more required):
☐Oxidized Root Channels (upper 12")
☐Water-stained leaves
☐Local Soil Survey Data
☐FAC – Neutral Test
☐Other:

Criteria Met? ☐Yes ☒ No
Comments: Depth to free water in pit at 14 inches.

DETERMINATION

WETLAND? ☐YES ☒NO **Comments: Wetland criteria not met.**

DEPARTMENT OF STATE LANDS WETLAND DETERMINATION DATA FORM – Quick Method

County: Yamhill	Date: 2/21	City: Newberg	File #:1985

Project/Contact: NewB./CS
Plant Community: meadow
Plot Location: Paired with sample plot 5
Recent Weather: rainy and cold

Det. By: C. Steinkoenig
Plot #:6

Do normal environmental conditions exist? Y☒ N☐ If no, explain:
Has Vegetation ☐ Soil☐ Hydrology ☐ been significantly disturbed?
Explain:

VEGETATION

Tree Stratum

Total Plot Cover:0	= 50%	= 20%
		Status/Raw % Cover
1.		
2.		
3.		
4.		
5.		

Sapling/Shrub Stratum

Total Plot Cover:	= 50%	= 20%	Status/Raw % Cover
1.			
2.			
3.			
4.			
5.			

Herb Stratum

Total Plot Cover:100	50 = 50%	20 = 20%
		Status/Raw % Cover
1. *Agrostis stolonifera*		FAC 25*
2. *Festuca arundinacea*		FAC- 50*
3. *Dactylis glomerata*		FACU 25*
4.		
5.		
6.		
7.		
8.		
9.		
10.		
11.		
12.		

Hydrophytic Vegetation Indicators:
☒ > 50% of dominants are OBL, FACW or FAC Percent of Dominant Species that are OBL, FACW, FAC (not FAC-):66
Other hydrophytic vegetation indicators:
Criteria Met? ☒Yes ☐ No **Comments:** Hydrophytic veg exceeds 50%. FEAR used as FAC veg.

SOILS

Map Unit Name: Amity silt loam
On Hydric Soil List? ☐ Yes ☒ No
Drainage Class: Somewhat poorly drained
Has Hydric Inclusions? ☒ Yes ☐ No

Depth Range of Horizon	Matrix Color	Redox Concentrations	Redox Depletions	Texture
0-11	10YR4/1	10YR4/4 FFD		Si CL
11-15	10YR3/4			Sl Cl

Hydric Soil Indicators:
☐Histosol
☐Histic Epipedon
☐Sulfidic Odor
☐Reducing Conditions (tests positive)
☒Gleyed or low chroma colors
☒Redox features within 10" (e.g., concentrations)
☐Concretions/Nodules (w/in 3", > 2mm)
☐High organic content in surface (in Sandy Soils)
☐Organic streaking (in Sandy Soils)
☐Organic pan (in Sandy Soils)
☐ Listed on Hydric Soils List (and soil profile matches)
☐ Meets hydric soil criteria 3 or 4 (ponded or flooded for long duration)
☐ Supplemental indicator (e.g., NRCS field indicator)

Criteria Met? ☒ Yes ☐ No

HYDROLOGY

Recorded Data:
☐Recorded Data Available ☐Aerial Photos ☐Stream Gauge ☐ Other ☒ No Recorded Data Available

Field Data
Depth of inundation: Depth to Saturation: Depth to Free Water:7"

Primary Hydrology Indicators:
☐Inundated
☒Saturated in upper 12 inches
☐Water Marks
☐Drift Lines
☐Sediment Deposits

Secondary Hydrology Indicators (2 or more required):
☐Oxidized Root Channels (upper 12")
☐Water-stained leaves
☐Local Soil Survey Data
☐FAC – Neutral Test
☐Other:

Criteria Met? ☒Yes ☐ No
Comments: Wetland hydrology observed.

DETERMINATION

WETLAND? ☒YES ☐NO **Comments: Wetland criteria is met.**

DEPARTMENT OF STATE LANDS WETLAND DETERMINATION DATA FORM – Quick Method

County: Yamhill	Date: 2/21	City: Newberg	File #:1985

Project/Contact: NewB./CS
Det. By: C. Steinkoenig
Plant Community: meadow
Plot #:7
Plot Location: Paired w/8-N side of seasonal drainage-E. of berm
Recent Weather: rainy and cold
Do normal environmental conditions exist? Y☒ N☐ If no, explain:
Has Vegetation ☐ Soil☐ Hydrology ☐ been significantly disturbed?
Explain:

VEGETATION

Tree Stratum				Herb Stratum	
Total Plot Cover:0	= 50%	= 20%		Total Plot Cover:100 / 50 = 50%	20 = 20%
		Status/Raw % Cover			Status/Raw % Cover
1.				1.*Poa pratensis*	FAC 75*
2.				2.*Festuca arundinacea*	FAC- 10
3.				3.*Trifolium latifolia*	FACU+ 15
4.				4.*Chrysanthemum Leu.*	NI trace
5.				5.	
Sapling/Shrub Stratum				6.	
Total Plot Cover:	= 50%	= 20%	Status/Raw % Cover	7.	
1.				8.	
2.				9.	
3.				10.	
4.				11.	
5.				12.	

Hydrophytic Vegetation Indicators:
☒ > 50% of dominants are OBL, FACW or FAC Percent of Dominant Species that are OBL, FACW, FAC (not FAC-):100
Other hydrophytic vegetation indicators:
Criteria Met? ☒Yes ☐ No **Comments:** FEAR (FAC-) used as FAC veg.

SOILS

Map Unit Name: Amity silt loam Drainage Class: Somewhat poorly drained
On Hydric Soil List? ☐ Yes ☒ No Has Hydric Inclusions? ☒ Yes ☐ No

Depth Range of Horizon	Matrix Color	Redox Concentrations	Redox Depletions	Texture
0-12	10YR4/2	None		Si CL
12-17	10YR4/2	10YR4/6 FFP		CL

Hydric Soil Indicators:
☐Histosol
☐Histic Epipedon
☐Sulfidic Odor
☐Reducing Conditions (tests positive)
☐Gleyed or low chroma colors
☐Redox features within 10" (e.g., concentrations)
☐Concretions/Nodules (w/in 3", > 2mm)
☐High organic content in surface (in Sandy Soils)
☐Organic streaking (in Sandy Soils)
☐Organic pan (in Sandy Soils)
☐ Listed on Hydric Soils List (and soil profile matches)
☐ Meets hydric soil criteria 3 or 4 (ponded or flooded for long duration)
☐ Supplemental indicator (e.g., NRCS field indicator)

Criteria Met? ☐ Yes ☒ No

HYDROLOGY

Recorded Data:
☐Recorded Data Available ☐Aerial Photos ☐Stream Gauge ☐ Other ☒ No Recorded Data Available
Field Data
Depth of inundation: Depth to Saturation:10 Depth to Free Water:12"
Primary Hydrology Indicators:
☐Inundated
☒Saturated in upper 12 inches
☐Water Marks
☐Drift Lines
☐Sediment Deposits

Secondary Hydrology Indicators (2 or more required):
☐Oxidized Root Channels (upper 12")
☐Water-stained leaves
☐Local Soil Survey Data
☐FAC – Neutral Test
☐Other:

Criteria Met? ☒Yes ☐ No **Comments: Recent heavy rainfall.**

DETERMINATION

WETLAND? ☐YES ☒NO **Comments: Wetland soil criterion is not met. Subdominant veg. is upland and higher topgraphy.**

DEPARTMENT OF STATE LANDS WETLAND DETERMINATION DATA FORM – Quick Method

County: Yamhill	Date: 2/21	City: Newberg	File #:1985

Project/Contact: NewB./CS — Det. By: C. Steinkoenig
Plant Community: meadow — Plot #:8
Plot Location:
Recent Weather: rainy and cold
Do normal environmental conditions exist? Y☒ N☐ If no, explain:
Has Vegetation ☐ Soil☐ Hydrology ☐ been significantly disturbed?
Explain:

VEGETATION

Tree Stratum

Total Plot Cover:0	= 50%	= 20%	Status/Raw % Cover
1.			
2.			
3.			
4.			
5.			

Sapling/Shrub Stratum

Total Plot Cover:	= 50%	= 20%	Status/Raw % Cover
1.			
2.			
3.			
4.			
5.			

Herb Stratum

Total Plot Cover:100	50 = 50%	20 = 20%
		Status/Raw % Cover
1. *Poa pratensis*		FAC 85*
2. *Rumex crispus*		FAC+ 5
3. *Gernaium richardsoni*		FACU+ 10
4.		
5.		
6.		
7.		
8.		
9.		
10.		
11.		
12.		

Hydrophytic Vegetation Indicators:
☒ > 50% of dominants are OBL, FACW or FAC Percent of Dominant Species that are OBL, FACW, FAC (not FAC-):100
Other hydrophytic vegetation indicators:
Criteria Met? ☒Yes ☐ No **Comments:** .

SOILS

Map Unit Name: Amity silt loam — Drainage Class: Somewhat poorly drained
On Hydric Soil List? ☐ Yes ☒ No — Has Hydric Inclusions? ☒ Yes ☐ No

Depth Range of Horizon	Matrix Color	Redox Concentrations	Redox Depletions	Texture
0-12	10YR3/2	10YR3/6 MFD		Si CL
12-17	10YR4/2	10YR4/4 FFD		CL

Hydric Soil Indicators:
☐Histosol
☐Histic Epipedon
☐Sulfidic Odor
☐Reducing Conditions (tests positive)
☐Gleyed or low chroma colors
☒Redox features within 10" (e.g., concentrations)
☐Concretions/Nodules (w/in 3", > 2mm)
☐High organic content in surface (in Sandy Soils)
☐Organic streaking (in Sandy Soils)
☐Organic pan (in Sandy Soils)
☐ Listed on Hydric Soils List (and soil profile matches)
☐ Meets hydric soil criteria 3 or 4 (ponded or flooded for long duration)
☐ Supplemental indicator (e.g., NRCS field indicator)

Criteria Met? ☒ Yes ☐ No

HYDROLOGY

Recorded Data:
☐Recorded Data Available ☐Aerial Photos ☐Stream Gauge ☐ Other ☒ No Recorded Data Available

Field Data
Depth of inundation: Depth to Saturation:to Surface Depth to Free Water:1"

Primary Hydrology Indicators:
☐Inundated
☒Saturated in upper 12 inches
☐Water Marks
☐Drift Lines
☐Sediment Deposits

Secondary Hydrology Indicators (2 or more required):
☒Oxidized Root Channels (upper 12")
☐Water-stained leaves
☐Local Soil Survey Data
☐FAC – Neutral Test
☐Other:

Criteria Met? ☒Yes ☐ No **Comments: Recent heavy rainfall and high water table.**

DETERMINATION

WETLAND? ☒YES ☐NO **Comments: Wetland criteia met.**

DEPARTMENT OF STATE LANDS WETLAND DETERMINATION DATA FORM – Quick Method

County: Yamhill	Date: 2/21	City: Newberg	File #:1985

Project/Contact: NewB./CS
Plant Community: forested
Plot Location: SW side of stream
Recent Weather: rainy and cold

Det. By: C. Steinkoenig
Plot #:9

Do normal environmental conditions exist? Y☒ N☐ If no, explain:
Has Vegetation ☐ Soil☐ Hydrology ☐ been significantly disturbed?
Explain:

VEGETATION

Tree Stratum

Total Plot Cover:100	50 = 50%	20 = 20%
		Status/Raw % Cover
1.*Fraxinus latifolia*		FACW 100*
2.		
3.		
4.		
5.		

Sapling/Shrub Stratum

Total Plot Cover:55	27.5= 50%	11= 20%	Status/Raw % Cover
1.*Rosa nutkana*			FAC 10
2.*Crataegus monogyna*			FACU+ 5
3.*Spirea douglasii*			FACW 40*
4.			
5.			

Herb Stratum

Total Plot Cover:70	35 = 50%	14 = 20%
		Status/Raw % Cover
1.*Carex obnupta*		OBL 60*
2.*Oenanthe sarmentosa*		OBL 10
3.		
4.		
5.		
6.		
7.		
8.		
9.		
10.		
11.		
12.		

Hydrophytic Vegetation Indicators:
☒ > 50% of dominants are OBL, FACW or FAC Percent of Dominant Species that are OBL, FACW, FAC (not FAC-):100
Other hydrophytic vegetation indicators:
Criteria Met? ☒Yes ☐ No **Comments:** .

SOILS

Map Unit Name: Amity silt loam
On Hydric Soil List? ☐ Yes ☒ No
Drainage Class: Somewhat poorly drained
Has Hydric Inclusions? ☒ Yes ☐ No

Depth Range of Horizon	Matrix Color	Redox Concentrations	Redox Depletions	Texture
0-12	10YR3/2	10YR3/6 MFD		Si CL
12-17	10YR4/2	10YR4/4 FFD		CL

Hydric Soil Indicators:
☐Histosol
☐Histic Epipedon
☐Sulfidic Odor
☐Reducing Conditions (tests positive)
☐Gleyed or low chroma colors
☒Redox features within 10" (e.g., concentrations)
☐Concretions/Nodules (w/in 3", > 2mm)
☐High organic content in surface (in Sandy Soils)
☐Organic streaking (in Sandy Soils)
☐Organic pan (in Sandy Soils)
☐ Listed on Hydric Soils List (and soil profile matches)
☐ Meets hydric soil criteria 3 or 4 (ponded or flooded for long duration)
☐ Supplemental indicator (e.g., NRCS field indicator)

Criteria Met? ☒ Yes ☐ No

HYDROLOGY

Recorded Data:
☐Recorded Data Available ☐Aerial Photos ☐Stream Gauge ☐ Other ☒ No Recorded Data Available

Field Data
Depth of inundation: Depth to Saturation:to Surface Depth to Free Water:1"

Primary Hydrology Indicators:
☐Inundated
☒Saturated in upper 12 inches
☐Water Marks
☐Drift Lines
☐Sediment Deposits

Secondary Hydrology Indicators (2 or more required):
☒Oxidized Root Channels (upper 12")
☐Water-stained leaves
☐Local Soil Survey Data
☐FAC – Neutral Test
☐Other:

Criteria Met? ☒Yes ☐ No
Comments: Recent heavy rainfall and high water table.

DETERMINATION

WETLAND? ☒YES ☐NO **Comments: Wetland criteia met.**

DEPARTMENT OF STATE LANDS WETLAND DETERMINATION DATA FORM – Quick Method

County: Yamhill	Date: 2/21	City: Newberg	File #:1985

Project/Contact: NewB./CS
Det. By: C. Steinkoenig
Plant Community: forested
Plot #:10
Plot Location: West side of stream
Recent Weather: rainy and cold
Do normal environmental conditions exist? Y☒ N☐ If no, explain:
Has Vegetation ☐ Soil☐ Hydrology ☐ been significantly disturbed?
Explain:

VEGETATION

Tree Stratum			Herb Stratum	
Total Plot Cover:30	15 = 50%	6 = 20%	Total Plot Cover:100 50 = 50% 20 = 20%	
		Status/Raw % Cover		Status/Raw % Cover
1.*Fraxinus latifolia*		FACW+30*	1.*Festuca arundinacea*	FAC- 15
2.			2.*Dactylis glomerata*	FACU 35*
3.			3.*Poa pratensis*	FAC 40*
4.			4.*Taraxacum officinale*	NOL 10
5.			5.	
Sapling/Shrub Stratum			6.	
Total Plot Cover:5	2.5= 50% 1= 20%	Status/Raw % Cover	7.	
1.*Corylus cornuta*		FACU+ 5*	8.	
2.			9.	
3.			10.	
4.			11.	
5.			12.	

Hydrophytic Vegetation Indicators:
☐ > 50% of dominants are OBL, FACW or FAC Percent of Dominant Species that are OBL, FACW, FAC (not FAC-):50
Other hydrophytic vegetation indicators:
Criteria Met? ☐Yes ☒ No **Comments:** Does not exceed fifty percent.

SOILS

Map Unit Name: Amity silt loam Drainage Class: Somewhat poorly drained
On Hydric Soil List? ☐ Yes ☒ No Has Hydric Inclusions? ☒ Yes ☐ No

Depth Range of Horizon	Matrix Color	Redox Concentrations	Redox Depletions	Texture
0-11	10YR3/2	None		Si CL
11-17	10YR3/3			CL

Hydric Soil Indicators:
☐Histosol
☐Histic Epipedon
☐Sulfidic Odor
☐Reducing Conditions (tests positive)
☐Gleyed or low chroma colors
☐Redox features within 10" (e.g., concentrations)
☐Concretions/Nodules (w/in 3", > 2mm)
☐High organic content in surface (in Sandy Soils)
☐Organic streaking (in Sandy Soils)
☐Organic pan (in Sandy Soils)
☐ Listed on Hydric Soils List (and soil profile matches)
☐ Meets hydric soil criteria 3 or 4 (ponded or flooded for long duration)
☐ Supplemental indicator (e.g., NRCS field indicator)

Criteria Met? ☐ Yes ☒ No

HYDROLOGY

Recorded Data:
☐Recorded Data Available ☐Aerial Photos ☐Stream Gauge ☐ Other ☒ No Recorded Data Available
Field Data
Depth of inundation: Depth to Saturation:13" Depth to Free Water:
Primary Hydrology Indicators:
☐Inundated
☐Saturated in upper 12 inches
☐Water Marks
☐Drift Lines
☐Sediment Deposits
Secondary Hydrology Indicators (2 or more required):
☐Oxidized Root Channels (upper 12")
☐Water-stained leaves
☐Local Soil Survey Data
☐FAC – Neutral Test
☐Other:
Criteria Met? ☐Yes ☒ No **Comments: Recent heavy rainfall and high water table.**

DETERMINATION

WETLAND? ☐YES ☒NO **Comments: Criteria not met.**

DEPARTMENT OF STATE LANDS WETLAND DETERMINATION DATA FORM – Quick Method

County: Yamhill	Date: 2/21	City: Newberg	File #:1985

Project/Contact: NewB./CS
Plant Community: forested
Plot Location: paired with sample plot 10
Recent Weather: rainy and cold

Det. By: C. Steinkoenig
Plot #:11

Do normal environmental conditions exist? Y☒ N☐ If no, explain:
Has Vegetation ☐ Soil☐ Hydrology ☐ been significantly disturbed?
Explain:

VEGETATION

Tree Stratum			
Total Plot Cover:50	25 = 50%	10 = 20%	
			Status/Raw % Cover
1.*Fraxinus latifolia*			FACW+ 50*
2.			
3.			
4.			
5.			

Sapling/Shrub Stratum			
Total Plot Cover:	= 50%	= 20%	Status/Raw % Cover
1.			
2.			
3.			
4.			
5.			

Herb Stratum		
Total Plot Cover:100	50 = 50%	20 = 20%
		Status/Raw % Cover
1.*Poa pratensis*		FAC 50*
2.*Rumex crispus*		FAC+ 10
3.*Agrostis stolonifera*		FAC 40*
4.		
5.		
6.		
7.		
8.		
9.		
10.		
11.		
12.		

Hydrophytic Vegetation Indicators:
☒ > 50% of dominants are OBL, FACW or FAC Percent of Dominant Species that are OBL, FACW, FAC (not FAC-):100
Other hydrophytic vegetation indicators:
Criteria Met? ☒**Yes** ☐ **No** **Comments: .**

SOILS

Map Unit Name: Amity silt loam
On Hydric Soil List? ☐ Yes ☒ No
Drainage Class: Somewhat poorly drained
Has Hydric Inclusions? ☒ Yes ☐ No

Depth Range of Horizon	Matrix Color	Redox Concentrations	Redox Depletions	Texture
0-11	10YR3/2	10YR3/6 FFF		Si CL
11-17	10YR4/2	10YR4/6 CFP		CL

Hydric Soil Indicators:
☐Histosol
☐Histic Epipedon
☐Sulfidic Odor
☐Reducing Conditions (tests positive)
☐Gleyed or low chroma colors
☒Redox features within 10" (e.g., concentrations)
☐Concretions/Nodules (w/in 3", > 2mm)
☐High organic content in surface (in Sandy Soils)
☐Organic streaking (in Sandy Soils)
☐Organic pan (in Sandy Soils)
☐ Listed on Hydric Soils List (and soil profile matches)
☐ Meets hydric soil criteria 3 or 4 (ponded or flooded for long duration)
☐ Supplemental indicator (e.g., NRCS field indicator)

Criteria Met? ☒ **Yes** ☐ **No**

HYDROLOGY

Recorded Data:
☐Recorded Data Available ☐Aerial Photos ☐Stream Gauge ☐ Other ☒ No Recorded Data Available
Field Data
Depth of inundation: Depth to Saturation:6" Depth to Free Water:9"
Primary Hydrology Indicators:
☐Inundated
☒Saturated in upper 12 inches
☐Water Marks
☐Drift Lines
☐Sediment Deposits
Secondary Hydrology Indicators (2 or more required):
☒Oxidized Root Channels (upper 12")
☐Water-stained leaves
☐Local Soil Survey Data
☐FAC – Neutral Test
☐Other:
Criteria Met? ☒**Yes** ☐ **No**
Comments: .

DETERMINATION

WETLAND? ☒**YES** ☐**NO** **Comments: Wetland Criteria is met.**

DEPARTMENT OF STATE LANDS WETLAND DETERMINATION DATA FORM – Quick Method

County: Yamhill	Date: 2/21	City: Newberg	File #:1985

Project/Contact: NewB./CS
Plant Community: forested
Plot Location: NW end of the property
Recent Weather: rainy and cold
Det. By: C. Steinkoenig
Plot #:12

Do normal environmental conditions exist? Y☒ N☐ If no, explain:
Has Vegetation ☐ Soil☐ Hydrology ☐ been significantly disturbed?
Explain:

VEGETATION

Tree Stratum			
Total Plot Cover:95	47.5 = 50%	19 = 20%	Status/Raw % Cover
1. *Fraxinus latifolia*			FACW+ 95*
2.			
3.			
4.			
5.			

Sapling/Shrub Stratum			
Total Plot Cover:10	5= 50%	2.5= 20%	Status/Raw % Cover
1. *Rubus discolor*			FACU 10*
2.			
3.			
4.			
5.			

Herb Stratum		
Total Plot Cover:	= 50%	= 20%
		Status/Raw % Cover
1.		
2.		
3.		
4.		
5.		
6.		
7.		
8.		
9.		
10.		
11.		
12.		

Hydrophytic Vegetation Indicators:
☐ > 50% of dominants are OBL, FACW or FAC Percent of Dominant **Species** that are OBL, FACW, FAC (not FAC-):50
Other hydrophytic vegetation indicators:
Criteria Met? ☒**Yes** ☐ **No** **Comments:** BPJ. Blackberry not rooted in sample plot. Dominant cover is ash

SOILS

Map Unit Name: Amity silt loam
Drainage Class: Somewhat poorly drained
On Hydric Soil List? ☐ Yes ☒ No
Has Hydric Inclusions? ☒ Yes ☐ No

Depth Range of Horizon	Matrix Color	Redox Concentrations	Redox Depletions	Texture
0-18	10YR2/1			Si CL

Hydric Soil Indicators:
- ☐Histosol
- ☐Histic Epipedon
- ☐Sulfidic Odor
- ☐Reducing Conditions (tests positive)
- ☒Gleyed or low chroma colors
- ☐Redox features within 10" (e.g., concentrations)
- ☐Concretions/Nodules (w/in 3", > 2mm)
- ☐High organic content in surface (in Sandy Soils)
- ☐Organic streaking (in Sandy Soils)
- ☐Organic pan (in Sandy Soils)
- ☐ Listed on Hydric Soils List (and soil profile matches)
- ☐ Meets hydric soil criteria 3 or 4 (ponded or flooded for long duration)
- ☐ Supplemental indicator (e.g., NRCS field indicator)

Criteria Met? ☒ **Yes** ☐ **No**

HYDROLOGY

Recorded Data:
☐Recorded Data Available ☐Aerial Photos ☐Stream Gauge ☐ Other ☒ No Recorded Data Available

Field Data
Depth of inundation: Depth to Saturation:3" Depth to Free Water:8"

Primary Hydrology Indicators:
- ☐Inundated
- ☒Saturated in upper 12 inches
- ☐Water Marks
- ☐Drift Lines
- ☐Sediment Deposits

Secondary Hydrology Indicators (2 or more required):
- ☐Oxidized Root Channels (upper 12")
- ☒Water-stained leaves
- ☐Local Soil Survey Data
- ☐FAC – Neutral Test
- ☐Other:

Criteria Met? ☒**Yes** ☐ **No**
Comments: .

DETERMINATION

WETLAND? ☒**YES** ☐**NO** **Comments: Wetland area adjacent to the creek. Wetland characteristc are met.**

DEPARTMENT OF STATE LANDS WETLAND DETERMINATION DATA FORM – Quick Method

County: Yamhill	Date: 2/28/07	City: Newberg	File #:1985

Project/Contact: NewB./CS
Plant Community: scrub-shrub/meadow
Plot Location: northeast side if isolated wetland
Recent Weather: cold and wet/hail
Det. By: C. Steinkoenig
Plot #:13

Do normal environmental conditions exist? Y☒ N☐ If no, explain:
Has Vegetation ☐ Soil☐ Hydrology ☐ been significantly disturbed?
Explain:

VEGETATION

Tree Stratum			Herb Stratum		
Total Plot Cover:	= 50%	= 20%	Total Plot Cover:100	50 = 50%	20 = 20%
		Status/Raw % Cover			Status/Raw % Cover
1.			1.*Alopecurus pratensis*		FACW 60*
2.			2.*Agrostis stolonifera*		FAC 40*
3.			3.		
4.			4.		
5.			5.		
Sapling/Shrub Stratum			6.		
Total Plot Cover:10	5= 50%	2.5= 20%	Status/Raw % Cover	7.	
1.*Rubus discolor*			FACU 5*	8.	
2.*Rosa nutkana*			FAC 5*	9.	
3.				10.	
4.				11.	
5.				12.	

Hydrophytic Vegetation Indicators:
☒ > 50% of dominants are OBL, FACW or FAC Percent of Dominant Species that are OBL, FACW, FAC (not FAC-):75
Other hydrophytic vegetation indicators:
Criteria Met? ☒Yes ☐ No **Comments:** Exceeds fifty percent.

SOILS

Map Unit Name: Amity silt loam Drainage Class: Somewhat poorly drained
On Hydric Soil List? ☐ Yes ☒ No Has Hydric Inclusions? ☒ Yes ☐ No

Depth Range of Horizon	Matrix Color	Redox Concentrations	Redox Depletions	Texture
0-13	10YR3/2	None		Si CL
13-18	10YR3/2	10YR3/4 FFF		CL

Hydric Soil Indicators:
☐Histosol
☐Histic Epipedon
☐Sulfidic Odor
☐Reducing Conditions (tests positive)
☐Gleyed or low chroma colors
☐Redox features within 10" (e.g., concentrations)
☐Concretions/Nodules (w/in 3", > 2mm)
☐High organic content in surface (in Sandy Soils)
☐Organic streaking (in Sandy Soils)
☐Organic pan (in Sandy Soils)
☐ Listed on Hydric Soils List (and soil profile matches)
☐ Meets hydric soil criteria 3 or 4 (ponded or flooded for long duration)
☐ Supplemental indicator (e.g., NRCS field indicator)

Criteria Met? ☐ Yes ☒ No

HYDROLOGY

Recorded Data:
☐Recorded Data Available ☐Aerial Photos ☐Stream Gauge ☐ Other ☒ No Recorded Data Available
Field Data
Depth of inundation: Depth to Saturation:3" Depth to Free Water:6"

Primary Hydrology Indicators:
☐Inundated
☒Saturated in upper 12 inches
☐Water Marks
☐Drift Lines
☐Sediment Deposits

Secondary Hydrology Indicators (2 or more required):
☐Oxidized Root Channels (upper 12")
☐Water-stained leaves
☐Local Soil Survey Data
☐FAC – Neutral Test
☐Other:

Criteria Met? ☒Yes ☐ No **Comments: Very high water table.**

DETERMINATION

WETLAND? ☐**YES** ☒**NO** **Comments: No hydric soil, rise in topogrpahy.**

DEPARTMENT OF STATE LANDS WETLAND DETERMINATION DATA FORM – Quick Method

County: Yamhill	Date: 2/28/07	City: Newberg	File #:1985

Project/Contact: NewB./CS Det. By: C. Steinkoenig
Plant Community: scrub-shrub/meadow Plot #:14
Plot Location: paired w/sample plot 13
Recent Weather: cold and wet/hail
Do normal environmental conditions exist? Y☒ N☐ If no, explain:
Has Vegetation ☐ Soil☐ Hydrology ☐ been significantly disturbed?
Explain:

VEGETATION

Tree Stratum

Total Plot Cover:0	= 50%	= 20%	Status/Raw % Cover
1.			
2.			
3.			
4.			
5.			

Sapling/Shrub Stratum

Total Plot Cover:10	5= 50%	2.5= 20%	Status/Raw % Cover
1.*Rubus discolor*			FACU 5*
2.*Rosa nutkana*			FAC 5*
3.			
4.			
5.			

Herb Stratum

Total Plot Cover:100	50 = 50%	20 = 20%	Status/Raw % Cover
1.*Alopecurus pratensis*			FACW 60*
2.*Agrostis stolonifera*			FAC 40*
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			

Hydrophytic Vegetation Indicators:
☒ > 50% of dominants are OBL, FACW or FAC Percent of Dominant Species that are OBL, FACW, FAC (not FAC-):75
Other hydrophytic vegetation indicators:
Criteria Met? ☒Yes ☐ No **Comments:** Exceeds fifty percent.

SOILS

Map Unit Name: Amity silt loam Drainage Class: Somewhat poorly drained
On Hydric Soil List? ☐ Yes ☒ No Has Hydric Inclusions? ☒ Yes ☐ No

Depth Range of Horizon	Matrix Color	Redox Concentrations	Redox Depletions	Texture
0-12	10YR4/2	10YR4/6 CFD		Si CL
12-18	10YR4/2	10YR4/4 FFF		CL

Hydric Soil Indicators:
☐Histosol
☐Histic Epipedon
☐Sulfidic Odor
☐Reducing Conditions (tests positive)
☐Gleyed or low chroma colors
☒Redox features within 10" (e.g., concentrations)
☐Concretions/Nodules (w/in 3", > 2mm)
☐High organic content in surface (in Sandy Soils)
☐Organic streaking (in Sandy Soils)
☐Organic pan (in Sandy Soils)
☐ Listed on Hydric Soils List (and soil profile matches)
☐ Meets hydric soil criteria 3 or 4 (ponded or flooded for long duration)
☐ Supplemental indicator (e.g., NRCS field indicator)

Criteria Met? ☒ Yes ☐ No

HYDROLOGY

Recorded Data:
☐Recorded Data Available ☐Aerial Photos ☐Stream Gauge ☐ Other ☒ No Recorded Data Available
Field Data
Depth of inundation: Depth to Saturation:to surface Depth to Free Water:0.5"

Primary Hydrology Indicators:
☐Inundated
☒Saturated in upper 12 inches
☐Water Marks
☐Drift Lines
☐Sediment Deposits
Criteria Met? ☒Yes ☐ No

Secondary Hydrology Indicators (2 or more required):
☒Oxidized Root Channels (upper 12")
☐Water-stained leaves
☐Local Soil Survey Data
☐FAC – Neutral Test
☐Other:
Comments: .

DETERMINATION

WETLAND? ☒YES ☐NO **Comments: All wetland criteria met.**

DEPARTMENT OF STATE LANDS WETLAND DETERMINATION DATA FORM – Quick Method

County: Yamhill	Date: 2/28/07	City: Newberg	File #:1985

Project/Contact: NewB./CS Det. By: C. Steinkoenig
Plant Community: meadow Plot #:15
Plot Location: Northwest end of wetland
Recent Weather: cold and wet/hail
Do normal environmental conditions exist? Y☒ N☐ If no, explain:
Has Vegetation ☐ Soil☐ Hydrology ☐ been significantly disturbed?
Explain:

VEGETATION

Tree Stratum				Herb Stratum		
Total Plot Cover:0	= 50%	= 20%		Total Plot Cover:100	50 = 50%	20 = 20%
		Status/Raw % Cover				Status/Raw % Cover
1.				1.*Alopecurus pratensis*		FACW 60*
2.				2.*Agrostis stolonifera*		FAC 40*
3.				3.		
4.				4.		
5.				5.		
Sapling/Shrub Stratum				6.		
Total Plot Cover:10	5= 50%	2.5= 20%	Status/Raw % Cover	7.		
1.*Rubus discolor*			FACU 5*	8.		
2.*Rosa nutkana*			FAC 5*	9.		
3.				10.		
4.				11.		
5.				12.		

Hydrophytic Vegetation Indicators:
☒ > 50% of dominants are OBL, FACW or FAC Percent of Dominant <u>Species</u> that are OBL, FACW, FAC (not FAC-):75
Other hydrophytic vegetation indicators:
Criteria Met? ☒Yes ☐ No **Comments:** Exceeds fifty percent.

SOILS

Map Unit Name: Amity silt loam Drainage Class: Somewhat poorly drained
On Hydric Soil List? ☐ Yes ☒ No Has Hydric Inclusions? ☒ Yes ☐ No

Depth Range of Horizon	Matrix Color	Redox Concentrations	Redox Depletions	Texture
0-12	10YR4/2	10YR4/6 CFD		Si CL
12-18	10YR4/2	10YR4/4 FFF		CL

Hydric Soil Indicators:
☐Histosol
☐Histic Epipedon
☐Sulfidic Odor
☐Reducing Conditions (tests positive)
☐Gleyed or low chroma colors
☒Redox features within 10" (e.g., concentrations)
☐Concretions/Nodules (w/in 3", > 2mm)
☐High organic content in surface (in Sandy Soils)
☐Organic streaking (in Sandy Soils)
☐Organic pan (in Sandy Soils)
☐ Listed on Hydric Soils List (and soil profile matches)
☐ Meets hydric soil criteria 3 or 4 (ponded or flooded for long duration)
☐ Supplemental indicator (e.g., NRCS field indicator)

Criteria Met? ☒ Yes ☐ No

HYDROLOGY

<u>Recorded Data:</u>
☐Recorded Data Available ☐Aerial Photos ☐Stream Gauge ☐ Other ☒ No Recorded Data Available
<u>Field Data</u>
Depth of inundation: Depth to Saturation:to surface Depth to Free Water:0.5"

<u>Primary Hydrology Indicators:</u>
☐Inundated
☒Saturated in upper 12 inches
☐Water Marks
☐Drift Lines
☐Sediment Deposits

Secondary Hydrology Indicators (2 or more required):
☒Oxidized Root Channels (upper 12")
☐Water-stained leaves
☐Local Soil Survey Data
☐FAC – Neutral Test
☐Other:

Criteria Met? ☒Yes ☐ No **Comments:.**

DETERMINATION

WETLAND? ☒**YES** ☐**NO** **Comments: All wetland criteria met.**

DEPARTMENT OF STATE LANDS WETLAND DETERMINATION DATA FORM – Quick Method

County: Yamhill	Date: 2/28/07	City: Newberg	File #:1985

Project/Contact: NewB./CS Det. By: C. Steinkoenig
Plant Community: meadow/scrub-shrub Plot #:16
Plot Location: Paired with sample plot 15
Recent Weather: cold and wet/hail
Do normal environmental conditions exist? Y☒ N☐ If no, explain:
Has Vegetation ☐ Soil☐ Hydrology ☐ been significantly disturbed?
Explain:

VEGETATION

Tree Stratum			Herb Stratum		
Total Plot Cover:15	7.5 = 50%	3 = 20%	Total Plot Cover:100	50 = 50%	20 = 20%
		Status/Raw % Cover			Status/Raw % Cover
1.*Quercus garryana*		UPL 5*	1. *Alopecurus pratensis*		FACW 40*
2.*Malus sp.*		NOL 5*	2.*Agrostis stolonifera*		FAC 40*
3.			3.*Dactylis glomerata*		FACU 15
4.			4.*Chrysanthemum l.*		NOL 5
5.			5.*Hypocheris radicata*		FACU trace
Sapling/Shrub Stratum			6.		
Total Plot Cover:15	7.5= 50% / 3= 20%	Status/Raw % Cover	7.		
1.*Rubus discolor*		FACU 10*	8.		
2.*Crataegus sp.*		FAC/FACU+ 5*	9.		
3.			10.		
4.			11.		
5.			12.		

Hydrophytic Vegetation Indicators:
☒ > 50% of dominants are OBL, FACW or FAC Percent of Dominant Species that are OBL, FACW, FAC (not FAC-):66
Other hydrophytic vegetation indicators:
Criteria Met? ☒Yes ☐ No **Comments:** Exceeds fifty percent. Sundominants are upland

SOILS

Map Unit Name: Amity silt loam Drainage Class: Somewhat poorly drained
On Hydric Soil List? ☐ Yes ☒ No Has Hydric Inclusions? ☒ Yes ☐ No

Depth Range of Horizon	Matrix Color	Redox Concentrations	Redox Depletions	Texture
0-12	10YR3/2	None		Si CL
12-18	10YR4/2	None		CL

Hydric Soil Indicators:
☐Histosol
☐Histic Epipedon
☐Sulfidic Odor
☐Reducing Conditions (tests positive)
☐Gleyed or low chroma colors
☐Redox features within 10" (e.g., concentrations)
☐Concretions/Nodules (w/in 3", > 2mm)
☐High organic content in surface (in Sandy Soils)
☐Organic streaking (in Sandy Soils)
☐Organic pan (in Sandy Soils)
☐ Listed on Hydric Soils List (and soil profile matches)
☐ Meets hydric soil criteria 3 or 4 (ponded or flooded for long duration)
☐ Supplemental indicator (e.g., NRCS field indicator)

Criteria Met? ☐ Yes ☒ No

HYDROLOGY

Recorded Data:
☐Recorded Data Available ☐Aerial Photos ☐Stream Gauge ☐ Other ☒ No Recorded Data Available
Field Data
Depth of inundation: Depth to Saturation:6" Depth to Free Water:9"
Primary Hydrology Indicators:
☐Inundated
☒Saturated in upper 12 inches
☐Water Marks
☐Drift Lines
☐Sediment Deposits
Secondary Hydrology Indicators (2 or more required):
☐Oxidized Root Channels (upper 12")
☐Water-stained leaves
☐Local Soil Survey Data
☐FAC – Neutral Test
☐Other:
Criteria Met? ☒Yes ☐ No **Comments:** .

DETERMINATION

WETLAND? ☐YES ☒NO **Comments: Wetland soil criterion is not met.**

DEPARTMENT OF STATE LANDS WETLAND DETERMINATION DATA FORM – Quick Method

County: Yamhill	Date: 2/28/07	City: Newberg	File #:1985

Project/Contact: NewB./CS
Plant Community: meadow/scrub-shrub
Plot Location: west side of wetland
Recent Weather: cold/wet
Det. By: C. Steinkoenig
Plot #:17

Do normal environmental conditions exist? Y☒ N☐ If no, explain:
Has Vegetation ☐ Soil☐ Hydrology ☐ been significantly disturbed?
Explain:

VEGETATION

Tree Stratum

Total Plot Cover:	= 50%	= 20%	Status/Raw % Cover
1.			
2.			
3.			
4.			
5.			

Sapling/Shrub Stratum

Total Plot Cover:15	7.5= 50%	3= 20%	Status/Raw % Cover
1.*Rosa nutkana*			FAC 15*
2.			
3.			
4.			
5.			

Herb Stratum

Total Plot Cover:100	50 = 50%	20 = 20%	Status/Raw % Cover
1. *Alopecurus pratensis*			FACW 30*
2.*Agrostis stolonifera*			FAC 55*
3.*Juncus patens*			FACW 15
4.*Vicia americana*			trace
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			

Hydrophytic Vegetation Indicators:
☒ > 50% of dominants are OBL, FACW or FAC Percent of Dominant Species that are OBL, FACW, FAC (not FAC-):100
Other hydrophytic vegetation indicators:
Criteria Met? ☒Yes ☐ No **Comments:** Mets wetland vegetation criteria.

SOILS

Map Unit Name: Amity silt loam Drainage Class: Somewhat poorly drained
On Hydric Soil List? ☐ Yes ☒ No Has Hydric Inclusions? ☒ Yes ☐ No

Depth Range of Horizon	Matrix Color	Redox Concentrations	Redox Depletions	Texture
0-11	10YR3/2	10YR4/6 FFF		CL L
11-16	10YR4/1	10YR4/6 CFD		Si CL

Hydric Soil Indicators:
☐Histosol
☐Histic Epipedon
☐Sulfidic Odor
☐Reducing Conditions (tests positive)
☐Gleyed or low chroma colors
☒Redox features within 10" (e.g., concentrations)
☐Concretions/Nodules (w/in 3", > 2mm)
☐High organic content in surface (in Sandy Soils)
☐Organic streaking (in Sandy Soils)
☐Organic pan (in Sandy Soils)
☐ Listed on Hydric Soils List (and soil profile matches)
☐ Meets hydric soil criteria 3 or 4 (ponded or flooded for long duration)
☐ Supplemental indicator (e.g., NRCS field indicator)

Criteria Met? ☒ **Yes** ☐ **No**

HYDROLOGY

Recorded Data:
☐Recorded Data Available ☐Aerial Photos ☐Stream Gauge ☐ Other ☒ No Recorded Data Available

Field Data
Depth of inundation: Depth to Saturation:1.5" Depth to Free Water:1.5"

Primary Hydrology Indicators:
☐Inundated
☒Saturated in upper 12 inches
☐Water Marks
☐Drift Lines
☐Sediment Deposits

Secondary Hydrology Indicators (2 or more required):
☐Oxidized Root Channels (upper 12")
☐Water-stained leaves
☐Local Soil Survey Data
☐FAC – Neutral Test
☐Other:

Criteria Met? ☒Yes ☐ No **Comments:** .

