

PLANNING COMMISSION STAFF REPORT
The Haworth Apartments
Conditional Use Permit and Design Review – CUP22-0016 / DR222-0011
Patrick R. and Elaine A. Maveety

FILE NO: CUP22-0016 and DR222-0011

REQUEST: 28-unit multi-family building in a commercial zone

LOCATION: SW corner of the intersection of N Springbrook Rd and E Haworth Ave.

TAX LOT: R3216CB 00800

APPLICANT: Grove Development

OWNER: Patrick R. Maveety and Elaine A. Maveety

ZONE: C-2 (Community Commercial)

PLAN: COM (Commercial)

OVERLAY: Airport Inner Horizontal Surface, Marijuana Exclusion Zone

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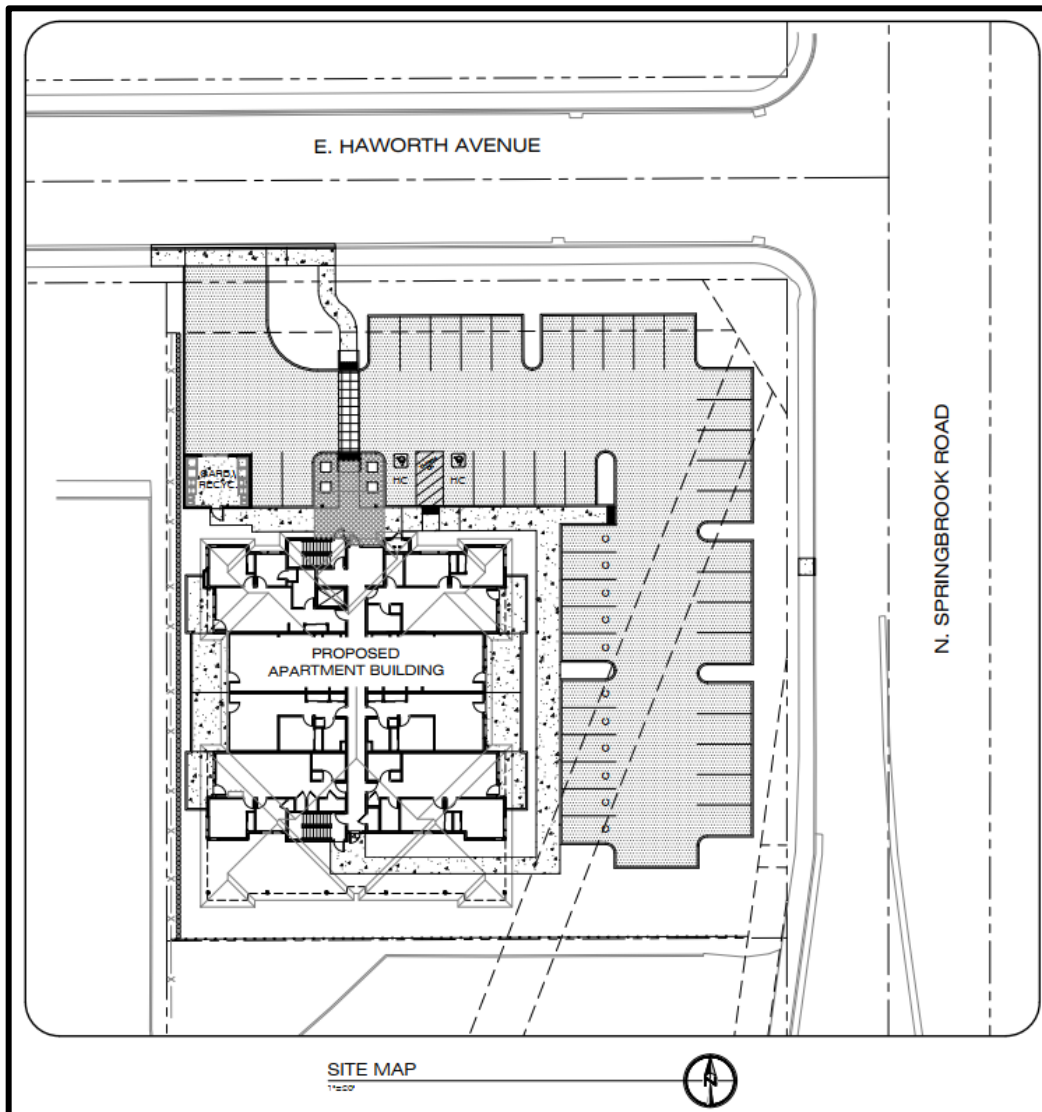
Attachments:

1. Application Material and Supplemental Material
2. Agency Comments

Section I: Application Information

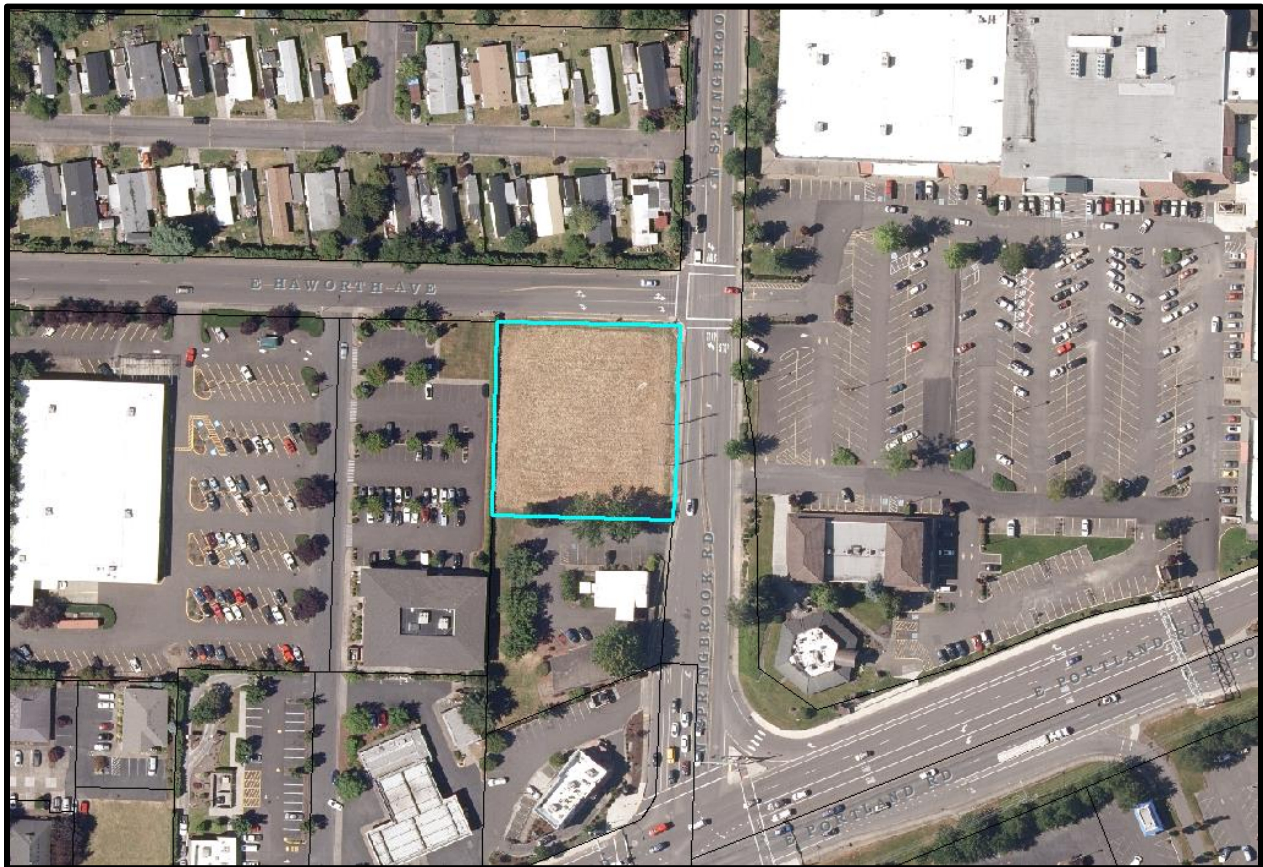
A. DESCRIPTION OF APPLICATION:

This is a proposal for a Type II Design Review to construct a 28-unit multifamily building with supporting site utilities and elements within the C-2 / Community Commercial zone. Due to the commercial zoning, a conditional use permit has also been submitted to request the approval of a residential building in a commercial zone. The 35,836 square foot lot is proposed to contain a three-story multifamily building which will consist of 16 one-bedroom units and 12 two-bedroom units. This site will also support the required parking, landscaping, outdoor common areas, storm water facilities, pedestrian pathways, trash enclosure, and exterior lighting requirements. The application also addresses the specific site and building design elements that are required for a multifamily project. Public improvement requirements have also been reviewed.



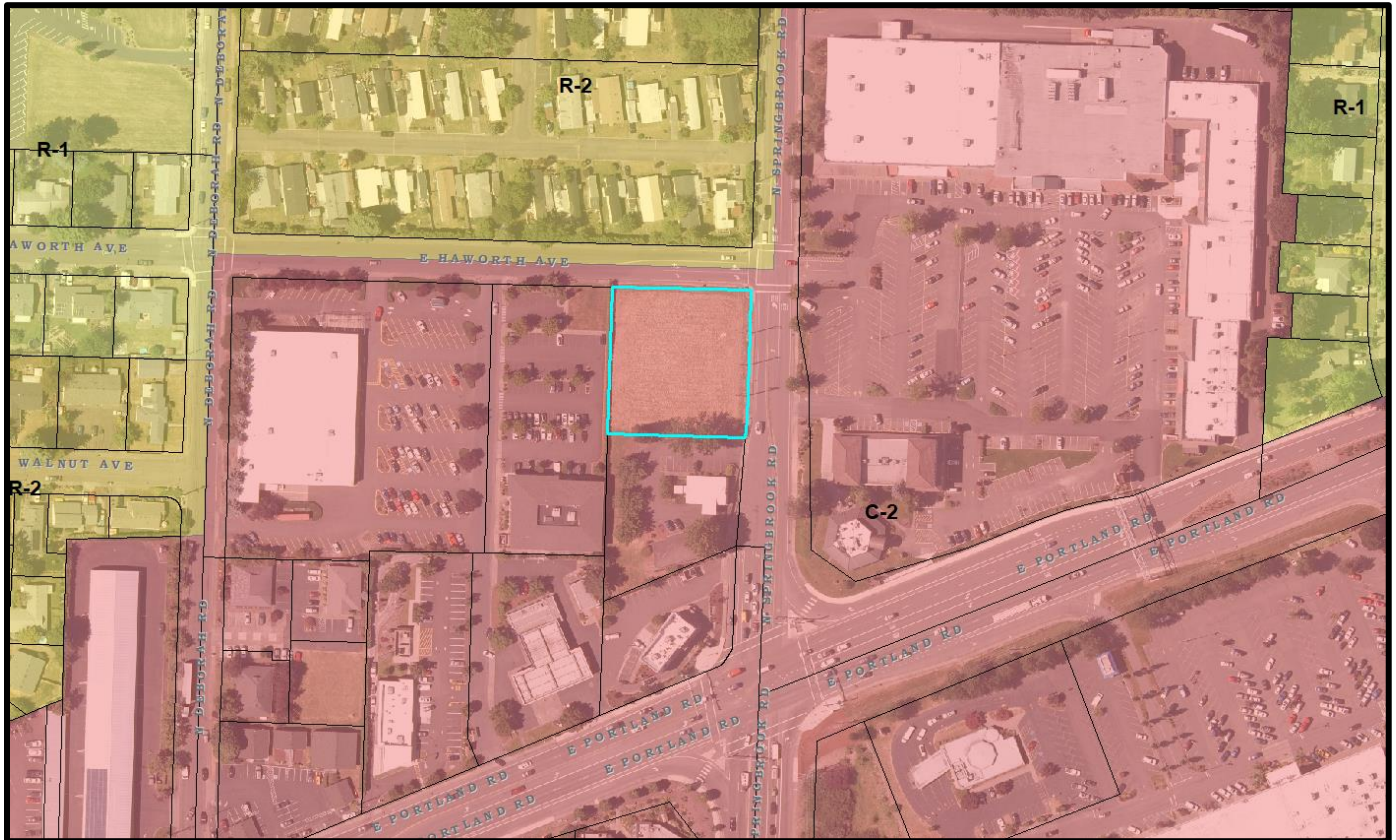
B. SITE INFORMATION:

1. **Location:** The project site, tax lot R3216CB 00800, is a corner lot located at the southwest corner of the intersection of E Haworth Avenue and N Springbrook Road. The site is in the C-2 / Community Commercial zone and is currently a vacant, predominately flat, field. The site has approximately 183 feet of frontage along E Haworth Avenue and approximately 195 feet of frontage along N Springbrook Road.



2. **Size:** 35,836 square foot lot
3. **Current Land Uses:** Vacant
4. **Natural Features:** Grass field, trees along west and south property lines.
5. **Adjacent Land Uses:**
 - a. North: Residential, Mobile Home Park
 - b. South: Commercial, Western Oregon Dispensary

- c. East: Commercial, Springbrook Plaza
 - d. West: Commercial, Newberg Professional Building
6. Zoning: The following zoning districts about the subject property.



- a. North: E Haworth Ave is divided at the center street line as C-2 Commercial Community to the south and R-2 / Medium Density Residential to the north.
 - b. East: C-2 / Commercial Community
 - c. South: C-2 / Commercial Community
 - d. West: C-2 / Commercial Community
7. **Access and Transportation:** Tax lot R3216CB 00800 has frontage on N Springbrook Road and E Haworth Avenue. N Springbrook Road is a Minor Arterial. E Haworth Avenue is a Major Collector. The proposed building will take access off Haworth Avenue because it has a lower functional classification. Additionally, the access must be at the furthest west end of the property to minimize impact to the N Springbrook Road/E Haworth Avenue intersection.

8. **Utilities:**

- a. Water: The City’s online GIS utility map indicates that there is an existing 8-inch water main located in E Haworth Avenue and a 12-inch water main in N Springbrook Road. The applicant will be responsible to confirm adequate flow for the use proposed and for fire protection. The applicant will need to provide fire flow test results with permit applications. The applicant will need to hire a private firm to conduct the fire flow test and coordinate with the Public Works Maintenance Division.
- b. Wastewater: The City’s GIS system shows there is an existing 8-inch wastewater line in E Haworth Avenue and a 15-inch line in N Springbrook Road. The applicant will be responsible for verifying capacity of existing lines. System Development Charges (SDCs) are associated with the number of fixture units proposed per building/tax lot. SDCs are calculated and collected as part of the building permit process.
- c. Stormwater: There is an existing 24-inch public stormwater main running across the northern section of the property adjacent to E Haworth Avenue and an existing approximately 36-inch stormwater main running diagonally across the property in a public easement.
- d. Overhead Lines: Any new connection the property will need to be undergrounded. Existing overhead lines will need to be undergrounded or the applicant will need to pay a fee in lieu for future undergrounding. See NMC 15.430.010(C) for exception provisions.

C. **PROCESS:** This Type II Design Review and Type III Conditional Use Permit application will follow the procedures in Newberg Development Code 15.100.050. The Planning Commission will hold a quasi-judicial public hearing on the applications. The Commission will make a decision on the applications based on the criteria listed in the attached findings. The Planning Commission’s decisions are final unless appealed. Important dates related to this application are as follows:

- 1. 12/15/2022: The Community Development Director deemed the application complete.
- 2. 01/10/2023: The applicant posted notice on the site.
- 3. 01/11/2023: The applicant mailed notice to the property owners within 500 feet of the site.
- 4. 01/25/2023: The *Newberg Graphic* published notice of Planning Commission hearing and notice was posted in four public

places.

5. 02/09/2023: The Planning Commission will hold a quasi-judicial public hearing to consider the applications.

D. AGENCY COMMENTS: The applications were routed to several public agencies for review and comment (Attachment 2). 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 agency comments:

1. Building Official: Reviewed, no conflict.
2. City Manager: Reviewed, no conflict.
3. Community Development Director: Comments:
 - a. Check Street trees to see if on approved list.
 - b. Design of fence at setback.
 - c. Check parking stall dimensions.
 - d. Check photometric for .5-foot candle at property line.
4. Finance Department: Reviewed, no conflict.
5. Police Department: Reviewed, no conflict.
6. Public Works Director: Comment:

“All Public Utility plans, fees, and costs to be approved by Public Works Engineering prior to construction. Note: Private fire hydrants are not permitted in the City of Newberg (preliminary Plans, Sheet P5.0, Water Note 5).”
7. Public Works Maintenance Superintendent: Original comments can be seen in Attachment 2 and are addressed in Section NMC 15.505 Public Improvement Standards’ findings.
 - a. “Move tree back to help pedestrian site lines for intersection.”
 - b. “All on site stormwater will be maintained by owner. Reports will be provided to Public Works Maintenance each year including maintenance records and that designed detention rates are still being maintained.”
 - c. “There should be a study done to see if there should be any alterations to the length of the turn lanes on Haworth to minimize congestion in front of the entrance.”
 - d. “I would like to see them relocate the city storm main out on to Springbrook as it is a major line and having it run under a property like this create a huge liability for the city that could be mitigated by relocation.”
8. Public Works Water Treatment: Reviewed, no conflict.

9. Public Works Water Superintendent: Reviewed, no conflict.

10. Zply Fiber: Reviewed; no conflict.

E. PUBLIC COMMENTS:

No public comments were received on the application.

F. PRELIMINARY STAFF RECOMMENDATION: The preliminary staff recommendation is made in the absence of public hearing testimony and may be modified after the close of the public hearing. At the time this report was drafted, staff recommends the following motion:

Move to adopt Planning Commission Order 2023-04, which approves the requested conditional use permit and design review with the attached conditions of approval in Exhibit C.



PLANNING COMMISSION ORDER 2023-04

**AN ORDER APPROVING CONDITIONAL USE PERMIT CUP22-0016 AND
DESIGN REVIEW DR222-0011 FOR A 28-UNIT MULTIFAMILY BUILDING
WITHIN THE C-2 / COMMUNITY COMMERCIAL ZONE AT YAMHILL
COUNTY TAX LOT R3216CB 00800**

RECITALS

1. Grove Development applied for a conditional use permit with an accompanying design review, for a 28-unit multifamily building within the C-2 / Community Commercial zone, Yamhill County tax lot R3216CB 00800.
2. After proper notice, the Newberg Planning Commission held a public hearing on February 9, 2023, to consider the application. The Commission considered testimony and deliberated.
3. The Newberg Planning Commission finds that the applications, as conditioned in Exhibit “C”, meet the applicable Newberg Municipal Code criteria as shown in the findings in Exhibit “A” and Exhibit “B”.

The Newberg Planning Commission orders as follows:

1. Conditional Use Permit Application CUP22-0016 is hereby approved, subject to the conditions contained in Exhibit “C”. Exhibit “C” is hereby adopted and by this reference incorporated.
2. Design Review Application DR222-0011 is hereby approved, subject to the conditions contained in Exhibit “C”. Exhibit “C” 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. The findings shown in Exhibit “B” are hereby adopted. Exhibit “B” is hereby adopted and is by this reference incorporated.
5. This order shall be effective on February 24, 2023, unless appealed prior to this date.
6. This order shall expire one year after the effective date above if the applicant does not obtain building permits and start construction by that time, unless an extension is granted per Newberg Development Code 15.220.020.
7. The conditional use permit shall expire one year after the effective date above, unless an

extension is granted per Newberg Development Code 15.225.100.

Adopted by the Newberg Planning Commission this 9th day of February 2023.

ATTEST:

Planning Commission Chair

Planning Commission Secretary

List of Exhibits:

- Exhibit "A": Conditional Use Permit Application Findings
- Exhibit "B": Design Review Application Findings
- Exhibit "C": Conditions of Approval

**Section II: Exhibit “A” to Planning Commission Order 2023-04
Conditional Use Permit Findings – File CUP22-0016
The Haworth Apartments – Patrick R. and Elaine A. Maveety**

NMC 15.225.060 General conditional use permit criteria – Type III.

- 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 project site, tax lot R3216CB 00800, is located with the C-2 / Community Commercial zone. Per NMC 15.302.032, which describes the purpose of each zoning district, the C-2 zone should be consistent with the commercial (COM) and mixed use (MIX) designation of the Newberg Comprehensive Plan. The mixed-use zone allows for a variety of uses including high-density residential. The applicant’s narrative has conveyed that thought and consideration have been given to the overall design of this building so that it blends well with the surrounding commercial properties but also identifies itself as a residential development.

This tax lot is located approximately 30 feet south of the zone change to R-2 / Medium Density residential, and less than 600 feet south of properties zoned R-3 / High Density residential. Recently, 400 feet to the north along N Springbrook Road, a large multifamily development project has been completed. While that project was located in the R-2 zone, there are no substantial land use transitions that occur between these two developments, and therefore staff find this shows this development will be reasonably compatible with the surrounding neighborhood.

The size of the structure, as stated in the applicant’s narrative is proposed to be on average 35 feet high, with an overall square footage of 24,422, has been designed to match the size of commercial buildings located to east, south, and west, of the site. The site will also meet or surpass standard lot coverage, landscaping, and parking requirements for commercial and multifamily developments. Therefore, the size of the building, combined with appropriate required supporting site features, show the design will be harmonious to the neighborhood.

Lastly, the site location does provide appropriate access to public facilities and utilities, as addressed in Section III. As well, it’s direct and adjacent access to collector and arterial streets will be able to accommodate the influx in vehicle traffic from the increase in area residents.

This criterion is met.

- 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: This site is located in the C-2/Community Commercial zone which has a variety of shopping, retail, and restaurant locations within close proximity to this development. E Portland Road (Hwy 99 W) is located roughly 300 feet to the south of the site, which provides convenient access to infrastructure that supports working opportunities.

The proposed design of the building and site layout will provide on-site parking, outdoor common areas, raised garden beds, bocce ball (an accessible onsite recreational activity), ground level unit patios, and in unit storage facilities, all contributing to functional living.

The project has shown to meet the minimum required site design and building elements required for multifamily units. Including thoughtful landscaping, variation in building color and building elevations, as well as porch style entry ways and the preferred hip-roof style. Staff find that this meets the intent to create a development that is attractive as the nature of the use and its location warrant.

This criterion is met.

- C. The proposed development will be consistent with this code.***

Finding: The findings outlined in Section III, show how the proposed development will meet the Type II Design Review requirements set forth in the Newberg Development Code.

CONCLUSION:

Based on the above findings, the project meets the criteria required within the Newberg Development Code, subject to completion of the attached conditions.

**Section III: Exhibit “B” to Planning Commission Order 2023-04
Design Review Application Findings – File DR222-0011
The Haworth Apartments – Patrick R. and Elaine A. Maveety**

Chapter 12.05 Street and Sidewalks

12.05.090 Permits and certificates.

A. Concurrent with the issuance of a building permit for the construction of a building for residential use or business structures or an addition to a dwelling or business structure, the value of which is \$30,000 or more except as the city engineer may require on building permits of lesser value in accordance with NMC 12.05.040, the owner, builder or contractor to whom the building permit is issued shall meet the following requirements:

1. Construct a sidewalk within the dedicated right-of-way for the full frontage in which a sidewalk in good repair does not exist. The sidewalk construction shall be completed within the building construction period or prior to issuance of an occupancy permit, whichever is the lesser.

Finding: The submitted materials show existing Type B curb tight sidewalks along the project site’s N Springbrook Road and E Haworth Avenue frontages. Because the condition of the existing sidewalks is uncertain, the applicant will be responsible for replacement of any sidewalk panels along the project site’s frontages that are not in good condition or do not meet current ADA standards along the project frontages. Determination of the limits of any sidewalk replacements will be part of the permit plan review process.

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

2. Dedicate right-of-way in accordance with the city transportation plan.

Finding: N Springbrook Road and E Haworth Avenue are improved adjacent to the project site. The existing rights-of-way widths for N Springbrook Road and E Haworth Avenue are consistent with the city transportation plan along the project site’s frontages.

This criterion is not applicable.

12.05.250 Required maintenance of planter strips.

A. “Planter strip” is defined as the area between the curb and sidewalk, between the sidewalk and property line, or between the edge of the street and property line that contains or is designed to contain landscaping or plant materials. Roadside ditches are generally not considered planter strips.

B. It shall be the duty of the owners of land adjoining any street or highway within the city to maintain planter strips adjoining their properties. Maintenance shall include, but not be limited to, removing or cutting weeds so the area is not overgrown, mowing grasses (except ornamental grasses) to a height of no more

than nine inches, irrigating as necessary to establish new plantings, removing dead plants, pruning trees and shrubs to keep them healthy and to keep sidewalks and streets clear from obstruction, and removing litter.

C. If the owner of such land adjoining any street or highway in the city shall fail to adequately maintain the planter strip, a designated city employee shall notify the adjoining property owner of the need to maintain the area. Notice may be mailed or personally delivered and shall describe the required time frame to complete the maintenance. If the owner fails to maintain the area within the time frame noted, the city may perform the required maintenance, bill the owner for the maintenance costs and assess a lien on the property for any unpaid maintenance costs.

D. No signs shall be placed within the planter strip, except as allowed under NMC 15.435.110.2632, 1-3-06. Code 2001 § 96.60.]

Findings: Please see findings addressed under NMC 15.420.020 (B).

Chapter 15.220 Site Design Review

15.220.020 Site design review applicability.

A. Applicability of Requirements. Site design review shall be required prior to issuance of building permits or commencement of work for all improvements noted below. Site design review permits shall be processed as either Type I or Type II, as noted below.

1. Type I.

- a. Single-family dwellings;*
- b. Duplex dwellings;*
- c. Triplex dwellings;*
- d. Quadplex dwellings;*
- e. Townhouse dwellings;*
- f. Cottage cluster projects;*
- g. Institutional, commercial or industrial additions which do not exceed 1,000 square feet in gross floor area;*
- h. Multifamily additions which do not exceed 1,000 square feet in gross floor area and do not add any new units, or new construction incidental to the main use on an existing developed site which does not exceed 1,000 square feet in gross floor area and does not add any new units;*
- i. Institutional, commercial or industrial interior remodels which do not exceed 25 percent of the assessed valuation of the existing structure;*
- j. Multifamily remodels which do not exceed 25 percent of the assessed valuation of the existing structure and do not add any new units;*
- k. Signs which are not installed in conjunction with a new development or remodel;*
- l. Modifications, paving, landscaping, restriping, or regrading of an existing multifamily, institutional, commercial or industrial parking lot;*
- m. Fences and trash enclosures;*

n. Accessory dwelling units.

2. Type II.

a. Any new development or remodel which is not specifically identified within subsection (A)(1) of this section.

b. Telecommunications facilities.

Finding: This application is for a new 28 unit-multifamily development, therefore is reviewed according to the Type II Design Review standards. The applicant has submitted narrative and plans accordingly.

This criterion is met.

15.220.050 Criteria for design review (Type II process).

B. Type II. The following criteria are required to be met in order to approve a Type II design review request:

1. Design compatibility. The proposed design review request incorporates an architectural design which is compatible with and/or superior to existing or proposed uses and structures in the surrounding area. This shall include, but not be limited to, building architecture, materials, colors, roof design, landscape design, and signage.

Finding: The proposed project is a multi-family residential building within the C-2 Community Commercial zone. The current lot is a vacant grass field. The surrounding uses to the east, south, and west are of commercial use and the surrounding buildings are scaled as expected for commercial sites. The applicant's narrative states that the proposed multi-family building has been designed to match the massing and height of the surrounding commercial buildings.

In regard to materials, colors, and landscape design the applicant's narrative and design drawings show that this building will incorporate residential details to meet the requirements of NMC 15.220.060. Some of those elements include a hip roof with eaves, lap siding, changes in color to create variation, porch style entry, asphalt shingle roof, and substantial landscaping to screen the lot from the street.

This criterion is met.

2. Parking and On-Site Circulation. Parking areas shall meet the requirements of NMC 15.440.010. Parking studies may be required to determine if adequate parking and circulation are provided for uses not specifically identified in NMC 15.440.010. Provisions shall be made to provide efficient and adequate on-site circulation without using the public streets as part of the parking lot circulation pattern. Parking areas shall be designed so that vehicles can efficiently enter and exit the public streets with a minimum impact on the functioning of the public street.

15.440.010 Required off-street parking

A. Off-street parking shall be provided on the lot or 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 lot or development site or within 400 feet of the lot or development site which the parking is required to serve. All required parking must be under the same ownership as the lot or development site served except through special covenant agreements as approved by the city attorney, which bind the parking to the lot or development site.

Finding: This project is located in the C-2 zone and parking is proposed on the development site. This criterion is met.

B. Off-street parking is required pursuant to NMC 15.440.030 in the C-2 district.

Finding: Per NMC 15.440.030 the following parking spaces must be provided for a multi-family dwelling:

1 bedroom	1 per dwelling unit	16 units x 1 =	16 parking spaces
2 bedrooms	1.5 per dwelling unit	12 units x 1.5 =	18 parking spaces
		Total of 28 dwelling units	Total 34 required spaces for dwelling units
Over 10 parking spaces required	15% must be created and labeled as unassigned	.15 x 34 required spaces =	5 unassigned spaces required
Over 10 parking spaces required	.2 visitor spaces per dwelling unit	.2 x 28 total dwelling units =	6 visitor spaces required
34 required spaces	+ 5 unassigned spaces	+ 6 visitor spaces	= Total of 45 parking spaces required for development

The applicant’s narrative states that 43 parking spaces will be provided. In the calculations provided by the applicant, the calculation for unassigned spaces was not included. Per staff calculations outlined above, 45 parking spaces will be required for the development. A revised site plan providing 45 parking spaces reviewed during the building permit application or a Type I Code Adjustment requesting a 25% reduction in parking spaces per NMC Chapter 15.210 to be approved prior to the building permit application shall be submitted.

If the aforementioned condition is adhered to, this criterion will be 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.

Finding: NMC 15.440.070 directs the design of parking areas and services drives. The submitted site plan shows a two-way travel aisle with a 24-foot-wide service drive with 90-degree parking spaces. This design requires stall widths to be 9 feet wide and 18 feet long. Compact spaces may be 8 feet wide and 16 feet long. The proposed site plan shows all parking spaces, regular and compact, with a 16-foot length. The applicant's narrative states that the remaining two feet for the standard spaces would be acquired past the curb either in the landscaping area or pedestrian path. Per Diagram 2 in NMC 15.440.070 the measurement is taken from the wall, property line, or obstruction. Both the landscaping area and pedestrian path could create obstructions that would not allow a vehicle to pull the required additional two feet. Furthermore, per NMC 15.410.020(B)(2) describing front yard setback standards in the C-2 zone, no parking may occur in the front yard. NMC 15.410.070(E)(3) only allows parking to occur in the side yards. The proposed parking spaces along the east side of the property, would encroach into the front yard by two feet. Therefore, all regular parking spaces are not in accordance with the minimum standards as set for in NMC 15.440.070. A revised site plan showing all parking spaces meeting the requirements of NMC 15.440.070 is required with the building permit plans.

If the aforementioned condition is adhered to this criterion will be met.

Staff would like to state that one solution may be to adjust the building footprint to the southwest. No interior yard setback is required along the west property line, and the proposed site design is surpassing the landscaping requirement and the outdoor space requirement. An adjustment of the building footprint in this direction may allow the additional two feet to be gained from the 10-foot front yard setbacks along E Haworth Avenue and N Springbrook Road to create the required 18-foot-long parking spaces while maintaining the 24-foot-wide two-way drive aisle. This also may allow for the proposed street trees to be placed outside the required public utility easement per NMC 15.505.040(F).

B. Groups of three or more parking spaces, except those in conjunction with a single-family detached dwelling, duplex dwelling, triplex dwelling, quadplex dwelling, townhouse dwelling or cottage cluster project 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.

Finding: According to the submitted parking lot plan no parking spaces will require a backward movement or other maneuvering of a vehicle within a street. The proposed service drive is a two-way service drive with a 24-foot width, which complies with the requirement when 90 degrees, 9-foot-wide parking spaces are utilized.

Please see the findings for NMC 15.440.060 for further information on service drive improvements.

This criterion is met.

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.

Finding: A private drive or private street are not proposed within this project. This criterion is not applicable.

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:

Finding: This project is located in the C-2 / Community Commercial zone, not within the AI airport industrial district or AR airport residential district. Therefore, this criterion is not applicable.

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	1 per dwelling unit
Two-bedroom unit	1.5 per dwelling unit
Three- and four-bedroom unit	2 per dwelling unit
Five- or more bedroom unit	0.75 spaces per bedroom
<ul style="list-style-type: none"> • 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.
<ul style="list-style-type: none"> • 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.

Finding: Please see previous findings listed under NMC15.440.010 (B) Off-street parking is required pursuant to NMC 15.440.030 in the C-2 district.

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.

Finding: The applicant's narrative and preliminary plan sheet P4.0 state that the parking will be surfaced standard duty AC pavement. Stormwater is shown to be drained to an underground detention chamber per sheet P5.0 and not over public sidewalks or adjacent private property.

This criterion is met.

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.

Finding: The proposed parking layout does not locate any parking places so that a vehicle would encroach on public streets, alleys, or rights-of-way. The proposed site plan on sheet P4.0 shows all parking will be on site and have a 10-foot landscape buffer between the parking space and the sidewalk at the property line. No parking is proposed to take place within the right-of-way, between a curb and sidewalk, or outside of the site's property line.

This criterion is met.

C. All parking areas, except those required in conjunction with a single-family detached, duplex, triplex, quadplex or townhouse dwelling, or cottage cluster project, shall provide a substantial bumper which will prevent cars from encroachment on abutting private and public property.

Finding: No parking will be located that would allow a vehicle to encroach on abutting private or public properties. Therefore, no bumpers will be required. Sheet P4.0 does show that a standard vertical concrete curb will outline the propose parking stall areas. Furthermore, the site plan shows parking stalls that face a property line will be screened by a 10-foot landscape buffer.

This criterion is met.

D. All parking areas, including service drives, except those required in conjunction with single-family detached, duplex, triplex, quadplex or townhouse dwellings or cottage cluster projects, shall be screened in accordance with NMC 15.420.010(B).

Finding: Please see NMC 15.420.010(B) for specific findings.

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.

Finding: Please see findings for NMC 15.425.020.

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

Finding: The proposed plans show 11 compact parking spaces indicated with a letter “C”. The compact parking spaces show the appropriate dimensions of 8 feet by 16 feet. The regular parking places also show a 16-foot length, however per NMC 15.440.070 are required to be 18 feet long. A revised site plan showing all parking spaces meeting the requirements of NMC 15.440.070 is required with the building permit plans.

If the aforementioned condition is adhered to, this criterion will be met.

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

1. Single-family detached, duplex, triplex, quadplex, and townhouse dwellings: parking is authorized in a front yard on a service drive which provides access to an improved parking area outside the front yard.

Finding: This project is not associated with a residential use stated in the section. Therefore, this criterion is not applicable.

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.

Finding: The development is required to have 45 parking places and proposed plans currently show 43. The current proposal shows 11 compact parking spaces which is 26% of 43 and under

the maximum 30 percent. With a reconfiguration to create 45 parking places, they would be allowed a maximum of 13 compact spaces. A revised site plan showing all parking spaces meeting the requirements of NMC 15.440.070 is required with the building permit plans.

If the aforementioned condition is adhered to, this criterion will be met.

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

Finding: This project is not an affordable housing project, nor is it proposing tandem parking. This criterion is not applicable.

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. 2889 § 2 (Exh. B §§ 38 – 40), 12-6-21; Ord. 2880 § 2 (Exh. B §§ 46 – 48), 6-7-21; 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.]

Finding: Transit related facilities are not proposed in this project. This criterion is not applicable.

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.

Finding: This is a multi-family building; materials and merchandise will not be received and distributed from this site. Therefore, this criterion is not applicable.

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

Finding: The 28-unit multi-family development would be required to have one bicycle space for every four units, for a total of seven bicycle parking spaces. Per the applicant's narrative and floor plans, each of the proposed units will include a storage area or patio that would meet the requirements for bicycle storage. This was discussed during the pre-application meeting and agreed upon at that time by the Community Development Director.

This criterion 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.

Finding: The applicant's narrative states that the site has been designed to comply with the Americans with Disabilities Act requirements. During the building permit review stage these designs standards will be confirmed.

B. Required private walkways shall be a minimum of four feet wide.

Finding: All proposed pedestrian pathways are shown to be a minimum of 5 feet wide.

This criterion is met.

C. Required private walkways shall be constructed of portland cement concrete or brick.

Finding: Per sheet P4.0 and the provided narrative, all private walkways will be made of concrete pavement.

This criterion is met.

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.

Finding: The proposed development does show one crosswalk crossing a service drive from the main entrance of the building north to E Haworth Avenue. The narrative states this will be a six-foot-wide path made from a mix of colored Portland concrete cement or pavers which will provide a visual contrast between the service drives AC pavement.

This criterion is met.

E. At a minimum, required private walkways shall connect each main pedestrian building entrance to each abutting public street and to each other.

Finding: The site plan shows a six-foot-wide path leading from the public sidewalk on E Haworth Avenue to the main building entrance.

This criterion is met.

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.]

3. Setbacks and General Requirements. The proposal shall comply with NMC 15.415.010 through 15.415.060 dealing with height restrictions and public access; and NMC 15.405.010 through 15.405.040 and NMC 15.410.010 through 15.410.070 dealing with setbacks, coverage, vision clearance, and yard requirements.

Finding: This criterion is addressed in the following findings.

15.415.020 Building height limitation.

B. Commercial, Industrial and Mixed Employment.

2. In the AI, C-2, C-3, M-E, 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.

Finding: The site is located within the C-2 zone. The average height of the building will be 36.65 feet. In the C-2 zone there are no height restrictions unless the property abuts a residential zone. To the north, across E Haworth Ave, is R-2 / Medium Density Residential. The project site does not directly abut the residential zone to the north as the zone change occurs at the center street line of E Haworth Ave. However, the submitted site plan shows the building will be located outside the 50-foot height restriction distance and therefore would meet this criterion if the residential zone abutted the property line.

This criterion is met.

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

Finding: A multi-family building in a commercial zone is a conditionally permitted use requiring the maximum height of the building to be stated in the conditional use permit. The applicant's narrative describes that the average height of the building will be 36.65 feet, with a maximum ridge height of 43.4 feet. The applicant is requesting a maximum allowed height of 45 feet to allow flexibility in construction. Since, the base zone does not have a maximum height limitation and the site placement of the building will not abut nor be within 50 feet of a residential district, staff find that placing a maximum height of 45 feet on the structure meets the base zone standards and is appropriate for the proposed use as multi-family building.

This criterion 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.

Finding: The development site is located at the southwest corner of the intersection E Haworth Avenue and N Springbrook Road. The site has approximately 183 feet of frontage along E Haworth Avenue and 195 feet of frontage along N Springbrook Road. No private streets are proposed.

This criterion is met.

15.405.010 Minimum and maximum lot area.

2. In the AI, 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.

Finding: Tax lot R3216CB 00800, the development site, is an existing lot of record located in the C-2 zone. The lot size is 35,836 square feet, meeting the minimum area of 5,000 square feet. No changes to the lot area are proposed.

This criterion is met.

15.405.030 Lot dimensions and frontage.

Finding: Tax lot R3216CB 00800, the development site, is an existing lot of record. No changes are proposed to lot dimensions or frontage. This criterion is not applicable.

15.405.040 Lot coverage and parking coverage requirements

B. Residential uses in residential zones shall meet the following maximum lot coverage and parking coverage standards; however, cottage cluster projects shall be exempt from the standards. See the definitions in NMC 15.05.030 and Appendix A, Figure 4.

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.

Finding: The subject property is located in the C-2 / Community Commercial zone which is not listed in subsection B. Therefore, per subsection C, lot coverage and parking coverage requirements are not applicable to this project.

15.410.020 Front yard setback.

B. Commercial.

2. All lots or development sites in the C-2 district shall have a front yard of not less than 10 feet. There shall be no minimum front yard setback for C-2 zoned property that has frontage on E. Portland Road or Highway 99 W. The maximum front yard setback for C-2 zoned property that has frontage on E. Portland Road or Highway 99 W. shall be no greater than 10 feet. A greater front yard setback is allowed for C-2 zoned property having frontage on E. Portland Road or Highway 99 W. when a plaza or other pedestrian amenity is provided; however, said front yard setback should be the minimum setback needed to accommodate a pedestrian amenity. No parking shall be allowed in said yard. Said yard shall be landscaped and maintained.

Finding: The project site is a corner lot with frontage along E Haworth Avenue and N Springbrook Road. A front yard is a yard extending between lot lines which intersect a street line. Therefore, front yard setbacks are required along both street frontages. Per the submitted preliminary plan set, sheet P4.0 site plan, a 10-foot setback is being met along all of the frontage of E Haworth Avenue and N Springbrook Road. No parking is allowed in said yard, please refer to findings in previous section NMC15.440.020(A) regarding parking space standards not being met. This section also states the yard shall be landscaped and maintained, please refer to findings in Chapter 15.420 Landscaping and Outdoor Areas.

This criterion is met.

15.410.030 Interior yard setback.

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.

Finding: Tax lot R3216CB 00800, the development site, is located in the C-2 zone with interior yards along the west and south property lines. Those property lines about C-2 zoned property; therefore, no interior yard distances are required to be maintained.

This criterion 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.

Finding: The site is located at the intersection of two streets, E Haworth Avenue and N Springbrook Road. A 50-foot vision clearance triangle is notated on sheet L1.0, Street Tree and Opens Space Planting plan, showing a proposed street tree located within the triangle. The street tree proposed within the 50-foot vision clearance triangle at the intersection of E Haworth Avenue and N Springbrook Road, shall be removed from final site plans submitted with public improvement permits and building permits. The sites access will be from E Haworth Avenue. Per the submitted preliminary site plan, sheet P4.0, a 25-foot vision clearance triangle is provided on either side of the service drive access. The site plan shows that no visual obstructions will be placed within the triangles. If the aforementioned condition is adhered to this criterion will be 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).*

Finding: The proposed plans do not show any depressed areas, new accessory buildings or projecting building features within the required yard setbacks. Therefore, no exceptions or permitted intrusions are proposed and the criteria of this section are not applicable.

D. Fences and Walls.

2. In any commercial, industrial, or mixed employment 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.*

Finding: Sheet L1.0, the Street Tree and Open Space Planting Plan, shows that a four-foot vinyl fence will be located on the north and east property lines. The fence will begin along the north property line, just outside of the required 25-foot vision clearance triangle on the eastside of the service drive entrance on E Haworth Avenue. Continuing along the north property line, the plan shows the four-foot fence will follow the perimeter of the 50-foot vision clearance triangle to the east property line along N Springbrook Road and will not encroach into the vision clearance

triangle. A new six-foot cedar fence will be installed along the south property line which is an interior property line with no required yard setback. An existing hedge and fence on the abutting property to the west will remain. This development is not proposing any fencing along the west property line.

These criteria are met.

3. If chain link (wire-woven) fences are used, they are manufactured of corrosion-proof materials of at least 11-1/2 gauge.

Finding: The development is not proposing the use of a chain-link fence. This criterion is not applicable.

4. The requirements of vision clearance shall apply to the placement of fences.

Finding: Please see findings of subsection 2 of this section. This criterion 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.

Finding: See response to NMC 15.440.020.

3. In any commercial or industrial district, except C-1, C-4, M-1, and M-E, 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 and the M-E district within the riverfront overlay subdistrict are described in NMC 15.352.040(H).

Finding: The proposed development, located within the C-2 / Community Commercial zone. This code section references NMC 15.410.030 which addresses interior yards. An interior yard would be required if this site bordered a residential zone, and this provision would have allowed parking in that area. This development is not located next to a residential zone and is not proposing parking within what would be an interior yard. Therefore, this section is not applicable.

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.

Finding: This criterion is not applicable because the applicant is not proposing any public telephone booths or public transit shelters. The standard is not applicable.

4. Landscaping Requirements. The proposal shall comply with NMC 15.420.010 dealing with landscape requirements and landscape screening.

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.

Finding: The submitted floor plans, Sheet 2, the first-floor plans show the outdoor areas ranging in size from 136 square feet to 170 square feet, surpassing the 48 square feet. The plans do not show how the areas will be screened. Elevation plans submitted for review during the building permit stage shall show how the ground-level units' outdoor private spaces will provide privacy according to NMC 15.420.010(A)(1). If the aforementioned condition is adhered to this criterion will be met.

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 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.***

Finding: The proposed multi-family development is a 28-unit building comprised of one- or two-bedroom units. Therefore, there would be 200 square feet per the 28 units, for a total of 5,600 square feet of outdoor recreation space. Sheet L1.0 shows the design of the site will provide 6,497 square feet of usable outdoor recreation space as outlined below.

4 x 135 sq ft patio area	540 square feet
4 x 176 sq ft patio area	704 square feet
Shared outdoor space	5,253 square feet
Total Outdoor Space	6597 square feet

This criterion is met.

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.

Finding: The provided floor plans show that each unit will have a storage unit.

This criterion 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.

Finding: The subject site, tax lot R3216CB 00800, is 35,836 square feet per Yamhill County assessor data. Therefore, a 15% landscaping requirement would be 5,375 square feet. The applicant narrative states that 12,471 square feet of landscaped area will be provided, which is a total of 34%, surpassing the minimum requirement. Per the provided landscape plans the 12,471 square feet is being met through the following components:

Parking lot and additional site landscaping	5,974 square feet
Outdoor space provided (common and individual)	6,497 square feet
Total Landscaped Square Footage	12,471 square feet – 34% of total site
Total Site Square Footage	35,836 square feet

This criterion is met.

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

Finding: The applicant's narrative and submitted landscape plan, Sheet L1.0, show that all areas not being utilized for direct parking, service drive aisle, pedestrian access ways, or the building itself, will be landscaped.

This criterion 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.

Finding: The site is required to have 45 parking places. Therefore, a total of 1,125 square feet of defined landscape area shall be incorporated with the parking area. The proposed site plan is deficient by two parking places, (see NMC 15.440.010(B) for finding), however, the proposed landscaping surpasses the 1,125 square feet required, by providing 5,974 square feet of landscaping defined within or surrounding the parking area. This total is separate from the required outdoor space for individual and common areas, which provides an additional 6,497 square feet.

This criterion is met.

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.

Finding: The north and east property lines that are adjacent to E Haworth Avenue and N Springbrook Road require a 10-foot front yard setback and will provide parking just outside that area. As shown on the landscape plan Sheet L1.0, both of these parking areas will be separated from the lot line adjacent to the street by a 10-foot-wide landscaped strip. The site design shows a five-foot-interior-wide landscape strip separating the service drive from the interior west lot line. No parking or driving will occur within 10 feet of the south property line.

This criterion is met.

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.

Finding: Per Sheet L1.0, landscaping plans show that along E Haworth Avenue and N Springbrook Road, a combination of street trees, shrubs, and ground cover will be planted in the landscape strip separating the parking area and drive aisle from the street. The trees noted are Black Gum (*Nyssa sylvatica*) and an Ash species. While Ash species are on the current street tree list, staff would encourage the developer to plant an alternative species from the list due the presence of the invasive Emerald Ash borer. The Oregon Department of Forestry is requesting Ash trees not be planted to help limit the spread of the invasive borer.

This criterion is met.

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).

Finding: Landscaping plans, sheet L1.0, show that within the landscape strip bordering the west side of drive aisle, a combination of two shrubs is present. The remainder of the aisle contains only one shrub, notated as Blue Pacific Shore Juniper. An updated landscape plan showing at least two different plant material groups planted within the west property line landscape strip separating the interior lot line from the parking area and drive aisle shall be submitted for review and approval during the building permit stage.

If the aforementioned condition is adhered to this criterion will be met.

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.

Finding: Defined landscaped areas have been provided per sheet L1.0. The landscaped areas completely border the parking area and are contained with a curb edge. Landscaped parking islands are also uniformly distributed throughout and meet NMC 15.420.010(B)(3)(h) requirements.

This criterion is met.

f. Landscaping areas in a parking lot, service drive or loading area shall have an interior width of not less than five feet.

Finding: Per sheet L1.0, the landscaping areas in the parking lot and service drive show an interior width of not less than five feet.

This criterion is met.

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.

Finding: Tax lot R3216CB 00800 is located within the C-2 / Community Commercial zone and does not abut a residential district, only additional C-2 zone properties. Therefore, the screening requirements of this section are not applicable.

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).

Finding: The submitted preliminary plans, Sheet P4.0, show that a maximum of six parking stalls will be grouped together without a landscape island separation. Landscaping plans show that in each of these landscape islands a deciduous tree will be planted, a total of eight, Autumn Gold Ginkgo and one, Shademaster Honeylocust. Please note the conditions of NMC 15.505.040(F) regarding trees placements within easements.

This criterion 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.

Finding: Per NMC 15.505.040 (F) a 10-foot-wide public utility easement is being required along N Springbrook Road, and as stated in the conditions no large trees are to be placed within that easement. If the placement of the trees were to be moved to the west and just outside the easement the following findings will apply. The canopy of the tree can be within the easement.

N Springbrook Road is identified as a minor arterial road, which would be require spacing to be approximately 50 feet on center. Submitted landscape plans, Sheet L1.0, show that street trees will be provided within the landscape strip that borders N Springbrook Road at a spacing of approximately 35 feet on center, surpassing the stated standard. The landscaping planting legend states the trees will be two-inch caliper and be an Ash species. The Landscape Plan notes the City of Newberg root barrier detail. The trees noted to be planted along N Springbrook Road are an Ash species. While Ash species are on the current street tree list, staff would encourage the developer to plant an alternative species from the list due the presence of the invasive Emerald Ash borer. The Oregon Department of Forestry is requesting Ash trees not be planted to help limit the spread of the invasive borer.

A streetlamp along N Springbrook Road was identified on the landscaping plan to be within approximately 15 to 20 feet of two of the proposed street trees. Street trees should be planted at least 25 feet from a streetlamp. Please note findings and conditions of NMC 15.505.040(F) for requirements of trees located in easements.

The Site Design Elements Plan, Sheet S, shows a proposed street tree at the corner of the intersection of E Haworth Avenue and N Springbrook Road, which places the tree within the 50-foot vision clearance triangle. A street tree shall not be placed within the vision clearance triangle.

An updated landscape plan showing a clear vision clearance triangle per NMC 15.410.060(A) and all street trees planted at distance of 25 feet from any streetlamp shall be submitted for review and approval during the building permit stage.

If the aforementioned condition is adhered to this criterion will be met.

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.

Finding: E Haworth Avenue is identified as a major collector street. The street trees proposed on the landscaping plan, Sheet L1.0, show the trees will be spaced approximately 40 feet on center, and will have a two-inch caliper. The Landscape plan notes the City of Newberg root barrier detail.

This criterion is met.

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.

Finding: Accent trees have been proposed and are listed as a Coral Bark Maple and a Vine Maple, both are multi-trunk species, as well as a Columnar Ginkgo Trees that have a two-inch caliper.

This criterion is met.

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.

Finding: Landscape plans, Sheet L1.0, show that the majority of all shrubs being planted will come from a two-gallon can, with one significant planting amount coming from 5-gallon cans. A final landscaping plan shall be provided with the building permit application so an accurate planning final site approval can occur prior to certificate of occupancy.

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:

<i>Gallon cans</i>	<i>3 feet on center</i>
<i>4" containers</i>	<i>2 feet on center</i>
<i>2-1/4" containers</i>	<i>18" on center</i>
<i>Rooted cuttings</i>	<i>12" on center</i>

Finding: Landscape plans submitted show that the ground cover proposed, Blue Pacific Shore Juniper, will be from a one-gallon container and planted at 18 inches on center. This surpasses the requirements of this section.

This criterion 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.

Finding: As stated in the narrative and on Sheet L1.0, landscaped areas will be provided with an automatic underground irrigation system.

This criterion is met.

6. Required landscaping shall be continuously maintained.

Finding: The narrative states the landscaping will be maintained by the applicant and/or building management.

This criterion is met.

7. Maximum height of tree species shall be considered when planting under overhead utility lines.

Finding: Overhead lines are existing along N Springbrook Road; therefore the applicant has considered trees that will be lower in height.

This criterion is met.

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.

Finding: The development does not have an approved site development master plan. The landscaping requirements of subsection (B)(3) of this section have been applied to this project.

This criterion is met.

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.

Finding: This project is in the C-2 / Community Commercial zone, not in the M-4 zone. This criterion is not applicable.

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.

Finding: All landscaping must be completed prior to final occupancy. If landscaping cannot be completed, options listed in NMC15.420.010(C) may be applied.

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.

Finding: The proposed development is a multifamily residential project and therefore the following code sections may be applied by the review body.

1. Street trees planted in pedestrian spaces shall be planted according to NMC 15.420.010(B)(4).

Finding: Street trees have been proposed. Please see findings for NMC 15.420.010(B)(4) for details.

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.

Finding: Per the submitted narrative and provided landscape plan, it is stated that the plants chosen will provide seasonal interest along the pedestrian space of E Haworth Avenue and N Springbrook Road. Both roads do not provide on-street parking in those areas. One primary planting that is proposed is the Cassa Blue Flax Lily. This is a drought tolerant plant that will grow between one and three feet. The other primary plants will be Brakelights Red Yucca and the Golden Sword Yucca. The plant height of the yuccas are two feet. The Golden Sword Yucca will have flower spears that can reach six feet in height. The landscape plan shows the Golden Sword Yucca will not be planted within the vision clearance triangles.

This criterion is met.

3. Pedestrian-scale lighting shall be installed along sidewalks and in medians used for pedestrian refuge

Finding: Pedestrian-scale lighting within the public right-of-way was not proposed with this project. This criterion is not applicable.

4. Street furniture such as benches and waste receptacles shall be provided for spaces near sidewalks only.

Finding: Street furniture within the public right-of-way was not proposed with this project. This criterion is not applicable.

5. Paving and curb cuts shall facilitate safe pedestrian crossing and meet all ADA requirements for accessibility.

Finding: Per the submitted site plans, the only curb cut occurring within the public right-of-way will be in conjunction with the access driveway on E Haworth Avenue. The narrative states this will comply with ADA requirements. Confirmation that this criterion is met will be evaluated during the public improvement and / or the building permit stage.

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.

Finding: The applicants narrative states that planter strips are not located on the property. However, per the definition of planter strips in NMC 12.02.050, planter strips are present between the sidewalk and the adjacent property line. Also, per NMC 12.02.050 it is the responsibility of the adjacent property owner to maintain those areas.

Per the provided landscaping plan, Sheet L1.0, there is approximately three and one-half feet of right-of-way between the east property line and N Springbrook Road, and approximately four and one-half feet of right-of-way between the north property line and E Haworth Avenue. Per NMC 120.02.050 these would be defined as planter strips. These planter strip areas do not have adjacent on-street parking and therefore shall have a combination of ground cover, shrubs and trees. The provided landscape plans do show that area will be landscaped with these requirements, and detailed findings were identified in NMC 15.420.020(A)(2) and in 15.420.010(B)(4).

This criterion is met.

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.

Finding: The provided landscape plan does show these are planting strips without adjacent on-street parking. A combination of shrubs in the right-of-way, and street trees planted just to the interior property line along both N Springbrook Road and E Haworth Avenue are present. Detailed findings were identified in NMC 15.420.020(A)(2) and in 15.420.010(B)(4).

This criterion is met.

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.

Finding: Please see findings for pedestrian spaces, NMC 15.420.020(A)(2), that also meet the requirements of this section.

This criterion is met.

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.

Finding: The provided narrative states that all landscaping on-site will be maintained by the applicant and / or building management. The narrative also states that any Newberg Municipal Code requirement for landscaping within the right-of-way required to be maintained by the property owner will be adhered to. Per NMC 12.05.250 property owners are required to maintain landscaping in planter strip and per NMC 12.05.260 are required to maintain street trees consistent with the approved street tree plan.

If the aforementioned condition is adhered to, this criterion will be 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.

Finding: Tax Lot: R3216CB 00800 is located in the C-2 / Community Commercial zone, not the AI airport industrial district or AR airport residential district. Therefore, this criterion is not applicable.

Plant Material Matrix – Newberg Transportation Planning Rule Implementation

	Median		Pedestrian Space	Planting Strip		
	Central Business District/Urban Application	Low Density Application		Frequent On-Street Parking	Infrequent On-Street Parking	Without On-Street Parking
Plant Material	Trees, shrubs and ground cover		Trees, shrubs and ground cover (where applicable)	Trees in tree wells with grates	Trees and ground cover	Trees, shrubs and ground cover
Tree and Shrub Arrangement	Single row of trees planted in triangular pattern, equally spaced, shrubs as desired	Single row of trees planted in triangular pattern, arranged in clusters, shrubs as desired	Refer to median or planting strip specifications as applicable	Single row of trees planted in linear pattern, equally spaced	Refer to tree specifications for median as applicable, ground cover as desired	Refer to tree specifications for median as applicable, ground cover as desired
Tree Form	Columnar to round tree canopy	Round to broad tree canopy	Refer to median or planting strip specifications as applicable	Refer to median recommendations as applicable	Refer to median recommendations as applicable	Refer to median recommendations as applicable
Examples of Recommended Tree Species	Bradford Flowering Pear (Pyrus calleryana "Bradford"), Flowering Cherry (Prunus serrulata,	Flowering Cherry (Prunus serrulata, several varieties), Flowering Dogwood (Cornus species, several	Refer to median or planting strip specifications as applicable	Refer to median recommendations as applicable, lowest tree limb height of 10 feet	Refer to median recommendations as applicable, lowest limb height of 10 feet	Refer to median recommendations as applicable, lowest limb height of 10 feet

	Median		Pedestrian Space	Planting Strip		
	Central Business District/Urban Application	Low Density Application		Frequent On-Street Parking	Infrequent On-Street Parking	Without On-Street Parking
	several varieties), Red Sunset Maple (Acer rubrum), Londos Plana (Platanus acerifolia)	varieties), Hawthorn (Crataegus species, several species), Red Sunset Maple (Acer rubrum), Red Oak (Quercus rubra)				
Shrub and Ground Cover Characteristics (i.e., environmental tolerance, mature size)	Pollutant and reflected heat tolerant	Pollutant and reflected heat tolerant	2.5 feet maximum height, pollutant and reflected heat tolerant	Not applicable	2.5 feet maximum height, pollutant and reflected heat tolerant	2.5 feet maximum height, pollutant and reflected heat tolerant
Examples of Recommended Shrub Species	Lonicera japonica (Privet Honeysuckle), Sargent Juniper (Juniperus sargentii), Cotoneaster (Cotoneaster, various varieties), Winter Creeper (Euonymus fortunei)	Lonicera japonica (Privet Honeysuckle), Sargent Juniper (Juniperus sargentii), Cotoneaster (Cotoneaster, various varieties), Winter Creeper (Euonymus fortunei)	Sargent Juniper (Juniperus sargentii), Cotoneaster (Cotoneaster, low varieties), Winter Creeper (Euonymus fortunei)	Not applicable	Sargent Juniper (Juniperus sargentii), Cotoneaster (Cotoneaster, prostrate varieties)	Sargent Juniper (Juniperus sargentii), Cotoneaster (Cotoneaster, various varieties), Winter Creeper (Euonymus fortunei)

5. Signs. Signs shall comply with NMC 15.435.010 et seq dealing with signs

15.435.030 Permit required.

A. Except as follows, no person or entity shall place any sign within the city without first obtaining a permit from the director.

Finding: A sign is being proposed with this project as shown on the submitted building elevation Sheet 1. A sign permit shall be applied for, reviewed, and approved prior to placement of such sign.

6. Manufactured Dwelling, Mobile Home and RV Parks. Manufactured dwelling and mobile home parks shall also comply with the standards listed in NMC 15.445.075 through 15.445.100 in addition to the other clear and objective criteria listed in this section. RV parks also shall comply with NMC 15.445.170 in addition to the other criteria listed in this section.

Finding: A manufactured dwelling or mobile home are not being proposed with this project. This criterion is not applicable.

7. Zoning District Compliance. The proposed use shall be listed as a permitted or conditionally permitted use in the zoning district in which it is located as found in NMC 15.305.010 through 15.336.020. Through this site review process, the director may make a determination that a use is determined to be similar to those listed in the applicable zoning district, if it is not already specifically listed. In this case, the director shall make a finding that the use shall not have any different or more detrimental effects upon the adjoining neighborhood area than those specifically listed.

Finding: The site, tax lot R3216CB 00800 is in the C-2 / Community Commercial zone and the proposed use is a multi-family residential building. Per the Newberg Zoning Use Table NMC 15.305.020, a multi-family dwelling requires a conditional use permit with the permitted density to be stated on the conditional use permit. The applicant, in conjunction with this Type II Design Review Application, has submitted a Type III Conditional Use Permit application (CUP22-0016). A Type III application requires a quasi-judicial hearing to be heard and decided by the Planning Commission. The Planning Commission decision is based on whether the applicant has shown that the proposed development has or will meet the conditional use criteria. Findings for CUP22-0016 were previously identified within this staff report under Section II.

8. Subdistrict Compliance. Properties located within subdistricts shall comply with the provisions of those subdistricts located in NMC 15.340.010 through 15.348.060.

15.340.010 Purpose.

A. In order to carry out the provisions of this airport overlay subdistrict, there are created and established certain zones which include all of the land lying beneath the airport imaginary surfaces as they apply to Sportsman Airpark in Yamhill County. Such zones are shown on the current airport overlay zone map and the displaced threshold approach surface map, prepared by the Newberg engineering department (see Appendix B, Maps 2 and 3).

B. Further, this overlay zone is intended to prevent the establishment of air space obstructions in airport approaches and surrounding areas through height restrictions and other land use controls as deemed essential to protect the health, safety and welfare of the people of the City of Newberg and Yamhill County. [Ord. 2451, 12-2-96. Code 2001 § 151.450.]

Finding: This property is located within the Airport Overlay subdistrict within the C-2 / Community Zone. However, the site is located just within the Airport Inner Horizontal Surface, and not within the airport approach safety zone. Therefore, the specific procedures and

limitations outlined within NMC 15.340 will not apply as those are directed towards developments in the airport approach safety zone.

This criterion is not applicable.

9. Alternative Circulation, Roadway Frontage Improvements and Utility Improvements

Finding: Findings are addressed in following sections.

15.220.030 Site design review requirements

B. Type II The following information is required to be submitted with all Type II applications for a site design review.

9. Buffering and Screening. Buffering and screening of areas, structures and facilities for storage, machinery and equipment, services (mail, refuse, utility wires, and the like), loading and parking and similar accessory areas and structures shall be shown on the plans.

Finding: The submitted preliminary plans show both parking areas and a trash enclosure area, both with required screening requirements.

This criterion is met.

11. Exterior Lighting. Exterior lighting within the design review plan shall be indicated on the plans. The direction of the lighting, size and type of fixtures, and an indication of the amount of lighting shall be shown on the plans.

15.425 Exterior Lighting

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.

Finding: Lighting information was provided with the application that includes location, make, model, lamp type, wattage, height and proposed cutoff angle.

This criterion is met.

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.

Finding: The area will be used after dark, and the provided lighting plan shows that on-site lights will be equally placed along all common areas in the parking lot and along the building elevations.

This criterion 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 noted on the front 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.

Finding: The lighting plan does show trespass occurring along the south interior property from a 20-foot high-level light fixture. It also shows trespass occurring along the west interior property line from an 8-foot medium-level light fixture and a 20-foot high-level light fixture. Trespass is occurring along the north and east, however the trespass is occurring on to the

adjacent public sidewalks and staff find this is not in violation of the code. The applicant will need to provide a photometric plan showing that exterior lighting will not exceed one-half-foot candle along the west and south interior property lines. This is to be submitted with building permit plans and approved prior to building permit issuance. If the aforementioned condition is adhered to, these criteria will be met.

12. Trash and Refuse Storage. All trash or refuse storage areas, along with appropriate screening, shall be indicated on the plans. Refuse storage areas must be constructed of brick, concrete block or other similar products as approved by the director.

Finding: The proposed site plan and elevations show a trash enclosure located in the northwest parking lot area. Submitted narrative and building design elements Sheet 1, state that the trash and refuse storage area will be screened with CMU (concrete masonry units). The drawings also show that a roof is provided. Per Newberg Municipal Code, trash and refuse storage areas are not required to be covered. The applicant shall coordinate with Waste Management to determine if the design and location of the trash and refuse storage area is appropriate for their vehicles. Approved communication shall be submitted with building permit applications. If the aforementioned condition is adhered to, this condition is met.

13. Roadways and Utilities. The proposed plans shall indicate any public improvements that will be constructed as part of the project, including, but not limited to, roadway and utility improvements.

Findings The submitted materials show installation of a driveway approach to serve the site along with water and wastewater service laterals to serve the proposed development.

This criterion is met.

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: The applicant submitted a traffic study dated October 31, 2022, with the land use application. Based on the analysis, the 28 units will generate an estimated 12 trips in the AM Peak hour (7am-9am) and 15 trips in the PM Peak hour (4pm-6pm). Four study area locations were evaluated to determine the impact to the adjacent transportation system. The traffic study identified that the N Springbrook Road/ E Haworth Avenue intersection is functioning below the City’s level of service standard and that trips from the proposed development continue to degrade the performance of the existing stop-controlled intersection. The traffic study identifies that signalizing the N Springbrook Road/E Haworth Avenue intersection will bring the intersection performance within the City’s performance standards. The applicant has submitted a traffic study that meets the City’s requirements.

This criterion is met.

15.220.060 Additional requirements for multifamily residential projects.

The purpose of this section is to ensure that multifamily residential projects containing five 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 smaller multifamily projects with five to eight units and at least 20 points are required for multifamily projects with nine or more units. For more information and illustrations of each element, refer to the Newberg Residential Development Design Guidelines (July 1997).

Findings: The applicants narrative shared the following table to show that the site and building design have incorporated at least 20 design points required for a multifamily project. The following findings will address these elements.

Site Design Elements		Building Design Elements		Total
Element 1	3 points	Element 3	3 points	
Element 7	2 points	Element 4	3 points	
Element 8	1 point	Element 8	2 points	
Element 9	1 point	Element 9	2 points	
Element 10	1 point			
Element 11	1 point			
Element 12	1 point			
Total	10 Points		10 Points	20 Points

A. Site Design Elements.

Findings: The following findings for this section, Site Design Elements, are identified on the provided Site Design Elements Plan, the Street Tree and Open Space Planting Plan, Sheet L1.0, and the Elevations and Building Design Elements, Sheet 1.

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).

Findings: Located along the south property is an approximate 5,253 square foot common outdoor space which is 14% of site. This area will include raised garden beds, walking area, and bocce court.

Three points is earned.

2. Preserve existing natural features, including topography, water features, and/or native vegetation (three points).

Findings: The applicant did not contest to this element criterion.

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).

Findings: The applicant did not contest to this element criterion.

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).

Findings: The applicant did not contest to this element criterion.

5. Create “outdoor” rooms in larger projects by grouping buildings to create well-defined outdoor spaces (two points).

Findings: The applicant did not contest to this element criterion.

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).

Findings: The applicant did not contest to this element criteria.

7. Landscape at the edges of parking lots to minimize visual impacts upon the street and surrounding properties (two points).

Findings: Per the provided narrative and planting plan, the landscaping provided at the edges of the parking area has been chosen to minimize visual impacts of the street and surrounding properties. Along the north and east property line, between the on-site parking area and the adjacent street, Schipka Cherry Laurel (*Prunus laurocerasus*) will be densely planted. Schipka Cherry Laurel are typically grown and manicured to be a hedge. An individual plant can grow 10 feet tall and equally as wide.

Two points earned.

8. Use street trees and vegetative screens at the front property line to soften visual impacts from the street and provide shade (one point).

Findings: The planting plan shows the use of street trees along both property frontages of E Haworth Avenue and N Springbrook Road. Proposed street trees are Black Gum and Golden Desert Ash. Schipka Cherry Laurel will also be planted along the property line to create a vegetative screen. Additional plants are proposed within the property frontage providing varying height and texture, from ground covers to small shrubs.

One point earned.

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).

Findings: The applicants narrative supports the planting plan, stating that the outdoor common area will include a patio area, appropriate landscaping, raised garden beds, and bocce ball court. In addition to the planting plan, the narrative states bench seating will also be provided.

One point earned.

10. Keep fences neighborly by keeping them low, placing them back from the sidewalk, and using compatible building materials (one point).

Findings: A four-foot high, black vinyl split rail fence is proposed along the north and east property lines. This height meets our residential fence heights for front yards. The split rail fence has been historically approved by the Community Development Director as a neighborly fence design choice. The placement will be approximately 5 and one half feet from the sidewalk along E Haworth Avenue and approximately 4 and one half feet from the sidewalk along N

Springbrook Road.

One point earned.

11. Use entry accents such as distinctive building or paving materials to mark major entries to multifamily buildings or to individual units (one point).

Findings: The main entrance for this building will face E Haworth Avenue. As shown on the planting plan the pedestrian path from the sidewalk on E Haworth will be a five-foot concrete path through the required frontage landscaping. This path will lead to a six-foot constructed of contrasting colored concrete or pavers that will cross the main drive aisle to reach the main entrance. The main entrance to building will have a covered patio area with added design and landscaping details.

One point earned.

12. Use appropriate outdoor lighting which enhances the nighttime safety and security of pedestrians without causing glare in nearby buildings (one point).

Findings: The provided lighting plan does show appropriate spacing to enhance nighttime safety and security of pedestrians. However, it also shows that light trespass is occurring along the south and west interior property lines on to adjacent private property. The applicant will need to provide a photometric plan showing that exterior lighting will not exceed one-half-foot candle along the west and south interior property lines. This is to be submitted with building permit plans and approved prior to building permit issuance. If the aforementioned condition is adhered to, the one point will be earned.