DETERMINATION

WETLAND? ☒**YES** ☐**NO** **Comments: Wetland criteria met.**

DEPARTMENT OF STATE LANDS WETLAND DETERMINATION DATA FORM – Quick Method

County: Yamhill	Date: 2/28/07	City: Newberg	File #:1985

Project/Contact: NewB./CS — Det. By: C. Steinkoenig
Plant Community: meadow/scrub-shrub — Plot #:18
Plot Location: Paired w/17
Recent Weather: cold /wet
Do normal environmental conditions exist? Y☒ N☐ If no, explain:
Has Vegetation ☐ Soil☐ Hydrology ☐ been significantly disturbed?
Explain:

VEGETATION

Tree Stratum			
Total Plot Cover:0	= 50%	= 20%	
			Status/Raw % Cover
1.			
2.			
3.			
4.			
5.			

Sapling/Shrub Stratum			
Total Plot Cover:15	7.5= 50%	3= 20%	Status/Raw % Cover
1.*Rosa nutkana*			FAC 15*
2.			
3.			
4.			
5.			

Herb Stratum		
Total Plot Cover:100	50 = 50%	20 = 20%
		Status/Raw % Cover
1. *Alopecurus pratensis*		FACW 30*
2.*Agrostis stolonifera*		FAC 55*
3.*Juncus patens*		FACW 15
4.*Vicia americana*		trace
5.		
6.		
7.		
8.		
9.		
10.		
11.		
12.		

Hydrophytic Vegetation Indicators:
☒ > 50% of dominants are OBL, FACW or FAC Percent of Dominant Species that are OBL, FACW, FAC (not FAC-):100
Other hydrophytic vegetation indicators:
Criteria Met? ☒**Yes** ☐ **No** **Comments:** Mets wetland vegetation criteria.

SOILS

Map Unit Name: Amity silt loam — Drainage Class: Somewhat poorly drained
On Hydric Soil List? ☐ Yes ☒ No — Has Hydric Inclusions? ☒ Yes ☐ No

Depth Range of Horizon	Matrix Color	Redox Concentrations	Redox Depletions	Texture
0-13	10YR3/2	None		Si L
13-18	10YR4/2	10YR4/6 CFD		Si CL

Hydric Soil Indicators:
☐Histosol
☐Histic Epipedon
☐Sulfidic Odor
☐Reducing Conditions (tests positive)
☐Gleyed or low chroma colors
☐Redox features within 10" (e.g., concentrations)
☐Concretions/Nodules (w/in 3", > 2mm)
☐High organic content in surface (in Sandy Soils)
☐Organic streaking (in Sandy Soils)
☐Organic pan (in Sandy Soils)
☐ Listed on Hydric Soils List (and soil profile matches)
☐ Meets hydric soil criteria 3 or 4 (ponded or flooded for long duration)
☐ Supplemental indicator (e.g., NRCS field indicator)

Criteria Met? ☐ **Yes** ☒ **No**

HYDROLOGY

Recorded Data:
☐Recorded Data Available ☐Aerial Photos ☐Stream Gauge ☐ Other ☒ No Recorded Data Available

Field Data
Depth of inundation: Depth to Saturation:4" Depth to Free Water:4"

Primary Hydrology Indicators:
☐Inundated
☒Saturated in upper 12 inches
☐Water Marks
☐Drift Lines
☐Sediment Deposits

Secondary Hydrology Indicators (2 or more required):
☐Oxidized Root Channels (upper 12")
☐Water-stained leaves
☐Local Soil Survey Data
☐FAC – Neutral Test
☐Other:

Criteria Met? ☒**Yes** ☐ **No** **Comments:**.

DETERMINATION

WETLAND? ☐**YES** ☒**NO** **Comments: Slight shift in topography, no hydric soil inidcators observed.**

DEPARTMENT OF STATE LANDS WETLAND DETERMINATION DATA FORM – Quick Method

County: Yamhill	Date: 2/28/07	City: Newberg	File #:1985

Project/Contact: NewB./CS — Det. By: C. Steinkoenig
Plant Community: meadow/scrub-shrub — Plot #:19
Plot Location: South end of wetland
Recent Weather: cold/wet
Do normal environmental conditions exist? Y [X] N [ ] If no, explain:
Has Vegetation [ ] Soil [ ] Hydrology [ ] been significantly disturbed?
Explain:

VEGETATION

Tree Stratum

Total Plot Cover:0	= 50%	= 20%	Status/Raw % Cover
1.			
2.			
3.			
4.			
5.			

Sapling/Shrub Stratum

Total Plot Cover:60	30= 50%	6= 20%	Status/Raw % Cover
1. *Rubus discolor*			FACU 45*
2. *Quercus garryana*			UPL 5
3. *Crataegus sp.*			FAC/FACU 5
4. *Malus sp.*			NOL 5
5.			

Herb Stratum

Total Plot Cover:55	27.5 = 50%	11 = 20%	Status/Raw % Cover
1. *Alopecurus pratensis*			FACW 20*
2. *Agrostis stolonifera*			FAC 35*
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			

Hydrophytic Vegetation Indicators:
[X] > 50% of dominants are OBL, FACW or FAC Percent of Dominant Species that are OBL, FACW, FAC (not FAC-):66
Other hydrophytic vegetation indicators:
Criteria Met? [X] Yes [ ] No **Comments:** Mets wetland vegetation criteria.

SOILS

Map Unit Name: Amity silt loam — Drainage Class: Somewhat poorly drained
On Hydric Soil List? [ ] Yes [X] No — Has Hydric Inclusions? [X] Yes [ ] No

Depth Range of Horizon	Matrix Color	Redox Concentrations	Redox Depletions	Texture
0-13	10YR3/2	None		Sl L
13-18	10YR4/2	10YR4/6 CFD		Si CL

Hydric Soil Indicators:
[ ] Histosol
[ ] Histic Epipedon
[ ] Sulfidic Odor
[ ] Reducing Conditions (tests positive)
[ ] Gleyed or low chroma colors
[ ] Redox features within 10" (e.g., concentrations)
[ ] Concretions/Nodules (w/in 3", > 2mm)
[ ] High organic content in surface (in Sandy Soils)
[ ] Organic streaking (in Sandy Soils)
[ ] Organic pan (in Sandy Soils)
[ ] Listed on Hydric Soils List (and soil profile matches)
[ ] Meets hydric soil criteria 3 or 4 (ponded or flooded for long duration)
[ ] Supplemental indicator (e.g., NRCS field indicator)

Criteria Met? [ ] Yes [X] No

HYDROLOGY

Recorded Data:
[ ] Recorded Data Available [ ] Aerial Photos [ ] Stream Gauge [ ] Other [X] No Recorded Data Available
Field Data
Depth of inundation: Depth to Saturation:4" Depth to Free Water:6"

Primary Hydrology Indicators:
[ ] Inundated
[X] Saturated in upper 12 inches
[ ] Water Marks
[ ] Drift Lines
[ ] Sediment Deposits

Secondary Hydrology Indicators (2 or more required):
[ ] Oxidized Root Channels (upper 12")
[ ] Water-stained leaves
[ ] Local Soil Survey Data
[ ] FAC – Neutral Test
[ ] Other:

Criteria Met? [X] Yes [ ] No **Comments:** .

DETERMINATION

WETLAND? [ ] YES [X] NO **Comments: Slight shift in topography, no hydric soil inidcators observed.**

DEPARTMENT OF STATE LANDS WETLAND DETERMINATION DATA FORM – Quick Method

County: Yamhill	Date: 2/28/07	City: Newberg	File #:1985

Project/Contact: NewB./CS
Plant Community: meadow/scrub-shrub
Plot Location: paired w/19
Recent Weather: cold/wet
Det. By: C. Steinkoenig
Plot #:20

Do normal environmental conditions exist? Y☒ N☐ If no, explain:
Has Vegetation ☐ Soil☐ Hydrology ☐ been significantly disturbed?
Explain:

VEGETATION

Tree Stratum				Herb Stratum			
Total Plot Cover:0	= 50%	= 20%	Status/Raw % Cover	Total Plot Cover:100	50 = 50%	20 = 20%	Status/Raw % Cover
1.				1. *Alopecurus pratensis*			FACW 20*
2.				2. *Agrostis stolonifera*			FAC 80*
3.				3.			
4.				4.			
5.				5.			
Sapling/Shrub Stratum				6.			
Total Plot Cover:15	7.5= 50%	3= 20%	Status/Raw % Cover	7.			
1. *Crataegus sp.*			FAC or FACU+ 15	8.			
2.				9.			
3.				10.			
4.				11.			
5.				12.			

Hydrophytic Vegetation Indicators:
☒ > 50% of dominants are OBL, FACW or FAC Percent of Dominant Species that are OBL, FACW, FAC (not FAC-):100
Other hydrophytic vegetation indicators:
Criteria Met? ☒Yes ☐ No **Comments:** Did not include hawthorn.

SOILS

Map Unit Name: Amity silt loam
On Hydric Soil List? ☐ Yes ☒ No
Drainage Class: Somewhat poorly drained
Has Hydric Inclusions? ☒ Yes ☐ No

Depth Range of Horizon	Matrix Color	Redox Concentrations	Redox Depletions	Texture
0-12	10YR3/2	10YR3/6 MFD		Sl CL
12-18	10YR4/2	10YR4/6 CFD		Si CL

Hydric Soil Indicators:
☐Histosol
☐Histic Epipedon
☐Sulfidic Odor
☐Reducing Conditions (tests positive)
☐Gleyed or low chroma colors
☒Redox features within 10" (e.g., concentrations)
☐Concretions/Nodules (w/in 3", > 2mm)
☐High organic content in surface (in Sandy Soils)
☐Organic streaking (in Sandy Soils)
☐Organic pan (in Sandy Soils)
☐ Listed on Hydric Soils List (and soil profile matches)
☐ Meets hydric soil criteria 3 or 4 (ponded or flooded for long duration)
☐ Supplemental indicator (e.g., NRCS field indicator)

Criteria Met? ☒ Yes ☐ No

HYDROLOGY

Recorded Data:
☐Recorded Data Available ☐Aerial Photos ☐Stream Gauge ☐ Other ☒ No Recorded Data Available
Field Data
Depth of inundation: Depth to Saturation:to surface Depth to Free Water:1"
Primary Hydrology Indicators:
☐Inundated
☒Saturated in upper 12 inches
☐Water Marks
☐Drift Lines
☐Sediment Deposits
Secondary Hydrology Indicators (2 or more required):
☐Oxidized Root Channels (upper 12")
☐Water-stained leaves
☐Local Soil Survey Data
☐FAC – Neutral Test
☐Other:
Criteria Met? ☒Yes ☐ No
Comments: Area has patches of standing water.

DETERMINATION

WETLAND? ☒YES ☐NO **Comments: Wetland criteria met.**

DEPARTMENT OF STATE LANDS WETLAND DETERMINATION DATA FORM – Quick Method

County: Yamhill	Date: 2/28/07	City: Newberg	File #:1985

Project/Contact: NewB./CS
Plant Community: meadow/scrub-shrub
Plot Location: east side if isolated wetland
Recent Weather: cold
Det. By: C. Steinkoenig
Plot #:21

Do normal environmental conditions exist? Y☒ N☐ If no, explain:
Has Vegetation ☐ Soil☐ Hydrology ☐ been significantly disturbed?
Explain:

VEGETATION

Tree Stratum				Herb Stratum	
Total Plot Cover:0	= 50%	= 20%		Total Plot Cover:55 27.5 = 50% 11 = 20%	
		Status/Raw % Cover			Status/Raw % Cover
1.				1. *Alopecurus pratensis*	FACW 20*
2.				2.*Agrostis stolonifera*	FAC 60*
3.				3.*Festuca aruninacea*	FAC- 20*
4.				4.	
5.				5.	
Sapling/Shrub Stratum				6.	
Total Plot Cover:50	25= 50%	10= 20%	Status/Raw % Cover	7.	
1.*Rubus discolor*			FACU 50*	8.	
2.				9.	
3.				10.	
4.				11.	
5.				12.	

Hydrophytic Vegetation Indicators:
☒ > 50% of dominants are OBL, FACW or FAC Percent of Dominant Species that are OBL, FACW, FAC (not FAC-):75
Other hydrophytic vegetation indicators:
Criteria Met? ☒Yes ☐ No **Comments:** Mets wetland vegetation criteria.

SOILS

Map Unit Name: Amity silt loam
On Hydric Soil List? ☐ Yes ☒ No
Drainage Class: Somewhat poorly drained
Has Hydric Inclusions? ☒ Yes ☐ No

Depth Range of Horizon	Matrix Color	Redox Concentrations	Redox Depletions	Texture
0-13	10YR3/2	None		Si CL
13-18	10YR4/2	10YR4/6 FFD		Si CL

Hydric Soil Indicators:
☐Histosol
☐Histic Epipedon
☐Sulfidic Odor
☐Reducing Conditions (tests positive)
☐Gleyed or low chroma colors
☐Redox features within 10" (e.g., concentrations)
☐Concretions/Nodules (w/in 3", > 2mm)
☐High organic content in surface (in Sandy Soils)
☐Organic streaking (in Sandy Soils)
☐Organic pan (in Sandy Soils)
☐ Listed on Hydric Soils List (and soil profile matches)
☐ Meets hydric soil criteria 3 or 4 (ponded or flooded for long duration)
☐ Supplemental indicator (e.g., NRCS field indicator)

Criteria Met? ☐ Yes ☒ No

HYDROLOGY

Recorded Data:
☐Recorded Data Available ☐Aerial Photos ☐Stream Gauge ☐ Other ☒ No Recorded Data Available

Field Data
Depth of inundation: Depth to Saturation: Depth to Free Water:

Primary Hydrology Indicators:
☐Inundated
☐Saturated in upper 12 inches
☐Water Marks
☐Drift Lines
☐Sediment Deposits

Secondary Hydrology Indicators (2 or more required):
☐Oxidized Root Channels (upper 12")
☐Water-stained leaves
☐Local Soil Survey Data
☐FAC – Neutral Test
☐Other:

Criteria Met? ☐Yes ☒ No
Comments: .

DETERMINATION

WETLAND? ☐YES ☒NO **Comments: No wetland hydrology or hydric soils.**

DEPARTMENT OF STATE LANDS WETLAND DETERMINATION DATA FORM – Quick Method

County: Yamhill	Date: 2/28/07	City: Newberg	File #:1985

Project/Contact: NewB./CS
Plant Community: meadow/scrub-shrub
Plot Location: Paired w/ sample plot 21
Recent Weather: cold/wet

Det. By: C. Steinkoenig
Plot #:22

Do normal environmental conditions exist? Y☒ N☐ If no, explain:
Has Vegetation ☐ Soil☐ Hydrology ☐ been significantly disturbed?
Explain:

VEGETATION

Tree Stratum

Total Plot Cover:0	= 50%	= 20%	Status/Raw % Cover
1.			
2.			
3.			
4.			
5.			

Sapling/Shrub Stratum

Total Plot Cover:5	2.5= 50%	1= 20%	Status/Raw % Cover
1. *Rubus discolor*			FACU 5 *
2.			
3.			
4.			
5.			

Herb Stratum

Total Plot Cover:100	50 = 50%	20 = 20%	Status/Raw % Cover
1. *Alopecurus pratensis*			FACW 50*
2. *Agrostis stolonifera*			FAC 45*
3. *Moss*			5
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			

Hydrophytic Vegetation Indicators:
☒ > 50% of dominants are OBL, FACW or FAC Percent of Dominant Species that are OBL, FACW, FAC (not FAC-):100
Other hydrophytic vegetation indicators:
Criteria Met? ☒Yes ☐ No **Comments:** Vegetation criterion is met.

SOILS

Map Unit Name: Amity silt loam
On Hydric Soil List? ☐ Yes ☒ No
Drainage Class: Somewhat poorly drained
Has Hydric Inclusions? ☒ Yes ☐ No

Depth Range of Horizon	Matrix Color	Redox Concentrations	Redox Depletions	Texture
0-12	10YR3/2	10YR3/6 CFF		Sl L
12-18	10YR4/2	10YR4/6 MFD		Si CL

Hydric Soil Indicators:
☐Histosol
☐Histic Epipedon
☐Sulfidic Odor
☐Reducing Conditions (tests positive)
☐Gleyed or low chroma colors
☒Redox features within 10" (e.g., concentrations)
☐Concretions/Nodules (w/in 3", > 2mm)
☐High organic content in surface (in Sandy Soils)
☐Organic streaking (in Sandy Soils)
☐Organic pan (in Sandy Soils)
☐ Listed on Hydric Soils List (and soil profile matches)
☐ Meets hydric soil criteria 3 or 4 (ponded or flooded for long duration)
☐ Supplemental indicator (e.g., NRCS field indicator)

Criteria Met? ☒ Yes ☐ No

HYDROLOGY

Recorded Data:
☐Recorded Data Available ☐Aerial Photos ☐Stream Gauge ☐ Other ☒ No Recorded Data Available
Field Data
Depth of inundation: Depth to Saturation:Saturated to the surface Depth to Free Water:

Primary Hydrology Indicators:
☐Inundated
☒Saturated in upper 12 inches
☐Water Marks
☐Drift Lines
☐Sediment Deposits

Secondary Hydrology Indicators (2 or more required):
☐Oxidized Root Channels (upper 12")
☐Water-stained leaves
☐Local Soil Survey Data
☐FAC – Neutral Test
☐Other:

Criteria Met? ☒Yes ☐ No
Comments: .

DETERMINATION

WETLAND? ☒YES ☐NO **Comments: All wetland criteria is met.**

DEPARTMENT OF STATE LANDS WETLAND DETERMINATION DATA FORM – Quick Method

County: Yamhill	Date: 2/28/07	City: Newberg	File #:1985

Project/Contact: NewB./CS
Plant Community: meadow/scrub-shrub
Plot Location:
Recent Weather: cold
Det. By: C. Steinkoenig
Plot #:23

Do normal environmental conditions exist? Y ☒ N ☐ If no, explain:
Has Vegetation ☐ Soil ☐ Hydrology ☐ been significantly disturbed?
Explain:

VEGETATION

Tree Stratum

Total Plot Cover:0	= 50%	= 20%

	Status/Raw % Cover
1.	
2.	
3.	
4.	
5.	

Sapling/Shrub Stratum

Total Plot Cover:35	17.5= 50%	7= 20%	Status/Raw % Cover
1.*Rubus discolor*			FACU- 10*
2.*Rubus laciniatus*			FACU+ trace
3.*Rhamnus purshiana*			FAC- 5
4.*Crataegus sp*			FAC/FACU 20*
5.			

Herb Stratum

Total Plot Cover:100	50 = 50%	20 = 20%

	Status/Raw % Cover
1. *Alopecurus pratensis*	FACW 20*
2.*Agrostis stolonifera*	FAC 50*
3.*Dactylis glomerata*	FACU 20*
4.*Chrysanthemum ;euc.*	NOL 5
5.*Aster sp.*	Unknown 5
6.	
7.	
8.	
9.	
10.	
11.	
12.	

Hydrophytic Vegetation Indicators:
☐ > 50% of dominants are OBL, FACW or FAC Percent of Dominant <u>Species</u> that are OBL, FACW, FAC (not FAC-):50
Other hydrophytic vegetation indicators:
Criteria Met? ☐Yes ☒ No **Comments:** Hawthron species not included.

SOILS

Map Unit Name: Amity silt loam
On Hydric Soil List? ☐ Yes ☒ No
Drainage Class: Somewhat poorly drained
Has Hydric Inclusions? ☒ Yes ☐ No

Depth Range of Horizon	Matrix Color	Redox Concentrations	Redox Depletions	Texture
0-13	10YR3/2	None		Si L
13-18	10YR4/2	10YR4/6 MFD		Si CL

Hydric Soil Indicators:
☐Histosol
☐Histic Epipedon
☐Sulfidic Odor
☐Reducing Conditions (tests positive)
☐Gleyed or low chroma colors
☐Redox features within 10" (e.g., concentrations)
☐Concretions/Nodules (w/in 3", > 2mm)
☐High organic content in surface (in Sandy Soils)
☐Organic streaking (in Sandy Soils)
☐Organic pan (in Sandy Soils)
☐ Listed on Hydric Soils List (and soil profile matches)
☐ Meets hydric soil criteria 3 or 4 (ponded or flooded for long duration)
☐ Supplemental indicator (e.g., NRCS field indicator)

Criteria Met? ☐ Yes ☒ No

HYDROLOGY

Recorded Data:
☐Recorded Data Available ☐Aerial Photos ☐Stream Gauge ☐ Other ☒ No Recorded Data Available
Field Data
Depth of inundation: Depth to Saturation: Depth to Free Water:10"
Primary Hydrology Indicators:
☐Inundated
☒Saturated in upper 12 inches
☐Water Marks
☐Drift Lines
☐Sediment Deposits
Criteria Met? ☒Yes ☐ No

Secondary Hydrology Indicators (2 or more required):
☐Oxidized Root Channels (upper 12")
☐Water-stained leaves
☐Local Soil Survey Data
☐FAC – Neutral Test
☐Other:
Comments: .

DETERMINATION

WETLAND? ☐YES ☒NO **Comments: Vegetation and soil did not met wetland criteria.**

DEPARTMENT OF STATE LANDS WETLAND DETERMINATION DATA FORM – Quick Method

County: Yamhill	Date: 2/28/07	City: Newberg	File #:1985

Project/Contact: NewB./CS
Det. By: C. Steinkoenig
Plant Community: meadow/scrub-shrub
Plot #:24
Plot Location: Paired w/ sample plot 23
Recent Weather: cold
Do normal environmental conditions exist? Y☒ N☐ If no, explain:
Has Vegetation ☐ Soil☐ Hydrology ☐ been significantly disturbed?
Explain:

VEGETATION

Tree Stratum			Herb Stratum		
Total Plot Cover:0	= 50%	= 20%	Total Plot Cover:100	50 = 50%	20 = 20%
		Status/Raw % Cover			Status/Raw % Cover
1.			1. *Alopecurus pratensis*		FACW 50*
2.			2.*Agrostis stolonifera*		FAC 45*
3.			3.*Moss*		5
4.			4.		
5.			5.		
Sapling/Shrub Stratum			6.		
Total Plot Cover:30	15= 50%	6= 20% / Status/Raw % Cover	7.		
1.*Rosa nutkana*		FAC 30*	8.		
2.			9.		
3.			10.		
4.			11.		
5.			12.		

Hydrophytic Vegetation Indicators:
☒ > 50% of dominants are OBL, FACW or FAC Percent of Dominant Species that are OBL, FACW, FAC (not FAC-):100
Other hydrophytic vegetation indicators:
Criteria Met? ☒Yes ☐ No **Comments:** Vegetation criterion is met.

SOILS

Map Unit Name: Amity silt loam
Drainage Class: Somewhat poorly drained
On Hydric Soil List? ☐ Yes ☒ No
Has Hydric Inclusions? ☒ Yes ☐ No

Depth Range of Horizon	Matrix Color	Redox Concentrations	Redox Depletions	Texture
0-10	10YR3/2	10YR3/6 MMF		Sl L
10-16	10YR4/2	10YR4/6 MFD		Si CL

Hydric Soil Indicators:

☐Histosol
☐Histic Epipedon
☐Sulfidic Odor
☐Reducing Conditions (tests positive)
☐Gleyed or low chroma colors
☒Redox features within 10" (e.g., concentrations)
☐Concretions/Nodules (w/in 3", > 2mm)
☐High organic content in surface (in Sandy Soils)
☐Organic streaking (in Sandy Soils)
☐Organic pan (in Sandy Soils)
☐ Listed on Hydric Soils List (and soil profile matches)
☐ Meets hydric soil criteria 3 or 4 (ponded or flooded for long duration)
☐ Supplemental indicator (e.g., NRCS field indicator)

Criteria Met? ☒ Yes ☐ No

HYDROLOGY

Recorded Data:
☐Recorded Data Available ☐Aerial Photos ☐Stream Gauge ☐ Other ☒ No Recorded Data Available

Field Data
Depth of inundation: Depth to Saturation:Saturated to the surface Depth to Free Water:

Primary Hydrology Indicators:
☐Inundated
☒Saturated in upper 12 inches
☐Water Marks
☐Drift Lines
☐Sediment Deposits

Secondary Hydrology Indicators (2 or more required):
☐Oxidized Root Channels (upper 12")
☐Water-stained leaves
☐Local Soil Survey Data
☐FAC – Neutral Test
☐Other:

Criteria Met? ☒Yes ☐ No **Comments:**.

DETERMINATION

WETLAND? ☒YES ☐NO **Comments: All wetland criteria is met.**

DEPARTMENT OF STATE LANDS WETLAND DETERMINATION DATA FORM – Quick Method

County: Yamhill	Date: 2/28/07	City: Newberg	File #:1985

Project/Contact: NewB./CS
Plant Community: meadow
Plot Location: south of isolated wetland
Recent Weather: cold/wet
Det. By: C. Steinkoenig
Plot #:25

Do normal environmental conditions exist? Y☒ N☐ If no, explain:
Has Vegetation ☐ Soil☐ Hydrology ☐ been significantly disturbed?
Explain:

VEGETATION

Tree Stratum

Total Plot Cover:0	= 50%	= 20%	Status/Raw % Cover
1.			
2.			
3.			
4.			
5.			

Sapling/Shrub Stratum

Total Plot Cover:	= 50%	= 20%	Status/Raw % Cover
1.			
2.			
3.			
4.			
5.			

Herb Stratum

Total Plot Cover:100	50 = 50%	20 = 20%
		Status/Raw % Cover
1. *Alopecurus pratensis*		FACW 20*
2. *Agrostis stolonifera*		FAC 80*
3.		
4.		
5.		
6.		
7.		
8.		
9.		
10.		
11.		
12.		

Hydrophytic Vegetation Indicators:
☒ > 50% of dominants are OBL, FACW or FAC Percent of Dominant __Species__ that are OBL, FACW, FAC (not FAC-):100
Other hydrophytic vegetation indicators:
Criteria Met? ☒Yes ☐ No **Comments:** Did not include hawthorn.

SOILS

Map Unit Name: Amity silt loam
Drainage Class: Somewhat poorly drained
On Hydric Soil List? ☐ Yes ☒ No
Has Hydric Inclusions? ☒ Yes ☐ No

Depth Range of Horizon	Matrix Color	Redox Concentrations	Redox Depletions	Texture
0-12	10YR3/2	10YR3/6 MFD		Si CL
12-18	10YR4/2	10YR4/6 CFD		Si CL

Hydric Soil Indicators:
☐Histosol
☐Histic Epipedon
☐Sulfidic Odor
☐Reducing Conditions (tests positive)
☐Gleyed or low chroma colors
☒Redox features within 10" (e.g., concentrations)
☐Concretions/Nodules (w/in 3", > 2mm)
☐High organic content in surface (in Sandy Soils)
☐Organic streaking (in Sandy Soils)
☐Organic pan (in Sandy Soils)
☐ Listed on Hydric Soils List (and soil profile matches)
☐ Meets hydric soil criteria 3 or 4 (ponded or flooded for long duration)
☐ Supplemental indicator (e.g., NRCS field indicator)

Criteria Met? ☒ Yes ☐ No

HYDROLOGY

Recorded Data:
☐Recorded Data Available ☐Aerial Photos ☐Stream Gauge ☐ Other ☒ No Recorded Data Available

Field Data
Depth of inundation: Depth to Saturation:to surface Depth to Free Water:1"

Primary Hydrology Indicators:
☐Inundated
☒Saturated in upper 12 inches
☐Water Marks
☐Drift Lines
☐Sediment Deposits

Secondary Hydrology Indicators (2 or more required):
☐Oxidized Root Channels (upper 12")
☐Water-stained leaves
☐Local Soil Survey Data
☐FAC – Neutral Test
☐Other:

Criteria Met? ☒Yes ☐ No **Comments: Area has patches of standing water.**

DETERMINATION

WETLAND? ☒YES ☐NO **Comments: Wetland criteria met.**

DEPARTMENT OF STATE LANDS WETLAND DETERMINATION DATA FORM – Quick Method

County: Yamhill	Date: 2/28/07	City: Newberg	File #:1985

Project/Contact: NewB./CS
Plant Community: meadow
Plot Location: Paired w/sampleplot 25
Recent Weather: cold

Det. By: C. Steinkoenig
Plot #:26

Do normal environmental conditions exist? Y☒ N☐ If no, explain:
Has Vegetation ☐ Soil☐ Hydrology ☐ been significantly disturbed?
Explain:

VEGETATION

Tree Stratum				Herb Stratum		
Total Plot Cover:0	= 50%	= 20%		Total Plot Cover:100	50 = 50%	20 = 20%
		Status/Raw % Cover				Status/Raw % Cover
1.				1. *Alopecurus pratensis*		FACW 45*
2.				2. *Agrostis stolonifera*		FAC 55*
3.				3.		
4.				4.		
5.				5.		
Sapling/Shrub Stratum				6.		
Total Plot Cover:10	5= 50%	2.5= 20%	Status/Raw % Cover	7.		
1. *Rubus discolor*			FACU 5*	8.		
2. *Malus sp.*			NOL 5*	9.		
3.				10.		
4.				11.		
5.				12.		

Hydrophytic Vegetation Indicators:
☒ > 50% of dominants are OBL, FACW or FAC Percent of Dominant Species that are OBL, FACW, FAC (not FAC-):66
Other hydrophytic vegetation indicators:
Criteria Met? ☒Yes ☐ No **Comments:** Mets wetland vegetation criteria.

SOILS

Map Unit Name: Amity silt loam
On Hydric Soil List? ☐ Yes ☒ No
Drainage Class: Somewhat poorly drained
Has Hydric Inclusions? ☒ Yes ☐ No

Depth Range of Horizon	Matrix Color	Redox Concentrations	Redox Depletions	Texture
0-12	10YR3/2	None		Sl L
12-18	10YR4/2	10YR4/6 CFD		Si CL

Hydric Soil Indicators:
☐Histosol
☐Histic Epipedon
☐Sulfidic Odor
☐Reducing Conditions (tests positive)
☐Gleyed or low chroma colors
☐Redox features within 10" (e.g., concentrations)
☐Concretions/Nodules (w/in 3", > 2mm)
☐High organic content in surface (in Sandy Soils)
☐Organic streaking (in Sandy Soils)
☐Organic pan (in Sandy Soils)
☐ Listed on Hydric Soils List (and soil profile matches)
☐ Meets hydric soil criteria 3 or 4 (ponded or flooded for long duration)
☐ Supplemental indicator (e.g., NRCS field indicator)

Criteria Met? ☐ Yes ☒ No

HYDROLOGY

Recorded Data:
☐Recorded Data Available ☐Aerial Photos ☐Stream Gauge ☐ Other ☒ No Recorded Data Available
Field Data
Depth of inundation: Depth to Saturation:5" Depth to Free Water:5"
Primary Hydrology Indicators:
☐Inundated
☒Saturated in upper 12 inches
☐Water Marks
☐Drift Lines
☐Sediment Deposits
Criteria Met? ☒Yes ☐ No

Secondary Hydrology Indicators (2 or more required):
☐Oxidized Root Channels (upper 12")
☐Water-stained leaves
☐Local Soil Survey Data
☐FAC – Neutral Test
☐Other:
Comments:.

DETERMINATION

WETLAND? ☐YES ☒NO **Comments: Soil did not met wetland criterion.**

DEPARTMENT OF STATE LANDS WETLAND DETERMINATION DATA FORM – Quick Method

County: Yamhill	Date: 2/28/07	City: Newberg	File #:1985

Project/Contact: NewB./CS
Plant Community: meadow
Plot Location: Tax lot 1000 Vet Clinic
Recent Weather: cold
Det. By: C. Steinkoenig
Plot #:27

Do normal environmental conditions exist? Y☒ N☐ If no, explain:
Has Vegetation ☐ Soil☐ Hydrology ☐ been significantly disturbed?
Explain:

VEGETATION

Tree Stratum				Herb Stratum			
Total Plot Cover:0	= 50%	= 20%	Status/Raw % Cover	Total Plot Cover:100	50 = 50%	20 = 20%	Status/Raw % Cover
1.				1.*Poa pratenisis*			FAC 45*
2.				2.*Agrostis stolonifera*			FAC 50*
3.				3.*Rumex crispus*			FAC+ trace
4.				4.*Chrysanthemum Leuc.*			UPL trace
5.				5.*Trifolium repens*			FAC 15
Sapling/Shrub Stratum				6.			
Total Plot Cover:	= 50%	= 20%	Status/Raw % Cover	7.			
1.				8.			
2.				9.			
3.				10.			
4.				11.			
5.				12.			

Hydrophytic Vegetation Indicators:
☒ > 50% of dominants are OBL, FACW or FAC Percent of Dominant Species that are OBL, FACW, FAC (not FAC-):100
Other hydrophytic vegetation indicators:
Criteria Met? ☒Yes ☐ No **Comments:** .

SOILS

Map Unit Name: Woodburn silt loam 0-7% Drainage Class: Moderately well drained
On Hydric Soil List? ☐ Yes ☒ No Has Hydric Inclusions? ☐ Yes ☒ No

Depth Range of Horizon	Matrix Color	Redox Concentrations	Redox Depletions	Texture
0-16	10YR3/3	None		Sl L

Hydric Soil Indicators:
☐Histosol
☐Histic Epipedon
☐Sulfidic Odor
☐Reducing Conditions (tests positive)
☐Gleyed or low chroma colors
☐Redox features within 10" (e.g., concentrations)
☐Concretions/Nodules (w/in 3", > 2mm)
☐High organic content in surface (in Sandy Soils)
☐Organic streaking (in Sandy Soils)
☐Organic pan (in Sandy Soils)
☐ Listed on Hydric Soils List (and soil profile matches)
☐ Meets hydric soil criteria 3 or 4 (ponded or flooded for long duration)
☐ Supplemental indicator (e.g., NRCS field indicator)

Criteria Met? ☐ Yes ☒ No

HYDROLOGY

Recorded Data:
☐Recorded Data Available ☐Aerial Photos ☐Stream Gauge ☐ Other ☒ No Recorded Data Available
Field Data
Depth of inundation: Depth to Saturation: Depth to Free Water:
Primary Hydrology Indicators:
☐Inundated
☐Saturated in upper 12 inches
☐Water Marks
☐Drift Lines
☐Sediment Deposits
Criteria Met? ☐Yes ☒ No

Secondary Hydrology Indicators (2 or more required):
☐Oxidized Root Channels (upper 12")
☐Water-stained leaves
☐Local Soil Survey Data
☐FAC – Neutral Test
☐Other:
Comments:

DETERMINATION

WETLAND? ☐YES ☒NO **Comments: No hydric soil or wetland hydrology observed.**

DEPARTMENT OF STATE LANDS WETLAND DETERMINATION DATA FORM – Quick Method

County: Yamhill	Date: 2/28/07	City: Newberg	File #:1985

Project/Contact: NewB./CS
Plant Community: meadow
Plot Location: Tax lot 900
Recent Weather: cold

Det. By: C. Steinkoenig
Plot #:28

Do normal environmental conditions exist? Y☒ N☐ If no, explain:
Has Vegetation ☐ Soil☐ Hydrology ☐ been significantly disturbed?
Explain:

VEGETATION

Tree Stratum				Herb Stratum	
Total Plot Cover:0	= 50%	= 20%		Total Plot Cover:100 / 50 = 50% / 20 = 20%	
		Status/Raw % Cover			Status/Raw % Cover
1.				1.*Poa pratenisis*	FAC 45*
2.				2.*Agrostis stolonifera*	FAC 50*
3.				3.*Rumex crispus*	FAC+ trace
4.				4.*Chrysanthemum Leuc.*	UPL trace
5.				5.*Trifolium repens*	FAC 15
Sapling/Shrub Stratum				6.	
Total Plot Cover:	= 50%	= 20%	Status/Raw % Cover	7.	
1.				8.	
2.				9.	
3.				10.	
4.				11.	
5.				12.	

Hydrophytic Vegetation Indicators:
☒ > 50% of dominants are OBL, FACW or FAC Percent of Dominant Species that are OBL, FACW, FAC (not FAC-):100
Other hydrophytic vegetation indicators:
Criteria Met? ☒Yes ☐ No **Comments:** .

SOILS

Map Unit Name: Woodburn silt loam 0-7% Drainage Class: Moderately well drained
On Hydric Soil List? ☐ Yes ☒ No Has Hydric Inclusions? ☐ Yes ☒ No

Depth Range of Horizon	Matrix Color	Redox Concentrations	Redox Depletions	Texture
0-17	10YR3/3	None		Sl L

Hydric Soil Indicators:
☐Histosol
☐Histic Epipedon
☐Sulfidic Odor
☐Reducing Conditions (tests positive)
☐Gleyed or low chroma colors
☐Redox features within 10" (e.g., concentrations)
☐Concretions/Nodules (w/in 3", > 2mm)
☐High organic content in surface (in Sandy Soils)
☐Organic streaking (in Sandy Soils)
☐Organic pan (in Sandy Soils)
☐ Listed on Hydric Soils List (and soil profile matches)
☐ Meets hydric soil criteria 3 or 4 (ponded or flooded for long duration)
☐ Supplemental indicator (e.g., NRCS field indicator)

Criteria Met? ☐ Yes ☒ No

HYDROLOGY

Recorded Data:
☐Recorded Data Available ☐Aerial Photos ☐Stream Gauge ☐ Other ☒ No Recorded Data Available
Field Data
Depth of inundation: Depth to Saturation: Depth to Free Water:
Primary Hydrology Indicators:
☐Inundated
☐Saturated in upper 12 inches
☐Water Marks
☐Drift Lines
☐Sediment Deposits
Criteria Met? ☐Yes ☒ No

Secondary Hydrology Indicators (2 or more required):
☐Oxidized Root Channels (upper 12")
☐Water-stained leaves
☐Local Soil Survey Data
☐FAC – Neutral Test
☐Other:
Comments:

DETERMINATION

WETLAND? ☐YES ☒NO **Comments: No hydric soil or wetland hydrology observed.**

Appendices

Boiler Plate Information
References

Boiler Plate Information

Wetland Definition and Authority

The U.S. Army Corps of Engineers (COE) regulates the discharge of dredged or fill materials into waters and adjacent wetlands of the United States under authority of Section 404 of the Clean Water Act (*Federal Register,* 1986). For purposes of the Section 404 permitting program, the COE and other federal agencies define wetlands as follows (*Federal Register,* 1980, 1982):

> "Those areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions."

In Oregon, the Department of State Lands (DSL) regulates removal/fill permitting in wetlands under ORS 196.800 to 196.990, and OAR 141-85-005 to OAR 141-85-090, and uses the same definition.

Regulatory Context

In 1987, the COE published a manual (Corps of Engineers Wetlands Delineation Manual or 1987 manual), which describes methods for determining the extent of jurisdictional wetlands under Section 404 of the Clean Water Act (Environmental Laboratory, 1987). *The Federal Manual for Identifying and Delineating Jurisdictional Wetlands* was published two years later as a collaborative effort by the COE, U.S. Fish and Wildlife Service (USFWS), U.S. Environmental Protection Agency (EPA), and U.S. Soil Conservation Service (SCS), revised the 1987 manual (Federal Interagency Committee for Wetland Delineation, or 1989 manual).

Both the COE and DSL used the 1989 manual until 1992 when the 1992 Energy and Water Development Appropriation Act went into effect. The Act limited the COE (federal permitting agency) to using the 1987 manual for determining the extent of wetlands under federal jurisdiction. Oregon continued to use the 1989 manual until March 23, 1993, when the Director of DSL signed a policy statement requiring the agency to use the 1987 manual. The policy statement was the result of the EPA agreement to use the 1987 manual.

Vegetation

Plants growing in wetlands must be specifically adapted for life under saturated or anaerobic conditions and are commonly referred to as hydrophytic vegetation. The U.S.F.W.S. in cooperation with the National and Regional Interagency Review Panels publishes regional lists estimating the probability of plant species' occurrence in wetlands (e.g., Fish and Wildlife Service, 1988). Each species is given an *indicator status*, which represents the likelihood that it will be found in a wetland. Categories defined in Table 1 are obligate (OBL), facultative wetland (FACW), facultative (FAC), facultative upland (FACU), or upland (UPL). Plants with an indicator status of OBL, FACW, or FAC are considered adapted for life in saturated or anaerobic soil conditions.

The percent coverage of each plant species within the herb, shrub, and tree layers was estimated at each sample plot. Shrubs within a five-foot radius and trees within a 30-foot radius of the center of each plot were identified and recorded. Within the plot, all species were recorded in descending order of coverage, and dominant species were determined. The presence of wetland vegetation was determined according to the indicator status of the dominant species within each vegetative stratum. According to the manual, a sample plot is considered to have wetland vegetation if more than 50% of the number of dominant species present has an indicator status of OBL, FACW, and/or FAC. By 1987 standards, dominant species are chosen by selecting the three most dominant species from each of the four strata (herbs, saplings/shrubs, woody vines, trees). If only one or two strata are represented, then the five most dominant species from each stratum are selected.

TABLE 1: DEFINITIONS OF INDICATOR STATUS

Indicator Symbol	Definition
OBL	Obligate. Species that occur in wetlands under natural conditions with an estimated probability of greater than 99%
FACW	Facultative wetland. Species that usually occur in wetlands (estimated probability 67 to 99%), but occasionally are found in non-wetlands.
FAC	Facultative. Species that are equally likely to occur in wetlands or non-wetlands (estimated probability 34 to 66%).
FACU	Facultative upland. Species that usually occur in non-wetlands (estimated probability 67 to 99%), but occasionally are found in wetlands.
UPL	Upland. Species that occur in non-wetlands under natural conditions with an estimated probability of greater than 99%
NI	No indicator. Species for which insufficient information was available to determine an indicator status.

Sources: Federal Interagency Committee for Wetland Delineation, 1989. Environmental Laboratory, 1987. Reed, 1988.

Soils

Hydric soils, defined as soils that are saturated, flooded, or ponded long enough during the growing season to develop anaerobic conditions in the upper part of the soil profile, are one characteristic of wetlands (USDA Soil Conservation Service, 1987). A list of hydric soils of the United States was compiled by the Soil Conservation Service (SCS), in cooperation with the National Technical Committee for Hydric Soils (NTCHS). All soils are mapped in county soil surveys. However, the mapped boundaries of SCS soil types are not at a fine enough resolution for delineating boundaries of jurisdictional wetlands. Errors of omission can occur on SCS maps. Inclusions of upland (non-wetland) soil may exist in hydric soils and uplands may have inclusions of hydric soil. Therefore, field examination of soils is important for accurately delineating the extent of hydric soils. Hydric soils exhibit certain characteristics that can be observed in the field. Field indicators include: high organic content, accumulation of sulfidic material (rotten egg odor), greenish or bluish gray color (gley formation), iron and manganese concretions, spots or blotches of color (mottling), and/or dark soil colors (low soil chroma).

A shovel, excavating down to a depth of at least 16 inches, was used to sample soil along the wetland boundary. Soil samples were checked for presence of sulfide gases; organic content was estimated visually and texturally; and soil colors were determined by using a Munsell soil color chart (Kollmorgen 1975). The Munsell soil color chart provides the standard for three attributes of color: hue, value, and chroma.

According to the 1987 manual, hydric soils are required to be inundated or saturated for seven or more consecutive days during the growing season. Soil color is examined in the horizon immediately below the A-horizon, or within 10 inches of the surface, whichever is shallower.

Hydrology

Wetlands, by their very name, must have water. Jurisdictional wetlands are characterized as having permanent or periodic inundation, or soil saturation for five percent or more of the growing season. Saturation occurs when the capillary fringe is within the major portion of the root zone (usually within 12 inches of the surface). Areas meeting one of these criteria are considered to have wetland hydrology.

Ponding or soil saturation for five percent or more of the growing season during the growing season is direct evidence of wetland hydrology. Bare soil and dried algae are evidence that a site was previously inundated. Oxidized rhizospheres along live root channels also indicate soil saturation for five percent or more of the growing season. At each sample plot, wetland hydrology was assumed if positive indicators were present.

Wetland Determination

Presence or absence of wetlands was based on soil, vegetation, and hydrology data collected at sample plots. Following procedures outlined in the 1987 manual, sample plots with homogeneous vegetation were determined to be wetlands if wetland characteristics were present or judged to be normally present (barring human or unusual natural events) for all three parameters.

Difficulties in wetland determination can arise because of disturbance or in problem areas. Both human (e.g., clearing vegetation, agriculture, filling, and excavation) and natural (e.g., mudslides, fire, and beaver dams) events have potential for obliterating field indicators of the three wetland parameters. In disturbed sites, both field and offsite data may be used to determine the presence of a wetland. Offsite information such as historical records, aerial photographs, previous soil, and vegetation surveys may indicate the presence of a jurisdictional wetland.

Some sites are difficult to evaluate because field indicators may not be present throughout the year. Field indicators may vary because of changing environmental conditions that occur seasonally and not necessarily the result of human or natural disturbance.

According to the 1987 manual, all three parameters (hydric soils, hydrophytic vegetation, and wetland hydrology) must be present for an area to be determined as wetland. Drumlins, seasonal wetlands, prairie potholes, and vegetated flats exemplify areas that are difficult to evaluate.

REFERENCES

Environmental Laboratory, 1987. *Corps of Engineers Wetlands Delineation Manual,* Technical Report Y-87-1, U.S. Army Engineers Waterways Experiment Station, Vicksburg, MS.

Federal Interagency Committee for Wetland Delineation, 1989. *Federal Manual for Identifying and Delineating Jurisdictional Wetlands*, U.S. Army Corps of Engineers, U.S. Environmental Protection Agency, U.S. Fish and Wildlife Service, and U.S.D.A. Soil Conservation Service, Washington, D.C. Cooperative technical publication. 138 pp.

Federal Register, 1980. 40 CFR Part 230: Section 404(b)(1), *Guidelines for Specification of Disposal Sites of Dredged or Fill Material,* Vol. 45, No. 249, pp. 85352-85353, U.S. Govt. Printing Office, Washington, D.C.

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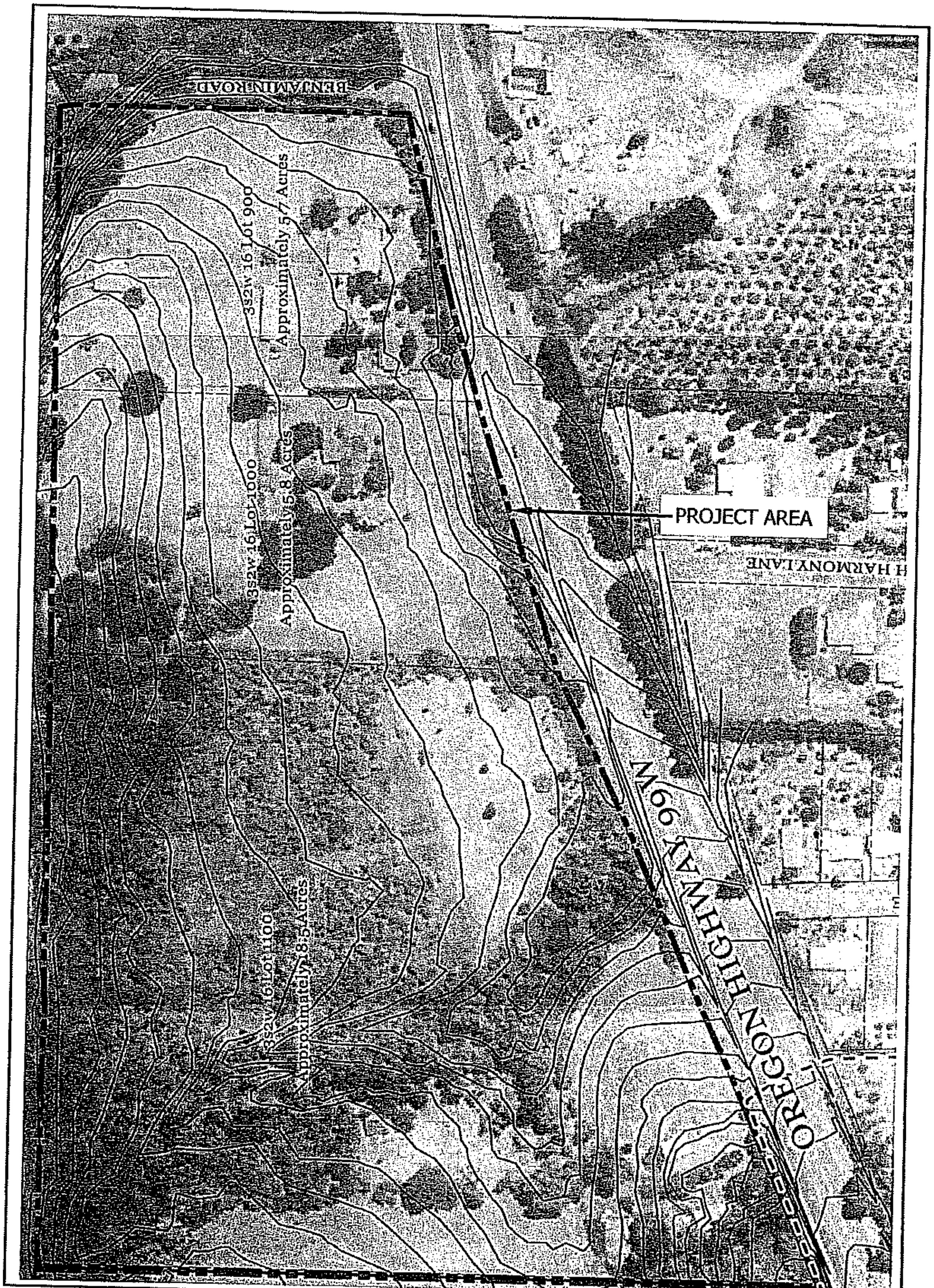
Kollmorgen Corporation, 1975. *Munsell Soil Color Charts.* Macbeth Division of Kollmorgen Corporation, Baltimore, MD.

Reed, P. B., Jr., 1988. *National List of Plant Species that Occur in Wetlands: Northwest (Region 9*), U.S. Fish and Wildlife Service, Biological Report 88 (26.9) 89 pp.

Reed, P. B., Jr., et al., 1993. *Supplement to List of Plant Species That Occur in Wetlands: Northwest (Region 9),* U.S. Fish and Wildlife Service. Washington D.C. 10p.

U.S. Department of Agriculture, Soil Conservation Service 1991. *Hydric Soils of the United States in Cooperation with the National Technical Committee for Hydric Soils.* Misc. Pub. No. 1491.

U.S. Department of Agriculture, Soil Conservation Service, 1982. *Soil Survey of Yamhill County, Oregon.* U.S.D.A. Soil Conservation Service, Washington, D.C., 138 pp.



AERIAL
S&A #1985

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Oregon
Theodore R. Kulongoski, Governor

Department of State Lands
775 Summer Street NE, Suite 100
Salem, OR 97301-1279
(503) 378-3805
FAX (503) 378-4844
www.oregonstatelands.us.

RECEIVED
JUL 31 2018
Initial:

February 4, 2008

Tim Speakman
New B. Properties, LLC
3401 SW Huber Street
Portland, OR 97219

Re: Wetland Delineation Report for 4505 E Portland Rd, Newberg; Yamhill County; T 3S R 2W Sec. 16 Tax Lots 900, 1000 & 1100; WD #07-0345

Dear Mr. Speakman:

The Department of State Lands has reviewed the wetland delineation report prepared by Schott and Associates for the site referenced above. Based upon the information presented in the report, we concur with the wetland and waterway boundaries as mapped in Wetland Map Pages 1 of 3 and 3 of 3 of the report. Within the study area, three wetlands (totaling approximately 2.24 acres) and two waterways within the mapped wetlands were identified. The wetlands and waterways are subject to the permit requirements of the state Removal-Fill Law. A state permit is required for cumulative fill or annual excavation of 50 cubic yards or more in the wetlands or below the ordinary high water line (OHWL) of a waterway (or the 2 year recurrence interval flood elevation if OHWL cannot be determined).

This concurrence is for purposes of the state Removal-Fill Law only. Federal or local permit requirements may apply as well. The Army Corps of Engineers will review the report and make a determination of jurisdiction for purposes of the Clean Water Act at the time that a permit application is submitted. We recommend that you attach a copy of this concurrence letter to both copies of any subsequent joint permit application to speed application review.

Please be advised that state law establishes a preference for avoidance of wetland impacts. Because measures to avoid and minimize wetland impacts may include reconfiguring parcel layout and size or development design, we recommend that you work with Department staff on appropriate site design before completing the city or county land use approval process.

This concurrence is based on information provided to the agency. The jurisdictional determination is valid for five years from the date of this letter, unless new information necessitates a revision. Circumstances under which the Department may change a determination and procedures for renewal of an expired determination are found in OAR 141-090-0045 (available on our web site or upon request). The applicant, landowner, or agent may submit a request for reconsideration of this determination in writing within 60 calendar days of the date of this letter.

Thank you for having the site evaluated. Please phone me at 503-986-5236 if you have any questions.

Sincerely,

Janet C. Morlan

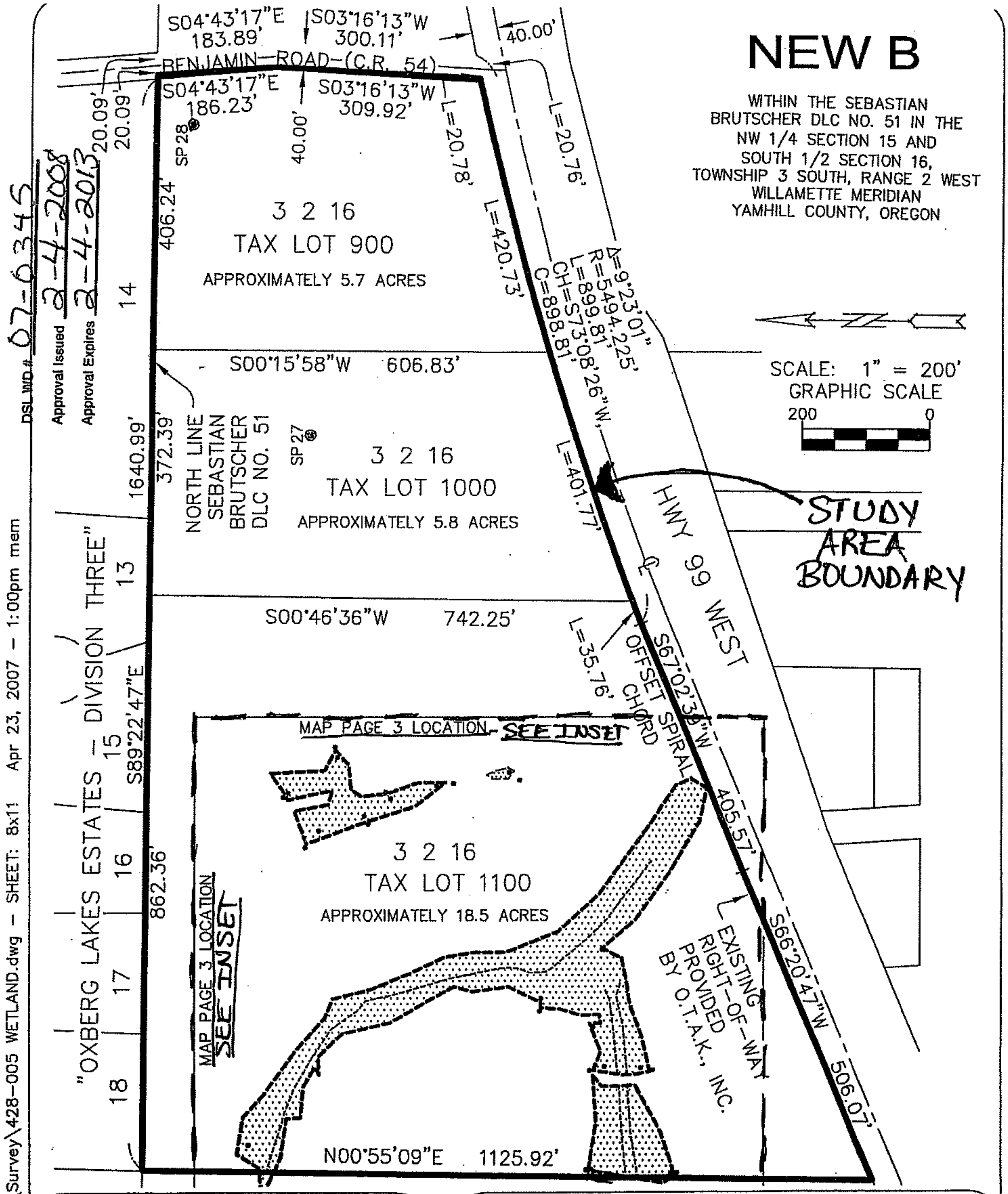
Janet C. Morlan, PWS
Wetlands Program Manager

Enclosures

cc: Claudia Steinkoenig, Schott and Associates
City of Newberg, Planning Department
Tina Teed, Corps of Engineers
Carrie Landrum, DSL

NEW B

WITHIN THE SEBASTIAN BRUTSCHER DLC NO. 51 IN THE NW 1/4 SECTION 15 AND SOUTH 1/2 SECTION 16, TOWNSHIP 3 SOUTH, RANGE 2 WEST WILLAMETTE MERIDIAN YAMHILL COUNTY, OREGON



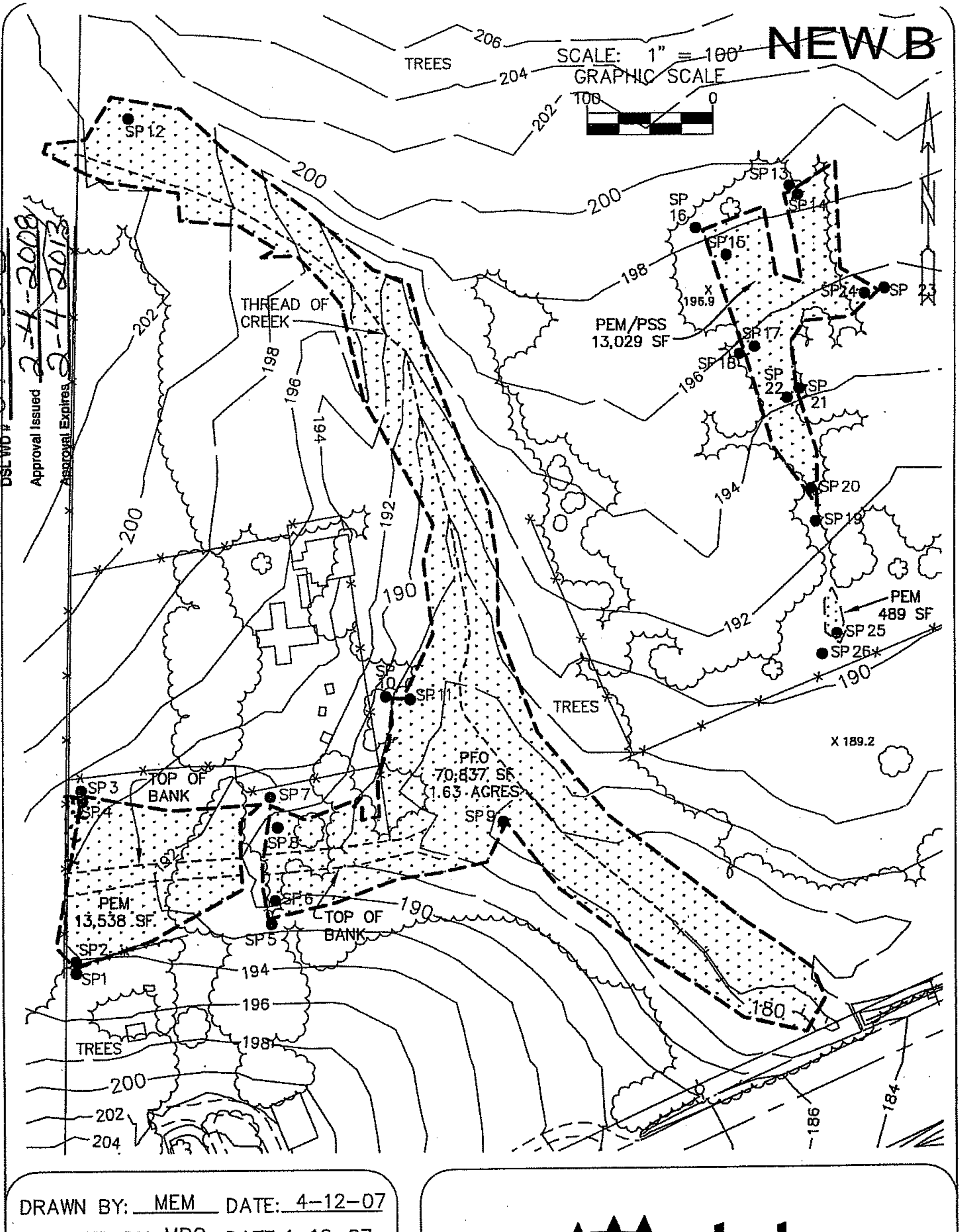
DSL WD # 07-0345
Approval Issued 2-4-2008
Approval Expires 2-4-2013

N:\proj\428-005\dwg\Survey\428-005 WETLAND.dwg – SHEET: 8x11 Apr 23, 2007 – 1:00pm mem

DRAWN BY: MEM DATE: 4-12-07
REVIEWED BY: MRG DATE: 4-12-07
PROJECT NO.: 0428-0005
SCALE: 1"=200'
WETLAND MAP PAGE 1 OF 3

alpha
COMMUNITY DEVELOPMENT

DSL WD # 07-0345
Approval Issued 2-4-2008
Approval Expires 2-4-2013



DRAWN BY: MEM DATE: 4-12-07

REVIEWED BY: MRG DATE: 4-12-07

PROJECT NO.: 0428-0005

SCALE: 1"=100'

WETLAND MAP PAGE 3 OF 3

alpha
COMMUNITY DEVELOPMENT

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Site Data Sheet

Project Name:	New B.
Project Number:	1985
Date of Site Visit:	February 21 & 28, 2007
Applicant:	Tim Speakman
Applicant's Address:	3401 SW Huber Street Portland, Oregon 97219
Owner(s):	Same
Owner(s) Address:	
State:	Oregon
County:	Yamhill
Site Location:	East of Victoria Way, North of 99W
USGS Quadrangle:	Newberg
Latitude/Longitude:	45°18.738'N / 122°55.870'W
Tax Map Information:	3S2W Sect.16 TL 1100, 1000, 900
Watershed:	Willamette River
Adjacent Waterbody:	Tributary of Spring Brook Creek
In the Floodplain:	Yes
Topography:	Gentle to moderate slopes
Site Zoning:	Agriculture/Forestry Small Holding (AF-10)
Proposed Use:	Residential/Commercial
Present/Past Use:	Rural/farmed
Surrounding Usage:	residential to the north and west/ rural to the east
Determination:	2 unnamed tributaries of Spring Brook Creek, 0.32 acre PEM wetland, 1.63 acre PFO wetland, 0.29 acre PEM/PSS wetland
Days Since Last Rain:	0
Mapping accuracy:	Alpha Community Development, PLS

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(A) Site Description

The 30-acre project area is located on the eastern edge of Newberg in Yamhill County, Oregon (SW1/4,NE1/4 Sec. 16, T3S, R2W TL#900,1000, 1100)(Figure 1) just outside of the city limits. The southern boundary abuts city limits. The study area is west of Benjamin Road and east of Victoria Way. Hwy 99W forms the southern property boundary. The new Providence Hospital (zoned I- Institutional) is to the southwest. The three tax lots that comprise the study area are designated as Agricultural/Forestry Small Holdings (AF-10).

For the purposes of this report, the project area will be described by tax lot. Tax lot 900 is located west of Benjamin Road and north of Highway 99 West. The lot is approximately 5.7 acres and has two homes and two large barns on it. The topography has gentle to moderate slopes to the east. The majority of the property consists of horse pasture comprised of grasses and forbs that include colonial bentgrass (*Agrostis stolonifera*), Kentucky bluegrass (*Poa pratensis*), tall fescue (*Festuca arundinacea*) and white clover (*Trifolium repens*) as dominants. Ornamental species were observed around the homes.

Tax Lot 1000 is located west of tax lot 900. It is 5.8 acres and has a vet clinic and associated buildings in the center of it. The topography slopes gently to the south, southeast. Fenced pastures are located on the south and north end of the property. Dominant vegetation includes bentgrass, Kentucky bluegrass, tall fescue and orchard grass (*Dactylis glomerata*). Groupings of Oregon Oak (*Quercus garryana*) and Douglas fir (*Pseudotsuga menziesii*) were scattered along the northern and western property perimeter.

Tax lot 1100 is 18.5 acres and located on the west end of the study area. Topography on the west end slopes gently east to two unnamed tributaries. The mid and east section of the tax lot slopes predominantly south. There is an existing residential home on the southwest end of the property and some outbuilding north of the home. A small drainage located behind the home flows to the east and joins a larger tributary of Spring Brook Creek which flows south to the Willamette River. Three meadow communities were identified on site. The first is along the western property boundary. The second is located southeast of the residence and the third is on the south end of the tax lot. The vegetation in the meadow communities consisted of grasses and forbs that included tall fescue, Kentucky bluegrass, bentgrass, orchard grass (*Dactylis glomerata*), and white clover, queen Anne's lace (*Daucus carota*) and cat's ear (*Hypochoeris radicata*) as subdominants. An upland forest community was located on the northern property boundary and included Oregon oak, Douglas fir, and bigleaf maple (*Acer macrophyllum*).

The dominant species found in the shrub layer included Service berry (*Amelanchier alnifolia*), Indian plum (*Oemleria cerasiformis*), beaked hazelnut (*Corylus cornuta*) and common snowberry (*Symphoricarpos albus*). Sword fern (*Polystichum munitum*) and English ivy (*Hedera helix*) were the dominants in the herbaceous layer.

A forested riparian area was located adjacent to the largest tributary. The tree species in the riparian forest include Oregon ash (*Fraxinus latifolia*) and willow (*Salix sp.*) Shrub communities varied from area to area along the drainage. Portions of the shrub layer consisted of a dense layer of Himalayan blackberry interspersed with dense patches of Nookta rose (*Rosa nutkana*) and Douglas spiraea (*Spiraea douglasii*). Species identified in the herbaceous layer included slough sedge (*Carex obnupta*), water parsley (*Oenanthe sarmentosa*) and bentgrass.

The National Wetland Inventory (NWI) map for Newberg shows a tributary of Spring Brook Creek on the west end of the study area. There is no Local Wetland Inventory (LWI) for the area. The Yamhill County Soil Survey indicated two mapping units on the property that include Woodburn silt loam and Amity silt loam. The topographic map shows a site gently sloping north, northeast.

Project purpose

The site is proposed for commercial development to service the new hospital across the street and the adjacent residential areas. The developer of the site is currently applying for annexation into the city of Newberg and rezoning designation to Community Commercial.

(B) Wetland Description

Based on soil, hydrology and vegetation data taken on site two unnamed tributaries of Spring Brook Creek, and four wetlands were delineated. Two of the wetlands are adjacent to the tributaries. A 0.31 acres palustrine emergent/RFT wetland is located along a short portion of the smaller tributary on the west end of the property. The second wetland is 1.63 acres palustrine forested/RFT wetland adjacent to the remaining portion of the smaller tributary and the entire length of the larger tributary. The other two wetlands are isolated and located in the north mid-section of the property. The larger wetland is 0.29 acre and classified as palustrine emergent/scrub-shrub/slope wetland. The smaller one is 0.011 acres classified as a palustrine emergent/slope wetland.

A small seasonal drainage channel enters on the southwest end of tax lot 1100. It is the extension of a drainage located on the adjoining property to the west. The hydrology of the channel is associated with stormwater runoff from the neighborhood to the west. The drainage channel is u-shaped with a varying width of 2 to 3 feet and depth of approximately 3.5 feet. It has a mud and small cobble substrate bottom. The drainage flows east and drains into a larger tributary of Spring Brook Creek. Duckweed (*Lemna* *minor*) was observed growing in portions of the drainage. The drainage has a defined channel for approximately 250 feet and then flattens out, draining as surface and subsurface lateral flow into the tributary of Spring Brook Creek.

A larger, unnamed perennial tributary of Spring Brook Creek enters the northwest corner of tax lot 1100 and exits the property on the south side. It flows to the south joining Spring Brook Creek on the south side of Hwy 99W. Portions of the creek are confined to a single channel while other portions of the channel are braided.

Two wetlands were identified adjacent to the two tributaries. The first is a 0.31 acre palustrine emergent (PEM/RFT) wetland. It was located on the west end of the study site where the smaller drainage entered the site. The plant community in this area is a meadow comprised of grasses and forbs. The dominant species are tall fescue and bentgrass. Hydrology for the wetland on the north and south side of the drainage is associated with precipitation, a seasonal high water table and overflow from the drainage during winter high water.

The second wetland is 1.63 acres and forested (PFO/RFT). The dominant tree in the canopy is Oregon ash (*Fraxinus latifolia*). The shrub layer consists of large dense patches of Douglas spirea (*Spiraea douglasii*) and nootka rose (*Rosa nutkana*). The herbaceous layer includes large patches of slough sedge (*Carex obnupta*) and water parsley (*Oenanthe sarmentosa*). Hydrology of the wetland is associated with precipitation, a seasonal high water table and overflow from the drainage during winter high water. The southern end of the drainage is fed by a perennial spring.

The other two wetlands are isolated and located in the north mid-section of the property. The larger wetland is 0.29 acres and classified as palustrine emergent/scrub-shrub/slope wetland. The dominant vegetation in the emergent portion is meadow foxtail (*Alopecurus pratensis*) and bentgrass (*Agrostis stolonifera*). The shrubs in the scrub shrub communities were nootka rose (*Rosa nutkana*) with scattered patches of hawthorn (*Crataegus sp*). The second isolated wetland is immediately below the first. It consists of a small depressional area with colonial bentgrass and meadow foxtail as the dominants.

The analysis of wetlands conducted on this site was based on published methods for implementing Section 404 of the Clean Water Act. The 1987 manual was used to satisfy the requirements of the COE on non-agricultural land. The manual requires three parameters to be examined: vegetation, soils, and hydrology. According to the 1987 manual, independent evidence of hydrophytic vegetation, hydric soils, and wetland hydrology must be present for an area to be declared a wetland. The analysis of wetlands on the project site was conducted by reviewing and analyzing existing site-specific literature and by field investigation.

(C) Site Analysis

The three tax lots that comprise the study area are designated as Agricultural/Forestry Small Holdings (AF-10). There was no evidence of alterations to the drainages observed onsite. The hydrology associated with the smaller drainage is stormwater runoff from the neighborhood to the west.

(D) Site Specific Methods

The Routine Onsite Determination Method (1987 manual, pp. 52-69) was used to determine the State of Oregon wetland boundaries and the Federal jurisdictional wetlands. The entire study area was walked and observed for wetland characteristics. Sample plots were dug and placed in areas determined to meet all wetland criteria. Adjacent plots were placed in the upland.

The first area investigated was located on the west end of the study site. A drainage swale located on the adjacent property to the west extended east into the study area. A delineation for the property to the west was conducted a year ago and is pending review by DSL. The area consists of a grazed meadow community with dominant grasses of bentgrass and fescue. Areas with wetland characteristics extend north and south of the drainage by approximately 30-40 feet. The source of hydrology for the wetland on the north and south side of the drainage is associated with precipitation, a seasonal high water table and overflow from the drainage during winter high water. The area had recently received days of heavy rain so that the ground water table was exceptionally high.

Along the north side of the swale the wetland boundary was determined predominantly by soil and hydrology since the vegetation in both wetland and upland were the same. On the south side of the swale the vegetation was the determining factor. The soil matrix color in the wetland varied between 10YR3/1 with redox concentrations of 10YR3/4 in sample plot 2 and 10YR3/2 with redox concentrations of 10YR3/6 in sample plot 4. Both sample plots had a depth to free water between 6 and 8 inches.

The upland area on the south side of the swale was determined by the vegetation. The topography was slightly higher and Himalayan blackberry formed a dense hedge. Some Douglas fir trees were planted in this area as well. On the north side of the swale the upland area did not have hydric soil or wetland hydrology.

Approximately 130 feet east of the property line a small berm built for vehicle access to the back barn area crosses the drainage and wetland area. The berm has been in place on the property well over fifty years. The drainage crosses the berm via a small culvert. It flows an additional 120 feet before it becomes an undefined channel and flows as broad sheet flow into the other tributary.

The wetland continues past the berm and is located adjacent to the tributaries. The plant community on the east side of the berm slowly transitions from a meadow into a forested community that joins the riparian community along the main tributary. Soils in this portion of the wetland (Sample plot, 8, 9 & 11) predominantly have a matrix value of 10YR3/2 with redox concentrations of 10YR3/6.

The upland edge was obvious by topography as well as vegetation and hydrology. The overstory transitioned from Oregon ash into Oregon oak and Douglas fir on the north end. Further south the vegetation in the upland riparian area had Oregon ash mixed with common snowberry (*Symphoricarpos alba*), beaked hazelnut (*Corylus cornuta*) and Himalayan blackberry. Upland soils observed along the tributaries included matrix colors of 10YR3/3 (sample plot 5), from 0 to 12 inches, 10YR4/2 (sample plot 7) and (10YR3/2) (sample plot 10). No redox concentration were observed within 10 inches and no evidence of wetland hydrology was observed.

The wetland identified in the middle of tax lot 1100 consists of an emergent and scrub shrub wetland. The majority of it is located in a clearing surrounded by dense thickets of English hawthorn, Himalayan blackberry and various overgrown fruit trees. The vegetation in the northern portion of the wetland consisted of scattered dense thickets of nootka rose (*Rosa nutkana*). Meadow foxtail was the dominant grass. The soil matrix color varied between 10YR3/2 and 10YR4/2 with redox concentrations that varied in color. The hydrology of the wetland was associated with overland sheet flow and a seasonal high water table. The wetland was hummocky with slight shift in topography along the upland edge.

The vegetation in the upland area was similar to the wetland vegetation. The upland area had a predominant soil color of 10YR3/2 with no redox concentrations (sample plot 13, 16, 18, 19, 23, 26) and no wetland hydrology.

(E) Deviation

No deviations were observed. The National Wetland Inventory (NWI) map for Newberg did not show any wetlands in the project area. It did show the tributary of Spring Brook Creek on the western portion of the study area. There is no Local Wetland Inventory (LWI) for the area.

(F) Methods of Determining Other Waters of the State

No other waters of the state were observed onsite. The top of bank was defined for the smaller tributary that flow west to east. The larger tributary had the center line mapped for the main branch of the creek, because the mid section is braided.

(G) Additional Info

None.

(H) Statement of Mapping Accuracy

The wetland boundaries were flagged and the flags were surveyed by Alpha Community Development, PLS.

(I) Date of Investigation

The site was visited on February 21 and 28, 2007.

(J) Weather

The weather on the day of the February 21 site visit was cold and rainy. The day before 0.67 inches of rain were recorded at the Forest Grove weather station. 2.48 inches of rain were recorded for the past two weeks.

The weather on the day of the February 28 site visit was cold interspersed with periods of hail, rain and sun. There was 0.26 inches of rain the day prior to the site visit. 3.21 inches of rain were recorded for the past two weeks. This is 52 percent of the average for the entire month. A total of 36.56 inches were recorded since October 1, 2006. This is 115 percent of the water year average.

(K) Results and Conclusions

The National Wetland Inventory (NWI) map did not show any onsite wetlands however it did show a tributary of Spring Brook Creek on the west end of the site. There is no Local Wetland Inventory for the Newberg area. The Yamhill County Soil Survey mapped two soil series on the subject property: Amity silt loam and Woodburn silt loam 0 to 7 percent slopes and 7 to 12 percent slopes. The Amity series is somewhat poorly drained. This soil series is not listed as hydric however it does have hydric inclusions. Some of the soil observed on site matched the Amity series.

Based on soil, hydrology and vegetation data taken on site two unnamed tributaries of Spring Brook Creek, and four wetlands were delineated. The smaller drainage is seasonal, the larger has recently developed a perennial flow. Two of the wetlands are adjacent to the tributaries. A 0.31 acres palustrine emergent/RFT wetland is located along a short portion of the smaller tributary on the west end of the property. The second wetland is 1.63 acres palustrine forested/RFT wetland adjacent to the tributaries. The other two wetlands are isolated and located in the north mid-section of the property. The larger wetland is 0.29 acre and classified as palustrine emergent/scrub-shrub/slope wetland. The smaller one is 0.011 acres classified as a palustrine emergent/slope wetland.

(L) Required Disclaimer

This report documents the investigation, best professional judgment and the conclusions of the investigator. It is correct and complete to the best of my knowledge. It should be considered a Preliminary Jurisdictional Determination of wetlands and other waters and used at your own risk unless it has been reviewed and approved in writing by the Oregon Department of State lands in accordance with OAR 141-090-0005 through 141-090-0055.