B. Building Design Elements.

Findings: The following findings for this section, Building Design Elements, are identified on the provided Elevations and Building Design Elements Plan, sheet 1.

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).

Findings: The applicant did not contest to this element criterion.

2. *Respect the scale and patterns of nearby buildings by reflecting the architectural styles, building details, materials, and scale of existing buildings (three points).*

Findings: The applicant did not contest to this element criterion.

3. *Break up large buildings into bays by varying planes at least every 50 feet (three points).*

Findings: The provided plans show that the building design has incorporated bay elements on all elevation sides. The longest plan identified was approximately 35 feet. All other plans vary in shorter lengths.

One point earned.

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).*

Findings: The narrative provided supports the elevations plans that detail the variation in color and size for the cement lap board siding. Additional design variation stated in narrative include variation in door locations to the ground floor patios.

Three points earned.

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).*

Findings: The applicant did not contest to this element criterion.

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).*

Findings: The applicant did not contest to this element criterion.

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).

Findings: The applicant did not contest to this element criterion.

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).

Findings: Provided plans show that a front porch cover will be provided on the main entry way that faces E Haworth Avenue. The narrative describes that this entry way will have uniquely designed paved pedestrian area to enhance the entry area, along with landscaping planting wells. A second covered porch entry is provided over the rear entrance area that connects to the outdoor common area.

Two points earned.

9. Use sloped roofs at a pitch of 3:12 or steeper. Gable and hip roof forms are preferable (two points). [Ord. 2889 § 2 (Exh. B § 7), 12-6-21; Ord. 2763 § 1 (Exh. A § 8), 9-16-13; Ord. 2505, 2-1-99. Code 2001 § 151.195.]

Findings: Building elevation plans show that the preferable hip roof is being proposed and will have a 4:12.

Two points earned.

Chapter 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.

Finding: The submitted materials indicate that all new utility lines to the building will be installed underground.

This criterion is met.

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. [Ord. 2537, 11-6-00. Code 2001 § 151.589.]*

Finding: The submitted plans show that there are existing overhead utilities along the N Springbrook Road frontage. The submitted narrative indicates that surrounding properties on the same side of the street are generally developed and that existing overhead utilities along these properties are unlikely to be placed underground.

However, utilities south of the project site on the same side of the street between the project site and E Portland Road (Highway 99W) are underground. These underground utilities continue from approximately 50-feet north of the southern boundary of the project site to approximately 200-feet south of the N Springbrook Road at E Portland Road (Highway 99W) intersection.

There are not any overhead utilities along either side of E Haworth Avenue in the area of the project site. It is anticipated that future improvements for a traffic signal at the intersection of N Springbrook Road and E Haworth Avenue will require that the existing overhead utilities be undergrounded or relocated.

Because it is not clear that one or more of the exception criteria to the requirement to underground utilities is met, the applicant is required to underground the existing overhead utilities along the project site's frontage in accordance with NMC Section 15.430.010 or to pay a fee in lieu for future undergrounding of these overhead utilities. If the fee in lieu is chosen by the applicant, the amount of the fee in lieu is to be determined as part of the permit plan review and approval process.

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

Chapter 15.505 Public Improvement 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. [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 city approval is required shall comply with the requirements of the most recently adopted Newberg public works design and construction standards.

Finding: All improvements reviewed under this application are identified in the NMC 15.505 section specific to them and are conditioned to comply with the Public Works Design and Construction Standards in those sections.

This criterion is met.

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: N Springbrook Road and E Haworth Avenue adjacent to the proposed development are already improved.

This criterion is met.

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: The plans show a proposed water service connection to the water line in E Haworth Avenue. Fire flow test results are to be submitted with permit applications to be reviewed by the Fire Marshall for approval.

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

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: The plans show a proposed wastewater service connection to the wastewater line in N Springbrook Road

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: The proposed development will create a net increase of more than 500 square feet of onsite impervious area. The applicant has submitted a preliminary stormwater report. Private

stormwater management facilities are shown on the plans with their outlet routed to a proposed connection to the stormwater line along the norther portion of the site.

This criterion is met.

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 submitted materials describe and show existing easements on the project site. No new easements are proposed. To address undergrounding of overhead utilities and an existing underground power line in the northeast corner of the site that does not appear to be located within an existing easements or public right-of-way, the applicant is required to provide a 10-foot-wide public utility easement along the N Springbrook Road frontage of the project site. The public utility easement documentation is to be provided as part of the permit plan review and approval process.

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

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.]

Finding: Any required public improvement permit(s) for this project must be submitted, approved, fees paid, and issued prior to building permits being issued.

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

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: N Springbrook Road and E Haworth Avenue are improved adjacent to the project site. The applicant is not proposing construction of new streets, and none are required.

This criterion is not applicable.

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: N Springbrook Road and E Haworth Avenue are improved adjacent to the project site. The existing rights-of-way widths for N Springbrook Road and E Haworth Avenue along the project site's frontages are consistent with subsection (G) of this section.

This criterion is met.

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.

Finding: N Springbrook Road and E Haworth Avenue are improved adjacent to the project site. The existing rights-of-way and pavement widths for N Springbrook Road and E Haworth Avenue along the project site's frontages are consistent with subsection (G) of this section.

This criterion is met.

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.

Finding: N Springbrook Road and E Haworth Avenue are improved adjacent to the project site. The existing rights-of-way and pavement widths for N Springbrook Road and E Haworth Avenue along the project site's frontages are consistent with subsection (G) of this section.

This criterion is not applicable.

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: The applicant submitted a traffic study dated October 31, 2022. The traffic study identified that the N Springbrook Road/E Haworth Avenue intersection is functioning below the City's level of service standard and that trips from the proposed development continue to degrade the performance of the existing stop-controlled intersection.

Project I09 in the City's 2016 Transportation System Plan (TSP) calls for installing a traffic signal and left turn lanes on E Haworth, at the N Springbrook Road/E Haworth Avenue intersection with an estimated cost of \$400,000 (2016 dollars). The traffic study notes that 10 AM trips out of a total 1283 AM trips and 13 PM trips out of a total of 1550 PM trips are being added to the Springbrook Road/Haworth Avenue intersection as a direct result of the development. A Traffic Impact Fee was developed to capture the proportional impact of the development on public facilities and services.

Because the applicant's development is adversely impacting the N Springbrook Road/E Haworth Avenue intersection, the applicant will be required to pay a Traffic Impact Fee for the Springbrook Road/Haworth Avenue intersection which is being assessed based on the proportional impact of the development on public facilities and services. The following formula was used to develop a Traffic Impact Fee to capture the proportional impact of the development based on the most significant AM or PM proportional volume contribution:

(13 PM trips directly proportional to the development)/(1550 PM peak hour total trips through the intersection)*(\$400,000 for the TSP cost of an intersection upgrade) = \$3,355 Traffic Impact Fee.

The Traffic Impact Fee of \$3,355 is to be paid at the time of, or prior to, building permit issuance.

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

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

* *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.*

Finding: N Springbrook Road and E Haworth Avenue are improved adjacent to the project site. The existing rights-of-way and pavement widths for N Springbrook Road and E Haworth Avenue along the project site’s frontages are consistent with subsection (G) of this section.

This criterion is not applicable.

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

a. Exception.

i. Minimum lane width of 11 feet along S River Street from E First Street to E Fourteenth Street.

Finding: No new collector or arterial streets are proposed, and none are required.

This criterion is not applicable.

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.*

a. Exception.

i. Minimum striped bike lane width of six feet with a one-foot wide buffer along S River Street from E First Street to the bypass.

Finding: E Haworth Avenue is classified as a Major Collector. Bike facilities are currently indicated along E Haworth Avenue with shared-lane markings, or “sharrows”. N Springbrook Road is classified as a Minor Arterial. Bike facilities are currently indicated along N Springbrook Road with a striped bike lane along the project site’s frontage.

This criterion is met.

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.*

a. Exception.

i. Minimum parking lane width of seven feet along S River Street from the bypass to E Fourteenth Street.

Finding: E Haworth Avenue is classified as a Major Collector and N Springbrook Road is classified as a Minor Arterial. On-street parking does not currently exist along either frontage of the project site and is not required.

This criterion is not applicable.

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

Finding: Center turn lanes currently exist on the E Haworth Avenue and N Springbrook Road frontages of the project site.

This criterion is met.

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.*

Finding: No new limited residential streets are proposed, and none are required for this development.

This criterion is not applicable.

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

a. Exception.

- i. Twelve-foot-wide sidewalks, inclusive of the curb, with tree wells along S River Street from the bypass to E Fourteenth Street.*
- ii. Twelve-foot-wide shared-use path and four-foot buffer, inclusive of the curb, with tree wells along the east side of S River Street from the bypass to E Fourteenth Street.*

Finding: The submitted materials show existing Type B curb tight sidewalks along the project site's N Springbrook Road and E Haworth Avenue frontages.

This criterion is met.

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 materials show existing Type B curb tight sidewalks along the project site's N Springbrook Road and E Haworth Avenue frontages. These existing curb tight sidewalks extend into the surrounding area. The applicant has proposed providing street trees along both frontages of the project site. Due to the existence of curb, gutter, sidewalk and pavement street improvements along the project site's N Springbrook Road and E Haworth Avenue frontages, the applicant is not required to update the cross-sectional elements to meet NMC 15.505.030(G).

This criterion is not applicable.

9. Slope Easements. Slope easements shall be provided adjacent to the street where required to maintain the stability of the street.

Finding: The submitted materials show an existing slope and drainage easement in the northeast corner of the project site. An existing easement for slopes, water, gas, electric and communication services lines, fixtures and facilities to ODOT for is show in the southeast portion of the site. No other slope easements have been proposed or found to be needed.

This criterion is met.

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: The applicant is not proposing street improvements, and none are required. The applicant is required pay a Traffic Impact Fee as participation in funding future improvements to the N Springbrook Road at E Haworth Avenue intersection that include a traffic signal as identified as Project I09 in the current Transportation System Plan (TSP).

This criterion is not applicable.

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.

Finding: The applicant is not proposing modifications to street standards for the purpose of ingress or egress.

This criterion is not applicable.

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.

Finding: The applicant has not proposed modifications to these street standards.

This criterion 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.*

Finding: The applicant is not proposing a temporary turnaround, and none are required.

This criterion is not applicable.

J. Topography. *The layout of streets shall give suitable recognition to surrounding topographical conditions in accordance with the purpose of this code.*

Finding: The applicant is not proposing new streets, and none are required.

This criterion is not applicable.

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: There are no possible future street extensions as part of this project.

This criterion is not applicable.

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.

Finding: The applicant is not proposing a cul-de-sac, and none are required.

This criterion 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.

Finding: The applicant is not naming streets.

This criterion is not applicable.

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.***

Finding: The applicant is not proposing alleys, and none are required.

This criterion is not applicable.

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.***

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

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: The applicant is not proposing blocks, and none are required.

This criterion is not applicable.

4. Public Pedestrian Walkways and Bicycle Access. *The approval authority in approving a land use application with conditions may require a developer to provide an access way where the creation of a street consistent with street spacing standards is infeasible and the creation of a cul-de-sac or dead-end street is unavoidable. A public walkway provides a connection through a block that is longer than established standards or connects the end of the street to another right-of-way or a public access easement. A public walkway shall*

be contained within a public right-of-way or public access easement, as required by the city. A public walkway shall be a minimum of 10 feet wide and shall provide a minimum six-foot-wide paved surface or other all-weather surface approved by the city (see subsection (S) of this section for public walkway standards).

Design features should be considered that allow access to emergency vehicles but that restrict access to non-emergency motorized vehicles.

Finding: The applicant is not proposing any public walkways or bicycle accesses, and none are required.

This criterion is not applicable.

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: The applicant is not proposing private streets.

This criterion is not applicable.

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.

Finding: The applicant is not proposing traffic calming, and none are required.

This criterion is not applicable.

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

<i>Roadway Functional Classification</i>	<i>Area¹</i>	<i>Minimum Public Street Intersection Spacing (Feet)²</i>	<i>Driveway Setback from Intersecting Street³</i>
<i>Expressway</i>	<i>All</i>	<i>Refer to ODOT Access Spacing Standards</i>	<i>NA</i>
<i>Major arterial</i>	<i>Urban CBD</i>	<i>Refer to ODOT Access Spacing Standards</i>	
<i>Minor arterial</i>	<i>Urban CBD</i>	<i>500 200</i>	<i>150 100</i>
<i>Major collector</i>	<i>All</i>	<i>400</i>	<i>150</i>
<i>Minor collector</i>	<i>All</i>	<i>300</i>	<i>100</i>

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*

<i>Roadway Functional Classification</i>	<i>Area¹</i>	<i>Minimum Public Street Intersection Spacing (Feet)²</i>	<i>Driveway Setback from Intersecting Street³</i>
------------------------------------------	-------------------------	----------------------------------------------------------------------	--------------------------------------------------------------

driveway, including shared driveways or driveways on adjoining streets, one driveway is allowed as far from the intersection as possible.

Finding: The project site has frontage on N Springbrook Road and E Haworth Avenue. N Springbrook Road is a Minor Arterial and E Haworth Avenue is a Major Collector. The proposed building will take access off E Haworth Avenue because it has a lower functional classification. The submitted materials describe and show the proposed driveway setback approximately 160-feet from N Springbrook Road meeting the access spacing standards in Table 15.505.R. As shown on the applicant’s preliminary plans and described in the application materials, the single access driveway on E Haworth Avenue is to be at the west end of the property as far from the intersection as possible to minimize impact to the N Springbrook Road/E Haworth Avenue intersection.

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

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.

a. For a duplex, triplex or quadplex dwelling or a cottage cluster project with frontage on two local streets, access may be permitted on both streets.

Finding: The project site has frontage on N Springbrook Road and E Haworth Avenue. N Springbrook Road is a Minor Arterial and E Haworth Avenue is a Major Collector. The proposed development is to take access off Haworth Avenue because it has a lower functional classification.

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

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.

a. For a duplex, triplex or quadplex dwelling or a cottage cluster project, 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 22 feet of lot frontage separating each driveway approach.

Finding: The applicant is not proposing a second driveway. Although the E Haworth frontage is sufficient to meet this criterion, a second driveway would be inconsistent with NMC Section 15.505.030.R.2.

This criterion is not applicable.

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 property does not have frontage on an alley.

This criterion is not applicable.

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.*

Finding: The project site does not have any existing accesses.

This criterion is not applicable.

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, with the exception of cottage dwellings on individual lots that are part of a cottage cluster.

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

e. Where three or more lots 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. However, duplex, triplex, quadplex, townhouse and cottage dwellings with shared driveways shall be exempt from this standard.

Finding: The project site does not have access to, or opportunity for, a shared driveway access.

This criterion is not applicable.

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.

Finding: A frontage street or alley is not proposed, and none are required.

This criterion 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.

Finding: The project site does not have access to Yamhill County right-of-way and will not have access to N Springbrook Road along this frontage of the project site that is under ODOT jurisdiction.

This criterion is not applicable.

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.

Finding: The applicant is not proposing any exceptions.

This criterion is not applicable.

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.

Finding: The applicant is not proposing any exceptions.

This criterion is not applicable.

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.

Finding: No public walkway is proposed or required.

This criterion is not applicable.

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: See previous finding NMC 15.420.010(B)(4).

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: It is unclear if the street lighting along E Haworth Avenue and N Springbrook Road meet current City standards. Because final plans have not been submitted, final plans which include an analysis of street lighting on E Haworth Avenue and N Springbrook Road demonstrating that the existing lighting along the project site's frontages meet city standards or plans to install any additional PGE Option A street lights necessary to meet City standards to be submitted with the permit application. Street lighting analysis is to extend to the center line of the E Haworth Avenue and N Springbrook Road frontages.

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

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. [Ord. 2889 § 2 (Exh. B §§ 43 – 45), 12-6-21; Ord. 2880 § 2 (Exh. B §§ 51, 52), 6-7-21; Ord. 2871 § 3 (Exh. D), 3-1-21; Ord. 2862 § 1 (Exh. A § 1), 6-15-20; Ord. 2822 § 1 (Exh. A), 2-5-18; Ord. 2810 § 2 (Exhs. B, C), 12-19-16; Ord. 2763 § 1 (Exh. A § 19), 9-16-13; Ord. 2736 § 1 (Exh. A §§ 1, 3, 4), 3-21-11; Ord. 2619, 5-16-05; Ord. 2513, 8-2-99; Ord. 2507, 3-1-99; Ord. 2494, 4-6-98; Ord. 2451, 12-2-96. Code 2001 §§ 151.681, 151.683, 151.684 – 151.686, 151.689 – 151.692, 151.694, 151.695, 151.701 – 151.703, 151.705.]

Finding: The applicant is not proposing transit improvements and the site is not adjacent to existing or planned transit facilities.

This criterion 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.

Finding: The submitted materials indicate a new water service connection to the water line in E Haworth Avenue. The preliminary plans show an onsite private fire hydrant. As noted in comments from the City of Newberg Public Works Director private fire hydrants are not permitted in the City of Newberg.

Fire flow test results need to be submitted with permit applications to be reviewed by the Fire Marshall for approval.

The applicant is required to submit construction plans and obtain a public improvement permit for the proposed water service.

All onsite fire hydrants are to be public fire hydrants served by public water lines. Onsite public water lines, including those serving onsite fire hydrants, are to be in a 15-foot-wide public water line easement.

Plans will be fully reviewed for compliance with city standards including the Public Works Design and Construction Standards as part of the permit plan review process.

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

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.

Finding: The submitted materials indicate a new wastewater service connection to the wastewater main in N Springbrook Road. The applicant will be responsible for verifying that the capacity of the existing wastewater line is adequate for the development.

The applicant is required to submit construction plans and obtain a public improvement permit for the proposed wastewater service. If work in N Springbrook Road is determined to require a permit from ODOT, the ODOT permit is required prior to City public improvement permit issuance. Plans will be fully reviewed for compliance with city standards including the Public Works Design and Construction Standards as part of the permit plan review process.

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

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 submitted materials describe and show existing easements on the project site. No new easements are proposed. Determination of the full extent of easements required will occur as part of the permit plan review process. To address undergrounding of overhead utilities and an existing underground power line in the northeast corner of the site that does not appear to be located within an existing easement or public right-of-way, the applicant is required to provide a 10-foot-wide public utility easement along the N Springbrook Road frontage of the project site. The public utility easement documentation is to be provided as part of the permit plan review and approval process.

A 15-foot-wide public water line easement for any onsite public water line needed for serving the development will be required. The applicant will also be required to provide any other easements determined to be necessary during the permit plan review process. Easement documentation is to be provided as part of the permit plan review and approval process.

No structures or large trees are to be constructed or installed within or to encroach into existing or new easements.

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

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.*

Finding: The proposed development will create a net increase of more than 500 square feet of onsite impervious area. The applicant has submitted a preliminary stormwater report. Private stormwater management facilities are shown on the plans. The preliminary plans include a proposed stormwater connection to the public stormwater line that is within an existing easement along the E Haworth Avenue frontage of the site. The connection to the public stormwater line will require a public works improvement permit. Because final plans have not been submitted, final plans showing the connection to the public stormwater system will be required for the public works improvement permit application.

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

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: The submitted materials indicate that the proposed project will disturb more than 500 square feet and less than 1 acre. With less than 1 acre of disturbance a City of Newberg Erosion Control Permit is required. Because the applicant has not provided documentation of an erosion and sedimentation control permit for the development site, the applicant will be required to obtain a City of Newberg Erosion Control Permit prior to any ground disturbing activity.

The proposed development will create a net increase of more than 500 square feet of onsite impervious area. The applicant has submitted a preliminary stormwater report. Private stormwater management facilities are shown on the plans with their outlet routed to a proposed connection to the stormwater line along the northern portion of the site.

The applicant is required to submit a stormwater report and construction plans with permit applications. The stormwater report is to be prepared in accordance with the Public Works Design and Construction Standards.

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

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: The submitted materials include a preliminary stormwater report and preliminary plans. This report and the preliminary plans describe the use of underground detention chambers and proprietary treatment systems to comply with City of Newberg requirements for stormwater

management. The preliminary stormwater report does not clearly demonstrate compliance with the stormwater facility selection hierarchy described in Section 4.6.8 of the Public Works Design and Construction Standards. Because the applicant has not provided construction plans and a final stormwater report, the applicant is required to provide detailed construction plans and stormwater report that address requirements outlined in the Public Works Design and Construction Standards in accordance with NMC 13.25 Stormwater Management. This includes demonstrating compliance with the stormwater facility selection hierarchy described in Section 4.6.8 of the Public Works Design and Construction Standards.

Plans will be fully reviewed for compliance with city standards including the Public Works Design and Construction Standards as part of the permit plan review process.

A private maintenance agreement for the stormwater facilities will be required. Because a private maintenance agreement for the stormwater facilities has not been recorded, the applicant is required to submit a private maintenance agreement for the onsite private stormwater facilities and have the approved agreement recorded and returned to the City of Newberg Engineering Division.

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

CONCLUSION:

Based on the above findings, the project meets the criteria required within the Newberg Development Code, subject to completion of the attached conditions.

**Section IV: Exhibit “C” for Planning Commission Order 2023-04
Conditions of Approval for CUP22-0016 and DR222-0011
The Haworth Apartments – Patrick R. and Elaine A. Maveety**

A. THE FOLLOWING MUST BE COMPLETED BEFORE THE CITY WILL ISSUE A BUILDING PERMIT:

1. **Permit Submittal:** Submit a building permit application and two (2) complete working drawing sets of the proposed project. Show all the features of the plan approved through design review, including the following:
 - a. Any required public improvement permit(s) for this project must be submitted, approved, and issued prior to building permits being issued.
2. **Conditions of Approval:** Either write or otherwise permanently affix the conditions of approval contained within this report onto the first page of the plans submitted for building permit review.
3. **Sidewalks:**
 - a. The applicant will be responsible for replacement of any sidewalk panels along the project site’s frontages that are not in good condition or do not meet current ADA standards along the project frontages. Determination of the limits of any sidewalk replacements will be part of the permit plan review process.
4. **Parking:**
 - a. A revised site plan providing 45 parking spaces reviewed during the building permit application or a Type I Code Adjustment requesting a 25% reduction in parking spaces per NMC Chapter 15.210 to be approved prior to the building permit application shall be submitted.
 - b. A revised site plan showing all parking spaces meeting the requirements of NMC 15.440.070 is required with the building permit plans.
5. **Vision Clearance:**
 - a. The street tree proposed within the 50-foot vision clearance tringle at the intersection of E Haworth Avenue and N Springbrook Road, shall be removed from final site plans submitted with public improvement permits and building permits.
6. **Landscaping:**
 - a. Elevation plans submitted for review during the building permit stage shall show how the ground-level units’ outdoor private spaces will provide privacy according to NMC 15.420.010(A)(1).
 - b. An updated landscape plan showing at least two different plant material groups planted within the west property line landscape strip separating the

interior lot line from the parking area and drive aisle shall be submitted for review and approval during the building permit stage.

- c. An updated landscape plan showing a clear vision clearance triangle per NMC 15.410.060(A) and all street trees planted at distance of 25 feet from any streetlamp shall be submitted for review and approval during the building permit stage.
- d. A final landscaping plan shall be provided with the building permit application so an accurate planning final site approval can occur prior to certificate of occupancy.
- e. All landscaping must be completed prior to final occupancy. If landscaping cannot be completed, options listed in NMC15.420.010(C) may be applied.
- f. Per NMC 12.05.250 property owners are required to maintain landscaping in planter strip and per NMC 12.05.260 are required to maintain street trees consistent with the approved street tree plan.

7. **Signs:**

- a. A sign permit shall be applied for, reviewed, and approved prior to placement of such sign.

8. **Exterior Lighting:**

- a. The applicant will need to provide a photometric plan showing that exterior lighting will not exceed one-half-foot candle along the west and south interior property lines. This is to be submitted with building permit plans and approved prior to building permit issuance.

9. **Trash Enclosure:**

- a. The applicant shall coordinate with Waste Management to determine if the design and location of the trash and refuse storage area is appropriate for their vehicles. Approved communication shall be submitted with building permit applications.

10. **Underground Utilities:**

- a. The applicant is required to underground the existing overhead utilities along the project site's frontage in accordance with NMC Section 15.430.010 or to pay a fee in lieu for future undergrounding of these overhead utilities. If the fee in lieu is chosen by the applicant, the amount of the fee in lieu is to be determined as part of the permit plan review and approval process.

11. **Fire Flow:**

- a. Fire flow test results are to be submitted with permit applications to be reviewed by the Fire Marshall for approval.

12. **Easements:**

- a. The applicant is required to provide a 10-foot-wide public utility easement along the N Springbrook Road frontage of the project site. The public utility easement documentation is to be provided as part of the permit plan review and approval process.
- b. A 15-foot-wide public water line easement for any onsite public water line needed for serving the development will be required. The applicant will also be required to provide any other easements determined to be necessary during the permit plan review process. Easement documentation is to be provided as part of the permit plan review and approval process.
- c. No structures or large trees are to be constructed or installed within or to encroach into existing or new easements.

13. **Permits:**

- a. Any required public improvement permit(s) for this project must be submitted, approved, fees paid, and issued prior to building permits being issued.

14. **Street Standards:**

- a. The applicant will be required to pay a Traffic Impact Fee for the Springbrook Road/Haworth Avenue intersection which is being assessed based on the proportional impact of the development on public facilities and services. The following formula was used to develop a Traffic Impact Fee to capture the proportional impact of the development based on the most significant AM or PM proportional volume contribution:
 - $(13 \text{ PM trips directly proportional to the development}) / (1550 \text{ PM peak hour total trips through the intersection}) * (\$400,000 \text{ for the TSP cost of an intersection upgrade}) = \$3,355 \text{ Traffic Impact Fee.}$
 - The Traffic Impact Fee of \$3,355 is to be paid at the time of, or prior to, building permit issuance.
- b. The single access driveway on E Haworth Avenue is to be at the west end of the property as far from the intersection as possible to minimize impact to the N Springbrook Road/E Haworth Avenue intersection.
- c. The proposed development is to take access off Haworth Avenue because it has a lower functional classification.

15. **Street Lighting:**

- a. Final plans which include an analysis of street lighting on E Haworth Avenue and N Springbrook Road demonstrating that the existing lighting along the project site's frontages meet city standards or plans to install any additional PGE Option A street lights necessary to meet City standards to be submitted with the permit application. Street lighting analysis is to extend to the center line of the E Haworth Avenue and N Springbrook

Road frontages.

16. **Water Improvements:**

- a. The applicant is required to submit construction plans and obtain a public improvement permit for the proposed water service.
- b. All onsite fire hydrants are to be public fire hydrants served by public water lines. Onsite public water lines, including those serving onsite fire hydrants, are to be in a 15-foot-wide public water line easement.
- c. Plans will be fully reviewed for compliance with city standards including the Public Works Design and Construction Standards as part of the permit plan review process.

17. **Wastewater Improvements:**

- a. The applicant will be responsible for verifying that the capacity of the existing wastewater line is adequate for the development.
- b. The applicant is required to submit construction plans and obtain a public improvement permit for the proposed wastewater service. If work in N Springbrook Road is determined to require a permit from ODOT, the ODOT permit is required prior to City public improvement permit issuance. Plans will be fully reviewed for compliance with city standards including the Public Works Design and Construction Standards as part of the permit plan review process.

18. **Stormwater**

- a. Final plans showing the connection to the public stormwater system will be required for the public works improvement permit application.
- b. The applicant is required to submit a stormwater report and construction plans with permit applications. The stormwater report is to be prepared in accordance with the Public Works Design and Construction Standards.
- c. The applicant is required to provide detailed construction plans and stormwater report that address requirements outlined in the Public Works Design and Construction Standards in accordance with NMC 13.25 Stormwater Management. This includes demonstrating compliance with the stormwater facility selection hierarchy described in Section 4.6.8 of the Public Works Design and Construction Standards.
- d. Plans will be fully reviewed for compliance with city standards including the Public Works Design and Construction Standards as part of the permit plan review process.
- e. The applicant is required to submit a private maintenance agreement for the onsite private stormwater facilities and have the approved agreement recorded and returned to the City of Newberg Engineering Division.

19. **Erosion Control:**

- a. The applicant will be required to obtain a City of Newberg Erosion Control Permit prior to any ground disturbing activity.

B. THE FOLLOWING MUST BE ACCOMPLISHED PRIOR TO OCCUPANCY

1. **Fire Department Requirements:** This project is subject to compliance with all Fire Department (TVF&R) standards relating to access and fire protection.
2. **Design Review Conditions:** Contact the Planning Division (503-537-1240) to verify that all design review conditions have been completed.
3. **Site Inspection:**
 - a. Contact the Building Division (503-537-1240) for Building, Mechanical, and Plumbing final inspections.
 - b. Contact the TVF&R (503-649-8577) for Fire Safety final inspections.
 - c. Contact Yamhill County (503-538-7302) for electrical final inspections.
 - d. Contact the Planning Division (503-537-1240) for landscaping final inspections.

C. DEVELOPMENT NOTES

1. Systems development charges (SDCs) will be collected when building permits are issued. For questions regarding SDCs please contact the Engineering Division.

Attachment 1: Application Material



TYPE III APPLICATION (QUASI-JUDICIAL REVIEW)

File #: _____

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
- Planned Unit Development
- Other: (Explain) Design Review (Companion to CUP)

APPLICANT INFORMATION:

APPLICANT: Grove Development

ADDRESS: 7570 SW 74th Avenue CITY: Portland STATE: OR ZIP: 97223

EMAIL ADDRESS: grove@grovedevelopment.net PHONE: (503) 793-3299 MOBILE: _____

OWNER (if different from above): Patrick R. Maveety and Elaine A. Maveety PHONE: _____

ADDRESS: 4604 Coopers Hawk Road CITY: Klamath Falls STATE: OR ZIP: 97601

ENGINEER/SURVEYOR: Pioneer Design Group - Luke Lappin, PE/Mike Harris, PLS CONTACT: Luke Lappin

EMAIL ADDRESS: llappin@pd-grp.com / mharris@pd-grp.com PHONE: (503) 643-8286 MOBILE: _____

GENERAL INFORMATION:

PROJECT LOCATION: SW cnr of E Haworth Ave and N Springbrook Rd PROJECT VALUATION: \$

PROJECT DESCRIPTION/USE: Conditional Use Permit & Site Design Review (Companion to CUP) for a 28 Unit Multi-Family Apartment Building

MAP/TAX LOT NO. (i.e.3200AB-400): 3S2 16CB 800 SITE SIZE: 0.822 SQ. FT. ACRE

COMP PLAN DESIGNATION: Commercial CURRENT ZONING: C-2

CURRENT USE: Vacant TOPOGRAPY: 202' - 208' above MSL (NAVD '29)

SURROUNDING USES:

NORTH: Haworth Avenue ROW (adj Azalea Gardens Mobile Manor) SOUTH: Retail Commercial (Western Oregon Dispensary)

EAST: N Springbrook Road ROW (adj. Springbrook Plaza) WEST: Retail Commercial (medical/service/retail)

ATTACHED PROJECT CRITERIA AND REQUIREMENTS (check all that apply)

- General Checklist:** Fees Public Notice Information Current Title Report Written Criteria Response Owner Signature
 2 Copies of full Application Packet

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. 24
Planned Unit Development	p. 27

The Application Packet can be submitted to Planning@newbergoregon.gov or at 414 E First St., Newberg OR. 97132
If the Application is emailed 2 physical copies must be mailed or brought into the Community Development Department

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.

DocuSigned by:
Grove Hunt
Applicant Signature

11/3/2022

Date

Patrick Maveety
Owner Signature

11-18-2022 3:51 PM PST

Date

Grove Hunt

Patrick Maveety

Print Name

Print Name

THIS MAP WAS PREPARED FOR
ASSESSMENT PURPOSE ONLY

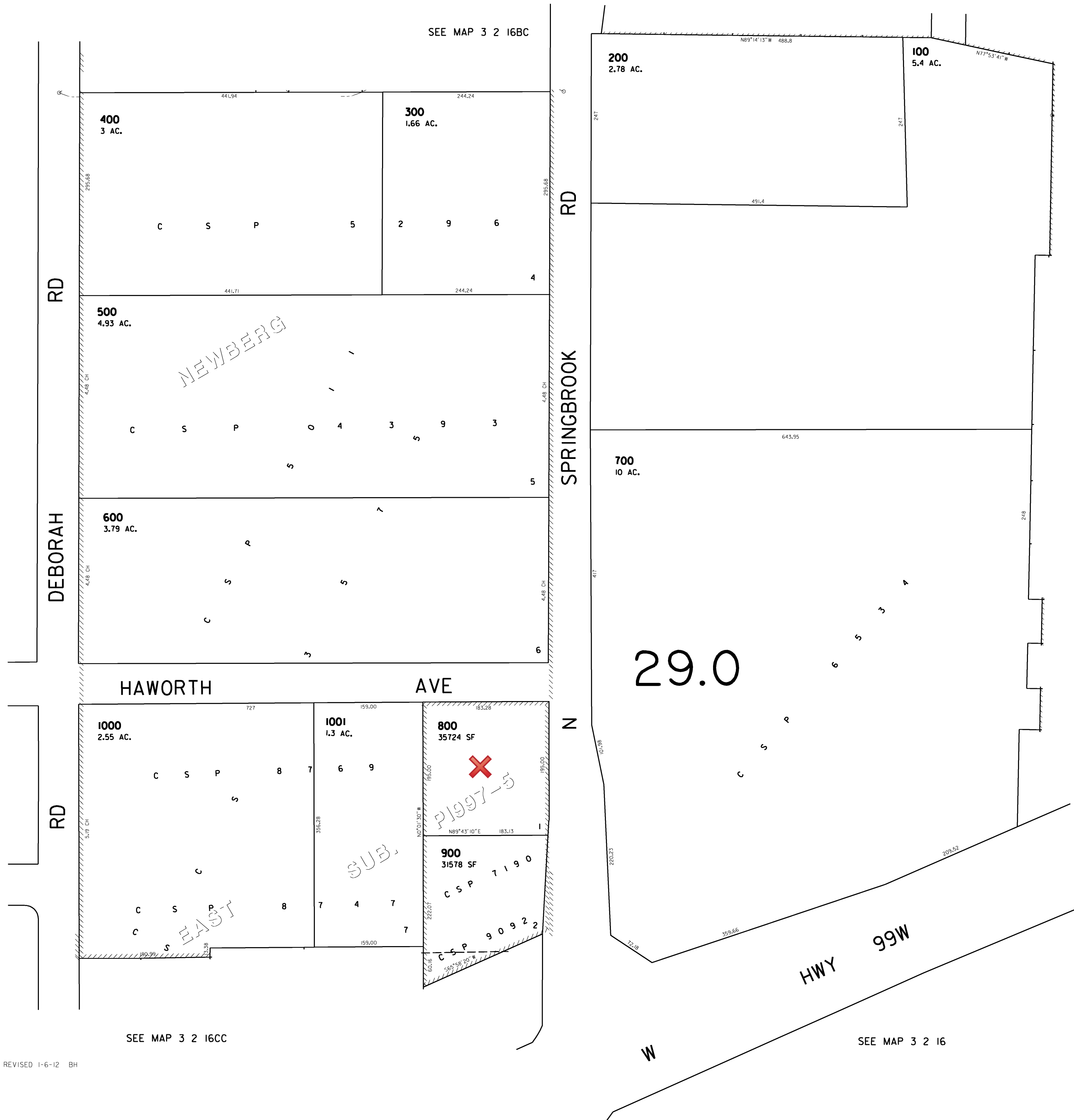
NW 1/4 SW 1/4 SEC 16 T3S R2W W.M.
YAMHILL COUNTY

3 2 16CB
NEWBERG

1" = 100'

CANCELLED

SEE MAP 3 2 17DA



SEE MAP 3 2 16CC

REVISED 1-6-12 BH

3 2 16CB

THE HAWORTH

TYPE III REVIEW FOR APPROVAL OF A CONDITIONAL USE PERMIT (RESIDENTIAL IN C-2 ZONE) & SITE DESIGN REVIEW (COMPANION TO CUP) FOR A 28-UNIT MULTI- FAMILY APARTMENT BUILDING

Tax Lot 3S2 16CB 800

November 22, 2022

NMC 15.415.020(C) Response Revised December 12, 2022

APPLICANT:

**Grove Development
7570 SW 74th Avenue
Portland, OR 97223
Contact: Grove Hunt
Phone: (503) 793-3299
Email: grove@grovedevelopment.net**



APPLICANT'S REPRESENTATIVE:

**Pioneer Design Group
9020 Washington Square Road, Suite 170
Portland, OR 97223
Contact: Matthew L. Sprague
Phone: 503-643-8286
Email: msprague@pd-grp.com**



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P 503.643.8286 www.pd-grp.com
9020 SW Washington Square Rd Suite 170
Portland, Oregon 97223

FACT SHEET

Project Name: The Haworth

Project Action: **Type III Review for Approval of a Conditional Use Permit (Residential in C-2 Zone) & Site Design Review (Companion to CUP) for a 28 Unit Multi-Family Apartment Building**

Tax Map/Lot: 3S2 16CB 00800

Site Size: 0.822 acres

Address: No address assigned

Location: At the south west corner of the intersection of E Haworth Avenue and N Springbrook Road

Zoning: C-2 (Community Commercial)

Pre-Application Meeting: 11/10/2021 – PRE21-0031

Owner

Patrick R. Maveety and Elaine A. Maveety
4604 Coopers Hawk Road
Klamath Falls, OR 97601

Applicant:

Grove Development
7570 SW 74th Avenue
Portland, OR 97223
Contact: Grove Hunt
Phone: (503) 793-3299
Email: grove@grovedevelopment.net

Applicant's Representative:

Pioneer Design Group
9020 Washington Square Road, Suite 170
Portland, OR 97223
Contact: Matthew L. Sprague
Phone: 503-643-8286
Email: msprague@pd-grp.com

GENERAL INFORMATION

The Applicant seeks approval of this request for a Type III Conditional Use Permit (Residential in C-2 Zone) and Site Design Review (companion to CUP) for a 28-unit multi-family apartment building. The 28 units are proposed to be developed within a single, 3-story multi-family building with 16 one-bedroom units and 12-two-bedroom units. The ground floor will contain 8 units (4 one-bedroom and 4 two-bedroom), while the 2nd and 3rd floors will each contain 10 units (6-one story and 4 two-story).

VICINITY & SITE INFORMATION

Site Location: The subject site is approximately 0.822 acres, and is identified as Tax Lot 3S2 16CB 00800. The site is generally rectangular in shape with a slightly greater depth (195 feet) than width (183 feet). The primary frontage is located to the north of the site on E Haworth Avenue, with secondary frontage to N Springbrook Road to the east. The City of Newberg Comprehensive Plan indicates the site is Zoned C-2 (Community Commercial). The site is generally flat yet 3-4 feet higher than the adjacent sidewalks on average. There is a 15-foot public storm drainage easement located along the northern boundary and another 15-foot public storm drainage easement crossing at an angle from the northwest corner to the mid-point on the southern boundary. Another triangular easement for slope and drainage is located at the northeast corner of the site as well.

Existing Uses: The site is currently vacant.

Surrounding Land Uses: The subject site and properties to the east, south, and west are all designated C-2 (Community Commercial). Immediately adjoining the site to the north is the E Haworth Avenue right-of-way, beyond which is the Azalea Gardens Mobile Manor located in the City's R-2 (Medium Density Residential zone). Adjoining to the east of the site is the N Springbrook Road right-of-way, beyond which is the Springbrook Plaza shopping center. To the south is located retail commercial uses (Western Oregon Dispensary), while to the west is mixed uses including medical/office/personal services, and large format retail commercial (Buy-Mart).

Topography: The property generally slopes from west to east. The high point of the site is along the southwest boundary at an approximate elevation of 208.55 feet, with a relative low point along the east property line near N Springbrook Road at an elevation of 203 feet. Existing grades range between 1 and 5%.

Vegetation: The site is currently vacant with grass covering the entire parcel. There are no trees on the property with a large arborvitae hedge bordering the west boundary and three large trees along the property line to the south. No wetlands or floodplains have been identified on site.

Transportation: The site has frontages on E Haworth Avenue (north side) and N Springbrook Road (east side).

E Haworth Avenue is designated as a Major Collector in the City of Newberg Transportation System Plan (TSP). The TSP specifies a minimum 60-foot right-of-way, with a 36-foot paved section, including 6-foot bike lanes. Existing right-of-way is approximately 60-feet, and existing pavement width is approximately 40 feet. No additional frontage improvements are proposed.

N Springbrook Road is designated as a Minor Arterial in the TSP. The TSP specifies a minimum 70-foot right-of-way, with a 52-foot paved section, including 6-foot bike lanes. Existing right-of-way is approximately 85-feet, and existing pavement width is approximately 52 feet. No additional frontage improvements are proposed.

The applicant will be required to replace any sidewalk panels in poor condition or not in compliance with ADA standards. Additionally, the applicant will be required to participate in funding improvements at the E Haworth Avenue and N Springbrook Road intersection that are indicated in the City of Newberg Transportation System Plan (TSP). Project I09 in the current TSP calls for installing a traffic signal and left turn lanes on Haworth. The full extent of intersection improvements has not been confirmed at this time.

The City of Newberg is located along three state highways: Highway 99W, Highway 219, and Highway 240. Highway 99W is a designated Freight System Route and is the principal link between the Portland metropolitan area and both the Oregon coast and the mid-Willamette Valley.

A variety of public mass transportation options are available within the Newberg area. The Yamhill County Transit operates bus programs, all of which are wheelchair accessible, including Yamhill County Transit's Newberg Routes 5 & 7; Yamhill County Transit's 99w/Tigard Routes from McMinnville to Sherwood and the Tigard Transit Mall, with connections to the Portland metropolitan area Tri-Met bus transit system; and the Dial-A-Ride program for curb-to-curb service is available for anyone unable to access YCTA's fixed routes because of mobility limitations, or those whose origins and/or destinations are not within close proximity to fixed routes.

COMPLIANCE WITH THE NEWBERG DEVELOPMENT CODE

Title 15 - DEVELOPMENT CODE

Chapter 15.100 – LAND USE PROCESSES AND PROCEDURES

Article I. Procedure Types and Determination of Proper Procedures

15.100.010 Procedures for processing development permits.

All development permits shall be classified as one of the following: Type I, Type II, Type III, or Type IV procedures.

RESPONSE: The proposed Conditional Use Permit (Residential in C-2 Zone) and Site Design Review (companion to CUP) for a 28-unit multi-family apartment building are being processed through the Type III procedure.

15.100.050 Type III procedure – Quasi-judicial hearing.

A. All Type III decisions shall be heard and decided by the planning commission. The planning commission's decision shall be final

unless the decision is appealed or the decision is a recommendation to the city council.

B. Type III actions include, but are not limited to:

- ...
- 2. Conditional use permits: This action is a final decision unless appealed.*
- ...

RESPONSE: This submittal includes a request for a Conditional Use Permit (Residential in C-2 Zone) and Site Design Review (companion to CUP) for a 28-unit multi-family apartment building, and is therefore included as a Type III action.

C. Planning Commission Decisions and Recommendation Actions.

- 1. Planning Commission Decision. Development actions shall be decided by the planning commission for those land use actions that require a Type III procedure and do not require the adoption of an ordinance. The decision shall be made after public notice and a public hearing is held in accordance with the requirements of NMC 15.100.090 et seq. A Type III decision may be appealed to the city council by a Type III affected party in accordance with NMC 15.100.160 et seq.*
- ...

RESPONSE: The applicant acknowledges the above requirements.

- D. City Council Action. If a recommendation to the city council is required, the matter shall be reviewed by the city council as a new hearing. The final decision on these actions is made by the city council.*
- E. The applicant shall provide notice pursuant to NMC 15.100.200 et seq.*
- F. The hearing body may attach certain conditions necessary to ensure compliance with this code.*
- G. If the application is approved, the director shall issue a building permit when the applicant has complied with all of the conditions and other requirements of this code.*
- H. If a Type III application is denied, or if the applicant wishes to make substantive modifications to an approved application, the applicant may modify the application after the planning commission hearing and request a new planning commission hearing to consider the application. An application so modified shall be considered a new*

application for purposes of the 120-day time limit for processing applications in accordance with NMC 15.100.100 and state statutes. The applicant shall acknowledge in writing that this is a new application for purposes of the 120-day rule. The city council shall establish a fee for such a reconsideration or modification by resolution. Application of this provision is limited to three times during a continuous calendar year

RESPONSE: The application shall be heard by the planning commission and may be appealed to the City Council, but is not subject to referral by recommendation to the City Council.

15.100.080 Determination of proper procedure type.

- A. The director shall determine the proper procedure for all development actions. If there is a question as to the appropriate type of procedure, the director shall resolve it in favor of the higher procedure type number.*
- B. An application that involves two or more procedures may be processed collectively under the highest numbered procedure required for any part of the application or processed individually under each of the procedures identified by this code. The applicant may determine whether the application shall be processed collectively or individually. If the application is processed under the individual procedure option, the highest numbered type procedure must be processed prior to subsequent lower numbered procedure.*

RESPONSE: The Conditional Use Permit is subject to a Type III review. While Site Design Review is listed as a Type II action, this request is submitted concurrently as a companion to the CUP application, and therefore both applications shall be reviewed through the Type III process.

Division 15.200 Land Use Applications

Chapter 15.220 – SITE DESIGN REVIEW

15.220.010 Purpose.

These provisions provide for the review and approval process of the design of certain developments and improvements in order to promote functional, safe and innovative site development compatible with the natural and manmade environment. The following provisions are intended to discourage unsightly development, improve the quality of new development in the city, coordinate the site planning process with existing and proposed development, and provide a pleasant working and living environment in the city. Furthermore, these provisions are intended to coordinate the site

development process through review of the architecture of the structure(s), signs, landscaping, and other design elements on the site.

RESPONSE: The proposed development is subject to the Site Design Review standards of this section. The applicant has provided substantial evidence with this submittal to demonstrate that the site has been designed to achieve the requirement for high quality new development which is compatible with existing and proposed development, and which provides a pleasant working and living environment in the city.

15.220.020 *Site design review applicability.*

- A. *Applicability of Requirements. Site design review shall be required prior to issuance of building permits or commencement of work for all improvements noted below. Site design review permits shall be processed as either Type I or Type II, as noted below.*
- 2. *Type II.*
 - a. *Any new development or remodel which is not specifically identified within subsection (A)(1) of this section.*

RESPONSE: As described above, while Site Design Review is listed as a Type II action, this request is submitted concurrently as a companion to the CUP application, and therefore both applications shall be reviewed through the Type III process.

- B. *Development in Accord with Plans. Construction, site development, and landscaping shall be carried out in substantial accord with the plans, drawings, sketches, and other documents approved as part of a final decision on a site design review.*

RESPONSE: The applicant will comply with the requirements of this section. Final compliance will be confirmed at the time of construction permit issuance.

- C. *Site Design Review Time Limit. An approved site design review plan intended to be constructed in a single phase shall be valid for one year from the date of the notice of final decision. A building permit must be acquired within this time period or the design review approval shall terminate. 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 design review approval; and*

2. *The applicable standards in this code which applied to the project have not changed.*

RESPONSE: The applicant will comply with all conditions of approval as imposed. Should an extension be required, the applicant will submit a request within the permitted timeframes.

- D. *Phased Design Review Approval. If a site plan is approved to be constructed in phases, completion of each phase shall extend the expiration of the original design review approval by 12 months from the date of its expiration. Prior to the expiration of each phase, the applicant may apply for an extension to the phase which is about to expire through subsection (C) of this section. The extension of a phase under subsection (C) of this section shall also extend any subsequent phases. The total number of extensions shall not extend the original design review approval more than five years from its original approval date. An applicant with a project containing two or more phases may elect to submit a master site development plan, with the following options:*

RESPONSE: The applicant is not requesting approval for phasing with this development.

15.220.030 Site design review requirements.

- A. *Type I. Applications for Type I permit decisions shall be submitted upon forms established by the director. The application shall include a site development plan, drawn to scale, with the following as appropriate to the nature of the use:*

...

RESPONSE: The submitted request is a Type II application, therefore the requirements of this section are not applicable.

- B. *Type II. The following information is required to be submitted with all Type II applications for site design review:*
 1. *Site Development Plan. A site development plan shall be to scale and shall indicate the following as appropriate to the nature of the use:*
 - a. *Access to site from adjacent right-of-way, streets and arterials;*
 - b. *Parking and circulation areas;*
 - c. *Location and design of buildings and signs;*

- d. *Orientation of windows and doors;*
- e. *Entrances and exits;*
- f. *Private and shared outdoor recreation spaces;*
- g. *Pedestrian circulation;*
- h. *Outdoor play areas;*
- i. *Service areas for uses such as mail delivery, trash disposal, above-ground utilities, loading and delivery;*
- j. *Areas to be landscaped;*
- k. *Exterior lighting;*
- l. *Special provisions for handicapped persons;*
- m. *Other site elements and spaces which will assist in the evaluation of site development;*
- n. *Proposed grading, slopes, and proposed drainage;*
- o. *Location and access to utilities including hydrant locations; and*
- p. *Streets, driveways, and sidewalks.*

RESPONSE: The application includes the above elements on site plans within this submittal, and in particular the Site Development Plan, as detailed below. Site grading, circulation, landscaping, building design, and parking areas are highlighted within the plan set. This requirement is satisfied.

- 2. *Site Analysis Diagram. A site analysis diagram shall be to scale and shall indicate the following characteristics on the site and within 100 feet of the P5.0 site:*
 - a. *Relationship of adjacent lands;*
 - b. *Location of species of trees greater than four inches in diameter at four feet above ground level;*
 - c. *Existing and proposed topography;*
 - d. *Natural drainage and proposed drainage and grading;*

- e. *Natural features and structures having a visual or other significant relationship with the site.*

RESPONSE: The application includes the above elements on site plans within this submittal, and in particular the Site Analysis Diagram, as detailed below. The site is generally flat, with little to no significant vegetation or natural features present. This requirement is satisfied.

- 3. *Architectural Drawings. Architectural drawings shall be prepared which identify floor plans and elevations.*

RESPONSE: The applicant has provided architectural drawings, including both floor plans and elevations, with this submittal. Indicative materials sheets have also been provided. This requirement is satisfied.

- 4. *Landscape Plan. The landscape plan shall indicate:*
 - a. *The size, species and approximate locations of plant materials to be retained or placed on the site together with a statement which indicates the mature size and canopy shape of all plant materials;*
 - b. *Proposed site contouring; and*
 - c. *A calculation of the percentage of the site to be landscaped.*

RESPONSE: The applicant has submitted Landscaping Plans (Sheet L1.0) as required by this Section, and addressing the requirements identified above. This requirement is satisfied.

- 5. *Special Needs for Handicapped. Where appropriate, the design review plan shall indicate compliance with handicapped accessibility requirements including, but not limited to, the location of handicapped parking spaces, the location of accessible routes from the entrance to the public way, and ramps for wheelchairs.*

RESPONSE: The applicant will provide ADA features as necessary, including building access and parking. Compliance will be determined at the time of final plan submittal and building permit review. This requirement is satisfied.

- 6. *Existing Features and Natural Landscape. The plans shall indicate existing landscaping and existing grades. Existing trees or other features intended to be preserved or removed shall be indicated on the plans.*

RESPONSE: As detailed previously and shown on the Existing Conditions and Demolition Plan (Sheet P2.0) submitted with the application, the site is generally flat yet 3-4 feet higher than the

adjacent sidewalks on average. The site is currently grassed, with no trees on site therefore none to require removal. This requirement is satisfied.

7. *Drives, Parking and Circulation. Proposed vehicular and pedestrian circulation, parking spaces, parking aisles, and the location and number of access points shall be indicated on the plans. Dimensions shall be provided on the plans for parking aisles, back-up areas, and other items as appropriate.*

RESPONSE: Proposed parking and site circulation is shown on site plans submitted with the application, notably Sheet P4.0 Preliminary Site Plan, and including dimensions and back up areas. This requirement is satisfied.

8. *Drainage. The direction and location of on- and off-site drainage shall be indicated on the plans. This shall include, but not be limited to, site drainage, parking lot drainage, size and location of storm drain lines, and any retention or detention facilities necessary for the project.*

RESPONSE: Site drainage and storm utility requirements are shown on site plans submitted with the application, including Sheet P3.0 Preliminary Grading and Erosion Control Plan, and Sheet P5.0 Preliminary Composite Utility Plan. This requirement is satisfied.

9. *Buffering and Screening. Buffering and screening of areas, structures and facilities for storage, machinery and equipment, services (mail, refuse, utility wires, and the like), loading and parking and similar accessory areas and structures shall be shown on the plans.*

RESPONSE: The applicant has submitted Landscaping Plans (Sheet L1.0) as required by this Section, showing screening of parking, loading and circulation areas. Screening of the garbage and recycling areas is also shown. This requirement is satisfied.

10. *Signs and Graphics. The location, colors, materials, and lighting of all exterior signs, graphics or other informational or directional features shall be shown on the plans.*

RESPONSE: Signs and graphics are proposed to be limited to the address and name of the complex, and any incidental wayfinding signage necessary. Signage is indicated on the preliminary elevations submitted with the application.

11. *Exterior Lighting. Exterior lighting within the design review plan shall be indicated on the plans. The direction of the lighting, size and type of fixtures, and an indication of the amount of lighting shall be shown on the plans.*

RESPONSE: The applicant has submitted an illumination plan showing parking area and pedestrian friendly building lighting, as required by this section.

12. *Trash and Refuse Storage. All trash or refuse storage areas, along with appropriate screening, shall be indicated on the plans. Refuse storage areas must be constructed of brick, concrete block or other similar products as approved by the director.*

RESPONSE: Trash and refuse storage is proposed to be located at the north west corner of the building, to allow easy access to residents and haulers. The trash and refuse storage area is proposed to be constructed using CMU bricks, with a stone cap as required by this section. Gates and a pedestrian door for resident access will be steel

13. *Roadways and Utilities. The proposed plans shall indicate any public improvements that will be constructed as part of the project, including, but not limited to, roadway and utility improvements.*

RESPONSE: The applicant has provided preliminary plans with this submittal showing all proposed public improvements, including transportation improvements and utility services. See Sheet P4.0 Preliminary Site Plan and Sheet P5.0 Preliminary Composite Utility Plan for more details.

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.*

RESPONSE: The applicant has submitted a Transportation Impact Study (TIS) for the development, prepared by Lancaster Mobley and dated October 31, 2022. Please see the submitted TIS for more information, findings, and recommendations.

15.220.040 *Conditions may be required.*

Applications for site design review may be approved subject to such conditions as are necessary to fulfill the purpose and provisions of this code.

RESPONSE: The applicant acknowledges that the City may provide an approval with conditions, and will comply with all jurisdictional conditions of approval as imposed.

15.220.050 Criteria for design review.

- B. *Type II. The following criteria are required to be met in order to approve a Type II design review request:*
1. *Design Compatibility. The proposed design review request incorporates an architectural design which is compatible with and/or superior to existing or proposed uses and structures in the surrounding area. This shall include, but not be limited to, building architecture, materials, colors, roof design, landscape design, and signage.*

RESPONSE: The applicant is proposing a 3 story multi-family building in a Community Commercial (C-2) zone. The C-2 community commercial district is intended to create, preserve, and enhance areas with a wide range of retail sales, commercial services, and office establishments. The C-2 district also includes some development which does not strictly fit the description of “commercial” but also does not merit a separate zoning district. Overall, the C-2 district is intended to be consistent with the commercial (COM) and mixed use (MIX) designations of the comprehensive plan, with the MIX designation allowing for high-density residential uses, primarily multi-plexes and low- or medium-rise multi-family dwellings. With 3 stories of residential units and an average height of 29.9 feet between the ground and the edge of eaves, the proposed building is consistent with the purpose of the C-2 Zone and the Mixed-Use plan designation, and existing surrounding uses.

The building has been designed to match the massing and height of nearby structures, including the big box retail setting of Bi-Mart, and the commercial services buildings at 3100 E Haworth Avenue to the west and the Mail Room within Springbrook Plaza to the east, and to complement the massing expected adjacent to an arterial and/or collector street. However, the building has also been designed with typical residential styling for the Newberg area, with narrow lap siding mixed with a larger lap to break up the façade, a hip roof form with eaves, and covered entryways. Landscaping surrounding the site is designed to provide privacy for residents and to shield parking and service areas from the street.

As described above, the development serves to be compatible with the surrounding Community Commercial land uses in the area, while also providing 28-units of multi-family housing which incorporates residential design and landscaping features consistent with Newberg’s traditional residential areas.

2. *Parking and On-Site Circulation. Parking areas shall meet the requirements of NMC 15.440.010. Parking studies may be required to determine if adequate parking and circulation are provided for uses not specifically identified in NMC 15.440.010. Provisions shall be made to provide efficient and adequate on-site circulation without using the public streets as part of the parking lot circulation pattern. Parking areas shall be designed*

so that vehicles can efficiently enter and exit the public streets with a minimum impact on the functioning of the public street.

RESPONSE: As demonstrated in the TIS for the development, prepared by Lancaster Mobley and dated October 31, 2022, the site includes one permanent access to the surrounding street network, located at the north west corner of the site. The TIS recommends that the proposed apartment complex be allowed an unrestricted full movement access onto E Haworth Avenue at that location, as based on the queuing analysis, adequate spacing between the proposed site access intersection and the intersection of Haworth Avenue at N Springbrook Road is available to allow un-restricted turning movements at the site access intersection without creating safety issues.

In accordance with Newberg Development Code Section 15.440.030, 1 off-street parking space is required for every studio or one-bedroom unit, with 1.5 off-street spaces required for every two-bedroom unit. As described, the proposed development includes 16 one-bedroom units and 12 two-bedroom units, therefore off-street parking is required as follows:

One-bedroom = 16 x 1 = 16 spaces
Two-bedroom = 12 x 1.5 = 18 spaces
Total = 34 spaces

In addition, 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. Accordingly, the following visitor spaces are required:

28 units x 0.2 = 5.6 = 6 spaces

As such, 40 off-street parking spaces are needed to meet the minimum parking requirements of Section 15.440.010.B. As shown on Sheet P4.0, Preliminary Site Plan, the applicant proposes to provide 43 off-street spaces, and therefore parking is provided in sufficient quantities to meet the requirements of this Section. Parking is designed in accordance with Section 15.44.070, in order to provide efficient and safe circulation.

3. *Setbacks and General Requirements. The proposal shall comply with NMC 15.415.010 through 15.415.060 dealing with height restrictions and public access; and NMC 15.405.010 through 15.405.040 and 15.410.010 through 15.410.070 dealing with setbacks, coverage, vision clearance, and yard requirements.*

RESPONSE: Setbacks, yards and vision clearance are shown on site plans submitted with the application, including Sheet P4.0 – Preliminary Site Plan and Sheet L1.0 – Preliminary Landscape Plans, and are further detailed in this report.

4. *Landscaping Requirements. The proposal shall comply with NMC 15.420.010 dealing with landscape requirements and landscape screening.*

RESPONSE: The applicant has provided landscaping plans with the submittal, including Sheet L1.0 – Preliminary Landscape Plans, meeting the requirements of NMC 15.420.010.

5. *Signs. Signs shall comply with NMC 15.435.010 et seq. dealing with signs.*

RESPONSE: Signage will be restricted to the wall mounted name and address of the building, which are shown on the elevations submitted with this application and will be confirmed prior building permits submittals.

6. *Manufactured Dwelling, Mobile Home and RV Parks. Manufactured dwelling and mobile home parks shall also comply with the standards listed in NMC 15.445.075 Through 15.445.100 in addition to the other clear and objective criteria listed in this section. RV parks also shall comply with NMC 15.445.170 in addition to the other criteria listed in this section.*

RESPONSE: The Applicant seeks approval of this request for a Type III Conditional Use Permit (Residential in C-2 Zone) and Site Design Review (companion to CUP) for a 28-unit multi-family apartment building. No Manufactured Dwelling, Mobile Home and RV Parks are proposed as part of the development.

7. *Zoning District Compliance. The proposed use shall be listed as a permitted or conditionally permitted use in the zoning district in which it is located as found in NMC 15.305.010 Through 15.336.020. Through this site review process, the director may make a determination that a use is determined to be similar to those listed in the applicable zoning district, if it is not already specifically listed. In this case, the director shall make a finding that the use shall not have any different or more detrimental effects upon the adjoining neighborhood area than those specifically listed.*

RESPONSE: The Applicant seeks approval of this request for a Type III Conditional Use Permit (Residential in C-2 Zone) and Site Design Review (companion to CUP) for a 28-unit multi-family apartment building. The use is conditionally permitted in the C-2 zone.

8. *Subdistrict Compliance. Properties located within subdistricts shall comply with the provisions of those subdistricts located in NMC 15.340.010 through 15.348.060.*

RESPONSE: The northwestern approximately 65% of the site is designated as being within a Marijuana Exclusion Zone (MEZ), while the remainder of the southeastern corner of the site is within the Airport Inner Horizontal Surface. These requirements are addressed in response to Sections NMC 15.340.010 through 15.348.060.

9. *Alternative Circulation, Roadway Frontage Improvements and Utility Improvements. Where applicable, new developments shall provide for access for vehicles and pedestrians to adjacent properties which are currently developed or will be developed in the future. This may be accomplished through the provision of local public streets or private access and utility easements. At the time of development of a parcel, provisions shall be made to develop the adjacent street frontage in accordance with city street standards and the standards contained in the transportation plan. At the discretion of the city, these improvements may be deferred through use of a deferred improvement agreement or other form of security.*

RESPONSE: Except for construction of a driveway access and a financial contribution to the construction of traffic signals at the Haworth/Springbrook intersection, neither the City nor the applicant have identified any specific street improvements required for the site, either within the right-of-way or to provide additional onsite circulation. All surrounding parcels are already developed with their own existing access to the surrounding public streets.

10. *Traffic Study Improvements. If a traffic study is required, improvements identified in the traffic study shall be implemented as required by the director.*

RESPONSE: The applicant has submitted a Transportation Impact Study (TIS) for the development, prepared by Lancaster Mobley and dated October 31, 2022. Please see the submitted TIS for more information, findings, and recommendations.

15.220.060 Additional requirements for multifamily residential projects.

The purpose of this section is to ensure that multifamily residential projects containing five 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 smaller multifamily projects with five to eight units and at least 20 points are required for multifamily projects with nine or more units. For more information and illustrations of each element, refer to the Newberg Residential Development Design Guidelines (July 1997).

RESPONSE: The applicant has provided Site Design Elements and Building Design Elements exceeding the minimum 20-point requirement, as described below. In total, the applicant is developing the project to achieve a combined total of 20 points as follows:

Site Design Elements		Building Design Elements		Total
Element 1	3 points	Element 3	3 points	
Element 7	2 points	Element 4	3 points	
Element 8	1 point	Element 8	2 points	
Element 9	1 point	Element 9	2 points	
Element 10	1 point			
Element 11	1 point			
Element 12	1 point			
Total	10 Points		10 Points	20 Points

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).*

RESPONSE: The applicant has consolidated green space within the development along the southern property line, in order to maximize utility of the space and provide residents with a range of opportunities for outdoor recreation. As shown on plans submitted with the application, the design of shared green space within the development includes a covered outdoor patio area at the rear of the building; bench seating; a bocce ball court; a garden area with raised steel planting tanks; and attractive landscaping throughout. The use of crushed, compacted granite outside the pathway and planted areas ensures low water demand, and an all-weather surface suitable for dog exercising with easy cleaning and maintenance.

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).*

RESPONSE: As shown on landscaping plans submitted with the application, the perimeter of the site has been thoughtfully landscaped to minimize the appearance of parking areas associated with the development, and to create a visually interesting street frontage. Plants have been selected for their hardiness, and to provide year-round texture and contrast to the site. Indicative examples include ground covers (sage), small shrubs (Yucca and New Zealand Flax), and visually interesting trees (Black gum, ginkgo).

8. *Use street trees and vegetative screens at the front property line to soften visual impacts from the street and provide shade (one point).*

RESPONSE: As shown on landscaping plans submitted with the application and as described above, the perimeter of the site has been thoughtfully landscaped to create a visually interesting street frontage, shade within the parking area and on the adjoining sidewalks during warmer months, and to create a more enjoyable space for residents and visitors alike. Landscaping incorporates both street trees and site landscaping into a cohesive design.

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).*

RESPONSE: As shown on landscaping plans submitted with the application. The applicant is providing a range of furnishings and improvements in order to enhance residential experience within the open space areas. The improvements include, but are not limited to, a bocce ball, attractive plantings, bench seating, a covered patio area, and a garden area with raised steel planting tanks.

10. *Keep fences neighborly by keeping them low, placing them back from the sidewalk, and using compatible building materials (one point).*

RESPONSE: Neighbor fencing exists along the south and west property lines, and as they are not under the control of the applicant, they will not be altered. Along the east and the north property lines, the proposed landscaping plan shows a low fence (except within corner vision areas, as shown) set back several feet from the back of sidewalk. The intervening areas will be planted with groundcover plants, with shrubs and trees behind the fence. The end result is an attractive, neighborly fence which screens parking areas from the street without becoming overbearing for pedestrians.

11. *Use entry accents such as distinctive building or paving materials to mark major entries to multifamily buildings or to individual units (one point).*

RESPONSE: The main entry to the building is facing E Haworth Avenue, as the lower classified street. No access is provided to N Springbrook Road. The main building entrance faces E Haworth Avenue, and is enhanced with a covered porch over a patio area constructed with dyed sand finished concrete with a decorative score pattern, along with several landscape wells for planting. From this entry area, a pedestrian pathway provides a direct access to E Haworth Avenue, at a distance of approximately 55 feet. As it crosses the parking drive aisle, the pathway will be constructed from a contrasting material, such as colored concrete or pavers.

12. *Use appropriate outdoor lighting which enhances the nighttime safety and security of pedestrians without causing glare in nearby buildings (one point).*

RESPONSE: The applicant has had a Lighting and Photometric Plan prepared by HL Stearns for the site illumination requirements. The parking area will be illuminated by 12 Lithonia Parking Area LED lighting fixtures on 20-foot-tall poles. Along sidewalks around the building, including the pathway to the solid waste and recyclable areas, and the pedestrian path from the front door to E Haworth Avenue, the applicant will install 11 pedestrian scale bollard lights to illuminate pedestrian ways for safety. Additional building downlights will also be provided to illuminate areas around the buildings.

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).*

RESPONSE: The proposed building is approximately 103 feet long (north to south) and 88 feet wide (east to west). As shown on building elevations and site renderings submitted with the application, each side of the building is divided into multiple bays to break up the mass of the structure and units. On the north side, the building includes 7 individual horizontal planes across the 88-foot width, while along the east side the building includes 5 individual horizontal planes across the 103-foot length, meeting the requirements of this section.

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).*

RESPONSE: In addition to the individual horizontal planes described above, which already provide differentiation across the structure, the applicant has utilized a number of different architectural elements to provide variation and identifying features. These include the use of both wide and narrow lap siding materials, with the wider lap boards painted in a light gray/off-white color, and the narrow lap boards painted a darker tone to underscore the variation. Ground floor patios with attractive privacy measures and reversed door locations provides further variation between units.

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).*

RESPONSE: A front porch is provided on the north street frontage, which serves as the main building entrance. The porch consists of an approximately 20.5-foot wide by 14-foot-deep permanent covered entryway, set over a dyed and scored sand finished paved pedestrian area. The uncovered area will include planting wells to add vegetation to the entrance, and will also connect to a distinctively marked pedestrian way leading directly to the frontage street, E Haworth Avenue. At the rear of the building, the cantilevered 2nd story will provide a large

covered porch area over the secondary building entrance, which also serves as part of the open space amenity provided on the site.

9. *Use sloped roofs at a pitch of 3:12 or steeper. Gable and hip roof forms are preferable (two points).*

RESPONSE: As shown on the building elevations submitted with the application, the applicant has proposed the use of a hip roof form with a 4:12 pitch, exceeding the minimum 3:12 specified by this section.