TOPO! map printed on 07/18/06 from "Oregon.tpo" and "Untitled.tpg"

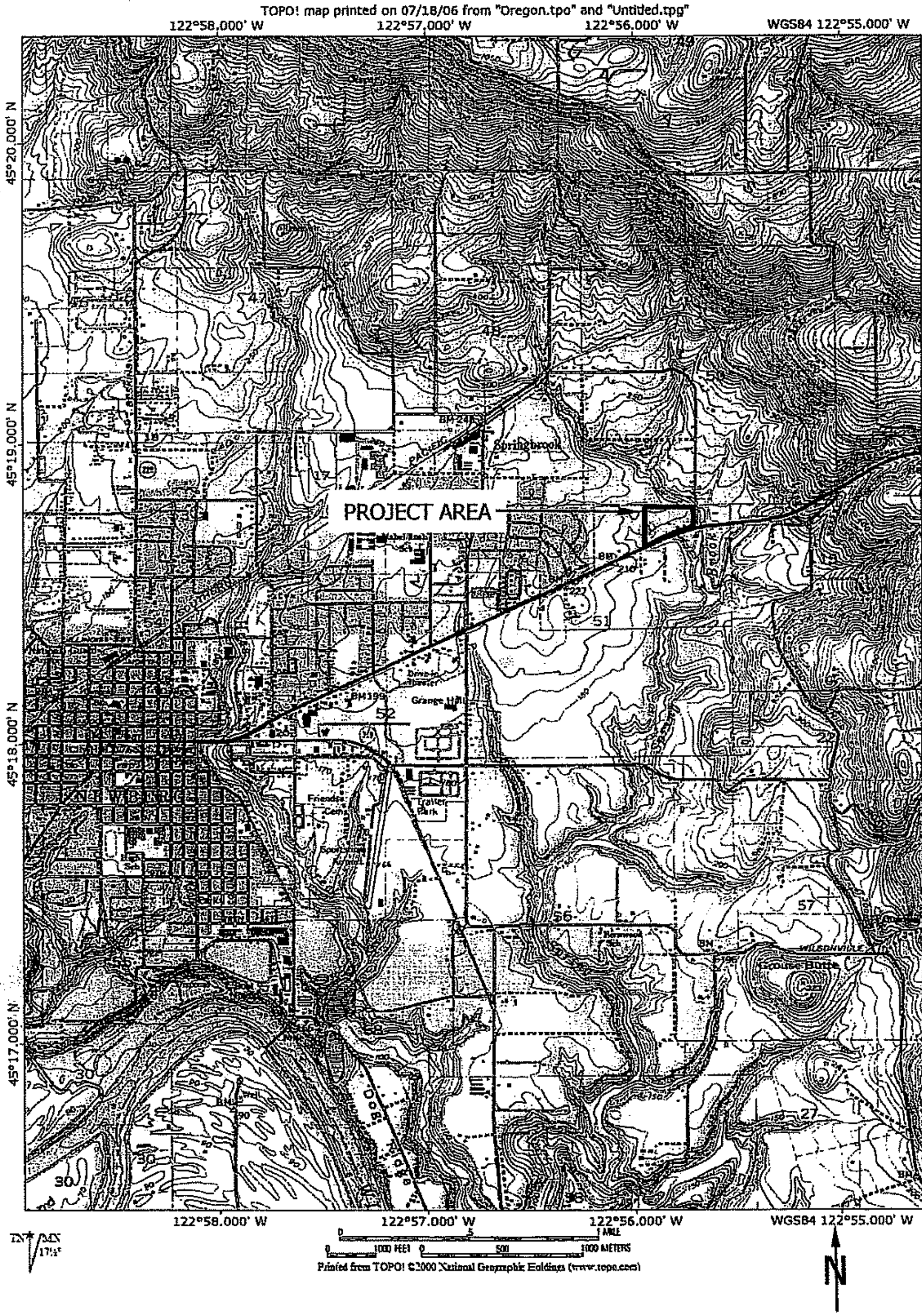

FIGURE 1. SITE VICINITY MAP
S&A #1985

Schott & Associates
P.O. Box 589
Aurora, OR. 97002
503.678.6007

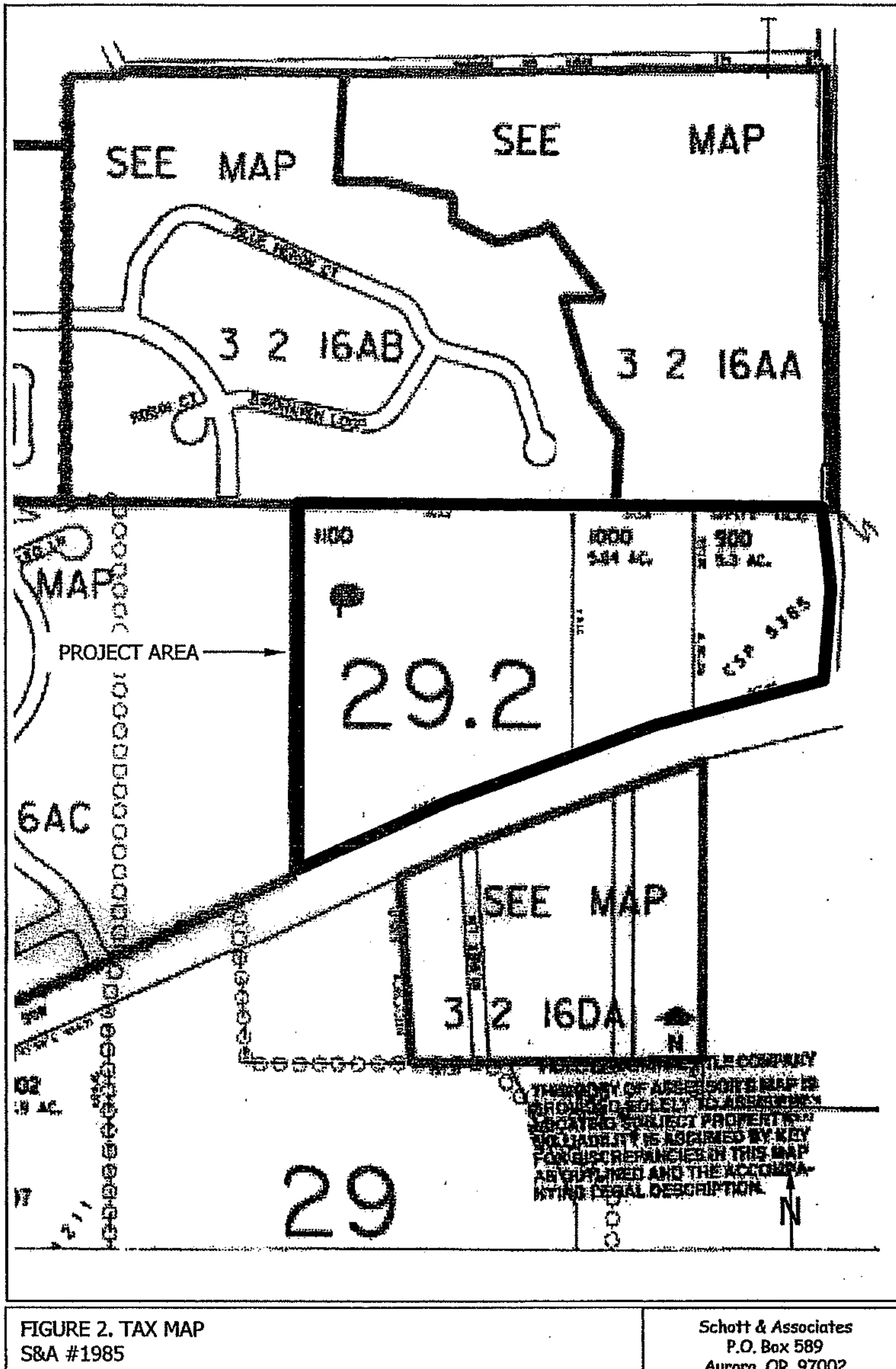

FIGURE 2. TAX MAP
S&A #1985

Schott & Associates
P.O. Box 589
Aurora, OR. 97002
503.678.6007

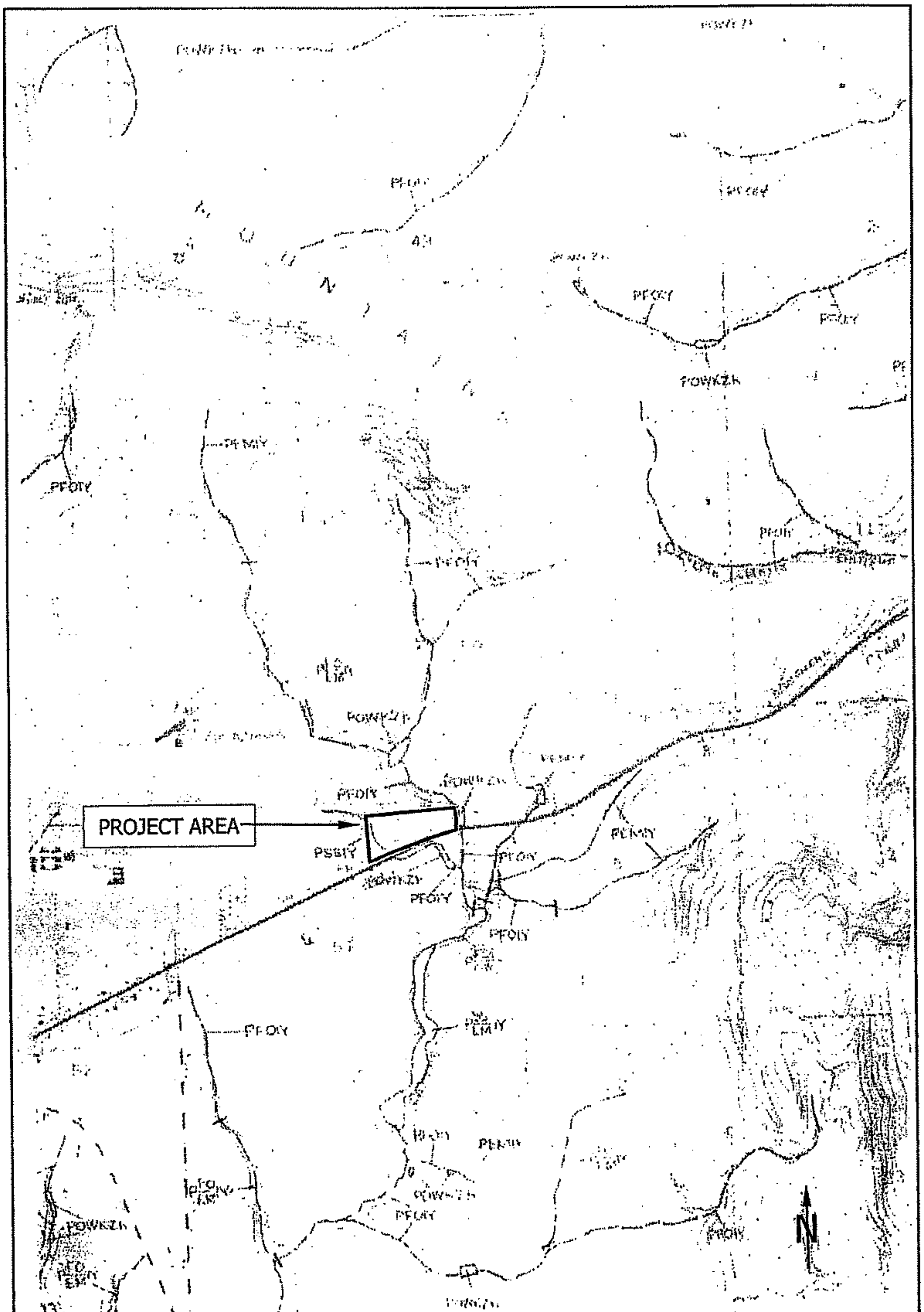

FIGURE 3. NEWBERG NWI
S&A #1985

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Aurora, OR. 97002
503.678.6007

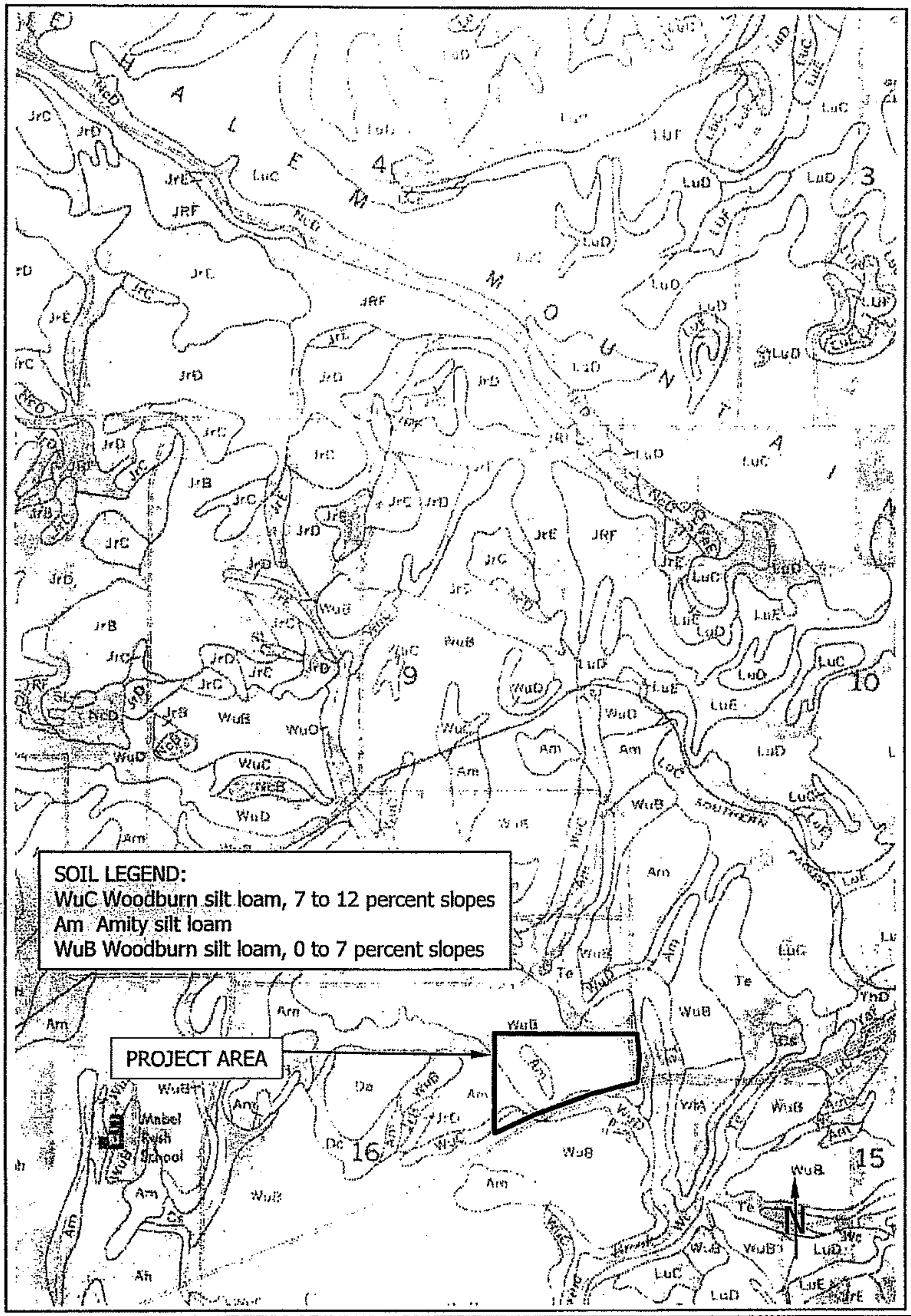

FIGURE 4. YAMHILL COUNTY SOIL SURVEY, SHEET 16
S&A #1985

Schott & Associates
P.O. Box 589
Aurora, OR. 97002
503.678.6007

Data Forms

DEPARTMENT OF STATE LANDS WETLAND DETERMINATION DATA FORM – Quick Method

County: Yamhill	Date: 2/21	City: Newberg	File #:1985

Project/Contact: NewB./CS
Plant Community: meadow
Plot Location: south side of swale
Recent Weather: rainy and cold
Det. By: C. Steinkoenig
Plot #:1

Do normal environmental conditions exist? Y☒ N☐ If no, explain:
Has Vegetation ☐ Soil☐ Hydrology ☐ been significantly disturbed?
Explain:

VEGETATION

Tree Stratum

Total Plot Cover:5	2.5 = 50%	1. = 20%
		Status/Raw % Cover
1. *Pseudotsuga menziesii*	FACU 5*	
2.		
3.		
4.		
5.		

Sapling/Shrub Stratum

Total Plot Cover:20	10= 50%	4= 20%	Status/Raw % Cover
1. *Rubus discolor*			FACU- 20*
2.			
3.			
4.			
5.			

Herb Stratum

Total Plot Cover:100	50 = 50%	20 = 20%
		Status/Raw % Cover
1. *Festuca arundinacea*		FAC- 100*
2.		
3.		
4.		
5.		
6.		
7.		
8.		
9.		
10.		
11.		
12.		

Hydrophytic Vegetation Indicators:
☐ > 50% of dominants are OBL, FACW or FAC Percent of Dominant **Species** that are OBL, FACW, FAC (not FAC-):50
Other hydrophytic vegetation indicators:
Criteria Met? ☐Yes ☒ No **Comments:** Hydrophytic veg. not exceeding 50 percent.

SOILS

Map Unit Name: Amity silt loam
On Hydric Soil List? ☐ Yes ☒ No
Drainage Class: Somewhat poorly drained
Has Hydric Inclusions? ☒ Yes ☐ No

Depth Range of Horizon	Matrix Color	Redox Concentrations	Redox Depletions	Texture
0-8	10YR3/1	10YR3/4 FFD		S CL
8-16	10YR3/1	10YR3/4 CMP		CL

Hydric Soil Indicators:
☐Histosol
☐Histic Epipedon
☐Sulfidic Odor
☐Reducing Conditions (tests positive)
☐Gleyed or low chroma colors
☐Redox features within 10" (e.g., concentrations)
☐Concretions/Nodules (w/in 3", > 2mm)
☐High organic content in surface (in Sandy Soils)
☐Organic streaking (in Sandy Soils)
☐Organic pan (in Sandy Soils)
☐ Listed on Hydric Soils List (and soil profile matches)
☐ Meets hydric soil criteria 3 or 4 (ponded or flooded for long duration)
☐ Supplemental indicator (e.g., NRCS field indicator)

Criteria Met? ☒ Yes ☐ No

HYDROLOGY

Recorded Data:
☐Recorded Data Available ☐Aerial Photos ☐Stream Gauge ☐ Other ☒ No Recorded Data Available

Field Data
Depth of inundation: Depth to Saturation:10" Depth to Free Water:

Primary Hydrology Indicators:
☐Inundated
☒Saturated in upper 12 inches
☐Water Marks
☐Drift Lines
☐Sediment Deposits

Secondary Hydrology Indicators (2 or more required):
☐Oxidized Root Channels (upper 12")
☐Water-stained leaves
☐Local Soil Survey Data
☐FAC – Neutral Test
☐Other:

Criteria Met? ☒Yes ☐ No
Comments: Recent heavy rains and high water table.

DETERMINATION

WETLAND? ☐YES ☒NO **Comments: Area adjacent blackberry thicket and higher topography.**

DEPARTMENT OF STATE LANDS WETLAND DETERMINATION DATA FORM – Quick Method

County: Yamhill	Date: 2/21	City: Newberg	File #:1985

Project/Contact: NewB./CS
Det. By: C. Steinkoenig
Plant Community: meadow
Plot #:2
Plot Location: paired with sample plot 1
Recent Weather: rainy and cold
Do normal environmental conditions exist? Y☒ N☐ If no, explain:
Has Vegetation ☐ Soil☐ Hydrology ☐ been significantly disturbed?
Explain:

VEGETATION

Tree Stratum			Herb Stratum		
Total Plot Cover:0	0 = 50%	0 = 20%	Total Plot Cover:100	50 = 50%	20 = 20%
		Status/Raw % Cover			Status/Raw % Cover
1.			1.*Agrostis stolonifera*		FAC 25*
2.			2.*Poa pratensis*		FAC 10
3.			3.*MOSS*		65
4.			4.		
5.			5.		
Sapling/Shrub Stratum			6.		
Total Plot Cover:	= 50%	= 20% Status/Raw % Cover	7.		
1.			8.		
2.			9.		
3.			10.		
4.			11.		
5.			12.		

Hydrophytic Vegetation Indicators:
☒ > 50% of dominants are OBL, FACW or FAC Percent of Dominant Species that are OBL, FACW, FAC (not FAC-):100
Other hydrophytic vegetation indicators:
Criteria Met? ☒Yes ☐ No **Comments:** Hydrophytic veg. exceeds 50 percent.

SOILS

Map Unit Name: Amity silt loam
Drainage Class: Somewhat poorly drained
On Hydric Soil List? ☐ Yes ☒ No
Has Hydric Inclusions? ☒ Yes ☐ No

Depth Range of Horizon	Matrix Color	Redox Concentrations	Redox Depletions	Texture
0-7	10YR3/1	10YR3/4 FFF		Si CL
7-16	10YR3/1	10YR3/4 CFD		CL

Hydric Soil Indicators:
☐Histosol
☐Histic Epipedon
☐Sulfidic Odor
☐Reducing Conditions (tests positive)
☒Gleyed or low chroma colors
☒Redox features within 10" (e.g., concentrations)
☐Concretions/Nodules (w/in 3", > 2mm)
☐High organic content in surface (in Sandy Soils)
☐Organic streaking (in Sandy Soils)
☐Organic pan (in Sandy Soils)
☐ Listed on Hydric Soils List (and soil profile matches)
☐ Meets hydric soil criteria 3 or 4 (ponded or flooded for long duration)
☐ Supplemental indicator (e.g., NRCS field indicator)

Criteria Met? ☒ Yes ☐ No

HYDROLOGY

Recorded Data:
☐Recorded Data Available ☐Aerial Photos ☐Stream Gauge ☐ Other ☒ No Recorded Data Available
Field Data
Depth of inundation: Depth to Saturation:2" Depth to Free Water:6"
Primary Hydrology Indicators:
☐Inundated
☒Saturated in upper 12 inches
☐Water Marks
☐Drift Lines
☐Sediment Deposits
Secondary Hydrology Indicators (2 or more required):
☒Oxidized Root Channels (upper 12")
☐Water-stained leaves
☐Local Soil Survey Data
☐FAC – Neutral Test
☐Other:
Criteria Met? ☒Yes ☐ No
Comments: A lot of moss growing on ground.

DETERMINATION

WETLAND? ☒YES ☐NO **Comments: Wetland criteia is met.**

DEPARTMENT OF STATE LANDS WETLAND DETERMINATION DATA FORM – Quick Method

County: Yamhill	Date: 2/21	City: Newberg	File #:1985

Project/Contact: NewB./CS
Plant Community: meadow
Plot Location: North side of swale
Recent Weather: rainy and cold

Det. By: C. Steinkoenig
Plot #:3

Do normal environmental conditions exist? Y☒ N☐ If no, explain:
Has Vegetation ☐ Soil☐ Hydrology ☐ been significantly disturbed?
Explain:

VEGETATION

Tree Stratum			
Total Plot Cover:0	0 = 50%	0 = 20%	Status/Raw % Cover
1.			
2.			
3.			
4.			
5.			

Sapling/Shrub Stratum			
Total Plot Cover:	= 50%	= 20%	Status/Raw % Cover
1.			
2.			
3.			
4.			
5.			

Herb Stratum			
Total Plot Cover:100	50 = 50%	20 = 20%	Status/Raw % Cover
1.*Agrostis stolonifera*			FAC 80*
2.*Festuca arundinacea*			FAC- 15
3.*Trifolium repens*			FACU+ 5
4.*Daucus carota*			NOL trace
5.*Geranium richardsonii*			trace
6.*Hypochoeris radicata*			trace
7.			
8.			
9.			
10.			
11.			
12.			

Hydrophytic Vegetation Indicators:
☒ > 50% of dominants are OBL, FACW or FAC Percent of Dominant Species that are OBL, FACW, FAC (not FAC-):100
Other hydrophytic vegetation indicators:
Criteria Met? ☒Yes ☐ No **Comments:** Hydrophytic veg. exceeds 50 percent.

SOILS

Map Unit Name: Amity silt loam
On Hydric Soil List? ☐ Yes ☒ No
Drainage Class: Somewhat poorly drained
Has Hydric Inclusions? ☒ Yes ☐ No

Depth Range of Horizon	Matrix Color	Redox Concentrations	Redox Depletions	Texture
0-12	10YR3/2	None		CL L
12-16	10YR4/2	10YR4/4 CCP		Sl Cl

Hydric Soil Indicators:
☐Histosol
☐Histic Epipedon
☐Sulfidic Odor
☐Reducing Conditions (tests positive)
☐Gleyed or low chroma colors
☐Redox features within 10" (e.g., concentrations)
☐Concretions/Nodules (w/in 3", > 2mm)
☐High organic content in surface (in Sandy Soils)
☐Organic streaking (in Sandy Soils)
☐Organic pan (in Sandy Soils)
☐ Listed on Hydric Soils List (and soil profile matches)
☐ Meets hydric soil criteria 3 or 4 (ponded or flooded for long duration)
☐ Supplemental indicator (e.g., NRCS field indicator)

Criteria Met? ☐ Yes ☒ No

HYDROLOGY

Recorded Data:
☐Recorded Data Available ☐Aerial Photos ☐Stream Gauge ☐ Other ☒ No Recorded Data Available

Field Data
Depth of inundation: Depth to Saturation: Depth to Free Water:

Primary Hydrology Indicators:
☐Inundated
☐Saturated in upper 12 inches
☐Water Marks
☐Drift Lines
☐Sediment Deposits

Secondary Hydrology Indicators (2 or more required):
☐Oxidized Root Channels (upper 12")
☐Water-stained leaves
☐Local Soil Survey Data
☐FAC – Neutral Test
☐Other:

Criteria Met? ☐Yes ☒ No
Comments: .

DETERMINATION

WETLAND? ☐YES ☒NO **Comments: No wetland soils or hydrology.**

DEPARTMENT OF STATE LANDS WETLAND DETERMINATION DATA FORM – Quick Method

County: Yamhill	Date: 2/21	City: Newberg	File #:1985

Project/Contact: NewB./CS
Plant Community: meadow
Plot Location: Paired with sample plot 3
Recent Weather: rainy and cold
Det. By: C. Steinkoenig
Plot #:4

Do normal environmental conditions exist? Y☒ N☐ If no, explain:
Has Vegetation ☐ Soil☐ Hydrology ☐ been significantly disturbed?
Explain:

VEGETATION

Tree Stratum				Herb Stratum			
Total Plot Cover:0	0 = 50%	0 = 20%		Total Plot Cover:100	50 = 50%	20 = 20%	
		Status/Raw % Cover				Status/Raw % Cover	
1.				1.*Agrostis stolonifera*		FAC 80*	
2.				2.*Festuca arundinacea*		FAC- 15	
3.				3.*Moss*		NI 20	
4.				4.*Daucus carota*		NOL trace	
5.				5.*Geranium richardsonii*		trace	
Sapling/Shrub Stratum				6.			
Total Plot Cover:	= 50%	= 20%	Status/Raw % Cover	7.			
1.				8.			
2.				9.			
3.				10.			
4.				11.			
5.				12.			

Hydrophytic Vegetation Indicators:
☒ > 50% of dominants are OBL, FACW or FAC Percent of Dominant <u>Species</u> that are OBL, FACW, FAC (not FAC-):100
Other hydrophytic vegetation indicators:
Criteria Met? ☒Yes ☐ No **Comments:** Hydrophytic veg. exceeds 50 percent.

SOILS

Map Unit Name: Amity silt loam
On Hydric Soil List? ☐ Yes ☒ No
Drainage Class: Somewhat poorly drained
Has Hydric Inclusions? ☒ Yes ☐ No

Depth Range of Horizon	Matrix Color	Redox Concentrations	Redox Depletions	Texture
0-12	10YR3/2	10YR3/6 FFF		CL L
12-18	10YR4/2	10YR4/6 CMD		Sl Cl

Hydric Soil Indicators:
☐Histosol
☐Histic Epipedon
☐Sulfidic Odor
☐Reducing Conditions (tests positive)
☐Gleyed or low chroma colors
☒Redox features within 10" (e.g., concentrations)
☐Concretions/Nodules (w/in 3", > 2mm)
☐High organic content in surface (in Sandy Soils)
☐Organic streaking (in Sandy Soils)
☐Organic pan (in Sandy Soils)
☐ Listed on Hydric Soils List (and soil profile matches)
☐ Meets hydric soil criteria 3 or 4 (ponded or flooded for long duration)
☐ Supplemental indicator (e.g., NRCS field indicator)

Criteria Met? ☒ Yes ☐ No

HYDROLOGY

<u>Recorded Data:</u>
☐Recorded Data Available ☐Aerial Photos ☐Stream Gauge ☐ Other ☒ No Recorded Data Available
<u>Field Data</u>
Depth of inundation: Depth to Saturation:5" Depth to Free Water:8"

<u>Primary Hydrology Indicators:</u>
☐Inundated
☒Saturated in upper 12 inches
☐Water Marks
☐Drift Lines
☐Sediment Deposits

Secondary Hydrology Indicators (2 or more required):
☐Oxidized Root Channels (upper 12")
☐Water-stained leaves
☐Local Soil Survey Data
☐FAC – Neutral Test
☐Other:

Criteria Met? ☒Yes ☐ No
Comments: .

DETERMINATION

WETLAND? ☒YES ☐NO **Comments: Wetland Criteria met.**

DEPARTMENT OF STATE LANDS WETLAND DETERMINATION DATA FORM – Quick Method

County: Yamhill	Date: 2/21	City: Newberg	File #:1985

Project/Contact: NewB./CS | Det. By: C. Steinkoenig
Plant Community: Scrub-shrub | Plot #:5
Plot Location: South side of tributary.
Recent Weather: rainy and cold
Do normal environmental conditions exist? Y☒ N☐ If no, explain:
Has Vegetation ☐ Soil☐ Hydrology ☐ been significantly disturbed?
Explain:

VEGETATION

Tree Stratum				Herb Stratum	
Total Plot Cover:45	22.5 = 50%	9 = 20%		Total Plot Cover:100 / 50 = 50% / 20 = 20%	
		Status/Raw % Cover			Status/Raw % Cover
1.*Malus sp.*		NOL 30*		1.*Agrostis stolonifera*	FAC 25*
2.*Crataegus monogyna*		FACU+ 15*		2.*Festuca arundinacea*	FAC- 50*
3.				3.*Dactylis glomerata*	FACU 25*
4.				4.	
5.				5.	
Sapling/Shrub Stratum				6.	
Total Plot Cover:20	10= 50%	4= 20%	Status/Raw % Cover	7.	
1.*Rubus discolor*			FACU- 20*	8.	
2.				9.	
3.				10.	
4.				11.	
5.				12.	

Hydrophytic Vegetation Indicators:
☐ > 50% of dominants are OBL, FACW or FAC Percent of Dominant <u>Species</u> that are OBL, FACW, FAC (not FAC-):40
Other hydrophytic vegetation indicators:
Criteria Met? ☐**Yes** ☒ **No** **Comments:** Hydrophytic veg does not exceed 50%. FEAR used as FAC veg.

SOILS

Map Unit Name: Amity silt loam | Drainage Class: Somewhat poorly drained
On Hydric Soil List? ☐ Yes ☒ No | Has Hydric Inclusions? ☒ Yes ☐ No

Depth Range of Horizon	Matrix Color	Redox Concentrations	Redox Depletions	Texture
0-12	10YR3/3	None		CL L
12-16	10YR3/4			Sl Cl

Hydric Soil Indicators:
☐Histosol
☐Histic Epipedon
☐Sulfidic Odor
☐Reducing Conditions (tests positive)
☐Gleyed or low chroma colors
☐Redox features within 10" (e.g., concentrations)
☐Concretions/Nodules (w/in 3", > 2mm)
☐High organic content in surface (in Sandy Soils)
☐Organic streaking (in Sandy Soils)
☐Organic pan (in Sandy Soils)
☐ Listed on Hydric Soils List (and soil profile matches)
☐ Meets hydric soil criteria 3 or 4 (ponded or flooded for long duration)
☐ Supplemental indicator (e.g., NRCS field indicator)

Criteria Met? ☐ **Yes** ☒ **No**

HYDROLOGY

<u>Recorded Data:</u>
☐Recorded Data Available ☐Aerial Photos ☐Stream Gauge ☐ Other ☒ No Recorded Data Available
<u>Field Data</u>
Depth of inundation: Depth to Saturation: Depth to Free Water:14"

<u>Primary Hydrology Indicators:</u>
☐Inundated
☐Saturated in upper 12 inches
☐Water Marks
☐Drift Lines
☐Sediment Deposits

Secondary Hydrology Indicators (2 or more required):
☐Oxidized Root Channels (upper 12")
☐Water-stained leaves
☐Local Soil Survey Data
☐FAC – Neutral Test
☐Other:

Criteria Met? ☐**Yes** ☒ **No**
Comments: Depth to free water in pit at 14 inches.

DETERMINATION

WETLAND? ☐**YES** ☒**NO** **Comments: Wetland criteria not met.**

DEPARTMENT OF STATE LANDS WETLAND DETERMINATION DATA FORM – Quick Method

County: Yamhill	Date: 2/21	City: Newberg	File #:1985

Project/Contact: NewB./CS
Plant Community: meadow
Plot Location: Paired with sample plot 5
Recent Weather: rainy and cold
Det. By: C. Steinkoenig
Plot #:6

Do normal environmental conditions exist? Y☒ N☐ If no, explain:
Has Vegetation ☐ Soil☐ Hydrology ☐ been significantly disturbed?
Explain:

VEGETATION

Tree Stratum

Total Plot Cover:0	= 50%	= 20%
		Status/Raw % Cover
1.		
2.		
3.		
4.		
5.		

Sapling/Shrub Stratum

Total Plot Cover:	= 50%	= 20%	Status/Raw % Cover
1.			
2.			
3.			
4.			
5.			

Herb Stratum

Total Plot Cover:100	50 = 50%	20 = 20%
		Status/Raw % Cover
1.*Agrostis stolonifera*		FAC 25*
2.*Festuca arundinacea*		FAC- 50*
3.*Dactylis glomerata*		FACU 25*
4.		
5.		
6.		
7.		
8.		
9.		
10.		
11.		
12.		

Hydrophytic Vegetation Indicators:
☒ > 50% of dominants are OBL, FACW or FAC Percent of Dominant Species that are OBL, FACW, FAC (not FAC-):66
Other hydrophytic vegetation indicators:
Criteria Met? ☒Yes ☐ No **Comments:** Hydrophytic veg exceeds 50%. FEAR used as FAC veg.

SOILS

Map Unit Name: Amity silt loam
On Hydric Soil List? ☐ Yes ☒ No
Drainage Class: Somewhat poorly drained
Has Hydric Inclusions? ☒ Yes ☐ No

Depth Range of Horizon	Matrix Color	Redox Concentrations	Redox Depletions	Texture
0-11	10YR4/1	10YR4/4 FFD		Si CL
11-15	10YR3/4			Sl Cl

Hydric Soil Indicators:
☐Histosol
☐Histic Epipedon
☐Sulfidic Odor
☐Reducing Conditions (tests positive)
☒Gleyed or low chroma colors
☒Redox features within 10" (e.g., concentrations)
☐Concretions/Nodules (w/in 3", > 2mm)
☐High organic content in surface (in Sandy Soils)
☐Organic streaking (in Sandy Soils)
☐Organic pan (in Sandy Soils)
☐ Listed on Hydric Soils List (and soil profile matches)
☐ Meets hydric soil criteria 3 or 4 (ponded or flooded for long duration)
☐ Supplemental indicator (e.g., NRCS field indicator)

Criteria Met? ☒ **Yes** ☐ **No**

HYDROLOGY

Recorded Data:
☐Recorded Data Available ☐Aerial Photos ☐Stream Gauge ☐ Other ☒ No Recorded Data Available

Field Data
Depth of inundation: Depth to Saturation: Depth to Free Water:7"

Primary Hydrology Indicators:
☐Inundated
☒Saturated in upper 12 inches
☐Water Marks
☐Drift Lines
☐Sediment Deposits

Secondary Hydrology Indicators (2 or more required):
☐Oxidized Root Channels (upper 12")
☐Water-stained leaves
☐Local Soil Survey Data
☐FAC – Neutral Test
☐Other:

Criteria Met? ☒Yes ☐ No
Comments: Wetland hydrology observed.

DETERMINATION

WETLAND? ☒YES ☐NO **Comments: Wetland criteria is met.**

DEPARTMENT OF STATE LANDS WETLAND DETERMINATION DATA FORM – Quick Method

County: Yamhill	Date: 2/21	City: Newberg	File #:1985

Project/Contact: NewB./CS Det. By: C. Steinkoenig
Plant Community: meadow Plot #:7
Plot Location: Paired w/8-N side of seasonal drainage-E. of berm
Recent Weather: rainy and cold
Do normal environmental conditions exist? Y☒ N☐ If no, explain:
Has Vegetation ☐ Soil☐ Hydrology ☐ been significantly disturbed?
Explain:

VEGETATION

Tree Stratum				Herb Stratum		
Total Plot Cover:0	= 50%	= 20%		Total Plot Cover:100	50 = 50%	20 = 20%
		Status/Raw % Cover				Status/Raw % Cover
1.				1. *Poa pratensis*		FAC 75*
2.				2. *Festuca arundinacea*		FAC- 10
3.				3. *Trifolium latifolia*		FACU+ 15
4.				4. *Chrysanthemum Leu.*		NI trace
5.				5.		
Sapling/Shrub Stratum				6.		
Total Plot Cover:	= 50%	= 20%	Status/Raw % Cover	7.		
1.				8.		
2.				9.		
3.				10.		
4.				11.		
5.				12.		

Hydrophytic Vegetation Indicators:
☒ > 50% of dominants are OBL, FACW or FAC Percent of Dominant Species that are OBL, FACW, FAC (not FAC-):100
Other hydrophytic vegetation indicators:
Criteria Met? ☒Yes ☐ No **Comments:** FEAR (FAC-) used as FAC veg.

SOILS

Map Unit Name: Amity silt loam Drainage Class: Somewhat poorly drained
On Hydric Soil List? ☐ Yes ☒ No Has Hydric Inclusions? ☒ Yes ☐ No

Depth Range of Horizon	Matrix Color	Redox Concentrations	Redox Depletions	Texture
0-12	10YR4/2	None		Si CL
12-17	10YR4/2	10YR4/6 FFP		CL

Hydric Soil Indicators:
☐Histosol
☐Histic Epipedon
☐Sulfidic Odor
☐Reducing Conditions (tests positive)
☐Gleyed or low chroma colors
☐Redox features within 10" (e.g., concentrations)
☐Concretions/Nodules (w/in 3", > 2mm)
☐High organic content in surface (in Sandy Soils)
☐Organic streaking (in Sandy Soils)
☐Organic pan (in Sandy Soils)
☐ Listed on Hydric Soils List (and soil profile matches)
☐ Meets hydric soil criteria 3 or 4 (ponded or flooded for long duration)
☐ Supplemental indicator (e.g., NRCS field indicator)

Criteria Met? ☐ Yes ☒ No

HYDROLOGY

Recorded Data:
☐Recorded Data Available ☐Aerial Photos ☐Stream Gauge ☐ Other ☒ No Recorded Data Available
Field Data
Depth of inundation: Depth to Saturation:10 Depth to Free Water:12"
Primary Hydrology Indicators:
☐Inundated
☒Saturated in upper 12 inches
☐Water Marks
☐Drift Lines
☐Sediment Deposits
Secondary Hydrology Indicators (2 or more required):
☐Oxidized Root Channels (upper 12")
☐Water-stained leaves
☐Local Soil Survey Data
☐FAC – Neutral Test
☐Other:
Criteria Met? ☒Yes ☐ No **Comments: Recent heavy rainfall.**

DETERMINATION

WETLAND? ☐YES ☒NO **Comments: Wetland soil criterion is not met. Subdominant veg. is upland and higher topgraphy.**

DEPARTMENT OF STATE LANDS WETLAND DETERMINATION DATA FORM – Quick Method

County: Yamhill	Date: 2/21	City: Newberg	File #:1985

Project/Contact: NewB./CS
Plant Community: meadow
Plot Location:
Recent Weather: rainy and cold
Do normal environmental conditions exist? Y☒ N☐ If no, explain:
Has Vegetation ☐ Soil☐ Hydrology ☐ been significantly disturbed?
Explain:

Det. By: C. Steinkoenig
Plot #:8

VEGETATION

Tree Stratum			
Total Plot Cover:0	= 50%	= 20%	Status/Raw % Cover
1.			
2.			
3.			
4.			
5.			

Sapling/Shrub Stratum			
Total Plot Cover:	= 50%	= 20%	Status/Raw % Cover
1.			
2.			
3.			
4.			
5.			

Herb Stratum		
Total Plot Cover:100	50 = 50%	20 = 20%
		Status/Raw % Cover
1.*Poa pratensis*		FAC 85*
2.*Rumex crispus*		FAC+ 5
3.*Gernaium richardsoni*		FACU+ 10
4.		
5.		
6.		
7.		
8.		
9.		
10.		
11.		
12.		

Hydrophytic Vegetation Indicators:
☒ > 50% of dominants are OBL, FACW or FAC Percent of Dominant Species that are OBL, FACW, FAC (not FAC-):100
Other hydrophytic vegetation indicators:
Criteria Met? ☒Yes ☐ No **Comments:** .

SOILS

Map Unit Name: Amity silt loam Drainage Class: Somewhat poorly drained
On Hydric Soil List? ☐ Yes ☒ No Has Hydric Inclusions? ☒ Yes ☐ No

Depth Range of Horizon	Matrix Color	Redox Concentrations	Redox Depletions	Texture
0-12	10YR3/2	10YR3/6 MFD		Si CL
12-17	10YR4/2	10YR4/4 FFD		CL

Hydric Soil Indicators:
☐Histosol
☐Histic Epipedon
☐Sulfidic Odor
☐Reducing Conditions (tests positive)
☐Gleyed or low chroma colors
☒Redox features within 10" (e.g., concentrations)
☐Concretions/Nodules (w/in 3", > 2mm)
☐High organic content in surface (in Sandy Soils)
☐Organic streaking (in Sandy Soils)
☐Organic pan (in Sandy Soils)
☐ Listed on Hydric Soils List (and soil profile matches)
☐ Meets hydric soil criteria 3 or 4 (ponded or flooded for long duration)
☐ Supplemental indicator (e.g., NRCS field indicator)

Criteria Met? ☒ Yes ☐ No

HYDROLOGY

Recorded Data:
☐Recorded Data Available ☐Aerial Photos ☐Stream Gauge ☐ Other ☒ No Recorded Data Available
Field Data
Depth of inundation: Depth to Saturation:to Surface Depth to Free Water:1"
Primary Hydrology Indicators:
☐Inundated
☒Saturated in upper 12 inches
☐Water Marks
☐Drift Lines
☐Sediment Deposits

Secondary Hydrology Indicators (2 or more required):
☒Oxidized Root Channels (upper 12")
☐Water-stained leaves
☐Local Soil Survey Data
☐FAC – Neutral Test
☐Other:

Criteria Met? ☒Yes ☐ No **Comments: Recent heavy rainfall and high water table.**

DETERMINATION

WETLAND? ☒YES ☐NO **Comments: Wetland criteia met.**

DEPARTMENT OF STATE LANDS WETLAND DETERMINATION DATA FORM – Quick Method

County: Yamhill	Date: 2/21	City: Newberg	File #:1985

Project/Contact: NewB./CS
Plant Community: forested
Plot Location: SW side of stream
Recent Weather: rainy and cold
Det. By: C. Steinkoenig
Plot #:9

Do normal environmental conditions exist? Y☒ N☐ If no, explain:
Has Vegetation ☐ Soil☐ Hydrology ☐ been significantly disturbed?
Explain:

VEGETATION

Tree Stratum

Total Plot Cover:100	50 = 50%	20 = 20%
		Status/Raw % Cover
1. *Fraxinus latifolia*		FACW 100*
2.		
3.		
4.		
5.		

Sapling/Shrub Stratum

Total Plot Cover:55	27.5= 50%	11= 20%	Status/Raw % Cover
1. *Rosa nutkana*			FAC 10
2. *Crataegus monogyna*			FACU+ 5
3. *Spirea douglasii*			FACW 40*
4.			
5.			

Herb Stratum

Total Plot Cover:70	35 = 50%	14 = 20%
		Status/Raw % Cover
1. *Carex obnupta*		OBL 60*
2. *Oenanthe sarmentosa*		OBL 10
3.		
4.		
5.		
6.		
7.		
8.		
9.		
10.		
11.		
12.		

Hydrophytic Vegetation Indicators:
☒ > 50% of dominants are OBL, FACW or FAC Percent of Dominant Species that are OBL, FACW, FAC (not FAC-):100
Other hydrophytic vegetation indicators:
Criteria Met? ☒Yes ☐ No **Comments:** .

SOILS

Map Unit Name: Amity silt loam
On Hydric Soil List? ☐ Yes ☒ No
Drainage Class: Somewhat poorly drained
Has Hydric Inclusions? ☒ Yes ☐ No

Depth Range of Horizon	Matrix Color	Redox Concentrations	Redox Depletions	Texture
0-12	10YR3/2	10YR3/6 MFD		Si CL
12-17	10YR4/2	10YR4/4 FFD		CL

Hydric Soil Indicators:
☐Histosol
☐Histic Epipedon
☐Sulfidic Odor
☐Reducing Conditions (tests positive)
☐Gleyed or low chroma colors
☒Redox features within 10" (e.g., concentrations)
☐Concretions/Nodules (w/in 3", > 2mm)
☐High organic content in surface (in Sandy Soils)
☐Organic streaking (in Sandy Soils)
☐Organic pan (in Sandy Soils)
☐ Listed on Hydric Soils List (and soil profile matches)
☐ Meets hydric soil criteria 3 or 4 (ponded or flooded for long duration)
☐ Supplemental indicator (e.g., NRCS field indicator)

Criteria Met? ☒ Yes ☐ No

HYDROLOGY

Recorded Data:
☐Recorded Data Available ☐Aerial Photos ☐Stream Gauge ☐ Other ☒ No Recorded Data Available

Field Data
Depth of inundation: Depth to Saturation:to Surface Depth to Free Water:1"

Primary Hydrology Indicators:
☐Inundated
☒Saturated in upper 12 inches
☐Water Marks
☐Drift Lines
☐Sediment Deposits

Secondary Hydrology Indicators (2 or more required):
☒Oxidized Root Channels (upper 12")
☐Water-stained leaves
☐Local Soil Survey Data
☐FAC – Neutral Test
☐Other:

Criteria Met? ☒Yes ☐ No
Comments: Recent heavy rainfall and high water table.