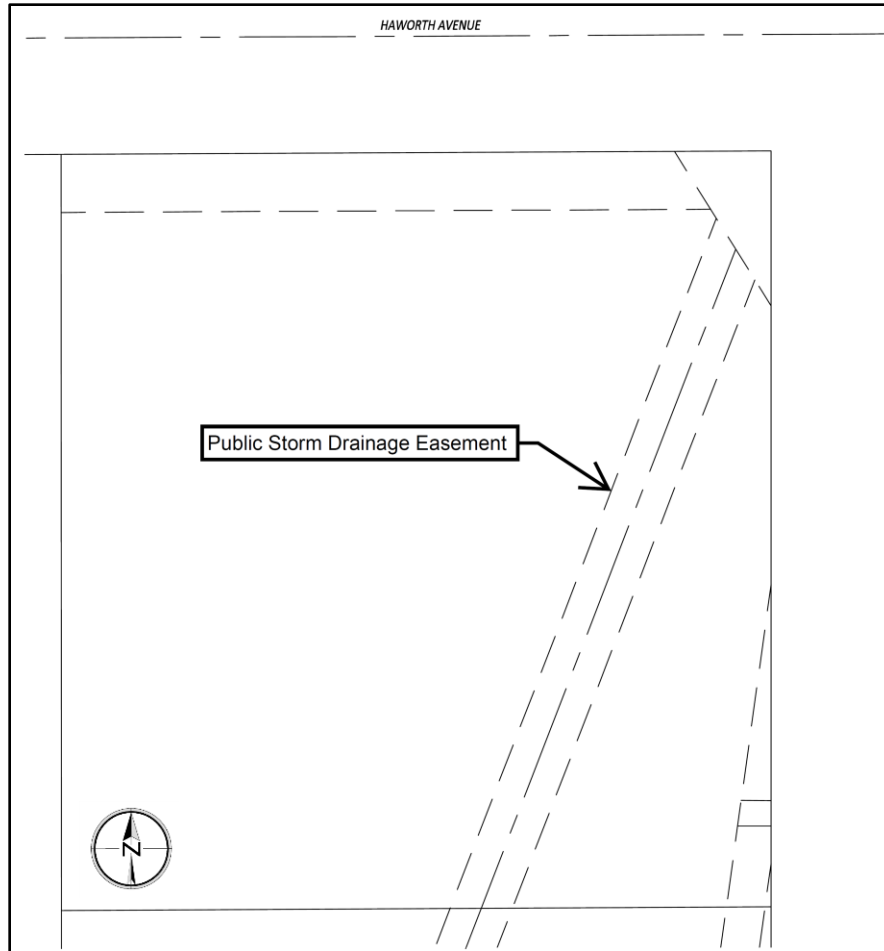
15.220.070 Additional requirements for development in the C-2 zoning district.

The purpose of this section is to ensure that development in the C-2 zoning district is designed to promote pedestrian and bicycle uses and improve aesthetics and compatibility. An applicant for a new development or redevelopment within the C-2 zoning district, which is subject to the site design review process, must demonstrate that the following site and building design elements have been incorporated into the design of the project. Exceptions to these additional development requirements may be granted if the requirements would result in construction that is out of character with surrounding development. Applicants for redevelopment of a designated landmark will not be subject to these additional requirements, except for requirements regarding parking and service drives.

RESPONSE: The proposed development is subject to the design review process, and is therefore subject to the additional site and building design elements below.

The proposal is for a 28-unit multi-family residential unit development, while the design elements below primarily address commercial or other mixed-use structures. In addition, the site is encumbered with an existing 15-foot-wide storm drainage easement, along with several other easements, which bisects the site and limits the ability to develop structures adjacent to N Springbrook Road. Further, access restrictions on both E Haworth Avenue and N Springbrook Road dictate that the site access be located at the north west corner of the site, resulting in the access drive being required to be located between E Haworth Avenue and the proposed structure. Accordingly, the applicant will describe compliance with the design elements to the extent practicable, as allowed through the exceptions described above and Subsection C below.

Despite the aforementioned site limitations, which would demonstrably apply to any comprehensive development of the property, the proposed development serves to achieve the purpose of this section and the C-2 district. The development has been designed to draw residents to Newberg's commercial districts, creating a denser downtown area, while complementing and supporting the established neighborhood and creating a sense of community. The development minimizes traffic impacts as residents can work and enjoy activities close to home, and take advantage of bicycle and pedestrian uses in the area. Increased population density can help revitalize commercial areas, creating new demand for commercial goods and services.



- A. *Building Entrances. Each building on a lot shall have a primary pedestrian entrance oriented to the primary street. “Oriented to a street” means that the building entrance faces the street or is connected to the street by a direct and convenient pathway not exceeding 60 feet in length. “Primary street” means the street which has the highest estimated volume of pedestrian traffic. This requirement does not apply to buildings that are located behind other buildings on the lot such that 50 percent or more of their building frontage is blocked by the front building, as measured by sight lines that are perpendicular to the street right-of-way. Such rear buildings shall have a primary entrance oriented to an internal sidewalk or pedestrian pathway system which is internally connected and provides a connection to the primary street.*

RESPONSE: The subject building has two building entrances, one facing the north property line (E Haworth Avenue), and one facing an internal property line to the south. The main building entrance faces E Haworth Avenue, and is enhanced with a covered porch over a patio area constructed with dyed sand finished concrete and a decorative score pattern, along with several landscape wells for planting. From this entry area, a pedestrian pathway provides a direct access to E Haworth Avenue, at a distance of approximately 55 feet. As it crosses the parking drive aisle, the pathway will be constructed from a contrasting material, such as colored concrete or

pavers. E Haworth Avenue, with lower vehicular traffic volumes, is considered to be the primary pedestrian street, with direct access to adjoining commercial development to the west, and convenient access to Springbrook Plaza to the east.

- B. Parking and Service Drives. No off-street parking or service drives shall be placed within the required front yard setback. No off-street parking shall be placed between the front property line of the primary street, as defined in subsection (A) of this section, and the building. This requirement does not apply to buildings that are located behind other buildings on the lot such that 50 percent or more of their building frontage is blocked by the front building, as measured by sight lines that are perpendicular to the street right-of-way.*

RESPONSE: The front yard setback within the C-2 district is 10-feet. As shown on site plans submitted with the application, parking is proposed to be located 10-feet from the front property line along E Haworth Avenue. The setback area will be landscaped as shown on Sheet L1.0.

Due to existing site and access conditions described above, a portion of the off-street parking provided is located between the front property line of the primary street (E Haworth Avenue) and the building. The applicant requests an exception to this requirement per C. below.

- C. Exceptions. The review body may approve exceptions to the above, provided there are no reasonable alternatives that would allow access to or parking on the lot.*

RESPONSE: As described above, the applicant requests an exception to allow a portion of the off-street parking to be located between the front property line to the primary street (E Haworth Avenue) and the building. As described, the site access is required to be located at the north west corner of the building due to access restrictions. As the building cannot be located further east towards N Springbrook Road due to the location of the existing storm drainage easement, the only reasonable option for access to parking is along the front and east of the building.

- D. Building Mass. Where building elevations are oriented to the street in conformance with subsection (A) of this section, architectural features such as windows, pedestrian entrances, building offsets, projections, detailing, change in materials or similar features, shall be used to break up and articulate large building surfaces and volumes.*

RESPONSE: In accordance with subsection (A) of this section, the primary elevation pointing to the street is the north façade. The north façade features the primary building entrance with a covered entryway and paved area; pedestrian connection to E Haworth Avenue; 7 individual breaks in the horizontal planes across the 88-foot width; and use of a narrow lap siding mixed with a larger lap to break up the façade, with the change in material further defined by the use of contrasting colors. It is also noted that of the approximately 2,632.6 square feet of 2D surface area of the north façade, approximately 890 square feet is made up of window glazing, or 33% of

the frontage. The above elements serve to break up the mass of the building, and provide articulation and visual interest, as required by this section.

- E. *Corner Lots. Buildings on corner lots shall have their primary entrance oriented to the street corner, or within 40 feet of the street corner (i.e., as measured from the lot corner). In this case, the street corner shall provide an extra-wide sidewalk or plaza area with landscaping, seating or other pedestrian amenities. The building corner shall provide architectural detailing or beveling to add visual interest to the corner.*

RESPONSE: As described above, existing easements prevent the location of the building near the intersection of E Haworth and N Springbrook Road. Further, the unknown ultimate alignment of traffic signals at the intersection and current corner vision requirements precludes locating the building at the corner, or construction of a plaza area with landscaping, seating or other pedestrian amenities.

- F. *Pedestrian-Scale Building Entrances. Recessed entries, canopies, and/or similar features shall be used at the entries to buildings in order to create a pedestrian scale.*

RESPONSE: The main building entrance faces E Haworth Avenue, and is enhanced with a covered porch over a patio area constructed with dyed sand finished concrete and a decorative score pattern, along with several landscape wells for planting. From this entry area, a pedestrian pathway provides a direct access to E Haworth Avenue, at a distance of approximately 55 feet. As it crosses the parking drive aisle, the pathway will be constructed from a contrasting material, such as colored concrete or pavers. E Haworth Avenue, with lower vehicular traffic volumes, is considered to be the primary pedestrian street, with direct access to adjoining commercial development to the west, and convenient access to Springbrook Plaza to the east.

- G. *Windows.*

- 1. *On commercial building facades facing a public street, windows shall comprise a minimum of 40 percent of the ground floor facade. For large-scale buildings and developments meeting the standards under subsection (H) of this section, windows shall comprise a minimum of 20 percent of the ground floor facade.*

RESPONSE: The proposed use of the site is a 28-unit multi-family residential development, rather than a commercial development. Accordingly, this section is not applicable.

- 2. *For large-scale buildings and developments meeting the standards under subsection (H) of this section, 50 percent of all required window area shall allow view into an active space. An “active space” is defined as any area within a building that is used for shopping, dining, office space, and so forth. Merchandise display windows with displays that change at*

least semi-annually shall be considered an active space. Examples of areas that are considered nonactive spaces are storage and mechanical equipment areas, and windows that are obscured by shelving or material affixed to the window.

RESPONSE: The proposed use of the site is a 28-unit multi-family residential development, with a total floor area of approximately 24,442 square feet. The development is not considered large scale, and accordingly, this section is not applicable.

H. Design of Large-Scale Buildings and Developments. All buildings on a development site shall conform to the design standards included under this subsection where the total square footage of one commercial building exceeds 30,000 square feet of total ground floor area or all commercial buildings exceed 50,000 square feet of total ground floor area. Deviations from these standards may be approved, where appropriate, through the conditional use permit process.

RESPONSE: The proposed use of the site is a 28-unit multi-family residential development, with a total floor area of approximately 24,422 square feet. The development is not considered large scale, and accordingly, this section is not applicable.

Chapter 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.*

- 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.*

RESPONSE: The applicant provides herein written evidence of compliance with the requirements of this section, including necessary studies including a Traffic Impact Assessment and a Preliminary Storm Drainage Analysis, supporting documents including site plans, landscaping plans, and building floor plans and elevations, and administrative documents including a title report and pre-application conference notes. All of the above demonstrate that the proposed development is consistent with the requirements of the Newberg Development Code and Chapter 15.255, and compatible with surrounding uses in the community.

15.225.020 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.

RESPONSE: The applicant will obtain Conditional Use Permit approval prior to issuance of any building permits for the site, as required by this section.

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.

RESPONSE: As described above, the applicant provides herein written evidence of compliance with the requirements of this section, including necessary supporting documentation including but not limited to a Traffic Impact Assessment and a Preliminary Storm Drainage Analysis, supporting documents including site plans, landscaping plans, and building floor plans and elevations, and administrative documents including a title report and pre-application conference notes. The applicant will provide any additional information requested by the City if required.

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.

RESPONSE: The Conditional Use Permit request has been submitted concurrently with a Design Review application as required.

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.

RESPONSE: The applicant has provided all information identified in the pre-application conference to allow the City to make an affirmative finding of compliance with the requirements of the Newberg Development Code. However, the applicant will provide any additional information requested by the City if required through the completeness review process, and in accordance with State law.

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.

RESPONSE: As described, the applicant has provided all information identified in the pre-application conference to allow the City to make an affirmative finding of compliance with the requirements of the Newberg Development Code, and the requirements listed above. The location, size, design and residential nature of the proposed development is compatible with abutting properties and the surrounding neighborhood, and will have and have minimal impact on their livability or appropriate development opportunities. The application is consistent with the requirements of this section.

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.*

RESPONSE: The applicant acknowledges the ability of the City to condition the proposal to ensure it remains consistent with the purposes of this Conditional Use Permit and the C-2 zoning district, and that the development occurs in an orderly and efficient manner.

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.

RESPONSE: The applicant has worked diligently to provide a detailed application which complies with the requirements of the Newberg Development Code. The development will remain in substantial conformance with the plans, drawings, conditions, sketches, and other documents approved as part of this application.

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.*

RESPONSE: The applicant acknowledges the requirements of this Section, and will exercise the right granted under any approval within one year from the effective date of the decision, unless the applicant files an extension request in writing prior to the expiration of the approval

Chapter 15.303 – USE CATEGORIES

15.303.010 Purpose.

- A. Defined and Categorized Uses.*

Chapter 15.305 NMC lists the allowable uses in each zoning district. The uses listed are of two types:

- 1. Defined Uses. Defined uses are those uses that fit a specific definition contained in the definition section under NMC 15.05.030. For example, a “family child care home” is a specific defined use that is different than other day care type uses.*

2. *Use Categories. Use categories are used to describe land uses and activities that may be known by several common names, but are organized on the basis of common functional, product, or physical characteristics. For example, beauty salons, tanning salons, and body art studios are classified into a general category, “personal services.” Uses are assigned to the category whose description most closely describes the nature of the primary use. The “characteristics” subsection of each use category describes the characteristics of each use category. Developments may have more than one primary use. Developments may also have one or more accessory uses.*

RESPONSE: The development request, for a 28-unit multi-family residential building, is a defined Residential use under Section 15.303.200.

B. Interpretation.

When a use’s category is not clearly identifiable, the director, through a Type I procedure, determines the applicable use category or similar use. The following is considered to determine what use category the use is in, and whether the activities constitute primary uses or accessory uses:

...

RESPONSE: The development request, for a 28-unit multi-family residential building, is a clearly identifiable as a Residential use under Section 15.303.200.

...

- D. Accessory Uses. The “accessory uses” subsection lists common accessory uses that are allowed by right in conjunction with the use unless stated otherwise in the regulations. Also, unless otherwise stated, they are subject to the same regulations as the primary use. Typical accessory uses are listed as examples with the categories.*

...

RESPONSE: The proposed use is residential, and will include those accessory uses as are typically allowed by right in conjunction with residential development.

15.303.200 Residential uses.

The following residential uses are defined in NMC 15.05.030:

...

- M. Dwelling, multifamily.*

RESPONSE: The development request, for a 28-unit multi-family residential building, is a clearly identified as a Dwelling, Multi-family use under Section 15.303.200.M. above.

Chapter 15.305 – ZONING USE TABLE

15.305.010 Classification of uses.

The zoning use table under NMC 15.305.020 identifies the land uses that are allowed in the various zoning districts. The specific land use categories are described in Chapter 15.303 NMC. The table identifies each use as one of the following:

P - Permitted Use. The use is a permitted use within the zone. Note that the use still may require design review, building permits, or other approval in order to operate.

C - Conditional Use. A conditional use permit is required for the use. See Chapter 15.225 NMC.

S - Special Use. The use is subject to specific standards as identified within this code. The applicable section is included in the last column of the table.

(#) - A note indicates specific limits on the use. These notes are listed at the bottom of the table.

X - Prohibited Use. The use is specifically prohibited.

If none of the codes above are indicated, then the use is not permitted within the zone.

Newberg Development Code – Zoning Use Table																					
#	Use	R-1	R-2	R-3	R-4	RP	C-1	C-2	C-3	C-4	M-E	M-1	M-2	M-3	M-4-I	M-4-C	CF	I	AR	AI	Notes and Special Use Standards
200	Residential Uses																				
Def.	Dwelling, Multifamily	C	P	P	C	P		C(4)	P(8)/C(4)												Subject to lot or development site area requirements of NMC 15.405.010

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

RESPONSE: The development request, for a 28-unit multi-family residential building in the C-2 zoning district, is designated as a conditional use, “Dwelling, Multi-Family”, in the City of Newberg Development Code Zoning Use Table,

Chapter 15.340 – AIRPORT OVERLAY (AO) SUBDISTRICT

15.340.010 Purpose.

- A. *In order to carry out the provisions of this airport overlay subdistrict, there are created and established certain zones which include all of the land lying beneath the airport imaginary surfaces as they apply to Sportsman Airpark in Yamhill County. Such zones are shown on the current airport overlay zone map and the displaced threshold approach surface map, prepared by the Newberg engineering department (see Appendix B, Maps 2 and 3).*
- B. *Further, this overlay zone is intended to prevent the establishment of air space obstructions in airport approaches and surrounding areas through height restrictions and other land use controls as deemed essential to protect the health, safety and welfare of the people of the City of Newberg and Yamhill County.*

RESPONSE: The subject site is located in the Airport Overlay Subdistrict, as shown on the current airport overlay zone map and the displaced threshold approach surface map. The site is further identified as being located within the Airport Inner Horizontal Surface, but is located outside the Airport approach Safety Zone or Airport Transitional Surface, as shown below:



15.340.020 *Permitted uses within the airport approach safety zone.*

RESPONSE: The subject site is not located within the Airport Approach Safety Zone; therefore, the requirements of this section are not applicable.

15.340.030 *Conditional uses within the airport approach safety zone.*

RESPONSE: The subject site is not located within the Airport Approach Safety Zone; therefore, the requirements of this section are not applicable.

15.340.040 *Procedures.*

- A. *Development Permits. An application for a development permit for any permitted use within the airport approach safety zone or the displaced threshold approach surface zone which is subject to site design review as required by NMC 15.220.010 et seq. and shall include the following information:*

RESPONSE: The subject site is not located within the Airport Approach Safety Zone or the Displaced Threshold Approach Surface Zone; therefore, the requirements of this section are not applicable.

- B. *FAA Notice Required. To meet the requirements of Federal Aviation Regulations Part 77, FAA Form 7460-1, Notice of Proposed Construction or Alteration, must be submitted for any construction or alteration of greater height than an imaginary surface extending outward and upward at a slope of 50 to one for a horizontal distance of 10,000 feet from the nearest point of the nearest runway of the airport. Notice is not required for construction or alteration that is shielded by existing structures or terrain as defined in Section 77.15 of Part 77 of the Federal Aviation Regulations.*

RESPONSE: The south west corner of the subject site is located approximately 3,500 feet from the northern end of the Sportsman Airpark runway, which is the nearest point of the runway to the property. At a distance of 3,500 feet, a Notice of Proposed Construction or Alteration pertaining to the site must be submitted for any construction or alteration of greater height than 70 feet, which is the height of an imaginary surface extending outward and upward at a slope of 50:1 ((3,500/50) x 1 = 70 feet). While the building height as measured under Section 15.415.020.2 of the Newberg Development Code is 36 feet 0.65 inches, the maximum ridge height of the structure is proposed at approximately 43.4 feet, which is well under the 70-foot imaginary surface height, and therefore FAA Form 7460-1 notice is not required.

15.340.050 *Limitations.*

- A. *To meet the standards and reporting requirements established in FAA Regulations, Part 77, no structure shall penetrate into the*

airport imaginary surfaces as defined in this code except as provided in NMC 15.340.030(B).

RESPONSE: As described above, no portion of the structure will penetrate into the airport imaginary surfaces as defined in this code, therefore the requirements of this section are met.

B. High density public uses as defined in this code shall not be permitted in the airport approach safety zone or the displaced threshold approach surface zone.

RESPONSE: The subject site is not located within the Airport Approach Safety Zone or the Displaced Threshold Approach Surface Zone; therefore, the requirements of this section are not applicable.

C. Following July 1990, if FAA funds are used by the city to improve or enhance the airport, new structures, buildings and dense uses shall be prohibited in the runway protection zone consistent with federal requirements.

RESPONSE: The subject site is not located within the in the runway protection zone; therefore, the requirements of this section are not applicable.

D. Whenever there is a conflict in height limitations prescribed by this overlay zone and the primary zoning district, the lowest height limitation fixed shall govern; provided, however, that the height limitations here imposed shall not apply to such structures customarily employed for aeronautical purposes.

RESPONSE: As described above, no portion of the structure will penetrate into the airport imaginary surfaces as defined in this code, therefore the requirements of this section are met.

E. No glare-producing materials shall be used on the exterior of any structure located within the airport approach safety zone.

RESPONSE: The subject site is not located within the Airport Approach Safety Zone; therefore, the requirements of this section are not applicable.

F. In noise-sensitive areas (within 1,500 feet of an airport or within established noise contour boundaries of 55 Ldn and above for identified airports) where noise levels are a concern, a declaration of anticipated noise levels shall be attached to any building permit or development approval. In areas where the noise level is anticipated to be 55 Ldn and above, prior to issuance of a building permit for construction of noise-sensitive land use (real property normally used for sleeping or normally used as schools, churches, hospitals, or public libraries) the permit applicant shall be required to demonstrate

that the indoor noise level will not exceed 55 Ldn. The director will review building permits for noise-sensitive developments.

RESPONSE: The south west corner of the subject site is located approximately 3,500 feet from the northern end of the Sportsman Airpark runway, which is the nearest point of the runway to the property. As such, the requirements of this section are not applicable.

Chapter 15.405 – LOT REQUIREMENTS

15.405.010 Minimum and maximum lot area.

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

RESPONSE: The development is located in the C-2 zoning district, and therefore requires a minimum lot area of 5,000 square feet. The site is approximately 0.822 acres, or approximately 35,806 square feet, exceeding the minimum requirement of this section.

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.*

RESPONSE: The site is generally rectangular in shape with a slightly greater depth (195 feet) than width (183 feet). The lot depth is 1.06 times the lot width, and is therefore within the maximum 2.5 times the average width between the side lines.

- 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.*

RESPONSE: The development is located in the C-2 zoning district, and therefore requires a minimum lot area of 5,000 square feet. The site is approximately 0.822 acres, or approximately 35,806 square feet, exceeding the minimum requirement of this section.

- 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 except as allowed by NMC 15.240.020(L)(2).*

RESPONSE: The subject site has approximately 193 feet of frontage to N Springbrook Road, and approximately 185 feet of frontage to E Haworth Avenue. The requirements of this section are satisfied.

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.*

RESPONSE: The development meets the purpose of this section as described in response to the requirements and standards listed below.

- B. *Maximum Lot or Development Site Area per Dwelling Unit.*
 1. *In the R-1 district, 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 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 R-2, AR and R-P districts, lots or development sites in excess of 15,000 square feet used for multiple single-family, duplex, triplex, quadplex, multifamily dwellings or cottage cluster projects shall be developed at a minimum of one dwelling per 5,000 square feet lot area.*

4. *In the R-3 district, lots or development sites in excess of 15,000 square feet used for multiple single-family, duplex, triplex, quadplex, multifamily dwellings or cottage cluster projects shall be developed at a minimum of one dwelling per 2,500 square feet lot area.*

RESPONSE: The subject site is not located in the R-1, R-2, R-3, R-P, or AR zoning districts; therefore, the requirements of this Section are not applicable.

- 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. [Ord. 2889 § 2*

RESPONSE: As the site is located in the C-2 zone, the site is not limited as to lot coverage and parking coverage in accordance with Subsection B, above.

Chapter 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.*

RESPONSE: All proposed open space and yard areas are provided within the boundaries of the site. No encroachments or easements from or onto the property are proposed for the purposes of providing open space or yard areas. The requirements of these sections are satisfied.

- 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.*

RESPONSE: The applicant has provided a 10-foot-wide landscaped front yard area between E Haworth Avenue and developed areas of the site. No private parking areas or garages, or other accessory buildings will be located within the 10-foot setback area.

- 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.*

RESPONSE: The subject development is located entirely within the perimeter site, and no encroachments onto or over the property lines are proposed. All applicable setbacks are to be provided as required.

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.

...

RESPONSE: The proposal is for a single use category, being a 28-unit multi-family residential development. No dwellings are provided above non-residential buildings; therefore, this section is not applicable.

15.410.020 Front yard setback.

B. Commercial.

- 2. All lots or development sites in the C-2 district shall have a front yard of not less than 10 feet. There shall be no minimum front yard setback for C-2 zoned property that has frontage on E. Portland Road or Highway 99 W. The maximum front yard setback for C-2 zoned property that has frontage on E. Portland Road or Highway 99 W. shall be no greater than 10 feet. A greater front yard setback is allowed for C-2 zoned property having frontage on E. Portland Road or Highway 99 W. when a plaza or other pedestrian amenity is provided; however, said front yard setback should be the minimum setback needed to accommodate a pedestrian amenity. No parking shall be allowed in said yard. Said yard shall be landscaped and maintained.*

RESPONSE: The applicant has provided a 10-foot-wide landscaped front yard area between E Haworth Avenue and developed areas of the site. The front yard setback are as shown on site plans submitted with the application, including Sheet P4.0., Preliminary Site Plan.

15.410.030 Interior yard setback.

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.*

RESPONSE: The subject site is abutted on the south and east by property within the C-2 zoning district, and by public right-of-way to the north and west. Accordingly, the site does not abut residentially zoned property, and no additional interior setbacks are required.

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.*

RESPONSE: The applicant has provided vision clearance triangles meeting the requirements of this section at the intersection of the new internal private drive and E Haworth Road, and at the north west corner of the site at the intersection of E Haworth Avenue and N Springbrook Road. Vision clearance triangles are identified on plans submitted with the application, including Sheets P4.0, Preliminary Site Plan, and L1.0, Street Tree and Open Space Planting Plan.

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:

RESPONSE: The applicant has provided a 10-foot-wide landscaped front yard area between E Haworth Avenue and developed areas of the site. The front yard setback are as shown on site plans submitted with the application, including Sheet P4.0., Preliminary Site Plan.

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:*

RESPONSE: The subject site is not located in a residential district; therefore, this requirement does not apply.

2. *In any commercial, industrial, or mixed employment 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.*

RESPONSE: The applicant has proposed to install a post and rail type fence along the north (front) and east (interior) property lines. The post and rail fence will be less than 4 feet in height, and will not intrude into the clear vision area. Along the south (interior) property line, a 6-foot-tall solid wood fence is proposed. Along the west property line, no change to the existing fencing located on the adjoining property is proposed.

3. *If chain link (wire-woven) fences are used, they are manufactured of corrosion-proof materials of at least 11-1/2 gauge.*

RESPONSE: No chain link fencing is proposed as part of this project.

4. *The requirements of vision clearance shall apply to the placement of fences.*

RESPONSE: Fencing along E Haworth Avenue has been located to comply with vision clearance requirements at the new internal private driveway through the use of lower fence heights and setbacks adjacent to the access. At the intersection of E Haworth Avenue and N Springbrook Road, the proposed fence and landscaping has been setback to provide for vision clearance. See plans submitted with the application including Sheets P4.0, Preliminary Site Plan, and L1.0, Street Tree and Open Space Planting Plan.

- 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.*

RESPONSE: The applicant proposes one small area of the new internal access drive within the front yard setback, being the access point in the northwest corner of the site. See sheet P4.0 preliminary site plan for details.

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:*

RESPONSE: The subject site is not located in residential zoning district; therefore, the requirements of this Section are not applicable.

3. *In any commercial or industrial district, except C-1, C-4, M-1, and M-E, 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 and the M-E district within the riverfront overlay subdistrict are described in NMC 15.352.040(H).*

RESPONSE: The subject site is located in the C-2 zoning district. The applicant proposes one small area of the new internal access drive within the front yard setback, being the access point in the north west corner of the site. See sheet P4.0 preliminary site plan for details.

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.*

RESPONSE: The subject site is not located in the I zoning district; therefore, the requirements of this Section are not applicable.

Chapter 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.*

RESPONSE: The structure housing the 28-multi-family units is the only building on the lot, and is therefore considered 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.*

RESPONSE: The subject site is not located in residential zoning district; therefore, the requirements of this Section are not applicable.

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

RESPONSE: The subject site is not located in residential zoning district; therefore, the requirements of this Section are not applicable.

15.415.020 Building height limitation.

- A. *Residential.*

RESPONSE: The subject site is not located in a residential zoning district; therefore, the requirements of this Section are not applicable.

- B. *Commercial, Industrial and Mixed Employment.*

1. *In the C-1 district no main building or accessory building shall exceed 30 feet in height.*

RESPONSE: The subject site is not located in the C-1 zoning district; therefore, the requirements of this Section are not applicable.

2. *In the AI, C-2, C-3, M-E, 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.*

RESPONSE: The subject site is located in the C-2 zoning district, and is not located abutting upon a residential zoning district. Accordingly, there is no building height limitation imposed by this section. It is noted, however, that in accordance with Section 15.05.030 – Definitions, the building height when measured as the vertical distance from the grade to the average height of the highest gable of a pitch or hip roof is 36 feet 0.65 inches.

3. *In the C-4 district, building height limitation is described in NMC 15.352.040(J)(1).*

4. *In the M-E district within the riverfront overlay subdistrict, building height limitation is described in NMC 15.352.060.*

RESPONSE: The subject site is not located in the C-4 or M-E zoning districts; therefore, the requirements of this Section are not applicable.

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

RESPONSE: The subject site is located in the C-2 zoning district, and is not located abutting upon a residential zoning district. As described above, as a result there is no building height limitation imposed by this section. It is noted that in accordance with Section 15.05.030 – Definitions, the building height is measured as the vertical distance from the grade to the average height of the highest gable of a pitch or hip roof. As measured using an average height, the building height is 36 feet 0.65 inches. However, the maximum ridge height of the structure is proposed at approximately 43.4 feet. Therefore, in order to allow some flexibility in construction, the applicant would request that the City *state in the conditional use permits* a maximum height of 45 feet.

D. Institutional. The maximum height of any building or structure will be 75 feet except as follows:

RESPONSE: The subject site is not located in an Institutional zoning district; therefore, the requirements of this Section are not applicable.

E. Alternative Building Height Standard. As an alternative to the building height standards above, any project may elect to use the following standard (see Figure 24 in Appendix A). To meet this standard:

RESPONSE: The subject site is located in the C-2 zoning district, and as such there is no building height limitation imposed. The alternative building height standard is not required.

F. Buildings within the airport overlay subdistrict are subject to the height limits of that subdistrict.

RESPONSE: The subject site is located in the Airport Overlay Subdistrict, within the Airport Inner Horizontal Surface but outside the Airport Approach Safety Zone or Airport Transitional Surface. No additional height restrictions are applicable.

15.415.030 Building height exemptions.

Roof structures and architectural features for the housing of elevators, stairways, tanks, ventilating fans and similar equipment required to operate and maintain the building, fire or parapet walls, skylights, towers, flagpoles, chimneys, smokestacks, wireless masts, TV antennas, steeples and similar structures may be erected above the height limits prescribed in this code; provided, that no roof structure, feature or any other device above the prescribed height limit shall be allowed or used for the purpose of providing additional floor space. Further, no roof structure or architectural feature under this exemption shall be erected more than 18 feet above the height of the main building, whether such structure is attached to it or freestanding, nor shall any such structure or feature exceed the height limits of the airport overlay subdistrict.

RESPONSE: The subject site is located in the C-2 zoning district, and as such there is no building height limitation imposed. The building height exemption standard is not required.

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.

RESPONSE: The subject site has frontage to two public streets, E Haworth Avenue and N Springbrook Road. This requirement is satisfied.

Chapter 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.*

RESPONSE: Each of the 8 proposed ground floor units is provided with an accessible outdoor private patio area, ranging from a small of approximately 135 square feet to a large of approximately 176 square feet. The requirements of this Section are met.

- 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 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.*

RESPONSE: With 28 one- and two-bedroom units proposed, the minimum amount of individual and shared outdoor recreation space required is 5,600 square feet (28 x 2,000 =

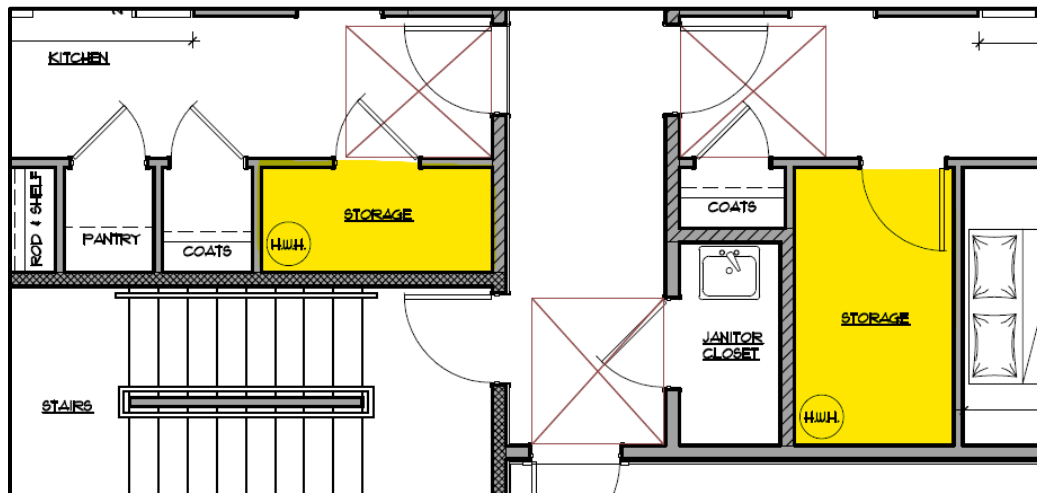
5,600). As shown on Sheet L1.0 – Preliminary Landscape Plan submitted with the application, the applicant is providing a minimum of 6,497 square feet of individual and shared outdoor recreation space, exceeding the requirement. The area is made up as follows:

4 x 135 sf patio area = 540 square feet
4 x 176 sf patio area = 704 square feet
shared outdoor space = 5,253 square feet

Total = 6,497 square feet

- 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.*

RESPONSE: As shown in floor plans submitted with the application, each of the proposed units includes designated storage areas within the main living area or patios sufficient for secure storage of items including bicycles, barbecues, luggage and similar items. Examples of these storage areas within ground floor units are shown below:



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.*

RESPONSE: The Subject site is not located within the AR airport residential district; therefore, this standard is not applicable.

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

dwellings, duplex dwellings, triplex dwellings, quadplex dwellings, townhouse dwellings and cottage cluster projects:

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.*

RESPONSE: As shown on Sheet L1.0 – Preliminary Landscape Plan submitted with the application, the applicant is providing approximately 34.9% of the lot area as landscaping, or 12,471.51 square feet. The requirements of this section are met.

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

RESPONSE: As shown on the Preliminary Landscape Plan submitted with the application (Sheet L1.0), all areas of the site which are not utilized for development with buildings, parking areas and walkways etc. will be appropriately landscaped for the area and the use. This includes areas such as parking islands, the proposed bocce ball court, the raised planters, and the narrow side yard space along the west side of the building, which will be landscaped with low maintenance materials such as river rock or bark dust to provide attractive ground coverage.

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.*

RESPONSE: As previously described, the proposed parking area on the site will provide 43 spaces. Accordingly, 1,075 square feet ($43 \times 25 = 1,075$) of landscaping is required within the parking area.

As shown on plans submitted with the application (Sheet P5.0 and Sheet L1.0), defined landscaping areas are provided throughout the parking lot. As calculated, the applicant is

providing approximately 1,700 square feet of parking area landscaping, exceeding the minimum by approximately 625 square feet.

- 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.*

RESPONSE: As shown on Sheet P5.0 and Sheet L1.0, and described previously herein, the parking areas associated with the development are located 10 feet from both E Haworth Avenue and N Springbrook Road, and separated from the right-of-way by substantial landscaping. The parking areas of the site do not abut the interior south and west property lines. The requirements of this Section are met.

- 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.*

RESPONSE: As shown on Landscape Plans submitted with the application (Sheet L1.0), substantial landscaping exists in the areas of the site located between the parking areas and the two street frontages. Street trees located in this area include 3 Black gum; 1 Shademaster honeylocust; and 5 Golden desert ash. Trees are spaced approximately 35 feet, 25 feet, and 30 feet apart based on species canopies, meeting spacing requirements for this Section. In addition to the street trees listed above, landscaping surrounding the parking areas includes a black vinyl post and rail fence for definition; a number of larger shrub species such as Schipka cherry laurel; and other smaller shrubs and grasses as shown on the Planting Legend provided on Sheet L1.0.

- 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).*

RESPONSE: To the north and east of the site parking areas abut the street, and landscaping is addressed above. At the south of the site, the parking area is located towards the south eastern corner, and is separated from the interior property line by a distance of 20 feet. Between the property line and parking in this area is proposed to be a portion of the shared outdoor open space, containing shrubs, trees, and a garden area with raised stainless steel tanks and crushed

granite walking paths. Along the west property line, the drive aisle/access at the north west corner of the site will be screened by the existing fencing and established arbor vitae screen.

- 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.*

RESPONSE: The applicant has provided 5 landscape islands consistently distributed through the parking area, along with landscaped bump outs at corners and adjacent to maneuvering areas.

- f. *Landscaping areas in a parking lot, service drive or loading area shall have an interior width of not less than five feet.*

RESPONSE: All parking area landscaping exceeds the 5-foot minimum width, as shown on Sheet P5.0 and Sheet L1.0 submitted with the application.

- 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.*

RESPONSE: The subject site does not abut a residential district, with the closest being located on the north side of e Haworth Avenue, and separated by 60 feet of right-of-way. The requirements of this section are not applicable.

- 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).

RESPONSE: As shown on the Preliminary Landscape Plans submitted with the application (Sheet L1.0), landscape islands are provided within the parking area such that groups of spaces are no greater than 6 without an island separation. With 43 spaces, 7 trees are required within parking area landscaping ($43/7 = 6.14$), and 8 are provided. These requirements are 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.*

RESPONSE: Street trees along the N Springbrook Road frontage are proposed as Golden desert ash. They have been selected from the Newberg street trees species list, and have been selected for their lower height due to the presence of overhead lines along the subject frontage, in accordance with Subsection 7 below. As a result, the trees also have a smaller canopy, and therefore will be planted with a spacing of 32 feet on center, under the maximum spacing listed above.

- 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.*

RESPONSE: Street trees along the E Haworth Avenue frontage are proposed as Black gum. They have been selected from the Newberg street trees species list. The trees will be planted with a spacing of 35 feet on center, consistent with the tree spacing listed above.

- 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.*

RESPONSE: Accent trees have been included to provide interesting color and texture within the landscape, and have varying spacing depending on species requirements. See Sheet L1.0 for details.

- 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.*

RESPONSE: Numerous evergreen and deciduous shrubs have been selected to provide screening, interesting color and texture within the landscape, and have varying spacing depending on species requirements. See Sheet L1.0 for further planting details.

- 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:*

<i>Gallon cans</i>	<i>3 feet on center</i>
<i>4" containers</i>	<i>2 feet on center</i>
<i>2-1/4" containers</i>	<i>18" on center</i>
<i>Rooted cuttings</i>	<i>12" on center</i>

RESPONSE: All plant units proposed have been selected for their ability to thrive in the conditions on-site, and will be planted in accordance with the above, and standard landscaping practice for establishment.

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 no irrigated areas. Landscaping material used within non irrigated 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.*

RESPONSE: The applicant has proposed to install an automated underground sprinkler system, including all landscape areas, street trees, and lawn areas. See Note 1 of the Preliminary Landscape Plan (Sheet L1.0).

6. *Required landscaping shall be continuously maintained.*

RESPONSE: The applicant and/or building management will be responsible for the long-term maintenance of all landscaping within the site.

7. *Maximum height of tree species shall be considered when planting under overhead utility lines.*

RESPONSE: In described in response to Subsection 4.a., above, street trees along the N Springbrook Road frontage are proposed as Golden desert ash. They have been selected from the Newberg street trees species list, and have been selected for their lower height due to the presence of overhead lines along the subject frontage, in accordance with the requirements of this section.

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.*

RESPONSE: The applicant is submitting this application for a Condition Use Permit and Design Review as a consolidated application; therefore, the requirements of this section are applicable for review and approval. An additional Type I review is not required.

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.*

RESPONSE: The subject site is not located in the M-4 zone; therefore, the requirements of this Section are not applicable.

- 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.*

RESPONSE: The applicant will comply with the requirements of this section, as applicable, prior to building occupancy.

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.*

RESPONSE: The areas between the back of sidewalk and property line and nearby spaces have been landscaped in accordance with the requirements of the Newberg Development Code, as described herein. As the existing sidewalks are curb-tight, care has been taken to ensure that the landscaping materials do not impact pedestrian accessibility within the sidewalk area, and also to preserve vision triangles as shown on the Preliminary Landscape Plan, Sheet L1.0.

1. *Street trees planted in pedestrian spaces shall be planted according to NMC 15.420.010(B)(4).*

RESPONSE: All street tree installation has been designed to meet the requirements of NMC 15.420.010(B)(4). Street tree planting details are included on Sheet L1.1, Planting Details & Notes.

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.*

RESPONSE: The landscape plans have been developed in accordance with the requirements of this section, including the provision of plantings which provide seasonal interest, with fall color or blooms. In addition, proposed landscaping will preserve vision triangles, as shown on the Preliminary Landscape Plan, Sheet L1.0.

- 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.*

RESPONSE: As per the purpose statement of this section. A review body may require any of the following landscaping and amenities to be placed in abutting public rights-of-way.... . Due to the classification of streets, curb tight sidewalks, and the future improvements proposed by others at the intersection of E Haworth Avenue and N Springbrook Road, the applicant is not aware of any requirement from the review body for pedestrian scale lighting within the public right-of-way. Pedestrian scale lighting is provided adjacent to walkways within the boundaries of the site. See the proposed lighting plan for further details.

- 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.*

RESPONSE: No street furniture is proposed within spaces near sidewalks as part of this proposal, and the applicant is not aware of any requirement from the review body for its placement. Street furniture in the area is more appropriately located on the east side of N Springbrook Road, adjacent to the Springbrook Plaza.

- 5. *Paving and curb cuts shall facilitate safe pedestrian crossing and meet all ADA requirements for accessibility.*

RESPONSE: With the exception of the single access driveway, which will be constructed to meet ADA requirements, no additional frontage improvements or pedestrian ramps are proposed.

- 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).*

RESPONSE: With the exception of the single access driveway additional frontage improvements or pedestrian ramps are proposed. Existing sidewalks along the frontage of the site are curb tight, and as such planter strips are not present adjacent to the site. The requirements of this section are not applicable.

- 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.*

RESPONSE: The applicant and/or building management will be responsible for the long-term maintenance of all landscaping within the site, including landscaping in the right-of-way to the extent required by the Newberg Municipal Code and State law.

- 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.*

RESPONSE: The subject site is not located in AI airport industrial district or AR airport residential district; therefore, the requirements of this Section are not applicable.

Chapter 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.*

RESPONSE: The information specified above, including the location, height, make, model, lamp type, wattage, and proposed cutoff angle of each outdoor lighting fixture, and photometric mapping, is included with the lighting plans submitted with this application. As the site will be used for residential purposes outdoor parking will occur after dark, and the applicant has provided pole mounted fixtures around the perimeter of the parking areas, bollard lights along outdoor pathways, and building downlights adjacent to shared open space areas and pathways to ensure adequate illumination of these areas for safety and personal security. Please see the submitted lighting plan and associated technical sheets for the fixtures for more detailed information on the above.

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.

RESPONSE: The applicant has selected LED light fixtures for the high-level lights, pole mounted at a height of 20 feet. Perimeter lighting will also be fitted with External Glare Shields (EGS) to avoid unnecessary light spillover. The supplied technical sheets provided with the lighting plan describe the features of the proposed lights, which have been selected for their relatively high Lumens Per Watt ratio (LPW), providing high energy efficiency despite a low system watt input of 51 watts. This is the lowest wattage of any of the lights in the RSX1 LED series selected by the applicant, helping the selected fixtures provide cost and energy savings over the long term, long life, and excellent photometric coverage.

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.*

RESPONSE: The applicant has proposed to install pedestrian scale bollard lighting adjacent to pedestrian areas within the site, using LED fixtures to prevent light overspill to residences and over property lines. This lighting will be augmented by wall mounted building downlights, typically mounted between 66 and 72 inches, particularly within shared open space areas. Please see the submitted lighting plan for detailed information.

- 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.*

RESPONSE: The applicant has not proposed medium-level light fixtures.

- 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.*

RESPONSE: The submitted Lighting Plan shows the installation of 12 pole mounted LED fixtures at a height of 20-feet. LED light fixtures are not listed within Table B below, and as described previously, the fixtures have a rating of 51 watts and therefore exceed the listed 50watt category of Table B. However high-level light fixtures adjacent to the property line are proposed to be shielded to the rear using factory EGS to avoid unnecessary light spillover.

B. Table of Shielding Requirements.

<i>Fixture Lamp Type</i>	<i>Shielded</i>
<i>Low/high pressure sodium, mercury vapor, metal halide and fluorescent over 50 watts</i>	<i>Fully</i>
<i>Incandescent over 160 watts</i>	<i>Fully</i>
<i>Incandescent 160 watts or less</i>	<i>None</i>
<i>Fossil fuel</i>	<i>None</i>
<i>Any light source of 50 watts or less</i>	<i>None</i>
<i>Other sources</i>	<i>As approved by NMC 15.425.030</i>
<i>Note: "Incandescent" includes tungsten-halogen (quartz) lamps.</i>	

RESPONSE: In accordance with Table B, high-level lighting will comply with the requirements of NMC 15.425.030.

Chapter 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.*

RESPONSE: Existing overhead utilities are located overhead on the east side of the site, along N Springbrook Road. No frontage improvements or utility relocations are required or proposed with the development, and surrounding properties on the same side of the street are generally fully developed and unlikely to be placed underground. All new utility services to the building will be placed underground, as required by this section.

Chapter 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 lot or 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 lot or development site or within 400 feet of the lot or development site which the parking is required to serve. All required parking must be under the same ownership as the lot or development site served except through special covenant agreements as approved by the city attorney, which bind the parking to the lot or development site.*
 1. *In cases where the applicant is proposing off-street parking, refer to subsection (F) of this section for the maximum number of parking spaces.*

RESPONSE: All off-street parking is proposed to be located on the development site, as required. See the applicant response to (F) below for maximum parking standards.

- B. *Off-street parking is required pursuant to NMC 15.440.030 in the C-2 district.*
 1. *In cases where the applicant is proposing off-street parking, refer to subsection (F) of this section for the maximum number of parking spaces.*

RESPONSE: See the applicant response to (F) below for maximum parking standards.

- F. *Maximum Number of Off-Street Automobile Parking Spaces. The maximum number of off-street automobile parking spaces allowed per site equals the minimum number of required spaces, pursuant to NMC 15.440.030, multiplied by a factor of:*

1. *One and one-fifth spaces for uses fronting a street with adjacent on-street parking spaces; or*
2. *One and one-half spaces for uses fronting no street with adjacent on-street parking; or*
3. *A factor determined according to a parking analysis.*

RESPONSE: As described in response to Newberg Development Code Section 15.440.030, 40 off-street spaces are needed to meet the minimum parking standards of Section 15.440.010.B. As neither E Haworth Avenue or N Springbrook Road allow on-street parking along the subject frontage, maximum parking is calculated in accordance with Subsection 2 above as follows:

$$1.5 \times 40 = 60 \text{ spaces maximum}$$

As shown on Sheet P4.0, Preliminary Site Plan, 43 off-street spaces are proposed, therefore off-street parking is provided within the minimum and maximum allowances.

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 a single-family detached dwelling, duplex dwelling, triplex dwelling, quadplex dwelling, townhouse dwelling or cottage cluster project 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.*

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 • Unassigned spaces • Visitor spaces	1 per dwelling unit 1.5 per dwelling unit 2 per dwelling unit 0.75 spaces per bedroom 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. 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 removed by planned future street widening or a bike lane on the street.

RESPONSE: In accordance with Newberg Development Code Section 15.440.030, 1 off-street parking space is required for every studio or one-bedroom unit, with 1.5 off-street spaces required for every two-bedroom unit. As described, the proposed development includes 16 one-bedroom units and 12 two-bedroom units, therefore off-street parking is required as follows:

One-bedroom = 16 x 1 = 16 spaces
 Two-bedroom = 12 x 1.5 = 18 spaces
 Total = 34 spaces

In addition, 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. Accordingly, the following visitor spaces are required:

$$28 \text{ units} \times 0.2 = 5.6 = 6 \text{ spaces}$$

As such, 40 off-street parking spaces are needed to meet the minimum parking requirements of Section 15.440.010.B. As shown on Sheet P4.0, Preliminary Site Plan, the applicant proposes to provide 43 off-street spaces, and therefore parking is provided in sufficient quantities to meet the requirements of this Section.

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.*

RESPONSE: As shown on Sheet P4.0 – Preliminary Site Plan of the submitted plan set, parking and circulation areas are proposed to be constructed using AC Pavement, with the exception of the pedestrian way between the main entry to the building and E Haworth Avenue, which will be constructed from a contrasting material such as colored Portland concrete cement or pavers to provide differentiation. As described in the Preliminary Storm Drainage Report submitted with the application, and consistent with Plan Sheet P5.0 - Preliminary Composite Utility Plan, Stormwater from the parking lot will be collected in trapped catch basins for pretreatment, pollution reduction and spill control prior to being conveyed into the proposed storm filter manholes within the parking area. The requirements of this section are satisfied.

- 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.*

RESPONSE: As shown on Sheet P4.0 – Preliminary Site Plan of the submitted plan set, all parking is appropriately located on the site, and is entirely contained within the boundaries of the site behind appropriate landscaping and front yard setbacks (E Haworth Avenue).

- C. *All parking areas, except those required in conjunction with a single-family detached, duplex, triplex, quadplex or townhouse dwelling, or cottage cluster project, shall provide a substantial bumper which will prevent cars from encroachment on abutting private and public property.*

RESPONSE: As described above, all parking is appropriately located on the site, and is entirely contained within the boundaries of the site behind appropriate landscaping and front yard setbacks (E Haworth Avenue). Further, the parking area is surrounded by standard curbing, which will act as a bumper. No encroachment on abutting private and public property is anticipated.

- D. *All parking areas, including service drives, except those required in conjunction with single-family detached, duplex, triplex, quadplex or townhouse dwellings or cottage cluster projects, shall be screened in accordance with NMC 15.420.010(B).*

RESPONSE: As described above, all parking is appropriately located on the site, and is entirely contained within the boundaries of the site behind appropriate landscaping and fencing. Landscaping is Shown on Sheet L1.0 – Preliminary Landscape Plan, of the submitted plan set.

- 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.*

RESPONSE: Lighting is provided on the site in order to provide safe vehicle circulation, general vehicle safety, and safety for pedestrians moving between the building and the parking area or E Haworth Avenue. While the site does not abut a residential district, the is residential to the north of E Haworth Avenue. The lighting plan submitted with the application indicates that along the north property line, 4 pole mounted LED fixtures will be installed. These LED fixtures will be separated from residential areas by site landscaping and the right-of-way of E Haworth Avenue. No light encroachment is anticipated.

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

RESPONSE: As shown on Sheet P4.0 – Preliminary Site Plan of the submitted plan set, parking and circulation areas are proposed to be constructed using AC Pavement, with the exception of the pedestrian way between the main entry to the building and E Haworth Avenue, which will be constructed from a contrasting material such as colored Portland concrete cement or pavers to provide differentiation.

- G. *Parking areas for residential uses shall not be located in a required front yard, except as follows:*
 - I. *Single-family detached, duplex, triplex, quadplex, and townhouse dwellings: parking is authorized in a front yard on*

a service drive which provides access to an improved parking area outside the front yard.

RESPONSE: As shown on Sheet P4.0 – Preliminary Site Plan of the submitted plan set, all parking is appropriately located on the site outside of front yard setbacks (E Haworth Avenue).

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.

RESPONSE: The applicant has proposed 11 of the 43 spaces as compact, as identified on Sheet P1.0 Cover Sheet. As proposed, approximately 26% of the provided spaces are for compact cars, less than the 30% maximum of this section.

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

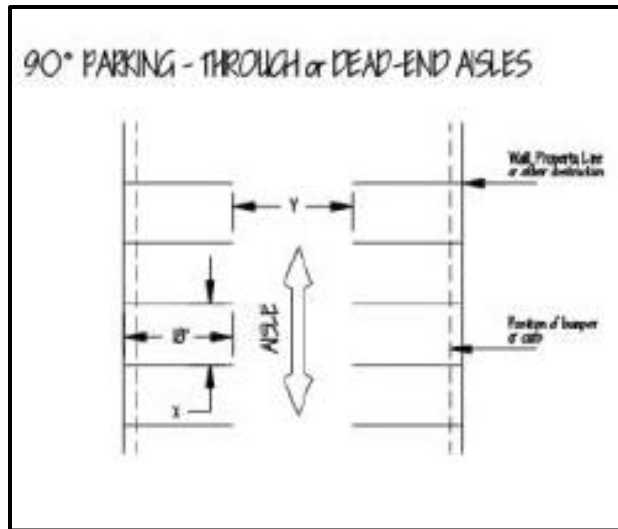
RESPONSE: The proposed development is not an affordable housing project; therefore, this section does not apply.

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.

RESPONSE: No transit related facilities are proposed with this development; therefore, this section does not apply.

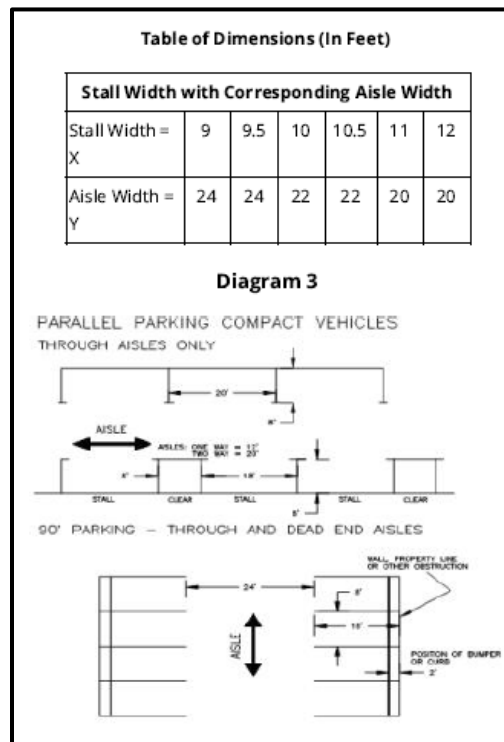
15.440.070 *Parking tables and diagrams.*

The following tables provide the minimum dimensions of public or private parking areas:



Notes:

1. Bumpers must be installed where paved areas abut street right-of-way (except at driveways).
2. No stalls shall be such that cars must back over the property line to enter or leave stall.
3. Stalls must be clearly marked and the markings must be maintained in good condition.
4. The sketches show typical situations to illustrate the required standards. For further information or advice, contact the community development department at 537-1210.



Notes:

1. *Bumpers must be installed where paved areas abut street right-of-way (except at driveways).*
2. *No stalls shall be such that cars must back over the property line to enter or leave stall.*
3. *Stalls must be clearly marked and the markings must be maintained in good condition.*
4. *The sketches show typical situations to illustrate the required standards. For further information or advice, contact the planning department.*

RESPONSE: The dimensions of parking spaces within the development are shown on Sheet P5.0, Preliminary Site Plan. Each of the proposed stalls is striped to a depth of 16 feet from the face of curb, with an additional 2 feet provided as bumper overhang beyond the curb to create an 18-foot depth, as required. Thirty-two of the spaces are standard stalls, with a width of 9 feet. 11 of the stalls are designated as compact, as described above, with a width of 8 feet. The parking area maintains a drive aisle width of no less than 24 feet. The dimensional standards of this section are 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.

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

Notes:

- a. *Short-term bicycle parking is parking intended to be used for durations less than two hours. Short-term bicycle parking shall consist of a stationary rack or other approved structure to which the bicycle can be locked securely and shall be located within 50 feet of the main building entrance or one of several main entrances, and no further from an entrance than the closest automobile*

parking space. Shelter or cover may be required for a specified percentage of short-term parking.

- b. Long-term bicycle parking is parking intended to be used for durations over two hours. Long-term parking shall consist of a lockable enclosure, a secure room in a building on-site, monitored parking, or another form of fully sheltered and secure parking.*

RESPONSE: In accordance with the above, with 28-units within the development the applicant is required to provide parking for 7 bicycles ($28/4 = 7$). As shown in floor plans submitted with the application, each of the proposed units includes storage areas or patios sufficient for secure bicycle storage.

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.*

RESPONSE: As described above, each of the proposed units includes storage areas or patios sufficient for secure bicycle storage meeting the requirements of this section.

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.

15.440.140 *Private walkway design.*

A. *All required private walkways shall meet the applicable building code and Americans with Disabilities Act requirements.*

RESPONSE: All walkways within the site have been designed to be compliant with the Americans with Disabilities Act. Compliance with these requirements will be confirmed through building permit submittal and review.

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.*

RESPONSE: All proposed private walkways within the site have been designed with a width of no less than 5 feet. Walkways are designed to be constructed using Portland cement concrete. See Sheet P5.0 Preliminary Site Plan for further details.

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.*

RESPONSE: Only one crossing is provided within the proposed service drives, located between the front building entrance and E Haworth Avenue. As it traverses the service drive, the crossing is proposed with a width of 6 feet, and will be constructed from a contrasting material such as

colored Portland concrete cement or pavers to provide differentiation from the surrounding AC pavement material.

- E. *At a minimum, required private walkways shall connect each main pedestrian building entrance to each abutting public street and to each other.*

RESPONSE: A private walkway is provided from the main building entrance, which abuts E Haworth Avenue, out to the subject street from the covered entryway of the building. The requirements of this section are satisfied.

- 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.*

RESPONSE: The applicant is not aware of any need for modification of these standards or additional private walkways.

Chapter 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.*

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.*

RESPONSE: No new public streets are proposed with this development.

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.*

RESPONSE: Except for construction of a driveway access and a financial contribution to the construction of traffic signals at the Haworth/Springbrook intersection, neither the City nor the

applicant have identified any specific street improvements required for the site, either within the right-of-way or to provide additional on-site circulation. All surrounding parcels are already developed with their own existing access to the surrounding public streets, and adjoining paved streets are improved top City standards. The applicant will provide street trees along both site frontages in coordination with overall landscaping for the site.

- 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.*

RESPONSE: As described above, public improvements are expected to be minimal for this development. The required financial contribution to the construction of traffic signals at the Haworth/Springbrook intersection will be calculated by the City based on the anticipated impacts of the development on the intersection, and shall be required to be roughly proportional to the impact of the development on public facilities.

- 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*

* *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.*

RESPONSE: Adjacent to the site on the north property boundary, E Haworth Avenue is designated as a Major Collector in the City of Newberg Transportation System Plan (TSP). The TSP specifies a minimum 61-foot right-of-way, with a 36-foot paved section, including 6-foot bike lanes. Existing right-of-way is approximately 61-feet, and existing pavement width is approximately 40 feet. No additional frontage improvements are proposed.

N Springbrook Road is designated as a Minor Arterial in the TSP. The TSP specifies a minimum 69-foot right-of-way, with a 48-foot paved section, including 6-foot bike lanes. Existing right-of-way is approximately 85-feet, and existing pavement width is approximately 52 feet. No additional frontage improvements are proposed.

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

a. *Exception.*

i. *Minimum lane width of 11 feet along S River Street from E First Street to E Fourteenth Street.*

RESPONSE: As noted above, each of the facilities adjacent to the site has adequate paving to support 2 bicycle lanes and two 12-foot-wide travel lanes, and in the case of N Springbrook Avenue, a center turn lane or median. This standard 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.*

a. *Exception.*

i. *Minimum striped bike lane width of six feet with a one-foot wide buffer along S River Street from E First Street to the bypass.*

RESPONSE: As noted above, each of the facilities adjacent to the site has adequate paving to support two 6-foot-wide bicycle lanes and two 12-foot-wide travel lanes, and in the case of N Springbrook Avenue, a center turn lane or median. This standard is met.

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.*

RESPONSE: In accordance with the table in Section 15.505.030.G above, neither E Haworth Avenue or N Springbrook Road support on-street parking, therefore this standard is not applicable.

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

RESPONSE: N Springbrook Road is designated as a Minor Arterial in the TSP, and a center turn lane or median is required. The TSP specifies a minimum 69-foot right-of-way, with a 48-foot paved section, including 6-foot bike lanes, and the 12-foot center lane. Existing right-of-way is approximately 85-feet, and existing pavement width is approximately 52 feet. When calculating whether the paved surface is adequate, the following is considered:

6 ft. (bike) + 12 ft. (travel) + 12 ft. (center/median) + 12 ft. (travel) + 6 ft. (bike) = 48 feet.

With 52 feet of paved surface, the existing street can accommodate the required improvements meeting City engineering standards.

No additional frontage improvements are proposed.

6. *Limited Residential Streets. Limited residential streets shall be allowed only at the discretion of the review authority, and only inconsideration of the following factors:*

RESPONSE: No new limited residential streets are proposed with this development.

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

RESPONSE: Both E Haworth Avenue and N Springbrook Road have standard sidewalks along the frontage of the property. The applicant will be required to replace any sidewalk panels in poor condition or not in compliance with ADA standards.

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.*

RESPONSE: Both E Haworth Avenue and N Springbrook Road have standard curb-tight sidewalks along the frontage of the property, which extends into the surrounding areas. The applicant will provide street trees along both site frontages in coordination with overall landscaping for the site.

9. *Slope Easements. Slope easements shall be provided adjacent to the street where required to maintain the stability of the street.*

RESPONSE: Slope easements can be provided as requested by the City Engineer, if necessary.

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.*

RESPONSE: No specific improvements are proposed at the intersection of E Haworth Avenue and N Springbrook Road at this time. However, the applicant will be required to participate in funding improvements at the E Haworth Avenue and N Springbrook Road intersection that are indicated in the City of Newberg Transportation System Plan (TSP). Project I09 in the current TSP calls for installing a traffic signal and left turn lanes on Haworth. The full extent of intersection improvements has not been confirmed at this time.

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.*

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:

RESPONSE: The applicant has not requested any modifications to street standards, or modifications of street Right-of-Way and improvement width.

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.*

RESPONSE: The lowest classification road with street frontage to the site is E Haworth Avenue, which has a classification as a Major Collector. Pursuant to the standards in Table 15.505.R., the spacing standard for driveways intersecting E Haworth Avenue is 150 feet. With a frontage of only 183 feet, the driveway access at the north west corner of the site is located approximately 160 feet from the intersection using the methodology in 3. above, and would therefore meet the requirements of this section.

As demonstrated in the TIS for the development, prepared by Lancaster Mobley and dated October 31, 2022, the one permanent site access to the surrounding street network is located at the north west corner of the site. The TIS recommends that the proposed apartment complex be allowed an unrestricted full movement access onto E Haworth Avenue at that location, as based on the queuing analysis, adequate spacing between the proposed site access intersection and the intersection of Haworth Avenue at N Springbrook Road is available to allow un-restricted turning movements at the site access intersection without creating safety issues.

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.*

RESPONSE: The subject property has frontage to two streets. The lowest classification road with street frontage to the site is E Haworth Avenue, which has a classification as a Major Collector. Accordingly, the sole site access is provided to E Haworth Avenue, at the north west corner of the site.

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:*

RESPONSE: A second access to E Haworth Avenue would technically meet the requirement for a second access, with 100 feet of spacing available between the accesses. However, the second access would violate other access spacing provisions of this Code. The site does not have frontage on an 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.*

RESPONSE: There are no existing access points to be closed as part of this development.

7. *Shared Driveways.*

RESPONSE: Access from a shared driveway is not available to the site, therefore the requirements of this section are not applicable.

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.*

RESPONSE: No need or opportunity for the construction of a frontage street or alley exists with this development. As described, the proposed access meets access spacing standards, and as demonstrated in the TIS for the development, prepared by Lancaster Mobley and dated October 31, 2022, the proposed apartment complex be allowed an unrestricted full movement

access onto E Haworth Avenue at the proposed location, as based on the queuing analysis, adequate spacing between the proposed site access intersection and the intersection of Haworth Avenue at N Springbrook Road is available to allow un-restricted turning movements at the site access intersection without creating safety issues.

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.*

RESPONSE: It is noted that the N Springbrook Road frontage is under ODOT jurisdiction. However, no access is permitted to N Springbrook under the standard procedures of this Chapter, and accordingly no access permit is necessary.

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.*

RESPONSE: The applicant has not requested any exceptions to the access standards listed above. Should any exceptions become necessary through the development process, approval for a revision or additional applications may be required.

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.

RESPONSE: The proposed development is residential in nature, and is located on a relatively small parcel at the intersection of two significant streets within the local transportation system. It is considered that no opportunities exist to provide meaningful changes to block lengths and circulation, or more practicable connections to adjoining properties than exist or are warranted in the area at this time. No public walkways, other than pedestrian walkways between E Haworth Street and the main building entrance, are provided.

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).

RESPONSE: Street trees will be installed along both site frontages, and have been designed in compliance with the requirements of NMC 15.420.010 (B)(4), and the wider landscape plan for the site. See Sheet L1.0 – Preliminary Landscape Plan, for details.

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.

RESPONSE: As improvements already exist along the frontage of the site, it is not anticipated that new street lights shall be required. However, if illumination is determined to be inadequate, the applicant shall comply with the requirements of this section to the extent practicable, and as guided by the City Engineer.

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:

RESPONSE: The applicant is not aware of any transit improvements necessary in the vicinity of the site, nor have any been identified. Accordingly, no transit improvements are proposed.

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.*

RESPONSE: The applicant will install residential services to the site typical of multi-family developments, therefore the requirements of this section are applicable.

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.*

RESPONSE: As the applicant has already done through the initial planning phases of this application, all proposed utilities will be designed to be consistent with the Newberg public works design and construction standards. Public improvements permits will be obtained prior to utility work being undertaken on the site. All utility work will be carried out with minimum feasible disturbances of soil and site, and will be coordinated by the developer under the appropriate public improvement permits 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.*

RESPONSE: Water service to the site will be provided in accordance with the requirements of the Water Master Plan for the area, the Newberg public works design and construction standards, and permits issued for the completion of the work. See Sheet P5.0 – Preliminary Composite Utility Plan, for utility locations and notes.

- 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.*

RESPONSE: The site has direct access to gravity service from the city wastewater system. No onsite disposal or pumping facilities are proposed. The sanitary sewer components serving the site will be designed in accordance with the applicable wastewater master plan for the area, the Newberg public works design and construction standards, and permits issued for the completion of the work. See Sheet P5.0 – Preliminary Composite Utility Plan, for utility locations and notes.

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.

RESPONSE: The site has direct access to gravity service within the city stormwater system. The applicant has submitted with this application a Preliminary Stormwater Drainage Plan, providing detail on the methods to be used to minimize the amount of runoff, sedimentation, and pollution created from the development both during and after construction, plans for the construction of stormwater management components and infrastructure, and calculations demonstrating compliance with the Newberg public works design and construction standards. See Sheet P3.0. – Grading and Erosion Control Plan; Sheet P5.0. – Preliminary Composite Utility Plan, for utility locations and notes; and the Preliminary Storm Drainage Plan prepared by Luke Lappin, P.E.

SUMMARY AND CONCLUSION

Based upon the materials submitted herein, the Applicant respectfully requests approval from the City of Newberg Planning Commission of an application for a Type III review for approval of a Conditional Use Permit (Residential in C-2 Zone) & Site Design Review (companion to CUP) for a 28-Unit Multi-Family Apartment Building, “The Haworth”.



PRELIMINARY REPORT

In response to the application for a policy of title insurance referenced herein Ticor Title Company of Oregon hereby reports that it is prepared to issue, or cause to be issued, as of the specified date, a policy or policies of title insurance describing the land and the estate or interest hereinafter set forth, insuring against loss which may be sustained by reason of any defect, lien or encumbrance not shown or referred to as an exception herein or not excluded from coverage pursuant to the printed Schedules, Conditions and Stipulations or Conditions of said policy forms.

The printed Exceptions and Exclusions from the coverage of said policy or policies are set forth in Exhibit One. Copies of the policy forms should be read. They are available from the office which issued this report.

This report (and any supplements or amendments hereto) is issued solely for the purpose of facilitating the issuance of a policy of title insurance and no liability is assumed hereby.

The policy(s) of title insurance to be issued hereunder will be policy(s) of Chicago Title Insurance Company, a/an Florida corporation.

Please read the exceptions shown or referred to herein and the Exceptions and Exclusions set forth in Exhibit One of this report carefully. The Exceptions and Exclusions are meant to provide you with notice of matters which are not covered under the terms of the title insurance policy and should be carefully considered.

It is important to note that this preliminary report is not a written representation as to the condition of title and may not list all liens, defects and encumbrances affecting title to the land.

This preliminary report is for the exclusive use of the parties to the contemplated transaction, and the Company does not have any liability to any third parties nor any liability until the full premium is paid and a policy is issued. Until all necessary documents are placed of record, the Company reserves the right to amend or supplement this preliminary report.

Countersigned

A handwritten signature in black ink, appearing to read "Peter Harris", is written above a horizontal line.



1433 SW 6th Avenue, Portland, OR 97201
(503)646-4444 FAX (503)219-9984

PRELIMINARY REPORT

TITLE OFFICER: Deborah Clark
deborah.clark@titlegroup.fntg.com
(503)535-3743

ORDER NO.: 471822119006
CUSTOMER NO.: 872201192

TO: Lawyers Title of Oregon, LLC
Shelley Williams
6000 Meadows Road, Suite 100
Lake Oswego, OR 97035

OWNER/SELLER: Patrick R. Maveety and Elaine A. Maveety

BUYER/BORROWER: TBD

PROPERTY ADDRESS: No Situs, Newberg, OR 97132

EFFECTIVE DATE: May 27, 2022, 08:00 AM

1. THE POLICY AND ENDORSEMENTS TO BE ISSUED AND THE RELATED CHARGES ARE:

	<u>AMOUNT</u>	<u>PREMIUM</u>
ALTA Owner's Policy 2006 Owner's Standard	\$ TBD	\$ TBD
Government Lien Search		\$ 25.00

2. THE ESTATE OR INTEREST IN THE LAND HEREINAFTER DESCRIBED OR REFERRED TO COVERED BY THIS REPORT IS:

A Fee

3. TITLE TO SAID ESTATE OR INTEREST AT THE DATE HEREOF IS VESTED IN:

Patrick R. Maveety and Elaine A. Maveety, as tenants by the entirety

4. THE LAND REFERRED TO IN THIS REPORT IS SITUATED IN THE CITY OF NEWBERG, COUNTY OF YAMHILL, STATE OF OREGON, AND IS DESCRIBED AS FOLLOWS:

SEE EXHIBIT "A" ATTACHED HERETO AND MADE A PART HEREOF

EXHIBIT "A"
Legal Description

Parcel 1 of PARTITION PLAT NO. 97-5, recorded January 22, 1997 in Film Volume 4, Page 378, Plat Records, in the City of Newberg, County of Yamhill, State of Oregon.