DETERMINATION

WETLAND? ☒YES ☐NO **Comments: Wetland criteia met.**

DEPARTMENT OF STATE LANDS WETLAND DETERMINATION DATA FORM – Quick Method

County: Yamhill	Date: 2/21	City: Newberg	File #:1985

Project/Contact: NewB./CS
Det. By: C. Steinkoenig
Plant Community: forested
Plot #:10
Plot Location: West side of stream
Recent Weather: rainy and cold
Do normal environmental conditions exist? Y☒ N☐ If no, explain:
Has Vegetation ☐ Soil☐ Hydrology ☐ been significantly disturbed?
Explain:

VEGETATION

Tree Stratum			Herb Stratum	
Total Plot Cover:30	15 = 50%	6 = 20%	Total Plot Cover:100 50 = 50%	20 = 20%
		Status/Raw % Cover		Status/Raw % Cover
1.*Fraxinus latifolia*		FACW+30*	1.*Festuca arundinacea*	FAC- 15
2.			2.*Dactylis glomerata*	FACU 35*
3.			3.*Poa pratensis*	FAC 40*
4.			4.*Taraxacum officinale*	NOL 10
5.			5.	
Sapling/Shrub Stratum			6.	
Total Plot Cover:5	2.5= 50%	1= 20% Status/Raw % Cover	7.	
1.*Corylus cornuta*		FACU+ 5*	8.	
2.			9.	
3.			10.	
4.			11.	
5.			12.	

Hydrophytic Vegetation Indicators:
☐ > 50% of dominants are OBL, FACW or FAC Percent of Dominant <u>Species</u> that are OBL, FACW, FAC (not FAC-):50
Other hydrophytic vegetation indicators:
Criteria Met? ☐Yes ☒ No **Comments:** Does not exceed fifty percent.

SOILS

Map Unit Name: Amity silt loam Drainage Class: Somewhat poorly drained
On Hydric Soil List? ☐ Yes ☒ No Has Hydric Inclusions? ☒ Yes ☐ No

Depth Range of Horizon	Matrix Color	Redox Concentrations	Redox Depletions	Texture
0-11	10YR3/2	None		Si CL
11-17	10YR3/3			CL

Hydric Soil Indicators:
☐Histosol
☐Histic Epipedon
☐Sulfidic Odor
☐Reducing Conditions (tests positive)
☐Gleyed or low chroma colors
☐Redox features within 10" (e.g., concentrations)
☐Concretions/Nodules (w/in 3", > 2mm)
☐High organic content in surface (in Sandy Soils)
☐Organic streaking (in Sandy Soils)
☐Organic pan (in Sandy Soils)
☐ Listed on Hydric Soils List (and soil profile matches)
☐ Meets hydric soil criteria 3 or 4 (ponded or flooded for long duration)
☐ Supplemental indicator (e.g., NRCS field indicator)

Criteria Met? ☐ Yes ☒ No

HYDROLOGY

<u>Recorded Data:</u>
☐Recorded Data Available ☐Aerial Photos ☐Stream Gauge ☐ Other ☒ No Recorded Data Available
<u>Field Data</u>
Depth of inundation: Depth to Saturation:13" Depth to Free Water:
<u>Primary Hydrology Indicators:</u>
☐Inundated
☐Saturated in upper 12 inches
☐Water Marks
☐Drift Lines
☐Sediment Deposits

Secondary Hydrology Indicators (2 or more required):
☐Oxidized Root Channels (upper 12")
☐Water-stained leaves
☐Local Soil Survey Data
☐FAC – Neutral Test
☐Other:

Criteria Met? ☐Yes ☒ No **Comments: Recent heavy rainfall and high water table.**

DETERMINATION

WETLAND? ☐YES ☒NO **Comments: Criteria not met.**

DEPARTMENT OF STATE LANDS WETLAND DETERMINATION DATA FORM – Quick Method

County: Yamhill	Date: 2/21	City: Newberg	File #:1985

Project/Contact: NewB./CS
Plant Community: forested
Plot Location: paired with sample plot 10
Recent Weather: rainy and cold

Det. By: C. Steinkoenig
Plot #:11

Do normal environmental conditions exist? Y☒ N☐ If no, explain:
Has Vegetation ☐ Soil☐ Hydrology ☐ been significantly disturbed?
Explain:

VEGETATION

Tree Stratum			
Total Plot Cover:50	25 = 50%	10 = 20%	Status/Raw % Cover
1. *Fraxinus latifolia*			FACW+ 50*
2.			
3.			
4.			
5.			

Sapling/Shrub Stratum			
Total Plot Cover:	= 50%	= 20%	Status/Raw % Cover
1.			
2.			
3.			
4.			
5.			

Herb Stratum			
Total Plot Cover:100	50 = 50%	20 = 20%	Status/Raw % Cover
1. *Poa pratensis*			FAC 50*
2. *Rumex crispus*			FAC+ 10
3. *Agrostis stolonifera*			FAC 40*
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			

Hydrophytic Vegetation Indicators:
☒ > 50% of dominants are OBL, FACW or FAC Percent of Dominant Species that are OBL, FACW, FAC (not FAC-):100
Other hydrophytic vegetation indicators:
Criteria Met? ☒**Yes** ☐ **No** **Comments:** .

SOILS

Map Unit Name: Amity silt loam
On Hydric Soil List? ☐ Yes ☒ No
Drainage Class: Somewhat poorly drained
Has Hydric Inclusions? ☒ Yes ☐ No

Depth Range of Horizon	Matrix Color	Redox Concentrations	Redox Depletions	Texture
0-11	10YR3/2	10YR3/6 FFF		Si CL
11-17	10YR4/2	10YR4/6 CFP		CL

Hydric Soil Indicators:
☐Histosol
☐Histic Epipedon
☐Sulfidic Odor
☐Reducing Conditions (tests positive)
☐Gleyed or low chroma colors
☒Redox features within 10" (e.g., concentrations)
☐Concretions/Nodules (w/in 3", > 2mm)
☐High organic content in surface (in Sandy Soils)
☐Organic streaking (in Sandy Soils)
☐Organic pan (in Sandy Soils)
☐ Listed on Hydric Soils List (and soil profile matches)
☐ Meets hydric soil criteria 3 or 4 (ponded or flooded for long duration)
☐ Supplemental indicator (e.g., NRCS field indicator)

Criteria Met? ☒ **Yes** ☐ **No**

HYDROLOGY

Recorded Data:
☐Recorded Data Available ☐Aerial Photos ☐Stream Gauge ☐ Other ☒ No Recorded Data Available
Field Data
Depth of inundation: Depth to Saturation:6" Depth to Free Water:9"

Primary Hydrology Indicators:
☐Inundated
☒Saturated in upper 12 inches
☐Water Marks
☐Drift Lines
☐Sediment Deposits

Secondary Hydrology Indicators (2 or more required):
☒Oxidized Root Channels (upper 12")
☐Water-stained leaves
☐Local Soil Survey Data
☐FAC – Neutral Test
☐Other:

Criteria Met? ☒**Yes** ☐ **No**
Comments: .

DETERMINATION

WETLAND? ☒**YES** ☐**NO** **Comments: Wetland Criteria is met.**

DEPARTMENT OF STATE LANDS WETLAND DETERMINATION DATA FORM – Quick Method

County: Yamhill	Date: 2/21	City: Newberg	File #:1985

Project/Contact: NewB./CS
Plant Community: forested
Plot Location: NW end of the property
Recent Weather: rainy and cold

Det. By: C. Steinkoenig
Plot #:12

Do normal environmental conditions exist? Y☒ N☐ If no, explain:
Has Vegetation ☐ Soil☐ Hydrology ☐ been significantly disturbed?
Explain:

VEGETATION

Tree Stratum			
Total Plot Cover:95	47.5 = 50%	19 = 20%	
			Status/Raw % Cover
1.*Fraxinus latifolia*			FACW+ 95*
2.			
3.			
4.			
5.			

Sapling/Shrub Stratum			
Total Plot Cover:10	5= 50%	2.5= 20%	Status/Raw % Cover
1.*Rubus discolor*			FACU 10*
2.			
3.			
4.			
5.			

Herb Stratum		
Total Plot Cover:	= 50%	= 20%
		Status/Raw % Cover
1.		
2.		
3.		
4.		
5.		
6.		
7.		
8.		
9.		
10.		
11.		
12.		

Hydrophytic Vegetation Indicators:
☐ > 50% of dominants are OBL, FACW or FAC Percent of Dominant <u>Species</u> that are OBL, FACW, FAC (not FAC-):50
Other hydrophytic vegetation indicators:
Criteria Met? ☒**Yes** ☐ **No** **Comments:** BPJ. Blackberry not rooted in sample plot. Dominant cover is ash

SOILS

Map Unit Name: Amity silt loam
On Hydric Soil List? ☐ Yes ☒ No
Drainage Class: Somewhat poorly drained
Has Hydric Inclusions? ☒ Yes ☐ No

Depth Range of Horizon	Matrix Color	Redox Concentrations	Redox Depletions	Texture
0-18	10YR2/1			Si CL

Hydric Soil Indicators:
☐Histosol
☐Histic Epipedon
☐Sulfidic Odor
☐Reducing Conditions (tests positive)
☒Gleyed or low chroma colors
☐Redox features within 10" (e.g., concentrations)
☐Concretions/Nodules (w/in 3", > 2mm)
☐High organic content in surface (in Sandy Soils)
☐Organic streaking (in Sandy Soils)
☐Organic pan (in Sandy Soils)
☐ Listed on Hydric Soils List (and soil profile matches)
☐ Meets hydric soil criteria 3 or 4 (ponded or flooded for long duration)
☐ Supplemental indicator (e.g., NRCS field indicator)

Criteria Met? ☒ **Yes** ☐ **No**

HYDROLOGY

Recorded Data:
☐Recorded Data Available ☐Aerial Photos ☐Stream Gauge ☐ Other ☒ No Recorded Data Available

Field Data
Depth of inundation: Depth to Saturation:3" Depth to Free Water:8"

Primary Hydrology Indicators:
☐Inundated
☒Saturated in upper 12 inches
☐Water Marks
☐Drift Lines
☐Sediment Deposits

Secondary Hydrology Indicators (2 or more required):
☐Oxidized Root Channels (upper 12")
☒Water-stained leaves
☐Local Soil Survey Data
☐FAC – Neutral Test
☐Other:

Criteria Met? ☒**Yes** ☐ **No**
Comments: .

DETERMINATION

WETLAND? ☒**YES** ☐**NO** **Comments: Wetland area adjacent to the creek. Wetland characteristc are met.**

DEPARTMENT OF STATE LANDS WETLAND DETERMINATION DATA FORM – Quick Method

County: Yamhill	Date: 2/28/07	City: Newberg	File #:1985

Project/Contact: NewB./CS
Det. By: C. Steinkoenig
Plant Community: scrub-shrub/meadow
Plot #:13
Plot Location: northeast side if isolated wetland
Recent Weather: cold and wet/hail
Do normal environmental conditions exist? Y☒ N☐ If no, explain:
Has Vegetation ☐ Soil☐ Hydrology ☐ been significantly disturbed?
Explain:

VEGETATION

Tree Stratum				Herb Stratum		
Total Plot Cover:	= 50%	= 20%		Total Plot Cover:100	50 = 50%	20 = 20%
		Status/Raw % Cover				Status/Raw % Cover
1.				1.*Alopecurus pratensis*		FACW 60*
2.				2.*Agrostis stolonifera*		FAC 40*
3.				3.		
4.				4.		
5.				5.		
Sapling/Shrub Stratum				6.		
Total Plot Cover:10	5= 50%	2.5= 20%	Status/Raw % Cover	7.		
1.*Rubus discolor*			FACU 5*	8.		
2.*Rosa nutkana*			FAC 5*	9.		
3.				10.		
4.				11.		
5.				12.		

Hydrophytic Vegetation Indicators:
☒ > 50% of dominants are OBL, FACW or FAC Percent of Dominant Species that are OBL, FACW, FAC (not FAC-):75
Other hydrophytic vegetation indicators:
Criteria Met? ☒**Yes** ☐ **No** **Comments:** Exceeds fifty percent.

SOILS

Map Unit Name: Amity silt loam
Drainage Class: Somewhat poorly drained
On Hydric Soil List? ☐ Yes ☒ No
Has Hydric Inclusions? ☒ Yes ☐ No

Depth Range of Horizon	Matrix Color	Redox Concentrations	Redox Depletions	Texture
0-13	10YR3/2	None		Si CL
13-18	10YR3/2	10YR3/4 FFF		CL

Hydric Soil Indicators:
☐Histosol
☐Histic Epipedon
☐Sulfidic Odor
☐Reducing Conditions (tests positive)
☐Gleyed or low chroma colors
☐Redox features within 10" (e.g., concentrations)
☐Concretions/Nodules (w/in 3", > 2mm)
☐High organic content in surface (in Sandy Soils)
☐Organic streaking (in Sandy Soils)
☐Organic pan (in Sandy Soils)
☐ Listed on Hydric Soils List (and soil profile matches)
☐ Meets hydric soil criteria 3 or 4 (ponded or flooded for long duration)
☐ Supplemental indicator (e.g., NRCS field indicator)

Criteria Met? ☐ **Yes** ☒ **No**

HYDROLOGY

Recorded Data:
☐Recorded Data Available ☐Aerial Photos ☐Stream Gauge ☐ Other ☒ No Recorded Data Available
Field Data
Depth of inundation: Depth to Saturation:3" Depth to Free Water:6"

Primary Hydrology Indicators:
☐Inundated
☒Saturated in upper 12 inches
☐Water Marks
☐Drift Lines
☐Sediment Deposits

Secondary Hydrology Indicators (2 or more required):
☐Oxidized Root Channels (upper 12")
☐Water-stained leaves
☐Local Soil Survey Data
☐FAC – Neutral Test
☐Other:

Criteria Met? ☒**Yes** ☐ **No**
Comments: Very high water table.

DETERMINATION

WETLAND? ☐**YES** ☒**NO** **Comments: No hydric soil, rise in topogrpahy.**

DEPARTMENT OF STATE LANDS WETLAND DETERMINATION DATA FORM – Quick Method

County: Yamhill	Date: 2/28/07	City: Newberg	File #:1985

Project/Contact: NewB./CS
Det. By: C. Steinkoenig
Plant Community: scrub-shrub/meadow
Plot #:14
Plot Location: paired w/sample plot 13
Recent Weather: cold and wet/hail
Do normal environmental conditions exist? Y☒ N☐ If no, explain:
Has Vegetation ☐ Soil☐ Hydrology ☐ been significantly disturbed?
Explain:

VEGETATION

Tree Stratum				Herb Stratum			
Total Plot Cover:0	= 50%	= 20%		Total Plot Cover:100	50 = 50%	20 = 20%	
			Status/Raw % Cover				Status/Raw % Cover
1.				1.*Alopecurus pratensis*			FACW 60*
2.				2.*Agrostis stolonifera*			FAC 40*
3.				3.			
4.				4.			
5.				5.			
Sapling/Shrub Stratum				6.			
Total Plot Cover:10	5= 50%	2.5= 20%	Status/Raw % Cover	7.			
1.*Rubus discolor*			FACU 5*	8.			
2.*Rosa nutkana*			FAC 5*	9.			
3.				10.			
4.				11.			
5.				12.			

Hydrophytic Vegetation Indicators:
☒ > 50% of dominants are OBL, FACW or FAC Percent of Dominant Species that are OBL, FACW, FAC (not FAC-):75
Other hydrophytic vegetation indicators:
Criteria Met? ☒Yes ☐ No **Comments:** Exceeds fifty percent.

SOILS

Map Unit Name: Amity silt loam
Drainage Class: Somewhat poorly drained
On Hydric Soil List? ☐ Yes ☒ No
Has Hydric Inclusions? ☒ Yes ☐ No

Depth Range of Horizon	Matrix Color	Redox Concentrations	Redox Depletions	Texture
0-12	10YR4/2	10YR4/6 CFD		Si CL
12-18	10YR4/2	10YR4/4 FFF		CL

Hydric Soil Indicators:
☐Histosol
☐Histic Epipedon
☐Sulfidic Odor
☐Reducing Conditions (tests positive)
☐Gleyed or low chroma colors
☒Redox features within 10" (e.g., concentrations)
☐Concretions/Nodules (w/in 3", > 2mm)
☐High organic content in surface (in Sandy Soils)
☐Organic streaking (in Sandy Soils)
☐Organic pan (in Sandy Soils)
☐ Listed on Hydric Soils List (and soil profile matches)
☐ Meets hydric soil criteria 3 or 4 (ponded or flooded for long duration)
☐ Supplemental indicator (e.g., NRCS field indicator)

Criteria Met? ☒ Yes ☐ No

HYDROLOGY

Recorded Data:
☐Recorded Data Available ☐Aerial Photos ☐Stream Gauge ☐ Other ☒ No Recorded Data Available
Field Data
Depth of inundation: Depth to Saturation:to surface Depth to Free Water:0.5"

Primary Hydrology Indicators:
☐Inundated
☒Saturated in upper 12 inches
☐Water Marks
☐Drift Lines
☐Sediment Deposits
Criteria Met? ☒Yes ☐ No

Secondary Hydrology Indicators (2 or more required):
☒Oxidized Root Channels (upper 12")
☐Water-stained leaves
☐Local Soil Survey Data
☐FAC – Neutral Test
☐Other:
Comments: .

DETERMINATION

WETLAND? ☒YES ☐NO **Comments: All wetland criteria met.**

DEPARTMENT OF STATE LANDS WETLAND DETERMINATION DATA FORM – Quick Method

County: Yamhill	Date: 2/28/07	City: Newberg	File #:1985

Project/Contact: NewB./CS
Det. By: C. Steinkoenig
Plant Community: meadow
Plot #:15
Plot Location: Northwest end of wetland
Recent Weather: cold and wet/hail
Do normal environmental conditions exist? Y☒ N☐ If no, explain:
Has Vegetation ☐ Soil☐ Hydrology ☐ been significantly disturbed?
Explain:

VEGETATION

Tree Stratum				Herb Stratum		
Total Plot Cover:0	= 50%	= 20%		Total Plot Cover:100	50 = 50%	20 = 20%
		Status/Raw % Cover				Status/Raw % Cover
1.				1.*Alopecurus pratensis*		FACW 60*
2.				2.*Agrostis stolonifera*		FAC 40*
3.				3.		
4.				4.		
5.				5.		
Sapling/Shrub Stratum				6.		
Total Plot Cover:10	5= 50%	2.5= 20%	Status/Raw % Cover	7.		
1.*Rubus discolor*			FACU 5*	8.		
2.*Rosa nutkana*			FAC 5*	9.		
3.				10.		
4.				11.		
5.				12.		

Hydrophytic Vegetation Indicators:
☒ > 50% of dominants are OBL, FACW or FAC Percent of Dominant Species that are OBL, FACW, FAC (not FAC-):75
Other hydrophytic vegetation indicators:
Criteria Met? ☒Yes ☐ No **Comments:** Exceeds fifty percent.

SOILS

Map Unit Name: Amity silt loam
Drainage Class: Somewhat poorly drained
On Hydric Soil List? ☐ Yes ☒ No
Has Hydric Inclusions? ☒ Yes ☐ No

Depth Range of Horizon	Matrix Color	Redox Concentrations	Redox Depletions	Texture
0-12	10YR4/2	10YR4/6 CFD		Si CL
12-18	10YR4/2	10YR4/4 FFF		CL

Hydric Soil Indicators:
☐Histosol
☐Histic Epipedon
☐Sulfidic Odor
☐Reducing Conditions (tests positive)
☐Gleyed or low chroma colors
☒Redox features within 10" (e.g., concentrations)
☐Concretions/Nodules (w/in 3", > 2mm)
☐High organic content in surface (in Sandy Soils)
☐Organic streaking (in Sandy Soils)
☐Organic pan (in Sandy Soils)
☐ Listed on Hydric Soils List (and soil profile matches)
☐ Meets hydric soil criteria 3 or 4 (ponded or flooded for long duration)
☐ Supplemental indicator (e.g., NRCS field indicator)

Criteria Met? ☒ **Yes** ☐ **No**

HYDROLOGY

Recorded Data:
☐Recorded Data Available ☐Aerial Photos ☐Stream Gauge ☐ Other ☒ No Recorded Data Available
Field Data
Depth of inundation: Depth to Saturation:to surface Depth to Free Water:0.5"

Primary Hydrology Indicators:
☐Inundated
☒Saturated in upper 12 inches
☐Water Marks
☐Drift Lines
☐Sediment Deposits

Secondary Hydrology Indicators (2 or more required):
☒Oxidized Root Channels (upper 12")
☐Water-stained leaves
☐Local Soil Survey Data
☐FAC – Neutral Test
☐Other:

Criteria Met? ☒Yes ☐ No
Comments: .

DETERMINATION

WETLAND? ☒**YES** ☐**NO** **Comments: All wetland criteria met.**

DEPARTMENT OF STATE LANDS WETLAND DETERMINATION DATA FORM – Quick Method

County: Yamhill	Date: 2/28/07	City: Newberg	File #:1985

Project/Contact: NewB./CS
Det. By: C. Steinkoenig
Plant Community: meadow/scrub-shrub
Plot #:16
Plot Location: Paired with sample plot 15
Recent Weather: cold and wet/hail
Do normal environmental conditions exist? Y☒ N☐ If no, explain:
Has Vegetation ☐ Soil☐ Hydrology ☐ been significantly disturbed?
Explain:

VEGETATION

Tree Stratum			Herb Stratum		
Total Plot Cover:15	7.5 = 50%	3 = 20%	Total Plot Cover:100	50 = 50%	20 = 20%
		Status/Raw % Cover			Status/Raw % Cover
1.*Quercus garryana*	UPL 5*		1. *Alopecurus pratensis*		FACW 40*
2.*Malus sp.*	NOL 5*		2.*Agrostis stolonifera*		FAC 40*
3.			3.*Dactylis glomerata*		FACU 15
4.			4.*Chrysanthemum l.*		NOL 5
5.			5.*Hypocheris radicata*		FACU trace

Sapling/Shrub Stratum				Herb Stratum (cont.)	
				6.	
Total Plot Cover:15	7.5= 50%	3= 20%	Status/Raw % Cover	7.	
1.*Rubus discolor*			FACU 10*	8.	
2.*Crataegus sp.*			FAC/FACU+ 5*	9.	
3.				10.	
4.				11.	
5.				12.	

Hydrophytic Vegetation Indicators:
☒ > 50% of dominants are OBL, FACW or FAC Percent of Dominant Species that are OBL, FACW, FAC (not FAC-):66
Other hydrophytic vegetation indicators:
Criteria Met? ☒Yes ☐ No **Comments:** Exceeds fifty percent. Sundominants are upland

SOILS

Map Unit Name: Amity silt loam
Drainage Class: Somewhat poorly drained
On Hydric Soil List? ☐ Yes ☒ No
Has Hydric Inclusions? ☒ Yes ☐ No

Depth Range of Horizon	Matrix Color	Redox Concentrations	Redox Depletions	Texture
0-12	10YR3/2	None		Si CL
12-18	10YR4/2	None		CL

Hydric Soil Indicators:
☐Histosol
☐Histic Epipedon
☐Sulfidic Odor
☐Reducing Conditions (tests positive)
☐Gleyed or low chroma colors
☐Redox features within 10" (e.g., concentrations)
☐Concretions/Nodules (w/in 3", > 2mm)
☐High organic content in surface (in Sandy Soils)
☐Organic streaking (in Sandy Soils)
☐Organic pan (in Sandy Soils)
☐ Listed on Hydric Soils List (and soil profile matches)
☐ Meets hydric soil criteria 3 or 4 (ponded or flooded for long duration)
☐ Supplemental indicator (e.g., NRCS field indicator)

Criteria Met? ☐ Yes ☒ No

HYDROLOGY

Recorded Data:
☐Recorded Data Available ☐Aerial Photos ☐Stream Gauge ☐ Other ☒ No Recorded Data Available
Field Data
Depth of inundation: Depth to Saturation:6" Depth to Free Water:9"

Primary Hydrology Indicators:
☐Inundated
☒Saturated in upper 12 inches
☐Water Marks
☐Drift Lines
☐Sediment Deposits

Secondary Hydrology Indicators (2 or more required):
☐Oxidized Root Channels (upper 12")
☐Water-stained leaves
☐Local Soil Survey Data
☐FAC – Neutral Test
☐Other:

Criteria Met? ☒Yes ☐ No **Comments:** .

DETERMINATION

WETLAND? ☐YES ☒NO **Comments: Wetland soil criterion is not met.**

DEPARTMENT OF STATE LANDS WETLAND DETERMINATION DATA FORM – Quick Method

County: Yamhill	Date: 2/28/07	City: Newberg	File #:1985

Project/Contact: NewB./CS
Det. By: C. Steinkoenig
Plant Community: meadow/scrub-shrub
Plot #:17
Plot Location: west side of wetland
Recent Weather: cold/wet
Do normal environmental conditions exist? Y☒ N☐ If no, explain:
Has Vegetation ☐ Soil☐ Hydrology ☐ been significantly disturbed?
Explain:

VEGETATION

Tree Stratum			
Total Plot Cover:	= 50%	= 20%	Status/Raw % Cover
1.			
2.			
3.			
4.			
5.			

Herb Stratum			
Total Plot Cover:100	50 = 50%	20 = 20%	Status/Raw % Cover
1. *Alopecurus pratensis*			FACW 30*
2.*Agrostis stolonifera*			FAC 55*
3.*Juncus patens*			FACW 15
4.*Vicia americana*			trace
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			

Sapling/Shrub Stratum			
Total Plot Cover:15	7.5= 50%	3= 20%	Status/Raw % Cover
1.*Rosa nutkana*			FAC 15*
2.			
3.			
4.			
5.			

Hydrophytic Vegetation Indicators:
☒ > 50% of dominants are OBL, FACW or FAC Percent of Dominant <u>Species</u> that are OBL, FACW, FAC (not FAC-):100
Other hydrophytic vegetation indicators:
Criteria Met? ☒Yes ☐ No **Comments:** Mets wetland vegetation criteria.

SOILS

Map Unit Name: Amity silt loam
Drainage Class: Somewhat poorly drained
On Hydric Soil List? ☐ Yes ☒ No
Has Hydric Inclusions? ☒ Yes ☐ No

Depth Range of Horizon	Matrix Color	Redox Concentrations	Redox Depletions	Texture
0-11	10YR3/2	10YR4/6 FFF		CL L
11-16	10YR4/1	10YR4/6 CFD		Si CL

Hydric Soil Indicators:
☐Histosol
☐Histic Epipedon
☐Sulfidic Odor
☐Reducing Conditions (tests positive)
☐Gleyed or low chroma colors
☒Redox features within 10" (e.g., concentrations)
☐Concretions/Nodules (w/in 3", > 2mm)
☐High organic content in surface (in Sandy Soils)
☐Organic streaking (in Sandy Soils)
☐Organic pan (in Sandy Soils)
☐ Listed on Hydric Soils List (and soil profile matches)
☐ Meets hydric soil criteria 3 or 4 (ponded or flooded for long duration)
☐ Supplemental indicator (e.g., NRCS field indicator)

Criteria Met? ☒ **Yes** ☐ **No**

HYDROLOGY

<u>Recorded Data:</u>
☐Recorded Data Available ☐Aerial Photos ☐Stream Gauge ☐ Other ☒ No Recorded Data Available

<u>Field Data</u>
Depth of inundation: Depth to Saturation:1.5" Depth to Free Water:1.5"

<u>Primary Hydrology Indicators:</u>
☐Inundated
☒Saturated in upper 12 inches
☐Water Marks
☐Drift Lines
☐Sediment Deposits

Secondary Hydrology Indicators (2 or more required):
☐Oxidized Root Channels (upper 12")
☐Water-stained leaves
☐Local Soil Survey Data
☐FAC – Neutral Test
☐Other:

Criteria Met? ☒Yes ☐ No
Comments: .

DETERMINATION

WETLAND? ☒**YES** ☐**NO** **Comments: Wetland criteria met.**

DEPARTMENT OF STATE LANDS WETLAND DETERMINATION DATA FORM – Quick Method

County: Yamhill	Date: 2/28/07	City: Newberg	File #:1985

Project/Contact: NewB./CS | Det. By: C. Steinkoenig
Plant Community: meadow/scrub-shrub | Plot #:18
Plot Location: Paired w/17
Recent Weather: cold /wet
Do normal environmental conditions exist? Y☒ N☐ If no, explain:
Has Vegetation ☐ Soil☐ Hydrology ☐ been significantly disturbed?
Explain:

VEGETATION

Tree Stratum

Total Plot Cover:0	= 50%	= 20%
		Status/Raw % Cover
1.		
2.		
3.		
4.		
5.		

Sapling/Shrub Stratum

Total Plot Cover:15	7.5= 50%	3= 20%	Status/Raw % Cover
1.*Rosa nutkana*			FAC 15*
2.			
3.			
4.			
5.			

Herb Stratum

Total Plot Cover:100	50 = 50%	20 = 20%
		Status/Raw % Cover
1. *Alopecurus pratensis*		FACW 30*
2.*Agrostis stolonifera*		FAC 55*
3.*Juncus patens*		FACW 15
4.*Vicia americana*		trace
5.		
6.		
7.		
8.		
9.		
10.		
11.		
12.		

Hydrophytic Vegetation Indicators:
☒ > 50% of dominants are OBL, FACW or FAC Percent of Dominant Species that are OBL, FACW, FAC (not FAC-):100
Other hydrophytic vegetation indicators:
Criteria Met? ☒Yes ☐ No **Comments:** Mets wetland vegetation criteria.

SOILS

Map Unit Name: Amity silt loam | Drainage Class: Somewhat poorly drained
On Hydric Soil List? ☐ Yes ☒ No | Has Hydric Inclusions? ☒ Yes ☐ No

Depth Range of Horizon	Matrix Color	Redox Concentrations	Redox Depletions	Texture
0-13	10YR3/2	None		Si L
13-18	10YR4/2	10YR4/6 CFD		Si CL

Hydric Soil Indicators:
☐Histosol
☐Histic Epipedon
☐Sulfidic Odor
☐Reducing Conditions (tests positive)
☐Gleyed or low chroma colors
☐Redox features within 10" (e.g., concentrations)
☐Concretions/Nodules (w/in 3", > 2mm)
☐High organic content in surface (in Sandy Soils)
☐Organic streaking (in Sandy Soils)
☐Organic pan (in Sandy Soils)
☐ Listed on Hydric Soils List (and soil profile matches)
☐ Meets hydric soil criteria 3 or 4 (ponded or flooded for long duration)
☐ Supplemental indicator (e.g., NRCS field indicator)

Criteria Met? ☐ Yes ☒ No

HYDROLOGY

Recorded Data:
☐Recorded Data Available ☐Aerial Photos ☐Stream Gauge ☐ Other ☒ No Recorded Data Available

Field Data
Depth of inundation: Depth to Saturation:4" Depth to Free Water:4"

Primary Hydrology Indicators:
☐Inundated
☒Saturated in upper 12 inches
☐Water Marks
☐Drift Lines
☐Sediment Deposits

Secondary Hydrology Indicators (2 or more required):
☐Oxidized Root Channels (upper 12")
☐Water-stained leaves
☐Local Soil Survey Data
☐FAC – Neutral Test
☐Other:

Criteria Met? ☒Yes ☐ No **Comments:** .

DETERMINATION

WETLAND? ☐YES ☒NO **Comments: Slight shift in topography, no hydric soil inidcators observed.**

DEPARTMENT OF STATE LANDS WETLAND DETERMINATION DATA FORM – Quick Method

County: Yamhill	Date: 2/28/07	City: Newberg	File #:1985

Project/Contact: NewB./CS
Det. By: C. Steinkoenig
Plant Community: meadow/scrub-shrub
Plot #:19
Plot Location: South end of wetland
Recent Weather: cold/wet
Do normal environmental conditions exist? Y☒ N☐ If no, explain:
Has Vegetation ☐ Soil☐ Hydrology ☐ been significantly disturbed?
Explain:

VEGETATION

Tree Stratum			Status/Raw % Cover
Total Plot Cover:0	= 50%	= 20%	
1.			
2.			
3.			
4.			
5.			

Sapling/Shrub Stratum			
Total Plot Cover:60	30= 50%	6= 20%	Status/Raw % Cover
1.*Rubus discolor*			FACU 45*
2.*Quercus garryana*			UPL 5
3.*Crataegus sp.*			FAC/FACU 5
4.*Malus sp.*			NOL 5
5.			

Herb Stratum			Status/Raw % Cover
Total Plot Cover:55	27.5 = 50%	11 = 20%	
1. *Alopecurus pratensis*			FACW 20*
2.*Agrostis stolonifera*			FAC 35*
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			

Hydrophytic Vegetation Indicators:
☒ > 50% of dominants are OBL, FACW or FAC Percent of Dominant Species that are OBL, FACW, FAC (not FAC-):66
Other hydrophytic vegetation indicators:
Criteria Met? ☒Yes ☐ No **Comments:** Mets wetland vegetation criteria.

SOILS

Map Unit Name: Amity silt loam
Drainage Class: Somewhat poorly drained
On Hydric Soil List? ☐ Yes ☒ No
Has Hydric Inclusions? ☒ Yes ☐ No

Depth Range of Horizon	Matrix Color	Redox Concentrations	Redox Depletions	Texture
0-13	10YR3/2	None		Si L
13-18	10YR4/2	10YR4/6 CFD		Si CL

Hydric Soil Indicators:
☐Histosol
☐Histic Epipedon
☐Sulfidic Odor
☐Reducing Conditions (tests positive)
☐Gleyed or low chroma colors
☐Redox features within 10" (e.g., concentrations)
☐Concretions/Nodules (w/in 3", > 2mm)
☐High organic content in surface (in Sandy Soils)
☐Organic streaking (in Sandy Soils)
☐Organic pan (in Sandy Soils)
☐ Listed on Hydric Soils List (and soil profile matches)
☐ Meets hydric soil criteria 3 or 4 (ponded or flooded for long duration)
☐ Supplemental indicator (e.g., NRCS field indicator)

Criteria Met? ☐ Yes ☒ No

HYDROLOGY

Recorded Data:
☐Recorded Data Available ☐Aerial Photos ☐Stream Gauge ☐ Other ☒ No Recorded Data Available
Field Data
Depth of inundation: Depth to Saturation:4" Depth to Free Water:6"

Primary Hydrology Indicators:
☐Inundated
☒Saturated in upper 12 inches
☐Water Marks
☐Drift Lines
☐Sediment Deposits

Secondary Hydrology Indicators (2 or more required):
☐Oxidized Root Channels (upper 12")
☐Water-stained leaves
☐Local Soil Survey Data
☐FAC – Neutral Test
☐Other:

Criteria Met? ☒Yes ☐ No **Comments:**.

DETERMINATION

WETLAND? ☐YES ☒NO **Comments: Slight shift in topography, no hydric soil inidcators observed.**

DEPARTMENT OF STATE LANDS WETLAND DETERMINATION DATA FORM – Quick Method

County: Yamhill	Date: 2/28/07	City: Newberg	File #:1985

Project/Contact: NewB./CS
Plant Community: meadow/scrub-shrub
Plot Location: paired w/19
Recent Weather: cold/wet

Det. By: C. Steinkoenig
Plot #:20

Do normal environmental conditions exist? Y☒ N ☐ If no, explain:
Has Vegetation ☐ Soil☐ Hydrology ☐ been significantly disturbed?
Explain:

VEGETATION

Tree Stratum

Total Plot Cover:0	= 50%	= 20%
		Status/Raw % Cover
1.		
2.		
3.		
4.		
5.		

Sapling/Shrub Stratum

Total Plot Cover:15	7.5= 50%	3= 20%	Status/Raw % Cover
1. *Crataegus sp.*			FAC or FACU+ 15
2.			
3.			
4.			
5.			

Herb Stratum

Total Plot Cover:100	50 = 50%	20 = 20%
		Status/Raw % Cover
1. *Alopecurus pratensis*		FACW 20*
2. *Agrostis stolonifera*		FAC 80*
3.		
4.		
5.		
6.		
7.		
8.		
9.		
10.		
11.		
12.		

Hydrophytic Vegetation Indicators:
☒ > 50% of dominants are OBL, FACW or FAC Percent of Dominant Species that are OBL, FACW, FAC (not FAC-):100
Other hydrophytic vegetation indicators:
Criteria Met? ☒Yes ☐ No **Comments:** Did not include hawthorn.

SOILS

Map Unit Name: Amity silt loam
On Hydric Soil List? ☐ Yes ☒ No
Drainage Class: Somewhat poorly drained
Has Hydric Inclusions? ☒ Yes ☐ No

Depth Range of Horizon	Matrix Color	Redox Concentrations	Redox Depletions	Texture
0-12	10YR3/2	10YR3/6 MFD		Sl CL
12-18	10YR4/2	10YR4/6 CFD		Si CL

Hydric Soil Indicators:
☐Histosol
☐Histic Epipedon
☐Sulfidic Odor
☐Reducing Conditions (tests positive)
☐Gleyed or low chroma colors
☒Redox features within 10" (e.g., concentrations)
☐Concretions/Nodules (w/in 3", > 2mm)
☐High organic content in surface (in Sandy Soils)
☐Organic streaking (in Sandy Soils)
☐Organic pan (in Sandy Soils)
☐ Listed on Hydric Soils List (and soil profile matches)
☐ Meets hydric soil criteria 3 or 4 (ponded or flooded for long duration)
☐ Supplemental indicator (e.g., NRCS field indicator)

Criteria Met? ☒ Yes ☐ No

HYDROLOGY

Recorded Data:
☐Recorded Data Available ☐Aerial Photos ☐Stream Gauge ☐ Other ☒ No Recorded Data Available

Field Data
Depth of inundation: Depth to Saturation:to surface Depth to Free Water:1"

Primary Hydrology Indicators:
☐Inundated
☒Saturated in upper 12 inches
☐Water Marks
☐Drift Lines
☐Sediment Deposits

Secondary Hydrology Indicators (2 or more required):
☐Oxidized Root Channels (upper 12")
☐Water-stained leaves
☐Local Soil Survey Data
☐FAC – Neutral Test
☐Other:

Criteria Met? ☒Yes ☐ No
Comments: Area has patches of standing water.

DETERMINATION

WETLAND? ☒YES ☐NO **Comments: Wetland criteria met.**

DEPARTMENT OF STATE LANDS WETLAND DETERMINATION DATA FORM – Quick Method

County: Yamhill	Date: 2/28/07	City: Newberg	File #:1985

Project/Contact: NewB./CS
Plant Community: meadow/scrub-shrub
Plot Location: east side if isolated wetland
Recent Weather: cold

Det. By: C. Steinkoenig
Plot #:21

Do normal environmental conditions exist? Y☒ N☐ If no, explain:
Has Vegetation ☐ Soil☐ Hydrology ☐ been significantly disturbed?
Explain:

VEGETATION

Tree Stratum				Herb Stratum			
Total Plot Cover:0	= 50%	= 20%	Status/Raw % Cover	Total Plot Cover:55	27.5 = 50%	11 = 20%	Status/Raw % Cover
1.				1. *Alopecurus pratensis*			FACW 20*
2.				2.*Agrostis stolonifera*			FAC 60*
3.				3.*Festuca aruninacea*			FAC- 20*
4.				4.			
5.				5.			
Sapling/Shrub Stratum				6.			
Total Plot Cover:50	25= 50%	10= 20%	Status/Raw % Cover	7.			
1.*Rubus discolor*			FACU 50*	8.			
2.				9.			
3.				10.			
4.				11.			
5.				12.			

Hydrophytic Vegetation Indicators:
☒ > 50% of dominants are OBL, FACW or FAC Percent of Dominant <u>Species</u> that are OBL, FACW, FAC (not FAC-):75
Other hydrophytic vegetation indicators:
Criteria Met? ☒Yes ☐ No **Comments:** Mets wetland vegetation criteria.