EXCEPTING THEREFROM that portion conveyed to the State of Oregon, by and through its Department of Transportation, by instrument recorded November 2, 2000, as Instrument No. 200015895, Yamhill County Records.

AS OF THE DATE OF THIS REPORT, ITEMS TO BE CONSIDERED AND EXCEPTIONS TO COVERAGE IN ADDITION TO THE PRINTED EXCEPTIONS AND EXCLUSIONS IN THE POLICY FORM WOULD BE AS FOLLOWS:

GENERAL EXCEPTIONS:

1. Taxes or assessments which are not shown as existing liens by the records of any taxing authority that levies taxes or assessments on real property or by the Public Records; proceedings by a public agency which may result in taxes or assessments, or notices of such proceedings, whether or not shown by the records of such agency or by the Public Records.
2. Any facts, rights, interests or claims, which are not shown by the Public Records but which could be ascertained by an inspection of the Land or by making inquiry of persons in possession thereof.
3. Easements, or claims of easement, which are not shown by the Public Records; reservations or exceptions in patents or in Acts authorizing the issuance thereof; water rights, claims or title to water.
4. Any encroachment (of existing improvements located on the Land onto adjoining land or of existing improvements located on adjoining land onto the subject Land), encumbrance, violation, variation or adverse circumstance affecting the Title that would be disclosed by an accurate and complete land survey of the subject Land.
5. Any lien or right to a lien for services, labor, material, equipment rental or workers compensation heretofore or hereafter furnished, imposed by law and not shown by the Public Records.

SPECIFIC ITEMS AND EXCEPTIONS:

6. City liens, if any of the City of Newberg. (This property is located within the city limits, but currently is not listed in Conduits. An inquiry call to the City should be made by the Escrow Officer.)
7. Existing leases and tenancies, if any, and any interests that may appear upon examination of such leases.
8. Easement(s) for the purpose(s) shown below and rights incidental thereto, as granted in a document:

Granted to: Owners of adjoining property
Purpose: Water pipeline
Recording Date: April 21, 1952
Recording No: [Book 165, Page 361](#)
Affects: Reference is hereby made to said document for full particulars

9. Easement(s) for the purpose(s) shown below and rights incidental thereto, as granted in a document:

Granted to: City of Newberg, Oregon
Purpose: Slopes and drainage facilities
Recording Date: September 26, 1979
Recording No: Film [Volume 146, Page 430](#)
Affects: Reference is hereby made to said document for full particulars

10. Easement(s) for the purpose(s) shown below and rights incidental thereto, as delineated on or as offered for dedication on

Plat: Partition Plat 97-5
Recording Date: January 22, 1997
Recording No: Plat Volume 4, Page 378
Purpose: Public storm sewer
Affects: North 15 feet

11. Easement(s) for the purpose(s) shown below and rights incidental thereto, as delineated on or as offered for dedication on

Plat: Partition Plat 97-5
Recording Date: January 22, 1997
Recording No: Plat Volume 4, Page 378
Purpose: Public storm sewer
Affects: 15 feet in width across the Easterly portion of the lot - reference is made to the recorded plat for exact location

12. Easement(s) for the purpose(s) shown below and rights incidental thereto, as granted in a document:

Granted to: State of Oregon, by and through its Department of Transportation
Purpose: Slope, utilities, fixtures and facilities, and sign
Recording Date: November 2, 2000
[Recording No: 200015895](#)
Affects: Reference is hereby made to said document for full particulars

13. The search did not disclose any open mortgages or deeds of trust of record, therefore the Company reserves the right to require further evidence to confirm that the property is unencumbered, and further reserves the right to make additional requirements or add additional items or exceptions upon receipt of the requested evidence.

14. If requested to issue an extended coverage ALTA loan policy, the following matters must be addressed:

- a) The rights of tenants holding under unrecorded leases or tenancies
- b) Matters disclosed by a statement as to parties in possession and as to any construction, alterations or repairs to the Land within the last 75 days. The Company must be notified in the event that any funds are to be used for construction, alterations or repairs.
- c) Any facts which would be disclosed by an accurate survey of the Land

ADDITIONAL REQUIREMENTS/NOTES:

A. Note: Property taxes for the fiscal year shown below are paid in full.

Fiscal Year: 2021-2022
Amount: \$4,164.77
Levy Code: 29.0
[Account No.: 282973](#)
Map No.: R3216CB 00800

Prior to close of escrow, please contact the Tax Collector's Office to confirm all amounts owing, including current fiscal year taxes, supplemental taxes, escaped assessments and any delinquencies.

- B. In addition to the standard policy exceptions, the exceptions enumerated above shall appear on the final 2006 ALTA Policy unless removed prior to issuance.
- C. Note: No utility search has been made or will be made for water, sewer or storm drainage charges unless the City/Service District claims them as liens (i.e. foreclosable) and reflects them on its lien docket as of the date of closing. Buyers should check with the appropriate city bureau or water service district and obtain a billing cutoff. Such charges must be adjusted outside of escrow.
- D. Note: Effective January 1, 2008, Oregon law (ORS 314.258) mandates withholding of Oregon income taxes from sellers who do not continue to be Oregon residents or qualify for an exemption. Please contact your Escrow Closer for further information.
- E. Note: There are NO conveyances affecting said Land recorded within 24 months of the date of this report.
- F. Note: The name(s) of the proposed insured(s) furnished with this application for title insurance is/are:

No names were furnished with the application. Please provide the name(s) of the buyers as soon as possible.
- G. THE FOLLOWING NOTICE IS REQUIRED BY STATE LAW: YOU WILL BE REVIEWING, APPROVING AND SIGNING IMPORTANT DOCUMENTS AT CLOSING. LEGAL CONSEQUENCES FOLLOW FROM THE SELECTION AND USE OF THESE DOCUMENTS. YOU MAY CONSULT AN ATTORNEY ABOUT THESE DOCUMENTS. YOU SHOULD CONSULT AN ATTORNEY IF YOU HAVE QUESTIONS OR CONCERNS ABOUT THE TRANSACTION OR ABOUT THE DOCUMENTS. IF YOU WISH TO REVIEW TRANSACTION DOCUMENTS THAT YOU HAVE NOT SEEN, PLEASE CONTACT THE ESCROW AGENT.
- H. Recording Charge (Per Document) is the following:

County	First Page	Each Additional Page
Yamhill	\$81.00	\$5.00

Note: When possible the company will record electronically. An additional charge of \$5.00 applies to each document that is recorded electronically.

Note: Please send any documents for recording to the following address:
Portland Title Group
Attn: Recorder
1433 SW 6th Ave.
Portland, OR. 97201

Please email your release to the following email address: or-ttc-yamhillrecording@ticortitle.com
- I. Note: This [map/plat](#) is being furnished as an aid in locating the herein described Land in relation to adjoining streets, natural boundaries and other land. Except to the extent a policy of title insurance is expressly modified by endorsement, if any, the Company does not insure dimensions, distances or acreage shown thereon.
- J. Notice: Please be aware that due to the conflict between federal and state laws concerning the cultivation, distribution, manufacture or sale of marijuana, the Company is not able to close or insure any transaction involving Land that is associated with these activities.

K. NOTE: IMPORTANT INFORMATION REGARDING PROPERTY TAX PAYMENTS:

Fiscal Year:	July 1st through June 30th
Taxes become a lien on real property, but are not yet payable:	July 1st
Taxes become certified and payable (approximately on this date):	October 15th
First one third payment of taxes is due:	November 15th
Second one third payment of taxes is due:	February 15th
Final payment of taxes is due:	May 15th

Discounts: If two thirds are paid by November 15th, a 2% discount will apply. If the full amount of the taxes are paid by November 15th, a 3% discount will apply.

Interest: Interest accrues as of the 15th of each month based on any amount that is unpaid by the due date. No interest is charged if the minimum amount is paid according to the above mentioned payment schedule.

EXHIBIT ONE

2006 AMERICAN LAND TITLE ASSOCIATION LOAN POLICY (06-17-06) EXCLUSIONS FROM COVERAGE

The following matters are expressly excluded from the coverage of this policy and the Company will not pay loss or damage, costs, attorneys' fees or expenses that arise by reason of:

- (a) Any law, ordinance or governmental regulation (including but not limited to building and zoning) restricting, regulating, prohibiting or relating to
 - the occupancy, use, or enjoyment of the Land;
 - the character, dimensions or location of any improvement erected on the land;
 - the subdivision of land; or
 - environmental protection;or the effect of any violation of these laws, ordinances or governmental regulations. This Exclusion 1(a) does not modify or limit the coverage provided under Covered Risk 5.
- (b) Any governmental police power. This Exclusion 1(b) does not modify or limit the coverage provided under Covered Risk 6.
- Rights of eminent domain. This Exclusion does not modify or limit the coverage provided under Covered Risk 7 or 8.
- Defects, liens, encumbrances, adverse claims, or other matters
 - created, suffered, assumed or agreed to by the Insured Claimant;
 - not known to the Company, not recorded in the Public Records at Date of Policy, but known to the Insured Claimant and not disclosed in writing to the Company by the Insured Claimant prior to the date the Insured Claimant became an Insured under this policy;

- resulting in no loss or damage to the Insured Claimant;
 - attaching or created subsequent to Date of Policy (however, this does not modify or limit the coverage provided under Covered Risk 11, 13, or 14); or
 - resulting in loss or damage that would not have been sustained if the Insured Claimant had paid value for the Insured Mortgage.
- Unenforceability of the lien of the Insured Mortgage because of the inability or failure of an Insured to comply with the applicable doing-business laws of the state where the Land is situated.
 - Invalidity or unenforceability in whole or in part of the lien of the Insured Mortgage that arises out of the transaction evidenced by the Insured Mortgage and is based upon usury or any consumer credit protection or truth-in-lending law.
 - Any claim, by reason of the operation of federal bankruptcy, state insolvency or similar creditors' rights laws, that the transaction creating the lien of the Insured Mortgage, is
 - a fraudulent conveyance or fraudulent transfer, or
 - a preferential transfer for any reason not stated in the Covered Risk 13(b) of this policy.
 - Any lien on the Title for real estate taxes or assessments imposed by governmental authority and created or attaching between Date of Policy and the date of recording of the Insured Mortgage in the Public Records. This Exclusion does not modify or limit the coverage provided under Covered Risk 11(b).

The above policy form may be issued to afford either Standard Coverage or Extended Coverage. In addition to the above Exclusions from Coverage, the Exceptions from Coverage in a Standard Coverage policy will also include the following Exceptions from Coverage.

SCHEDULE B - GENERAL EXCEPTIONS FROM COVERAGE

This policy does not insure against loss or damage (and the Company will not pay costs, attorneys' fees or expenses) which arise by reason of:

- Taxes or assessments which are not shown as existing liens by the records of any taxing authority that levies taxes or assessments on real property or by the Public Records; proceedings by a public agency which may result in taxes or assessments, or notices of such proceedings, whether or not shown by the records of such agency or by the Public Records.
- Facts, rights, interests or claims which are not shown by the Public Records but which could be ascertained by an inspection of the Land or by making inquiry of persons in possession thereof.
- Easements, or claims of easement, not shown by the Public Records; reservations or exceptions in patents or in Acts authorizing the issuance thereof, water rights, claims or title to water.
- Any encroachment, encumbrance, violation, variation, or adverse circumstance affecting the Title that would be disclosed by an accurate and complete land survey of the Land. The term "encroachment" includes encroachments of existing improvements located on the Land onto adjoining land, and encroachments onto the Land of existing improvements located on adjoining land.
- Any lien for services, labor or material heretofore or hereafter furnished, or for contributions due to the State of Oregon for unemployment compensation or worker's compensation, imposed by law and not shown by the Public Records.

2006 AMERICAN LAND TITLE ASSOCIATION OWNER'S POLICY (06-17-06) EXCLUSIONS FROM COVERAGE

The following matters are expressly excluded from the coverage of this policy and the Company will not pay loss or damage, costs, attorneys' fees or expenses that arise by reason of:

- (a) Any law, ordinance or governmental regulation (including but not limited to building and zoning) restricting, regulating, prohibiting or relating to
 - the occupancy, use, or enjoyment of the Land;
 - the character, dimensions or location of any improvement erected on the land;
 - the subdivision of land; or
 - environmental protection;or the effect of any violation of these laws, ordinances or governmental regulations. This Exclusion 1(a) does not modify or limit the coverage provided under Covered Risk 5.
- (b) Any governmental police power. This Exclusion 1(b) does not modify or limit the coverage provided under Covered Risk 6.
- Rights of eminent domain. This Exclusion does not modify or limit the coverage provided under Covered Risk 7 or 8.
- Defects, liens, encumbrances, adverse claims, or other matters
 - created, suffered, assumed or agreed to by the Insured Claimant;

- not known to the Company, not recorded in the Public Records at Date of Policy, but known to the Insured Claimant and not disclosed in writing to the Company by the Insured Claimant prior to the date the Insured Claimant became an Insured under this policy;
 - resulting in no loss or damage to the Insured Claimant;
 - attaching or created subsequent to Date of Policy (however, this does not modify or limit the coverage provided under Covered Risk 9 and 10); or
 - resulting in loss or damage that would not have been sustained if the Insured Claimant had paid value for the Title.
- Any claim, by reason of the operation of federal bankruptcy, state insolvency or similar creditors' rights laws, that the transaction creating the lien of the Insured Mortgage, is
 - a fraudulent conveyance or fraudulent transfer, or
 - a preferential transfer for any reason not stated in the Covered Risk 9 of this policy.
 - Any lien on the Title for real estate taxes or assessments imposed by governmental authority and created or attaching between Date of Policy and the date of recording of the deed or other instrument of transfer in the Public Records that vests Title as shown in Schedule A.

The above policy form may be issued to afford either Standard Coverage or Extended Coverage. In addition to the above Exclusions from Coverage, the Exceptions from Coverage in a Standard Coverage policy will also include the following Exceptions from Coverage.

SCHEDULE B - GENERAL EXCEPTIONS FROM COVERAGE

This policy does not insure against loss or damage (and the Company will not pay costs, attorneys' fees or expenses) which arise by reason of:

- Taxes or assessments which are not shown as existing liens by the records of any taxing authority that levies taxes or assessments on real property or by the Public Records; proceedings by a public agency which may result in taxes or assessments, or notices of such proceedings, whether or not shown by the records of such agency or by the Public Records.
- Facts, rights, interests or claims which are not shown by the Public Records but which could be ascertained by an inspection of the Land or by making inquiry of persons in possession thereof.
- Easements, or claims of easement, not shown by the Public Records; reservations or exceptions in patents or in Acts authorizing the issuance thereof, water rights, claims or title to water.
- Any encroachment, encumbrance, violation, variation, or adverse circumstance affecting the Title that would be disclosed by an accurate and complete land survey of the Land. The term "encroachment" includes encroachments of existing improvements located on the Land onto adjoining land, and encroachments onto the Land of existing improvements located on adjoining land.
- Any lien for services, labor or material heretofore or hereafter furnished, or for contributions due to the State of Oregon for unemployment compensation or worker's compensation, imposed by law and not shown by the Public Records.



Inquire before you wire!

WIRE FRAUD ALERT

This Notice is not intended to provide legal or professional advice.
If you have any questions, please consult with a lawyer.

All parties to a real estate transaction are targets for wire fraud and many have lost hundreds of thousands of dollars because they simply relied on the wire instructions received via email, without further verification. **If funds are to be wired in conjunction with this real estate transaction, we strongly recommend verbal verification of wire instructions through a known, trusted phone number prior to sending funds.**

In addition, the following non-exclusive self-protection strategies are recommended to minimize exposure to possible wire fraud.

- **NEVER RELY** on emails purporting to change wire instructions. Parties to a transaction rarely change wire instructions in the course of a transaction.
- **ALWAYS VERIFY** wire instructions, specifically the ABA routing number and account number, by calling the party who sent the instructions to you. DO NOT use the phone number provided in the email containing the instructions, use phone numbers you have called before or can otherwise verify. **Obtain the number of relevant parties to the transaction as soon as an escrow account is opened.** DO NOT send an email to verify as the email address may be incorrect or the email may be intercepted by the fraudster.
- **USE COMPLEX EMAIL PASSWORDS** that employ a combination of mixed case, numbers, and symbols. Make your passwords greater than eight (8) characters. Also, change your password often and do NOT reuse the same password for other online accounts.
- **USE MULTI-FACTOR AUTHENTICATION** for email accounts. Your email provider or IT staff may have specific instructions on how to implement this feature.

For more information on wire-fraud scams or to report an incident, please refer to the following links:

Federal Bureau of Investigation:

<http://www.fbi.gov>

Internet Crime Complaint Center:

<http://www.ic3.gov>

FIDELITY NATIONAL FINANCIAL PRIVACY NOTICE

Effective January 1, 2021

Fidelity National Financial, Inc. and its majority-owned subsidiary companies (collectively, "FNF," "our," or "we") respect and are committed to protecting your privacy. This Privacy Notice explains how we collect, use, and protect personal information, when and to whom we disclose such information, and the choices you have about the use and disclosure of that information.

A limited number of FNF subsidiaries have their own privacy notices. If a subsidiary has its own privacy notice, the privacy notice will be available on the subsidiary's website and this Privacy Notice does not apply.

Collection of Personal Information

FNF may collect the following categories of Personal Information:

- contact information (e.g., name, address, phone number, email address);
- demographic information (e.g., date of birth, gender, marital status);
- identity information (e.g. Social Security Number, driver's license, passport, or other government ID number);
- financial account information (e.g. loan or bank account information); and
- other personal information necessary to provide products or services to you.

We may collect Personal Information about you from:

- information we receive from you or your agent;
- information about your transactions with FNF, our affiliates, or others; and
- information we receive from consumer reporting agencies and/or governmental entities, either directly from these entities or through others.

Collection of Browsing Information

FNF automatically collects the following types of Browsing Information when you access an FNF website, online service, or application (each an "FNF Website") from your Internet browser, computer, and/or device:

- Internet Protocol (IP) address and operating system;
- browser version, language, and type;
- domain name system requests; and
- browsing history on the FNF Website, such as date and time of your visit to the FNF Website and visits to the pages within the FNF Website.

Like most websites, our servers automatically log each visitor to the FNF Website and may collect the Browsing Information described above. We use Browsing Information for system administration, troubleshooting, fraud investigation, and to improve our websites. Browsing Information generally does not reveal anything personal about you, though if you have created a user account for an FNF Website and are logged into that account, the FNF Website may be able to link certain browsing activity to your user account.

Other Online Specifics

Cookies. When you visit an FNF Website, a "cookie" may be sent to your computer. A cookie is a small piece of data that is sent to your Internet browser from a web server and stored on your computer's hard drive. Information gathered using cookies helps us improve your user experience. For example, a cookie can help the website load properly or can customize the display page based on your browser type and user preferences. You can choose whether or not to accept cookies by changing your Internet browser settings. Be aware that doing so may impair or limit some functionality of the FNF Website.

Web Beacons. We use web beacons to determine when and how many times a page has been viewed. This information is used to improve our websites.

Do Not Track. Currently our FNF Websites do not respond to "Do Not Track" features enabled through your browser.

Links to Other Sites. FNF Websites may contain links to unaffiliated third-party websites. FNF is not responsible for the privacy practices or content of those websites. We recommend that you read the privacy policy of every website you visit.

Use of Personal Information

FNF uses Personal Information for three main purposes:

- To provide products and services to you or in connection with a transaction involving you.
- To improve our products and services.
- To communicate with you about our, our affiliates', and others' products and services, jointly or independently.

When Information Is Disclosed

We may disclose your Personal Information and Browsing Information in the following circumstances:

- to enable us to detect or prevent criminal activity, fraud, material misrepresentation, or nondisclosure;
- to nonaffiliated service providers who provide or perform services or functions on our behalf and who agree to use the information only to provide such services or functions;
- to nonaffiliated third party service providers with whom we perform joint marketing, pursuant to an agreement with them to jointly market financial products or services to you;
- to law enforcement or authorities in connection with an investigation, or in response to a subpoena or court order; or
- in the good-faith belief that such disclosure is necessary to comply with legal process or applicable laws, or to protect the rights, property, or safety of FNF, its customers, or the public.

The law does not require your prior authorization and does not allow you to restrict the disclosures described above. Additionally, we may disclose your information to third parties for whom you have given us authorization or consent to make such disclosure. We do not otherwise share your Personal Information or Browsing Information with nonaffiliated third parties, except as required or permitted by law. We may share your Personal Information with affiliates (other companies owned by FNF) to directly market to you. Please see "Choices with Your Information" to learn how to restrict that sharing.

We reserve the right to transfer your Personal Information, Browsing Information, and any other information, in connection with the sale or other disposition of all or part of the FNF business and/or assets, or in the event of bankruptcy, reorganization, insolvency, receivership, or an assignment for the benefit of creditors. By submitting Personal Information and/or Browsing Information to FNF, you expressly agree and consent to the use and/or transfer of the foregoing information in connection with any of the above described proceedings.

Security of Your Information

We maintain physical, electronic, and procedural safeguards to protect your Personal Information.

Choices With Your Information

If you do not want FNF to share your information among our affiliates to directly market to you, you may send an "opt out" request as directed at the end of this Privacy Notice. We do not share your Personal Information with nonaffiliates for their use to direct market to you without your consent.

Whether you submit Personal Information or Browsing Information to FNF is entirely up to you. If you decide not to submit Personal Information or Browsing Information, FNF may not be able to provide certain services or products to you.

For California Residents: We will not share your Personal Information or Browsing Information with nonaffiliated third parties, except as permitted by California law. For additional information about your California privacy rights, please visit the "California Privacy" link on our website (<https://fnf.com/pages/californiaprivacy.aspx>) or call (888) 413-1748.

For Nevada Residents: You may be placed on our internal Do Not Call List by calling (888) 934-3354 or by contacting us via the information set forth at the end of this Privacy Notice. Nevada law requires that we also provide you with the following contact information: Bureau of Consumer Protection, Office of the Nevada Attorney General, 555 E. Washington St., Suite 3900, Las Vegas, NV 89101; Phone number: (702) 486-3132; email: BCPINFO@ag.state.nv.us.

For Oregon Residents: We will not share your Personal Information or Browsing Information with nonaffiliated third parties for marketing purposes, except after you have been informed by us of such sharing and had an opportunity to indicate that you do not want a disclosure made for marketing purposes.

For Vermont Residents: We will not disclose information about your creditworthiness to our affiliates and will not disclose your personal information, financial information, credit report, or health information to nonaffiliated third parties to market to you, other than as permitted by Vermont law, unless you authorize us to make those disclosures.

Information From Children

The FNF Websites are not intended or designed to attract persons under the age of eighteen (18). We do not collect Personal Information from any person that we know to be under the age of thirteen (13) without permission from a parent or guardian.

International Users

FNF's headquarters is located within the United States. If you reside outside the United States and choose to provide Personal Information or Browsing Information to us, please note that we may transfer that information outside of your country of residence. By providing FNF with your Personal Information and/or Browsing Information, you consent to our collection, transfer, and use of such information in accordance with this Privacy Notice.

FNF Website Services for Mortgage Loans

Certain FNF companies provide services to mortgage loan servicers, including hosting websites that collect customer information on behalf of mortgage loan servicers (the "Service Websites"). The Service Websites may contain links to both this Privacy Notice and the mortgage loan servicer or lender's privacy notice. The sections of this Privacy Notice titled When Information is Disclosed, Choices with Your Information, and Accessing and Correcting Information do not apply to the Service Websites. The mortgage loan servicer or lender's privacy notice governs use, disclosure, and access to your Personal Information. FNF does not share Personal Information collected through the Service Websites, except as required or authorized by contract with the mortgage loan servicer or lender, or as required by law or in the good-faith belief that such disclosure is necessary: to comply with a legal process or applicable law, to enforce this Privacy Notice, or to protect the rights, property, or safety of FNF or the public.

Your Consent To This Privacy Notice; Notice Changes; Use of Comments or Feedback

By submitting Personal Information and/or Browsing Information to FNF, you consent to the collection and use of the information in accordance with this Privacy Notice. We may change this Privacy Notice at any time. The Privacy Notice's effective date will show the last date changes were made. If you provide information to us following any change of the Privacy Notice, that signifies your assent to and acceptance of the changes to the Privacy Notice.

Accessing and Correcting Information; Contact Us

If you have questions, would like to correct your Personal Information, or want to opt-out of information sharing for affiliate marketing, visit FNF's [Opt Out Page](#) or contact us by phone at (888) 934-3354 or by mail to:

Fidelity National Financial, Inc.
601 Riverside Avenue,
Jacksonville, Florida 32204
Attn: Chief Privacy Officer



Community Development Department

P.O. Box 970 ▪ 414 E First Street ▪ Newberg, Oregon 97132
503-537-1240. Fax 503-537-1272 www.newbergoregon.gov

NOTICE OF PLANNING COMMISSION HEARING ON A CONDITIONAL USE PERMIT

A property owner in your neighborhood submitted an application to the City of Newberg for a conditional use permit to allow a 28-Unit Multi-Family Residential building. The Newberg Planning Commission will hold a hearing on **February 9, 2023** at 7 p.m. at the Newberg Public Safety Building, 401 E. Third Street, Newberg, OR, to evaluate the proposal. You are invited to take part in the City's review of this project by sending in your written comments or by testifying before the Planning Commission. For more details about giving comments, please see the back of this sheet.

The application would change the use of this 0.822-acre parcel to allow a Type III Conditional Use Permit (Residential in C-2 Zone) and Type II Site Design Review (companion to CUP) for a 28-unit multi-family residential building. The 28 units are proposed to be developed within a single, 3-story building with 16 one-bedroom units and 12-two-bedroom units. Development of the site will include 43 off-street spaces, shared open space areas, and attractive landscaping.

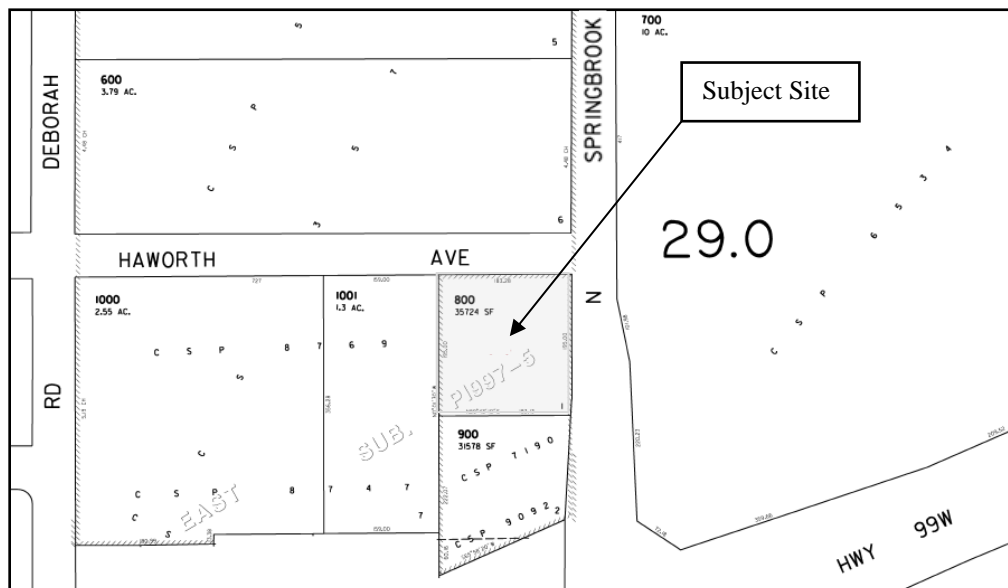
APPLICANT: Grove Development

TELEPHONE: (503) 793-3299

PROPERTY OWNER: Patrick and Elaine Maveety

LOCATION: At the south west corner of the intersection of E Haworth Avenue and N Springbrook Road

TAX LOT NUMBER: 3S2 16CB 00800



We are mailing you information about this project because you own land within 500 feet of the proposed conditional use. We invite you to participate in the land use hearing scheduled before the Planning Commission. If you wish to participate in the hearing, you may do so in person or be represented by someone else. Oral testimony typically is limited to five minutes per speaker.

If you mail your comments to the City, please put the following information on the outside of the envelope:

Written Comments: CUP22-0016 / DR222-0011
City of Newberg
Community Development Department
PO Box 970
Newberg, OR 97132

All written comments must be turned in by noon on Monday **February 6, 2023**. Written information received after this time will be read out loud at the hearing subject to time limits for speakers, and will be included in the record if there are further proceedings.

You can look over all the information about this project or drop comments off at Newberg City Hall, 414 E. First Street. You can also buy copies of the information for a cost of 25 cents a page. A staff report relating to the proposal will be available for inspection at no cost seven days prior to the public hearing. If you have any questions about the project, you can call the Newberg Planning Division at 503-537-1240 or visit <https://www.newbergoregon.gov/planning> to view our current planning projects.

Any issue which might be raised in an appeal of this case to the Land Use Board of Appeals (LUBA) must be raised during the public hearing process. You must include enough detail to enable the decision maker an opportunity to respond. The applicable criteria used to make a decision on this application for a conditional use permit are found in Newberg Development Code Section 15.225.060.

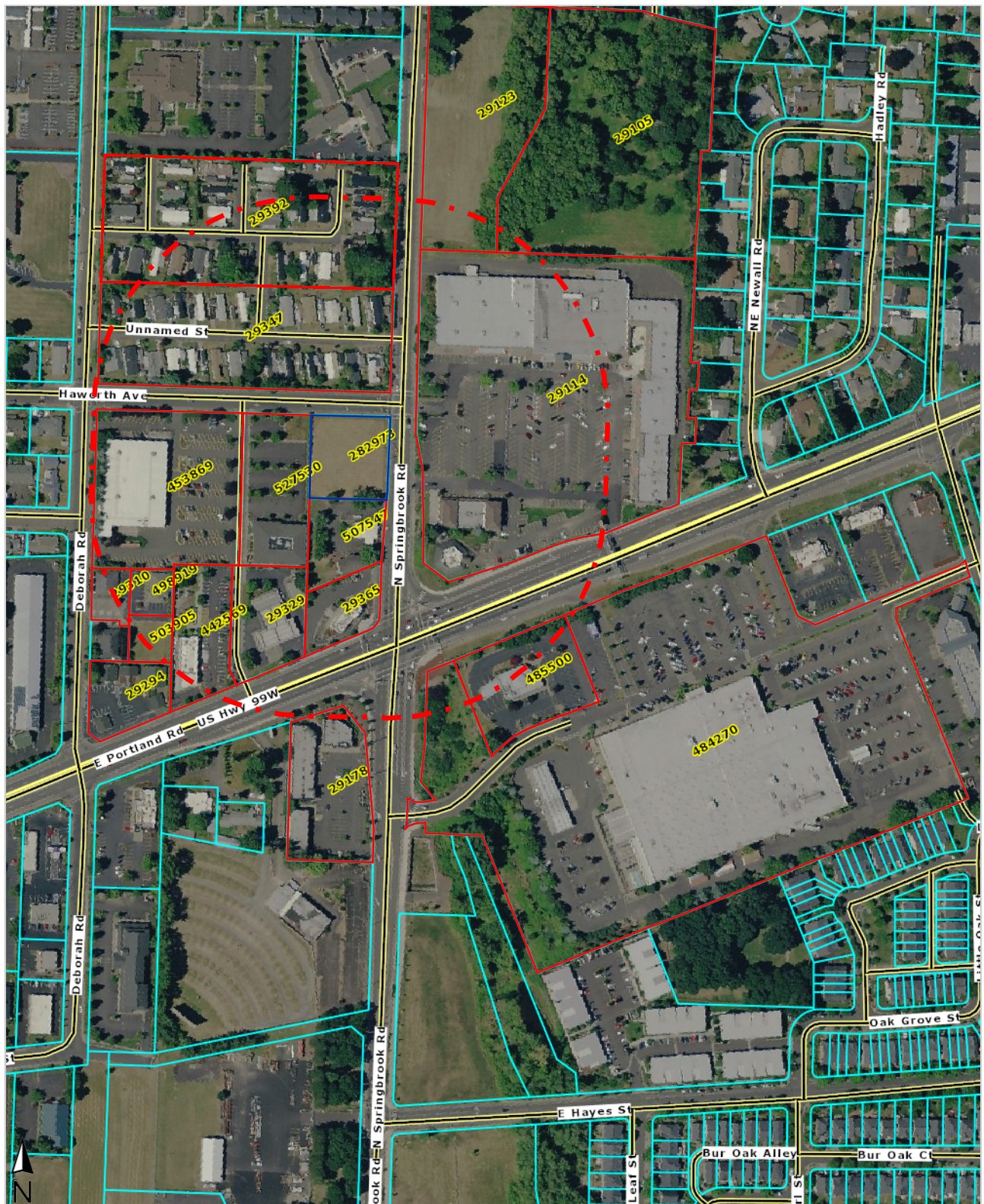
Prior to the conclusion of the initial evidentiary hearing, any participant may request an opportunity to present additional evidence, arguments or testimony regarding the application through a continuance or extension of the record. Failure of an issue to be raised in the hearing, in person or by letter, or failure to provide statements or evidence sufficient to afford the decision maker an opportunity to respond to the issue precludes appeal to the State Land Use Board of Appeals based on that issue.

If you participate in the public hearing process, either by testifying at the public hearing, or by sending in written comments, you will be sent information about any decision made by the City relating to this project.

Date Mailed: ***Date notice is mailed***

ACCOMMODATION OF PHYSICAL IMPAIRMENTS:

In order to accommodate persons with physical impairments, please notify the City Recorder's office of any special physical or language accommodations you may need as far in advance of the meeting as possible and no later than 48 hours prior to the meeting. To request these arrangements, please contact the City Recorder at 503-537-1283. For TTY services please dial 711.



Radius Map - 500 Ft around Parcel R3216CB-00800, labeled by parcel ID#s



Lawyers Title

This map/plot is being furnished as an aid in locating the herein described land in relation to adjoining streets, natural boundaries and other land, and is not a survey of the land depicted. Except to the extent a policy of title insurance is expressly modified by endorsement, if any, the company does not insure dimensions, distances, location of easements, acreage or other matters shown thereon.

LAND USE NOTICE

FILE # CUP22-0016

PROPOSAL: Type III Review for a Conditional Use Permit & Site Design Review for a 28 Unit Multi-Family Residential Building

FOR FURTHER INFORMATION, CONTACT:

City of Newberg
Community Development Department
414 E First Street
Phone: 503-537-1240

LAND USE NOTICE

FILE # _____

PROPOSAL: Type III Review for a Conditional Use Permit & Site Design Review for a 28 Unit Multi-Family Residential Building

FOR FURTHER INFORMATION, CONTACT:

City of Newberg
Community Development Department
414 E First Street
Phone: 503-537-1240

2'

3'

ParcelId	OwnerNameLabelFormat	SiteAddr	SiteCity	SiteState	SiteZIP
29105	Meadow Brook Villas LLC	1306 N Springbrook Rd	Newberg	OR	97132
29114	Springbrook Plaza LLC	1100 N Springbrook Rd	Newberg	OR	97132
29123	Meadow Brook Villas LLC	1306 N Springbrook Rd	Newberg	OR	97132
29178	Crossroads Plaza LLC	705 N Springbrook Rd	Newberg	OR	97132
29294	Brugato Joseph A & Marita G Trustees For	2911 E Portland Rd	Newberg	OR	97132
29310	Burgner Family Trust	908 Deborah Rd	Newberg	OR	97132
29329	Raddie Michael Trustee	3101 E Portland Rd	Newberg	OR	97132
29347	Azalea Gardens Mobile Manor LLC	1103 N Springbrook Rd Unit 39	Newberg	OR	97132
29365	Delsol D LLC	3105 E Portland Rd	Newberg	OR	97132
29392	Azalea Gardens Mobile Manor LLC	1103 N Springbrook Rd Unit 45	Newberg	OR	97132
442569	McDonalds Corporation	3005 E Portland Rd	Newberg	OR	97132
453869	Bi-Mart Corporation	2900 Haworth Ave	Newberg	OR	97132
484270	Fred Meyer Stores Inc	3300 E Portland Rd Unit 400	Newberg	OR	97132
485500	United States National Bank Of Oregon	3220 E Portland Rd	Newberg	OR	97132
498919	Springbrook Dental LLC	906 Deborah Rd	Newberg	OR	97132
503905	Springbrook Dental LLC	904 Deborah Rd	Newberg	OR	97132
507547	Ralston & Ralston LLC	1015 N Springbrook Rd	Newberg	OR	97132
527530	Newberg Professional Building LLC	2950 Haworth Ave	Newberg	OR	97132

OwnerAddr	OwnerCityNm	OwnerState	OwnerZIP	DocRcrdgDt	SaleAmt	TaxTtl1	AssdTtlVal	MktTtlVal
4695 SE Deer Creek Pl	Gresham	OR	97080	7/29/2019	800000	2209.55	138640	1823558
19300 Merridy St	Northridge	CA	91324	9/28/2004	10	160894.73	10095482	19571280
4695 SE Deer Creek Pl	Gresham	OR	97080	5/31/2019	800000	25086.22	1574057	5178523
PO Box 8880	Ketchum	ID	83340	3/31/2014	3698000	33864.6	2124864	4026253
17415 SE River Rd	Milwaukie	OR	97267	11/1/2006	0	11331.77	711022	1160693
9227 E Lincoln Ave Ste 200-240	Lone Tree	CO	80124	11/23/2021	1162250	7976.57	500497	754401
Attn: Michael Delagnes Of DI&D LLP	San Francisco	CA	94104	8/8/2016	475000	19617	1230886	2438548
PO Box 17	Guerneville	CA	95446	2/14/2019	0	14063.44	413481	413481
3950 Via Dolce No 519	Marina Del Rey	CA	90292	5/16/2012	2124000	17005.02	1066995	1810687
PO Box 17	Guerneville	CA	95446	2/14/2019	0	15639.54	488957	488957
Attn: Double K Ventures	Tigard	OR	97223	3/2/1985	219550	23537.43	1476877	3168138
PO Box 2310	Eugene	OR	97402	6/25/2004	0	36912.94	2316135	3416120
Attn: Property Tax	Cincinnati	OH	45202	11/12/2013	15335642	317688.51	19933647	33969028
C/O Ryan Pts Dept. 908	Houston	TX	77056	7/29/1993	672754	24646.59	1546472	2109169
906 Deborah Rd	Newberg	OR	97132	8/29/2014	550000	6721.35	421737	712100
906 Deborah Rd	Newberg	OR	97132	2/15/2008	175000	1414.39	88747	240719
2959 SW Bennington Dr	Portland	OR	97205	9/11/2015	450000	8828.74	553967	622200
Attn: Roland G Stewart	Salem	OR	97302	6/25/2004	333750	23311.23	1462684	4217786

MktImprVal	MktLandVal	LandUseStdDsc	PlatNm
0	1823558	Single Family Residence	
12102848	7468432	Commercial Miscellaneous	
3377750	1800773	Other	
2601375	1424878	Commercial Miscellaneous	
471489	689204	Commercial Miscellaneous	East Newberg Subdivision
530384	224017	Commercial Miscellaneous	
1589886	848662	Commercial Miscellaneous	East Newberg
0	413481	Mobile Home Parks, Trailers	East Newberg Subdivision
1020135	790552	Commercial Miscellaneous	East Newberg
0	488957	Mobile Home Parks, Trailers	East Newberg Subdivision
2174970	993168	Commercial Miscellaneous	East Newberg
1896573	1519547	Commercial Miscellaneous	East Newberg Subdivision
21086742	12882286	Commercial Miscellaneous	
1260507	848662	Commercial Miscellaneous	
471381	240719	Commercial Miscellaneous	
0	240719	Commercial Miscellaneous	
107792	514408	Commercial Miscellaneous	
3410837	806949	Commercial Miscellaneous	East Newberg Subdivision

LegalDsc

WtrfntNm NbrhdCd

See Metes & Bounds

See Metes & Bounds

See Metes & Bounds

Township 3S Range 2W Section 16 Qtr C QQtr C TaxLot 01400

Pt Lot 8 in EAST NEWBERG SUBDIVISION

PT PARCEL 1 P1996-10

Township 3S Range 2W Section 16 Qtr C QQtr C TaxLot 00200

Lot 6 in EAST NEWBERG SUBDIVISION

Township 3S Range 2W Section 16 Qtr C QQtr C TaxLot 00100

Lot 5 in EAST NEWBERG SUBDIVISION

Township 3S Range 2W Section 16 Qtr C QQtr C TaxLot 00300

Township 3S Range 2W Section 16 Qtr C QQtr B TaxLot 01000 Lot 7 SubdivisionName EAST NEWBERG SUBDIVISION

Township 3S Range 2W Section 16 TaxLot 02004

Township 3S Range 2W Section 16 TaxLot 02005

Township 3S Range 2W Section 16 Qtr C QQtr C TaxLot 00400

Township 3S Range 2W Section 16 Qtr C QQtr C TaxLot 00700

PARCEL 2 P1997-5

Township 3S Range 2W Section 16 Qtr C QQtr B TaxLot 01001 Lot 7 SubdivisionName EAST NEWBERG SUBDIVISION

YrBlt	Acres	LotSqFt	FinTtlSqFt	Flr1SqFt	Flr2SqFt	BsmtFinSqFt	GarageSqFt	BedCt	BathTtlCt	MapGrid	TaxAcctNum	ZoneCd
0	5.49	239144	0	0	0	0	0	0	0	0 713-F6	R3216CB00100	R-2
0	9.96	433857	0	0	0	0	0	0	0	0 713-F6	R3216CB00700	C-2
0	3.18	138520	0	0	0	0	0	0	0	0 713-F6	R3216CB00200	R-2
0	1.48	64468	0	0	0	0	0	0	0	0 713-F7	R3216CC01400	C-2
0	0.68	29620	0	0	0	0	0	0	0	0 713-E6	R3216CC00800	C-2
0	0.26	11325	0	0	0	0	0	0	0	0 713-E6	R3216CC00500	C-2
0	1	43560	0	0	0	0	0	0	0	0 713-E6	R3216CC00200	C-2
0	3.79	165092	0	0	0	0	0	0	0	0 713-E6	R3216CB00600	R-2
0	0.6	26136	0	0	0	0	0	0	0	0 713-F6	R3216CC00100	C-2
0	4.93	214750	0	0	0	0	0	0	0	0 713-E6	R3216CB00500	R-2
0	1	43560	0	0	0	0	0	0	0	0 713-E6	R3216CC00300	C-2
0	2.55	111077	0	0	0	0	0	0	0	0 713-E6	R3216CB01000	C-2
0	17.18	748360	0	0	0	0	0	0	0	0 713-F7	R321602004	C-2
0	1	43560	0	0	0	0	0	0	0	0 713-F6	R321602005	C-2
0	0.25	10890	0	0	0	0	0	0	0	0 713-E6	R3216CC00400	C-2
0	0.25	10890	0	0	0	0	0	0	0	0 713-E6	R3216CC00700	C-2
0	0.7249	31576	0	0	0	0	0	0	0	0 713-F6	R3216CB00900	C-2
0	1.3	56628	0	0	0	0	0	0	0	0 713-E6	R3216CB01001	C-2

ZoneDsc	OwnerOccupiedInd	InvestmentProp	DoNotMailInd
Medium Density Residential	FALSE	FALSE	FALSE
C-2 Community Commercial	FALSE	FALSE	FALSE
Medium Density Residential	FALSE	FALSE	FALSE
C-2 Community Commercial	FALSE	FALSE	FALSE
C-2 Community Commercial	FALSE	FALSE	FALSE
C-2 Community Commercial	FALSE	FALSE	FALSE
C-2 Community Commercial	FALSE	FALSE	FALSE
Medium Density Residential	FALSE	FALSE	FALSE
C-2 Community Commercial	FALSE	FALSE	FALSE
Medium Density Residential	FALSE	FALSE	FALSE
C-2 Community Commercial	FALSE	FALSE	FALSE
C-2 Community Commercial	FALSE	FALSE	FALSE
C-2 Community Commercial	FALSE	FALSE	FALSE
C-2 Community Commercial	FALSE	FALSE	FALSE
C-2 Community Commercial	TRUE	FALSE	FALSE
C-2 Community Commercial	FALSE	FALSE	FALSE
C-2 Community Commercial	FALSE	FALSE	FALSE
C-2 Community Commercial	FALSE	FALSE	FALSE

PRE-APPLICATION MEETING NOTES

DATE OF PRE-APPLICATION MEETING: 11/10/21, PRE21-0031

MEETING TYPE: Video Conference call

SUBJECT PROPERTY ADDRESS: No address

TAXMAP ID: R3216CB 00800

LOT SIZE: .822 acres

ZONING DISTRICT: C-2 (Community Commercial)

REQUESTOR’S NAME/BUSINESS: Grove Development Inc./Pioneer Design Group Inc.

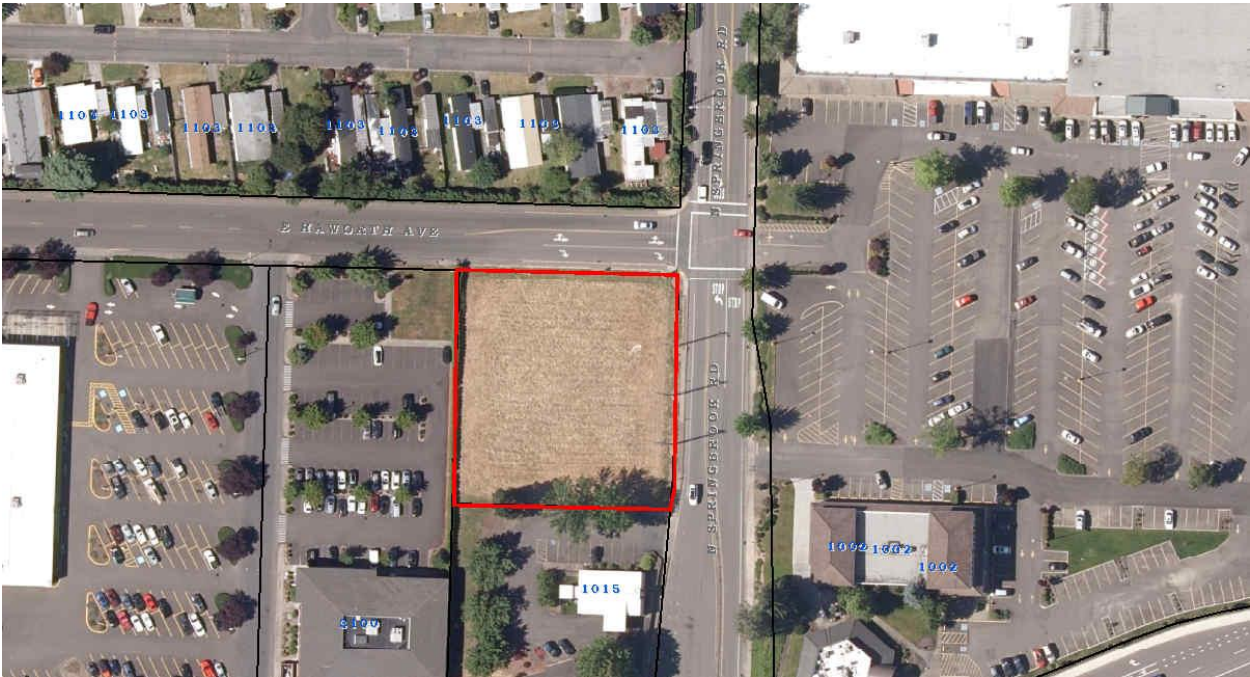
REQUEST DESCRIPTION: Development of apartments

PROPOSED USE ALLOWED: Conditional Use Permit and Design Review, 15.305.010

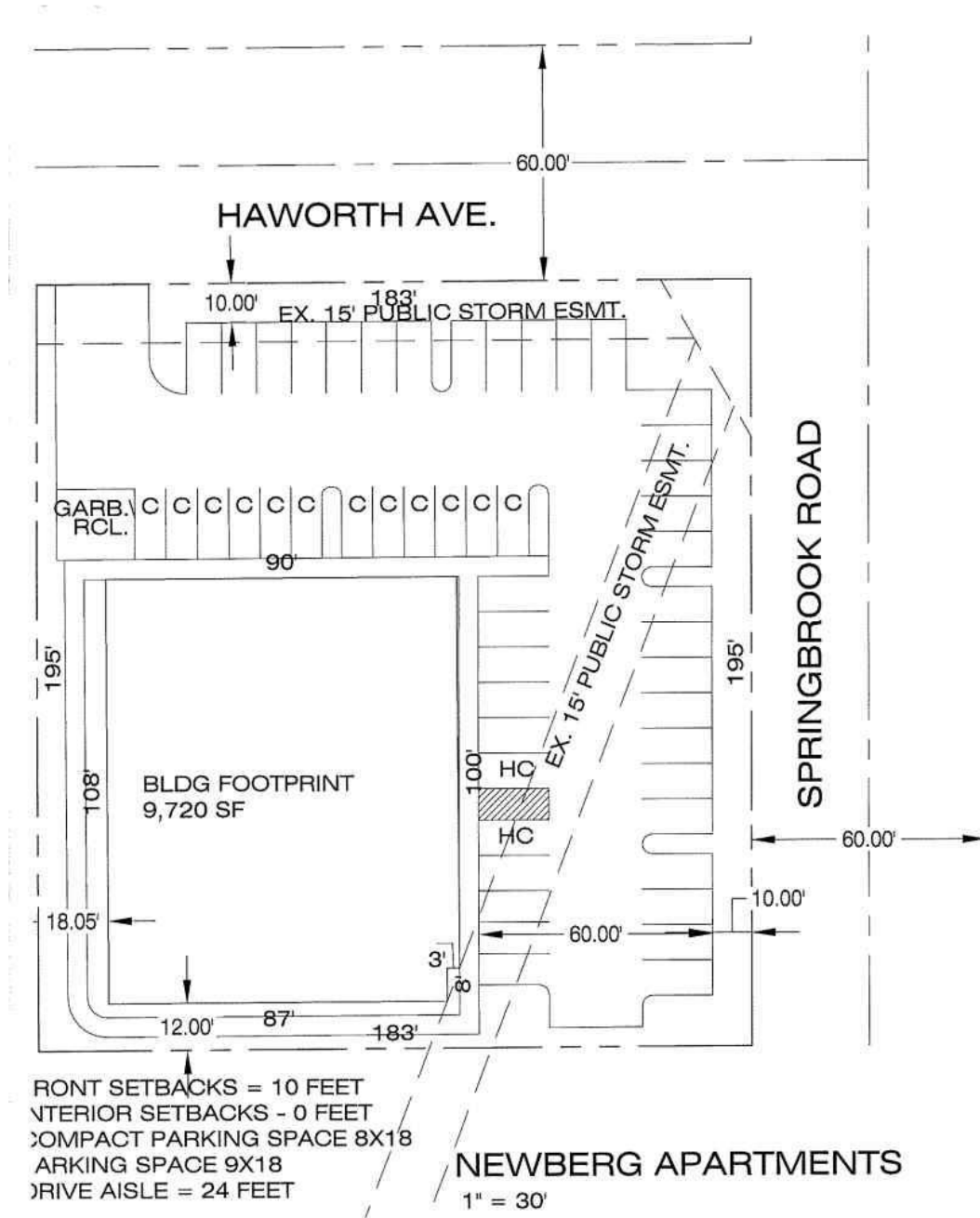
PARTICIPANTS

APPLICANT	CITY STAFF
Grove Hunt	Doug Rux (Host) - CDD
Curt Olson	Brett Musick – ENG
Luke Lappin	Karyn Hanson - ENG
	Ty Darby - TVF&R

Aerial Photo



Site Plan



TUALATIN VALLEY FIRE & RESCUE COMMENTS:

- Fire flow analysis required; closest hydrant is located at the NW corner of E Haworth and N Springbrook Road.
- Hydrant no further than 600 feet from the proposed building.
- 26-foot fire lane
- Secondary emergency access
 - Contact Ty Darby: Ty.Darby@tvfr.com

BUILDING SAFETY DIVISION COMMENTS: Contact: Jared Bradbury:
Jared.Bradbury@newbergoregon.gov

ENGINEERING COMMENTS:

Street: The proposed building on Tax Lot 800 has frontage on N Springbrook Road and E Haworth Avenue. N Springbrook Road is a Minor Arterial. E Haworth Avenue is a Major Collector. The proposed building will take access off Haworth Avenue because it has a lower functional classification. Additionally, the access must be at the furthest west end of the property to minimize impact to the N Springbrook Road/E Haworth Avenue intersection. A right turn only to access might be appropriate based on the LOS of the intersection. A traffic study that includes any mitigation recommendations will be required due to the location being adjacent to an intersection with operating at a poor level of service. Information regarding existing right-of-way and cross-sections can be seen below and is consistent with the City’s Transportation System Plan.

Roadway	Functional Classification	Existing Right-of-way	Existing Pavement Width	Minimum Right-of-way	Minimum Pavement Width	Typical Cross-Section (per Transportation System Plan)
N Springbrook Road	Minor Arterial (69-feet to 80-feet)	Approx. 85-feet	Approx. 52 feet	70-feet	52-feet	<ul style="list-style-type: none"> • 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 center turn lane • 12-foot travel lane • 6-foot bike lane • 5.5-foot planter* • 5-foot sidewalk • 1-foot from back of walk to right-of-way
Roadway	Functional Classification	Existing Right-of-way	Existing Pavement Width	Minimum Right-of-way	Minimum Pavement Width	Typical Cross-Section (per Transportation System Plan)

E Haworth Avenue	Major Collector (57-feet to 80-feet)	Approx. 60-foot	Approx. 40-foot	60-foot For typical section per TSP.	36-foot	<ul style="list-style-type: none"> • 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
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*5-foot minimum per NMC 15.505.030(G)(8)

If more than \$30,000 of improvements are made to the property, street/frontage improvements can be required, see NMC 12.05.090.

12.05.090 Permits and certificates.

A. Concurrent with the issuance of a building permit for the construction of a building for residential use or business structures or an addition to a dwelling or business structure, the value of which is \$30,000 or more except as the city engineer may require on building permits of lesser value in accordance with NMC [12.05.040](#), the owner, builder or contractor to whom the building permit is issued shall meet the following requirements:

1. Construct a sidewalk within the dedicated right-of-way for the full frontage in which a sidewalk in good repair does not exist. The sidewalk construction shall be completed within the building construction period or prior to issuance of an occupancy permit, whichever is the lesser.
2. Dedicate right-of-way in accordance with the city transportation plan.

The applicant will be required to replace any sidewalk in poor condition or not in compliance with ADA. Additionally, the applicant will be required to participate in funding improvements at the E Haworth Avenue and N Springbrook Road intersection that are indicated in the City of Newberg Transportation System Plan (TSP). Project I09 in the current TSP calls for installing a traffic signal and left turn lanes on Haworth. The full extent of intersection improvements have not been confirmed. The current TSP can be found at the following link: [Transportation System Plan - Updated in 2021 | Newberg Oregon](#)

Below is the Traffic Impact Fee formula developed to capture the proportional impact of developments based on the most significant a.m. or p.m. proportional volume contribution. The trips referenced in the formula will come from the traffic study required for the development.

(Cost in the TSP for improvements) x (Trips directly related to the development) / (Total trips through the intersection)

Examples of developments where this Traffic Impact Fee has been conditioned include a two phased multi-family development on N Springbrook Road (DR218-003 and DR220-004).

There is some street lighting along the property frontage. The applicant will be required to verify that existing street lighting meets current City standards and will be required to add additional street lighting where deficiencies exist. Street lighting standards can be found in the [Public Works Design and Construction Standards](#) in section “**5.17 Street Lighting, Trees, Names and Signage.**”

Traffic Study/Trip Rates/Transportation SDCs: To develop Transportation System Development Charges (TSDC), the city uses the Institute of Transportation Engineers, Trip Generation Manual, 10th Edition (or current edition) in coordination with the City’s TSDC Methodology document which can be found on the City’s website. Apartments are charged Transportation SDCs based on the number of dwelling units. Each dwelling unit will cost approximately \$4,700 dollars for transportation SDCs. SDCs are calculated and collected as part of the building permit process.

The City’s Transportation SDC calculator can be found online here:

<https://www.newbergoregon.gov/engineering/page/systems-development-charges>

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.]

A traffic study that includes any mitigation recommendations will be required due to the location being adjacent to an intersection with operating at a poor level of service

Wastewater: The City’s GIS system shows there is an existing 8-inch wastewater line in E Haworth Avenue and a 15-inch line in N Springbrook Road. The applicant will be responsible for verifying capacity of existing lines. System Development Charges (SDCs) are associated with the number of fixture units proposed per building/tax lot. SDCs are calculated and collected as part of the building permit process.

Water: There is an existing 8-inch water main located in E Haworth Ave. and a 12-inch water main in N Springbrook Road. The applicant will be responsible to confirm adequate flow for the use proposed and for fire protection. The applicant will need provide fire flow test results with the building permit application. The applicant will need to hire a private firm to conduct the fire flow test and coordinate with the Public Works Maintenance Division.

Occupancy determines the need for fire sprinklers. If fire sprinklers are required a separate fire service connection is necessary.

Stormwater: There is an existing 24-inch public stormwater main running across the northern section of the property adjacent to E Haworth Avenue and an existing approximately 36-inch stormwater main running diagonally across the property in a public easement. The City’s public works department is working on identifying more details about the larger stormwater line. The impact of the building foundation on the larger line running diagonally should be addressed in preliminary and final designs.

This could include field verification of the size and depth of the line in the area of building or foundations. Appropriate landscaping may be located in a stormwater easement. If the applicant is proposing to create more than 500 sq ft of new impervious surface, the quantity and quality of stormwater will need to be treated and a stormwater report completed by a licensed professional civil engineer (PWDCS 4.6 and NMC 13.25.280) will be required per the [Public Works Design and Construction Standards](#) (PWDCS). Section 4.6.8 of the PWDCS contains the stormwater facility selection hierarchy to be followed.

Erosion and Sedimentation Control (ESC): A City issued Erosion Control and Sedimentation Plan/Permit will be required for any site disturbance. The permit can be found online here:

<https://www.newbergoregon.gov/engineering/page/erosion-sedimentation-control-permit-application>

Other Utilities: Any new service connection to the property is required to be undergrounded. Any poles impacted during construction will be required to be undergrounded. There are some exceptions for high voltage lines. See NMC 15.430.010 for exception provisions.

Notes: The City's GIS System can be accessed online to view utility and planning maps:

<http://www.newbergoregon.gov/planning/page/interactive-city-map>

General Comment: The engineering pre-application notes provided are preliminary based on the information provided by the applicant and may not cover all of the development issues or requirements for the project. When a complete application is received and a full review is conducted, it may be determined that additional requirements to meet the Municipal Code or the Public Works Design and Construction Standards exist.

The Engineering Department also administers/assigns System Development Charges (SDCs) for the following utilities:

- Transportation System Development Charge
- Water System Development Charge
- Wastewater System Development Charge
- Stormwater System Development Charge
- Non-Potable System Development Charge

***ALL SDC FEES ARE APPROXIMATE (rounded to the nearest \$50) AND SUBJECT TO CHANGE – See City's Current Fees for exact costs.**

***Transportation SDC** – Transportation SDC are based on the land use and the associated trip rate.

- Transportation SDC = Unit x ITE Trip Rate x 1.68 x \$3,750
- ITE Trip Rate is based on the PM Peak Hour using the "Trip Generation Manual, 10th Edition" published by the Institute of Transportation Engineers.
- Multi Family Developments – Per Unit \$4,700

***Water SDC** – Water SDCs are based on the meter size.

- 5/8" – 3/4" Meter \$6,050
- 1" Meter \$10,300
- 1.25" Meter \$15,150
- 2" Meter \$32,050

***Wastewater SDC** – Wastewater SDCs are based on fixture units which are defined in the Uniform Plumbing Code.

- For the first 18 fixture units \$7,500
- Per each fixture unit over 18 \$450

***Stormwater SDC** – Stormwater SDCs are based on net new impervious surface areas on the property.

- Single Family 1 EDU (Equivalent Dwelling Unit) = \$415
- Other Than Single Family Impervious Area/2877 = #EDU) x \$415

***Non-Potable SDC** – Water SDCs are based on the meter size.

- 3/4" Meter \$4,000
- 1" Meter \$6,750
- 1.25" Meter \$9,950
- 1.5" Meter \$13,100

PLANNING COMMENTS:

Application:

Conditional Use Permit (Residential in C-2 Zone)– Type III
Design Review (Companions to CUP) – Type III

Applications can be found at:

https://www.newbergoregon.gov/sites/default/files/fileattachments/planning/page/4578/type_iii_application_fillable.pdf

Fees: The application packets have the fees schedule. Make sure to add the 5% technology to the total permit cost. Engineering fees are also included in the schedules. Fees typically increase on April 1st of each year.

Completeness Check: Submit two paper copies of your application for the Engineering and Planning Divisions to review in addition to an electronic (digital) copy. Typically, completeness check takes two weeks. We will send a letter to you notifying you if your application is complete or if we need additional information and a second completeness check submittal.

Notice: All property owners within 500 feet of subject property, sign(s) posted on each street frontage no greater than 600 feet apart.

Review Time Frame: Typically, 4-6 weeks. However, staffing levels and current workload can extend the typical review timeframe. A Planning Commission hearing will be required for the CUP and the companions Design Review. Planning Commission hearings dates will need to be coordinated.

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.

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](#).

15.225.020 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](#). [Ord. [2451](#), 12-2-96. Code 2001 § 151.206.]

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.

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.

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](#).

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](#).

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](#). [Ord. [2451](#), 12-2-96. Code 2001 § 151.212.]

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](#). [Ord. [2451](#), 12-2-96. Code 2001 § 151.213.]

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. [Ord. [2451](#), 12-2-96. Code 2001 § 151.214.]

Development Process

15.100.050 Type III procedure – Quasi-judicial hearing.

B. Type III actions include, but are not limited to:

1. An appeal of a Type I or Type II decision: This action of the [planning commission](#) is a final decision unless appealed to the [city council](#).
2. Conditional [use](#) permits: This action is a final decision unless appealed.
3. Planned unit developments: This action is a final decision unless appealed.
4. Substantial change to the exterior appearance of a historic landmark: This action is final unless appealed.
5. Establishment of a historic landmark: This is a final decision by the [planning commission](#), unless appealed.
6. Establishment of a historic [landmark](#) subdistrict: This is a recommendation to the [city council](#).
7. [Comprehensive plan](#) map amendments: This action is a recommendation to the process, pursuant to NMC [15.235.030\(A\)](#).

C. [Planning Commission](#) Decisions and Recommendation Actions.

1. [Planning Commission](#) Decision. Development actions shall be decided by the [planning commission](#) for those land [use](#) actions that require a Type III procedure and do not require the adoption of an ordinance. The decision shall be made after public notice and a public [hearing](#) is held in accordance with the requirements of NMC [15.100.090](#) et seq. A Type III decision may be appealed to the [city council](#) by a Type III affected party in accordance with NMC [15.100.160](#) et seq.
2. [Planning Commission](#) Recommendation to [City Council](#). Land [use](#) actions that would require the adoption of an ordinance shall be referred to the [city council](#) by the [planning commission](#) together with the record and a recommendation. The recommendation shall be made after public notice and a public [hearing](#) is held in accordance with the requirements of NMC [15.100.090](#) et seq.

15.100.150 Decision, findings and order – Types III and IV.

A. Following the [hearing](#) for review of a [development permit](#), the [hearing body](#) shall approve, conditionally approve, or deny the application. If the [hearing](#) is an appeal, the [hearing body](#) shall affirm, reverse, or remand the decision that is on appeal.

B. The [hearing body](#) shall prepare written findings of fact and an order which shall include:

1. A statement of the applicable criteria against which the proposal was tested.
2. A statement of the facts that the [hearing body](#) found establishing compliance or noncompliance with each applicable criterion and assurance of compliance with applicable standards.
3. The reasons for a conclusion to approve or deny.
4. The decision to approve the proposed change with or without conditions, or the decision to deny the proposed change.

C. The [director](#) shall notify the [applicant](#) and others entitled to notice of the disposition of the application within five calendar days of the written decision. This shall include the [applicant](#), anyone providing written testimony prior to the close of the [hearing](#), anyone providing oral testimony at the [hearing](#), or anyone requesting such notice. The notice shall include a description of the item, indicate the date that the decision will take effect and describe the right of appeal pursuant to NMC [15.100.160](#) et seq. [Ord. [2691](#) § 3, 2-19-08; Ord. [2451](#), 12-2-96. Code 2001 § 151.046.]

15.100.210 Mailed notice.

B. Type II and Type III Actions. The [applicant](#) shall provide public notice to:

1. The [owner](#) of the site for which the application is made; and
2. [Owners](#) of property within 500 feet of the entire site for which the application is made. The list shall be compiled from the most recent property tax assessment roll. For purposes of review, this requirement shall be deemed met when the [applicant](#) can provide an affidavit or other certification that such notice was deposited in the mail or personally delivered.
3. To the [owner](#) of a public [use](#) airport, subject to the provisions of ORS [215.416](#) or [227.175](#).

C. The [director](#) may request that the [applicant](#) provide notice to people other than those required in this section if the [director](#) believes they are affected or otherwise represent an interest that may be affected by the proposed development. This includes, but is not limited to, neighborhood associations, other governmental agencies, or other parties the [director](#) believes may be affected by the decision.

D. The [director](#) shall provide the [applicant](#) with the following information regarding the mailing of notice:

1. The latest date by which the notice must be mailed;

2. An affidavit of mailing (to be signed and returned) certifying that the notice was mailed, acknowledging that a failure to mail the notice in a timely manner constitutes an agreement by the [applicant](#) to defer the 120-day process limit and acknowledging that failure to mail will result in the automatic postponement of a decision on the application; and

3. A sample notice.

E. The notice of a Type II and Type III development application shall be reasonably calculated to give actual notice and shall:

1. Set forth the [street](#) address or other easily understood geographical reference to the subject property;

2. List, by commonly used citation, the applicable criteria for the decision;

3. Include the name and phone number of a local government contact [person](#), the telephone number where additional information may be obtained and where information may be examined;

4. Explain the nature of the application and the proposed [use](#) or [uses](#) which could be authorized;

5. State that a copy of the application, all documents and evidence relied upon by the [applicant](#) and applicable criteria are available for inspection at no cost and will be provided at a reasonable cost.

F. Prior to mailing or posting any notice required by this [code](#), the [applicant](#) shall submit a copy of the notice to the [director](#).

G. The [applicant](#) shall mail the notice for Type II actions at least 14 days before a decision is rendered. The [applicant](#) shall file with the [director](#) an affidavit of mailing as identified in subsection (D) of this section within two business days after notice is mailed.

H. The [applicant](#) shall mail the notice for Type III actions at least 20 days before the first [new hearing](#), or if two or more [new hearings](#) are allowed, 10 days before the first [new hearing](#). The [applicant](#) shall file with the [director](#) an affidavit of mailing as identified in subsection (D) of this section within two business days after notice is mailed.

I. All public notices shall be deemed to have been provided or received upon the date the notice is deposited in the mail or personally delivered, whichever occurs first. The failure of a property [owner](#) to receive notice shall not invalidate an action if a good faith attempt was made to notify all [persons](#) entitled to notice. An affidavit of mailing issued by the [person](#) conducting the mailing shall be conclusive evidence of a good faith attempt to contact all [persons](#) listed in the affidavit.

J. Failure to mail the notice and affirm that the mailing was completed in conformance with the [code](#) shall result in:

1. Postponement of a decision until the mailing requirements have been met; or
2. Postponement of the [hearing](#) to the next regularly scheduled meeting or to such other meeting as may be available for the [hearing](#); or
3. The entire process being invalidated; or
4. Denial of the application. [Ord. [2581](#), 7-7-03; Ord. [2451](#), 12-2-96. Code 2001 § 151.071.]

15.100.230 Additional notice procedures for Type III quasi-judicial hearing.

In addition to the requirements of NMC [15.100.210](#), mailed notice for Type III development actions shall also contain the following:

A. State that an issue which may be the basis for an appeal to the Land [Use](#) Board of Appeals shall be raised not later than the close of the record at or following the final [new hearing](#) on the proposal before the [city](#). Such issues shall be raised with sufficient specificity so as to afford the [hearing body](#) and the parties an adequate opportunity to respond to each issue;

B. State the date, time and location of the [hearing](#);

C. State that the failure of an issue to be raised in a [hearing](#), in [person](#) or by letter, or failure to provide sufficient specificity to afford the [hearing body](#) an opportunity to respond to the issue may preclude appeal to the Land [Use](#) Board of Appeals on that issue;

D. State that a copy of the staff report will be available for inspection at no cost at least seven calendar days prior to the [hearing](#) and will be provided at reasonable cost;

E. Include a general explanation of the requirements for submission of testimony and the procedure for conduct of [hearings](#). [Ord. [2451](#), 12-2-96. Code 2001 § 151.073.]

15.100.260 Procedure for posted notice for Type II and III procedures.

A. Posted Notice Required. Posted notice is required for all Type II and III procedures. The notice shall be posted on the subject property by the [applicant](#).