SOILS

Map Unit Name: Amity silt loam
On Hydric Soil List? ☐ Yes ☒ No
Drainage Class: Somewhat poorly drained
Has Hydric Inclusions? ☒ Yes ☐ No

Depth Range of Horizon	Matrix Color	Redox Concentrations	Redox Depletions	Texture
0-13	10YR3/2	None		Si CL
13-18	10YR4/2	10YR4/6 FFD		Si CL

Hydric Soil Indicators:
☐Histosol
☐Histic Epipedon
☐Sulfidic Odor
☐Reducing Conditions (tests positive)
☐Gleyed or low chroma colors
☐Redox features within 10" (e.g., concentrations)
☐Concretions/Nodules (w/in 3", > 2mm)
☐High organic content in surface (in Sandy Soils)
☐Organic streaking (in Sandy Soils)
☐Organic pan (in Sandy Soils)
☐ Listed on Hydric Soils List (and soil profile matches)
☐ Meets hydric soil criteria 3 or 4 (ponded or flooded for long duration)
☐ Supplemental indicator (e.g., NRCS field indicator)

Criteria Met? ☐ Yes ☒ No

HYDROLOGY

<u>Recorded Data:</u>
☐Recorded Data Available ☐Aerial Photos ☐Stream Gauge ☐ Other ☒ No Recorded Data Available
<u>Field Data</u>
Depth of inundation: Depth to Saturation: Depth to Free Water:

<u>Primary Hydrology Indicators:</u>
☐Inundated
☐Saturated in upper 12 inches
☐Water Marks
☐Drift Lines
☐Sediment Deposits
Criteria Met? ☐Yes ☒ No

Secondary Hydrology Indicators (2 or more required):
☐Oxidized Root Channels (upper 12")
☐Water-stained leaves
☐Local Soil Survey Data
☐FAC – Neutral Test
☐Other:
Comments: .

DETERMINATION

WETLAND? ☐YES ☒NO **Comments: No wetland hydrology or hydric soils.**

DEPARTMENT OF STATE LANDS WETLAND DETERMINATION DATA FORM – Quick Method

County: Yamhill	Date: 2/28/07	City: Newberg	File #:1985

Project/Contact: NewB./CS
Plant Community: meadow/scrub-shrub
Plot Location: Paired w/ sample plot 21
Recent Weather: cold/wet

Det. By: C. Steinkoenig
Plot #:22

Do normal environmental conditions exist? Y☒ N☐ If no, explain:
Has Vegetation ☐ Soil☐ Hydrology ☐ been significantly disturbed?
Explain:

VEGETATION

Tree Stratum

Total Plot Cover:0	= 50%	= 20%

	Status/Raw % Cover
1.	
2.	
3.	
4.	
5.	

Sapling/Shrub Stratum

Total Plot Cover:5	2.5= 50%	1= 20%

	Status/Raw % Cover
1.*Rubus discolor*	FACU 5 *
2.	
3.	
4.	
5.	

Herb Stratum

Total Plot Cover:100	50 = 50%	20 = 20%

	Status/Raw % Cover
1. *Alopecurus pratensis*	FACW 50*
2.*Agrostis stolonifera*	FAC 45*
3.*Moss*	5
4.	
5.	
6.	
7.	
8.	
9.	
10.	
11.	
12.	

Hydrophytic Vegetation Indicators:
☒ > 50% of dominants are OBL, FACW or FAC Percent of Dominant Species that are OBL, FACW, FAC (not FAC-):100
Other hydrophytic vegetation indicators:
Criteria Met? ☒Yes ☐ No **Comments:** Vegetation criterion is met.

SOILS

Map Unit Name: Amity silt loam
On Hydric Soil List? ☐ Yes ☒ No
Drainage Class: Somewhat poorly drained
Has Hydric Inclusions? ☒ Yes ☐ No

Depth Range of Horizon	Matrix Color	Redox Concentrations	Redox Depletions	Texture
0-12	10YR3/2	10YR3/6 CFF		Sl L
12-18	10YR4/2	10YR4/6 MFD		Si CL

Hydric Soil Indicators:
☐Histosol
☐Histic Epipedon
☐Sulfidic Odor
☐Reducing Conditions (tests positive)
☐Gleyed or low chroma colors
☒Redox features within 10" (e.g., concentrations)
☐Concretions/Nodules (w/in 3", > 2mm)
☐High organic content in surface (in Sandy Soils)
☐Organic streaking (in Sandy Soils)
☐Organic pan (in Sandy Soils)
☐ Listed on Hydric Soils List (and soil profile matches)
☐ Meets hydric soil criteria 3 or 4 (ponded or flooded for long duration)
☐ Supplemental indicator (e.g., NRCS field indicator)

Criteria Met? ☒ Yes ☐ No

HYDROLOGY

Recorded Data:
☐Recorded Data Available ☐Aerial Photos ☐Stream Gauge ☐ Other ☒ No Recorded Data Available
Field Data
Depth of inundation: Depth to Saturation:Saturated to the surface Depth to Free Water:

Primary Hydrology Indicators:
☐Inundated
☒Saturated in upper 12 inches
☐Water Marks
☐Drift Lines
☐Sediment Deposits

Secondary Hydrology Indicators (2 or more required):
☐Oxidized Root Channels (upper 12")
☐Water-stained leaves
☐Local Soil Survey Data
☐FAC – Neutral Test
☐Other:

Criteria Met? ☒Yes ☐ No **Comments:** .

DETERMINATION

WETLAND? ☒YES ☐NO **Comments: All wetland criteria is met.**

DEPARTMENT OF STATE LANDS WETLAND DETERMINATION DATA FORM – Quick Method

County: Yamhill	Date: 2/28/07	City: Newberg	File #:1985

Project/Contact: NewB./CS
Plant Community: meadow/scrub-shrub
Plot Location:
Recent Weather: cold

Det. By: C. Steinkoenig
Plot #:23

Do normal environmental conditions exist? Y☒ N☐ If no, explain:
Has Vegetation ☐ Soil☐ Hydrology ☐ been significantly disturbed?
Explain:

VEGETATION

Tree Stratum

Total Plot Cover:0	= 50%	= 20%
		Status/Raw % Cover
1.		
2.		
3.		
4.		
5.		

Sapling/Shrub Stratum

Total Plot Cover:35	17.5= 50%	7= 20%	Status/Raw % Cover
1. *Rubus discolor*			FACU- 10*
2. *Rubus laciniatus*			FACU+ trace
3. *Rhamnus purshiana*			FAC- 5
4. *Crataegus sp*			FAC/FACU 20*
5.			

Herb Stratum

Total Plot Cover:100	50 = 50%	20 = 20%
		Status/Raw % Cover
1. *Alopecurus pratensis*		FACW 20*
2. *Agrostis stolonifera*		FAC 50*
3. *Dactylis glomerata*		FACU 20*
4. *Chrysanthemum ;euc.*		NOL 5
5. *Aster sp.*		Unknown 5
6.		
7.		
8.		
9.		
10.		
11.		
12.		

Hydrophytic Vegetation Indicators:
☐ > 50% of dominants are OBL, FACW or FAC Percent of Dominant Species that are OBL, FACW, FAC (not FAC-):50
Other hydrophytic vegetation indicators:
Criteria Met? ☐Yes ☒ No **Comments:** Hawthron species not included.

SOILS

Map Unit Name: Amity silt loam
On Hydric Soil List? ☐ Yes ☒ No
Drainage Class: Somewhat poorly drained
Has Hydric Inclusions? ☒ Yes ☐ No

Depth Range of Horizon	Matrix Color	Redox Concentrations	Redox Depletions	Texture
0-13	10YR3/2	None		SI L
13-18	10YR4/2	10YR4/6 MFD		Si CL

Hydric Soil Indicators:
☐Histosol
☐Histic Epipedon
☐Sulfidic Odor
☐Reducing Conditions (tests positive)
☐Gleyed or low chroma colors
☐Redox features within 10" (e.g., concentrations)
☐Concretions/Nodules (w/in 3", > 2mm)
☐High organic content in surface (in Sandy Soils)
☐Organic streaking (in Sandy Soils)
☐Organic pan (in Sandy Soils)
☐ Listed on Hydric Soils List (and soil profile matches)
☐ Meets hydric soil criteria 3 or 4 (ponded or flooded for long duration)
☐ Supplemental indicator (e.g., NRCS field indicator)

Criteria Met? ☐ Yes ☒ No

HYDROLOGY

Recorded Data:
☐Recorded Data Available ☐Aerial Photos ☐Stream Gauge ☐ Other ☒ No Recorded Data Available

Field Data
Depth of inundation: Depth to Saturation: Depth to Free Water:10"

Primary Hydrology Indicators:
☐Inundated
☒Saturated in upper 12 inches
☐Water Marks
☐Drift Lines
☐Sediment Deposits

Secondary Hydrology Indicators (2 or more required):
☐Oxidized Root Channels (upper 12")
☐Water-stained leaves
☐Local Soil Survey Data
☐FAC – Neutral Test
☐Other:

Criteria Met? ☒Yes ☐ No
Comments: .

DETERMINATION

WETLAND? ☐YES ☒NO **Comments: Vegetation and soil did not met wetland criteria.**

DEPARTMENT OF STATE LANDS WETLAND DETERMINATION DATA FORM – Quick Method

County: Yamhill	Date: 2/28/07	City: Newberg	File #:1985

Project/Contact: NewB./CS — Det. By: C. Steinkoenig
Plant Community: meadow/scrub-shrub — Plot #:24
Plot Location: Paired w/ sample plot 23
Recent Weather: cold
Do normal environmental conditions exist? Y☒ N☐ If no, explain:
Has Vegetation ☐ Soil☐ Hydrology ☐ been significantly disturbed?
Explain:

VEGETATION

Tree Stratum				Herb Stratum		
Total Plot Cover:0	= 50%	= 20%		Total Plot Cover:100	50 = 50%	20 = 20%
		Status/Raw % Cover				Status/Raw % Cover
1.				1. *Alopecurus pratensis*		FACW 50*
2.				2.*Agrostis stolonifera*		FAC 45*
3.				3.*Moss*		5
4.				4.		
5.				5.		
Sapling/Shrub Stratum				6.		
Total Plot Cover:30	15= 50%	6= 20%	Status/Raw % Cover	7.		
1.*Rosa nutkana*			FAC 30*	8.		
2.				9.		
3.				10.		
4.				11.		
5.				12.		

Hydrophytic Vegetation Indicators:
☒ > 50% of dominants are OBL, FACW or FAC Percent of Dominant Species that are OBL, FACW, FAC (not FAC-):100
Other hydrophytic vegetation indicators:
Criteria Met? ☒Yes ☐ No **Comments:** Vegetation criterion is met.

SOILS

Map Unit Name: Amity silt loam — Drainage Class: Somewhat poorly drained
On Hydric Soil List? ☐ Yes ☒ No — Has Hydric Inclusions? ☒ Yes ☐ No

Depth Range of Horizon	Matrix Color	Redox Concentrations	Redox Depletions	Texture
0-10	10YR3/2	10YR3/6 MMF		Sl L
10-16	10YR4/2	10YR4/6 MFD		Si CL

Hydric Soil Indicators:
☐Histosol
☐Histic Epipedon
☐Sulfidic Odor
☐Reducing Conditions (tests positive)
☐Gleyed or low chroma colors
☒Redox features within 10" (e.g., concentrations)
☐Concretions/Nodules (w/in 3", > 2mm)
☐High organic content in surface (in Sandy Soils)
☐Organic streaking (in Sandy Soils)
☐Organic pan (in Sandy Soils)
☐ Listed on Hydric Soils List (and soil profile matches)
☐ Meets hydric soil criteria 3 or 4 (ponded or flooded for long duration)
☐ Supplemental indicator (e.g., NRCS field indicator)

Criteria Met? ☒ Yes ☐ No

HYDROLOGY

Recorded Data:
☐Recorded Data Available ☐Aerial Photos ☐Stream Gauge ☐ Other ☒ No Recorded Data Available

Field Data
Depth of inundation: Depth to Saturation:Saturated to the surface Depth to Free Water:

Primary Hydrology Indicators:
☐Inundated
☒Saturated in upper 12 inches
☐Water Marks
☐Drift Lines
☐Sediment Deposits

Secondary Hydrology Indicators (2 or more required):
☐Oxidized Root Channels (upper 12")
☐Water-stained leaves
☐Local Soil Survey Data
☐FAC – Neutral Test
☐Other:

Criteria Met? ☒Yes ☐ No **Comments:** .

DETERMINATION

WETLAND? ☒YES ☐NO **Comments: All wetland criteria is met.**

DEPARTMENT OF STATE LANDS WETLAND DETERMINATION DATA FORM – Quick Method

County: Yamhill	Date: 2/28/07	City: Newberg	File #:1985

Project/Contact: NewB./CS
Plant Community: meadow
Plot Location: south of isolated wetland
Recent Weather: cold/wet

Det. By: C. Steinkoenig
Plot #:25

Do normal environmental conditions exist? Y☒ N☐ If no, explain:
Has Vegetation ☐ Soil☐ Hydrology ☐ been significantly disturbed?
Explain:

VEGETATION

Tree Stratum			
Total Plot Cover:0	= 50%	= 20%	Status/Raw % Cover
1.			
2.			
3.			
4.			
5.			

Sapling/Shrub Stratum			
Total Plot Cover:	= 50%	= 20%	Status/Raw % Cover
1.			
2.			
3.			
4.			
5.			

Herb Stratum			
Total Plot Cover:100	50 = 50%	20 = 20%	Status/Raw % Cover
1. *Alopecurus pratensis*			FACW 20*
2. *Agrostis stolonifera*			FAC 80*
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			

Hydrophytic Vegetation Indicators:
☒ > 50% of dominants are OBL, FACW or FAC Percent of Dominant Species that are OBL, FACW, FAC (not FAC-):100
Other hydrophytic vegetation indicators:
Criteria Met? ☒Yes ☐ No **Comments:** Did not include hawthorn.

SOILS

Map Unit Name: Amity silt loam Drainage Class: Somewhat poorly drained
On Hydric Soil List? ☐ Yes ☒ No Has Hydric Inclusions? ☒ Yes ☐ No

Depth Range of Horizon	Matrix Color	Redox Concentrations	Redox Depletions	Texture
0-12	10YR3/2	10YR3/6 MFD		Si CL
12-18	10YR4/2	10YR4/6 CFD		Si CL

Hydric Soil Indicators:
☐Histosol
☐Histic Epipedon
☐Sulfidic Odor
☐Reducing Conditions (tests positive)
☐Gleyed or low chroma colors
☒Redox features within 10" (e.g., concentrations)
☐Concretions/Nodules (w/in 3", > 2mm)
☐High organic content in surface (in Sandy Soils)
☐Organic streaking (in Sandy Soils)
☐Organic pan (in Sandy Soils)
☐ Listed on Hydric Soils List (and soil profile matches)
☐ Meets hydric soil criteria 3 or 4 (ponded or flooded for long duration)
☐ Supplemental indicator (e.g., NRCS field indicator)

Criteria Met? ☒ Yes ☐ No

HYDROLOGY

Recorded Data:
☐Recorded Data Available ☐Aerial Photos ☐Stream Gauge ☐ Other ☒ No Recorded Data Available
Field Data
Depth of inundation: Depth to Saturation:to surface Depth to Free Water:1"

Primary Hydrology Indicators:
☐Inundated
☒Saturated in upper 12 inches
☐Water Marks
☐Drift Lines
☐Sediment Deposits

Secondary Hydrology Indicators (2 or more required):
☐Oxidized Root Channels (upper 12")
☐Water-stained leaves
☐Local Soil Survey Data
☐FAC – Neutral Test
☐Other:

Criteria Met? ☒Yes ☐ No **Comments: Area has patches of standing water.**

DETERMINATION

WETLAND? ☒**YES** ☐**NO** **Comments: Wetland criteria met.**

DEPARTMENT OF STATE LANDS WETLAND DETERMINATION DATA FORM – Quick Method

County: Yamhill	Date: 2/28/07	City: Newberg	File #:1985

Project/Contact: NewB./CS
Plant Community: meadow
Plot Location: Paired w/sampleplot 25
Recent Weather: cold

Det. By: C. Steinkoenig
Plot #:26

Do normal environmental conditions exist? Y☒ N☐ If no, explain:
Has Vegetation ☐ Soil☐ Hydrology ☐ been significantly disturbed?
Explain:

VEGETATION

Tree Stratum

Total Plot Cover:0	= 50%	= 20%
		Status/Raw % Cover
1.		
2.		
3.		
4.		
5.		

Sapling/Shrub Stratum

Total Plot Cover:10	5= 50%	2.5= 20%
		Status/Raw % Cover
1. *Rubus discolor*		FACU 5*
2. *Malus sp.*		NOL 5*
3.		
4.		
5.		

Herb Stratum

Total Plot Cover:100	50 = 50%	20 = 20%
		Status/Raw % Cover
1. *Alopecurus pratensis*		FACW 45*
2. *Agrostis stolonifera*		FAC 55*
3.		
4.		
5.		
6.		
7.		
8.		
9.		
10.		
11.		
12.		

Hydrophytic Vegetation Indicators:
☒ > 50% of dominants are OBL, FACW or FAC Percent of Dominant Species that are OBL, FACW, FAC (not FAC-):66
Other hydrophytic vegetation indicators:
Criteria Met? ☒Yes ☐ No **Comments:** Mets wetland vegetation criteria.

SOILS

Map Unit Name: Amity silt loam
On Hydric Soil List? ☐ Yes ☒ No
Drainage Class: Somewhat poorly drained
Has Hydric Inclusions? ☒ Yes ☐ No

Depth Range of Horizon	Matrix Color	Redox Concentrations	Redox Depletions	Texture
0-12	10YR3/2	None		Sl L
12-18	10YR4/2	10YR4/6 CFD		Si CL

Hydric Soil Indicators:
☐Histosol
☐Histic Epipedon
☐Sulfidic Odor
☐Reducing Conditions (tests positive)
☐Gleyed or low chroma colors
☐Redox features within 10" (e.g., concentrations)
☐Concretions/Nodules (w/in 3", > 2mm)
☐High organic content in surface (in Sandy Soils)
☐Organic streaking (in Sandy Soils)
☐Organic pan (in Sandy Soils)
☐ Listed on Hydric Soils List (and soil profile matches)
☐ Meets hydric soil criteria 3 or 4 (ponded or flooded for long duration)
☐ Supplemental indicator (e.g., NRCS field indicator)

Criteria Met? ☐ Yes ☒ No

HYDROLOGY

Recorded Data:
☐Recorded Data Available ☐Aerial Photos ☐Stream Gauge ☐ Other ☒ No Recorded Data Available

Field Data
Depth of inundation: Depth to Saturation:5" Depth to Free Water:5"

Primary Hydrology Indicators:
☐Inundated
☒Saturated in upper 12 inches
☐Water Marks
☐Drift Lines
☐Sediment Deposits

Secondary Hydrology Indicators (2 or more required):
☐Oxidized Root Channels (upper 12")
☐Water-stained leaves
☐Local Soil Survey Data
☐FAC – Neutral Test
☐Other:

Criteria Met? ☒Yes ☐ No **Comments:** .

DETERMINATION

WETLAND? ☐YES ☒NO **Comments: Soil did not met wetland criterion.**

DEPARTMENT OF STATE LANDS WETLAND DETERMINATION DATA FORM – Quick Method

County: Yamhill	Date: 2/28/07	City: Newberg	File #:1985

Project/Contact: NewB./CS
Plant Community: meadow
Plot Location: Tax lot 1000 Vet Clinic
Recent Weather: cold
Det. By: C. Steinkoenig
Plot #:27

Do normal environmental conditions exist? Y☒ N ☐ If no, explain:
Has Vegetation ☐ Soil☐ Hydrology ☐ been significantly disturbed?
Explain:

VEGETATION

Tree Stratum

Total Plot Cover:0	= 50%	= 20%
		Status/Raw % Cover
1.		
2.		
3.		
4.		
5.		

Sapling/Shrub Stratum

Total Plot Cover:	= 50%	= 20%	Status/Raw % Cover
1.			
2.			
3.			
4.			
5.			

Herb Stratum

Total Plot Cover:100	50 = 50%	20 = 20%
		Status/Raw % Cover
1. *Poa pratenisis*		FAC 45*
2. *Agrostis stolonifera*		FAC 50*
3. *Rumex crispus*		FAC+ trace
4. *Chrysanthemum Leuc.*		UPL trace
5. *Trifolium repens*		FAC 15
6.		
7.		
8.		
9.		
10.		
11.		
12.		

Hydrophytic Vegetation Indicators:
☒ > 50% of dominants are OBL, FACW or FAC Percent of Dominant Species that are OBL, FACW, FAC (not FAC-):100
Other hydrophytic vegetation indicators:
Criteria Met? ☒Yes ☐ No **Comments:** .

SOILS

Map Unit Name: Woodburn silt loam 0-7% Drainage Class: Moderately well drained
On Hydric Soil List? ☐ Yes ☒ No Has Hydric Inclusions? ☐ Yes ☒ No

Depth Range of Horizon	Matrix Color	Redox Concentrations	Redox Depletions	Texture
0-16	10YR3/3	None		Sl L

Hydric Soil Indicators:
☐Histosol
☐Histic Epipedon
☐Sulfidic Odor
☐Reducing Conditions (tests positive)
☐Gleyed or low chroma colors
☐Redox features within 10" (e.g., concentrations)
☐Concretions/Nodules (w/in 3", > 2mm)
☐High organic content in surface (in Sandy Soils)
☐Organic streaking (in Sandy Soils)
☐Organic pan (in Sandy Soils)
☐ Listed on Hydric Soils List (and soil profile matches)
☐ Meets hydric soil criteria 3 or 4 (ponded or flooded for long duration)
☐ Supplemental indicator (e.g., NRCS field indicator)

Criteria Met? ☐ Yes ☒ No

HYDROLOGY

Recorded Data:
☐Recorded Data Available ☐Aerial Photos ☐Stream Gauge ☐ Other ☒ No Recorded Data Available
Field Data
Depth of inundation: Depth to Saturation: Depth to Free Water:
Primary Hydrology Indicators:
☐Inundated
☐Saturated in upper 12 inches
☐Water Marks
☐Drift Lines
☐Sediment Deposits
Criteria Met? ☐Yes ☒ No

Secondary Hydrology Indicators (2 or more required):
☐Oxidized Root Channels (upper 12")
☐Water-stained leaves
☐Local Soil Survey Data
☐FAC – Neutral Test
☐Other:
Comments:

DETERMINATION

WETLAND? ☐YES ☒NO **Comments: No hydric soil or wetland hydrology observed.**

DEPARTMENT OF STATE LANDS WETLAND DETERMINATION DATA FORM – Quick Method

County: Yamhill	Date: 2/28/07	City: Newberg	File #:1985

Project/Contact: NewB./CS
Plant Community: meadow
Plot Location: Tax lot 900
Recent Weather: cold

Det. By: C. Steinkoenig
Plot #:28

Do normal environmental conditions exist? Y☒ N☐ If no, explain:
Has Vegetation ☐ Soil☐ Hydrology ☐ been significantly disturbed?
Explain:

VEGETATION

Tree Stratum			Herb Stratum	
Total Plot Cover:0	= 50%	= 20%	Total Plot Cover:100	50 = 50% / 20 = 20%
		Status/Raw % Cover		Status/Raw % Cover
1.			1. *Poa pratenisis*	FAC 45*
2.			2. *Agrostis stolonifera*	FAC 50*
3.			3. *Rumex crispus*	FAC+ trace
4.			4. *Chrysanthemum Leuc.*	UPL trace
5.			5. *Trifolium repens*	FAC 15
Sapling/Shrub Stratum			6.	
Total Plot Cover:	= 50% / = 20%	Status/Raw % Cover	7.	
1.			8.	
2.			9.	
3.			10.	
4.			11.	
5.			12.	

Hydrophytic Vegetation Indicators:
☒ > 50% of dominants are OBL, FACW or FAC Percent of Dominant Species that are OBL, FACW, FAC (not FAC-):100
Other hydrophytic vegetation indicators:
Criteria Met? ☒Yes ☐ No **Comments:** .

SOILS

Map Unit Name: Woodburn silt loam 0-7% Drainage Class: Moderately well drained
On Hydric Soil List? ☐ Yes ☒ No Has Hydric Inclusions? ☐ Yes ☒ No

Depth Range of Horizon	Matrix Color	Redox Concentrations	Redox Depletions	Texture
0-17	10YR3/3	None		Sl L

Hydric Soil Indicators:
☐Histosol
☐Histic Epipedon
☐Sulfidic Odor
☐Reducing Conditions (tests positive)
☐Gleyed or low chroma colors
☐Redox features within 10" (e.g., concentrations)
☐Concretions/Nodules (w/in 3", > 2mm)
☐High organic content in surface (in Sandy Soils)
☐Organic streaking (in Sandy Soils)
☐Organic pan (in Sandy Soils)
☐ Listed on Hydric Soils List (and soil profile matches)
☐ Meets hydric soil criteria 3 or 4 (ponded or flooded for long duration)
☐ Supplemental indicator (e.g., NRCS field indicator)

Criteria Met? ☐ Yes ☒ No

HYDROLOGY

Recorded Data:
☐Recorded Data Available ☐Aerial Photos ☐Stream Gauge ☐ Other ☒ No Recorded Data Available
Field Data
Depth of inundation: Depth to Saturation: Depth to Free Water:

Primary Hydrology Indicators:
☐Inundated
☐Saturated in upper 12 inches
☐Water Marks
☐Drift Lines
☐Sediment Deposits
Criteria Met? ☐Yes ☒ No

Secondary Hydrology Indicators (2 or more required):
☐Oxidized Root Channels (upper 12")
☐Water-stained leaves
☐Local Soil Survey Data
☐FAC – Neutral Test
☐Other:
Comments:

DETERMINATION

WETLAND? ☐YES ☒NO **Comments: No hydric soil or wetland hydrology observed.**

Appendices

Boiler Plate Information
References

Boiler Plate Information

Wetland Definition and Authority

The U.S. Army Corps of Engineers (COE) regulates the discharge of dredged or fill materials into waters and adjacent wetlands of the United States under authority of Section 404 of the Clean Water Act (*Federal Register,* 1986). For purposes of the Section 404 permitting program, the COE and other federal agencies define wetlands as follows (*Federal Register,* 1980, 1982):

> "Those areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions."

In Oregon, the Department of State Lands (DSL) regulates removal/fill permitting in wetlands under ORS 196.800 to 196.990, and OAR 141-85-005 to OAR 141-85-090, and uses the same definition.

Regulatory Context

In 1987, the COE published a manual (Corps of Engineers Wetlands Delineation Manual or 1987 manual), which describes methods for determining the extent of jurisdictional wetlands under Section 404 of the Clean Water Act (Environmental Laboratory, 1987). *The Federal Manual for Identifying and Delineating Jurisdictional Wetlands* was published two years later as a collaborative effort by the COE, U.S. Fish and Wildlife Service (USFWS), U.S. Environmental Protection Agency (EPA), and U.S. Soil Conservation Service (SCS), revised the 1987 manual (Federal Interagency Committee for Wetland Delineation, or 1989 manual).

Both the COE and DSL used the 1989 manual until 1992 when the 1992 Energy and Water Development Appropriation Act went into effect. The Act limited the COE (federal permitting agency) to using the 1987 manual for determining the extent of wetlands under federal jurisdiction. Oregon continued to use the 1989 manual until March 23, 1993, when the Director of DSL signed a policy statement requiring the agency to use the 1987 manual. The policy statement was the result of the EPA agreement to use the 1987 manual.

Vegetation

Plants growing in wetlands must be specifically adapted for life under saturated or anaerobic conditions and are commonly referred to as hydrophytic vegetation. The U.S.F.W.S. in cooperation with the National and Regional Interagency Review Panels publishes regional lists estimating the probability of plant species' occurrence in wetlands (e.g., Fish and Wildlife Service, 1988). Each species is given an *indicator status*, which represents the likelihood that it will be found in a wetland. Categories defined in Table 1 are obligate (OBL), facultative wetland (FACW), facultative (FAC), facultative upland (FACU), or upland (UPL). Plants with an indicator status of OBL, FACW, or FAC are considered adapted for life in saturated or anaerobic soil conditions.

The percent coverage of each plant species within the herb, shrub, and tree layers was estimated at each sample plot. Shrubs within a five-foot radius and trees within a 30-foot radius of the center of each plot were identified and recorded. Within the plot, all species were recorded in descending order of coverage, and dominant species were determined. The presence of wetland vegetation was determined according to the indicator status of the dominant species within each vegetative stratum. According to the manual, a sample plot is considered to have wetland vegetation if more than 50% of the number of dominant species present has an indicator status of OBL, FACW, and/or FAC. By 1987 standards, dominant species are chosen by selecting the three most dominant species from each of the four strata (herbs, saplings/shrubs, woody vines, trees). If only one or two strata are represented, then the five most dominant species from each stratum are selected.

TABLE 1: DEFINITIONS OF INDICATOR STATUS

Indicator Symbol	Definition
OBL	Obligate. Species that occur in wetlands under natural conditions with an estimated probability of greater than 99%
FACW	Facultative wetland. Species that usually occur in wetlands (estimated probability 67 to 99%), but occasionally are found in non-wetlands.
FAC	Facultative. Species that are equally likely to occur in wetlands or non-wetlands (estimated probability 34 to 66%).
FACU	Facultative upland. Species that usually occur in non-wetlands (estimated probability 67 to 99%), but occasionally are found in wetlands.
UPL	Upland. Species that occur in non-wetlands under natural conditions with an estimated probability of greater than 99%
NI	No indicator. Species for which insufficient information was available to determine an indicator status.

Sources: Federal Interagency Committee for Wetland Delineation, 1989. Environmental Laboratory, 1987. Reed, 1988.

Soils

Hydric soils, defined as soils that are saturated, flooded, or ponded long enough during the growing season to develop anaerobic conditions in the upper part of the soil profile, are one characteristic of wetlands (USDA Soil Conservation Service, 1987). A list of hydric soils of the United States was compiled by the Soil Conservation Service (SCS), in cooperation with the National Technical Committee for Hydric Soils (NTCHS). All soils are mapped in county soil surveys. However, the mapped boundaries of SCS soil types are not at a fine enough resolution for delineating boundaries of jurisdictional wetlands. Errors of omission can occur on SCS maps. Inclusions of upland (non-wetland) soil may exist in hydric soils and uplands may have inclusions of hydric soil. Therefore, field examination of soils is important for accurately delineating the extent of hydric soils. Hydric soils exhibit certain characteristics that can be observed in the field. Field indicators include: high organic content, accumulation of sulfidic material (rotten egg odor), greenish or bluish gray color (gley formation), iron and manganese concretions, spots or blotches of color (mottling), and/or dark soil colors (low soil chroma).

A shovel, excavating down to a depth of at least 16 inches, was used to sample soil along the wetland boundary. Soil samples were checked for presence of sulfide gases; organic content was estimated visually and texturally; and soil colors were determined by using a Munsell soil color chart (Kollmorgen 1975). The Munsell soil color chart provides the standard for three attributes of color: hue, value, and chroma.

According to the 1987 manual, hydric soils are required to be inundated or saturated for seven or more consecutive days during the growing season. Soil color is examined in the horizon immediately below the A-horizon, or within 10 inches of the surface, whichever is shallower.

Hydrology

Wetlands, by their very name, must have water. Jurisdictional wetlands are characterized as having permanent or periodic inundation, or soil saturation for five percent or more of the growing season. Saturation occurs when the capillary fringe is within the major portion of the root zone (usually within 12 inches of the surface). Areas meeting one of these criteria are considered to have wetland hydrology.

Ponding or soil saturation for five percent or more of the growing season during the growing season is direct evidence of wetland hydrology. Bare soil and dried algae are evidence that a site was previously inundated. Oxidized rhizospheres along live root channels also indicate soil saturation for five percent or more of the growing season. At each sample plot, wetland hydrology was assumed if positive indicators were present.

Wetland Determination

Presence or absence of wetlands was based on soil, vegetation, and hydrology data collected at sample plots. Following procedures outlined in the 1987 manual, sample plots with homogeneous vegetation were determined to be wetlands if wetland characteristics were present or judged to be normally present (barring human or unusual natural events) for all three parameters.

Difficulties in wetland determination can arise because of disturbance or in problem areas. Both human (e.g., clearing vegetation, agriculture, filling, and excavation) and natural (e.g., mudslides, fire, and beaver dams) events have potential for obliterating field indicators of the three wetland parameters. In disturbed sites, both field and offsite data may be used to determine the presence of a wetland. Offsite information such as historical records, aerial photographs, previous soil, and vegetation surveys may indicate the presence of a jurisdictional wetland.

Some sites are difficult to evaluate because field indicators may not be present throughout the year. Field indicators may vary because of changing environmental conditions that occur seasonally and not necessarily the result of human or natural disturbance.

According to the 1987 manual, all three parameters (hydric soils, hydrophytic vegetation, and wetland hydrology) must be present for an area to be determined as wetland. Drumlins, seasonal wetlands, prairie potholes, and vegetated flats exemplify areas that are difficult to evaluate.

REFERENCES

Environmental Laboratory, 1987. *Corps of Engineers Wetlands Delineation Manual,* Technical Report Y-87-1, U.S. Army Engineers Waterways Experiment Station, Vicksburg, MS.

Federal Interagency Committee for Wetland Delineation, 1989. *Federal Manual for Identifying and Delineating Jurisdictional Wetlands*, U.S. Army Corps of Engineers, U.S. Environmental Protection Agency, U.S. Fish and Wildlife Service, and U.S.D.A. Soil Conservation Service, Washington, D.C. Cooperative technical publication. 138 pp.

Federal Register, 1980. 40 CFR Part 230: Section 404(b)(1), *Guidelines for Specification of Disposal Sites of Dredged or Fill Material,* Vol. 45, No. 249, pp. 85352-85353, U.S. Govt. Printing Office, Washington, D.C.

Federal Register, 1982. Title 33, *Navigation and Navigable Waters; Chapter II, Regulatory Programs of the Corps of Engineers.* Vol. 47, No. 138, p. 31810, U.S. Govt. Printing Office, Washington, D.C.

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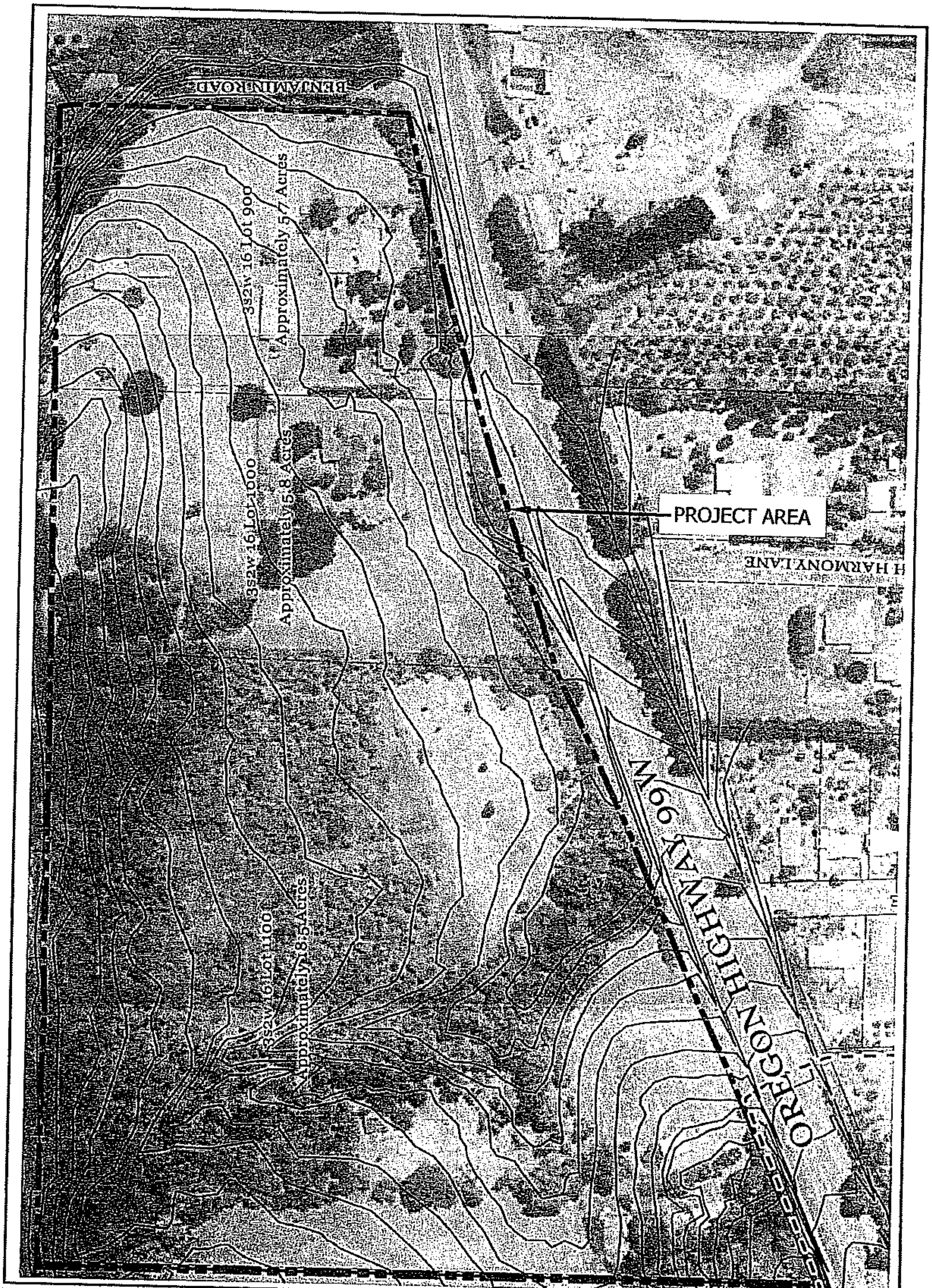
Kollmorgen Corporation, 1975. *Munsell Soil Color Charts.* Macbeth Division of Kollmorgen Corporation, Baltimore, MD.

Reed, P. B., Jr., 1988. *National List of Plant Species that Occur in Wetlands: Northwest (Region 9*), U.S. Fish and Wildlife Service, Biological Report 88 (26.9) 89 pp.

Reed, P. B., Jr., et al., 1993. *Supplement to List of Plant Species That Occur in Wetlands: Northwest (Region 9),* U.S. Fish and Wildlife Service. Washington D.C. 10p.

U.S. Department of Agriculture, Soil Conservation Service 1991. *Hydric Soils of the United States in Cooperation with the National Technical Committee for Hydric Soils.* Misc. Pub. No. 1491.

U.S. Department of Agriculture, Soil Conservation Service, 1982. *Soil Survey of Yamhill County, Oregon.* U.S.D.A. Soil Conservation Service, Washington, D.C., 138 pp.



AERIAL
S&A #1985

Schott & Associates
P.O. Box 589
Aurora, OR. 97002
503.678.6007

Attachment 4: Joint Permit Application Excerpts

Joint Permit Application

RECEIVED
OCT 06 2017
DEPARTMENT OF ... Date Stamp

This is a joint application, and must be sent to both agencies, who administer separate permit programs. Alternative forms of permit applications may be acceptable; contact the Corps and DSL for more information.

U.S. Army Corps of Engineers Portland District	Oregon Department of State Lands
Corps Action ID Number	DSL Number 58464-RF Revised

(1) APPLICANT AND LANDOWNER CONTACT INFORMATION

	Applicant	Property Owner (if different)	Authorized Agent (if applicable) ☑ Consultant ☐ Contractor
Contact Name	Barry Cain	Jeffrey Smith	Juniper Tagliabue
Business Name	Gramor Investments	JT Smith Co.	Schott and Associates
Mailing Address 1	19767 SW 72nd Ave	5285 Meadows Drive	PO Box 589
Mailing Address 2	Suite 100	Suite 171	
City, State, Zip	Tualatin, OR 97062	Lake Oswego, OR 97035	Aurora, OR 97002
Business Phone	503.245.1976		503.678.6007
Cell Phone			
Fax			
Email	ryan@gramor.com		juniper@schottandassociates.com

(2) PROJECT INFORMATION

A. Provide the project location.

Project Name	Tax Lot #	Latitude & Longitude*
Crestview Crossing	1000, 1100	43.3118, -1229362
Project Address / Location	**City (nearest)**	**County**
NE Corner Hwy 99W & Vittoria Ln.	Newberg	Yamhill

Township	Range	Section	Quarter/Quarter
3S	2W	16	AC

Brief Directions to the Site
Highway 99W to Newberg. Site is N of highway, E of Vittoria Lane and across from the hospital.

B. What types of waterbodies or wetlands are present in your project area? (Check all that apply.)

☑ River / Stream ☑ Non-Tidal Wetland ☐ Lake / Reservoir / Pond
☐ Estuary or Tidal Wetland ☐ Other ☐ Pacific Ocean

Waterbody or Wetland Name**	River Mile	6th Field HUC Name	6th Field HUC (12 digits)
Trib to Springbrook Creek	Unk.	Hess Creek- Willamette	17090070307

C. Indicate the project category. (Check all that apply.)

☑ Commercial Development ☐ Industrial Development ☑ Residential Development
☐ Institutional Development ☐ Agricultural ☐ Recreational
☐ Transportation ☐ Restoration ☐ Bank Stabilization
☐ Dredging ☑ Utility lines ☐ Survey or Sampling
☐ In- or Over-Water Structure ☐ Maintenance ☐ Other:

* In decimal format (e.g., 44.9399, -123.0283)

(2) PROJECT INFORMATION

** If there is no official name for the wetland or waterway, create a unique name (such as "Wetland 1" or "Tributary A").

(3) PROJECT PURPOSE AND NEED

Provide a statement of the purpose and need for the overall project.