B. Notice Information Provided by [City](#). The [director](#) shall provide the [applicant](#) with the following information regarding the posting of notice:

1. The number of notices required;
2. The latest date by which the notice must be posted;

3. An affidavit of posting (to be signed and returned) certifying that the notice was posted on site, acknowledging that a failure to post the notice in a timely manner constitutes an agreement by the [applicant](#) to defer the 120-day process limit and acknowledging that failure to post will result in the automatic postponement of a decision on the application; and

4. A sample notice.

C. Submission of Notice. Prior to posting any notice required by this section, the [applicant](#) shall submit a copy of the notice to the [director](#) for review.

D. Size, Number and Location Requirements. A waterproof notice which measures a minimum of two feet by three feet shall be placed on each frontage of the site. If a frontage is over 600 feet long, a notice is required for each 600 feet, or fraction of 600 feet. If possible, notices shall be posted within 10 feet of a [street](#) lot line and shall be visible to pedestrians and motorists in clear view from a public [right-of-way](#). Notices shall not be posted in a public [right-of-way](#) or on trees.

E. Contents of Notice. The posted notice shall only contain the following information: planning action number, brief description of the proposal, phone number and address for contact at the Newberg planning and [building](#) department.

F. Standards and Timing, Type II Actions. The [applicant](#) shall post the notice at least 14 days before a decision is rendered. The [applicant](#) shall file with the [director](#) an affidavit of posting as identified in subsection (B) of this section within two business days after notice is posted.

G. Standards and Timing, Type III Actions. The [applicant](#) shall post the notice at least 10 days before the first scheduled [hearing](#). The [applicant](#) shall file with the [director](#) an affidavit of posting as identified in subsection (B) of this section within two business days after notice is posted.

H. Removal of Notice. The [applicant](#) shall not remove the notice before the final decision. All posted notice shall be removed by the [applicant](#) within 10 days following the date of the final decision on the request.

I. Failure to Post Notice. The failure of the posted notice to remain on the property shall not invalidate the proceedings. Failure by the [applicant](#) to post a notice and affirm that the posting was completed in conformance with the [code](#) shall result in:

1. Postponement of a decision until the mailing requirements have been met; or

2. Postponement of the [hearing](#) to the next regularly scheduled meeting or to such other meeting as may be available for the [hearing](#); or

3. The entire process being invalidated; or

4. Denial of the application. [Ord. [2451](#), 12-2-96. Code 2001 § 151.076.]

15.100.270 Procedure for published notice on Type III and Type IV procedures.

A. Notice shall be provided within a newspaper of general circulation within the [city](#) at least 10 days prior to the first public [hearing](#) on the action.

B. The notice shall reasonably describe:

1. Type III Proceedings. The proposed [development permit](#) request, location, file number, the name and phone number of a local government contact [person](#) and the location where information may be examined.

2. Type IV Proceedings. The nature of the proposed final action of an [amendment](#) to the Newberg [comprehensive plan](#), [code](#) or new land [use](#) regulation.

C. The notice shall include a statement that all interested [persons](#) may appear and provide testimony and that only those [persons](#) who participate either orally or in writing in the [hearing](#) proceedings leading to the adoption of the action may appeal the decision.

D. The notice shall state the place, date and time of the [hearing](#).

E. See NMC [15.100.240](#) for Type III notice for annexations. [Ord. [2451](#), 12-2-96. Code 2001 § 151.077.]

15.220.030 Site design review requirements.

B. Type II. The following information is required to be submitted with all Type II applications for site design review:

1. Site [Development Plan](#). A site [development plan](#) shall be to scale and shall indicate the following as appropriate to the nature of the use:

- a. [Access](#) to site from adjacent [right-of-way](#), [streets](#) and [arterials](#);
- b. Parking and circulation areas;
- c. Location and design of [buildings](#) and [signs](#);
- d. Orientation of windows and doors;
- e. Entrances and exits;
- f. Private and shared outdoor recreation spaces;
- g. Pedestrian circulation;
- h. Outdoor play areas;
- i. Service areas for [uses](#) such as mail delivery, trash disposal, above-ground [utilities](#), loading and delivery;
- j. Areas to be landscaped;
- k. Exterior lighting;
- l. Special provisions for handicapped [persons](#);

- m. Other site elements and spaces which will assist in the evaluation of site development;
 - n. Proposed grading, slopes, and proposed drainage;
 - o. Location and [access](#) to [utilities](#) including hydrant locations; and
 - p. [Streets](#), [driveways](#), and [sidewalks](#).
2. Site Analysis Diagram. A site analysis diagram shall be to scale and shall indicate the following characteristics on the site and within 100 feet of the site:
- a. Relationship of adjacent lands;
 - b. Location of species of trees greater than four inches in diameter at four feet above ground level;
 - c. Existing and proposed topography;
 - d. Natural drainage and proposed drainage and grading;
 - e. Natural features and [structures](#) having a visual or other significant relationship with the site.
3. Architectural Drawings. Architectural drawings shall be prepared which identify floor plans and elevations.
4. [Landscape](#) Plan. The [landscape](#) plan shall indicate:
- a. The size, species and approximate locations of plant materials to be retained or placed on the site together with a statement which indicates the mature size and canopy shape of all plant materials;
 - b. Proposed site contouring; and
 - c. A calculation of the percentage of the site to be landscaped.
5. Special Needs for Handicapped. Where appropriate, the design review plan shall indicate compliance with handicapped accessibility requirements including, but not limited to, the location of handicapped [parking spaces](#), the location of accessible routes from the entrance to the public way, and ramps for wheelchairs.
6. Existing Features and Natural [Landscape](#). The plans shall indicate existing landscaping and existing [grades](#). Existing trees or other features intended to be preserved or removed shall be indicated on the plans.
7. Drives, Parking and Circulation. Proposed vehicular and pedestrian circulation, [parking spaces](#), parking aisles, and the location and number of [access](#) points shall be indicated on the plans. Dimensions shall be provided on the plans for parking aisles, back-up areas, and other items as appropriate.
8. Drainage. The direction and location of on- and off-site drainage shall be indicated on the plans. This shall include, but not be limited to, site drainage, parking [lot](#) drainage, size and location of storm drain lines, and any retention or detention facilities necessary for the project.

9. Buffering and Screening. Buffering and screening of areas, [structures](#) and facilities for storage, machinery and equipment, services (mail, refuse, utility wires, and the like), loading and parking and similar accessory areas and [structures](#) shall be shown on the plans.

10. [Signs](#) and Graphics. The location, colors, materials, and lighting of all exterior [signs](#), graphics or other informational or directional features shall be shown on the plans.

11. Exterior Lighting. Exterior lighting within the design review plan shall be indicated on the plans. The direction of the lighting, size and type of fixtures, and an indication of the amount of lighting shall be shown on the plans.

12. Trash and Refuse Storage. All trash or refuse storage areas, along with appropriate screening, shall be indicated on the plans. Refuse storage areas must be constructed of brick, concrete [block](#) or other similar products as approved by the [director](#).

13. Roadways and [Utilities](#). The proposed plans shall indicate any public improvements that will be constructed as part of the project, including, but not limited to, roadway and utility improvements.

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.]

15.220.050 Criteria for design review (Type II process).

B. Type II. The following criteria are required to be met in order to approve a Type II design review request:

1. Design Compatibility. The proposed design review request incorporates an architectural design which is compatible with and/or superior to existing or proposed [uses](#) and [structures](#) in the surrounding area. This shall include, but not be limited to, [building](#) architecture, materials, colors, roof design, [landscape](#) design, and signage.

2. Parking and On-Site Circulation. Parking areas shall meet the requirements of NMC [15.440.010](#). Parking studies may be required to determine if adequate parking and

circulation are provided for [uses](#) not specifically identified in NMC [15.440.010](#). Provisions shall be made to provide efficient and adequate on-site circulation without using the public [streets](#) as part of the parking [lot](#) circulation pattern. Parking areas shall be designed so that vehicles can efficiently enter and exit the public [streets](#) with a minimum impact on the functioning of the public [street](#).

3. Setbacks and General Requirements. The proposal shall comply with NMC [15.415.010](#) through [15.415.060](#) dealing with height restrictions and public [access](#); and NMC [15.405.010](#) through [15.405.040](#) and [15.410.010](#) through [15.410.070](#) dealing with setbacks, coverage, vision clearance, and [yard](#) requirements.

4. Landscaping Requirements. The proposal shall comply with NMC [15.420.010](#) dealing with [landscape](#) requirements and [landscape](#) screening.

5. [Signs](#). [Signs](#) shall comply with NMC [15.435.010](#) et seq. dealing with [signs](#).

6. [Manufactured Dwelling](#), [Mobile Home](#) and [RV Parks](#). [Manufactured dwelling](#) and [mobile home parks](#) shall also comply with the standards listed in NMC [15.445.075](#) through [15.445.100](#) in addition to the other clear and objective criteria listed in this section. [RV parks](#) also shall comply with NMC [15.445.170](#) in addition to the other criteria listed in this section.

7. Zoning District Compliance. The proposed [use](#) shall be listed as a permitted or conditionally permitted [use](#) in the zoning district in which it is located as found in NMC [15.305.010](#) through [15.336.020](#). Through this site review process, the [director](#) may make a determination that a [use](#) is determined to be similar to those listed in the applicable zoning district, if it is not already specifically listed. In this case, the [director](#) shall make a finding that the [use](#) shall not have any different or more detrimental effects upon the adjoining neighborhood area than those specifically listed.

8. Subdistrict Compliance. Properties located within subdistricts shall comply with the provisions of those subdistricts located in NMC [15.340.010](#) through [15.348.060](#).

9. Alternative Circulation, Roadway Frontage Improvements and Utility Improvements. Where applicable, new developments shall provide for [access](#) for vehicles and pedestrians to adjacent properties which are currently developed or will be developed in the future. This may be accomplished through the provision of local public [streets](#) or private [access](#) and utility [easements](#). At the time of development of a [parcel](#), provisions shall be made to develop the adjacent [street](#) frontage in accordance with [city](#) street standards and the standards contained in the transportation plan. At the discretion of the [city](#), these improvements may be deferred through [use](#) of a deferred improvement agreement or other form of security.

10. Traffic Study Improvements. If a traffic study is required, improvements identified in the traffic study shall be implemented as required by the [director](#). [Ord. [2763](#) § 1 (Exh. A § 7), 9-16-13; Ord. [2747](#) § 1 (Exh. A § 5), 9-6-11; Ord. [2451](#), 12-2-96. Code 2001 § 151.194.]

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.]

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:

4. 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.

15.405.040 Lot coverage and parking coverage requirements.

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](#). [Ord. [2880](#) § 2 (Exh. B § 39), 6-7-21; Ord. [2832](#) § 1 (Exh. A), 7-2-18; Ord. [2746](#) § 1 (Exh. A § 1), 8-15-11; Ord. [2730](#) § 1 (Exh. A (3)), 10-18-10; Ord. [2647](#), 6-5-06; Ord. [2451](#), 12-2-96. Code 2001 § 151.568.

15.410.020 Front yard setback.

B. Commercial.

2. All [lots](#) or [development sites](#) in the C-2 district shall have a [front yard](#) of not less than 10 feet. There shall be no minimum [front yard](#) setback for C-2 zoned property that has frontage on E. Portland Road or Highway 99 W. The maximum [front yard](#) setback for C-2 zoned property that has frontage on E. Portland Road or Highway 99 W. shall be no greater than 10 feet. A greater [front yard](#) setback is allowed for C-2 zoned property having frontage on E. Portland Road or Highway 99 W. when a plaza or other pedestrian amenity is provided; however, said [front yard](#) setback should be the minimum setback needed to accommodate a pedestrian amenity. No parking shall be allowed in said [yard](#). Said [yard](#) shall be landscaped and maintained

15.410.030 Interior yard setback.

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.

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. [Ord. [2564](#), 4-15-02; Ord. [2507](#), 3-1-99; Ord. [2451](#), 12-2-96. Code 2001 § 151.555.]

15.410.070 Yard exceptions and permitted intrusions into required yard setbacks.

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).

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

3. In any commercial or industrial district, except C-1, C-4, M-1, and M-E, 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 and the M-E district within the riverfront overlay subdistrict are described in NMC [15.352.040](#)(H).

Chapter 15.415 BUILDING AND SITE DESIGN STANDARDS

Comply with applicable criteria and standards.

Chapter 15.420 LANDSCAPING AND OUTDOOR AREAS

Comply with applicable criteria and standards.

Chapter 15.425 EXTERIOR LIGHTING

Chapter 15.430 UNDERGROUND UTILITY INSTALLATION

Comply with applicable criteria and standards.

Chapter 15.440 OFF-STREET PARKING, BICYCLE PARKING, AND PRIVATE WALKWAYS

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.

1. In cases where the applicant is proposing off-street parking, refer to subsection (F) of this section for the maximum number of parking spaces.

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	1 per dwelling unit 1.5 per dwelling unit

<u>Use</u>	Minimum <u>Parking Spaces</u> Required
Two-bedroom unit Three- and four-bedroom unit Five- or more bedroom unit • Unassigned spaces • Visitor spaces	2 per <u>dwelling unit</u> 0.75 spaces per bedroom If a development is required to have more than 10 spaces on a <u>lot</u> , then it must provide some unassigned spaces. At least 15 percent of the total required <u>parking spaces</u> must be unassigned and be located for convenient <u>use</u> by all occupants of the development. The location shall be approved by the <u>director</u> . If a development is required to have more than 10 spaces on a <u>lot</u> , then it must provide at least 0.2 visitor spaces per <u>dwelling unit</u> .
• On-street parking credit • Available transit service	On-street <u>parking spaces</u> may be counted toward the minimum number of required spaces for developments required to have more than 10 spaces on a <u>lot</u> . The on-street spaces must be directly adjoining and on the same side of the <u>street</u> as the subject property, must be legal spaces that meet all <u>city</u> standards, and cannot be counted if they could be removed by planned future <u>street</u> widening or a <u>bike lane</u> on the <u>street</u> . At the review body's discretion, affordable <u>housing projects</u> 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.
Commercial neighborhood district (C-1)	1 for each <u>dwelling</u>
<u>Dwelling, duplex</u>	1 for each <u>dwelling unit</u>
<u>Dwelling, single-family</u>	2 for each <u>dwelling unit</u> on a single <u>lot</u>

General Comment: The planning pre-application notes provided are preliminary based on the information provided by the applicant and may not cover all of the development issues or requirements for the project. When a complete application is received and a full review is conducted, it may be determined that additional information or other regulations within the Municipal Code apply that were not determine during the limited pre-application review.

City will accept building permit plans for review after the Notice of Decision is released

Contact FAA and Oregon Department of Aviation for appropriate forms to determine applicable structure height.

Contact: Doug Rux doug.rux@newbergoregon.gov





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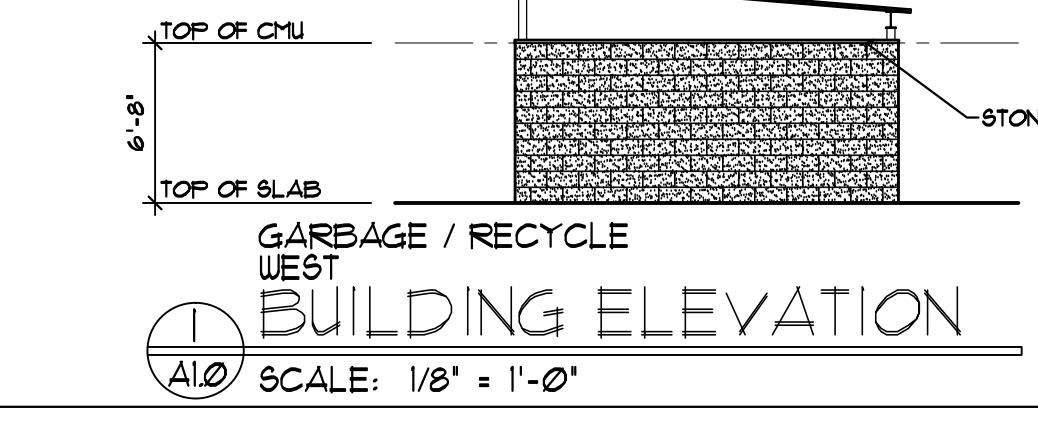
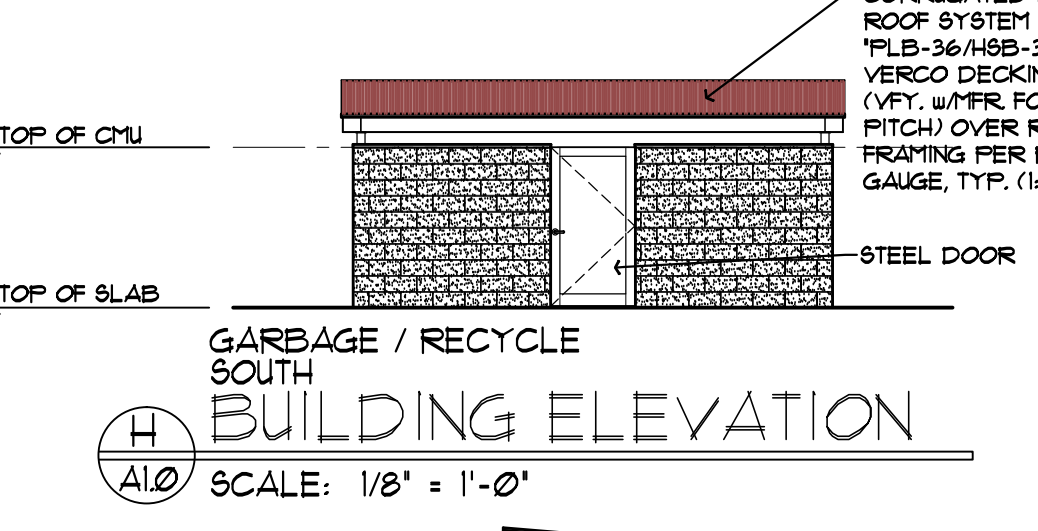
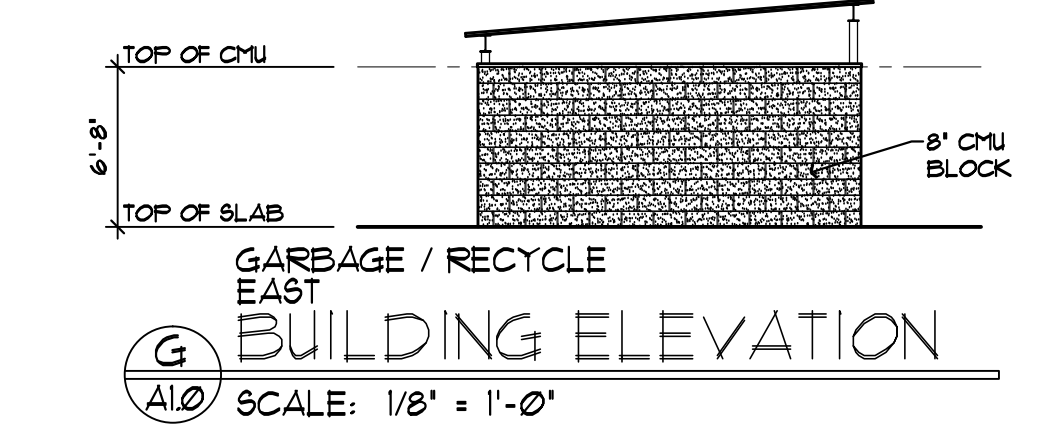
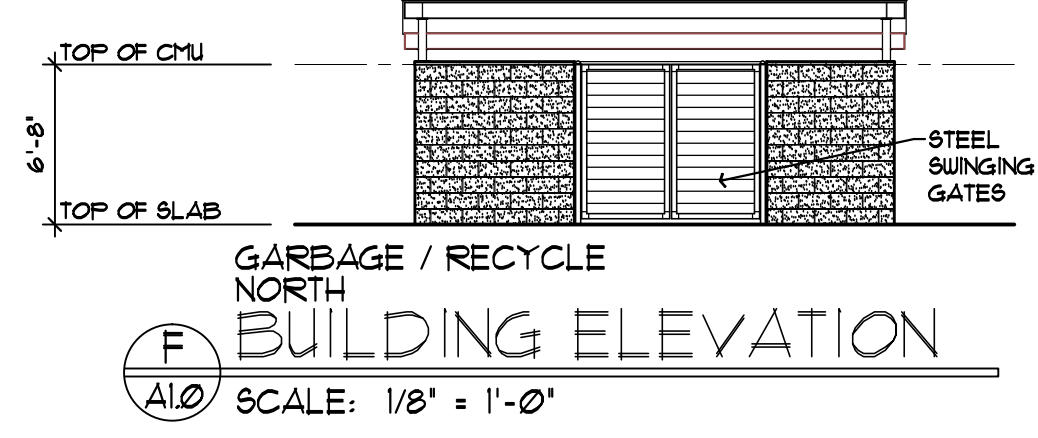
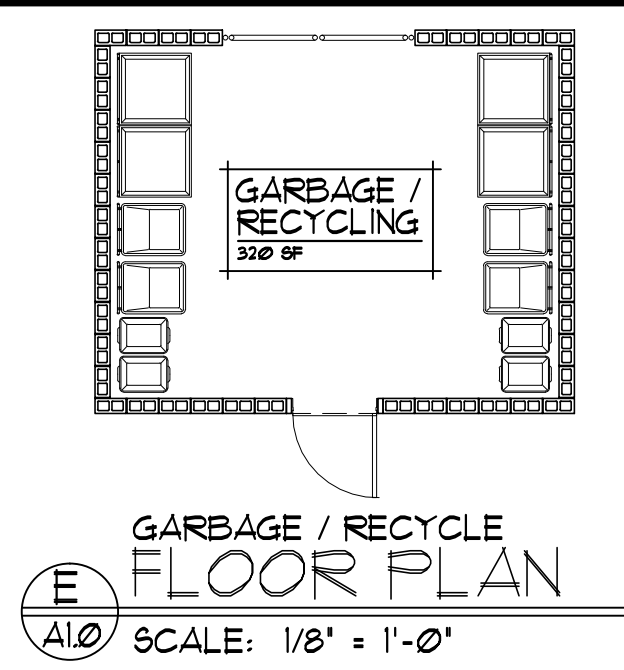
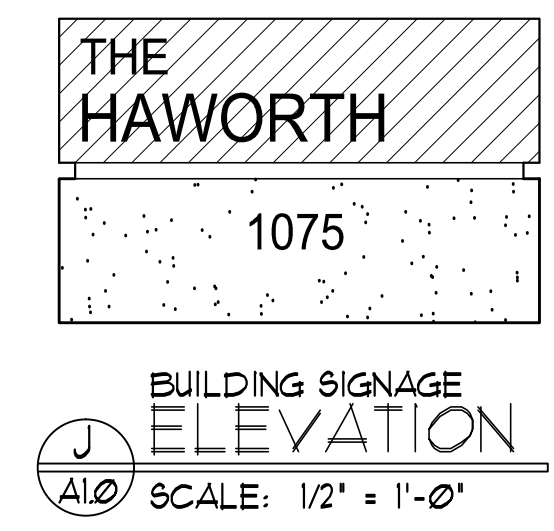
NORTH BUILDING ELEVATION
SCALE: 1/8" = 1'-0"



ADDITIONAL REQUIREMENTS FOR MULTIFAMILY RESIDENTIAL PROJECTS (PER CHAPTER 15.220.060).
BUILDING DESIGN ELEMENTS:
- ITEM #4 (3 POINTS) - PROVIDE VARIATION IN REPEATED UNITS, ELEMENTS SUCH AS COLOR, WINDOWS, BUILDING MATERIALS, AND FORM (EITHER ALONE OR IN COMBINATION) CAN BE USED TO CREATE THIS VARIETY.

CEMENT BOARD LAP SIDING (V.FY. EXPOSURE AND COLOR, MAIN BODY OF BUILDING PAINTED IN LIGHT GREY / OFF WHITE)

CEMENT BOARD LAP SIDING (WITH NARROWER EXPOSURE AND DARKER PAINTED COLOR WHERE SHOWN)



EAST BUILDING ELEVATION
SCALE: 1/8" = 1'-0"



ARCHITECTURAL COMPOSITION ASPHALT SHINGLE ROOF (DARK GREY)

PAINTED 2 STEP FASCIA BOARD • ENTRY PORCH (BLACK)

ADDITIONAL REQUIREMENTS FOR MULTIFAMILY RESIDENTIAL PROJECTS (PER CHAPTER 15.220.060).
BUILDING DESIGN ELEMENTS:
- ITEM #3 (2 POINTS) - 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.

SOUTH BUILDING ELEVATION
SCALE: 1/8" = 1'-0"



ADDITIONAL REQUIREMENTS FOR MULTIFAMILY RESIDENTIAL PROJECTS (PER CHAPTER 15.220.060).
BUILDING DESIGN ELEMENTS:
- ITEM #3 (2 POINTS) - USE SLOPED ROOFS AT A PITCH OF 3:12 OR STEEPER. GABLE AND HIP ROOF FORMS ARE PREFERABLE.

ADDITIONAL REQUIREMENTS FOR MULTIFAMILY RESIDENTIAL PROJECTS (PER CHAPTER 15.220.060).
SITE DESIGN ELEMENTS (SEE SITE DESIGN ELEMENTS SUMMARY).
- ITEM #2 (1 POINT) - USE APPROPRIATE OUTDOOR LIGHTING WHICH ENHANCES THE NIGHTTIME SAFETY AND SECURITY OF PEDESTRIANS WITHOUT CAUSING GLARE IN NEARBY BUILDINGS.
V.FY. EXTERIOR WALL MOUNTED HOODED LIGHT FIXTURES, TO LIGHT PEDESTRIAN WALKWAYS

43'-5" MAX. PROPOSED RIDGE HEIGHT

WEST BUILDING ELEVATION
SCALE: 1/8" = 1'-0"



PAINTED STEEL GUTTER (DARK) OVER PAINTED FASCIA BOARD (BLACK)

ADDITIONAL REQUIREMENTS FOR MULTIFAMILY RESIDENTIAL PROJECTS (PER CHAPTER 15.220.060).
BUILDING DESIGN ELEMENTS:
- ITEM #3 (3 POINTS) - BREAK UP LARGE BUILDINGS INTO BAYS BY VARYING PLANES AT LEAST EVERY 50 FEET.

VINYL WINDOWS (BLACK)

PAINTED STEEL COLUMNS WHERE SHOWN

NEW APARTMENTS FOR :
GROVE DEVELOPMENT
1075 N. SPRINGBROOK RD.
NEWBERG, OREGON

CONTRACTOR:
GROVE DEVELOPMENT, INC.
6500 SW BEAVERTON-
HILLSDALE HWY. #3
PORTLAND, OR 97225
(503) 793-3299
CCB# 123694

SURVEY:
PIONEER DESIGN GROUP, INC.
3020 SW WASHINGTON SQUARE RD.
SUITE 170
PORTLAND, OR 97223
(503) 643-8286

CIVIL ENGINEER:
PIONEER DESIGN GROUP, INC.
3020 SW WASHINGTON SQUARE RD.
SUITE 170
PORTLAND, OR 97223
(503) 643-8286

BUILDING DESIGN ELEMENTS SUMMARY:
10 POINTS TOTAL

ADDITIONAL REQUIREMENTS FOR MULTIFAMILY RESIDENTIAL PROJECTS (PER CHAPTER 15.220.060):

BUILDING DESIGN ELEMENTS:

- ITEM #3 (3 POINTS) - BREAK UP LARGE BUILDINGS INTO BAYS BY VARYING PLANES AT LEAST EVERY 50 FEET.

- ITEM #4 (3 POINTS) - PROVIDE VARIATION IN REPEATED UNITS, ELEMENTS SUCH AS COLOR, WINDOWS, BUILDING MATERIALS, AND FORM (EITHER ALONE OR IN COMBINATION) CAN BE USED TO CREATE THIS VARIETY.

- ITEM #3 (2 POINTS) - 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.

- ITEM #3 (2 POINTS) - USE SLOPED ROOFS AT A PITCH OF 3:12 OR STEEPER. GABLE AND HIP ROOF FORMS ARE PREFERABLE.

DESIGN REVIEW SUBMITTAL

REVISED
DATED 10/25/22
DRAWN SSR
CHECKED
ELEVATIONS
1



NEW APARTMENTS FOR :
GROVE DEVELOPMENT
 1015 N. SPRINGBROOK RD.
 NEWBERG, OREGON

CONTRACTOR:
 GROVE DEVELOPMENT, INC.
 6500 SW BEAVERTON-
 HILLSDALE HWY. #3
 PORTLAND, OR 97225
 (503) 793-3299
 CCB# 129694

SURVEY:
 PIONEER DESIGN GROUP, INC.
 92020 SW WASHINGTON SQUARE RD.
 SUITE 170
 PORTLAND, OR 97223
 (503) 643-8286

CIVIL ENGINEER:
 PIONEER DESIGN GROUP, INC.
 92020 SW WASHINGTON SQUARE RD.
 SUITE 170
 PORTLAND, OR 97223
 (503) 643-8286

DESIGN REVIEW SUBMITTAL

PROPOSED
1ST LEVEL FLOOR PLAN 1,050 GROSS SQ. FT.
 SCALE: 3/16" = 1'-0"

REVISED
DATED 10/18/22
DRAWN SSR
CHECKED
1ST FLOOR PLAN
2



NEW APARTMENTS FOR :
GROVE DEVELOPMENT
 1075 N. SPRINGBROOK RD.
 NEWBERG, OREGON

CONTRACTOR:
 GROVE DEVELOPMENT, INC.
 6500 SW BEAVERTON-
 HILLSDALE HWY. #3
 PORTLAND, OR 97225
 (503) 793-3299
 CCB# 129694

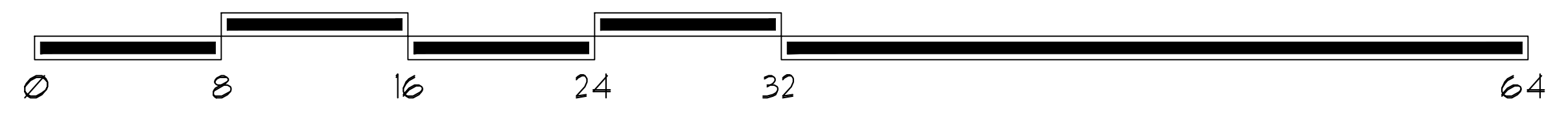
SURVEY:
 PIONEER DESIGN GROUP, INC.
 92020 SW WASHINGTON SQUARE RD.
 SUITE 170
 PORTLAND, OR 97223
 (503) 643-8286

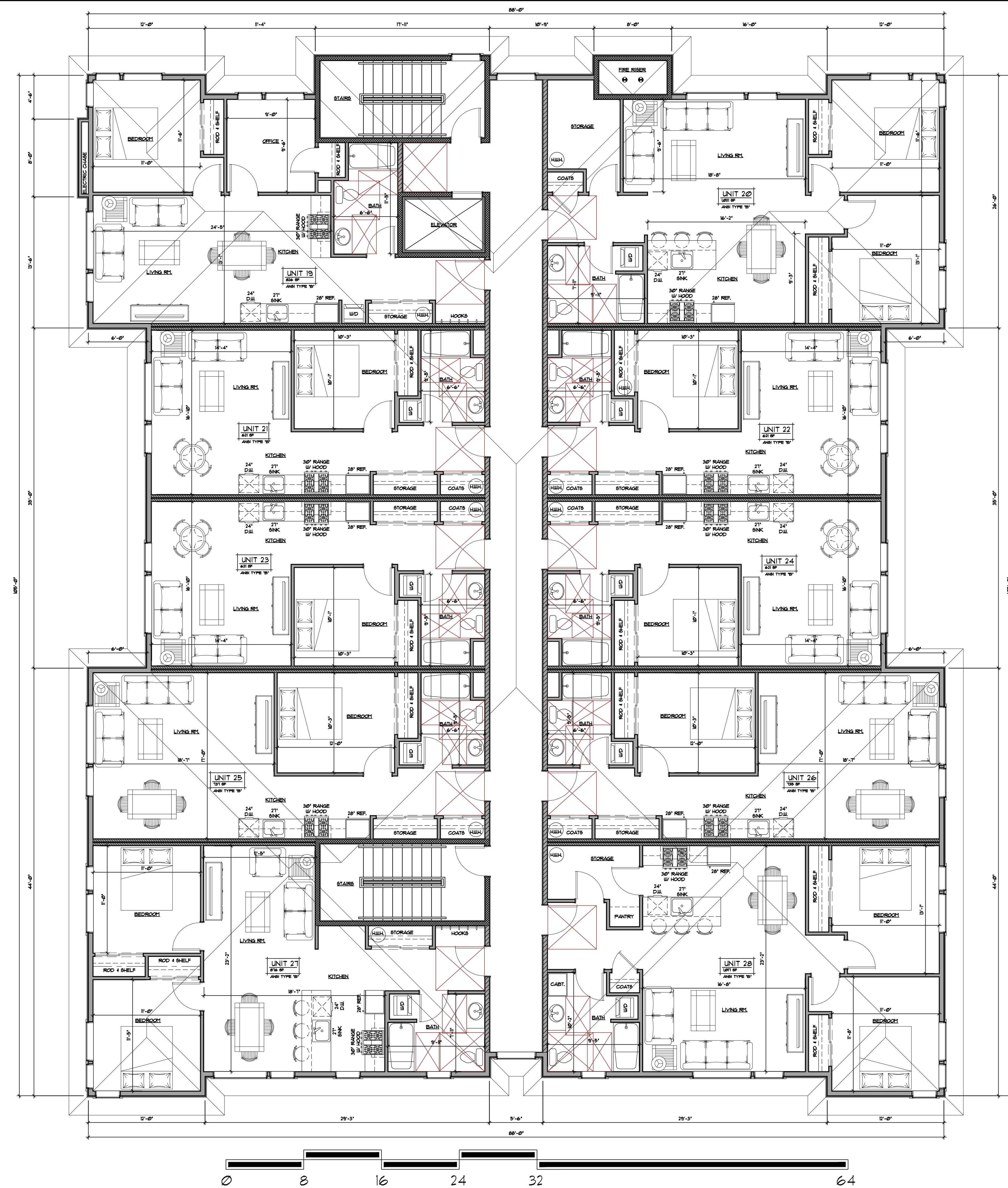
CIVIL ENGINEER:
 PIONEER DESIGN GROUP, INC.
 92020 SW WASHINGTON SQUARE RD.
 SUITE 170
 PORTLAND, OR 97223
 (503) 643-8286

DESIGN REVIEW SUBMITTAL

REVISED
DATED 10/18/22
DRAWN SSR
CHECKED
2ND FLOOR PLAN

PROPOSED
2ND LEVEL FLOOR PLAN 8886 GROSS SQ. FT.
 SCALE: 3/16" = 1'-0"





NEW APARTMENTS FOR :
GROVE DEVELOPMENT
 1075 N. SPRINGBROOK RD.
 NEUBERG, OREGON

CONTRACTOR:
 GROVE DEVELOPMENT, INC.
 6500 SW BEAVERTON-
 HILLSDALE HWY. #3
 PORTLAND, OR 97225
 (503) 793-3299
 CCB# 129694

SURVEY:
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 92020 SW WASHINGTON SQUARE RD.
 SUITE 170
 PORTLAND, OR 97223
 (503) 643-8286

CIVIL ENGINEER:
 PIONEER DESIGN GROUP, INC.
 92020 SW WASHINGTON SQUARE RD.
 SUITE 170
 PORTLAND, OR 97223
 (503) 643-8286

DESIGN REVIEW SUBMITTAL

PROPOSED
3RD LEVEL FLOOR PLAN 8686 GROSS SQ. FT.
 A40 SCALE: 3/16" = 1'-0"

REVISED
DATED 10/18/22
DRAWN SSR
CHECKED
3RD FLOOR PLAN

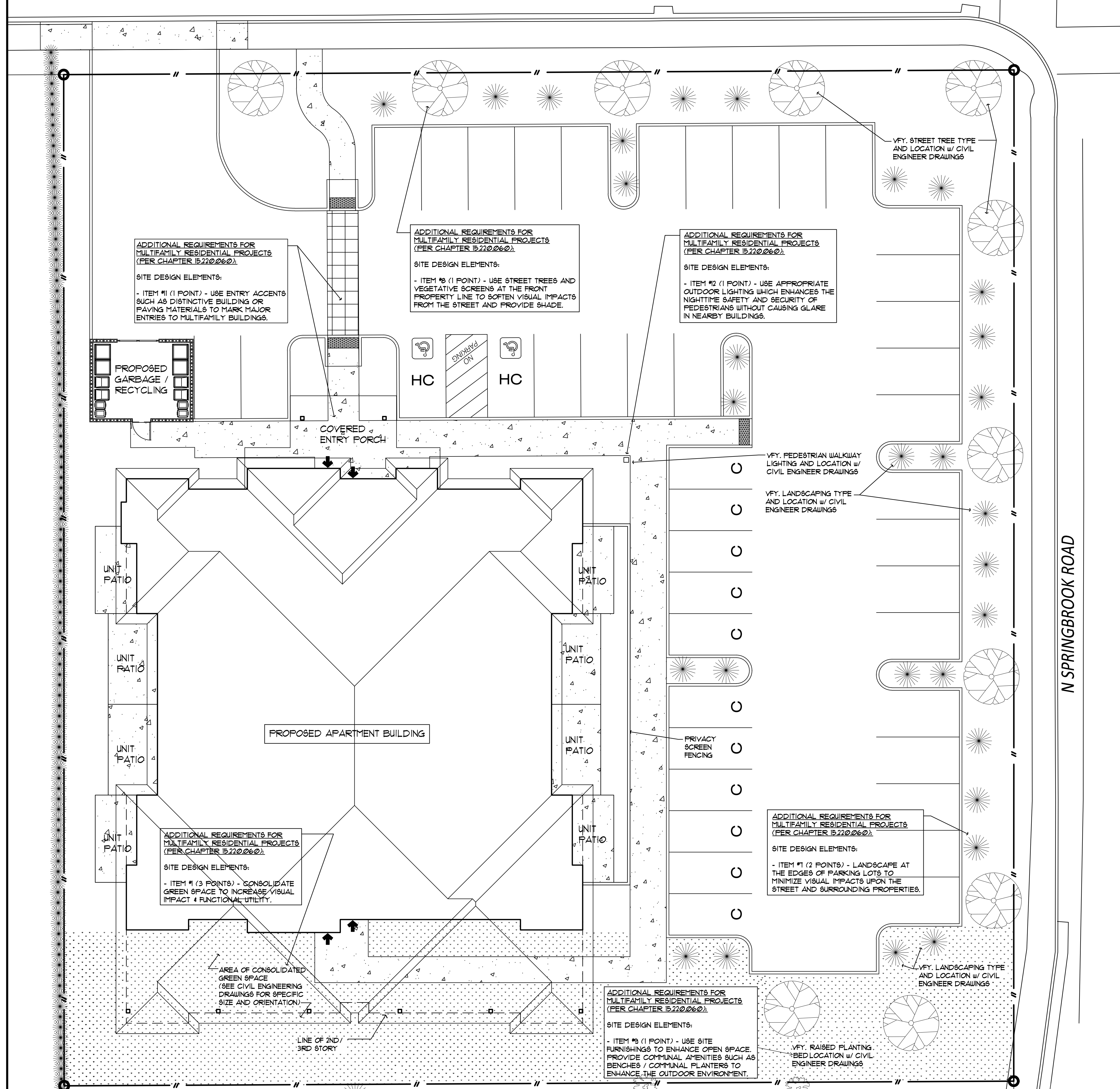
HAWORTH AVENUE

SITE DESIGN ELEMENTS SUMMARY:
POINTS TOTAL

ADDITIONAL REQUIREMENTS FOR MULTIFAMILY RESIDENTIAL PROJECTS (PER CHAPTER 15.220.060):

SITE DESIGN ELEMENTS:

- ITEM #1 (3 POINTS) - CONSOLIDATE GREEN SPACE TO INCREASE VISUAL IMPACT & FUNCTIONAL UTILITY.
- ITEM #1 (2 POINTS) - LANDSCAPE AT THE EDGES OF PARKING LOTS TO MINIMIZE VISUAL IMPACTS UPON THE STREET AND SURROUNDING PROPERTIES.
- ITEM #3 (1 POINT) - USE STREET TREES AND VEGETATIVE SCREENS AT THE FRONT PROPERTY LINE TO SOFTEN VISUAL IMPACTS FROM THE STREET AND PROVIDE SHADE.
- ITEM #3 (1 POINT) - USE SITE FURNISHINGS TO ENHANCE OPEN SPACE. PROVIDE COMMUNAL AMENITIES SUCH AS BENCHES / COMMUNAL PLANTERS TO ENHANCE THE OUTDOOR ENVIRONMENT.
- ITEM #10 (1 POINT) - KEEP FENCES NEIGHBORLY BY KEEPING THEM LOW, PLACING THEM BACK FROM THE SIDEWALK, AND USING COMPATIBLE BUILDING MATERIALS
- ITEM #11 (1 POINT) - USE ENTRY ACCENTS SUCH AS DISTINCTIVE BUILDING OR PAVING MATERIALS TO MARK MAJOR ENTRIES TO MULTIFAMILY BUILDINGS.
- ITEM #12 (1 POINT) - USE APPROPRIATE OUTDOOR LIGHTING WHICH ENHANCES THE NIGHTTIME SAFETY AND SECURITY OF PEDESTRIANS WITHOUT CAUSING GLARE IN NEARBY BUILDINGS.



NEW APARTMENTS FOR :
GROVE DEVELOPMENT
1015 N. SPRINGBROOK RD.
NEWBERG, OREGON

CONTRACTOR:
GROVE DEVELOPMENT, INC.
6500 SW BEAVERTON-
HILLSDALE HWY. #3
PORTLAND, OR 97225
(503) 793-3299
CCB# 129694

SURVEY:
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3020 SW WASHINGTON SQUARE RD.
SUITE 170
PORTLAND, OR 97223
(503) 643-8286

CIVIL ENGINEER:
PIONEER DESIGN GROUP, INC.
3020 SW WASHINGTON SQUARE RD.
SUITE 170
PORTLAND, OR 97223
(503) 643-8286

SITE INFORMATION

ZONE: C-2
SITE AREA: 35,124 SQ. FT.

SETBACKS

MINIMUM REQUIRED	
FRONT:	10 FT.
STREET SIDE:	10 FT.
INTERIOR:	0 FT.

HEIGHT

MAXIMUM ALLOWED TO EAVE:	30 FT.
PROPOSED EAVE HEIGHT:	29.9 FT.
PROPOSED HIGHEST RIDGE:	43.4 FT.

LOT COVERAGE

NOT APPLICABLE IN C-2 ZONE

FLOOR AREA RATIO

NOT APPLICABLE IN C-2 ZONE

- ADDITIONAL NOTES**
- * FOOTINGS TO BEAR ON FIRM, UNDISTURBED NATIVE SOIL OR PROPERLY COMPACTED ENGINEERED FILL (95% PROCTOR)
 - * VERIFY LOCATION OF ELECTRIC, CABLE T.V., TELEPHONE, AND NATURAL GAS SERVICE RUNS TO BUILDING. ALL SERVICE TO BE UNDERGROUND.
 - * VERIFY LOCATION OF EXISTING WATER METER, PROVIDE SERVICE TO BUILDING BY OTHERS. PROVIDE P.R.V. IF OVER 80 P.S.I.
 - * VERIFY LOCATION OF EXISTING SANITARY SEWER STUB OUT. PROVIDE 4" A.B.S. SERVICE TO BUILDING.

AS SITE DESIGN ELEMENTS PLAN

SCALE: 1:10

LEGAL DESCRIPTION:
TAX LOT 800,
CITY OF NEWBERG
SEC. 16, T.35, R.2W, W.M. YAMHILL COUNTY, OREGON

DESIGN REVIEW SUBMITTAL

REVISED

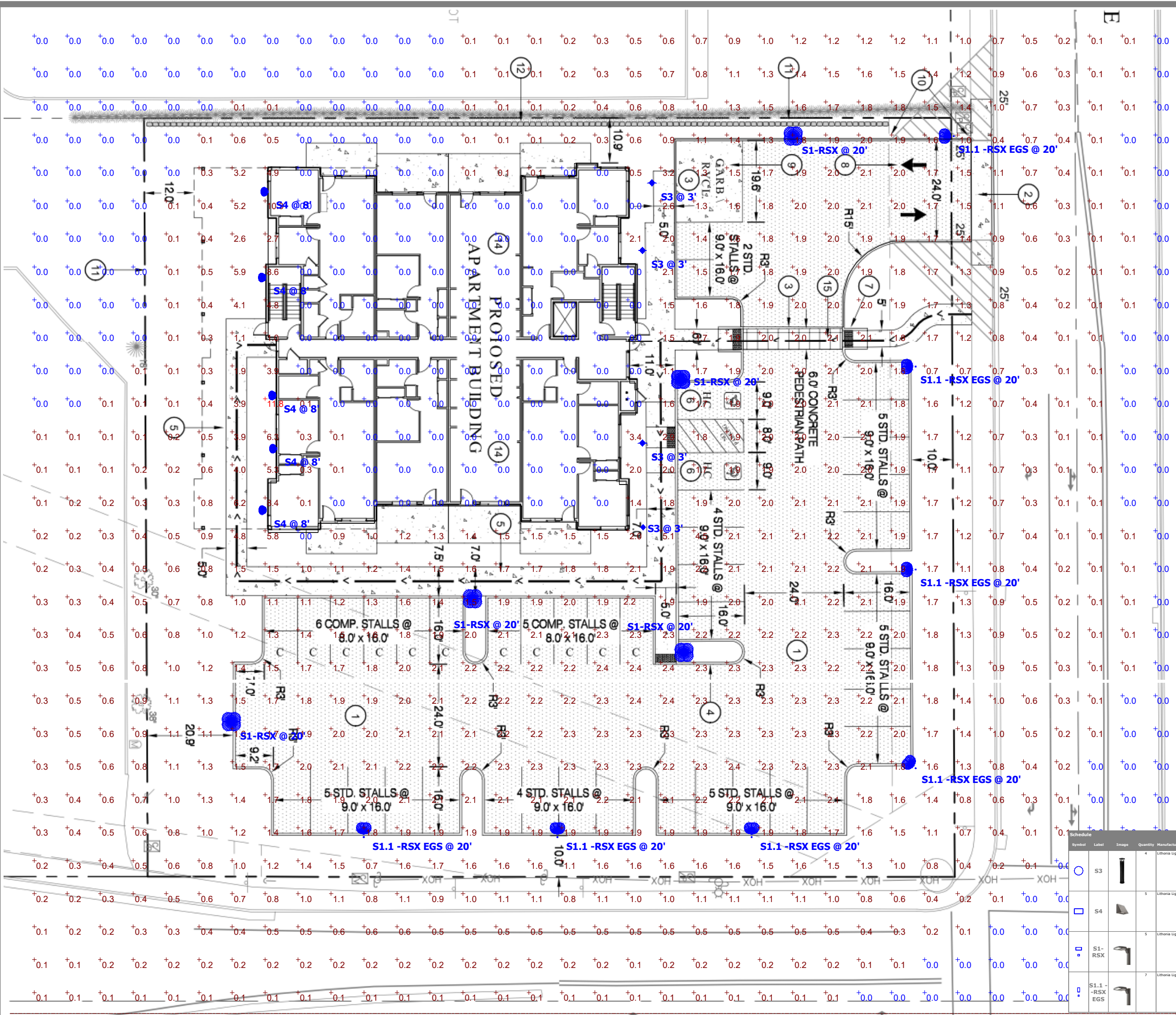
DATED 10/18/22

DRAWN SSR

CHECKED

SITE PLAN

S



Symbol	Label	Image	Quantity	Manufacturer	Catalog Number	Description	Number Lamps	Lumens per Lamp	Light Loss Factor	Wattage	Plot
	S3		4	Lithonia Lighting	RA06 LED P2 40K 5YM DBXVD	RA06 LED P2 40K 5YM DBXVD	1	615	0.9	8	
	S4		5	Lithonia Lighting	W051 LED P2 40K W051 VW	W051 LED WITH P2 - PERFORMANCE PACKAGE - 4000K, 90CRI, VISUAL COMFORT WIDE OPTIC	1	1962	0.9	15.0178	
	S1-RSX		5	Lithonia Lighting	RSX1 LED P1 40K R5	RSX Area Fixture Size 1 P1 Lumen Package 4000K CCT Type R5 Distribution	1	7285	0.9	51.34	
	S1.1-RSX EGS		7	Lithonia Lighting	RSX1 LED P1 40K R5 EGS	RSX Area Fixture Size 1 P1 Lumen Package 4000K CCT Type R5 Distribution with EGS Shield	1	4964	0.9	53.3435	

Designer
ET
Date
10/27/2022
Scale

Drawing No.
Summary

Plan View

Preliminary Storm Drainage Report

The Haworth
Newberg, Oregon

Applicant:

Grove Development, Inc.
7570 SW 74th Avenue
Portland, Oregon 97223
503.793.3299

Engineer:

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Newberg Case File No:



VALID THROUGH 12-31-22

Date: November 7, 2022
Prepared by: Luke Lappin, PE
PDG Job No. 121-029

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APPENDIX 'B' – DETENTION CHAMBER SIZING CALCULATIONS

APPENDIX 'C' – FLOW CONTROL MANHOLE DETAIL

APPENDIX 'D' – STORMFILTER MANHOLE DETAIL

APPENDIX 'E' – PRELIMINARY OPERARTIONS AND MAINTENANCE PLAN

1.0 INTRODUCTION

This report represents the **preliminary** storm drainage and stormwater analysis for The Haworth apartment project. The basis of this report is to comply with City of Newberg, and the State of Oregon's regulations and engineering standards as well as the latest edition of the Oregon Plumbing Specialty Code (OSPC). Compiled in this report are the design criteria for the site, the hydrologic methodology, and the **preliminary** drainage analysis.

2.0 SITE DESCRIPTION AND LOCATION

The proposed development is a 28-unit apartment building with associated parking and utilities. The property is identified as tax lot 00800 of Tax Map 3S216CB and is approximately 0.82 acres. The site is not currently addressed and is located at the southwest corner of the intersection of E. Haworth Avenue and N. Springbrook Road. The property is zoned C2 – Community Commercial.

3.0 EXISTING CONDITIONS

The site is currently vacant with grass covering the entire parcel. There are no trees on the property with a large arborvitae hedge bordering the west boundary and three large trees along the property line to the south. No wetlands or floodplains have been identified on site.

There is a 15-foot public storm drainage easement located along the northern boundary and another 15-foot public storm drainage easement crossing at an angle from the northeast corner to the mid-point on the southern boundary. A third triangular easement for slope and drainage is located at the northeast corner of the property.

The site has frontage along two public streets, E. Haworth Avenue and N. Springbrook Road. Existing storm, sanitary and water systems surround the property and are available for use to serve the development.

3.1 Site Topography

The property generally slopes from west to east. The high point of the site is along the southwest boundary at an approximate elevation of 208.55 feet, with a relative low point along the east property line near N Springbrook Road at an elevation of 203 feet. Existing grades range between 1 and 5%.

The adjacent properties to the east, south and west are all zoned C-2 while across E Haworth Avenue to the north is the Azalea Gardens Mobile Manor designated R-2. East of the site is the Springbrook Plaza shopping center.

3.2 Soil Type

The predominant soil types found on site are Verboort silt clay loam (2027A) and Woodburn silt loam (2310A) with a corresponding hydrologic soil group (HSG) designation ‘D’ and ‘C’ respectively, as shown on the attached Natural Resources Conservation Service (NRCS) soil survey for Yamhill County.

Table 3-2: Hydrologic Soil Group Ratings		
NRCS Map Unit Symbol	NRCS Map Unit Name	Hydrologic Soil Group Rating
2027A	Verboort silt clay loam	D
2310A	Woodburn silt loam	C

3.3 Runoff Curve Numbers

Predeveloped pervious areas will use a composite Runoff Curve Number (RCN) of 78 corresponding to “Open Space” cover type (HSG designation ‘C’) in good condition. Developed pervious areas will use a composite Runoff Curve Number (RCN) of 83.2 corresponding to “Open Space” cover type (HSG designation ‘C’) in fair condition. A runoff curve number of 98 will be used for all predeveloped and developed impervious areas (refer to the *SCS Runoff Curve Numbers* Exhibit).

Table 3.3 – Runoff Curve Numbers		
Land Description	Existing RCN	Proposed RCN
Open Space, Good Condition	78	---
Open Space, Fair Condition	---	83.2
Impervious	98	98

4.0 PROPOSED IMPROVEMENTS

We will be constructing impervious surfaces as a result of the proposed apartment building, parking lot and sidewalks. Private utilities will be extended to the site for use by the development.

On-site impervious areas will be treated in proprietary stormfilter cartridge manholes while an underground Stormtech detention chamber system will provide detention for the site meeting boundary, site, slope, building, and structure setbacks.

4.1 Hydrology/Hydraulic Methodology

Using the Santa Barbara Urban Hydrograph (SBUH) method based on a Type 1A rainfall distribution, the site has been analyzed to determine the proposed peak runoff rates for half the 2, 5, 10, and 25-year 24-hour storm event. The SBUH method uses runoff curve numbers in conjunction with the property's hydrologic soil group to model the site's permeability. Stormwater analysis and facility design was provided using the "HydroCAD" 10.00 Stormwater modeling software.

A predeveloped time of concentration of 16.45 minutes and a developed time of concentration of 5.0 minutes were calculated using the methodology outlined in the TR-55 technical manual (*refer to the Time of Concentration Calculations and Exhibits*).

Rainfall depths for all storm events used in the calculations and design of the proposed storm drainage system are found in latest edition of the City of Newberg Public Works Design and Construction Standards and shown below.

Table 4-1: 24-Hour Rainfall Depths (City of Newberg)					
Recurrence Interval, Years	2	5	10	25	100
24-Hour Depths, Inches	2.5	3.0	3.5	4.0	4.5

4.2 Water Quality

As required by City of Newberg, any new development that creates more than 2,877 square feet of impervious area will be required to provide water quality and quantity treatment. Stormwater management will be provided in accordance with the *2015 Public Works Design and Construction Standards, Section 4*.

As per *Section 4.6.1.III – Impervious Surface Area*, for all developments other than single family and duplex, including row houses and condominiums, the sizing of stormwater quality facilities shall be based on the net impervious area created by the development, including structures, roads, and other impervious areas.

The water quality storm defines both the volume and rate of runoff. 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. See *Appendix 'D' – Stormfilter Manhole Detail* for water quality storm flow rate.

On-site runoff will be treated by two proprietary 48" diameter stormfilter manholes (*refer to Appendix 'D' – Stormfilter Manhole Detail*). These facilities will provide treatment for all contributing onsite pavement impervious surfaces as outlined in the City of Newberg's "*Public Works Design and Construction Standard's*," 2015.

Stormwater from the parking lot will be collected in trapped catch basins for pretreatment, pollution reduction and spill control prior to being conveyed into the proposed stormfilter manholes.

Private facilities shall be maintained by the owner with a maintenance agreement recorded with Yamhill County.

Existing and proposed impervious area have been calculated for the development and are listed in the *Impervious Area Calculation* spreadsheet. The proposed project will create approximately 24,472 sq. ft of new impervious surface. There is no existing impervious area.

4.3 Water Quantity

Stormwater quantity facilities shall be designed to capture runoff so the post-development runoff rates from the site do not exceed the predevelopment runoff rates from the site, based on 24-hour storm events ranging from the ½ of 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.

Water quantity control (detention) will be managed onsite meeting the requirements of the City of Newberg's *"Public Works Design and Construction Standard's," 2015 – Section 4.7.*

Underground detention will be provided in the form of manufactured corrugated plastic chambers (StormTech ADS SC-740). Runoff from the site will flow into seven rows of seven chambers located underneath the parking lot. An "isolator" row will provide enhanced suspended solids and pollutant removal while allowing for maintenance access and cleaning. 6 inches of drainage rock will be placed below the chambers with 6 inches of rock above to provide the required volume.

A 30% void spacing in the fill material has been assumed for design purposes.

During the 25-year storm event, the water level in the underground detention facility will rise to an elevation approximately eight inches below the top of the chambers. The extra capacity in the system will account for sedimentation over the life of the project.

In the event the facility fails, stormwater overflow will be directed out of the trapped catch basin nearest the detention chambers where it will overtop the curb and sheet flow out to N. Springbrook Street and into the public storm system.

A flow control manhole with two orifices will attenuate the post-developed peak runoff for the 2, 10, and 25-year storm events to the respective ½ of the 2, 2, 10, and 25-year

predeveloped peak flows for the site. Orifice “A” will be sized to attenuate the 2-year storm, while Orifice “B” will be set above the 2-year storm elevation to attenuate larger storms. The top of the baffle wall will be set at an elevation to provide emergency overflow for the 100-year storm. The underground detention facility will have a total storage volume of 2,538 cubic feet. Confirmation of the chamber sizing is verified by the HydroCAD software calculations shown in *Appendix ‘B’ – Detention Chamber Sizing Calculations*.

Table 4.3 – Underground Detention			
Storm Event (yr)	Pre-Developed (cfs)	Developed (cfs)	Released Outflow (cfs)
½-2	0.045	0.17	0.04
2	0.09	0.40	0.09
5	0.16	0.50	0.16
10	0.22	0.59	0.22
25	0.30	0.69	0.30

4.4 Conveyance

The conveyance system for the site consists of an underground pipe system, underground detention facility, roof drains, trapped catch basins and filtered manholes. Stormwater from the project will be conveyed to an existing 24” storm system located in a public easement adjacent to E. Haworth Avenue. The existing storm main continues east to N. Springbrook Road where it connects to an existing 42” storm pipe that runs southwest diagonally through the subject site.

As per the requirements of the City of Newberg, the drainage system will be designed to convey the 25-year storm event and comply with the requirements of the Uniform Plumbing Code.

The outflow pipe connecting the underground detention facility to the existing storm main in E Haworth Avenue will be 12 inches at a slope of 0.010 ft/ft. All storm pipes conveying runoff into the detention facility will be 6, 8, and 10 inches, with a minimum slope of 0.010 ft/ft. Using a Manning’s ‘n’ value of 0.013, a 6”, 8”, and 10” pipe at a slope of 0.010 ft./ft. has sufficient capacity to convey the 25-year storm event for the entire site (refer to the *Stormwater Conveyance Calculations*).

5.0 DOWNSTREAM ANALYSIS

Runoff from the development is ultimately discharged into an existing 42-inch storm main that runs through the middle of the development, past the adjacent property to the south

and across Hwy 99. Approximately 695 feet downstream of the subject site, runoff is discharged into an existing regional facility (wetlands) west of the Fred Meyer shopping center.

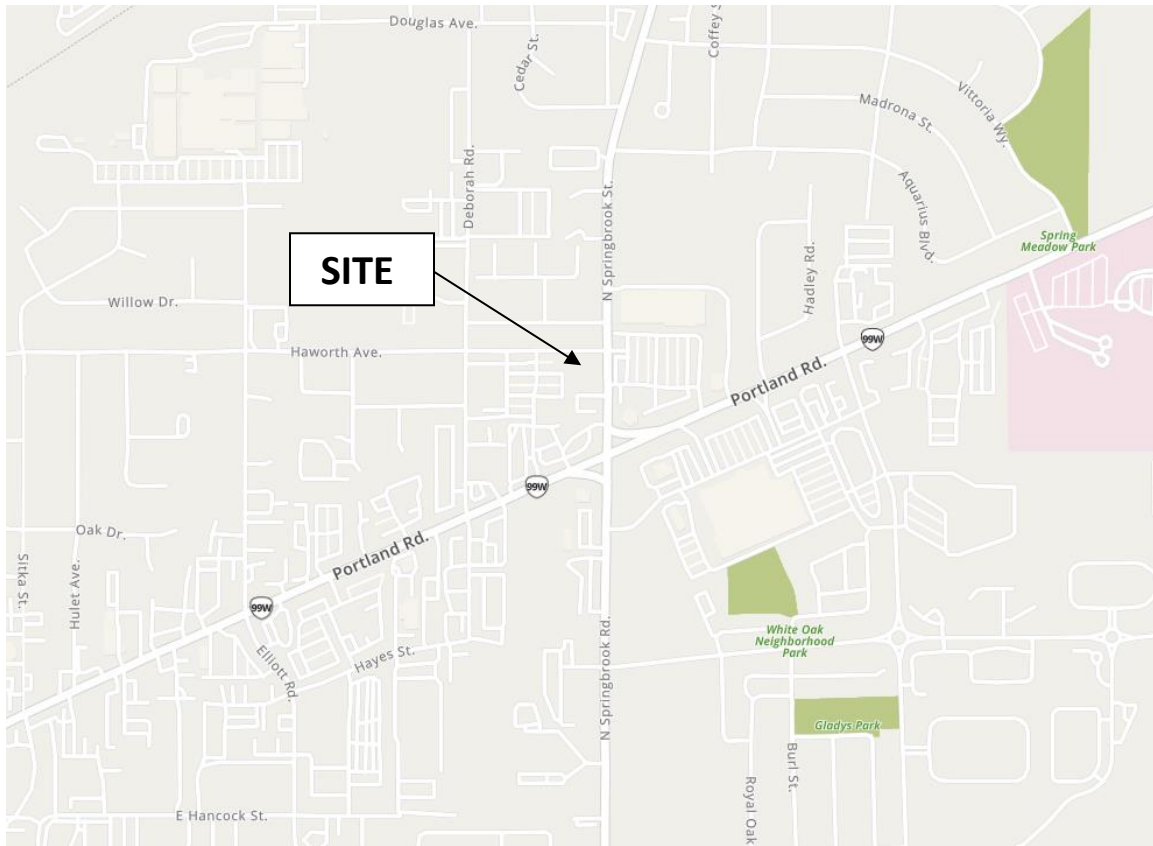
Per City of Newberg *“Public Works Design and Construction Standard’s,” 2015 – Section 4.5.IV.c – Downstream Analysis*, when the downstream analysis does not continue for at least one-quarter (1/4) mile, the design engineer shall provide a stamped certification of investigation that states the design Engineer has visually investigated the downstream system for at least one-quarter (1/4) mile downstream and is aware of no observable downstream impacts to the conveyance system.

No downstream restrictions were found between our site and the existing wetland facility. Furthermore, detention is provided on site and will not increase peak runoff nor exacerbate any potential downstream restrictions.

6.0 CONCLUSION

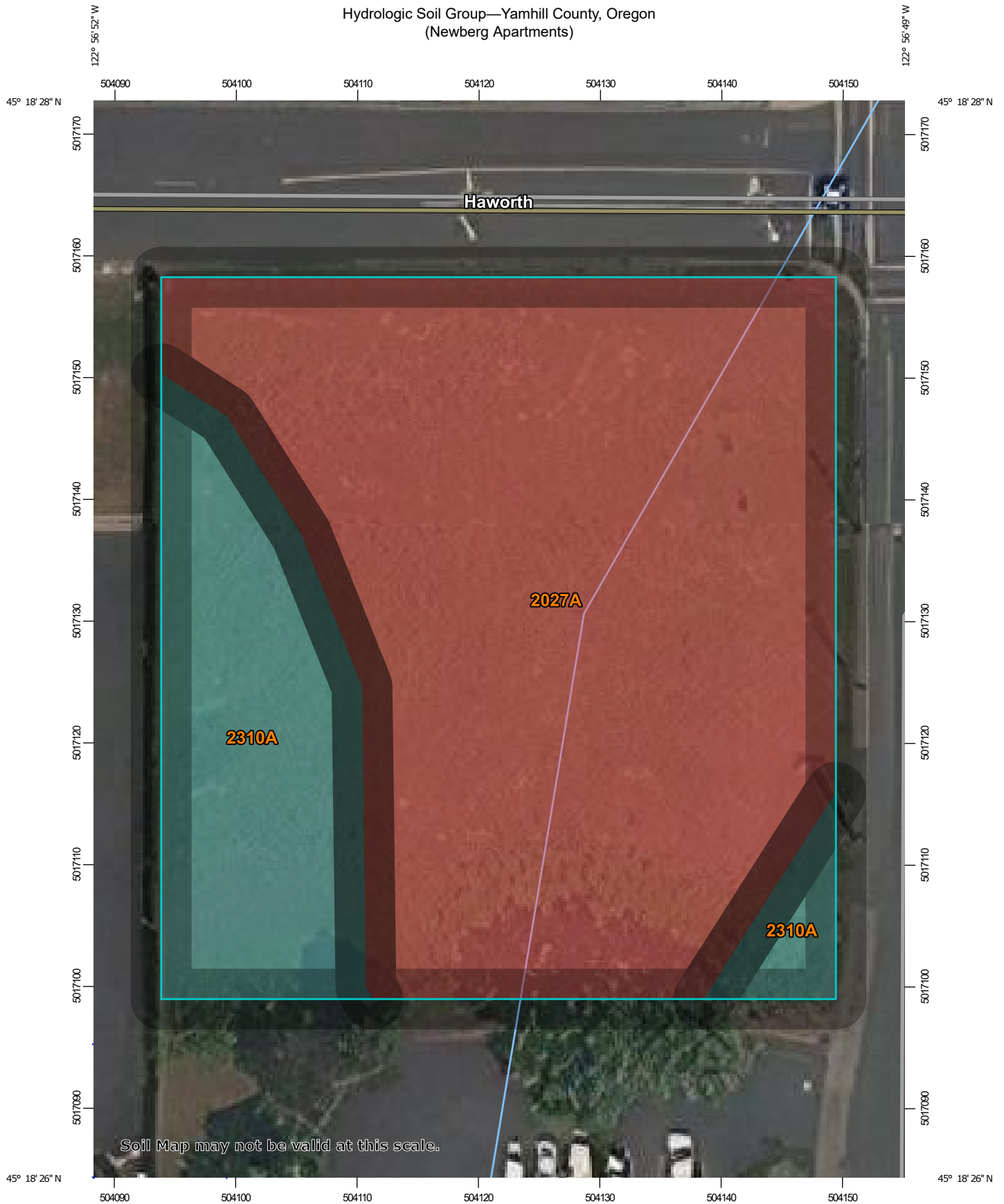
Based on the supporting stormwater calculations and attached analysis, it is the opinion of Pioneer Design Group that the development of The Haworth Apartments development project will not adversely affect the existing downstream drainage system or adjacent property owners. We have provided water quality and quantity treatment with the private proprietary stormfilter manholes and underground detention chambers. Therefore, all the requirements associated with City of Newberg’s *Design and Construction Standards, 2015* have been met for this project.

7.0 VICINITY MAP

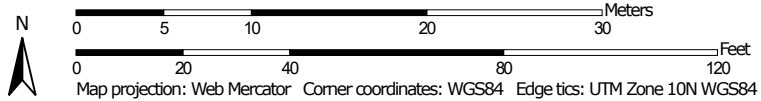


ENGINEERING CALCULATIONS AND SPREADSHEETS

Hydrologic Soil Group—Yamhill County, Oregon
(Newberg Apartments)



Map Scale: 1:431 if printed on A portrait (8.5" x 11") sheet.



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 10, Oct 27, 2021

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

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
2027A	Verboort silty clay loam, 0 to 3 percent slopes	D	0.6	76.1%
2310A	Woodburn silt loam, 0 to 3 percent slopes	C	0.2	23.9%
Totals for Area of Interest			0.8	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.

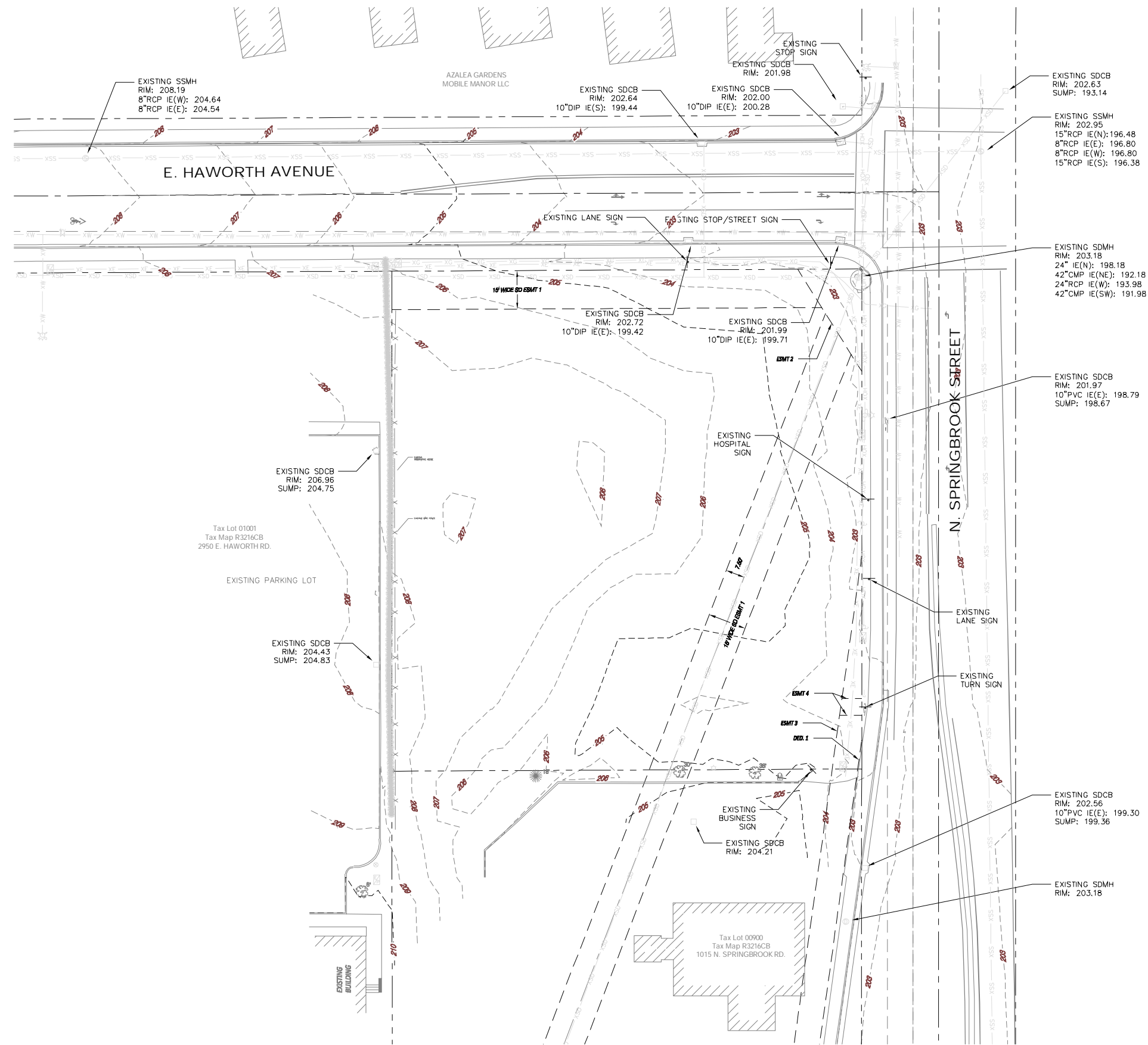
If a soil is assigned to a dual hydrologic group (A/D, B/D, or C/D), the first letter is for drained areas and the second is for undrained areas. Only the soils that in their natural condition are in group D are assigned to dual classes.

Rating Options

Aggregation Method: Dominant Condition

Component Percent Cutoff: None Specified

Tie-break Rule: Higher

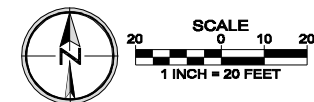


LEGEND

- RIGHT-OF-WAY LINE
- BOUNDARY LINE
- EXISTING LOT LINE
- CENTER LINE
- STORM DRAINAGE LINE
- SANITARY SEWER LINE
- WATER LINE
- GAS LINE
- COMMUNICATION LINE
- UNDERGROUND POWER LINE
- OVERHEAD WIRE
- WOOD FENCE (AS NOTED)
- EXISTING 2' CONTOUR
- EXISTING 10' CONTOUR
- CONIFEROUS TREE (DBH)
- DECIDUOUS TREE (DBH)
- EXISTING TREES TO BE REMOVED
- EXISTING CONCRETE
- EXISTING ASPHALT PAVEMENT
- EXISTING BUILDING
- CATCH BASIN/DRAIN INLET
- STORM MANHOLE
- SANITARY MANHOLE
- WATER VALVE
- FIRE HYDRANT ASSEMBLY
- WATER METER
- GAS VALVE
- GAS METER
- STREET SIGN
- MAILBOX
- ELECTRIC PEDESTAL
- ELECTRIC VAULT
- TELECOMMUNICATION VAULT
- TELECOMMUNICATION PEDESTAL
- UTILITY VAULT
- UTILITY PEDESTAL
- POWER POLE
- GUY WIRE
- EXISTING SLOPE DIRECTION

EASEMENT AND DEDICATION LEGEND

- ESMT. 1 15' WIDE PUBLIC STORM SEWER EASEMENTS PER PARTITION PLAT NO. 97-5
- ESMT. 2 SLOPE AND DRAINAGE FACILITY EASEMENT PER FILM VOL. 146, PG 430
- ESMT. 3 EASEMENT AS DESCRIBED BY PARCEL 2 OF RECORD DOCUMENT #200015895, BEING A PERMANENT EASEMENT FOR SLOPES, WATER, GAS, ELECTRIC AND COMMUNICATION SERVICE LINES, FIXTURES AND FACILITIES TO ODOT.
- ESMT. 4 EASEMENT AS DESCRIBED BY PARCEL 3 OF RECORD DOCUMENT #200015895, BEING A PERMANENT EASEMENT FOR SIGN TO ODOT
- DED. 1 DEDICATION TO ODOT AS DESCRIBED BY PARCEL 1 OF RECORD DOCUMENT #200015895



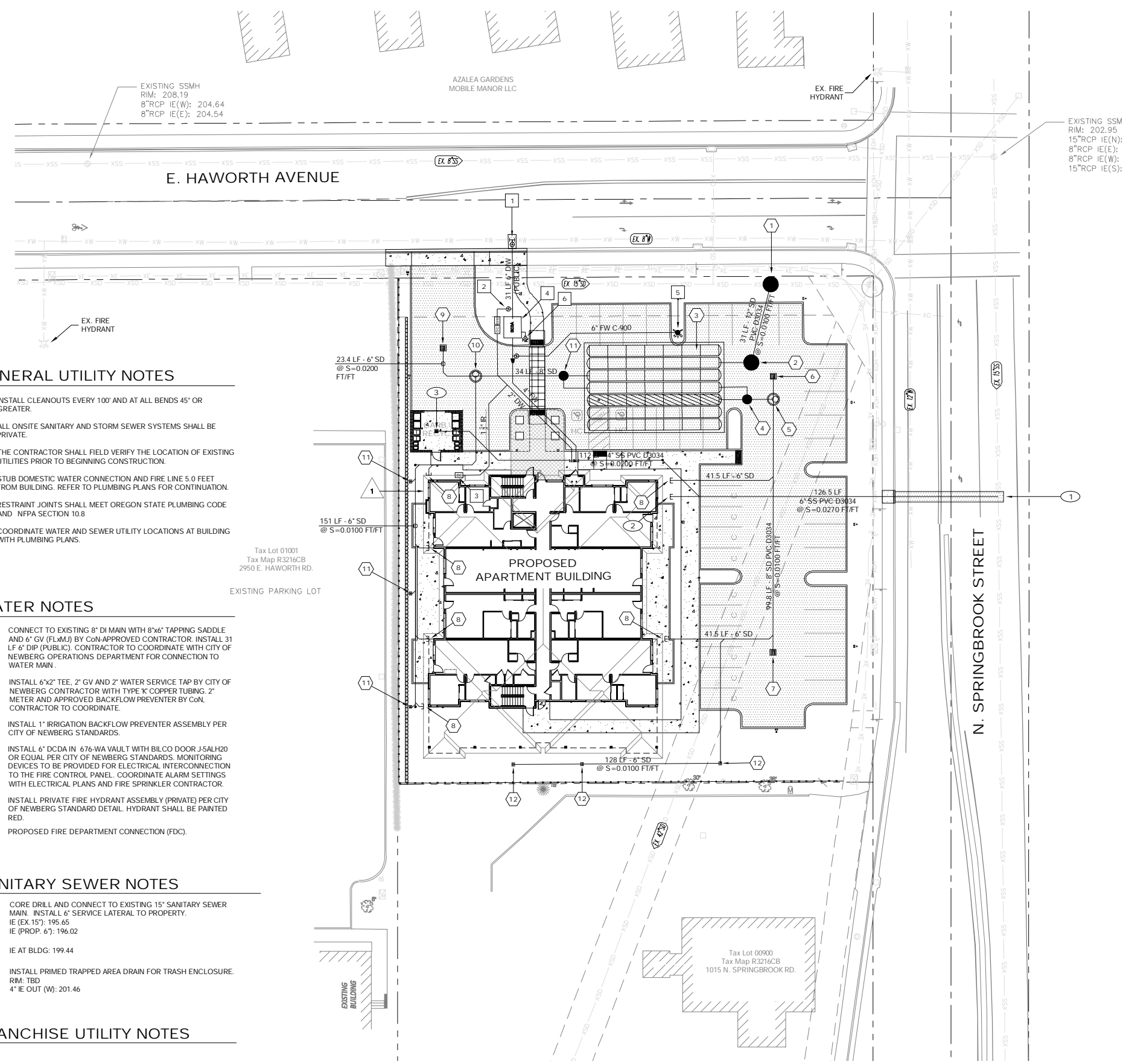
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Designed by	11/2022	Drawn by	11/2022	Reviewed by	11/2022	
Project No.	121-029	Horiz. Scale:		Vert. Scale:		

By	Date	Project
		NEWBERG APARTMENTS
		No. 121-029
		Type PLANNING
		Sheet

Designed by	Date	Drawn by	Date	Reviewed by	Date	Project No.	REF.
	11/2022		11/2022		11/2022	121-029	

By	Revision	Date	Scale

Project	No.	Type	Sheet
NEWBERG APARTMENTS	121-029	PLANNING	



- ### LEGEND
- PROPOSED DOMESTIC WATER LINE
 - PROPOSED FIRE SERVICE LINE
 - PROPOSED DOUBLE CHECK DETECTOR ASSEMBLY
 - PROPOSED CLEANOUT
 - PROPOSED TRAPPED CATCH BASIN
 - PROPOSED LANDSCAPE DRAIN
 - PROPOSED SANITARY SEWER LINE
 - PROPOSED STORM DRAIN LINE
 - PROPOSED FIRE HYDRANT
 - PROPOSED FIRE DEPARTMENT CONNECTION (FDC)
 - PROPOSED WATER AND IRRIGATION METER
 - PROPOSED DOUBLE CHECK ASSEMBLY
 - PROPOSED DOUBLE CHECK DETECTOR ASSEMBLY
 - PROPOSED STORM SEWER MANHOLE
 - PROPOSED STORMFILTER MANHOLE
 - PROPOSED UNDERGROUND DETENTION CHAMBERS

- ### STORM SEWER NOTES
1. INSTALL 60" Ø MANHOLE OVER EXISTING 24" STORM SEWER LINE.
 RIM = 203.87
 EX 24" IE IN (E) = 193.85
 12" IE IN (SW) = 194.65
 EX 24" IE OUT (W) = 193.65
 2. INSTALL 60" FLOW CONTROL MANHOLE.
 RIM = TBD
 12" IE IN (W) = 194.96
 12" IE OUT (NE) = 194.96
 3. 7 ROWS OF 7 UNDERGROUND DETENTION CHAMBERS (STORMTECH ADS SC-740)
 6" ROCK BASE, 6" ROCK COVER
 ROCK BOTTOM ELEV = 196.58
 CHAMBER BOTTOM ELEV = 197.08
 4. INSTALL 30" Ø NYLOPLAST DRAIN BASIN (STANDARD AASHTO H-20 GRATE)
 INSTALL 11 LF 24" ACCESS PIPE WITH 10" MANIFOLD
 RIM = TBD
 10" IE IN (E) = 198.35
 10" IE OUT (N) = 198.35
 24" IE OUT (W) = 197.18
 5. CONSTRUCT 48" Ø WATER QUALITY STORMFILTER MANHOLE (SFMH-1) (3-18" CARTRIDGES)
 RIM: TBD
 6" IE IN (N): 200.75
 8" IE IN (S): 200.75
 10" IE OUT (W): 198.45
 6. CONSTRUCT TRAPPED CATCH BASIN
 INSTALL 8 LF 6" PVC D3034
 RIM: 204.06
 6" IE OUT (S): 200.56
 7. CONSTRUCT TRAPPED CATCH BASIN
 INSTALL 180 LF 8" PVC D3034
 RIM: 204.63
 8" IE OUT (N): 201.75
 8. CONNECT TO BUILDING ROOF DRAIN WITH 6" SD AT 2.0% MIN.
 9. CONSTRUCT TRAPPED CATCH BASIN
 INSTALL 23.4 LF 6" PVC D3034
 RIM: 205.02
 6" IE OUT (S): 201.63
 10. CONSTRUCT 48" Ø WATER QUALITY STORMFILTER MANHOLE (SFMH-2) (3-18" CARTRIDGES)
 RIM: TBD
 6" IE IN (W): 201.16
 6" IE IN (S): 201.16
 10" IE OUT (E): 198.86
 11. INSTALL 30" Ø NYLOPLAST DRAIN BASIN (STANDARD AASHTO H-20 GRATE)
 INSTALL 11 LF 24" ACCESS PIPE WITH 10" MANIFOLD
 RIM = TBD
 8" IE IN (W) = 198.52
 10" IE OUT (S) = 198.35
 24" IE OUT (E) = 197.18
 12. CONSTRUCT 12" SQ. LANDSCAPE AREA DRAIN WITH ATRIUM GRATE (ADS PART NOS. 1200, 1290, AND 1242 OR EQUAL).
 13. CONSTRUCT 12" SQ. LANDSCAPE AREA DRAIN WITH ATRIUM GRATE (ADS PART NOS. 1200, 1290, AND 1242 OR EQUAL).

GENERAL UTILITY NOTES

1. INSTALL CLEANOUTS EVERY 100' AND AT ALL BENDS 45' OR GREATER.
2. ALL ONSITE SANITARY AND STORM SEWER SYSTEMS SHALL BE PRIVATE.
3. THE CONTRACTOR SHALL FIELD VERIFY THE LOCATION OF EXISTING UTILITIES PRIOR TO BEGINNING CONSTRUCTION.
4. STUB DOMESTIC WATER CONNECTION AND FIRE LINE 5.0 FEET FROM BUILDING. REFER TO PLUMBING PLANS FOR CONTINUATION.
5. RESTRAINT JOINTS SHALL MEET OREGON STATE PLUMBING CODE AND NFPA SECTION 10.8
6. COORDINATE WATER AND SEWER UTILITY LOCATIONS AT BUILDING WITH PLUMBING PLANS.

WATER NOTES

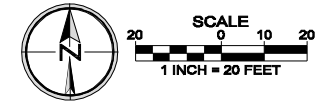
1. CONNECT TO EXISTING 8" DI MAIN WITH 8"x6" TAPPING SADDLE AND 4" GV (FLMJ) BY COA-APPROVED CONTRACTOR. INSTALL 31 LF 6" DIP (PUBLIC). CONTRACTOR TO COORDINATE WITH CITY OF NEWBERG OPERATIONS DEPARTMENT FOR CONNECTION TO WATER MAIN.
2. INSTALL 6"x2" TEE, 2" GV AND 2" WATER SERVICE TAP BY CITY OF NEWBERG CONTRACTOR WITH TYPE K COPPER TUBING, 2" METER AND APPROVED BACKFLOW PREVENTER BY COA, CONTRACTOR TO COORDINATE.
3. INSTALL 1" IRRIGATION BACKFLOW PREVENTER ASSEMBLY PER CITY OF NEWBERG STANDARDS.
4. INSTALL 6" DCDA IN 676-WA VAULT WITH BILCO DOOR J-5ALH20 OR EQUAL PER CITY OF NEWBERG STANDARDS. MONITORING DEVICES TO BE PROVIDED FOR ELECTRICAL INTERCONNECTION TO THE FIRE CONTROL PANEL. COORDINATE ALARM SETTINGS WITH ELECTRICAL PLANS AND FIRE SPRINKLER CONTRACTOR.
5. INSTALL PRIVATE FIRE HYDRANT ASSEMBLY (PRIVATE) PER CITY OF NEWBERG STANDARD DETAIL. HYDRANT SHALL BE PAINTED RED.
6. PROPOSED FIRE DEPARTMENT CONNECTION (FDC).

SANITARY SEWER NOTES

1. CORE DRILL AND CONNECT TO EXISTING 15" SANITARY SEWER MAIN. INSTALL 6" SERVICE LATERAL TO PROPERTY.
 IE (EX 15"): 195.65
 IE (PROP. 6"): 196.02
2. IE AT BLDG: 199.44
3. INSTALL PRIMED TRAPPED AREA DRAIN FOR TRASH ENCLOSURE.
 RIM: TBD
 4" IE OUT (W): 201.46

FRANCHISE UTILITY NOTES

1. PROPOSED ELECTRIC METERS. FINAL DESIGN BY OTHERS.



RUNOFF CURVE NUMBERS (TR55)

Table 2-2a: Runoff curve numbers for urban areas¹

Cover description	Average percent impervious area ²	CN for hydrologic soil group			
		A	B	C	D
<i>Fully developed urban areas (vegetation established)</i>					
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
<i>Developing urban areas</i>					
Newly graded areas (pervious areas only, no vegetation) ⁵	77	86	91	94	
Idle lands (CNs 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.

MANNING'S "n" VALUES

SHEET FLOW EQUATION MANNING'S VALUES		n_s
Smooth Surfaces (concrete, asphalt, gravel, or bare hand packed soil)		0.011
Fallow Fields or loose soil surface (no residue)		0.05
Cultivated soil with residue cover ($\leq 20\%$)		0.06
Cultivated soil with residue cover ($> 20\%$)		0.17
Short prairie grass and lawns		0.15
Dense grasses		0.24
Bermuda grasses		0.41
Range (natural)		0.13
Woods or forrest with light underbrush		0.40
Woods or forrest with dense underbrush		0.80
SHALLOW CONCENTRATED FLOW (after initial 300 ft of sheet flow, R = 0.1)		k_s
Forrest with heavy ground litter and meadows (n = 0.010)		3
Brushy ground with some trees (n = 0.060)		5
Fallow or minimum tillage cultivation (n = 0.040)		8
High grass (n = 0.035)		9
Short grass, pasture and lawns (n = 0.030)		11
Nearly bare ground (n = 0.25)		13
Paved and gravel areas (n = 0.012)		27
CHANNEL FLOW (Intermittent) (At the beginning of all visible channels, R = 0.2)		k_c
Forested swale with heavy ground cover (n = 0.10)		5
Forested drainage course/ravine with defined channel bed (n = 0.050)		10
Rock-lined waterway (n = 0.035)		15
Grassed waterway (n = 0.030)		17
Earth-lined waterway (n = 0.025)		20
CMP pipe (n = 0.024)		21
Concrete pipe (n = 0.012)		42
Other waterways and pipe	0.508/n	
CHANNEL FLOW (continuous stream, R = 0.4)		k_c
Meandering stream (n = 0.040)		20
Rock-lined stream (n = 0.035)		23
Grass-lined stream (n = 0.030)		27
Other streams, man-made channels and pipe	(n = 0.807/n)	



IMPERVIOUS AREA CALCULATIONS

JOB NUMBER: 121-029
 PROJECT: Newberg Apartments
 FILE: 12129_hydro_planning

NEW IMPERVIOUS AREA

BUILDING	9,562.00 ft ²	
SIDEWALKS	3,314.00 ft ²	
STREET PAVEMENT	14,596.00 ft ²	
	27,472.00 ft ²	0.63 ac

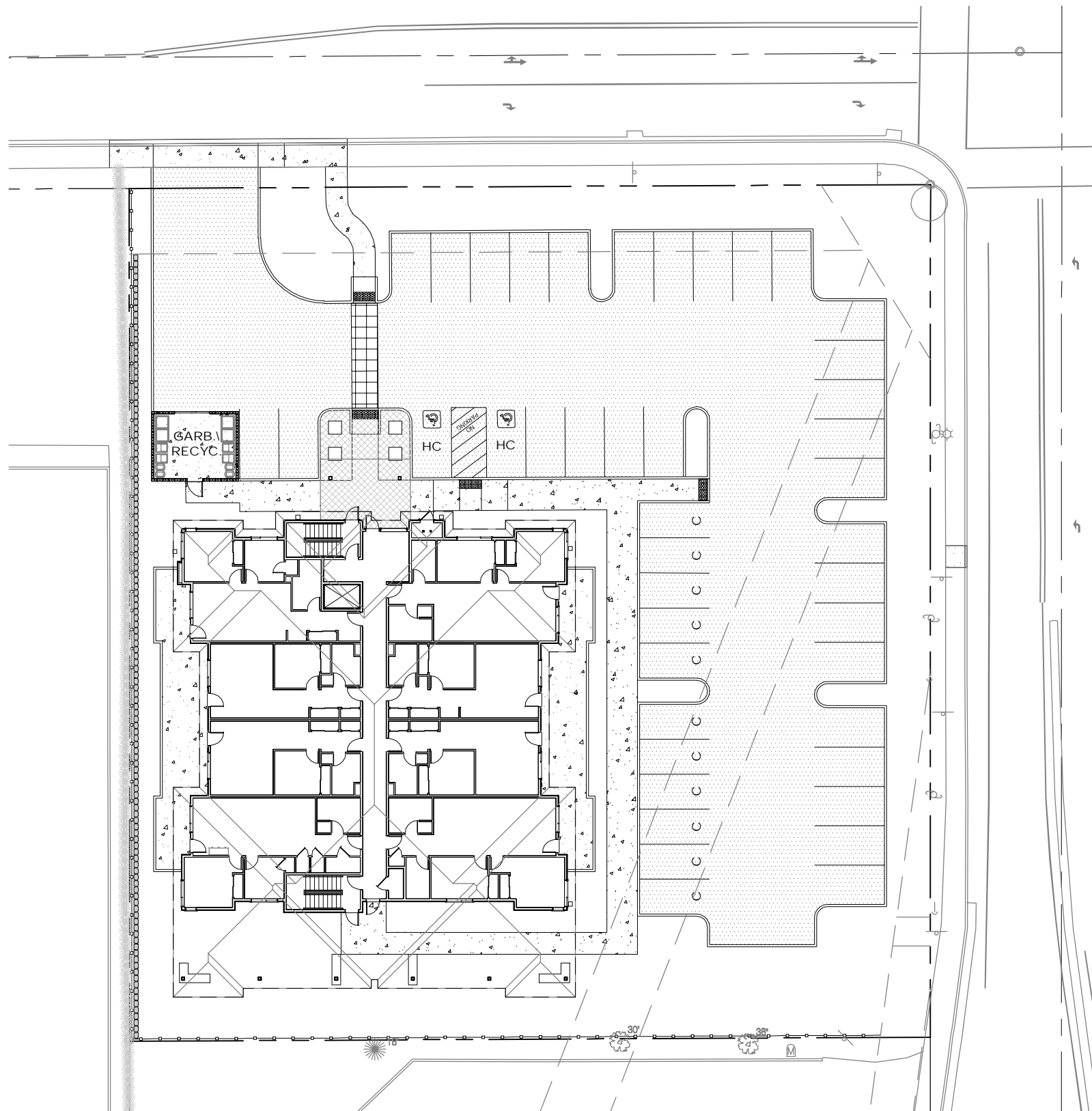
EXISTING IMPERVIOUS AREA

BUILDINGS	0.00 ft ²	
SIDEWALKS	0.00 ft ²	
GRAVEL AT 60% IMPERVIOUS	0.00 ft ²	
STREET PAVEMENT	0.00 ft ²	
	0.00 ft ²	0.00 ac

Total Shed Area	35,725.00 ft²	0.82 ac
Existing Impervious Area	0.00 ft²	0.00 ac
% Impervious		0.0 %
Proposed Impervious Area	27,472.00 ft²	0.63 ac
% Impervious		76.9 %

Impervious Area Exhibit

THE HAWORTH APARTMENTS



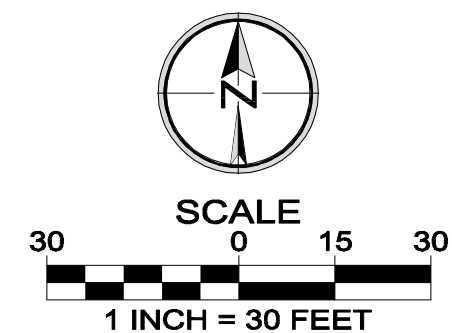
DISTURBED AREA

ONSITE	=	35,725 SF (0.82 AC)
OFFSITE	=	521 SF (0.01 AC)
TOTAL DISTURBED AREA	=	36,246 SF (0.83 AC)

IMPERVIOUS AREA

BUILDING	=	0 SF
SIDEWALK	=	0 SF
PAVEMENT	=	0 SF
TOTAL EXISTING IMPERVIOUS	=	0 SF
		(0.00 AC)

BUILDING	=	9,562 SF
SIDEWALKS	=	3,314 SF
PAVEMENT	=	14,596 SF
TOTAL PROPOSED IMPERVIOUS	=	27,472 SF
		(0.63 AC)



PIONEER DESIGN GROUP
 CIVIL ENGINEERING • LAND USE PLANNING • LAND SURVEYING • LANDSCAPE ARCHITECTURE
 PORTLAND, OREGON | HONOLULU, HAWAII
 PH: 503.643.8286 | PH: 808.753.2376
 WWW.PD-GRP.COM

Designed by	LRL	Date	11/2022
Drawn by	LRL	Date	11/2022
Reviewed by	BEF	Date	11/2022
Project No.	121-029	REF.	
Horiz. Scale:	1"=30'		
Vert. Scale:			

Impervious Area Exhibit.dwg

Project
THE HAWORTH
No.
121-029
Type
PLANNING
Sheet



PREDEVELOPED TIME OF CONCENTRATION

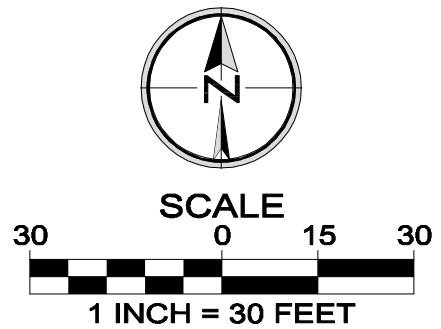
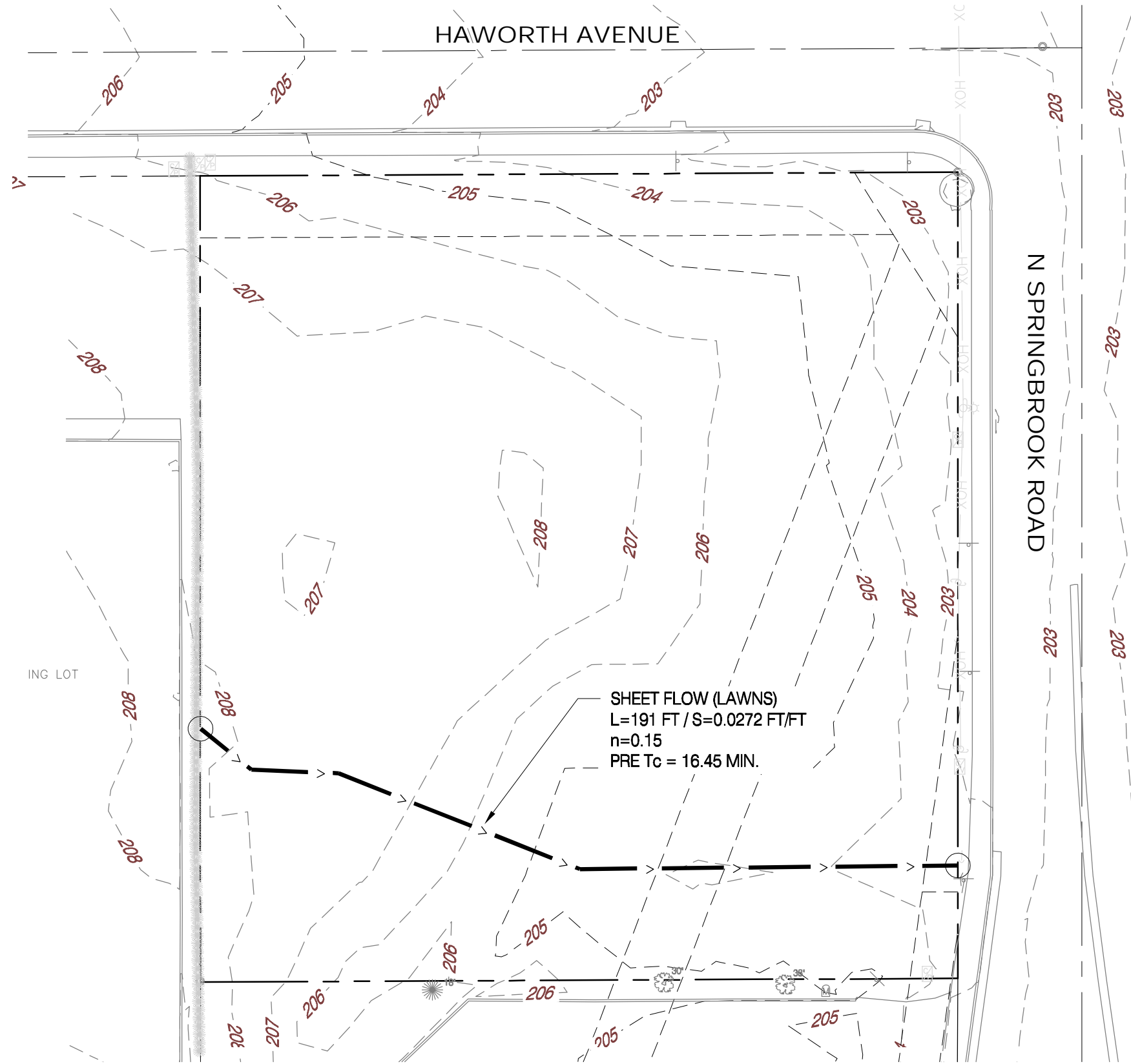
JOB NUMBER: 121-029
 PROJECT: Newberg Apartments
 FILE: 12129_hydro_planning

	Accum. Tc
LAG ONE: SHEET FLOW (FIRST 191 FEET)	
Tt = Travel time	
Manning's "n" = 0.15	
Flow Length, L = 191 ft (300 ft. max.)	
P = 2-year, 24hr storm = 2.5 in	
Slope, S ₀ = 0.027 ft/ft	
$T_T = \frac{(0.42)(n * L)^{0.8}}{(P)^{0.5} (S_0)^{0.4}}$	16.45 min.

TOTAL PREDEVELOPED TIME OF CONCENTRATION (Tc) = 16.45 min.

Predeveloped Time of Concentration

THE HAWORTH



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Designed by	LRL	Date	11/2022
Drawn by	LRL	Date	11/2022
Reviewed by	BEF	Date	11/2022
Project No.	121-029	REF.	
Horiz. Scale:	1"=30'		
Vert. Scale:	N/A		

12129_PRE Tc.DWG

Project
HAWORTH APARTMENTS

No.
121-029

Type
PLANNING

Sheet



DEVELOPED TIME OF CONCENTRATION

JOB NUMBER: 121-029
PROJECT: Newberg Apartments
FILE: 12129_hydro_planning

Catchment Time	5 min.
Longest Run of Pipe	0 ft
Velocity of Flow	3 ft/s
Time in Pipe = (0 ft)/(3.00 ft/s) =	0 s

TOTAL DEVELOPED Tc = **5 min.**



EXISTING CONDITIONS - PERVIOUS COMPOSITE CURVE NUMBERS

JOB NUMBER: 121-029
 PROJECT: Newberg Apartments
 FILE: 12129_hydro_planning

TOTAL AREA= 35,725 SF

EXISTING CONDITIONS

COVER TYPE	SOIL TYPE	AREA (SF)	SOIL GRADE	CURVE NUMBER
OPEN SPACE "GOOD CONDITION"	2027A Verbort silty clay loam	23,817	D	80
OPEN SPACE "GOOD CONDITION"	2310A Cornelius silt loam	11,908	C	74

EXISTING COMPOSITE CN (PERVIOUS) = $\frac{(109,447 \times 71) + (130,569 \times 84)}{35,725}$ = 78.0



DEVELOPED CONDITIONS - PERVIOUS COMPOSITE CURVE NUMBERS

JOB NUMBER: 121-029
 PROJECT: Newberg Apartments
 FILE: 12129_hydro_planning

TOTAL AREA= 35,725 SF

DEVELOPED CONDITIONS

COVER TYPE	SOIL TYPE	AREA (SF)	SOIL GRADE	CURVE NUMBER
OPEN SPACE "FAIR CONDITION"	2027A Verbort silty clay loam	23,817	D	84
OPEN SPACE "FAIR CONDITION"	2310A Woodburn silt loam	11,908	C	79

DEVELOPED COMPOSITE CN (PERVIOUS) = $\frac{(109,447 \times 71) + (130,569 \times 84)}{35,725}$ = 82.3



STORMWATER CONVEYANCE CALCULATIONS

JOB NUMBER: 121-029
 PROJECT: Newberg Apartments
 FILE: 12129_hydro_planning
 Design Storm: 25 YR
 Storm Duration: 24 HRS
 Precipitation: 4 IN
 Manning's "n": 0.013

LINE	INC. AREA (AC)	AREA TOTAL (AC)	% IMP.	AREA PERV. (AC)	CN PER.	AREA IMP. (AC)	CN IMP.	TIME (MIN)	Q (CFS)	PIPE SIZE (IN)	SLOPE (FT/FT)	Qf (CFS)	Q/Qf (%)	Vf (FPS)	V/Vf (%)	ACTUAL V (FPS)
ENTIRE SHED	0.82	0.82	76.9	0.19	82.3	0.63	98	5.00	0.77	6	0.0100	0.56	1.37	2.87	1.14	3.26
ENTIRE SHED	0.82	0.82	76.9	0.19	82.3	0.63	98	5.00	0.77	8	0.0075	1.05	0.74	3.01	1.12	3.37
ENTIRE SHED	0.82	0.82	76.9	0.19	82.3	0.63	98	5.00	0.77	10	0.0060	1.70	0.45	3.12	0.97	3.04
ENTIRE SHED	0.82	0.82	76.9	0.19	82.3	0.63	98	5.00	0.77	12	0.0050	2.53	0.31	3.22	0.86	2.78

STORM DRAINAGE

23,230 sq. ft.
@ 1.3 in./hr/
(6" Pipe)

16,461 sq. ft.
@ 1.3 in./hr/
(6" Pipe)

**SITE AREA =
35,719 SF**

**TABLE 11-2
SIZING OF HORIZONTAL RAINWATER PIPING^{1, 2}**

SIZE OF PIPE inches	FLOW (1/8 inch per foot slope) gpm	MAXIMUM ALLOWABLE HORIZONTAL PROJECTED ROOF AREAS AT VARIOUS RAINFALL RATES (square feet)					
		1 (in/h)	2 (in/h)	3 (in/h)	4 (in/h)	5 (in/h)	6 (in/h)
3	34	3288	1644	1096	822	657	548
4	78	7520	3760	2506	1880	1504	1253
5	139	13 360	6680	4453	3340	2672	2227
6	222	21 400	10 700	7133	5350	4280	3566
8	478	46 000	23 000	15 330	11 500	9200	7670
10	860	82 800	41 400	27 600	20 700	16 580	13 800
12	1384	133 200	66 600	44 400	33 300	26 650	22 200
15	2473	238 000	119 000	79 333	59 500	47 600	39 650

SIZE OF PIPE inches	FLOW (1/4 inch per foot slope) gpm	MAXIMUM ALLOWABLE HORIZONTAL PROJECTED ROOF AREAS AT VARIOUS RAINFALL RATES (square feet)					
		1 (in/h)	2 (in/h)	3 (in/h)	4 (in/h)	5 (in/h)	6 (in/h)
3	48	4640	2320	1546	1160	928	773
4	110	10 600	5300	3533	2650	2120	1766
5	196	18 880	9440	6293	4720	3776	3146
6	314	30 200	15 100	10 066	7550	6040	5033
8	677	65 200	32 600	21 733	16 300	13 040	10 866
10	1214	116 800	58 400	38 950	29 200	23 350	19 450
12	1953	188 000	94 000	62 600	47 000	37 600	31 350
15	3491	336 000	168 000	112 000	84 000	67 250	56 000

SIZE OF PIPE inches	FLOW (1/2 inch per foot slope) gpm	MAXIMUM ALLOWABLE HORIZONTAL PROJECTED ROOF AREAS AT VARIOUS RAINFALL RATES (square feet)					
		1 (in/h)	2 (in/h)	3 (in/h)	4 (in/h)	5 (in/h)	6 (in/h)
3	68	6576	3288	2192	1644	1310	1096
4	156	15 040	7520	5010	3760	3010	2500
5	278	26 720	13 360	8900	6680	5320	4450
6	445	42 800	21 400	14 267	10 700	8580	7140
8	956	92 000	46 000	30 650	23 000	18 400	15 320
10	1721	165 600	82 800	55 200	41 400	33 150	27 600
12	2768	266 400	133 200	88 800	66 600	53 200	44 400
15	4946	476 000	238 000	158 700	119 000	95 200	79 300

For SI units: 1 inch = 25 mm, 1 gallon per minute = 0.06 L/s, 1/8 inch per foot = 10.4 mm/m, 1 inch per hour = 25.4 mm/h, 1 square foot = 0.0929 m²

Notes:

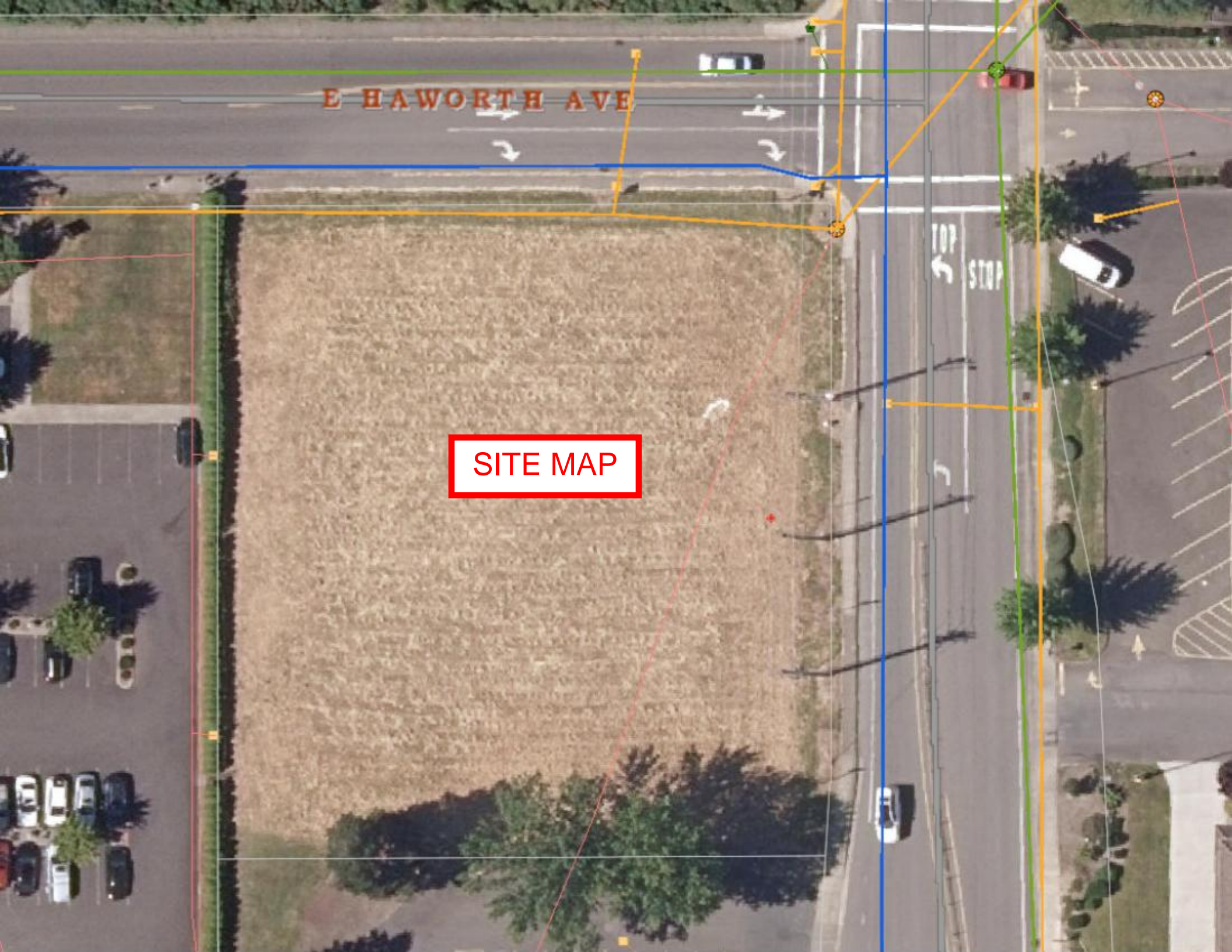
¹ The sizing data for horizontal piping are based on the pipes flowing full.

² For rainfall rates other than those listed, determine the allowable roof area by dividing the area given in the 1 inch per hour (25.4 mm/h) column by the desired rainfall rate.

APPENDIX 'A' – CITY OF NEWBERG UTILITY MAPS

E HAWORTH AVE

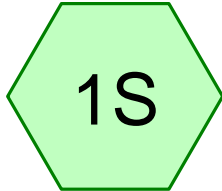
SITE MAP



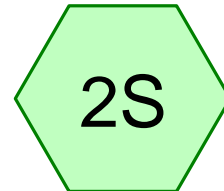
OVERALL
MAP



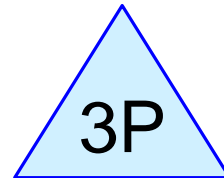
APPENDIX 'B' – DETENTION CHAMBER SIZING CALCULATIONS



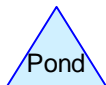
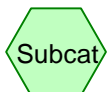
Predeveloped (On Site)



Developed (On Site)



Detention Chambers



12129_Detention_7x7

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Page 2

Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
0.820	78	(1S)
0.190	82	(2S)
0.630	98	(2S)
1.640	86	TOTAL AREA

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Page 3

Soil Listing (all nodes)

Area (acres)	Soil Group	Subcatchment Numbers
0.000	HSG A	
0.000	HSG B	
0.000	HSG C	
0.000	HSG D	
1.640	Other	1S, 2S
1.640		TOTAL AREA

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Page 4

Ground Covers (all nodes)

HSG-A (acres)	HSG-B (acres)	HSG-C (acres)	HSG-D (acres)	Other (acres)	Total (acres)	Ground Cover	Subcatchment Numbers
0.000	0.000	0.000	0.000	1.640	1.640		1S, 2S
0.000	0.000	0.000	0.000	1.640	1.640	TOTAL AREA	

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Pipe Listing (all nodes)

Line#	Node Number	In-Invert (feet)	Out-Invert (feet)	Length (feet)	Slope (ft/ft)	n	Diam/Width (inches)	Height (inches)	Inside-Fill (inches)
1	3P	195.96	195.65	31.0	0.0100	0.013	12.0	0.0	0.0

12129_Detention_7x7

Type IA 24-hr 1/2 2 year Rainfall=1.25"

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Time span=0.00-50.00 hrs, dt=0.01 hrs, 5001 points
Runoff by SBUH method, Split Pervious/Imperv.
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment 1S: Predeveloped (On Site)

Runoff Area=0.820 ac 0.00% Impervious Runoff Depth=0.13"
Tc=16.4 min CN=78/0 Runoff=0.01 cfs 0.009 af

Subcatchment 2S: Developed (On Site)

Runoff Area=0.820 ac 76.83% Impervious Runoff Depth=0.85"
Tc=5.0 min CN=82/98 Runoff=0.17 cfs 0.058 af

Pond 3P: Detention Chambers

Peak Elev=197.21' Storage=441 cf Inflow=0.17 cfs 0.058 af
Outflow=0.04 cfs 0.058 af

Total Runoff Area = 1.640 ac Runoff Volume = 0.067 af Average Runoff Depth = 0.49"
61.59% Pervious = 1.010 ac 38.41% Impervious = 0.630 ac

12129_Detention_7x7

Type IA 24-hr 1/2 2 year Rainfall=1.25"

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Summary for Subcatchment 1S: Predeveloped (On Site)

Runoff = 0.01 cfs @ 18.15 hrs, Volume= 0.009 af, Depth= 0.13"

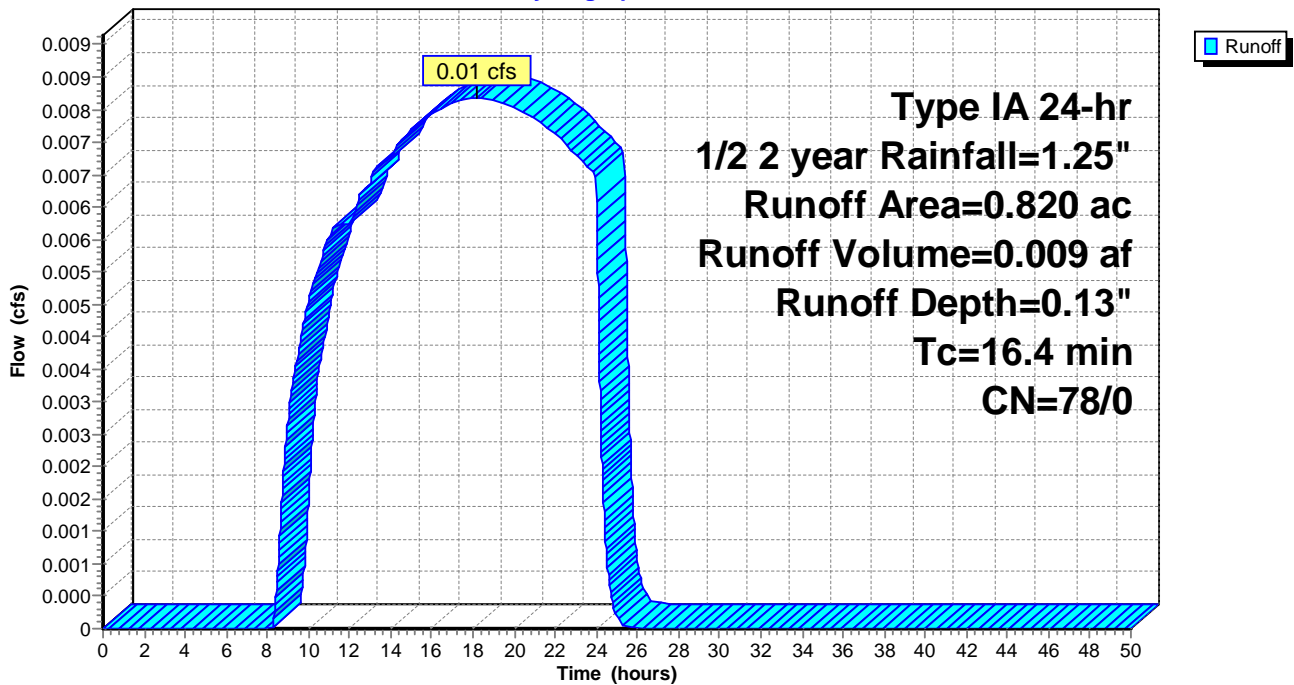
Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-50.00 hrs, dt= 0.01 hrs
Type IA 24-hr 1/2 2 year Rainfall=1.25"

Area (ac)	CN	Description
* 0.820	78	
0.820	78	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
16.4					Direct Entry,

Subcatchment 1S: Predeveloped (On Site)

Hydrograph



12129_Detention_7x7

Type IA 24-hr 1/2 2 year Rainfall=1.25"

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Hydrograph for Subcatchment 1S: Predeveloped (On Site)

Time (hours)	Precip. (inches)	Perv.Excess (inches)	Imp.Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Perv.Excess (inches)	Imp.Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00	0.00	27.00	1.25	0.13	0.00	0.00
0.50	0.01	0.00	0.00	0.00	27.50	1.25	0.13	0.00	0.00
1.00	0.02	0.00	0.00	0.00	28.00	1.25	0.13	0.00	0.00
1.50	0.04	0.00	0.00	0.00	28.50	1.25	0.13	0.00	0.00
2.00	0.06	0.00	0.00	0.00	29.00	1.25	0.13	0.00	0.00
2.50	0.08	0.00	0.00	0.00	29.50	1.25	0.13	0.00	0.00
3.00	0.10	0.00	0.00	0.00	30.00	1.25	0.13	0.00	0.00
3.50	0.12	0.00	0.00	0.00	30.50	1.25	0.13	0.00	0.00
4.00	0.15	0.00	0.00	0.00	31.00	1.25	0.13	0.00	0.00
4.50	0.17	0.00	0.00	0.00	31.50	1.25	0.13	0.00	0.00
5.00	0.19	0.00	0.00	0.00	32.00	1.25	0.13	0.00	0.00
5.50	0.23	0.00	0.00	0.00	32.50	1.25	0.13	0.00	0.00
6.00	0.26	0.00	0.00	0.00	33.00	1.25	0.13	0.00	0.00
6.50	0.30	0.00	0.00	0.00	33.50	1.25	0.13	0.00	0.00
7.00	0.34	0.00	0.00	0.00	34.00	1.25	0.13	0.00	0.00
7.50	0.39	0.00	0.00	0.00	34.50	1.25	0.13	0.00	0.00
8.00	0.53	0.00	0.00	0.00	35.00	1.25	0.13	0.00	0.00
8.50	0.60	0.00	0.00	0.00	35.50	1.25	0.13	0.00	0.00
9.00	0.65	0.00	0.00	0.00	36.00	1.25	0.13	0.00	0.00
9.50	0.69	0.01	0.00	0.00	36.50	1.25	0.13	0.00	0.00
10.00	0.72	0.01	0.00	0.01	37.00	1.25	0.13	0.00	0.00
10.50	0.75	0.01	0.00	0.01	37.50	1.25	0.13	0.00	0.00
11.00	0.78	0.02	0.00	0.01	38.00	1.25	0.13	0.00	0.00
11.50	0.81	0.02	0.00	0.01	38.50	1.25	0.13	0.00	0.00
12.00	0.83	0.02	0.00	0.01	39.00	1.25	0.13	0.00	0.00
12.50	0.85	0.03	0.00	0.01	39.50	1.25	0.13	0.00	0.00
13.00	0.88	0.03	0.00	0.01	40.00	1.25	0.13	0.00	0.00
13.50	0.90	0.04	0.00	0.01	40.50	1.25	0.13	0.00	0.00
14.00	0.92	0.04	0.00	0.01	41.00	1.25	0.13	0.00	0.00
14.50	0.94	0.04	0.00	0.01	41.50	1.25	0.13	0.00	0.00
15.00	0.96	0.05	0.00	0.01	42.00	1.25	0.13	0.00	0.00
15.50	0.98	0.05	0.00	0.01	42.50	1.25	0.13	0.00	0.00
16.00	1.00	0.06	0.00	0.01	43.00	1.25	0.13	0.00	0.00
16.50	1.02	0.06	0.00	0.01	43.50	1.25	0.13	0.00	0.00
17.00	1.04	0.07	0.00	0.01	44.00	1.25	0.13	0.00	0.00
17.50	1.06	0.07	0.00	0.01	44.50	1.25	0.13	0.00	0.00
18.00	1.07	0.08	0.00	0.01	45.00	1.25	0.13	0.00	0.00
18.50	1.09	0.08	0.00	0.01	45.50	1.25	0.13	0.00	0.00
19.00	1.11	0.09	0.00	0.01	46.00	1.25	0.13	0.00	0.00
19.50	1.13	0.09	0.00	0.01	46.50	1.25	0.13	0.00	0.00
20.00	1.14	0.10	0.00	0.01	47.00	1.25	0.13	0.00	0.00
20.50	1.16	0.10	0.00	0.01	47.50	1.25	0.13	0.00	0.00
21.00	1.17	0.11	0.00	0.01	48.00	1.25	0.13	0.00	0.00
21.50	1.19	0.11	0.00	0.01	48.50	1.25	0.13	0.00	0.00
22.00	1.20	0.12	0.00	0.01	49.00	1.25	0.13	0.00	0.00
22.50	1.21	0.12	0.00	0.01	49.50	1.25	0.13	0.00	0.00
23.00	1.23	0.13	0.00	0.01	50.00	1.25	0.13	0.00	0.00
23.50	1.24	0.13	0.00	0.01					
24.00	1.25	0.13	0.00	0.01					
24.50	1.25	0.13	0.00	0.00					
25.00	1.25	0.13	0.00	0.00					
25.50	1.25	0.13	0.00	0.00					
26.00	1.25	0.13	0.00	0.00					
26.50	1.25	0.13	0.00	0.00					

12129_Detention_7x7

Type IA 24-hr 1/2 2 year Rainfall=1.25"

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Summary for Subcatchment 2S: Developed (On Site)

Runoff = 0.17 cfs @ 7.91 hrs, Volume= 0.058 af, Depth= 0.85"

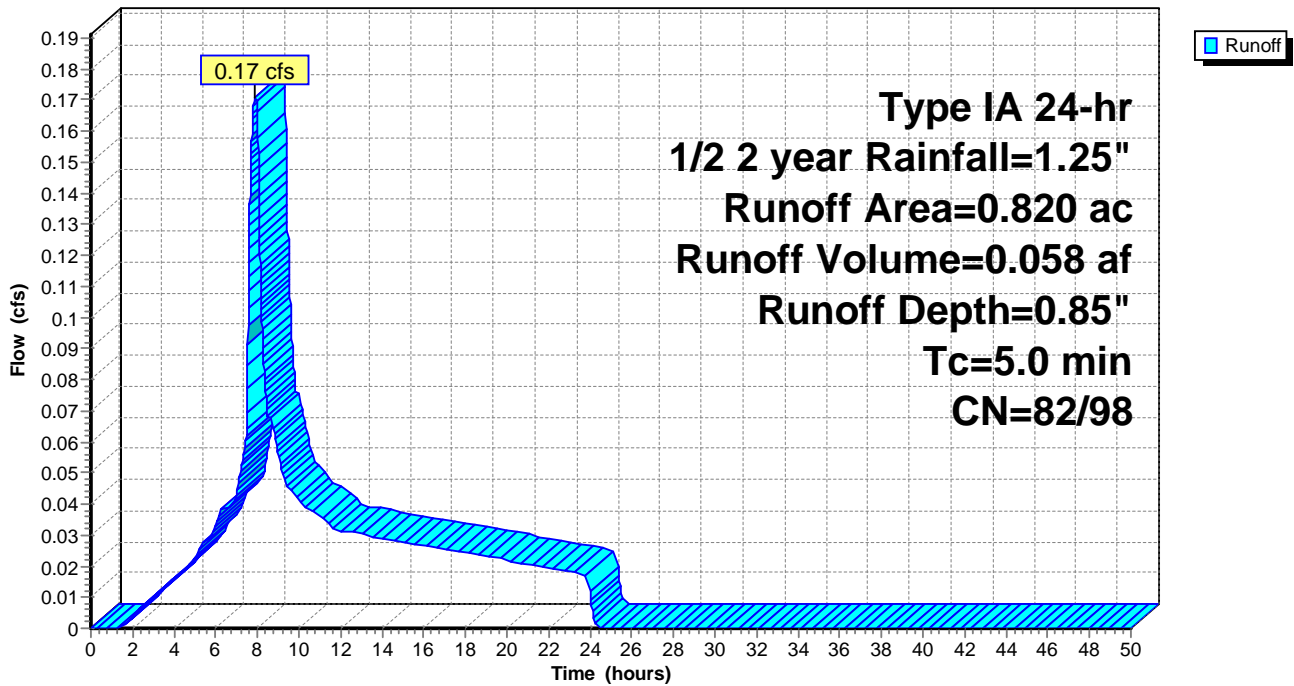
Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-50.00 hrs, dt= 0.01 hrs
Type IA 24-hr 1/2 2 year Rainfall=1.25"

Area (ac)	CN	Description
* 0.190	82	
* 0.630	98	
0.820	94	Weighted Average
0.190	82	23.17% Pervious Area
0.630	98	76.83% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					Direct Entry,

Subcatchment 2S: Developed (On Site)

Hydrograph



12129_Detention_7x7

Type IA 24-hr 1/2 2 year Rainfall=1.25"

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Hydrograph for Subcatchment 2S: Developed (On Site)

Time (hours)	Precip. (inches)	Perv.Excess (inches)	Imp.Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Perv.Excess (inches)	Imp.Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00	0.00	27.00	1.25	0.22	1.03	0.00
0.50	0.01	0.00	0.00	0.00	27.50	1.25	0.22	1.03	0.00
1.00	0.02	0.00	0.00	0.00	28.00	1.25	0.22	1.03	0.00
1.50	0.04	0.00	0.00	0.00	28.50	1.25	0.22	1.03	0.00
2.00	0.06	0.00	0.00	0.00	29.00	1.25	0.22	1.03	0.00
2.50	0.08	0.00	0.01	0.01	29.50	1.25	0.22	1.03	0.00
3.00	0.10	0.00	0.01	0.01	30.00	1.25	0.22	1.03	0.00
3.50	0.12	0.00	0.02	0.01	30.50	1.25	0.22	1.03	0.00
4.00	0.15	0.00	0.04	0.02	31.00	1.25	0.22	1.03	0.00
4.50	0.17	0.00	0.05	0.02	31.50	1.25	0.22	1.03	0.00
5.00	0.19	0.00	0.07	0.02	32.00	1.25	0.22	1.03	0.00
5.50	0.23	0.00	0.09	0.03	32.50	1.25	0.22	1.03	0.00
6.00	0.26	0.00	0.11	0.03	33.00	1.25	0.22	1.03	0.00
6.50	0.30	0.00	0.14	0.04	33.50	1.25	0.22	1.03	0.00
7.00	0.34	0.00	0.17	0.04	34.00	1.25	0.22	1.03	0.00
7.50	0.39	0.00	0.22	0.06	34.50	1.25	0.22	1.03	0.00
8.00	0.53	0.00	0.35	0.17	35.00	1.25	0.22	1.03	0.00
8.50	0.60	0.01	0.41	0.07	35.50	1.25	0.22	1.03	0.00
9.00	0.65	0.02	0.46	0.06	36.00	1.25	0.22	1.03	0.00
9.50	0.69	0.03	0.49	0.04	36.50	1.25	0.22	1.03	0.00
10.00	0.72	0.03	0.52	0.04	37.00	1.25	0.22	1.03	0.00
10.50	0.75	0.04	0.55	0.04	37.50	1.25	0.22	1.03	0.00
11.00	0.78	0.05	0.58	0.04	38.00	1.25	0.22	1.03	0.00
11.50	0.81	0.05	0.60	0.03	38.50	1.25	0.22	1.03	0.00
12.00	0.83	0.06	0.63	0.03	39.00	1.25	0.22	1.03	0.00
12.50	0.85	0.07	0.65	0.03	39.50	1.25	0.22	1.03	0.00
13.00	0.88	0.07	0.67	0.03	40.00	1.25	0.22	1.03	0.00
13.50	0.90	0.08	0.69	0.03	40.50	1.25	0.22	1.03	0.00
14.00	0.92	0.09	0.71	0.03	41.00	1.25	0.22	1.03	0.00
14.50	0.94	0.09	0.73	0.03	41.50	1.25	0.22	1.03	0.00
15.00	0.96	0.10	0.75	0.03	42.00	1.25	0.22	1.03	0.00
15.50	0.98	0.11	0.77	0.03	42.50	1.25	0.22	1.03	0.00
16.00	1.00	0.11	0.79	0.03	43.00	1.25	0.22	1.03	0.00
16.50	1.02	0.12	0.81	0.03	43.50	1.25	0.22	1.03	0.00
17.00	1.04	0.13	0.83	0.03	44.00	1.25	0.22	1.03	0.00
17.50	1.06	0.14	0.85	0.02	44.50	1.25	0.22	1.03	0.00
18.00	1.07	0.14	0.86	0.02	45.00	1.25	0.22	1.03	0.00
18.50	1.09	0.15	0.88	0.02	45.50	1.25	0.22	1.03	0.00
19.00	1.11	0.16	0.90	0.02	46.00	1.25	0.22	1.03	0.00
19.50	1.13	0.16	0.91	0.02	46.50	1.25	0.22	1.03	0.00
20.00	1.14	0.17	0.93	0.02	47.00	1.25	0.22	1.03	0.00
20.50	1.16	0.18	0.94	0.02	47.50	1.25	0.22	1.03	0.00
21.00	1.17	0.18	0.96	0.02	48.00	1.25	0.22	1.03	0.00
21.50	1.19	0.19	0.97	0.02	48.50	1.25	0.22	1.03	0.00
22.00	1.20	0.20	0.98	0.02	49.00	1.25	0.22	1.03	0.00
22.50	1.21	0.20	1.00	0.02	49.50	1.25	0.22	1.03	0.00
23.00	1.23	0.21	1.01	0.02	50.00	1.25	0.22	1.03	0.00
23.50	1.24	0.21	1.02	0.02					
24.00	1.25	0.22	1.03	0.02					
24.50	1.25	0.22	1.03	0.00					
25.00	1.25	0.22	1.03	0.00					
25.50	1.25	0.22	1.03	0.00					
26.00	1.25	0.22	1.03	0.00					
26.50	1.25	0.22	1.03	0.00					

12129_Detention_7x7

Type IA 24-hr 1/2 2 year Rainfall=1.25"

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Summary for Pond 3P: Detention Chambers

[44] Hint: Outlet device #2 is below defined storage

Inflow Area = 0.820 ac, 76.83% Impervious, Inflow Depth = 0.85" for 1/2 2 year event
 Inflow = 0.17 cfs @ 7.91 hrs, Volume= 0.058 af
 Outflow = 0.04 cfs @ 9.93 hrs, Volume= 0.058 af, Atten= 75%, Lag= 121.4 min
 Primary = 0.04 cfs @ 9.93 hrs, Volume= 0.058 af

Routing by Stor-Ind method, Time Span= 0.00-50.00 hrs, dt= 0.01 hrs
 Peak Elev= 197.21' @ 9.93 hrs Surf.Area= 1,685 sf Storage= 441 cf

Plug-Flow detention time= 89.3 min calculated for 0.058 af (100% of inflow)
 Center-of-Mass det. time= 89.2 min (804.7 - 715.4)

Volume	Invert	Avail.Storage	Storage Description
#1A	196.58'	1,094 cf	32.75'W x 51.46'L x 3.50'H Field A 5,898 cf Overall - 2,251 cf Embedded = 3,647 cf x 30.0% Voids
#2A	197.08'	2,251 cf	ADS_StormTech SC-740 +Cap x 49 Inside #1 Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap 49 Chambers in 7 Rows
		3,345 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	195.96'	12.0" Round Culvert L= 31.0' RCP, rounded edge headwall, Ke= 0.100 Inlet / Outlet Invert= 195.96' / 195.65' S= 0.0100 '/ Cc= 0.900 n= 0.013, Flow Area= 0.79 sf
#2	Device 1	193.96'	1.2" Vert. Orifice/Grate C= 0.600
#3	Device 1	198.00'	3.0" Vert. Orifice/Grate C= 0.600
#4	Device 1	198.86'	5.0' long x 0.5' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32

Primary OutFlow Max=0.04 cfs @ 9.93 hrs HW=197.21' (Free Discharge)

- ↑ **1=Culvert** (Passes 0.04 cfs of 3.52 cfs potential flow)
- ↑ **2=Orifice/Grate** (Orifice Controls 0.04 cfs @ 5.39 fps)
- ↑ **3=Orifice/Grate** (Controls 0.00 cfs)
- ↑ **4=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond 3P: Detention Chambers - Chamber Wizard Field A

Chamber Model = ADS_StormTech SC-740 +Cap (ADS StormTech® SC-740 with cap length)

Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf

Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap

51.0" Wide + 6.0" Spacing = 57.0" C-C Row Spacing

7 Chambers/Row x 7.12' Long +0.81' Cap Length x 2 = 51.46' Row Length

7 Rows x 51.0" Wide + 6.0" Spacing x 6 = 32.75' Base Width

6.0" Base + 30.0" Chamber Height + 6.0" Cover = 3.50' Field Height

49 Chambers x 45.9 cf = 2,251.1 cf Chamber Storage

5,898.2 cf Field - 2,251.1 cf Chambers = 3,647.2 cf Stone x 30.0% Voids = 1,094.1 cf Stone Storage

Chamber Storage + Stone Storage = 3,345.2 cf = 0.077 af

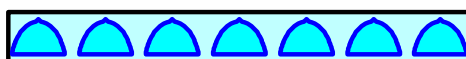
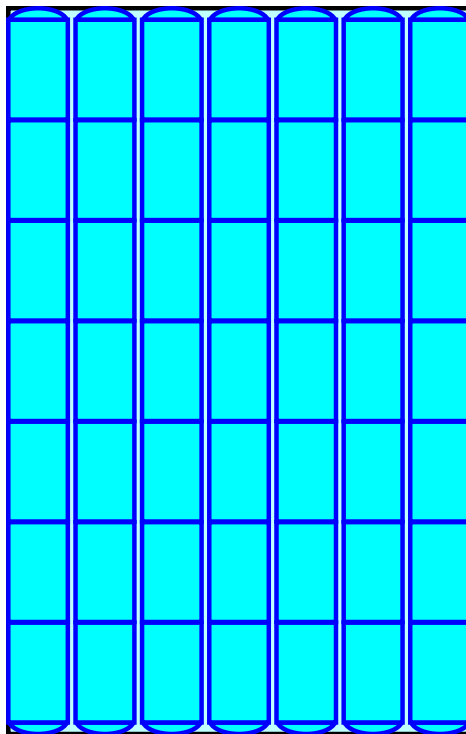
Overall Storage Efficiency = 56.7%

Overall System Size = 51.46' x 32.75' x 3.50'

49 Chambers

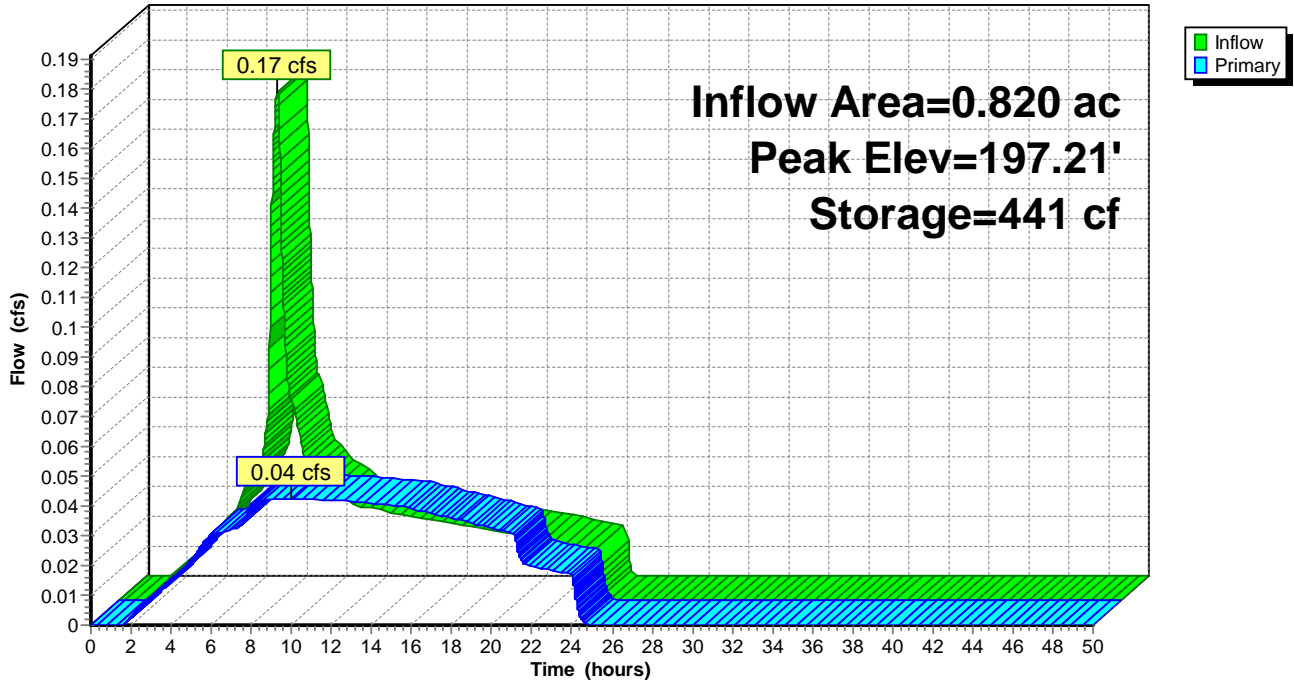
218.5 cy Field

135.1 cy Stone



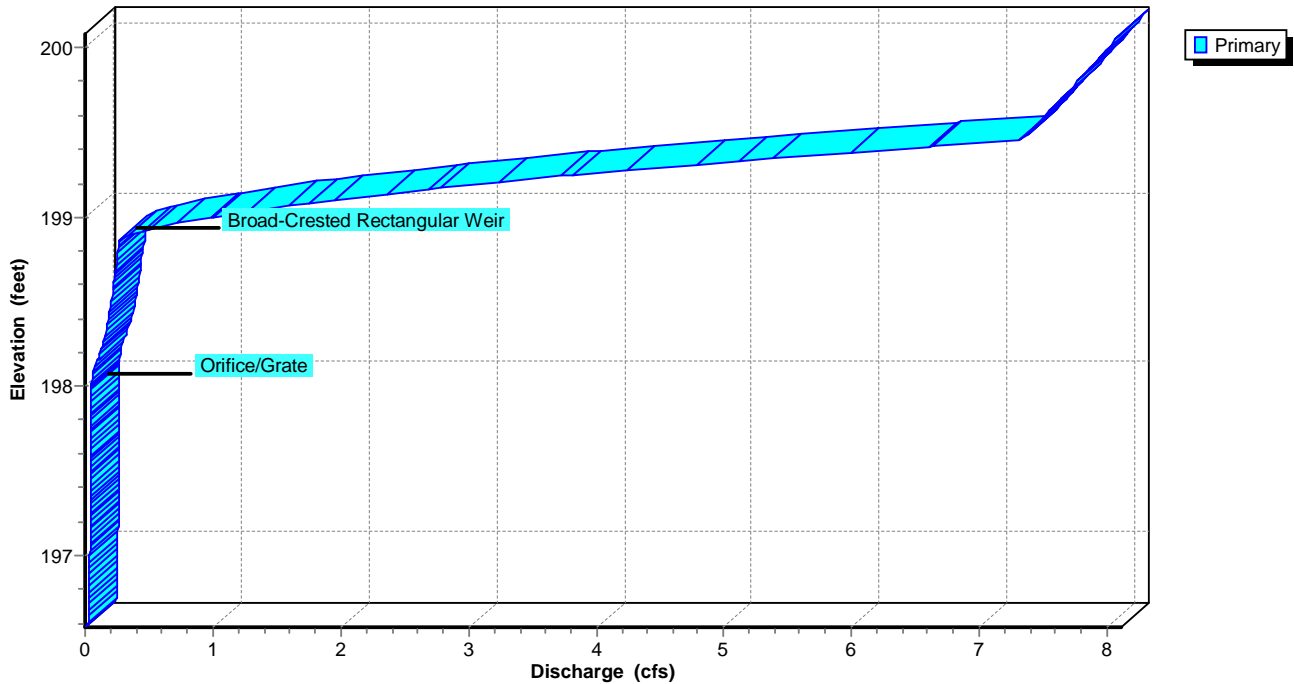
Pond 3P: Detention Chambers

Hydrograph

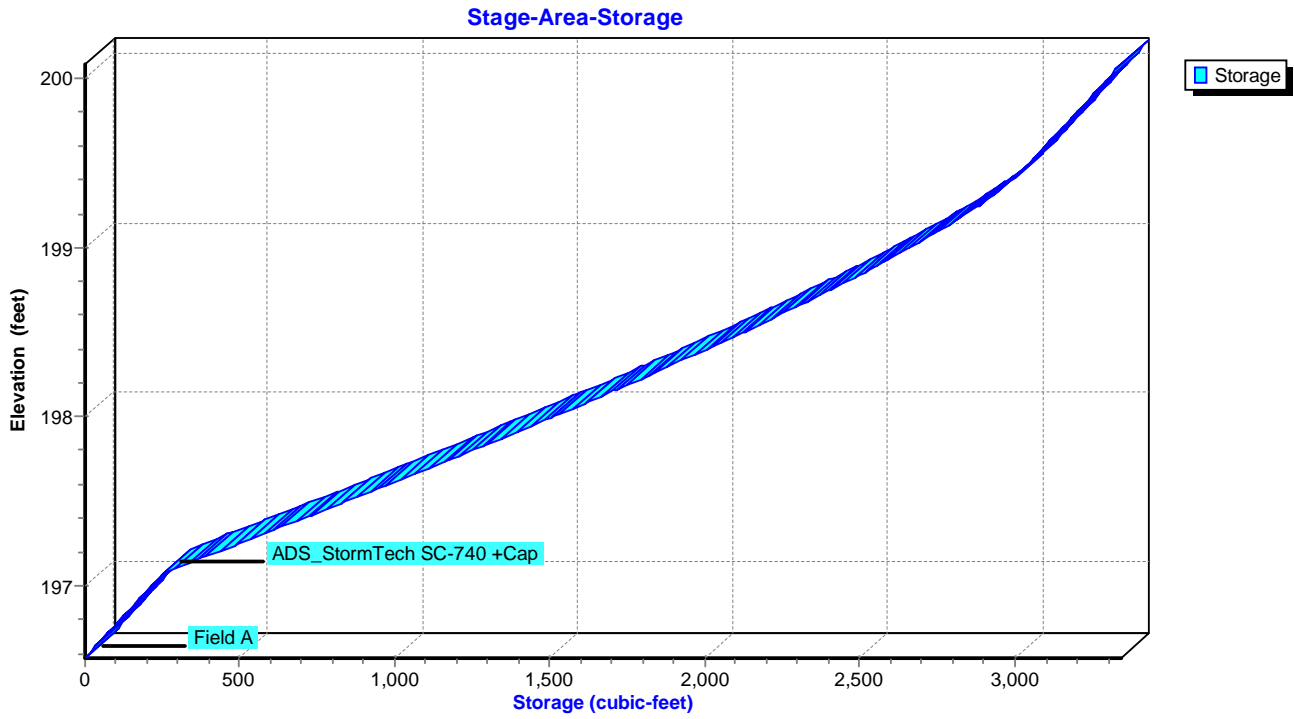


Pond 3P: Detention Chambers

Stage-Discharge



Pond 3P: Detention Chambers



12129_Detention_7x7

Type IA 24-hr 1/2 2 year Rainfall=1.25"