Introduction

The applicant (Gramor Development, Inc.) is proposing to develop planned and essential street extensions and connections in conjunction with an associated supporting new mixed-use development to service the east Newberg market area on an approximately 33-acre site on the north side of Highway 99W in the City of Newberg, Yamhill County, Oregon. The project will serve the City's identified needs for a community-serving commercial retail services, single-family residences, and a new north-south street connection and related intersections in the east Newberg market area. If the project is not developed, it will force east Newberg residents to travel out-of-direction with increased congestion on existing streets for both general vehicular travel and to obtain basic retail services, will force residential development into less desirable locations, and will threaten the ability to retain significant regional employers, which are dependent upon additional transportation connections to move goods and services and attract clients.

Purpose and Need Statement:

The purpose of this project is to develop a north-south street connection and associated supporting mixed-use development to serve identified needs in the east Newberg market. The identified needs served by the project include the following: (1) a new north-south minor arterial street connection across Highway 99W at an existing intersection and as depicted in City of Newberg adopted plans; (2) community-serving commercial retail services with necessary visibility from and direct accessibility to both Highway 99W and a north-south minor arterial street that crosses Highway 99W; and (3) residential housing opportunities consistent with the City's identified housing needs; all located near the gateway to east Newberg.

North-South Street Connection to East Newberg

The City has identified the extension of Crestview Drive as an essential and planned component of the City's System Transportation System Plan, and construction of this road connection will be achieved as a condition of the private development requiring such new infrastructure. The need for the road has been well-documented and is anticipated to be even greater upon completion of the Bypass project currently under construction. According to the City Engineer, the need for traffic relief in this vicinity will become even more crucial due to the expected failure of the current Springbrook intersection after the Bypass is completed. Additionally, the City has identified the importance of providing adequate roads for movement of goods and access for tourism services and for retention of existing businesses. The location of the road, including its connection points, is dictated by the City's Transportation System Plan as well as the need to connect with Highway 99W at an existing access point. These locations are fixed due to safety and connectivity requirements. Construction of the road is expected to occur in conjunction with private development consistent with the City's acknowledged comprehensive plan.

The requirement to construct the road and to do so in a defined location has two important implications for the site. First, the designated road location cuts through the upslope portion of the largest consolidated wetland from north to south and will create a dam effect, significantly impacting hydrologic connection and likely reducing the size of the remaining wetland areas, which will be fragmented, isolated and surrounded by development, providing minimal wetland function on the site. Any proposed development must include this road along with its significant wetland impact. Second, due to limited availability of public funds, the road must be privately funded and constructed. As a result, the private development on-site must be sufficiently substantial to allow a return on investment and allow funding for this public improvement.

Supporting Associated Development

Commercial Retail Shopping Center

The portion of the subject property fronting on Highway 99W has been identified and zoned by the City for development of a commercial retail shopping center to support the needs of east Newberg. The City

(3) PROJECT PURPOSE AND NEED

annexed the subject property for this specific purpose, and it is the only undeveloped parcel left within the City's Urban Growth Boundary ("UGB") that could support the needed infrastructure. The location serves as the entry to Newberg as well as a gateway to the surrounding 'wine country'. The location along Highway 99W is crucial for both visibility and access for the retail center, and as outlined in the Alternatives Analysis, no other viable location for such a development is available that meets the project purpose. In order to adequately develop such a commercial center, the design must meet numerous criteria that cannot be met without the proposed wetland impacts as demonstrated in the Alternatives Analysis.

Residential
The City has documented its need for residential development. Employment growth is occurring and is further anticipated due to expansion of George Fox University as well as A-dec and other regional employers. The UGB is fixed, defining where residential development can occur. This portion of the subject property area is zoned for residential development. The existing residents to the north are in support of the proposed commercial development but desire the 'buffer' of a residential component between themselves and the commercial development. This is also a requirement of the annexation decision.

Medical Office
Doctors want a medical office with direct and quick access to Providence Newberg Medical Center, which is across Highway 99W from the subject property. Having a medical office within close proximity to a commercial center is also beneficial to both entities. A medical office also has the development advantage of being able to exist on its own, outside of the primary commercial retail center. The access requirements for entering the site require impacts to this portion of the wetland. Avoiding this portion of the wetland and eliminating the medical office from the proposal would reduce the number of uses provided by the development while leaving only a low functioning isolated wetland surrounded by development.
All of the above project elements have a documented need and need each other in order for the project to be practicable. In order to adequately develop each of the project elements of this multi-use development, significant wetland/waterway impacts are unavoidable. Opportunities for minimization have been explored but largely rejected due to the fact that any such avoided areas would be significantly compromised due to fragmentation and functions provided by such small areas surrounded by development would be minimal. Minimization has been provided to the extent possible in the western portion of the site.

(4) DESCRIPTION OF RESOURCES IN PROJECT AREA

A. Describe the existing physical and biological characteristics of each wetland or waterway. Reference the wetland and waters delineation report if one is available. Include the list of items provided in the instructions.

Based on soil, vegetation and hydrology data taken in the field, four wetlands (totaling approximately 6.95 acres) and one perennial drainage were delineated onsite. The drainage was a tributary to Springbrook Creek and contained within Wetland A. A second tributary was less defined and was also contained within Wetland A. The delineation was conducted and concurred with by DSL in 2013 (WD#13-0148). No vernal pools, bogs, fens, mature forested wetland, seasonal mudflats, or native wet prairies were identified in or near the project area. Wetlands were assessed using the Guidebook for Hydrogeomorphic (HGM)-based Assessment of Oregon Wetland and Riparian Sites Willamette Valley Ecoregion. The reference based method was used. Existing wildlife usage is low but present. The western portion of the property consists primarily of a large open meadow area which is regularly mowed. To the east is a managed tree farm. In the center is a perennial stream and riparian area which provides the highest quality habitat. Small mammals and birds certainly use the site while deer and coyote also likely move through. There is no fish access through the culvert under Highway 99W at the southern edge of the site. Downstream of the Hwy 99W culvert there is an existing pond, containing a dam also preventing fish passage.

Wetland A (A1,A2) (288,785sf) was primarily a PEM/slope wetland with areas of PSS and PFO. A 1,447lf perennial drainage was located within and directly adjacent to the wetland with an area of 6,589sf. Combined wetland/water area was 6.7 acres (295,374sf). The western portion of the wetland consisted of a hayed meadow community with dominant grasses of meadow foxtail (Alopecurus pratensis) in the swale

(4) DESCRIPTION OF RESOURCES IN PROJECT AREA

to the south and sweet vernal grass (Anthoxanthum odoratum) in the grassy areas further north. Vegetation in the swale and to the south was dominated by meadow foxtail, sweet vernal grass and bentgrass (Agrostis sp) as well as tall fescue (Festuca arundinacea). Oregon ash (Fraxinus latifolia), willow (Salix sp.) and Douglas hawthorn (Crataegus douglasii) saplings were also present. Soils met the Redox Dark Surface (F6) hydric soil indicator and soils were saturated at or near the surface. Further north and throughout the field, vegetation was similar, with sweet vernal grass more dominant. Sweet vernal grass is now considered a problematic species and vegetation was considered to meet hydrophytic wetland criteria where soils and hydrology criteria were also met. Wetland determination was based on presence of soils and hydrology. The source of hydrology in this area is associated with precipitation, a seasonal high water table and the stormwater outfall at the western property boundary. Despite below average precipitation patterns for the previous one and a half months, the groundwater table was high due to exceptionally high rainfall for the 3 months prior to that. It was also suggested by the property owner that an increase in hydrology onsite may have been due to the construction of the interchange of Springbrook Street and Crestview Drive offsite to the northwest.

The wetland boundary at the eastern edge of TL#13800 was defined by a ditch at the property boundary. Approximately 130 feet east of the property line at its south end a small berm built for vehicle access to the back barn area crosses the drainage and wetland area. The berm has been in place on the property well over fifty years. The drainage crosses the berm via a small culvert and continues to flow east as a ditch with adjacent wetland before flowing into the larger tributary. The plant community east of the berm transitions from meadow into a forested community that joins the riparian community along the main tributary. Where the community transitioned to a forested community vegetation was dominated by Oregon ash in the overstory with buttercup (Ranunculus sp) and sedge (Carex sp) species in the herbaceous layer. Pacific ninebark (Physocarpus capitatus) and Himalayan blackberry (Rubus armeniacus) were also observed. Soils met the F6 indicator and there was saturation to the surface. The upland sloped up with a thick canopy of planted apple species (Malus sp), as well as snowberry (Symphoricarpos albus), sword fern (Polystichum munitum) and Himalayan blackberry. Another community was observed to the north, along the western side of the larger tributary. This community was dominated by slough sedge (Carex obnupta) with soil meeting the F6 indicator and hydrology observed 7" from the surface. To the west was a grove of black locust trees (Robinia pseudoacacia) with blackberry and sword fern in the understory. Soils did not meet any hydric criteria and no hydrology indicators were observed.

Further north, along the tributary to Springbrook Creek, wetland was identified adjacent to the eastern bank with the western boundary defined by the steep top of bank. The wetland was forested with an Oregon ash canopy with creeping buttercup and camas (Camassia quamash) both observed in the understory. Soils met the F6 indicator and at the northern boundary the depleted matrix (F3) indicator was met. One distinct open grassy community was observed adjacent to the tributary. Vegetation consisted of lush grass dominated by bluegrass (Poa sp.) and meadow foxtail. Soils met the F6 indicator and water was observed 8" from the surface. The adjacent upland along the eastern wetland boundary was thick with Himalayan blackberry and Douglas hawthorn as well as Oregon ash, trailing blackberry (Rubus ursinus), hazelnut (Corylus cornuta) and sword fern. Although hydric soil criterion was met, vegetation and hydrology were not. The western top of bank was steep and well defined, with no adjacent wetland. Vegetation was thick Himalayan blackberry. Soil and hydrology criteria were not met. The northern boundary of the wetland was defined by a break in vegetation and soils. Based on the HGM Assessment method used, functions for this entire wetland were highest for sediment stabilization, nitrogen removal, primary production and songbird habitat.

Wetland B, at 189sf (0.004 acre) was a PFO/depressional wetland located in the northwest corner of the site. This area west of the culvert outlet is believed to be a remnant of the historical drainage. The wetland consisted of a mud bottom depressional area. Vegetation was dominated by Oregon ash canopy with some willow, rush (Juncus sp.) and meadow foxtail in the understory. Soils met the F6 hydric soil indicator and surface saturation was observed although it appeared to be perched. The adjacent upland was dominated by Himalayan blackberry, which was encroaching into the wetland, as well as meadow foxtail to the east. No hydrology or hydric soil indicators were observed. The remainder of the upland boundary was defined by topography, non-hydric soils and vegetation that was dominated by upland species such as

(4) DESCRIPTION OF RESOURCES IN PROJECT AREA

Oregon white oak (Quercus garryana), sword fern and common snowberry as well as Himalayan blackberry. Based on the HGM Assessment method used, functions for this entire wetland were highest for nitrogen removal with sediment stabilization and support of characteristic vegetation close behind.

The other two wetlands are isolated and located in the eastern portion of the property which is planted to small trees for a tree farm. These wetlands were delineated in 2007 and although no hydrology was indicated in 2013 their presence was based on vegetation and soils criteria. Wetland C is 13,147sf (0.3 acres) and classified as palustrine emergent slope wetland. The dominant vegetation in the emergent portion is meadow foxtail (Alopecurus pratensis) and bentgrass (Agrostis stolonifera). Wetland D is another isolated wetland (469sf) immediately below the first. It consists of a small depressional area with colonial bentgrass and meadow foxtail as the dominants. Functions for these wetlands were generally low with unsupported moderately high scores for invertebrate habitat support.

The onsite waterway (6,589sf) is a perennial tributary to Springbrook Creek with its onsite source being a culvert in the northwest portion of the property. An additional culvert entering the property from the west provided hydrology to a smaller tributary entirely surrounded by wetland. The waterway was mostly encompassed by Wetland A but defined a portion of the boundary. The narrow channel had vertical banks. Substrate was generally silt. Riparian conditions were a mix of reed canary grass at the upper end with a more intact forest including Oregon ash, buttercup and sedge as well as some fruit trees in the central portion. There used to be a small pond at the lower end of the site. The waterway exits the site through a culvert under Highway 99W. Assessed functions were included within the assessment for Wetland A.

No vernal pools, bogs, fens, mature forested wetlands, seasonal mudflats, or native wet prairies were identified on or near the project area.

B. Describe the existing navigation, fishing and recreational use of the waterway or wetland.

None

(5) PROJECT SPECIFIC CRITERIA AND ALTERNATIVES ANALYSIS

Describe project-specific criteria necessary to achieve the project purpose. Describe alternative sites and project designs that were considered to avoid or minimize impacts to the waterway or wetland.

The specific requirements for the project described above include:

NORTH-SOUTH STREET CONNECTION

o Provide a planned new north-south connection across Highway 99W for east Newberg

o Intersect Highway 99W at an existing, approved intersection

o Accommodates a minor arterial street with a 34-74 foot wide cross-section and projected capacity of 400-1000 vehicles per day

o Must be privately constructed and funded by proceeds from surrounding mixed-use development due to lack of currently available public funding

o Consistent with City's adopted Transportation System Plan including safety requirements

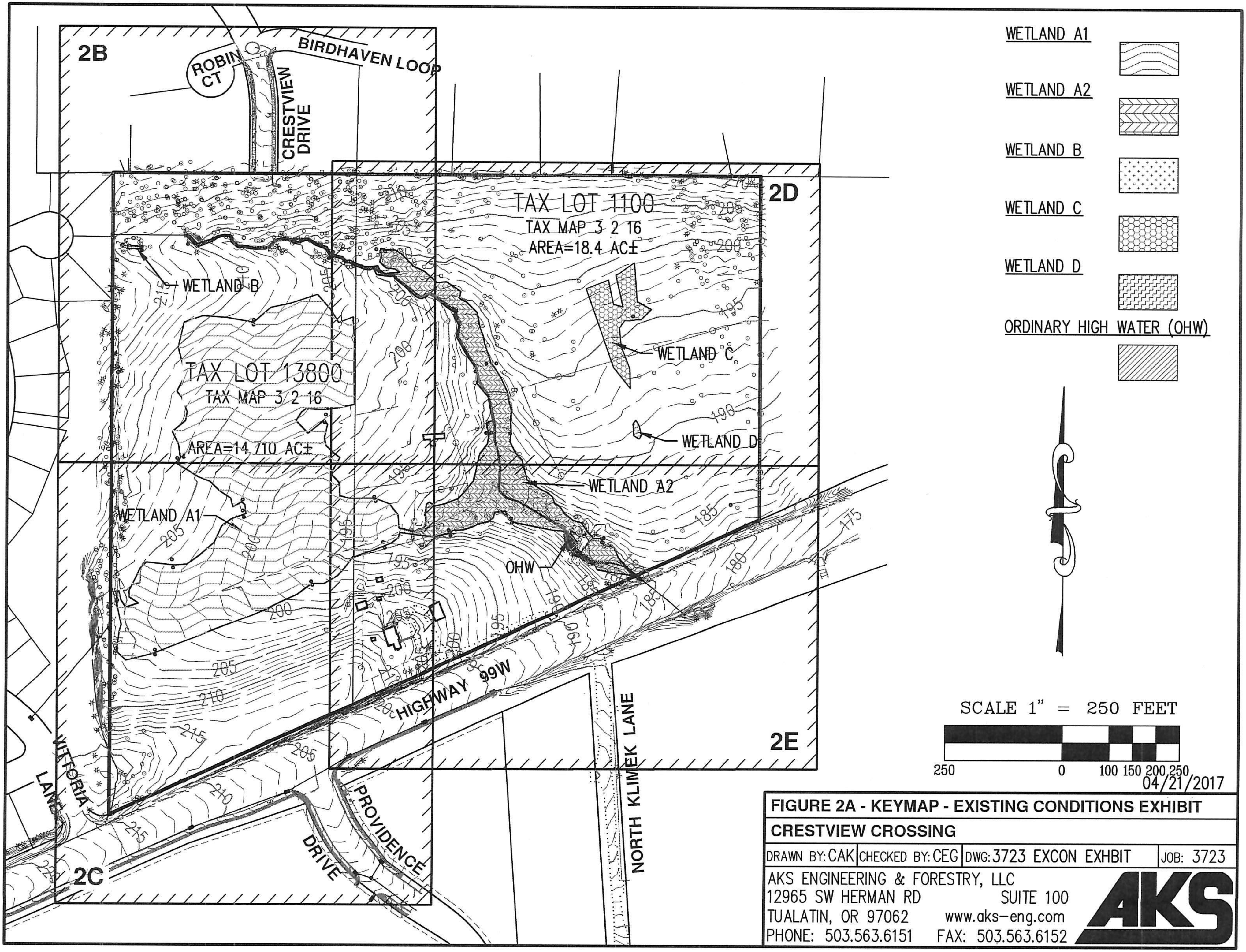
o Creates intersection and access to allow development of adjacent planned commercial land, consistent with the City's commercial land needs inventory and plan map designations

o Provides connectivity in northeast Newberg to serve residents and key business interests, including A-dec and Allison Inn and Spa

COMMERCIAL RETAIL SERVICES

o Highway 99W and intersecting street direct accessibility

o Highway 99W and intersecting street visual retail exposure



2B
2C
2D
2E
ROBIN CT
BIRDHAVEN LOOP
CRESTVIEW DRIVE
TAX LOT 1100
TAX MAP 3 2 16
AREA=18.4 AC±
TAX LOT 13800
TAX MAP 3 2 16
AREA=14.710 AC±
WETLAND B
WETLAND C
WETLAND D
WETLAND A2
WETLAND A1
OHW
HIGHWAY 99W
NORTH KLIMEK LANE
VITTORIA LANE
PROVIDENCE DRIVE
WETLAND A1
WETLAND A2
WETLAND B
WETLAND C
WETLAND D
ORDINARY HIGH WATER (OHW)
SCALE 1" = 250 FEET
250
0
100 150 200 250
04/21/2017
FIGURE 2A - KEYMAP - EXISTING CONDITIONS EXHIBIT
CRESTVIEW CROSSING
DRAWN BY: CAK
CHECKED BY: CEG
DWG: 3723 EXCON EXHBIT
JOB: 3723
AKS ENGINEERING & FORESTRY, LLC
12965 SW HERMAN RD SUITE 100
TUALATIN, OR 97062
www.aks-eng.com
PHONE: 503.563.6151
FAX: 503.563.6152

Attachment 5: Submittals by Applicant after July 25, 2018

Keith Leonard

From: Andrew Tull <andrew.tull@3j-consulting.com>
Sent: Friday, July 27, 2018 9:14 AM
To: Mercedes Smith; Keith Leonard
Subject: RE: Crestview Crossing - Density Worksheet
Attachments: Copy of Density and Parking Calculations akt.xlsx

Hi Keith,

Attached is our updated density calculation spreadsheet. The previous worksheet that you received yesterday was not fully populated – the populated document was sitting in my email and I'm sorry about that.

Regarding the breakdown of units:

There are 51 apartments proposed – 27 of which will be one-bedroom units and 24 will be two-bedroom units.

Of the home plans submitted 80 will be three-bedroom units and 168 will have either four or five-bedrooms.

Please let me know your thoughts on the attached spreadsheet.

Andrew Tull
PH: (503) 545-1907
andrew.tull@3j-consulting.com

From: Mercedes Smith
Sent: Thursday, July 26, 2018 1:12 PM
To: Keith Leonard
Cc: Andrew Tull
Subject: RE: Crestview Crossing - Density Worksheet

Hi Keith,

I believe the table I sent does not show the density points for the commercial area. The narrative states that the C-2 zone allows density of the R-3 district. We calculated the area used for residential development that is zoned commercial, which I believe was approximately 14 acres. We then multiplied this by the density point allowance and added it to the R-1 and R-2 zones. This gave us a total of 11,859.85.

Let me know if you need anything else.

Thanks!

Mercedes Smith
Urban Designer
3J Consulting, Inc.
PH: (503) 946-9365 x211

From: Keith Leonard <Keith.Leonard@newbergoregon.gov>
Sent: Thursday, July 26, 2018 12:56 PM

To: Mercedes Smith <mercedes.smith@3j-consulting.com>
Cc: Andrew Tull <andrew.tull@3j-consulting.com>
Subject: RE: Crestview Crossing - Density Worksheet

Hi Mercedes,

Thank you for the info. Can you tell me how you arrived at the total number of density points of 11,859.85 listed on page 14 of the narrative? I didn't see this number in the table you provided.

Thanks!

Keith Leonard, AICP |Associate Planner
City of Newberg
(503) 537-1215
keith.leonard@newbergoregon.gov
City of Newberg

From: Mercedes Smith [mailto:mercedes.smith@3j-consulting.com]
Sent: Thursday, July 26, 2018 12:43 PM
To: Keith Leonard <Keith.Leonard@newbergoregon.gov>
Cc: Andrew Tull <andrew.tull@3j-consulting.com>
Subject: Crestview Crossing - Density Worksheet

Hi Keith,

I've attached our internal density and parking matrix worksheet for your use. If you have any questions or concerns feel free to contact me directly.

Thank you,

Mercedes Smith
Urban Designer
3J Consulting, Inc.
5075 SW Griffith Drive, Suite 150
Beaverton, OR 97005
O: (503) 946-9365 x211 C: (541) 999-7870
mercedes.smith@3j-consulting.com
Civil Engineering – Water Resources – Land Use Planning
www.3j-consulting.com | *Follow us on LinkedIn* | *Like us on Facebook*

Crestview Crossing Density and Parking Matrix

Per Newberg Development Code Sections 15.240.020.F and 15.440.030

	DENSITY						MULTI-FAMILY PAR	
Dwelling Type	**Number of Units-Standard**	**Density Points per Unit-Standard**	**Total Number of Points Required**	**Number of Units-Income Restricted Affordable**	**Density Points Per Unit - Income Restricted Affordable**	**Total Number of Points Required**	**Parking Required per Dwelling Unit**	**Number of Dwelling Units per Type**
Studio and Efficiency	0	12	0	Need Value	9	9	1	0
One-Bedroom	27	14	378	Need Value	11	11	1	27
Two-Bedroom	24	21	504	Need Value	16	16	1.5	24
Three-Bedroom	80	28	2240	Need Value	21	21	2	0
Four+ Bedrooms	168	35	5880	Need Value	26	26	2	0
Five Bedrooms	Value only applicable for Parking Standards						0.75/br	Need Value
							0.2	48
Total Density Points Needed:			**9002**	**Total Density Points Needed:**		**83**	**Total Multi-Family Parking Spaces Required:**	
							*Single-Family Parking provided on individu	

Maximum Allowable Density on the Site		
Zoning District	**Gross Site Size**	**Max. Allowable Density**
R-1	4.31	754.25
R-2	6.58	4211.2
C-2	22.24	6894.4
TOTAL DENSITY POINTS AVAILABLE:		**11859.85**

Total Density Points Available to Crestview Crossing Based on Gross Area of Each Zoning Type:	**11859.85**
Total Density Points Needed to Develop Crestview Crossing PUD as Proposed:	**9085**

KING*
Number of Parking Spaces Required
0
27
36
0
0
9.6
72.6
Spaces al lots

Keith Leonard

From: Andrew Tull <andrew.tull@3j-consulting.com>
Sent: Friday, July 27, 2018 9:58 AM
To: Keith Leonard
Cc: Kristen Svicarovich; Aaron Murphy
Subject: RE: Additional questions - Crestview
Attachments: DOC008.pdf

Hi Keith,

I've attached a drawing showing the private streets and walkways in Orange and the public streets in Yellow. I've also replied to each of your comments below.

Andrew Tull
PH: (503) 545-1907
andrew.tull@3j-consulting.com

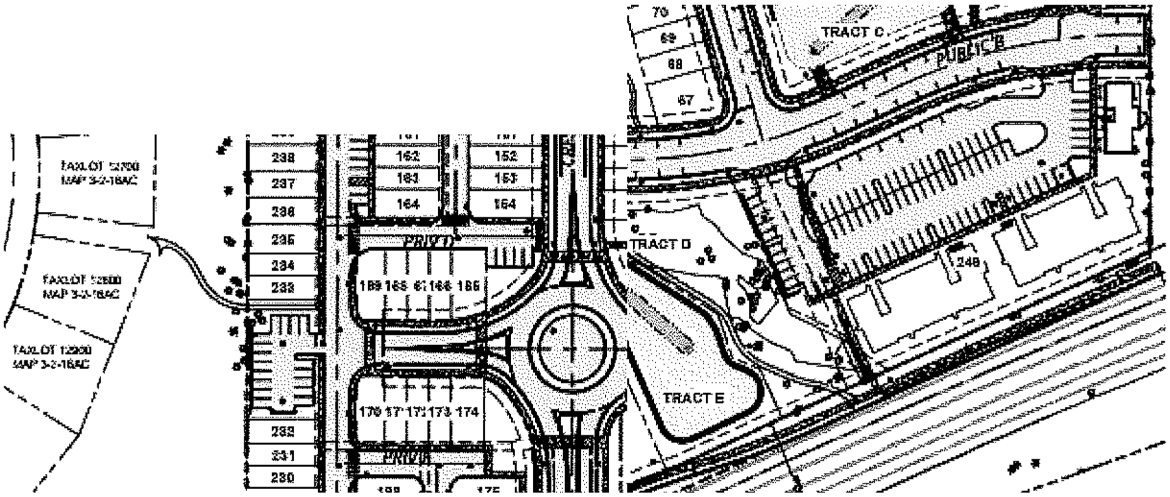
From: Keith Leonard [mailto:Keith.Leonard@newbergoregon.gov]
Sent: Thursday, July 26, 2018 3:17 PM
To: Aaron Murphy ; Andrew Tull
Cc: Kristen Svicarovich
Subject: Additional questions - Crestview

Hello,

I met with engineering this afternoon to discuss your submittal.

1. Public vs Private walkways – We can't tell you which paths should be public and which should be private. We do agree that those sidewalks fronting public streets should be public and meet city requirements. There are two other areas that we suggest should be public. The pathway leading to the park (shown below) and the one leading from the Apartments to Hwy 99. Do you have permission to build a path into the park? We believe that it would be appropriate to have a public path leading up to the park in the first picture but stopping at the property line. The second pathway that should probably be public pathway is the one leading from the Apartments to Hwy 99. Aaron and Kristen Svicarovich should discuss this issue.

We intended to make all walkways fronting right-of-way public and all other walkways private. The applicant would accept a condition of approval requiring all public walkways to be built to public standards. We'd also accept a condition requiring all private walkways to be built to private standards. We're happy to provide a blanket public access easement over the top of all private walkways.



2. We cannot determine where the alleys are on your site plans.

I'm sorry if this is confusing within the narrative. The private streets and alleys are basically considered to be a parking/access driveway network. There are no alleys – just private streets.

We've designed this site in this manner to be more of a multi-family styled project. This approach reflects the higher density of the products that will be constructed.

Please feel free to omit the term alley from your report. The private streets will either be

3. Parking (more of a planning issue) – TVF&R provided a comment stating no parking on the private roads with a width of only 24 feet. It is not clear if TVF&R comments have been addressed in your site plans. Does your parking calculations include on –street parking on the private streets? If so then your parking calculations will need to be updated.

All private streets will have at least 26 feet of access. In some cases, access drives will be 24' in width with mountable curbs and sidewalks built to withstand wheel-loads. Private streets without walkways will have 26' of pavement.

The fire access plan that we submitted shows the wheel pathways for an aerial access emergency vehicle. We should no problem meeting TVFR's requirements.

Aaron, please talk to Kristen directly, her direct line is 503-537-1282.

Keith Leonard, AICP | Associate Planner
City of Newberg
(503) 537-1215
keith.leonard@newbergoregon.gov

P17393-JTS-CRESTVIEW CROSSING\CAD\DD\C210 SITE PLAN.DWG

OVERALL SITE PLAN

CRESTVIEW CROSSING

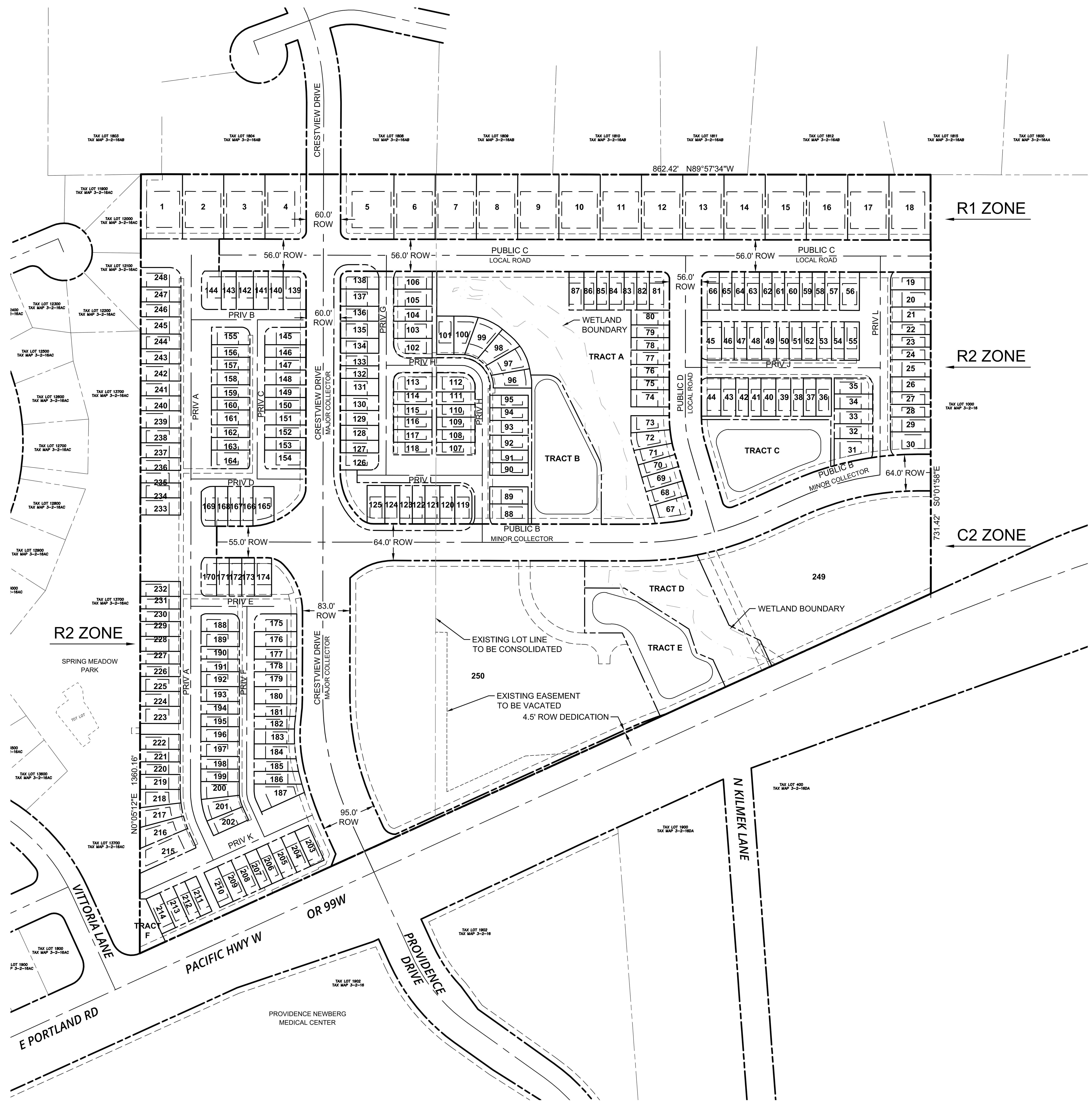
PLANNED UNIT DEVELOPMENT

JT SMITH COMPANIES
NEWBERG, OR

3J CONSULTING
CIVIL ENGINEERING
WATER RESOURCES
LAND USE PLANNING
5075 SW GRIFFITH DRIVE, SUITE 150; BEAVERTON, OR 97005

PUBLISH DATE
06.06.2018
ISSUED FOR
LAND USE DOCUMENTS

SHEET NUMBER
C210



SITE STATISTICS

SITE ADDRESS	4505 E PORTLAND ROAD
TAX LOT / ALT. PARCEL NO.	3216AC 13800 & 1100
JURISDICTION	CITY OF NEWBERG
GROSS SITE AREA	33.13 ACRES
PROPERTY ZONING	R-1, R-2, C-2
FLOOD HAZARD MAP NUMBER	FIRM PANEL NUMBER: 41071C0241D - ZONE X (UN-SHADED) 41071C0235D - ZONE X (UN-SHADED)

SUBDIVISION STATISTICS

ZONING CODE CHAPTER 33.120	ZONE R-1	ZONE R-2	ZONE R-2 PUD* AS PROPOSED	ZONE C-2
ZONE AREA	4.31 ACRES	6.58 ACRES	6.58 ACRES	22.24 ACRES
MAXIMUM DENSITY*	175 DENSITY POINTS/ACRE	310 DENSITY POINTS/ACRE	310 DENSITY POINTS/ACRE	640 DENSITY POINTS/ACRE
MAXIMUM LOT SIZE	10,000 SF	5,000 SF	3,100 SF	N/A
MINIMUM LOT SIZE	5,000 SF	3,000 SF	1,440 SF	5,000 SF
MINIMUM LOT WIDTH	35 FT @ BL	35 FT @ BL	22 FT	N/A
MAXIMUM LOT COVERAGE	30%	50%	60%	N/A
MAXIMUM BUILDING HEIGHT	30 FT	30 FT	30 FT	N/A

SETBACKS

FRONT	15 FT	15 FT	10 FT	10 FT
INTERIOR	5 FT	5 FT	2.5 FT	0 FT/10FT

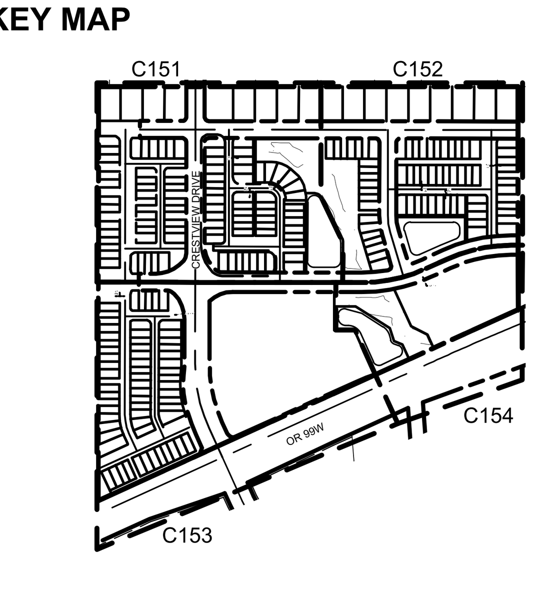
*THIS SUBDIVISION IS A PLANNED UNIT DEVELOPMENT (PUD) THAT PROPOSES REDUCED LOT OR DEVELOPMENT SITE AREA AND INSTEAD USES MAXIMUM DENSITY POINTS PER ACRE.

THIS PLAN HAS BEEN PREPARED FOR PLANNING AND ILLUSTRATIVE PURPOSES ONLY. THIS TENTATIVE PLAT SHOWS PROPOSED LOT CONSOLIDATION AND DIMENSIONS. THIS IS NOT AN OFFICIAL PLAT AND IS NOT TO BE USED FOR SURVEY OR RECORDING PURPOSES.

LEGEND

- PROJECT BOUNDARY
- EXISTING RIGHT-OF-WAY LINE
- EXISTING RIGHT-OF-WAY CENTERLINE
- EXISTING LOT LINE
- EXISTING ADJACENT PROPERTY LINE
- EXISTING EASEMENT
- PROPOSED RIGHT-OF-WAY LINE
- PROPOSED RIGHT-OF-WAY CENTERLINE
- PROPOSED LOT LINE
- PROPOSED SETBACK LINE
- PROPOSED EASEMENT

KEY MAP



Know what's below. Call before you dig.