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Hydrograph for Pond 3P: Detention Chambers

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
0.00	0.00	0	196.58	0.00
1.00	0.00	0	196.58	0.00
2.00	0.00	2	196.58	0.00
3.00	0.01	5	196.59	0.01
4.00	0.02	9	196.60	0.02
5.00	0.02	13	196.60	0.02
6.00	0.03	18	196.62	0.03
7.00	0.04	44	196.67	0.03
8.00	0.17	278	197.10	0.04
9.00	0.06	425	197.20	0.04
10.00	0.04	441	197.21	0.04
11.00	0.04	427	197.20	0.04
12.00	0.03	396	197.18	0.04
13.00	0.03	358	197.15	0.04
14.00	0.03	316	197.12	0.04
15.00	0.03	272	197.09	0.04
16.00	0.03	226	197.03	0.04
17.00	0.03	183	196.94	0.04
18.00	0.02	140	196.86	0.04
19.00	0.02	100	196.78	0.03
20.00	0.02	61	196.70	0.03
21.00	0.02	23	196.63	0.03
22.00	0.02	11	196.60	0.02
23.00	0.02	11	196.60	0.02
24.00	0.02	10	196.60	0.02
25.00	0.00	0	196.58	0.00
26.00	0.00	0	196.58	0.00
27.00	0.00	0	196.58	0.00
28.00	0.00	0	196.58	0.00
29.00	0.00	0	196.58	0.00
30.00	0.00	0	196.58	0.00
31.00	0.00	0	196.58	0.00
32.00	0.00	0	196.58	0.00
33.00	0.00	0	196.58	0.00
34.00	0.00	0	196.58	0.00
35.00	0.00	0	196.58	0.00
36.00	0.00	0	196.58	0.00
37.00	0.00	0	196.58	0.00
38.00	0.00	0	196.58	0.00
39.00	0.00	0	196.58	0.00
40.00	0.00	0	196.58	0.00
41.00	0.00	0	196.58	0.00
42.00	0.00	0	196.58	0.00
43.00	0.00	0	196.58	0.00
44.00	0.00	0	196.58	0.00
45.00	0.00	0	196.58	0.00
46.00	0.00	0	196.58	0.00
47.00	0.00	0	196.58	0.00
48.00	0.00	0	196.58	0.00
49.00	0.00	0	196.58	0.00
50.00	0.00	0	196.58	0.00

12129_Detention_7x7

Type IA 24-hr 1/2 2 year Rainfall=1.25"

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Stage-Discharge for Pond 3P: Detention Chambers

Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)
196.58	0.00	197.66	0.05	198.74	0.25	199.82	7.79
196.60	0.03	197.68	0.05	198.76	0.25	199.84	7.82
196.62	0.03	197.70	0.05	198.78	0.25	199.86	7.84
196.64	0.03	197.72	0.05	198.80	0.26	199.88	7.87
196.66	0.03	197.74	0.05	198.82	0.26	199.90	7.89
196.68	0.03	197.76	0.05	198.84	0.26	199.92	7.92
196.70	0.03	197.78	0.05	198.86	0.27	199.94	7.94
196.72	0.03	197.80	0.05	198.88	0.31	199.96	7.96
196.74	0.03	197.82	0.05	198.90	0.38	199.98	7.99
196.76	0.03	197.84	0.05	198.92	0.48	200.00	8.01
196.78	0.03	197.86	0.05	198.94	0.60	200.02	8.04
196.80	0.03	197.88	0.05	198.96	0.72	200.04	8.06
196.82	0.04	197.90	0.05	198.98	0.87	200.06	8.08
196.84	0.04	197.92	0.05	199.00	1.02	200.08	8.11
196.86	0.04	197.94	0.05	199.02	1.19		
196.88	0.04	197.96	0.05	199.04	1.36		
196.90	0.04	197.98	0.05	199.06	1.55		
196.92	0.04	198.00	0.05	199.08	1.75		
196.94	0.04	198.02	0.06	199.10	1.96		
196.96	0.04	198.04	0.06	199.12	2.18		
196.98	0.04	198.06	0.06	199.14	2.42		
197.00	0.04	198.08	0.07	199.16	2.66		
197.02	0.04	198.10	0.08	199.18	2.91		
197.04	0.04	198.12	0.08	199.20	3.17		
197.06	0.04	198.14	0.09	199.22	3.44		
197.08	0.04	198.16	0.10	199.24	3.72		
197.10	0.04	198.18	0.11	199.26	4.01		
197.12	0.04	198.20	0.12	199.28	4.32		
197.14	0.04	198.22	0.13	199.30	4.63		
197.16	0.04	198.24	0.14	199.32	4.96		
197.18	0.04	198.26	0.14	199.34	5.29		
197.20	0.04	198.28	0.15	199.36	5.64		
197.22	0.04	198.30	0.16	199.38	5.99		
197.24	0.04	198.32	0.16	199.40	6.35		
197.26	0.04	198.34	0.17	199.42	6.73		
197.28	0.04	198.36	0.17	199.44	7.11		
197.30	0.04	198.38	0.18	199.46	7.34		
197.32	0.04	198.40	0.18	199.48	7.36		
197.34	0.04	198.42	0.19	199.50	7.39		
197.36	0.04	198.44	0.19	199.52	7.42		
197.38	0.05	198.46	0.20	199.54	7.44		
197.40	0.05	198.48	0.20	199.56	7.47		
197.42	0.05	198.50	0.21	199.58	7.49		
197.44	0.05	198.52	0.21	199.60	7.52		
197.46	0.05	198.54	0.21	199.62	7.54		
197.48	0.05	198.56	0.22	199.64	7.57		
197.50	0.05	198.58	0.22	199.66	7.59		
197.52	0.05	198.60	0.22	199.68	7.62		
197.54	0.05	198.62	0.23	199.70	7.64		
197.56	0.05	198.64	0.23	199.72	7.67		
197.58	0.05	198.66	0.24	199.74	7.69		
197.60	0.05	198.68	0.24	199.76	7.72		
197.62	0.05	198.70	0.24	199.78	7.74		
197.64	0.05	198.72	0.25	199.80	7.77		

12129_Detention_7x7

Type IA 24-hr 1/2 2 year Rainfall=1.25"

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Stage-Area-Storage for Pond 3P: Detention Chambers

Elevation (feet)	Storage (cubic-feet)	Elevation (feet)	Storage (cubic-feet)
196.58	0	199.28	2,911
196.63	25	199.33	2,947
196.68	51	199.38	2,980
196.73	76	199.43	3,010
196.78	101	199.48	3,039
196.83	126	199.53	3,066
196.88	152	199.58	3,092
196.93	177	199.63	3,118
196.98	202	199.68	3,143
197.03	228	199.73	3,168
197.08	253	199.78	3,194
197.13	323	199.83	3,219
197.18	394	199.88	3,244
197.23	465	199.93	3,269
197.28	535	199.98	3,295
197.33	605	200.03	3,320
197.38	675	200.08	3,345
197.43	744		
197.48	813		
197.53	882		
197.58	950		
197.63	1,019		
197.68	1,086		
197.73	1,154		
197.78	1,220		
197.83	1,287		
197.88	1,353		
197.93	1,418		
197.98	1,484		
198.03	1,548		
198.08	1,612		
198.13	1,676		
198.18	1,739		
198.23	1,801		
198.28	1,863		
198.33	1,924		
198.38	1,985		
198.43	2,044		
198.48	2,104		
198.53	2,162		
198.58	2,220		
198.63	2,276		
198.68	2,332		
198.73	2,387		
198.78	2,441		
198.83	2,494		
198.88	2,546		
198.93	2,596		
198.98	2,646		
199.03	2,694		
199.08	2,741		
199.13	2,786		
199.18	2,830		
199.23	2,872		

12129_Detention_7x7

Type IA 24-hr 2 year Rainfall=2.50"

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Time span=0.00-50.00 hrs, dt=0.01 hrs, 5001 points
Runoff by SBUH method, Split Pervious/Imperv.
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment 1S: Predeveloped (On Site) Runoff Area=0.820 ac 0.00% Impervious Runoff Depth=0.79"
Tc=16.4 min CN=78/0 Runoff=0.09 cfs 0.054 af

Subcatchment 2S: Developed (On Site) Runoff Area=0.820 ac 76.83% Impervious Runoff Depth=1.98"
Tc=5.0 min CN=82/98 Runoff=0.40 cfs 0.135 af

Pond 3P: Detention Chambers Peak Elev=198.14' Storage=1,686 cf Inflow=0.40 cfs 0.135 af
Outflow=0.09 cfs 0.135 af

Total Runoff Area = 1.640 ac Runoff Volume = 0.189 af Average Runoff Depth = 1.38"
61.59% Pervious = 1.010 ac 38.41% Impervious = 0.630 ac

12129_Detention_7x7

Type IA 24-hr 2 year Rainfall=2.50"

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Summary for Subcatchment 1S: Predeveloped (On Site)

Runoff = 0.09 cfs @ 8.01 hrs, Volume= 0.054 af, Depth= 0.79"

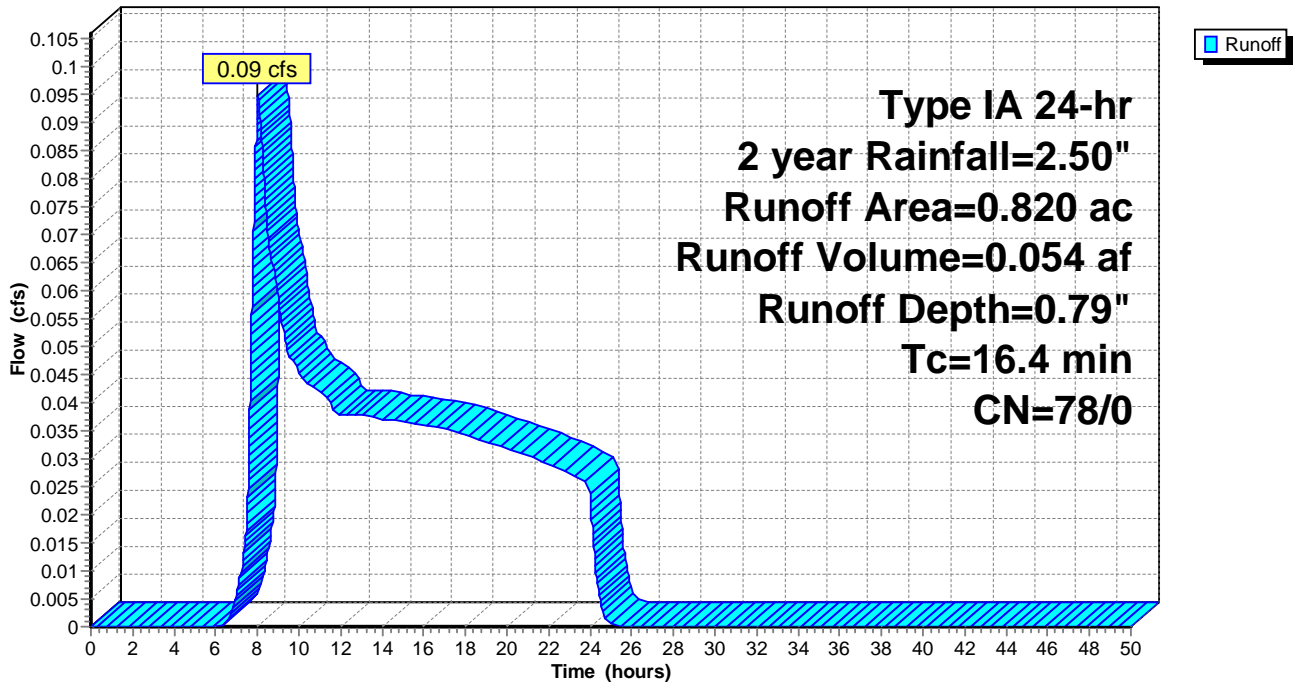
Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-50.00 hrs, dt= 0.01 hrs
 Type IA 24-hr 2 year Rainfall=2.50"

Area (ac)	CN	Description
* 0.820	78	
0.820	78	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
16.4					Direct Entry,

Subcatchment 1S: Predeveloped (On Site)

Hydrograph



12129_Detention_7x7

Type IA 24-hr 2 year Rainfall=2.50"

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Hydrograph for Subcatchment 1S: Predeveloped (On Site)

Time (hours)	Precip. (inches)	Perv.Excess (inches)	Imp.Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Perv.Excess (inches)	Imp.Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00	0.00	27.00	2.50	0.79	0.00	0.00
0.50	0.02	0.00	0.00	0.00	27.50	2.50	0.79	0.00	0.00
1.00	0.05	0.00	0.00	0.00	28.00	2.50	0.79	0.00	0.00
1.50	0.09	0.00	0.00	0.00	28.50	2.50	0.79	0.00	0.00
2.00	0.13	0.00	0.00	0.00	29.00	2.50	0.79	0.00	0.00
2.50	0.16	0.00	0.00	0.00	29.50	2.50	0.79	0.00	0.00
3.00	0.20	0.00	0.00	0.00	30.00	2.50	0.79	0.00	0.00
3.50	0.25	0.00	0.00	0.00	30.50	2.50	0.79	0.00	0.00
4.00	0.29	0.00	0.00	0.00	31.00	2.50	0.79	0.00	0.00
4.50	0.34	0.00	0.00	0.00	31.50	2.50	0.79	0.00	0.00
5.00	0.39	0.00	0.00	0.00	32.00	2.50	0.79	0.00	0.00
5.50	0.45	0.00	0.00	0.00	32.50	2.50	0.79	0.00	0.00
6.00	0.51	0.00	0.00	0.00	33.00	2.50	0.79	0.00	0.00
6.50	0.59	0.00	0.00	0.00	33.50	2.50	0.79	0.00	0.00
7.00	0.67	0.00	0.00	0.01	34.00	2.50	0.79	0.00	0.00
7.50	0.78	0.01	0.00	0.02	34.50	2.50	0.79	0.00	0.00
8.00	1.06	0.07	0.00	0.09	35.00	2.50	0.79	0.00	0.00
8.50	1.20	0.12	0.00	0.07	35.50	2.50	0.79	0.00	0.00
9.00	1.30	0.15	0.00	0.06	36.00	2.50	0.79	0.00	0.00
9.50	1.37	0.18	0.00	0.05	36.50	2.50	0.79	0.00	0.00
10.00	1.44	0.21	0.00	0.05	37.00	2.50	0.79	0.00	0.00
10.50	1.50	0.23	0.00	0.04	37.50	2.50	0.79	0.00	0.00
11.00	1.56	0.26	0.00	0.04	38.00	2.50	0.79	0.00	0.00
11.50	1.61	0.28	0.00	0.04	38.50	2.50	0.79	0.00	0.00
12.00	1.66	0.31	0.00	0.04	39.00	2.50	0.79	0.00	0.00
12.50	1.71	0.33	0.00	0.04	39.50	2.50	0.79	0.00	0.00
13.00	1.75	0.35	0.00	0.04	40.00	2.50	0.79	0.00	0.00
13.50	1.80	0.38	0.00	0.04	40.50	2.50	0.79	0.00	0.00
14.00	1.84	0.40	0.00	0.04	41.00	2.50	0.79	0.00	0.00
14.50	1.88	0.42	0.00	0.04	41.50	2.50	0.79	0.00	0.00
15.00	1.92	0.44	0.00	0.04	42.00	2.50	0.79	0.00	0.00
15.50	1.96	0.46	0.00	0.04	42.50	2.50	0.79	0.00	0.00
16.00	2.00	0.49	0.00	0.04	43.00	2.50	0.79	0.00	0.00
16.50	2.04	0.51	0.00	0.04	43.50	2.50	0.79	0.00	0.00
17.00	2.08	0.53	0.00	0.04	44.00	2.50	0.79	0.00	0.00
17.50	2.11	0.55	0.00	0.03	44.50	2.50	0.79	0.00	0.00
18.00	2.15	0.57	0.00	0.03	45.00	2.50	0.79	0.00	0.00
18.50	2.18	0.59	0.00	0.03	45.50	2.50	0.79	0.00	0.00
19.00	2.22	0.61	0.00	0.03	46.00	2.50	0.79	0.00	0.00
19.50	2.25	0.63	0.00	0.03	46.50	2.50	0.79	0.00	0.00
20.00	2.28	0.65	0.00	0.03	47.00	2.50	0.79	0.00	0.00
20.50	2.31	0.67	0.00	0.03	47.50	2.50	0.79	0.00	0.00
21.00	2.34	0.69	0.00	0.03	48.00	2.50	0.79	0.00	0.00
21.50	2.37	0.71	0.00	0.03	48.50	2.50	0.79	0.00	0.00
22.00	2.40	0.72	0.00	0.03	49.00	2.50	0.79	0.00	0.00
22.50	2.43	0.74	0.00	0.03	49.50	2.50	0.79	0.00	0.00
23.00	2.45	0.76	0.00	0.03	50.00	2.50	0.79	0.00	0.00
23.50	2.48	0.77	0.00	0.03					
24.00	2.50	0.79	0.00	0.03					
24.50	2.50	0.79	0.00	0.00					
25.00	2.50	0.79	0.00	0.00					
25.50	2.50	0.79	0.00	0.00					
26.00	2.50	0.79	0.00	0.00					
26.50	2.50	0.79	0.00	0.00					

12129_Detention_7x7

Type IA 24-hr 2 year Rainfall=2.50"

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Summary for Subcatchment 2S: Developed (On Site)

Runoff = 0.40 cfs @ 7.89 hrs, Volume= 0.135 af, Depth= 1.98"

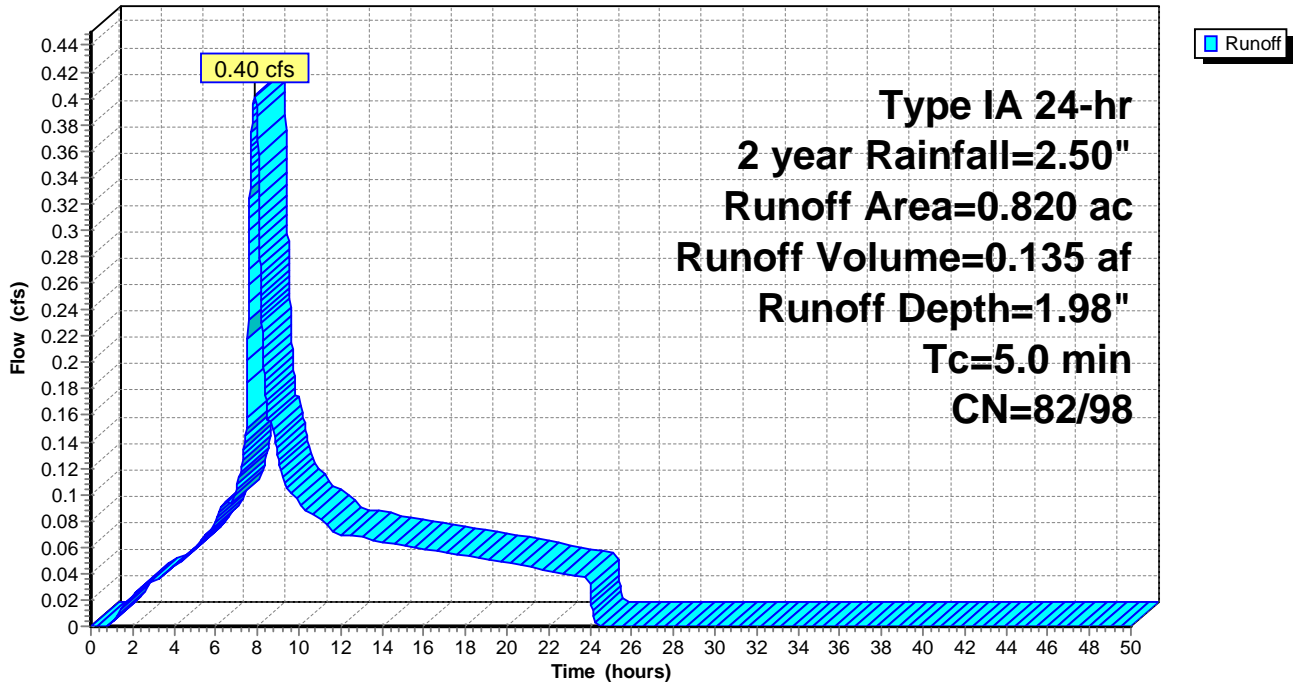
Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-50.00 hrs, dt= 0.01 hrs
 Type IA 24-hr 2 year Rainfall=2.50"

Area (ac)	CN	Description
* 0.190	82	
* 0.630	98	
0.820	94	Weighted Average
0.190	82	23.17% Pervious Area
0.630	98	76.83% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					Direct Entry,

Subcatchment 2S: Developed (On Site)

Hydrograph



12129_Detention_7x7

Type IA 24-hr 2 year Rainfall=2.50"

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Hydrograph for Subcatchment 2S: Developed (On Site)

Time (hours)	Precip. (inches)	Perv.Excess (inches)	Imp.Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Perv.Excess (inches)	Imp.Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00	0.00	27.00	2.50	1.00	2.27	0.00
0.50	0.02	0.00	0.00	0.00	27.50	2.50	1.00	2.27	0.00
1.00	0.05	0.00	0.00	0.00	28.00	2.50	1.00	2.27	0.00
1.50	0.09	0.00	0.01	0.01	28.50	2.50	1.00	2.27	0.00
2.00	0.13	0.00	0.02	0.02	29.00	2.50	1.00	2.27	0.00
2.50	0.16	0.00	0.05	0.03	29.50	2.50	1.00	2.27	0.00
3.00	0.20	0.00	0.07	0.03	30.00	2.50	1.00	2.27	0.00
3.50	0.25	0.00	0.10	0.04	30.50	2.50	1.00	2.27	0.00
4.00	0.29	0.00	0.14	0.05	31.00	2.50	1.00	2.27	0.00
4.50	0.34	0.00	0.18	0.05	31.50	2.50	1.00	2.27	0.00
5.00	0.39	0.00	0.22	0.06	32.00	2.50	1.00	2.27	0.00
5.50	0.45	0.00	0.27	0.07	32.50	2.50	1.00	2.27	0.00
6.00	0.51	0.00	0.33	0.08	33.00	2.50	1.00	2.27	0.00
6.50	0.59	0.01	0.40	0.10	33.50	2.50	1.00	2.27	0.00
7.00	0.67	0.02	0.48	0.10	34.00	2.50	1.00	2.27	0.00
7.50	0.78	0.04	0.57	0.15	34.50	2.50	1.00	2.27	0.00
8.00	1.06	0.14	0.85	0.39	35.00	2.50	1.00	2.27	0.00
8.50	1.20	0.20	0.99	0.16	35.50	2.50	1.00	2.27	0.00
9.00	1.30	0.24	1.08	0.13	36.00	2.50	1.00	2.27	0.00
9.50	1.37	0.28	1.16	0.10	36.50	2.50	1.00	2.27	0.00
10.00	1.44	0.31	1.22	0.09	37.00	2.50	1.00	2.27	0.00
10.50	1.50	0.35	1.28	0.09	37.50	2.50	1.00	2.27	0.00
11.00	1.56	0.38	1.34	0.08	38.00	2.50	1.00	2.27	0.00
11.50	1.61	0.41	1.39	0.07	38.50	2.50	1.00	2.27	0.00
12.00	1.66	0.44	1.44	0.07	39.00	2.50	1.00	2.27	0.00
12.50	1.71	0.46	1.48	0.07	39.50	2.50	1.00	2.27	0.00
13.00	1.75	0.49	1.53	0.07	40.00	2.50	1.00	2.27	0.00
13.50	1.80	0.52	1.57	0.07	40.50	2.50	1.00	2.27	0.00
14.00	1.84	0.55	1.62	0.06	41.00	2.50	1.00	2.27	0.00
14.50	1.88	0.57	1.66	0.06	41.50	2.50	1.00	2.27	0.00
15.00	1.92	0.60	1.70	0.06	42.00	2.50	1.00	2.27	0.00
15.50	1.96	0.62	1.74	0.06	42.50	2.50	1.00	2.27	0.00
16.00	2.00	0.65	1.78	0.06	43.00	2.50	1.00	2.27	0.00
16.50	2.04	0.68	1.81	0.06	43.50	2.50	1.00	2.27	0.00
17.00	2.08	0.70	1.85	0.06	44.00	2.50	1.00	2.27	0.00
17.50	2.11	0.73	1.89	0.05	44.50	2.50	1.00	2.27	0.00
18.00	2.15	0.75	1.92	0.05	45.00	2.50	1.00	2.27	0.00
18.50	2.18	0.77	1.96	0.05	45.50	2.50	1.00	2.27	0.00
19.00	2.22	0.80	1.99	0.05	46.00	2.50	1.00	2.27	0.00
19.50	2.25	0.82	2.02	0.05	46.50	2.50	1.00	2.27	0.00
20.00	2.28	0.84	2.05	0.05	47.00	2.50	1.00	2.27	0.00
20.50	2.31	0.86	2.08	0.05	47.50	2.50	1.00	2.27	0.00
21.00	2.34	0.88	2.11	0.05	48.00	2.50	1.00	2.27	0.00
21.50	2.37	0.90	2.14	0.04	48.50	2.50	1.00	2.27	0.00
22.00	2.40	0.92	2.17	0.04	49.00	2.50	1.00	2.27	0.00
22.50	2.43	0.94	2.20	0.04	49.50	2.50	1.00	2.27	0.00
23.00	2.45	0.96	2.22	0.04	50.00	2.50	1.00	2.27	0.00
23.50	2.48	0.98	2.25	0.04					
24.00	2.50	1.00	2.27	0.04					
24.50	2.50	1.00	2.27	0.00					
25.00	2.50	1.00	2.27	0.00					
25.50	2.50	1.00	2.27	0.00					
26.00	2.50	1.00	2.27	0.00					
26.50	2.50	1.00	2.27	0.00					

12129_Detention_7x7

Type IA 24-hr 2 year Rainfall=2.50"

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Summary for Pond 3P: Detention Chambers

[44] Hint: Outlet device #2 is below defined storage

Inflow Area = 0.820 ac, 76.83% Impervious, Inflow Depth = 1.98" for 2 year event
 Inflow = 0.40 cfs @ 7.89 hrs, Volume= 0.135 af
 Outflow = 0.09 cfs @ 10.12 hrs, Volume= 0.135 af, Atten= 77%, Lag= 133.7 min
 Primary = 0.09 cfs @ 10.12 hrs, Volume= 0.135 af

Routing by Stor-Ind method, Time Span= 0.00-50.00 hrs, dt= 0.01 hrs
 Peak Elev= 198.14' @ 10.12 hrs Surf.Area= 1,685 sf Storage= 1,686 cf

Plug-Flow detention time= 323.2 min calculated for 0.135 af (100% of inflow)
 Center-of-Mass det. time= 323.2 min (1,014.7 - 691.5)

Volume	Invert	Avail.Storage	Storage Description
#1A	196.58'	1,094 cf	32.75'W x 51.46'L x 3.50'H Field A 5,898 cf Overall - 2,251 cf Embedded = 3,647 cf x 30.0% Voids
#2A	197.08'	2,251 cf	ADS_StormTech SC-740 +Cap x 49 Inside #1 Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap 49 Chambers in 7 Rows
		3,345 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	195.96'	12.0" Round Culvert L= 31.0' RCP, rounded edge headwall, Ke= 0.100 Inlet / Outlet Invert= 195.96' / 195.65' S= 0.0100 '/ Cc= 0.900 n= 0.013, Flow Area= 0.79 sf
#2	Device 1	193.96'	1.2" Vert. Orifice/Grate C= 0.600
#3	Device 1	198.00'	3.0" Vert. Orifice/Grate C= 0.600
#4	Device 1	198.86'	5.0' long x 0.5' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32

Primary OutFlow Max=0.09 cfs @ 10.12 hrs HW=198.14' (Free Discharge)

- ↑ **1=Culvert** (Passes 0.09 cfs of 5.34 cfs potential flow)
- ↑ **2=Orifice/Grate** (Orifice Controls 0.06 cfs @ 7.11 fps)
- ↑ **3=Orifice/Grate** (Orifice Controls 0.04 cfs @ 1.26 fps)
- ↑ **4=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

12129_Detention_7x7

Type IA 24-hr 2 year Rainfall=2.50"

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Pond 3P: Detention Chambers - Chamber Wizard Field A

Chamber Model = ADS_StormTech SC-740 +Cap (ADS StormTech® SC-740 with cap length)

Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf

Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap

51.0" Wide + 6.0" Spacing = 57.0" C-C Row Spacing

7 Chambers/Row x 7.12' Long +0.81' Cap Length x 2 = 51.46' Row Length

7 Rows x 51.0" Wide + 6.0" Spacing x 6 = 32.75' Base Width

6.0" Base + 30.0" Chamber Height + 6.0" Cover = 3.50' Field Height

49 Chambers x 45.9 cf = 2,251.1 cf Chamber Storage

5,898.2 cf Field - 2,251.1 cf Chambers = 3,647.2 cf Stone x 30.0% Voids = 1,094.1 cf Stone Storage

Chamber Storage + Stone Storage = 3,345.2 cf = 0.077 af

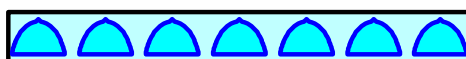
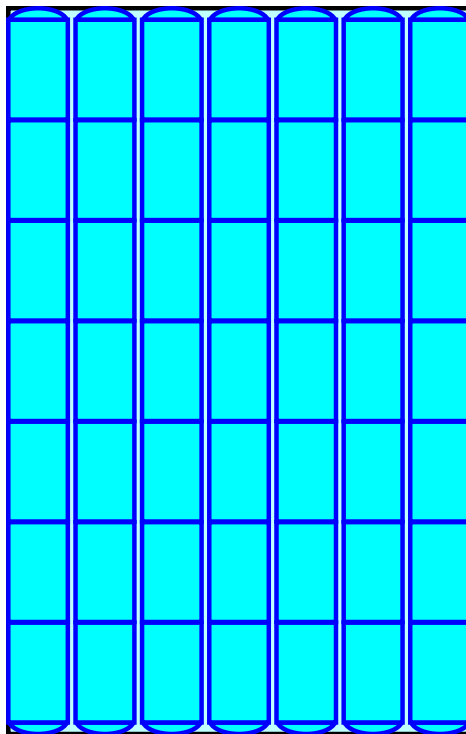
Overall Storage Efficiency = 56.7%

Overall System Size = 51.46' x 32.75' x 3.50'

49 Chambers

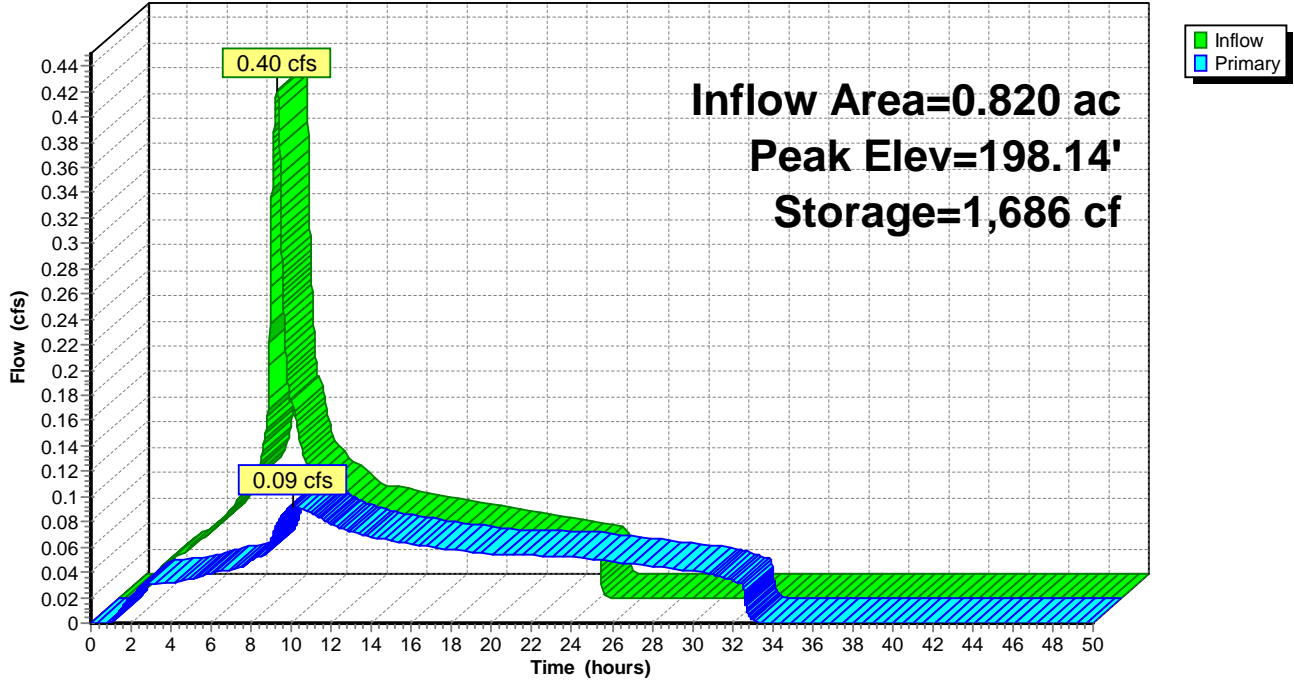
218.5 cy Field

135.1 cy Stone



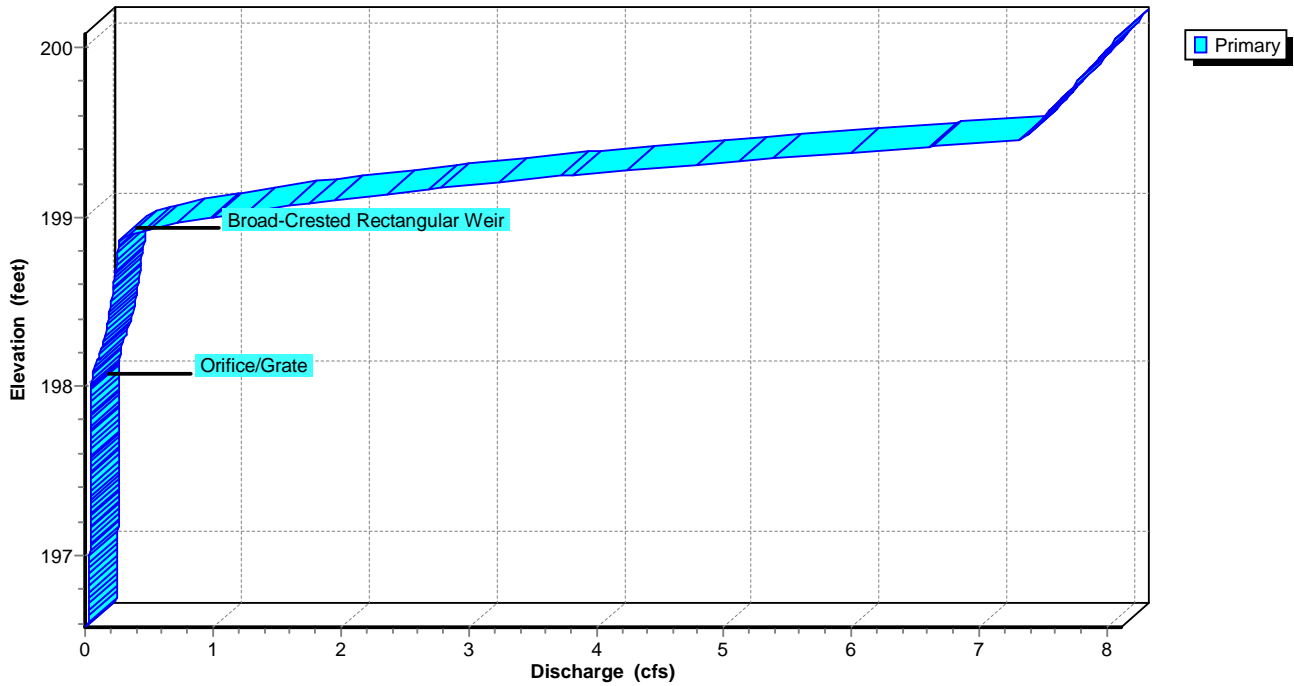
Pond 3P: Detention Chambers

Hydrograph

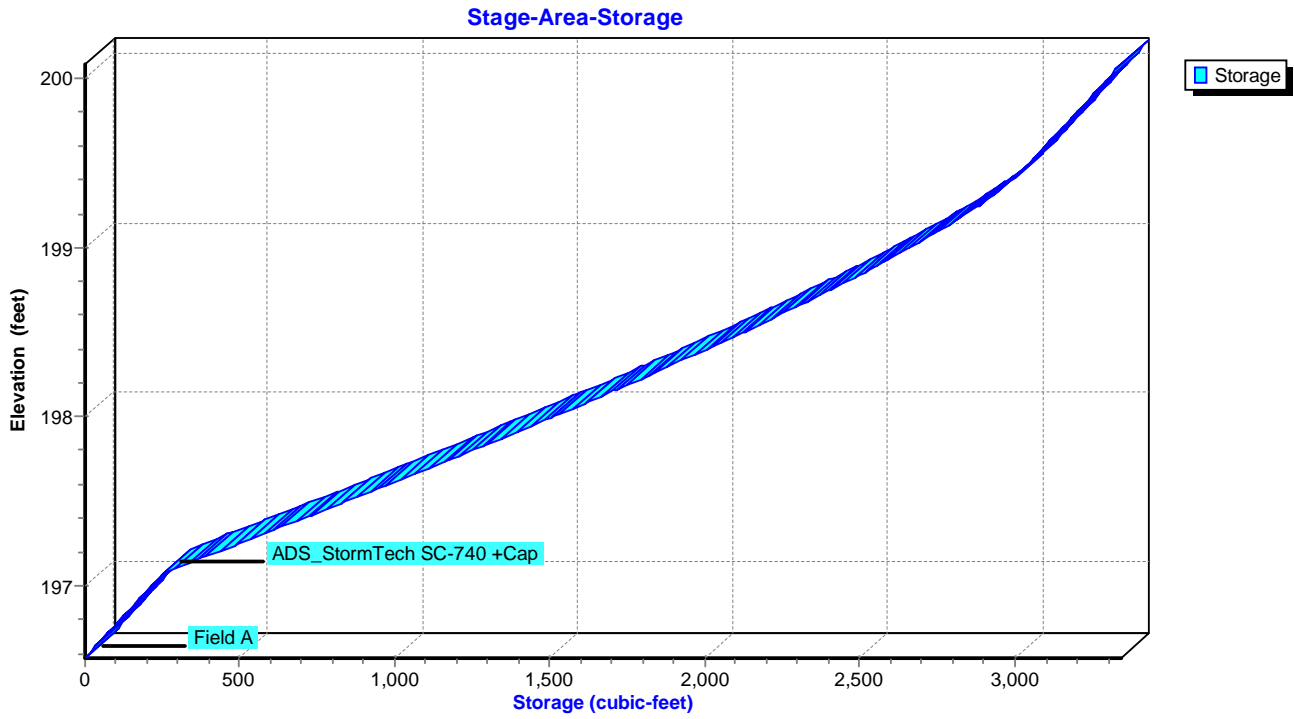


Pond 3P: Detention Chambers

Stage-Discharge



Pond 3P: Detention Chambers



12129_Detention_7x7

Type IA 24-hr 2 year Rainfall=2.50"

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Hydrograph for Pond 3P: Detention Chambers

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
0.00	0.00	0	196.58	0.00
1.00	0.00	0	196.58	0.00
2.00	0.02	12	196.60	0.02
3.00	0.03	21	196.62	0.03
4.00	0.05	50	196.68	0.03
5.00	0.06	117	196.81	0.03
6.00	0.08	233	197.04	0.04
7.00	0.10	420	197.20	0.04
8.00	0.39	1,109	197.70	0.05
9.00	0.13	1,599	198.07	0.07
10.00	0.09	1,685	198.14	0.09
11.00	0.08	1,675	198.13	0.09
12.00	0.07	1,646	198.11	0.08
13.00	0.07	1,625	198.09	0.07
14.00	0.06	1,610	198.08	0.07
15.00	0.06	1,597	198.07	0.06
16.00	0.06	1,584	198.06	0.06
17.00	0.06	1,572	198.05	0.06
18.00	0.05	1,557	198.04	0.06
19.00	0.05	1,539	198.02	0.06
20.00	0.05	1,519	198.01	0.05
21.00	0.05	1,491	197.99	0.05
22.00	0.04	1,455	197.96	0.05
23.00	0.04	1,411	197.92	0.05
24.00	0.04	1,358	197.88	0.05
25.00	0.00	1,184	197.75	0.05
26.00	0.00	1,005	197.62	0.05
27.00	0.00	833	197.49	0.05
28.00	0.00	668	197.37	0.04
29.00	0.00	509	197.26	0.04
30.00	0.00	357	197.15	0.04
31.00	0.00	212	197.00	0.04
32.00	0.00	82	196.74	0.03
33.00	0.00	1	196.58	0.00
34.00	0.00	0	196.58	0.00
35.00	0.00	0	196.58	0.00
36.00	0.00	0	196.58	0.00
37.00	0.00	0	196.58	0.00
38.00	0.00	0	196.58	0.00
39.00	0.00	0	196.58	0.00
40.00	0.00	0	196.58	0.00
41.00	0.00	0	196.58	0.00
42.00	0.00	0	196.58	0.00
43.00	0.00	0	196.58	0.00
44.00	0.00	0	196.58	0.00
45.00	0.00	0	196.58	0.00
46.00	0.00	0	196.58	0.00
47.00	0.00	0	196.58	0.00
48.00	0.00	0	196.58	0.00
49.00	0.00	0	196.58	0.00
50.00	0.00	0	196.58	0.00

12129_Detention_7x7

Type IA 24-hr 2 year Rainfall=2.50"

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Stage-Discharge for Pond 3P: Detention Chambers

Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)
196.58	0.00	197.66	0.05	198.74	0.25	199.82	7.79
196.60	0.03	197.68	0.05	198.76	0.25	199.84	7.82
196.62	0.03	197.70	0.05	198.78	0.25	199.86	7.84
196.64	0.03	197.72	0.05	198.80	0.26	199.88	7.87
196.66	0.03	197.74	0.05	198.82	0.26	199.90	7.89
196.68	0.03	197.76	0.05	198.84	0.26	199.92	7.92
196.70	0.03	197.78	0.05	198.86	0.27	199.94	7.94
196.72	0.03	197.80	0.05	198.88	0.31	199.96	7.96
196.74	0.03	197.82	0.05	198.90	0.38	199.98	7.99
196.76	0.03	197.84	0.05	198.92	0.48	200.00	8.01
196.78	0.03	197.86	0.05	198.94	0.60	200.02	8.04
196.80	0.03	197.88	0.05	198.96	0.72	200.04	8.06
196.82	0.04	197.90	0.05	198.98	0.87	200.06	8.08
196.84	0.04	197.92	0.05	199.00	1.02	200.08	8.11
196.86	0.04	197.94	0.05	199.02	1.19		
196.88	0.04	197.96	0.05	199.04	1.36		
196.90	0.04	197.98	0.05	199.06	1.55		
196.92	0.04	198.00	0.05	199.08	1.75		
196.94	0.04	198.02	0.06	199.10	1.96		
196.96	0.04	198.04	0.06	199.12	2.18		
196.98	0.04	198.06	0.06	199.14	2.42		
197.00	0.04	198.08	0.07	199.16	2.66		
197.02	0.04	198.10	0.08	199.18	2.91		
197.04	0.04	198.12	0.08	199.20	3.17		
197.06	0.04	198.14	0.09	199.22	3.44		
197.08	0.04	198.16	0.10	199.24	3.72		
197.10	0.04	198.18	0.11	199.26	4.01		
197.12	0.04	198.20	0.12	199.28	4.32		
197.14	0.04	198.22	0.13	199.30	4.63		
197.16	0.04	198.24	0.14	199.32	4.96		
197.18	0.04	198.26	0.14	199.34	5.29		
197.20	0.04	198.28	0.15	199.36	5.64		
197.22	0.04	198.30	0.16	199.38	5.99		
197.24	0.04	198.32	0.16	199.40	6.35		
197.26	0.04	198.34	0.17	199.42	6.73		
197.28	0.04	198.36	0.17	199.44	7.11		
197.30	0.04	198.38	0.18	199.46	7.34		
197.32	0.04	198.40	0.18	199.48	7.36		
197.34	0.04	198.42	0.19	199.50	7.39		
197.36	0.04	198.44	0.19	199.52	7.42		
197.38	0.05	198.46	0.20	199.54	7.44		
197.40	0.05	198.48	0.20	199.56	7.47		
197.42	0.05	198.50	0.21	199.58	7.49		
197.44	0.05	198.52	0.21	199.60	7.52		
197.46	0.05	198.54	0.21	199.62	7.54		
197.48	0.05	198.56	0.22	199.64	7.57		
197.50	0.05	198.58	0.22	199.66	7.59		
197.52	0.05	198.60	0.22	199.68	7.62		
197.54	0.05	198.62	0.23	199.70	7.64		
197.56	0.05	198.64	0.23	199.72	7.67		
197.58	0.05	198.66	0.24	199.74	7.69		
197.60	0.05	198.68	0.24	199.76	7.72		
197.62	0.05	198.70	0.24	199.78	7.74		
197.64	0.05	198.72	0.25	199.80	7.77		

12129 Detention 7x7

Type IA 24-hr 2 year Rainfall=2.50"

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Stage-Area-Storage for Pond 3P: Detention Chambers

Elevation (feet)	Storage (cubic-feet)	Elevation (feet)	Storage (cubic-feet)
196.58	0	199.28	2,911
196.63	25	199.33	2,947
196.68	51	199.38	2,980
196.73	76	199.43	3,010
196.78	101	199.48	3,039
196.83	126	199.53	3,066
196.88	152	199.58	3,092
196.93	177	199.63	3,118
196.98	202	199.68	3,143
197.03	228	199.73	3,168
197.08	253	199.78	3,194
197.13	323	199.83	3,219
197.18	394	199.88	3,244
197.23	465	199.93	3,269
197.28	535	199.98	3,295
197.33	605	200.03	3,320
197.38	675	200.08	3,345
197.43	744		
197.48	813		
197.53	882		
197.58	950		
197.63	1,019		
197.68	1,086		
197.73	1,154		
197.78	1,220		
197.83	1,287		
197.88	1,353		
197.93	1,418		
197.98	1,484		
198.03	1,548		
198.08	1,612		
198.13	1,676		
198.18	1,739		
198.23	1,801		
198.28	1,863		
198.33	1,924		
198.38	1,985		
198.43	2,044		
198.48	2,104		
198.53	2,162		
198.58	2,220		
198.63	2,276		
198.68	2,332		
198.73	2,387		
198.78	2,441		
198.83	2,494		
198.88	2,546		
198.93	2,596		
198.98	2,646		
199.03	2,694		
199.08	2,741		
199.13	2,786		
199.18	2,830		
199.23	2,872		

12129_Detention_7x7

Type IA 24-hr 5 year Rainfall=3.00"

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Time span=0.00-50.00 hrs, dt=0.01 hrs, 5001 points
Runoff by SBUH method, Split Pervious/Imperv.
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment 1S: Predeveloped (On Site) Runoff Area=0.820 ac 0.00% Impervious Runoff Depth=1.13"
Tc=16.4 min CN=78/0 Runoff=0.16 cfs 0.077 af

Subcatchment 2S: Developed (On Site) Runoff Area=0.820 ac 76.83% Impervious Runoff Depth=2.45"
Tc=5.0 min CN=82/98 Runoff=0.50 cfs 0.167 af

Pond 3P: Detention Chambers Peak Elev=198.31' Storage=1,895 cf Inflow=0.50 cfs 0.167 af
Outflow=0.16 cfs 0.167 af

Total Runoff Area = 1.640 ac Runoff Volume = 0.244 af Average Runoff Depth = 1.79"
61.59% Pervious = 1.010 ac 38.41% Impervious = 0.630 ac

12129_Detention_7x7

Type IA 24-hr 5 year Rainfall=3.00"

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Summary for Subcatchment 1S: Predeveloped (On Site)

Runoff = 0.16 cfs @ 8.01 hrs, Volume= 0.077 af, Depth= 1.13"

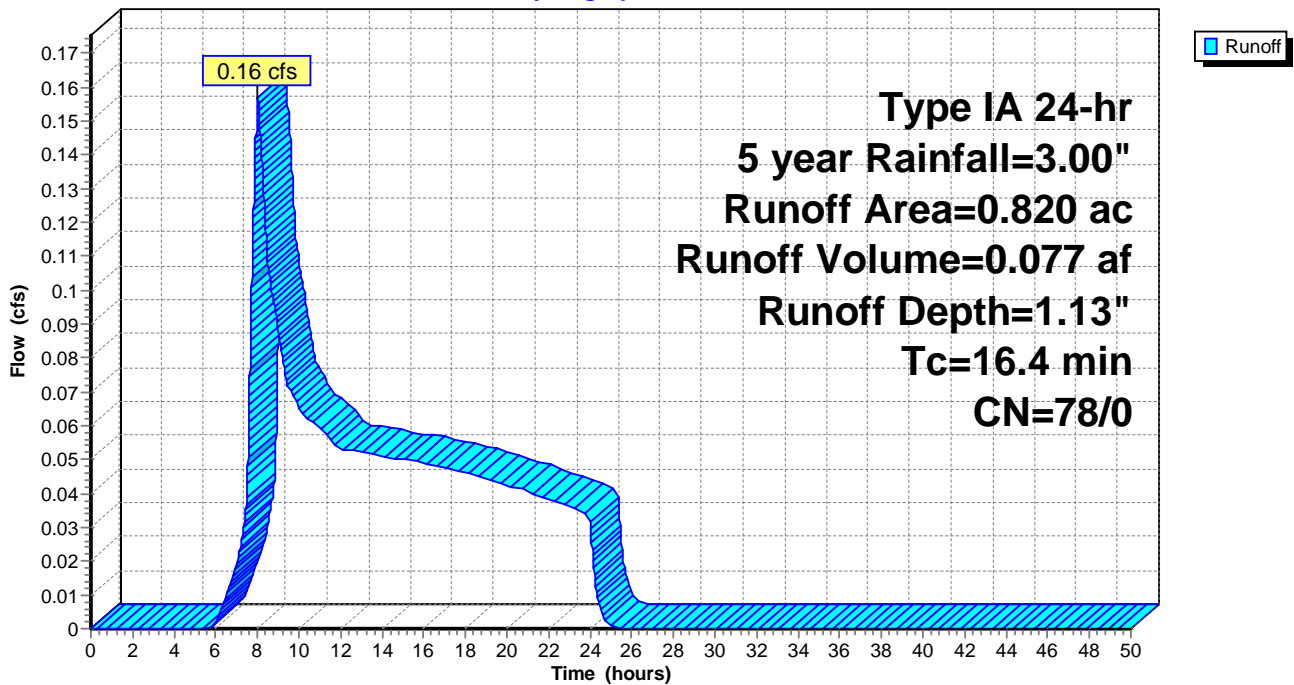
Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-50.00 hrs, dt= 0.01 hrs
 Type IA 24-hr 5 year Rainfall=3.00"

Area (ac)	CN	Description
* 0.820	78	
0.820	78	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
16.4					Direct Entry,

Subcatchment 1S: Predeveloped (On Site)

Hydrograph



12129_Detention_7x7

Type IA 24-hr 5 year Rainfall=3.00"

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Hydrograph for Subcatchment 1S: Predeveloped (On Site)

Time (hours)	Precip. (inches)	Perv.Excess (inches)	Imp.Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Perv.Excess (inches)	Imp.Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00	0.00	27.00	3.00	1.13	0.00	0.00
0.50	0.03	0.00	0.00	0.00	27.50	3.00	1.13	0.00	0.00
1.00	0.06	0.00	0.00	0.00	28.00	3.00	1.13	0.00	0.00
1.50	0.10	0.00	0.00	0.00	28.50	3.00	1.13	0.00	0.00
2.00	0.15	0.00	0.00	0.00	29.00	3.00	1.13	0.00	0.00
2.50	0.20	0.00	0.00	0.00	29.50	3.00	1.13	0.00	0.00
3.00	0.25	0.00	0.00	0.00	30.00	3.00	1.13	0.00	0.00
3.50	0.29	0.00	0.00	0.00	30.50	3.00	1.13	0.00	0.00
4.00	0.35	0.00	0.00	0.00	31.00	3.00	1.13	0.00	0.00
4.50	0.40	0.00	0.00	0.00	31.50	3.00	1.13	0.00	0.00
5.00	0.47	0.00	0.00	0.00	32.00	3.00	1.13	0.00	0.00
5.50	0.54	0.00	0.00	0.00	32.50	3.00	1.13	0.00	0.00
6.00	0.62	0.00	0.00	0.00	33.00	3.00	1.13	0.00	0.00
6.50	0.71	0.01	0.00	0.01	33.50	3.00	1.13	0.00	0.00
7.00	0.80	0.02	0.00	0.02	34.00	3.00	1.13	0.00	0.00
7.50	0.93	0.04	0.00	0.04	34.50	3.00	1.13	0.00	0.00
8.00	1.28	0.14	0.00	0.16	35.00	3.00	1.13	0.00	0.00
8.50	1.44	0.21	0.00	0.11	35.50	3.00	1.13	0.00	0.00
9.00	1.56	0.26	0.00	0.09	36.00	3.00	1.13	0.00	0.00
9.50	1.65	0.30	0.00	0.07	36.50	3.00	1.13	0.00	0.00
10.00	1.73	0.34	0.00	0.07	37.00	3.00	1.13	0.00	0.00
10.50	1.80	0.38	0.00	0.06	37.50	3.00	1.13	0.00	0.00
11.00	1.87	0.41	0.00	0.06	38.00	3.00	1.13	0.00	0.00
11.50	1.94	0.45	0.00	0.06	38.50	3.00	1.13	0.00	0.00
12.00	1.99	0.48	0.00	0.05	39.00	3.00	1.13	0.00	0.00
12.50	2.05	0.51	0.00	0.05	39.50	3.00	1.13	0.00	0.00
13.00	2.10	0.54	0.00	0.05	40.00	3.00	1.13	0.00	0.00
13.50	2.16	0.57	0.00	0.05	40.50	3.00	1.13	0.00	0.00
14.00	2.21	0.61	0.00	0.05	41.00	3.00	1.13	0.00	0.00
14.50	2.26	0.64	0.00	0.05	41.50	3.00	1.13	0.00	0.00
15.00	2.31	0.67	0.00	0.05	42.00	3.00	1.13	0.00	0.00
15.50	2.36	0.70	0.00	0.05	42.50	3.00	1.13	0.00	0.00
16.00	2.40	0.73	0.00	0.05	43.00	3.00	1.13	0.00	0.00
16.50	2.45	0.75	0.00	0.05	43.50	3.00	1.13	0.00	0.00
17.00	2.49	0.78	0.00	0.05	44.00	3.00	1.13	0.00	0.00
17.50	2.54	0.81	0.00	0.05	44.50	3.00	1.13	0.00	0.00
18.00	2.58	0.84	0.00	0.05	45.00	3.00	1.13	0.00	0.00
18.50	2.62	0.87	0.00	0.05	45.50	3.00	1.13	0.00	0.00
19.00	2.66	0.89	0.00	0.04	46.00	3.00	1.13	0.00	0.00
19.50	2.70	0.92	0.00	0.04	46.50	3.00	1.13	0.00	0.00
20.00	2.74	0.95	0.00	0.04	47.00	3.00	1.13	0.00	0.00
20.50	2.77	0.97	0.00	0.04	47.50	3.00	1.13	0.00	0.00
21.00	2.81	1.00	0.00	0.04	48.00	3.00	1.13	0.00	0.00
21.50	2.84	1.02	0.00	0.04	48.50	3.00	1.13	0.00	0.00
22.00	2.88	1.04	0.00	0.04	49.00	3.00	1.13	0.00	0.00
22.50	2.91	1.07	0.00	0.04	49.50	3.00	1.13	0.00	0.00
23.00	2.94	1.09	0.00	0.04	50.00	3.00	1.13	0.00	0.00
23.50	2.97	1.11	0.00	0.04					
24.00	3.00	1.13	0.00	0.03					
24.50	3.00	1.13	0.00	0.01					
25.00	3.00	1.13	0.00	0.00					
25.50	3.00	1.13	0.00	0.00					
26.00	3.00	1.13	0.00	0.00					
26.50	3.00	1.13	0.00	0.00					

12129 Detention 7x7

Type IA 24-hr 5 year Rainfall=3.00"

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Summary for Subcatchment 2S: Developed (On Site)

Runoff = 0.50 cfs @ 7.89 hrs, Volume= 0.167 af, Depth= 2.45"

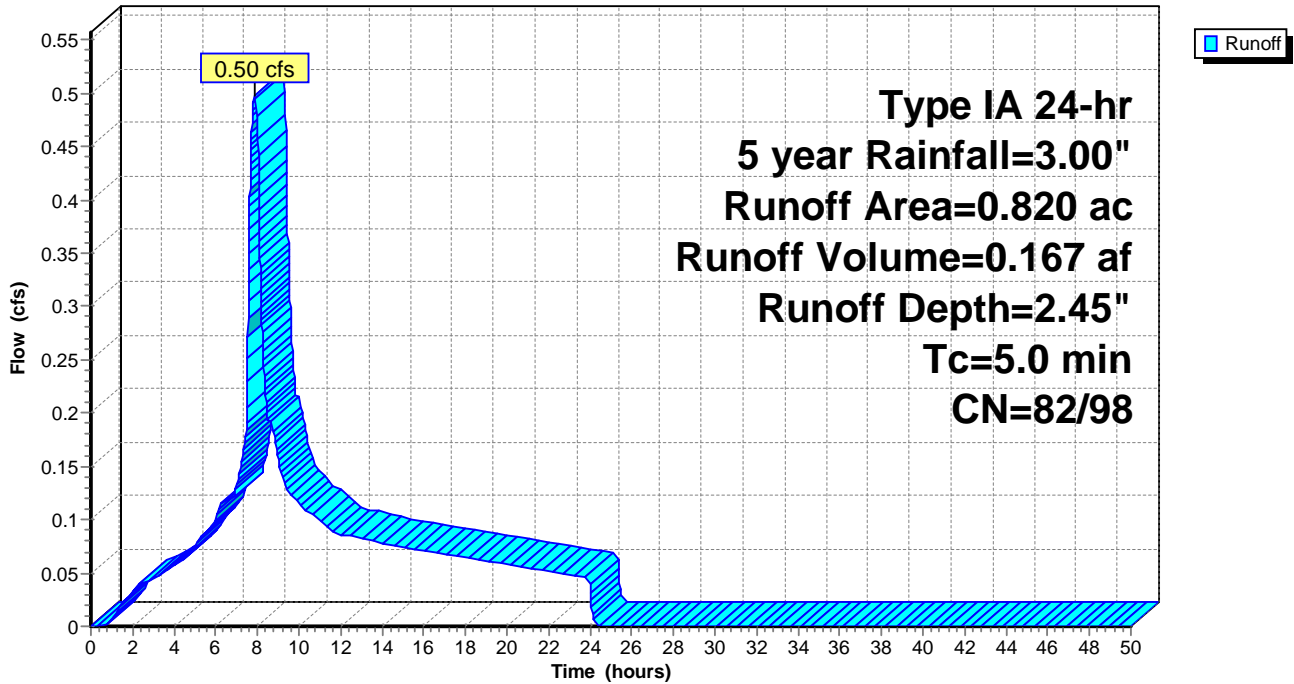
Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-50.00 hrs, dt= 0.01 hrs
Type IA 24-hr 5 year Rainfall=3.00"

Area (ac)	CN	Description
* 0.190	82	
* 0.630	98	
0.820	94	Weighted Average
0.190	82	23.17% Pervious Area
0.630	98	76.83% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					Direct Entry,

Subcatchment 2S: Developed (On Site)

Hydrograph



12129_Detention_7x7

Type IA 24-hr 5 year Rainfall=3.00"

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Hydrograph for Subcatchment 2S: Developed (On Site)

Time (hours)	Precip. (inches)	Perv.Excess (inches)	Imp.Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Perv.Excess (inches)	Imp.Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00	0.00	27.00	3.00	1.38	2.77	0.00
0.50	0.03	0.00	0.00	0.00	27.50	3.00	1.38	2.77	0.00
1.00	0.06	0.00	0.00	0.01	28.00	3.00	1.38	2.77	0.00
1.50	0.10	0.00	0.02	0.02	28.50	3.00	1.38	2.77	0.00
2.00	0.15	0.00	0.04	0.03	29.00	3.00	1.38	2.77	0.00
2.50	0.20	0.00	0.07	0.04	29.50	3.00	1.38	2.77	0.00
3.00	0.25	0.00	0.10	0.05	30.00	3.00	1.38	2.77	0.00
3.50	0.29	0.00	0.14	0.05	30.50	3.00	1.38	2.77	0.00
4.00	0.35	0.00	0.18	0.06	31.00	3.00	1.38	2.77	0.00
4.50	0.40	0.00	0.23	0.06	31.50	3.00	1.38	2.77	0.00
5.00	0.47	0.00	0.29	0.07	32.00	3.00	1.38	2.77	0.00
5.50	0.54	0.00	0.35	0.09	32.50	3.00	1.38	2.77	0.00
6.00	0.62	0.01	0.43	0.10	33.00	3.00	1.38	2.77	0.00
6.50	0.71	0.03	0.51	0.12	33.50	3.00	1.38	2.77	0.00
7.00	0.80	0.05	0.60	0.13	34.00	3.00	1.38	2.77	0.00
7.50	0.93	0.09	0.72	0.19	34.50	3.00	1.38	2.77	0.00
8.00	1.28	0.23	1.06	0.48	35.00	3.00	1.38	2.77	0.00
8.50	1.44	0.31	1.22	0.19	35.50	3.00	1.38	2.77	0.00
9.00	1.56	0.38	1.34	0.16	36.00	3.00	1.38	2.77	0.00
9.50	1.65	0.43	1.43	0.12	36.50	3.00	1.38	2.77	0.00
10.00	1.73	0.48	1.51	0.12	37.00	3.00	1.38	2.77	0.00
10.50	1.80	0.52	1.58	0.10	37.50	3.00	1.38	2.77	0.00
11.00	1.87	0.57	1.65	0.10	38.00	3.00	1.38	2.77	0.00
11.50	1.94	0.61	1.71	0.09	38.50	3.00	1.38	2.77	0.00
12.00	1.99	0.64	1.77	0.08	39.00	3.00	1.38	2.77	0.00
12.50	2.05	0.68	1.82	0.09	39.50	3.00	1.38	2.77	0.00
13.00	2.10	0.72	1.88	0.08	40.00	3.00	1.38	2.77	0.00
13.50	2.16	0.75	1.93	0.08	40.50	3.00	1.38	2.77	0.00
14.00	2.21	0.79	1.98	0.08	41.00	3.00	1.38	2.77	0.00
14.50	2.26	0.82	2.03	0.08	41.50	3.00	1.38	2.77	0.00
15.00	2.31	0.86	2.08	0.07	42.00	3.00	1.38	2.77	0.00
15.50	2.36	0.89	2.13	0.07	42.50	3.00	1.38	2.77	0.00
16.00	2.40	0.93	2.17	0.07	43.00	3.00	1.38	2.77	0.00
16.50	2.45	0.96	2.22	0.07	43.50	3.00	1.38	2.77	0.00
17.00	2.49	0.99	2.26	0.07	44.00	3.00	1.38	2.77	0.00
17.50	2.54	1.03	2.31	0.07	44.50	3.00	1.38	2.77	0.00
18.00	2.58	1.06	2.35	0.07	45.00	3.00	1.38	2.77	0.00
18.50	2.62	1.09	2.39	0.06	45.50	3.00	1.38	2.77	0.00
19.00	2.66	1.12	2.43	0.06	46.00	3.00	1.38	2.77	0.00
19.50	2.70	1.15	2.47	0.06	46.50	3.00	1.38	2.77	0.00
20.00	2.74	1.18	2.51	0.06	47.00	3.00	1.38	2.77	0.00
20.50	2.77	1.20	2.54	0.06	47.50	3.00	1.38	2.77	0.00
21.00	2.81	1.23	2.58	0.05	48.00	3.00	1.38	2.77	0.00
21.50	2.84	1.26	2.61	0.05	48.50	3.00	1.38	2.77	0.00
22.00	2.88	1.28	2.65	0.05	49.00	3.00	1.38	2.77	0.00
22.50	2.91	1.31	2.68	0.05	49.50	3.00	1.38	2.77	0.00
23.00	2.94	1.33	2.71	0.05	50.00	3.00	1.38	2.77	0.00
23.50	2.97	1.36	2.74	0.05					
24.00	3.00	1.38	2.77	0.04					
24.50	3.00	1.38	2.77	0.00					
25.00	3.00	1.38	2.77	0.00					
25.50	3.00	1.38	2.77	0.00					
26.00	3.00	1.38	2.77	0.00					
26.50	3.00	1.38	2.77	0.00					

12129_Detention_7x7

Type IA 24-hr 5 year Rainfall=3.00"

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Summary for Pond 3P: Detention Chambers

[44] Hint: Outlet device #2 is below defined storage

Inflow Area = 0.820 ac, 76.83% Impervious, Inflow Depth = 2.45" for 5 year event
 Inflow = 0.50 cfs @ 7.89 hrs, Volume= 0.167 af
 Outflow = 0.16 cfs @ 9.00 hrs, Volume= 0.167 af, Atten= 68%, Lag= 66.5 min
 Primary = 0.16 cfs @ 9.00 hrs, Volume= 0.167 af