SCALE: 1" = 100'
0 100' 200'

REGISTERED PROFESSIONAL ENGINEER
OREGON
ASHLEY ROCHELLE SEAL
PRELIMINARY
EXPIRES: 06/30/20

PUBLISH DATE
06.06.2018
ISSUED FOR
LAND USE DOCUMENTS

OVERALL TENTATIVE PLAT
CRESTVIEW CROSSING PLANNED UNIT DEVELOPMENT
JT SMITH COMPANIES
NEWBERG, OR

3J CONSULTING
CIVIL ENGINEERING
WATER RESOURCES
LAND USE PLANNING
5075 SW GRIFFITH DRIVE, SUITE 150; BEAVERTON, OR 97005

PROJECT INFORMATION

3J PROJECT #	17393
TAX LOT(S)	3S2W16 13800, 1100
LAND USE #	N/A
DESIGNED BY	ARS, JEJ, BMO
CHECKED BY	AJM, RGW

SHEET NUMBER
C150

P:\17393-JTS-CRESTVIEW CROSSING\CAD\DD\C150 TENTATIVE PLAT.DWG

SITE STATISTICS

SITE ADDRESS	4505 E PORTLAND ROAD
TAX LOT / ALT. PARCEL NO.	3216AC 13800 & 1100
JURISDICTION	CITY OF NEWBERG
GROSS SITE AREA	33.13 ACRES
PROPERTY ZONING	R-1, R-2, C-2
FLOOD HAZARD MAP NUMBER	FIRM PANEL NUMBER: 41071C0241D - ZONE X (UN-SHADED) 41071C0235D - ZONE X (UN-SHADED)

SUBDIVISION STATISTICS

ZONING CODE CHAPTER 33.120	ZONE R-1	ZONE R-2	ZONE R-2 PUD* AS PROPOSED	ZONE C-2
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INTERIOR	5 FT	5 FT	2.5 FT	0 FT/10FT

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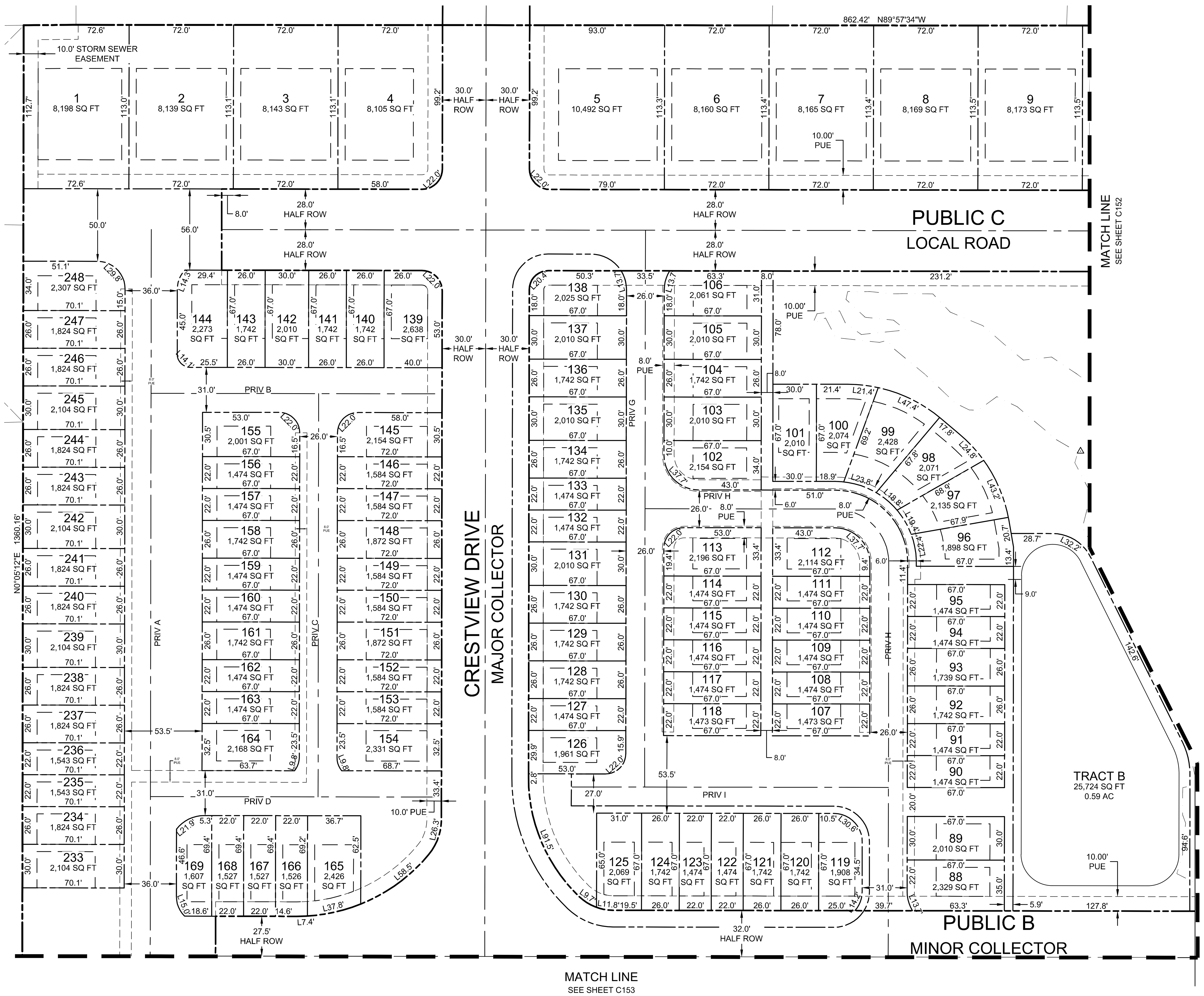

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- EXISTING EASEMENT
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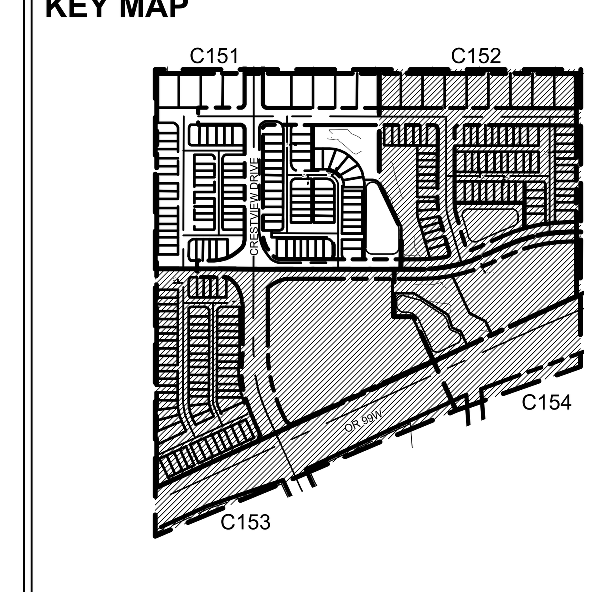
- PROPOSED RIGHT-OF-WAY CENTERLINE
- PROPOSED LOT LINE
- PROPOSED SETBACK LINE
- PROPOSED EASEMENT
- PROPOSED WETLAND BOUNDARY

KEY MAP



811 Know what's below. Call before you dig.

N E S W

SCALE: 1" = 100'
0 100' 200'

REGISTERED PROFESSIONAL ENGINEER 87762PE OREGON ASHLEY ROCHELLE SEAL
PRELIMINARY
EXPIRES: 06/30/20

PUBLISH DATE
06.06.2018
ISSUED FOR
LAND USE DOCUMENTS

TENTATIVE PLAT I
CRESTVIEW CROSSING PLANNED UNIT DEVELOPMENT
JT SMITH COMPANIES
NEWBERG, OR

3J CONSULTING
CIVIL ENGINEERING
WATER RESOURCES
LAND USE PLANNING
5075 SW GRIFFITH DRIVE, SUITE 150; BEAVERTON, OR 97005

PROJECT INFORMATION

3J PROJECT #	17393
TAX LOT(S)	3S2W16 13800, 1100
LAND USE #	N/A
DESIGNED BY	ARS, JEJ, BMO
CHECKED BY	AJM, RGW

SHEET NUMBER
C151

P:\17393-JTS-CRESTVIEW CROSSING\CAD\DD\C150 TENTATIVE PLAT.DWG

SITE STATISTICS

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FLOOD HAZARD MAP NUMBER	FIRM PANEL NUMBER: 41071C0241D - ZONE X (UN-SHADED) 41071C0235D - ZONE X (UN-SHADED)

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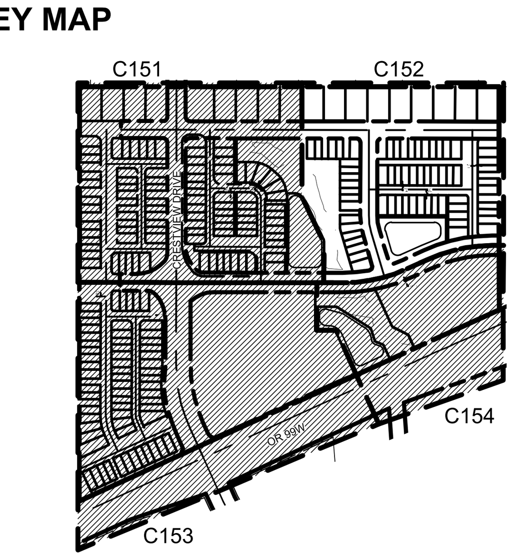
- EXISTING LOT LINE
- EXISTING ADJACENT PROPERTY LINE
- EXISTING EASEMENT
- PROPOSED RIGHT-OF-WAY LINE
- PROPOSED RIGHT-OF-WAY CENTERLINE
- PROPOSED LOT LINE
- PROPOSED SETBACK LINE
- PROPOSED EASEMENT
- PROPOSED WETLAND BOUNDARY

KEY MAP



811 Know what's below. Call before you dig.

N W E S

SCALE: 1" = 100'
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REGISTERED PROFESSIONAL ENGINEER 87762PE OREGON ASHLEY ROCHELLE SEAL PRELIMINARY
EXPIRES: 06/30/20

PUBLISH DATE
06.06.2018
ISSUED FOR
LAND USE DOCUMENTS

TENTATIVE PLAT II
CRESTVIEW CROSSING
PLANNED UNIT DEVELOPMENT
JT SMITH COMPANIES
NEWBERG, OR

3J CONSULTING
CIVIL ENGINEERING
WATER RESOURCES
LAND USE PLANNING
5075 SW GRIFFITH DRIVE, SUITE 150; BEAVERTON, OR 97005

PROJECT INFORMATION

3J PROJECT #	17393
TAX LOT(S)	3S2W16 13800, 1100
LAND USE #	N/A
DESIGNED BY	ARS, JEJ, BMO
CHECKED BY	AJM, RGW

SHEET NUMBER
C152

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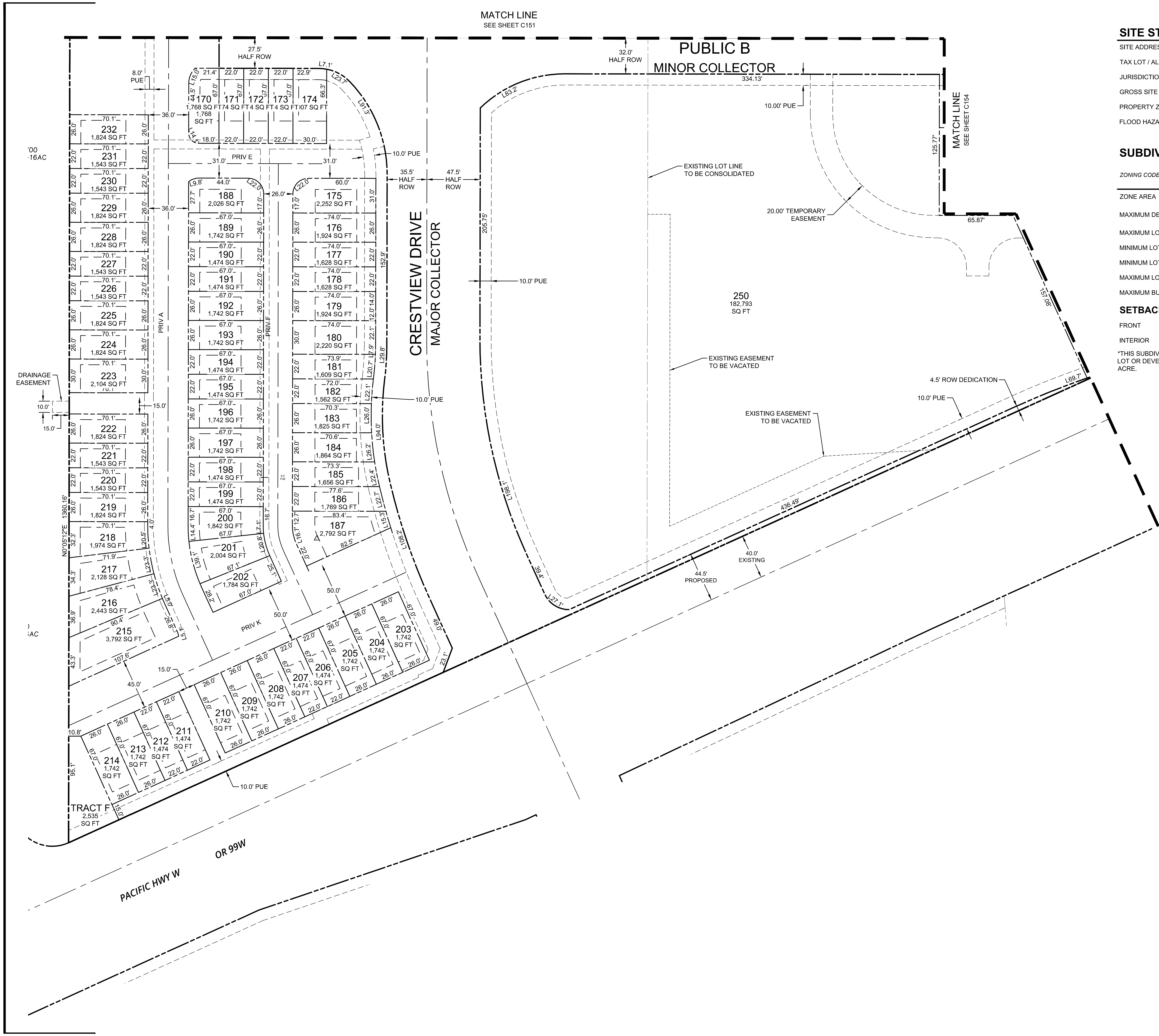


SITE STATISTICS

SITE ADDRESS	4505 E PORTLAND ROAD
TAX LOT / ALT. PARCEL NO.	3216AC 13800 & 1100
JURISDICTION	CITY OF NEWBERG
GROSS SITE AREA	33.13 ACRES
PROPERTY ZONING	R-1, R-2, C-2
FLOOD HAZARD MAP NUMBER	FIRM PANEL NUMBER: 41071C0241D - ZONE X (UN-SHADED) 41071C0235D - ZONE X (UN-SHADED)

SUBDIVISION STATISTICS

ZONING CODE CHAPTER 33.120	ZONE R-1	ZONE R-2	ZONE R-2 PUD* AS PROPOSED	ZONE C-2
ZONE AREA	4.31 ACRES	6.58 ACRES	6.58 ACRES	22.24 ACRES
MAXIMUM DENSITY*	175 DENSITY POINTS/ACRE	310 DENSITY POINTS/ACRE	310 DENSITY POINTS/ACRE	640 DENSITY POINTS/ACRE
MAXIMUM LOT SIZE	10,000 SF	5,000 SF	3,100 SF	N/A
MINIMUM LOT SIZE	5,000 SF	3,000 SF	1,440 SF	5,000 SF
MINIMUM LOT WIDTH	35 FT @ BL	35 FT @ BL	22 FT	N/A
MAXIMUM LOT COVERAGE	30%	50%	60%	N/A
MAXIMUM BUILDING HEIGHT	30 FT	30 FT	30 FT	N/A
SETBACKS				
FRONT	15 FT	15 FT	10 FT	10 FT
INTERIOR	5 FT	5 FT	2.5 FT	0 FT/10FT

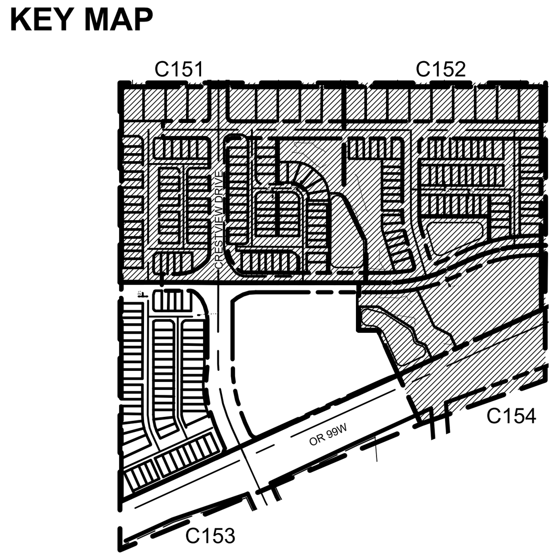
*THIS SUBDIVISION IS A PLANNED UNIT DEVELOPMENT (PUD) THAT PROPOSES REDUCED LOT OR DEVELOPMENT SITE AREA AND INSTEAD USES MAXIMUM DENSITY POINTS PER ACRE.

THIS PLAN HAS BEEN PREPARED FOR PLANNING AND ILLUSTRATIVE PURPOSES ONLY. THIS TENTATIVE PLAT SHOWS PROPOSED LOT CONSOLIDATION AND DIMENSIONS. THIS IS NOT AN OFFICIAL PLAT AND IS NOT TO BE USED FOR SURVEY OR RECORDING PURPOSES.

LEGEND

- PROJECT BOUNDARY
- EXISTING RIGHT-OF-WAY LINE
- EXISTING RIGHT-OF-WAY CENTERLINE
- EXISTING LOT LINE
- EXISTING ADJACENT PROPERTY LINE
- EXISTING EASEMENT
- PROPOSED RIGHT-OF-WAY LINE
- PROPOSED RIGHT-OF-WAY CENTERLINE
- PROPOSED LOT LINE
- PROPOSED SETBACK LINE
- PROPOSED EASEMENT

KEY MAP



Know what's below. Call before you dig.

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SCALE: 1" = 100'
0 100' 200'

PRELIMINARY
REGISTERED PROFESSIONAL ENGINEER
OREGON
ASHLEY ROCHELLE
EXPIRES: 06/30/20

PUBLISH DATE
06.06.2018
ISSUED FOR
LAND USE DOCUMENTS

TENTATIVE PLAT III
CRESTVIEW CROSSING PLANNED UNIT DEVELOPMENT
JT SMITH COMPANIES
NEWBERG, OR

3J CONSULTING
CIVIL ENGINEERING
WATER RESOURCES
LAND USE PLANNING
5075 SW GRIFFITH DRIVE, SUITE 150; BEAVERTON, OR 97005

PROJECT INFORMATION

3J PROJECT #	17393
TAX LOT(S)	3S2W16 13800, 1100
LAND USE #	N/A
DESIGNED BY	ARS, JEJ, BMO
CHECKED BY	AJM, RGW

SHEET NUMBER
C153

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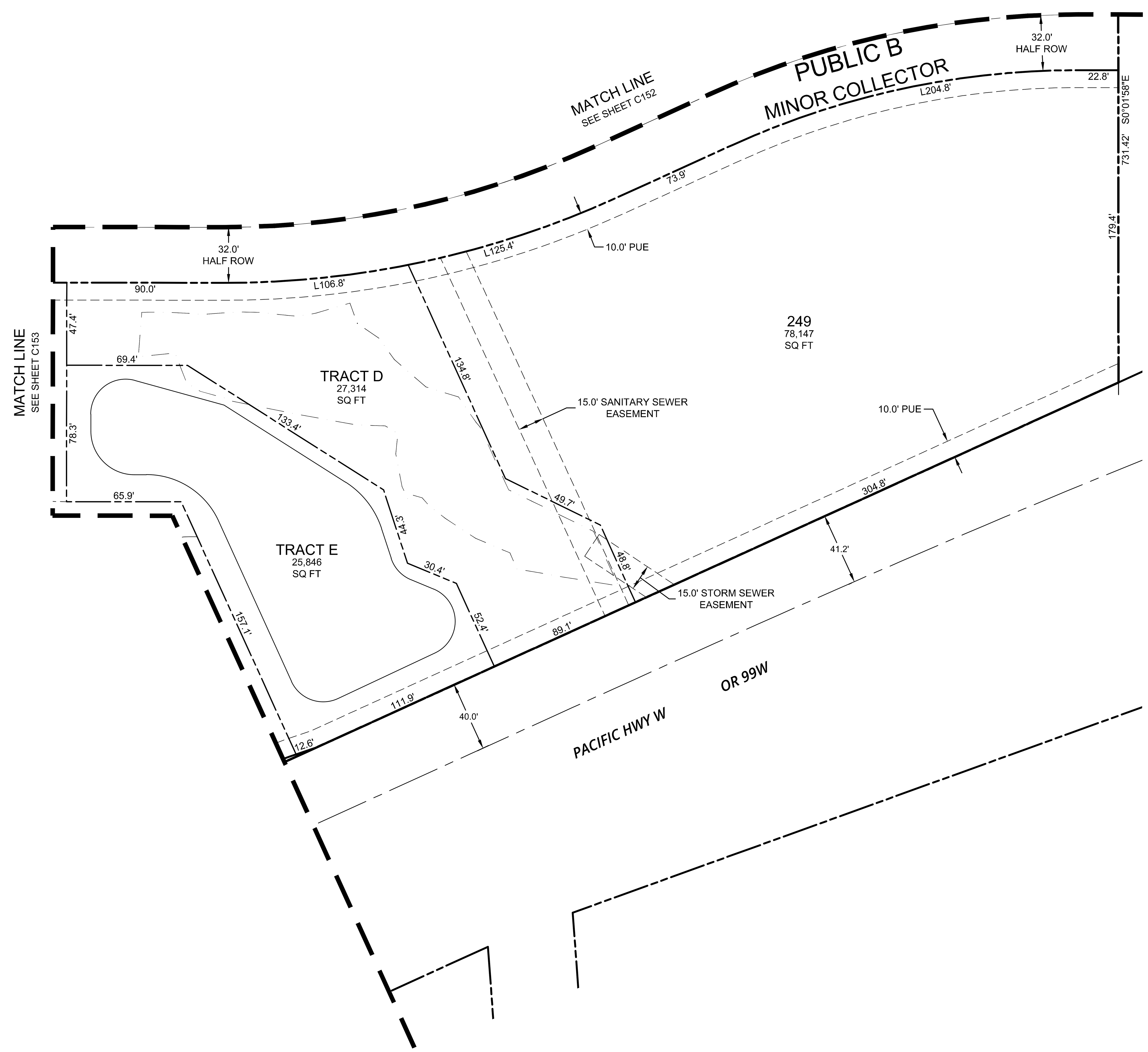

SITE STATISTICS

SITE ADDRESS	4505 E PORTLAND ROAD
TAX LOT / ALT. PARCEL NO.	3216AC 13800 & 1100
JURISDICTION	CITY OF NEWBERG
GROSS SITE AREA	33.13 ACRES
PROPERTY ZONING	R-1, R-2, C-2
FLOOD HAZARD MAP NUMBER	FIRM PANEL NUMBER: 41071C0241D - ZONE X (UN-SHADED) 41071C0235D - ZONE X (UN-SHADED)

SUBDIVISION STATISTICS

ZONING CODE CHAPTER 33.120	ZONE R-1	ZONE R-2	ZONE R-2 PUD* AS PROPOSED	ZONE C-2
ZONE AREA	4.31 ACRES	6.58 ACRES	6.58 ACRES	22.24 ACRES
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- PROJECT BOUNDARY
- EXISTING RIGHT-OF-WAY LINE
- EXISTING RIGHT-OF-WAY CENTERLINE
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- PROPOSED RIGHT-OF-WAY LINE
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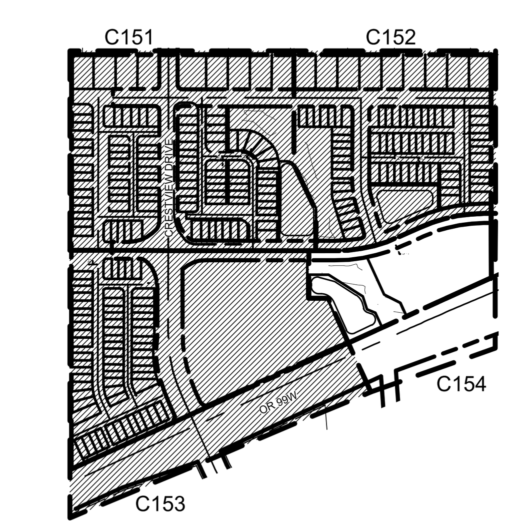
- PROPOSED WETLAND BOUNDARY

KEY MAP



811 Know what's below. Call before you dig.

N W E S

SCALE: 1" = 100'
0 100' 200'

PRELIMINARY

REGISTERED PROFESSIONAL ENGINEER 87762PE OREGON ASHLEY ROCHELLE SEAL EXPIRES: 06/30/20

PUBLISH DATE
06.06.2018
ISSUED FOR
LAND USE DOCUMENTS

TENTATIVE PLAT IV
CRESTVIEW CROSSING PLANNED UNIT DEVELOPMENT
JT SMITH COMPANIES
NEWBERG, OR

3J CONSULTING
CIVIL ENGINEERING
WATER RESOURCES
LAND USE PLANNING
5075 SW GRIFFITH DRIVE, SUITE 150; BEAVERTON, OR 97005

PROJECT INFORMATION

3J PROJECT #	17393
TAX LOT(S)	3S2W16 13800, 1100
LAND USE #	N/A
DESIGNED BY	ARS, JEJ, BMO
CHECKED BY	AJM, RGW

SHEET NUMBER
C154

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3J CONSULTING

5075 SW GRIFFITH DRIVE, SUITE 150
BEAVERTON, OREGON 97005
PH: (503) 946.9365
WWW.3J-CONSULTING.COM

July 24, 2018

Mr. Keith Leonard, AICP
Associate Planner
City of Newberg
414 E. First Street
Newberg, Oregon 97132

Crestview Crossing
#3216AC-13800

Dear Mr. Leonard,

This letter has been prepared on behalf of our client, JT Smith Companies, to introduce new information into the record for the Crestview Crossing Planned Unit Development and Conditional Use Permit (#3216AC-13800).

As you are aware, this is a large and complex project. During the time which has elapsed since the initial submission to the City, our clients have been receiving refined sales and absorption projections and have been updating the plat to accommodate a series of potential changes to the housing mix. Our office has also been working over the past several weeks to develop a project phasing plan for construction and for the platting of lots within the development. Phasing plans are permitted within Planned Unit Developments within section 15.240.020.C of the City's Community Development Code. Because of the size and complexity of this development project, the Applicant has submitted the attached preliminary phasing plan and revised preliminary plat for consideration by the City. The following sections have been provided in order to further explain the intent of the submission of each document:

Project Phasing:
As directed by section 15.240.020.D of the City's general provisions for a Planned Unit Development, the Applicant is entitled to propose a phasing schedule for the completion of final plan phases and may specify a schedule for the completion of phase within a development. This section indicates that if preliminary plans encompassing only a portion of the site are submitted, they must be accompanied by a statement and be sufficiently detailed to prove that the entire area can be developed and used in accordance with city standards, policies, plans, and ordinances. In the original land use application, the applicant acknowledged that a phasing plan could be submitted. This letter has been prepared to transmit a proposed phasing plan. The phasing plan is described as follows:

- Phase 1: This phase will include improvements to the site's frontage along Highway 99 and the installation of underground utility connections necessary to provide service to the site.

- Phase 1a: This phase will include the extension of Crestview Drive through the site and the construction of roadways and lots located east of the Crestview extension to public road D. This phase will also include the stormwater facility located south of public road B.

- Phase 2: This phase will include the installation of the roadways, infrastructure and lots which are to be located west of the Crestview extension.

- Phase 3: This phase will include the lots located east of public road D to the property's eastern property boundary.

- Phases B and C will be constructed after the construction of Phases 1 and 1A and may be constructed independently of the subdivision lots and by other entities or assigns.

Due to the size of the plan and the complexity of the various components within the development, the Applicant would request that the City grant the developer a ten (10) year window for the construction of the infrastructure shown within the plan's phases with opportunities for up to five (5) one (1) year extensions following the approval of the preliminary plat. While the Applicant does not intend to wait for ten (10) years to allow for the construction of the proposed improvements, the flexibility afforded by the ten (10) year schedule with the requested extensions will allow for the project's various components to be sensitive to changing market conditions.

In addition to covering the entitlements afforded to the developer through Section D of the Planned Unit Development's general conditions, this phasing schedule is also intended to supersede the one (1) year limitation imposed upon Conditional Use Permits which is described in section 15.225.100 and the Final Plat criteria described in section 15.235.070. This time limitation can be made to be flexible by section 15.225.080.L of the City's code. Within this section, the City's hearing body provided with the ability to define the time period within which the proposed uses shall be developed.

Revised Preliminary Plat
As mentioned above, the preliminary plat submitted with the application has been recently evaluated by a series of real estate professionals with the intent of providing guidance regarding product selection and absorption. While the guidance provided is helpful to the developer, it should be noted that as the development is constructed and as homes are constructed and sold, the projected data regarding product typologies and market preferences will convert from projection to tangible sales data.

The attached revised preliminary plat has been submitted as a slight alternative to the plat initially submitted. The proposed changes in the alternative plat reflect a desire on the part of the builder to remove the attached product from the plan in favor of all detached homes. This resulted in a slight reconfiguration of several of the lots which had previously been identified as attached units. The reconfiguration resulted in slight adjustments to the proposed lots to accommodate the desired setback configurations for detached products.

The information gathered as sales commence may cause the developer to select slight alterations to the product mixture represented within the attached plat and may result in the need for changes to the widths of lots within the proposed preliminary plat. This request has been expressed in order to allow the developer to make adjustments as required to support homebuyer's preferences and choices. In no event would the developer anticipate the removal of or addition of new lots within the development without first requesting an amendment to the approved planned unit development.

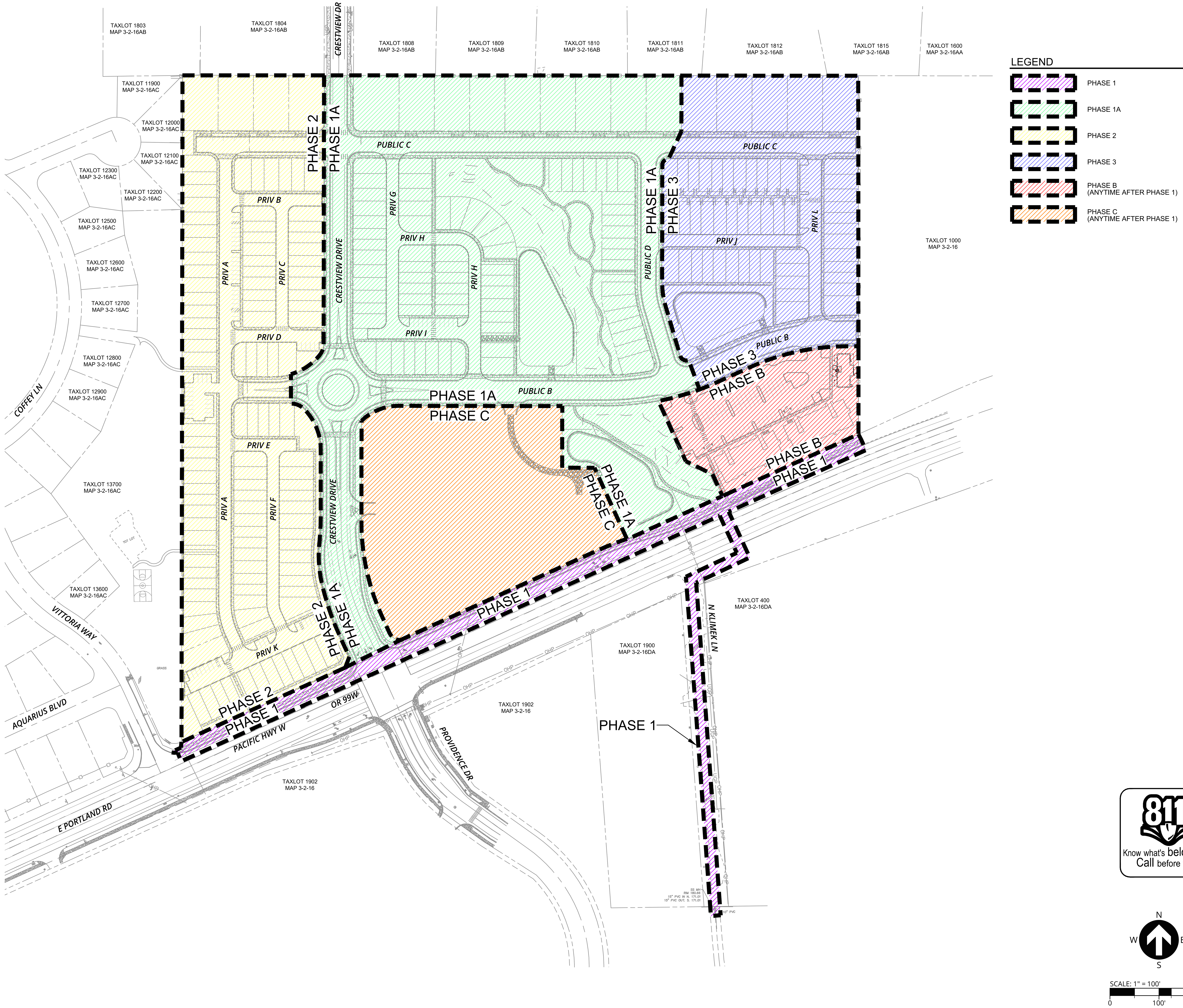
We very much appreciate the City's considerations of the additional materials submitted herein. We would invite you to please feel free to give us a call if you have any questions or need any additional clarification.

Sincerely,

Andrew Tull

Principal Planner
3J Consulting, Inc.

copy: Jesse Nemec, JT Smith Companies
Mike Robinson, Schwabe Williamson and Wyatt
File - 17393



PUBLISH DATE
07.18.2018

ISSUED FOR
LAND USE DOCUMENTS

PHASING PLAN
CRESTVIEW CROSSING
PLANNED UNIT DEVELOPMENT
JT SMITH COMPANIES
NEWBERG, OR

3J CONSULTING
CIVIL ENGINEERING
WATER RESOURCES
LAND USE PLANNING
5075 SW GRIFFITH DRIVE, SUITE 150; BEAVERTON, OR 97005

PROJECT INFORMATION

3J PROJECT #	17393
TAX LOT(S)	3S2W16 13800, 1100
LAND USE #	N/A
DESIGNED BY	ARS, JEJ, BMO
CHECKED BY	AJM, RGW

SHEET NUMBER
EXH

P:\17393-JTS-CRESTVIEW CROSSING\CAD\DD\DDEXHIBITS\2018-07-17 PHASING EXHIBIT\17393-EXH-PHASING PLAN.DWG

Attachment 6: 5 Party Agreement

CITY OF NEWBERG
CITY RECORDER INDEX NO. 2246

City of Newberg	"City"
Yamhill County 535 NE Fifth St. McMinnville, OR 97128	"County"
Oxberg Lake Homeowners Association.	"Association"
Ken Austin Joan Austin	"Austin"
JT Smith Companies (T3S R2W Tax Lot 13800)	"JT Smith"
MeadowWood Development, LLC (T3S R2W Tax Lots 900, 1000 and 1100)	"MeadowWood"

Dated: April 10, 2006

RECITALS

A. City's Transportation System Plan ("TSP") calls for a northerly arterial via Crestview Drive connecting to Hwy. 99W (the "TSP Northern Arterial").

B. Association has expressed its concern about a northerly arterial Crestview Drive terminating at Hwy. 99W.

C. Austin intends to submit for master plan approval for the development of an approximately 400-acre site (the "Austin Master Plan") located in the City. Austin desires a transportation system that will have adequate capacity to serve the development on the Austin Master Plan parcel.

5. Improvements on the proposed Crestview Drive Major Collector will be paid for as a capital improvement subject to City's transportation SDC program.

6. The parties agree to support an amendment to County Board Order 06-070 to delete the condition requiring a study and County approval before the City can construct a roundabout on Springbrook Road.

7. County will expeditiously initiate a process to surrender jurisdiction of that portion of Crestview Drive as originally requested by City.

8. The parties agree with the findings of the initial study that the capacity in the transportation system achieved through the Springbrook Northern Arterial Plan will have virtually no effect on Springbrook Road operations and will maintain the capacity and functionality of the City of Newberg's Transportation System Plan.

9. This agreement has no bearing on the City's consideration to annex or not annex Oxberg Lake Estates.

10. Each party hereto represents to the other parties that the party has all necessary power and authority to perform under and be bound by the terms and conditions of this Agreement.

11. All of the terms and provisions contained herein shall inure to the benefit of and shall be binding upon the parties hereto and their respective heirs, successors, and assigns.

12. Counterparts and facsimile signatures. The parties may execute this agreement in counterparts, each of which shall be deemed to be an original thereof. The parties agree that facsimile signatures shall be accepted as original signatures with respect to this agreement.

CITY OF NEWBERG

By: J M Bennett
Its: CITY MANAGER

YAMHILL COUNTY

By: Leslie M. Lewis
Its: Chair, Yamhill County Commissioners

OXBERG LAKE HOMEOWNERS ASSOCIATION

By: Dick Petersen
Its: President

KEN AUSTIN
JOAN AUSTIN

By: George K. Austin Jr.
Its: Joan D. Austin

JT SMITH COMPANIES

By:
Its: PRESIDENT

MEADOWWOOD DEVELOPMENT LLC

By: Timothy Sheafnsw
Its: MEMBER / MANAGER

Ac... ed by Yamhill Co...
Boa... of Commissioners...
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4/19/2006 02:40PM

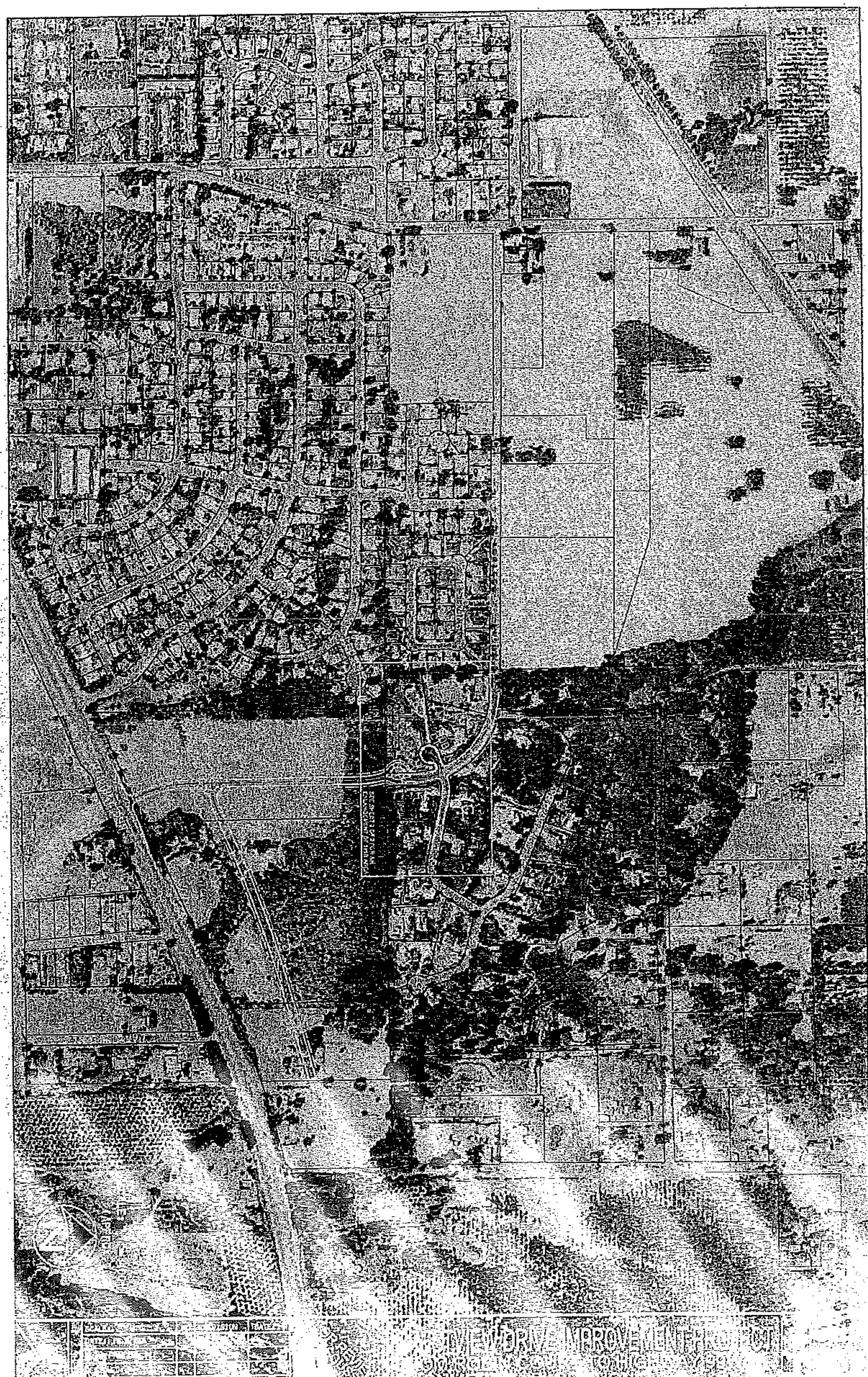
DRIVE IMPROVEMENT

EXHIBIT B

JRH Engineering Study
March 27, 2006

THE EFFECT ON SPRINGBROOK STREET OF CONVERTING THE NEWBERG NORTHERN ARTERIAL (CRESTVIEW DRIVE) TO A MAJOR COLLECTOR

This memo outlines JRH Transportation Engineering's findings relating to the effect on Springbrook Street resulting from changing the Newberg Northern Arterial (Crestview Drive) from an arterial classification to a traffic-calmed major collector.

Briefly stated, the conclusions of the report are:

1) The physical capacity of Crestview Drive will not be materially reduced. Therefore, capacity restrictions will not divert traffic from Crestview Drive to Springbrook Street.

2) A ten mile per hour operating speed reduction on Crestview Drive (as might be expected from the reclassification of the street and the addition of traffic calming measures) would have virtually no effect on Springbrook Street operations.

The following contains the analysis used to develop these conclusions.

BACKGROUND

The City of Newberg Transportation System Plan envisions a northern arterial connecting Mountain View Drive at the north, crossing the railroad tracks and continuing east from Springbrook Street along the alignment of Crestview Drive to the Oxburg neighborhood, and then south to an intersection with ORE 99W. Residents along the proposed arterial are concerned that this facility would have a negative effect on the livability of their neighborhood. They have proposed that this arterial be changed to a major collector with traffic calming to reduce operating speeds to 25 miles per hour to help mitigate traffic impacts.

There is concern by others that this downgrading of classification on Crestview Drive will produce traffic spill over onto Springbrook Street. This, in turn, would require additional transportation mitigation should vacant property be developed. Our challenge is to evaluate the relative traffic demand on Springbrook, resulting from the conversion of Crestview from an arterial to a major collector.

There are two ways that this conversion might impact Springbrook. The first would be the reduction in capacity on Crestview Drive to the extent that traffic would be forced to divert from Crestview to Springbrook. The second question is, would reducing speeds on Crestview Drive make Springbrook become relatively more attractive and, thus, increase traffic volumes? This memo analyzes both effects.

the thru traffic volumes on Springbrook using California Department of Transportation "Freeway Diversion" curves.[1] These calculations determine relative traffic volumes along parallel routes based on differentials in time and distance. We calculated the arterial travel times along Crestview assuming a 35 MPH speed for traffic driven on that route as well as a 35 MPH speed for Springbrook. To these travel times, we placed a delay factor on Springbrook for delay at signalized intersections along OR 99W, between Springbrook and the proposed intersection between Crestview and OR 99W.

Table 1 provides the Year 2025 projected through traffic volumes for Crestview and Springbrook with Crestview as an arterial and as a collector assuming a ten MPH reduction in speed.

A ten mile per hour speed differential was selected using information contained in Appendix A "Traffic Calming, State of the Proactive", by ITE/ FHWA. This is available on the web at http://ite.org/traffic/tcstate.htm#tcsop

A review of the data indicates that a ten MPH speed is a reasonable best case for effective traffic calming measures, and conservative for use in determining the impacts on Springbrook. If the speed reduction is less, then fewer cars will transfer from Crestview to Springbrook and the impacts will be less.

[1] Freeway Diversion curves, more properly, should be called parallel route diversion curves. They are using relative time and distance as variable. Appendix 4 provides the Freeway Diversion Curves.

Merely knowing the difference in numbers is not sufficient to determine the impact on Springbrook. To do this difference, we adjusted 2025 turning movements shown in the Transportation System Plan to reflect the increase in traffic on Springbrook. We then ran these adjusted traffic volumes using the SYNCHRO traffic evaluation model to determine the effect on level of service at both the Crestview intersection with ORE 99W, and the Springbrook intersection with ORE 99W. These volumes were compared with the traffic volumes in a SYNCHRO run using the unadjusted volumes representing the current classification. Both of these runs were for the year 2025. The results of this analysis are shown in Table 2. As can be seen, the traffic volumes change is so small that there is no effect in level of service or volume-to-capacity ratio at Springbrook and Highway 99 West. There is a 0.1 second increase in delay at Crestview and OR 99W due to a diversion of vehicles turning right onto Crestview changing to through traffic on OR 99W. Appendix 2 contains the outputs from the SYNCHRO runs.

TABLE 1: Year 2025 Through Traffic Volumes Crestview/Springbrook Intersection to Crestview/OR 99W Intersection

CRESTVIEW SPEED

	35 MPH		25 MPH	
	Northbound	Southbound	Northbound	Southbound
Crestview Drive	473	317	426	291
Springbrook Street	214	117	261	143

Curve indicates a higher traffic volume estimated to be diverted and, therefore, represents a more conservative analysis.

All of the analysis in this study assumes land development in accordance with the adopted Comprehensive Plan. In discussions with ODOT staff, they indicated that this development includes full development of the Austin Industries property. It should be noted, however, that property may develop with more or less intensity than anticipated in the Plan. This should not impact the conclusions of this study, as this study is focused on the relative impact on Springbrook due to changes in the functional classification of Crestview. It is not focused on the absolute impacts on Springbrook due to any specific land use.