Routing by Stor-Ind method, Time Span= 0.00-50.00 hrs, dt= 0.01 hrs
 Peak Elev= 198.31' @ 9.00 hrs Surf.Area= 1,685 sf Storage= 1,895 cf

Plug-Flow detention time= 289.2 min calculated for 0.167 af (100% of inflow)
 Center-of-Mass det. time= 289.2 min (975.4 - 686.2)

Volume	Invert	Avail.Storage	Storage Description
#1A	196.58'	1,094 cf	32.75'W x 51.46'L x 3.50'H Field A 5,898 cf Overall - 2,251 cf Embedded = 3,647 cf x 30.0% Voids
#2A	197.08'	2,251 cf	ADS_StormTech SC-740 +Cap x 49 Inside #1 Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap 49 Chambers in 7 Rows
		3,345 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	195.96'	12.0" Round Culvert L= 31.0' RCP, rounded edge headwall, Ke= 0.100 Inlet / Outlet Invert= 195.96' / 195.65' S= 0.0100 '/ Cc= 0.900 n= 0.013, Flow Area= 0.79 sf
#2	Device 1	193.96'	1.2" Vert. Orifice/Grate C= 0.600
#3	Device 1	198.00'	3.0" Vert. Orifice/Grate C= 0.600
#4	Device 1	198.86'	5.0' long x 0.5' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32

Primary OutFlow Max=0.16 cfs @ 9.00 hrs HW=198.31' (Free Discharge)

- ↑ **1=Culvert** (Passes 0.16 cfs of 5.63 cfs potential flow)
- ↑ **2=Orifice/Grate** (Orifice Controls 0.06 cfs @ 7.38 fps)
- ↑ **3=Orifice/Grate** (Orifice Controls 0.10 cfs @ 2.05 fps)
- ↑ **4=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

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Type IA 24-hr 5 year Rainfall=3.00"

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Pond 3P: Detention Chambers - Chamber Wizard Field A

Chamber Model = ADS_StormTech SC-740 +Cap (ADS StormTech® SC-740 with cap length)

Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf

Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap

51.0" Wide + 6.0" Spacing = 57.0" C-C Row Spacing

7 Chambers/Row x 7.12' Long +0.81' Cap Length x 2 = 51.46' Row Length

7 Rows x 51.0" Wide + 6.0" Spacing x 6 = 32.75' Base Width

6.0" Base + 30.0" Chamber Height + 6.0" Cover = 3.50' Field Height

49 Chambers x 45.9 cf = 2,251.1 cf Chamber Storage

5,898.2 cf Field - 2,251.1 cf Chambers = 3,647.2 cf Stone x 30.0% Voids = 1,094.1 cf Stone Storage

Chamber Storage + Stone Storage = 3,345.2 cf = 0.077 af

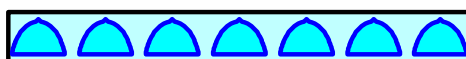
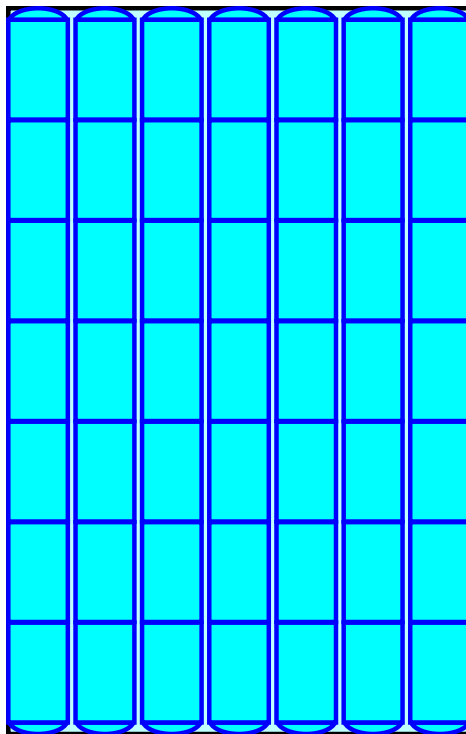
Overall Storage Efficiency = 56.7%

Overall System Size = 51.46' x 32.75' x 3.50'

49 Chambers

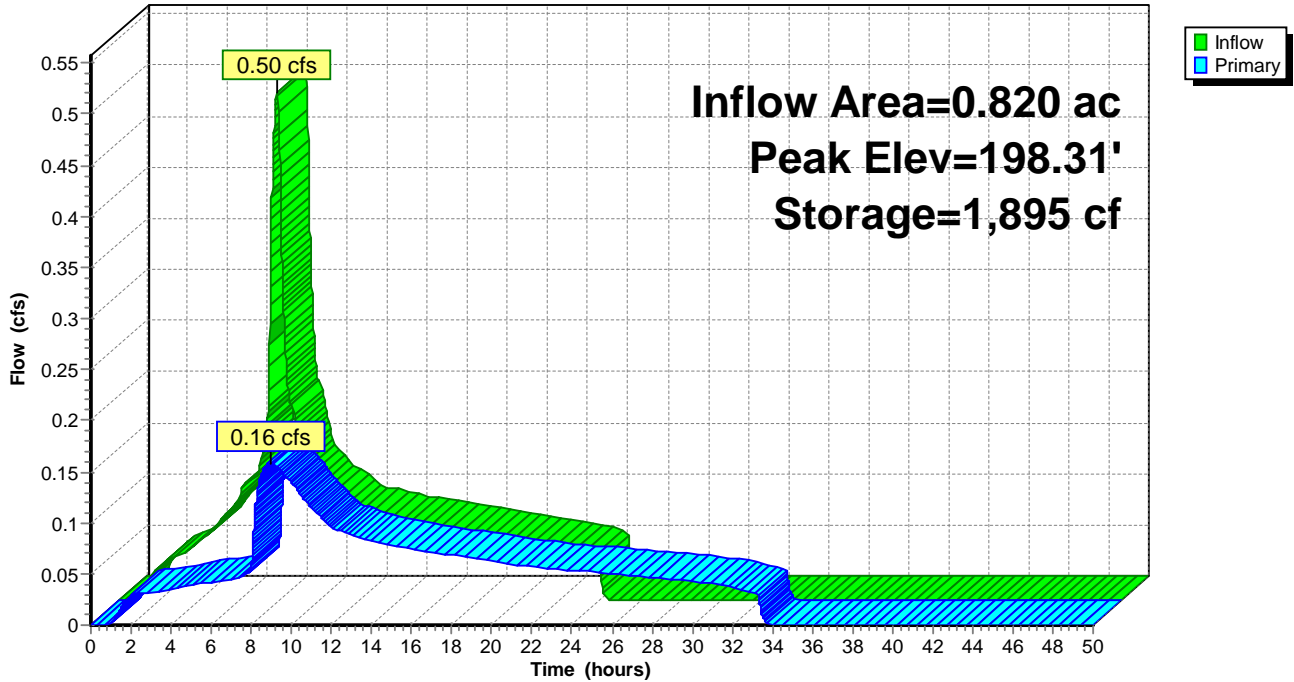
218.5 cy Field

135.1 cy Stone



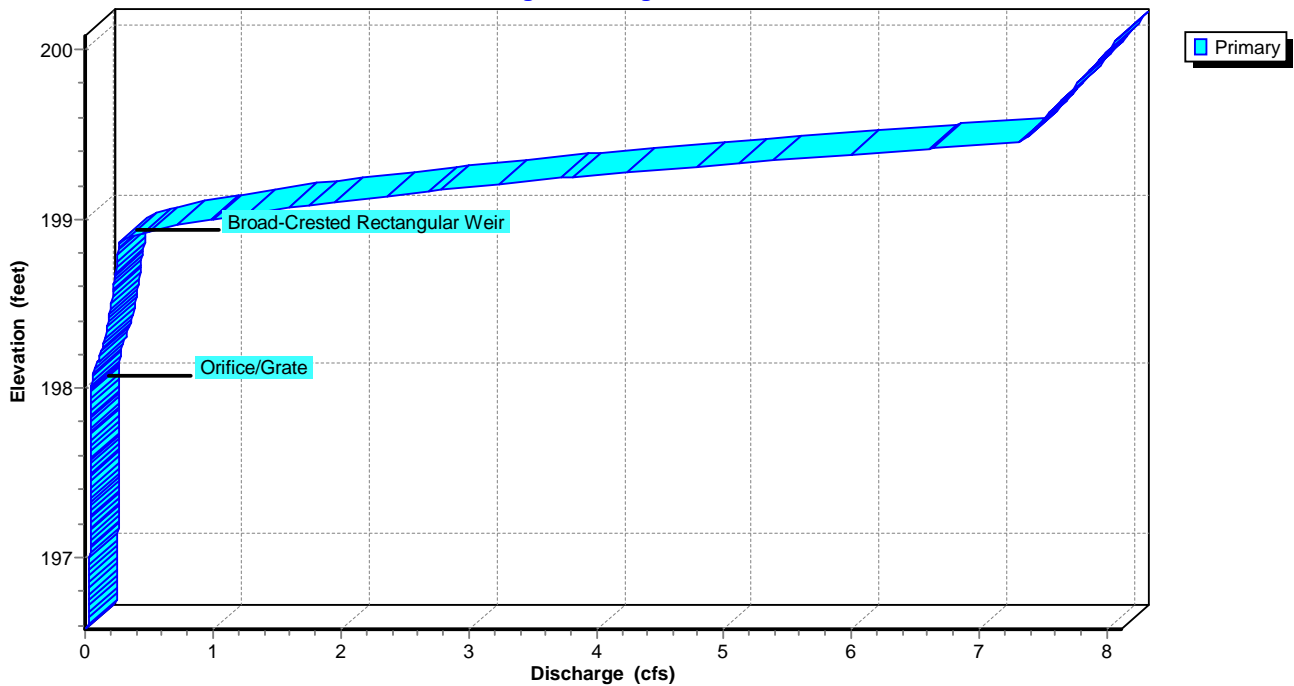
Pond 3P: Detention Chambers

Hydrograph

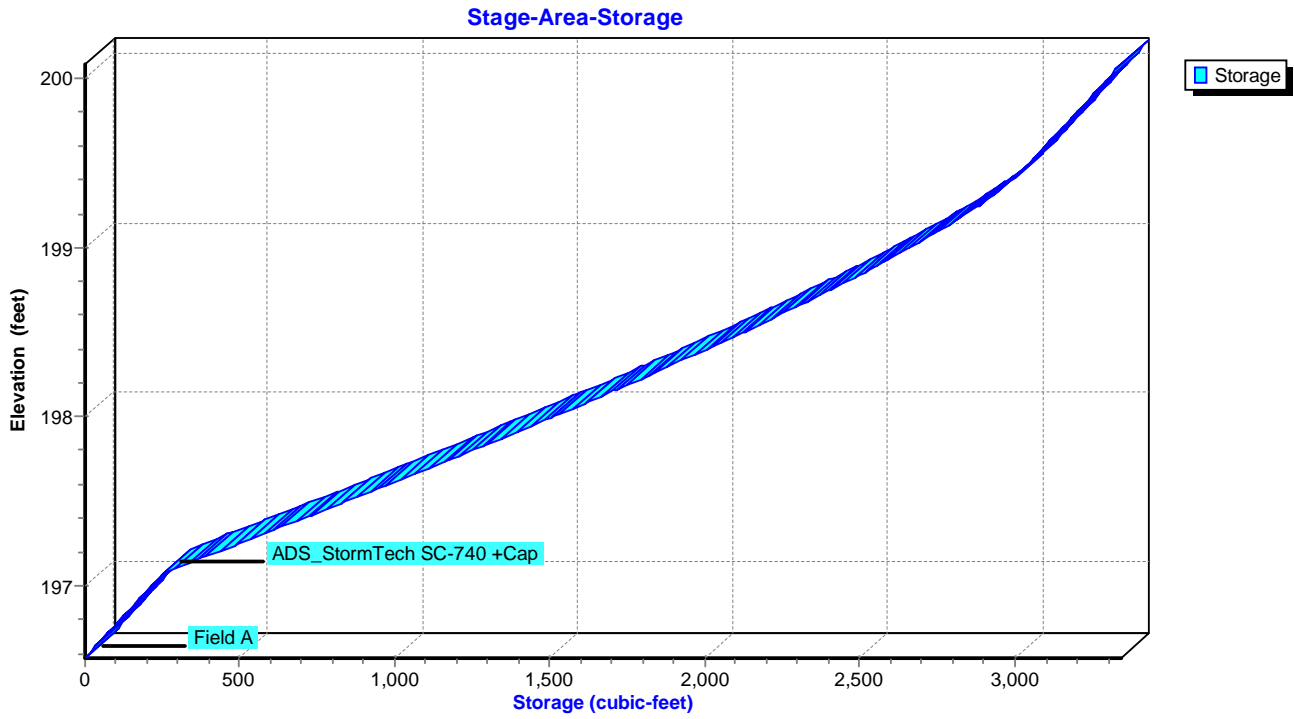


Pond 3P: Detention Chambers

Stage-Discharge



Pond 3P: Detention Chambers



12129_Detention_7x7

Type IA 24-hr 5 year Rainfall=3.00"

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Hydrograph for Pond 3P: Detention Chambers

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
0.00	0.00	0	196.58	0.00
1.00	0.01	1	196.58	0.00
2.00	0.03	17	196.61	0.03
3.00	0.05	49	196.68	0.03
4.00	0.06	112	196.80	0.03
5.00	0.07	214	197.00	0.04
6.00	0.10	384	197.17	0.04
7.00	0.13	648	197.36	0.04
8.00	0.48	1,531	198.02	0.05
9.00	0.16	1,895	198.31	0.16
10.00	0.12	1,822	198.25	0.14
11.00	0.10	1,750	198.19	0.12
12.00	0.08	1,700	198.15	0.10
13.00	0.08	1,675	198.13	0.09
14.00	0.08	1,659	198.12	0.08
15.00	0.07	1,647	198.11	0.08
16.00	0.07	1,636	198.10	0.07
17.00	0.07	1,625	198.09	0.07
18.00	0.07	1,613	198.08	0.07
19.00	0.06	1,601	198.07	0.07
20.00	0.06	1,586	198.06	0.06
21.00	0.05	1,571	198.05	0.06
22.00	0.05	1,551	198.03	0.06
23.00	0.05	1,529	198.01	0.05
24.00	0.04	1,500	197.99	0.05
25.00	0.00	1,323	197.86	0.05
26.00	0.00	1,139	197.72	0.05
27.00	0.00	962	197.59	0.05
28.00	0.00	791	197.46	0.05
29.00	0.00	628	197.35	0.04
30.00	0.00	471	197.23	0.04
31.00	0.00	320	197.13	0.04
32.00	0.00	178	196.93	0.04
33.00	0.00	53	196.69	0.03
34.00	0.00	0	196.58	0.00
35.00	0.00	0	196.58	0.00
36.00	0.00	0	196.58	0.00
37.00	0.00	0	196.58	0.00
38.00	0.00	0	196.58	0.00
39.00	0.00	0	196.58	0.00
40.00	0.00	0	196.58	0.00
41.00	0.00	0	196.58	0.00
42.00	0.00	0	196.58	0.00
43.00	0.00	0	196.58	0.00
44.00	0.00	0	196.58	0.00
45.00	0.00	0	196.58	0.00
46.00	0.00	0	196.58	0.00
47.00	0.00	0	196.58	0.00
48.00	0.00	0	196.58	0.00
49.00	0.00	0	196.58	0.00
50.00	0.00	0	196.58	0.00

12129 Detention 7x7

Type IA 24-hr 5 year Rainfall=3.00"

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Stage-Discharge for Pond 3P: Detention Chambers

Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)
196.58	0.00	197.66	0.05	198.74	0.25	199.82	7.79
196.60	0.03	197.68	0.05	198.76	0.25	199.84	7.82
196.62	0.03	197.70	0.05	198.78	0.25	199.86	7.84
196.64	0.03	197.72	0.05	198.80	0.26	199.88	7.87
196.66	0.03	197.74	0.05	198.82	0.26	199.90	7.89
196.68	0.03	197.76	0.05	198.84	0.26	199.92	7.92
196.70	0.03	197.78	0.05	198.86	0.27	199.94	7.94
196.72	0.03	197.80	0.05	198.88	0.31	199.96	7.96
196.74	0.03	197.82	0.05	198.90	0.38	199.98	7.99
196.76	0.03	197.84	0.05	198.92	0.48	200.00	8.01
196.78	0.03	197.86	0.05	198.94	0.60	200.02	8.04
196.80	0.03	197.88	0.05	198.96	0.72	200.04	8.06
196.82	0.04	197.90	0.05	198.98	0.87	200.06	8.08
196.84	0.04	197.92	0.05	199.00	1.02	200.08	8.11
196.86	0.04	197.94	0.05	199.02	1.19		
196.88	0.04	197.96	0.05	199.04	1.36		
196.90	0.04	197.98	0.05	199.06	1.55		
196.92	0.04	198.00	0.05	199.08	1.75		
196.94	0.04	198.02	0.06	199.10	1.96		
196.96	0.04	198.04	0.06	199.12	2.18		
196.98	0.04	198.06	0.06	199.14	2.42		
197.00	0.04	198.08	0.07	199.16	2.66		
197.02	0.04	198.10	0.08	199.18	2.91		
197.04	0.04	198.12	0.08	199.20	3.17		
197.06	0.04	198.14	0.09	199.22	3.44		
197.08	0.04	198.16	0.10	199.24	3.72		
197.10	0.04	198.18	0.11	199.26	4.01		
197.12	0.04	198.20	0.12	199.28	4.32		
197.14	0.04	198.22	0.13	199.30	4.63		
197.16	0.04	198.24	0.14	199.32	4.96		
197.18	0.04	198.26	0.14	199.34	5.29		
197.20	0.04	198.28	0.15	199.36	5.64		
197.22	0.04	198.30	0.16	199.38	5.99		
197.24	0.04	198.32	0.16	199.40	6.35		
197.26	0.04	198.34	0.17	199.42	6.73		
197.28	0.04	198.36	0.17	199.44	7.11		
197.30	0.04	198.38	0.18	199.46	7.34		
197.32	0.04	198.40	0.18	199.48	7.36		
197.34	0.04	198.42	0.19	199.50	7.39		
197.36	0.04	198.44	0.19	199.52	7.42		
197.38	0.05	198.46	0.20	199.54	7.44		
197.40	0.05	198.48	0.20	199.56	7.47		
197.42	0.05	198.50	0.21	199.58	7.49		
197.44	0.05	198.52	0.21	199.60	7.52		
197.46	0.05	198.54	0.21	199.62	7.54		
197.48	0.05	198.56	0.22	199.64	7.57		
197.50	0.05	198.58	0.22	199.66	7.59		
197.52	0.05	198.60	0.22	199.68	7.62		
197.54	0.05	198.62	0.23	199.70	7.64		
197.56	0.05	198.64	0.23	199.72	7.67		
197.58	0.05	198.66	0.24	199.74	7.69		
197.60	0.05	198.68	0.24	199.76	7.72		
197.62	0.05	198.70	0.24	199.78	7.74		
197.64	0.05	198.72	0.25	199.80	7.77		

12129 Detention 7x7

Type IA 24-hr 5 year Rainfall=3.00"

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Stage-Area-Storage for Pond 3P: Detention Chambers

Elevation (feet)	Storage (cubic-feet)	Elevation (feet)	Storage (cubic-feet)
196.58	0	199.28	2,911
196.63	25	199.33	2,947
196.68	51	199.38	2,980
196.73	76	199.43	3,010
196.78	101	199.48	3,039
196.83	126	199.53	3,066
196.88	152	199.58	3,092
196.93	177	199.63	3,118
196.98	202	199.68	3,143
197.03	228	199.73	3,168
197.08	253	199.78	3,194
197.13	323	199.83	3,219
197.18	394	199.88	3,244
197.23	465	199.93	3,269
197.28	535	199.98	3,295
197.33	605	200.03	3,320
197.38	675	200.08	3,345
197.43	744		
197.48	813		
197.53	882		
197.58	950		
197.63	1,019		
197.68	1,086		
197.73	1,154		
197.78	1,220		
197.83	1,287		
197.88	1,353		
197.93	1,418		
197.98	1,484		
198.03	1,548		
198.08	1,612		
198.13	1,676		
198.18	1,739		
198.23	1,801		
198.28	1,863		
198.33	1,924		
198.38	1,985		
198.43	2,044		
198.48	2,104		
198.53	2,162		
198.58	2,220		
198.63	2,276		
198.68	2,332		
198.73	2,387		
198.78	2,441		
198.83	2,494		
198.88	2,546		
198.93	2,596		
198.98	2,646		
199.03	2,694		
199.08	2,741		
199.13	2,786		
199.18	2,830		
199.23	2,872		

12129_Detention_7x7

Type IA 24-hr 10 year Rainfall=3.50"

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Time span=0.00-50.00 hrs, dt=0.01 hrs, 5001 points
Runoff by SBUH method, Split Pervious/Imperv.
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment 1S: Predeveloped (On Site)

Runoff Area=0.820 ac 0.00% Impervious Runoff Depth=1.50"
Tc=16.4 min CN=78/0 Runoff=0.23 cfs 0.102 af

Subcatchment 2S: Developed (On Site)

Runoff Area=0.820 ac 76.83% Impervious Runoff Depth=2.92"
Tc=5.0 min CN=82/98 Runoff=0.59 cfs 0.200 af

Pond 3P: Detention Chambers

Peak Elev=198.56' Storage=2,199 cf Inflow=0.59 cfs 0.200 af
Outflow=0.22 cfs 0.200 af

Total Runoff Area = 1.640 ac Runoff Volume = 0.302 af Average Runoff Depth = 2.21"
61.59% Pervious = 1.010 ac 38.41% Impervious = 0.630 ac

12129_Detention_7x7

Type IA 24-hr 10 year Rainfall=3.50"

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Summary for Subcatchment 1S: Predeveloped (On Site)

Runoff = 0.23 cfs @ 8.01 hrs, Volume= 0.102 af, Depth= 1.50"

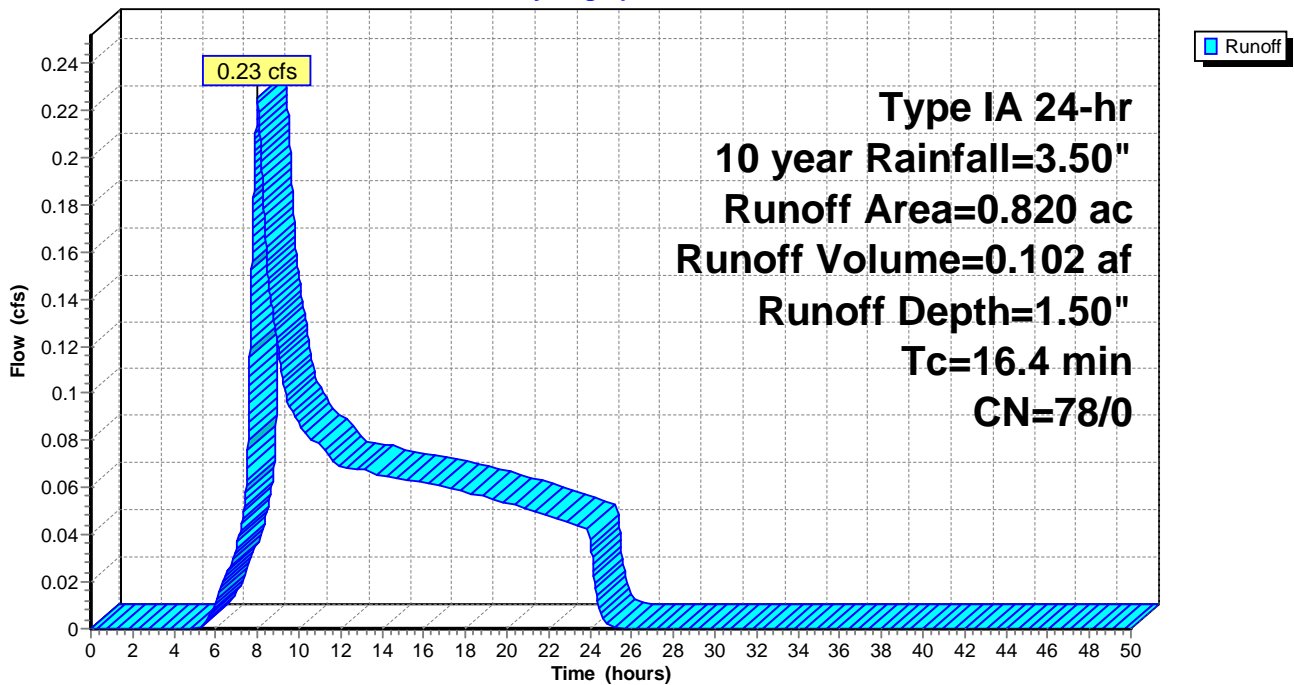
Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-50.00 hrs, dt= 0.01 hrs
Type IA 24-hr 10 year Rainfall=3.50"

Area (ac)	CN	Description
* 0.820	78	
0.820	78	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
16.4					Direct Entry,

Subcatchment 1S: Predeveloped (On Site)

Hydrograph



12129_Detention_7x7

Type IA 24-hr 10 year Rainfall=3.50"

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Hydrograph for Subcatchment 1S: Predeveloped (On Site)

Time (hours)	Precip. (inches)	Perv.Excess (inches)	Imp.Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Perv.Excess (inches)	Imp.Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00	0.00	27.00	3.50	1.50	0.00	0.00
0.50	0.03	0.00	0.00	0.00	27.50	3.50	1.50	0.00	0.00
1.00	0.07	0.00	0.00	0.00	28.00	3.50	1.50	0.00	0.00
1.50	0.12	0.00	0.00	0.00	28.50	3.50	1.50	0.00	0.00
2.00	0.18	0.00	0.00	0.00	29.00	3.50	1.50	0.00	0.00
2.50	0.23	0.00	0.00	0.00	29.50	3.50	1.50	0.00	0.00
3.00	0.29	0.00	0.00	0.00	30.00	3.50	1.50	0.00	0.00
3.50	0.34	0.00	0.00	0.00	30.50	3.50	1.50	0.00	0.00
4.00	0.41	0.00	0.00	0.00	31.00	3.50	1.50	0.00	0.00
4.50	0.47	0.00	0.00	0.00	31.50	3.50	1.50	0.00	0.00
5.00	0.55	0.00	0.00	0.00	32.00	3.50	1.50	0.00	0.00
5.50	0.63	0.00	0.00	0.00	32.50	3.50	1.50	0.00	0.00
6.00	0.72	0.01	0.00	0.01	33.00	3.50	1.50	0.00	0.00
6.50	0.83	0.02	0.00	0.02	33.50	3.50	1.50	0.00	0.00
7.00	0.94	0.04	0.00	0.03	34.00	3.50	1.50	0.00	0.00
7.50	1.09	0.08	0.00	0.06	34.50	3.50	1.50	0.00	0.00
8.00	1.49	0.23	0.00	0.22	35.00	3.50	1.50	0.00	0.00
8.50	1.68	0.32	0.00	0.15	35.50	3.50	1.50	0.00	0.00
9.00	1.82	0.39	0.00	0.12	36.00	3.50	1.50	0.00	0.00
9.50	1.92	0.44	0.00	0.10	36.50	3.50	1.50	0.00	0.00
10.00	2.02	0.50	0.00	0.09	37.00	3.50	1.50	0.00	0.00
10.50	2.10	0.54	0.00	0.08	37.50	3.50	1.50	0.00	0.00
11.00	2.18	0.59	0.00	0.08	38.00	3.50	1.50	0.00	0.00
11.50	2.26	0.64	0.00	0.07	38.50	3.50	1.50	0.00	0.00
12.00	2.32	0.68	0.00	0.07	39.00	3.50	1.50	0.00	0.00
12.50	2.39	0.72	0.00	0.07	39.50	3.50	1.50	0.00	0.00
13.00	2.45	0.76	0.00	0.07	40.00	3.50	1.50	0.00	0.00
13.50	2.52	0.80	0.00	0.07	40.50	3.50	1.50	0.00	0.00
14.00	2.58	0.84	0.00	0.06	41.00	3.50	1.50	0.00	0.00
14.50	2.63	0.88	0.00	0.06	41.50	3.50	1.50	0.00	0.00
15.00	2.69	0.92	0.00	0.06	42.00	3.50	1.50	0.00	0.00
15.50	2.75	0.95	0.00	0.06	42.50	3.50	1.50	0.00	0.00
16.00	2.80	0.99	0.00	0.06	43.00	3.50	1.50	0.00	0.00
16.50	2.86	1.03	0.00	0.06	43.50	3.50	1.50	0.00	0.00
17.00	2.91	1.06	0.00	0.06	44.00	3.50	1.50	0.00	0.00
17.50	2.96	1.10	0.00	0.06	44.50	3.50	1.50	0.00	0.00
18.00	3.01	1.14	0.00	0.06	45.00	3.50	1.50	0.00	0.00
18.50	3.06	1.17	0.00	0.06	45.50	3.50	1.50	0.00	0.00
19.00	3.10	1.20	0.00	0.06	46.00	3.50	1.50	0.00	0.00
19.50	3.15	1.24	0.00	0.05	46.50	3.50	1.50	0.00	0.00
20.00	3.19	1.27	0.00	0.05	47.00	3.50	1.50	0.00	0.00
20.50	3.24	1.30	0.00	0.05	47.50	3.50	1.50	0.00	0.00
21.00	3.28	1.33	0.00	0.05	48.00	3.50	1.50	0.00	0.00
21.50	3.32	1.36	0.00	0.05	48.50	3.50	1.50	0.00	0.00
22.00	3.36	1.39	0.00	0.05	49.00	3.50	1.50	0.00	0.00
22.50	3.40	1.42	0.00	0.05	49.50	3.50	1.50	0.00	0.00
23.00	3.43	1.45	0.00	0.05	50.00	3.50	1.50	0.00	0.00
23.50	3.47	1.47	0.00	0.04					
24.00	3.50	1.50	0.00	0.04					
24.50	3.50	1.50	0.00	0.01					
25.00	3.50	1.50	0.00	0.00					
25.50	3.50	1.50	0.00	0.00					
26.00	3.50	1.50	0.00	0.00					
26.50	3.50	1.50	0.00	0.00					

12129 Detention 7x7

Type IA 24-hr 10 year Rainfall=3.50"

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Summary for Subcatchment 2S: Developed (On Site)

Runoff = 0.59 cfs @ 7.89 hrs, Volume= 0.200 af, Depth= 2.92"

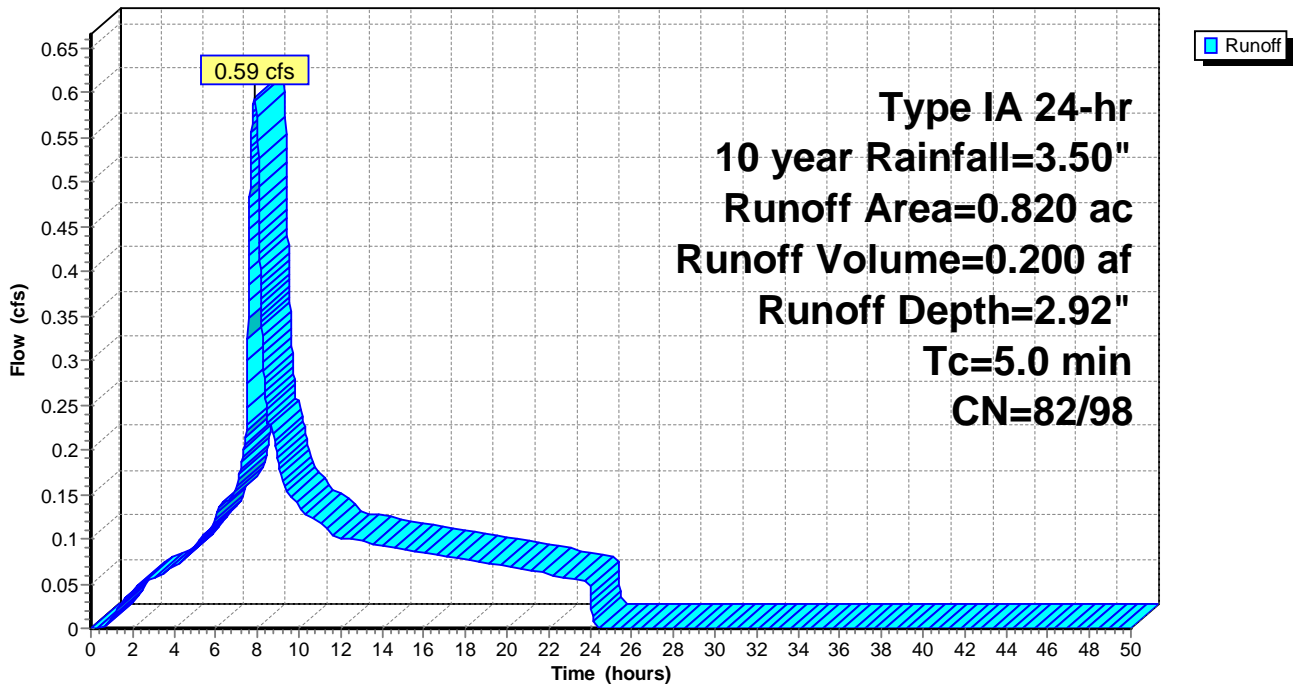
Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-50.00 hrs, dt= 0.01 hrs
 Type IA 24-hr 10 year Rainfall=3.50"

Area (ac)	CN	Description
* 0.190	82	
* 0.630	98	
0.820	94	Weighted Average
0.190	82	23.17% Pervious Area
0.630	98	76.83% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					Direct Entry,

Subcatchment 2S: Developed (On Site)

Hydrograph



12129_Detention_7x7

Type IA 24-hr 10 year Rainfall=3.50"

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Hydrograph for Subcatchment 2S: Developed (On Site)

Time (hours)	Precip. (inches)	Perv.Excess (inches)	Imp.Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Perv.Excess (inches)	Imp.Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00	0.00	27.00	3.50	1.78	3.27	0.00
0.50	0.03	0.00	0.00	0.00	27.50	3.50	1.78	3.27	0.00
1.00	0.07	0.00	0.00	0.01	28.00	3.50	1.78	3.27	0.00
1.50	0.12	0.00	0.02	0.03	28.50	3.50	1.78	3.27	0.00
2.00	0.18	0.00	0.05	0.04	29.00	3.50	1.78	3.27	0.00
2.50	0.23	0.00	0.09	0.05	29.50	3.50	1.78	3.27	0.00
3.00	0.29	0.00	0.13	0.06	30.00	3.50	1.78	3.27	0.00
3.50	0.34	0.00	0.18	0.06	30.50	3.50	1.78	3.27	0.00
4.00	0.41	0.00	0.23	0.07	31.00	3.50	1.78	3.27	0.00
4.50	0.47	0.00	0.29	0.08	31.50	3.50	1.78	3.27	0.00
5.00	0.55	0.00	0.36	0.09	32.00	3.50	1.78	3.27	0.00
5.50	0.63	0.02	0.44	0.11	32.50	3.50	1.78	3.27	0.00
6.00	0.72	0.03	0.52	0.12	33.00	3.50	1.78	3.27	0.00
6.50	0.83	0.06	0.63	0.15	33.50	3.50	1.78	3.27	0.00
7.00	0.94	0.09	0.73	0.16	34.00	3.50	1.78	3.27	0.00
7.50	1.09	0.15	0.87	0.23	34.50	3.50	1.78	3.27	0.00
8.00	1.49	0.34	1.27	0.58	35.00	3.50	1.78	3.27	0.00
8.50	1.68	0.45	1.46	0.23	35.50	3.50	1.78	3.27	0.00
9.00	1.82	0.53	1.60	0.19	36.00	3.50	1.78	3.27	0.00
9.50	1.92	0.60	1.70	0.15	36.50	3.50	1.78	3.27	0.00
10.00	2.02	0.66	1.79	0.14	37.00	3.50	1.78	3.27	0.00
10.50	2.10	0.72	1.88	0.12	37.50	3.50	1.78	3.27	0.00
11.00	2.18	0.77	1.96	0.12	38.00	3.50	1.78	3.27	0.00
11.50	2.26	0.82	2.03	0.11	38.50	3.50	1.78	3.27	0.00
12.00	2.32	0.87	2.10	0.10	39.00	3.50	1.78	3.27	0.00
12.50	2.39	0.92	2.16	0.10	39.50	3.50	1.78	3.27	0.00
13.00	2.45	0.96	2.22	0.10	40.00	3.50	1.78	3.27	0.00
13.50	2.52	1.01	2.29	0.09	40.50	3.50	1.78	3.27	0.00
14.00	2.58	1.05	2.35	0.09	41.00	3.50	1.78	3.27	0.00
14.50	2.63	1.10	2.40	0.09	41.50	3.50	1.78	3.27	0.00
15.00	2.69	1.14	2.46	0.09	42.00	3.50	1.78	3.27	0.00
15.50	2.75	1.18	2.52	0.09	42.50	3.50	1.78	3.27	0.00
16.00	2.80	1.23	2.57	0.08	43.00	3.50	1.78	3.27	0.00
16.50	2.86	1.27	2.63	0.08	43.50	3.50	1.78	3.27	0.00
17.00	2.91	1.31	2.68	0.08	44.00	3.50	1.78	3.27	0.00
17.50	2.96	1.35	2.73	0.08	44.50	3.50	1.78	3.27	0.00
18.00	3.01	1.39	2.78	0.08	45.00	3.50	1.78	3.27	0.00
18.50	3.06	1.42	2.83	0.07	45.50	3.50	1.78	3.27	0.00
19.00	3.10	1.46	2.87	0.07	46.00	3.50	1.78	3.27	0.00
19.50	3.15	1.50	2.92	0.07	46.50	3.50	1.78	3.27	0.00
20.00	3.19	1.53	2.96	0.07	47.00	3.50	1.78	3.27	0.00
20.50	3.24	1.57	3.00	0.07	47.50	3.50	1.78	3.27	0.00
21.00	3.28	1.60	3.05	0.06	48.00	3.50	1.78	3.27	0.00
21.50	3.32	1.63	3.09	0.06	48.50	3.50	1.78	3.27	0.00
22.00	3.36	1.67	3.12	0.06	49.00	3.50	1.78	3.27	0.00
22.50	3.40	1.70	3.16	0.06	49.50	3.50	1.78	3.27	0.00
23.00	3.43	1.73	3.20	0.06	50.00	3.50	1.78	3.27	0.00
23.50	3.47	1.75	3.23	0.05					
24.00	3.50	1.78	3.27	0.05					
24.50	3.50	1.78	3.27	0.00					
25.00	3.50	1.78	3.27	0.00					
25.50	3.50	1.78	3.27	0.00					
26.00	3.50	1.78	3.27	0.00					
26.50	3.50	1.78	3.27	0.00					

Summary for Pond 3P: Detention Chambers

[44] Hint: Outlet device #2 is below defined storage

Inflow Area = 0.820 ac, 76.83% Impervious, Inflow Depth = 2.92" for 10 year event
 Inflow = 0.59 cfs @ 7.89 hrs, Volume= 0.200 af
 Outflow = 0.22 cfs @ 8.75 hrs, Volume= 0.200 af, Atten= 63%, Lag= 51.9 min
 Primary = 0.22 cfs @ 8.75 hrs, Volume= 0.200 af

Routing by Stor-Ind method, Time Span= 0.00-50.00 hrs, dt= 0.01 hrs
 Peak Elev= 198.56' @ 8.75 hrs Surf.Area= 1,685 sf Storage= 2,199 cf

Plug-Flow detention time= 260.8 min calculated for 0.200 af (100% of inflow)
 Center-of-Mass det. time= 260.9 min (942.8 - 681.9)

Volume	Invert	Avail.Storage	Storage Description
#1A	196.58'	1,094 cf	32.75'W x 51.46'L x 3.50'H Field A 5,898 cf Overall - 2,251 cf Embedded = 3,647 cf x 30.0% Voids
#2A	197.08'	2,251 cf	ADS_StormTech SC-740 +Cap x 49 Inside #1 Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap 49 Chambers in 7 Rows
		3,345 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	195.96'	12.0" Round Culvert L= 31.0' RCP, rounded edge headwall, Ke= 0.100 Inlet / Outlet Invert= 195.96' / 195.65' S= 0.0100 '/ Cc= 0.900 n= 0.013, Flow Area= 0.79 sf
#2	Device 1	193.96'	1.2" Vert. Orifice/Grate C= 0.600
#3	Device 1	198.00'	3.0" Vert. Orifice/Grate C= 0.600
#4	Device 1	198.86'	5.0' long x 0.5' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32

Primary OutFlow Max=0.22 cfs @ 8.75 hrs HW=198.56' (Free Discharge)

- ↑ 1=Culvert (Passes 0.22 cfs of 6.05 cfs potential flow)
- ↑ 2=Orifice/Grate (Orifice Controls 0.06 cfs @ 7.77 fps)
- ↑ 3=Orifice/Grate (Orifice Controls 0.16 cfs @ 3.18 fps)
- ↑ 4=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

12129_Detention_7x7

Type IA 24-hr 10 year Rainfall=3.50"

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Pond 3P: Detention Chambers - Chamber Wizard Field A

Chamber Model = ADS_StormTech SC-740 +Cap (ADS StormTech® SC-740 with cap length)

Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf

Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap

51.0" Wide + 6.0" Spacing = 57.0" C-C Row Spacing

7 Chambers/Row x 7.12' Long +0.81' Cap Length x 2 = 51.46' Row Length

7 Rows x 51.0" Wide + 6.0" Spacing x 6 = 32.75' Base Width

6.0" Base + 30.0" Chamber Height + 6.0" Cover = 3.50' Field Height

49 Chambers x 45.9 cf = 2,251.1 cf Chamber Storage

5,898.2 cf Field - 2,251.1 cf Chambers = 3,647.2 cf Stone x 30.0% Voids = 1,094.1 cf Stone Storage

Chamber Storage + Stone Storage = 3,345.2 cf = 0.077 af

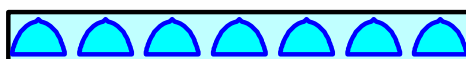
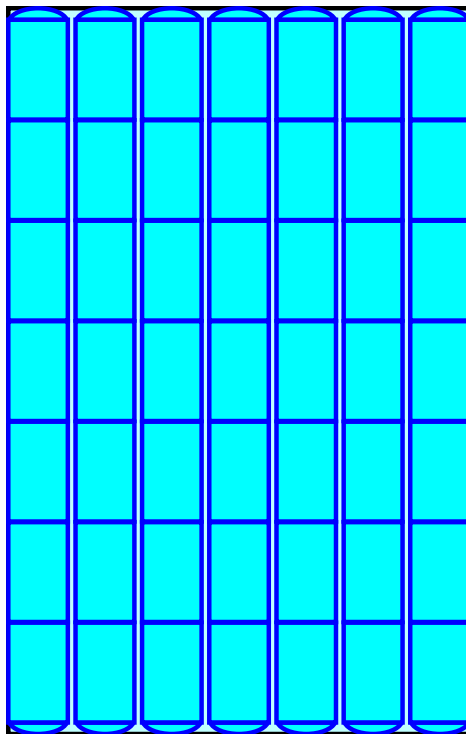
Overall Storage Efficiency = 56.7%

Overall System Size = 51.46' x 32.75' x 3.50'

49 Chambers

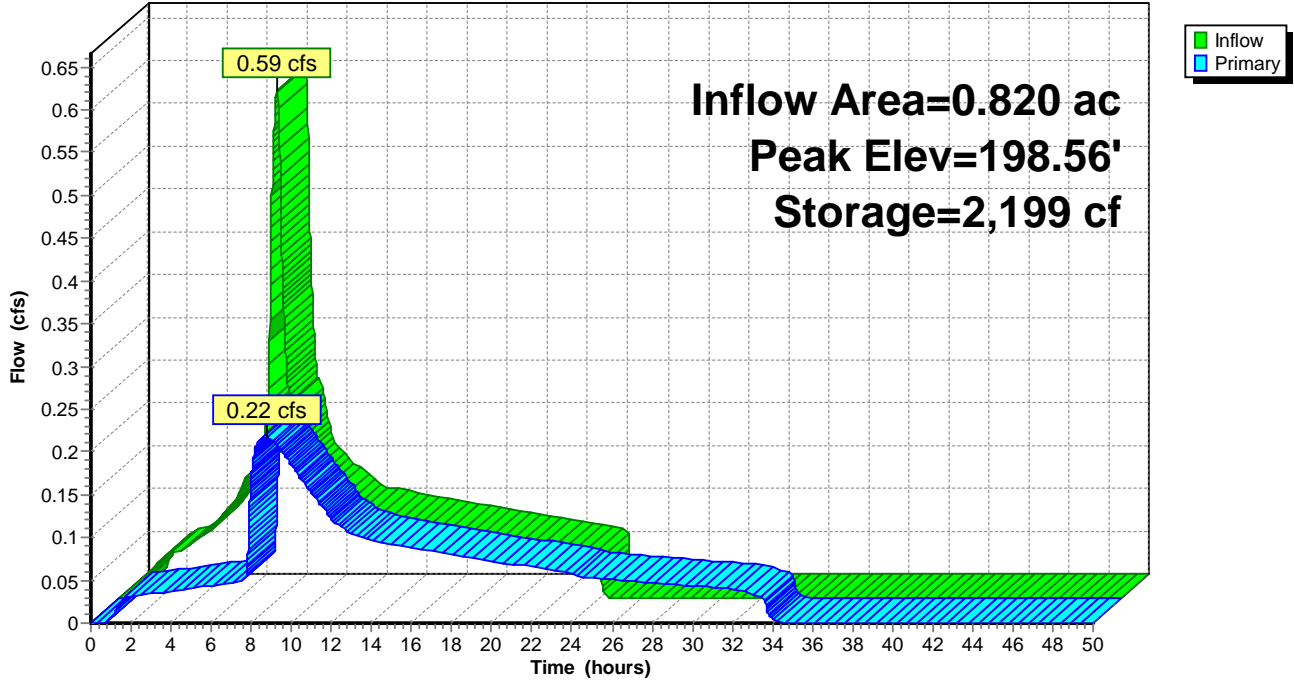
218.5 cy Field

135.1 cy Stone



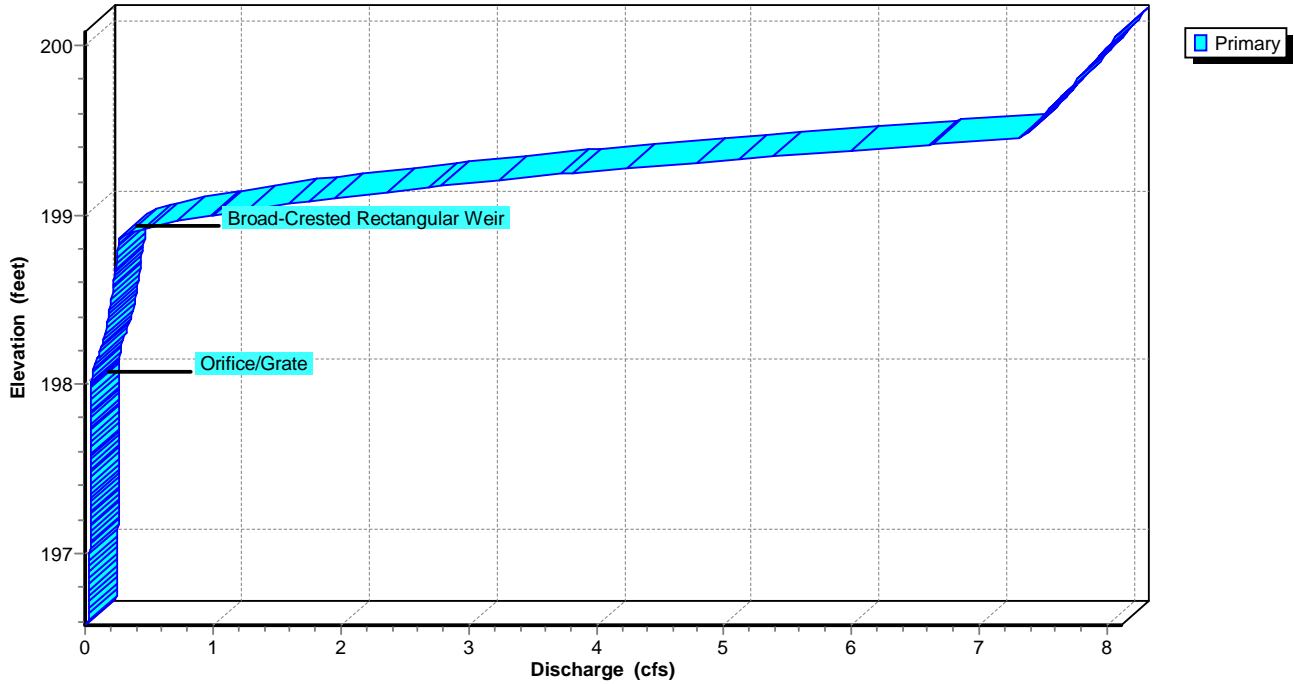
Pond 3P: Detention Chambers

Hydrograph

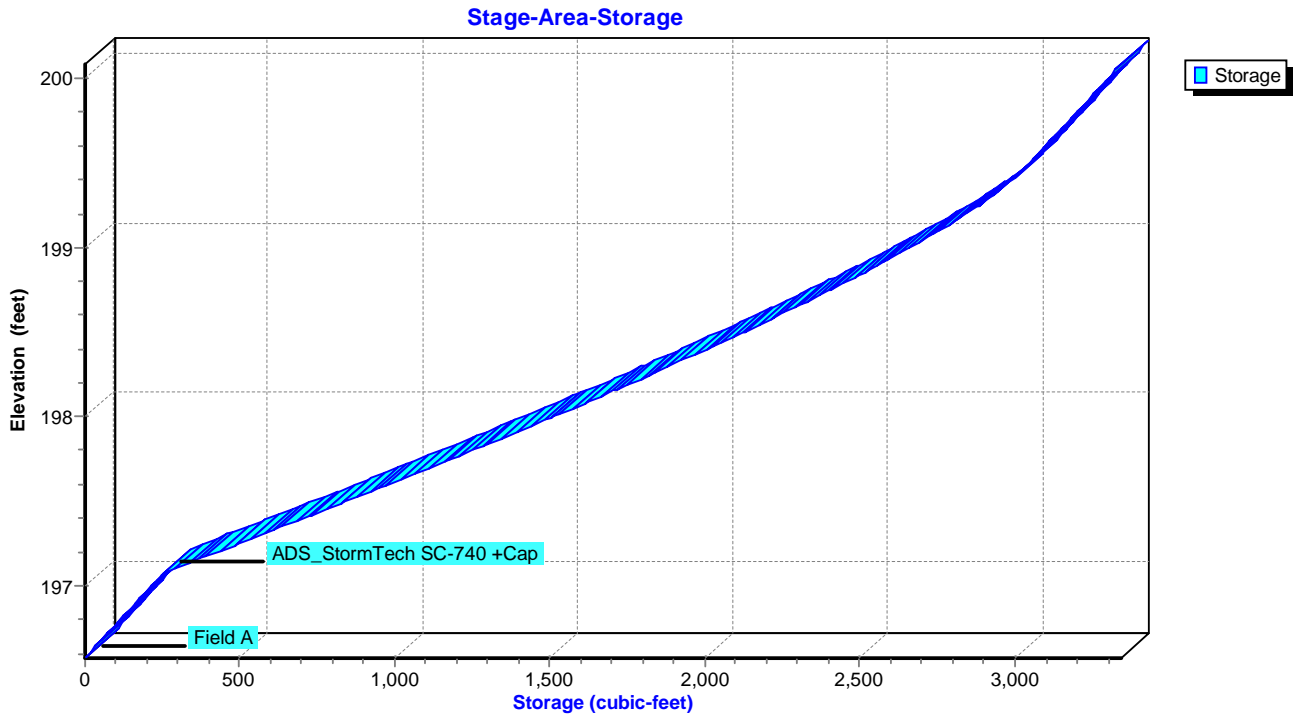


Pond 3P: Detention Chambers

Stage-Discharge



Pond 3P: Detention Chambers



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Type IA 24-hr 10 year Rainfall=3.50"

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Hydrograph for Pond 3P: Detention Chambers

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
0.00	0.00	0	196.58	0.00
1.00	0.01	3	196.59	0.01
2.00	0.04	26	196.63	0.03
3.00	0.06	91	196.76	0.03
4.00	0.07	186	196.95	0.04
5.00	0.09	328	197.13	0.04
6.00	0.12	558	197.30	0.04
7.00	0.16	900	197.54	0.05
8.00	0.58	1,933	198.34	0.17
9.00	0.19	2,187	198.55	0.22
10.00	0.14	2,019	198.41	0.19
11.00	0.12	1,870	198.29	0.15
12.00	0.10	1,767	198.20	0.12
13.00	0.10	1,723	198.17	0.10
14.00	0.09	1,702	198.15	0.10
15.00	0.09	1,688	198.14	0.09
16.00	0.08	1,677	198.13	0.09
17.00	0.08	1,666	198.12	0.08
18.00	0.08	1,654	198.11	0.08
19.00	0.07	1,641	198.10	0.08
20.00	0.07	1,628	198.09	0.07
21.00	0.06	1,615	198.08	0.07
22.00	0.06	1,599	198.07	0.07
23.00	0.06	1,582	198.06	0.06
24.00	0.05	1,562	198.04	0.06
25.00	0.00	1,383	197.90	0.05
26.00	0.00	1,197	197.76	0.05
27.00	0.00	1,018	197.63	0.05
28.00	0.00	845	197.50	0.05
29.00	0.00	679	197.38	0.05
30.00	0.00	520	197.27	0.04
31.00	0.00	368	197.16	0.04
32.00	0.00	222	197.02	0.04
33.00	0.00	91	196.76	0.03
34.00	0.00	2	196.58	0.00
35.00	0.00	0	196.58	0.00
36.00	0.00	0	196.58	0.00
37.00	0.00	0	196.58	0.00
38.00	0.00	0	196.58	0.00
39.00	0.00	0	196.58	0.00
40.00	0.00	0	196.58	0.00
41.00	0.00	0	196.58	0.00
42.00	0.00	0	196.58	0.00
43.00	0.00	0	196.58	0.00
44.00	0.00	0	196.58	0.00
45.00	0.00	0	196.58	0.00
46.00	0.00	0	196.58	0.00
47.00	0.00	0	196.58	0.00
48.00	0.00	0	196.58	0.00
49.00	0.00	0	196.58	0.00
50.00	0.00	0	196.58	0.00

12129 Detention 7x7

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Stage-Discharge for Pond 3P: Detention Chambers

Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)
196.58	0.00	197.66	0.05	198.74	0.25	199.82	7.79
196.60	0.03	197.68	0.05	198.76	0.25	199.84	7.82
196.62	0.03	197.70	0.05	198.78	0.25	199.86	7.84
196.64	0.03	197.72	0.05	198.80	0.26	199.88	7.87
196.66	0.03	197.74	0.05	198.82	0.26	199.90	7.89
196.68	0.03	197.76	0.05	198.84	0.26	199.92	7.92
196.70	0.03	197.78	0.05	198.86	0.27	199.94	7.94
196.72	0.03	197.80	0.05	198.88	0.31	199.96	7.96
196.74	0.03	197.82	0.05	198.90	0.38	199.98	7.99
196.76	0.03	197.84	0.05	198.92	0.48	200.00	8.01
196.78	0.03	197.86	0.05	198.94	0.60	200.02	8.04
196.80	0.03	197.88	0.05	198.96	0.72	200.04	8.06
196.82	0.04	197.90	0.05	198.98	0.87	200.06	8.08
196.84	0.04	197.92	0.05	199.00	1.02	200.08	8.11
196.86	0.04	197.94	0.05	199.02	1.19		
196.88	0.04	197.96	0.05	199.04	1.36		
196.90	0.04	197.98	0.05	199.06	1.55		
196.92	0.04	198.00	0.05	199.08	1.75		
196.94	0.04	198.02	0.06	199.10	1.96		
196.96	0.04	198.04	0.06	199.12	2.18		
196.98	0.04	198.06	0.06	199.14	2.42		
197.00	0.04	198.08	0.07	199.16	2.66		
197.02	0.04	198.10	0.08	199.18	2.91		
197.04	0.04	198.12	0.08	199.20	3.17		
197.06	0.04	198.14	0.09	199.22	3.44		
197.08	0.04	198.16	0.10	199.24	3.72		
197.10	0.04	198.18	0.11	199.26	4.01		
197.12	0.04	198.20	0.12	199.28	4.32		
197.14	0.04	198.22	0.13	199.30	4.63		
197.16	0.04	198.24	0.14	199.32	4.96		
197.18	0.04	198.26	0.14	199.34	5.29		
197.20	0.04	198.28	0.15	199.36	5.64		
197.22	0.04	198.30	0.16	199.38	5.99		
197.24	0.04	198.32	0.16	199.40	6.35		
197.26	0.04	198.34	0.17	199.42	6.73		
197.28	0.04	198.36	0.17	199.44	7.11		
197.30	0.04	198.38	0.18	199.46	7.34		
197.32	0.04	198.40	0.18	199.48	7.36		
197.34	0.04	198.42	0.19	199.50	7.39		
197.36	0.04	198.44	0.19	199.52	7.42		
197.38	0.05	198.46	0.20	199.54	7.44		
197.40	0.05	198.48	0.20	199.56	7.47		
197.42	0.05	198.50	0.21	199.58	7.49		
197.44	0.05	198.52	0.21	199.60	7.52		
197.46	0.05	198.54	0.21	199.62	7.54		
197.48	0.05	198.56	0.22	199.64	7.57		
197.50	0.05	198.58	0.22	199.66	7.59		
197.52	0.05	198.60	0.22	199.68	7.62		
197.54	0.05	198.62	0.23	199.70	7.64		
197.56	0.05	198.64	0.23	199.72	7.67		
197.58	0.05	198.66	0.24	199.74	7.69		
197.60	0.05	198.68	0.24	199.76	7.72		
197.62	0.05	198.70	0.24	199.78	7.74		
197.64	0.05	198.72	0.25	199.80	7.77		

12129_Detention_7x7

Type IA 24-hr 10 year Rainfall=3.50"

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Stage-Area-Storage for Pond 3P: Detention Chambers

Elevation (feet)	Storage (cubic-feet)	Elevation (feet)	Storage (cubic-feet)
196.58	0	199.28	2,911
196.63	25	199.33	2,947
196.68	51	199.38	2,980
196.73	76	199.43	3,010
196.78	101	199.48	3,039
196.83	126	199.53	3,066
196.88	152	199.58	3,092
196.93	177	199.63	3,118
196.98	202	199.68	3,143
197.03	228	199.73	3,168
197.08	253	199.78	3,194
197.13	323	199.83	3,219
197.18	394	199.88	3,244
197.23	465	199.93	3,269
197.28	535	199.98	3,295
197.33	605	200.03	3,320
197.38	675	200.08	3,345
197.43	744		
197.48	813		
197.53	882		
197.58	950		
197.63	1,019		
197.68	1,086		
197.73	1,154		
197.78	1,220		
197.83	1,287		
197.88	1,353		
197.93	1,418		
197.98	1,484		
198.03	1,548		
198.08	1,612		
198.13	1,676		
198.18	1,739		
198.23	1,801		
198.28	1,863		
198.33	1,924		
198.38	1,985		
198.43	2,044		
198.48	2,104		
198.53	2,162		
198.58	2,220		
198.63	2,276		
198.68	2,332		
198.73	2,387		
198.78	2,441		
198.83	2,494		
198.88	2,546		
198.93	2,596		
198.98	2,646		
199.03	2,694		
199.08	2,741		
199.13	2,786		
199.18	2,830		
199.23	2,872		

12129_Detention_7x7

Type IA 24-hr 25 year Rainfall=4.00"

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Time span=0.00-50.00 hrs, dt=0.01 hrs, 5001 points
Runoff by SBUH method, Split Pervious/Imperv.
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment 1S: Predeveloped (On Site)

Runoff Area=0.820 ac 0.00% Impervious Runoff Depth=1.89"
Tc=16.4 min CN=78/0 Runoff=0.30 cfs 0.129 af

Subcatchment 2S: Developed (On Site)

Runoff Area=0.820 ac 76.83% Impervious Runoff Depth=3.40"
Tc=5.0 min CN=82/98 Runoff=0.69 cfs 0.233 af

Pond 3P: Detention Chambers

Peak Elev=198.87' Storage=2,538 cf Inflow=0.69 cfs 0.233 af
Outflow=0.30 cfs 0.233 af

Total Runoff Area = 1.640 ac Runoff Volume = 0.361 af Average Runoff Depth = 2.65"
61.59% Pervious = 1.010 ac 38.41% Impervious = 0.630 ac

12129_Detention_7x7

Type IA 24-hr 25 year Rainfall=4.00"

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Summary for Subcatchment 1S: Predeveloped (On Site)

Runoff = 0.30 cfs @ 8.01 hrs, Volume= 0.129 af, Depth= 1.89"

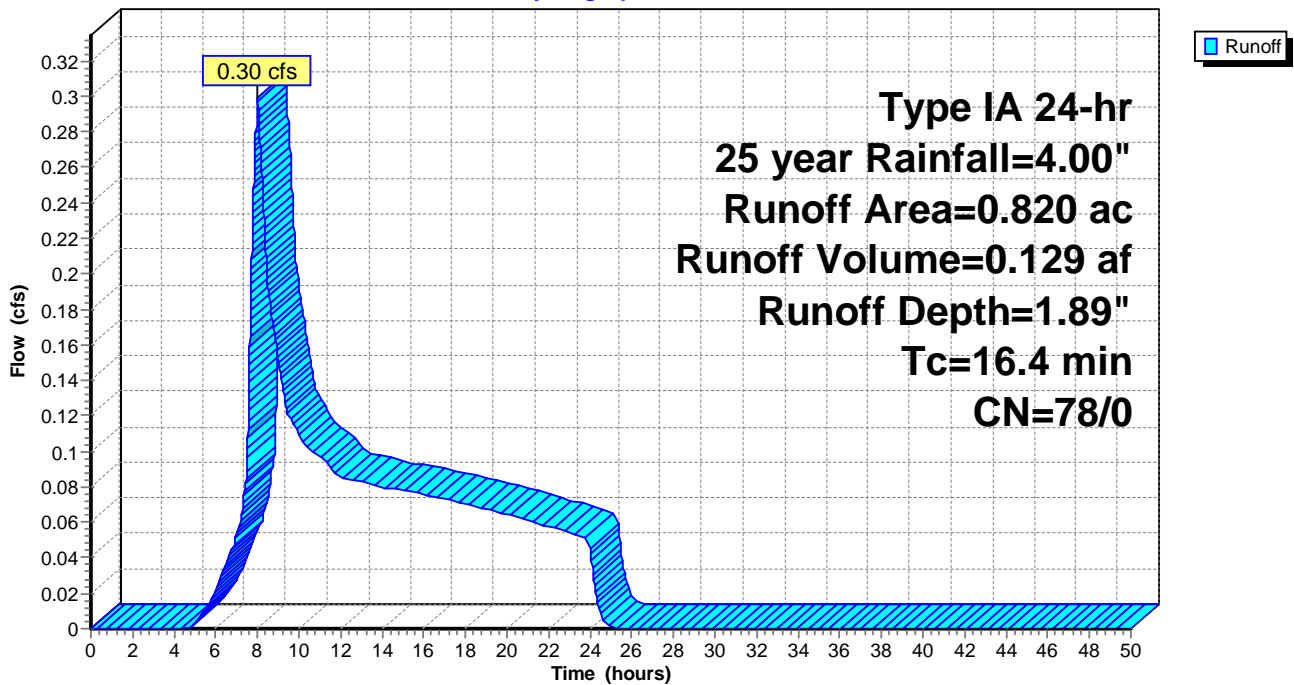
Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-50.00 hrs, dt= 0.01 hrs
Type IA 24-hr 25 year Rainfall=4.00"

Area (ac)	CN	Description
* 0.820	78	
0.820	78	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
16.4					Direct Entry,

Subcatchment 1S: Predeveloped (On Site)

Hydrograph



12129_Detention_7x7

Type IA 24-hr 25 year Rainfall=4.00"

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Hydrograph for Subcatchment 1S: Predeveloped (On Site)

Time (hours)	Precip. (inches)	Perv.Excess (inches)	Imp.Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Perv.Excess (inches)	Imp.Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00	0.00	27.00	4.00	1.89	0.00	0.00
0.50	0.04	0.00	0.00	0.00	27.50	4.00	1.89	0.00	0.00
1.00	0.08	0.00	0.00	0.00	28.00	4.00	1.89	0.00	0.00
1.50	0.14	0.00	0.00	0.00	28.50	4.00	1.89	0.00	0.00
2.00	0.20	0.00	0.00	0.00	29.00	4.00	1.89	0.00	0.00
2.50	0.26	0.00	0.00	0.00	29.50	4.00	1.89	0.00	0.00
3.00	0.33	0.00	0.00	0.00	30.00	4.00	1.89	0.00	0.00
3.50	0.39	0.00	0.00	0.00	30.50	4.00	1.89	0.00	0.00
4.00	0.46	0.00	0.00	0.00	31.00	4.00	1.89	0.00	0.00
4.50	0.54	0.00	0.00	0.00	31.50	4.00	1.89	0.00	0.00
5.00	0.62	0.00	0.00	0.00	32.00	4.00	1.89	0.00	0.00
5.50	0.72	0.01	0.00	0.01	32.50	4.00	1.89	0.00	0.00
6.00	0.82	0.02	0.00	0.02	33.00	4.00	1.89	0.00	0.00
6.50	0.95	0.05	0.00	0.04	33.50	4.00	1.89	0.00	0.00
7.00	1.07	0.08	0.00	0.05	34.00	4.00	1.89	0.00	0.00
7.50	1.24	0.13	0.00	0.09	34.50	4.00	1.89	0.00	0.00
8.00	1.70	0.33	0.00	0.30	35.00	4.00	1.89	0.00	0.00
8.50	1.92	0.44	0.00	0.19	35.50	4.00	1.89	0.00	0.00
9.00	2.08	0.53	0.00	0.15	36.00	4.00	1.89	0.00	0.00
9.50	2.20	0.60	0.00	0.12	36.50	4.00	1.89	0.00	0.00
10.00	2.31	0.67	0.00	0.11	37.00	4.00	1.89	0.00	0.00
10.50	2.40	0.73	0.00	0.10	37.50	4.00	1.89	0.00	0.00
11.00	2.50	0.79	0.00	0.10	38.00	4.00	1.89	0.00	0.00
11.50	2.58	0.84	0.00	0.09	38.50	4.00	1.89	0.00	0.00
12.00	2.66	0.89	0.00	0.08	39.00	4.00	1.89	0.00	0.00
12.50	2.73	0.94	0.00	0.09	39.50	4.00	1.89	0.00	0.00
13.00	2.80	0.99	0.00	0.08	40.00	4.00	1.89	0.00	0.00
13.50	2.88	1.04	0.00	0.08	40.50	4.00	1.89	0.00	0.00
14.00	2.94	1.09	0.00	0.08	41.00	4.00	1.89	0.00	0.00
14.50	3.01	1.14	0.00	0.08	41.50	4.00	1.89	0.00	0.00
15.00	3.08	1.18	0.00	0.08	42.00	4.00	1.89	0.00	0.00
15.50	3.14	1.23	0.00	0.08	42.50	4.00	1.89	0.00	0.00
16.00	3.20	1.28	0.00	0.08	43.00	4.00	1.89	0.00	0.00
16.50	3.26	1.32	0.00	0.07	43.50	4.00	1.89	0.00	0.00
17.00	3.32	1.37	0.00	0.07	44.00	4.00	1.89	0.00	0.00
17.50	3.38	1.41	0.00	0.07	44.50	4.00	1.89	0.00	0.00
18.00	3.44	1.45	0.00	0.07	45.00	4.00	1.89	0.00	0.00
18.50	3.49	1.49	0.00	0.07	45.50	4.00	1.89	0.00	0.00
19.00	3.55	1.53	0.00	0.07	46.00	4.00	1.89	0.00	0.00
19.50	3.60	1.57	0.00	0.07	46.50	4.00	1.89	0.00	0.00
20.00	3.65	1.61	0.00	0.06	47.00	4.00	1.89	0.00	0.00
20.50	3.70	1.65	0.00	0.06	47.50	4.00	1.89	0.00	0.00
21.00	3.75	1.69	0.00	0.06	48.00	4.00	1.89	0.00	0.00
21.50	3.79	1.72	0.00	0.06	48.50	4.00	1.89	0.00	0.00
22.00	3.84	1.76	0.00	0.06	49.00	4.00	1.89	0.00	0.00
22.50	3.88	1.79	0.00	0.06	49.50	4.00	1.89	0.00	0.00
23.00	3.92	1.82	0.00	0.05	50.00	4.00	1.89	0.00	0.00
23.50	3.96	1.86	0.00	0.05					
24.00	4.00	1.89	0.00	0.05					
24.50	4.00	1.89	0.00	0.01					
25.00	4.00	1.89	0.00	0.00					
25.50	4.00	1.89	0.00	0.00					
26.00	4.00	1.89	0.00	0.00					
26.50	4.00	1.89	0.00	0.00					

12129_Detention_7x7

Type IA 24-hr 25 year Rainfall=4.00"

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Summary for Subcatchment 2S: Developed (On Site)

Runoff = 0.69 cfs @ 7.89 hrs, Volume= 0.233 af, Depth= 3.40"

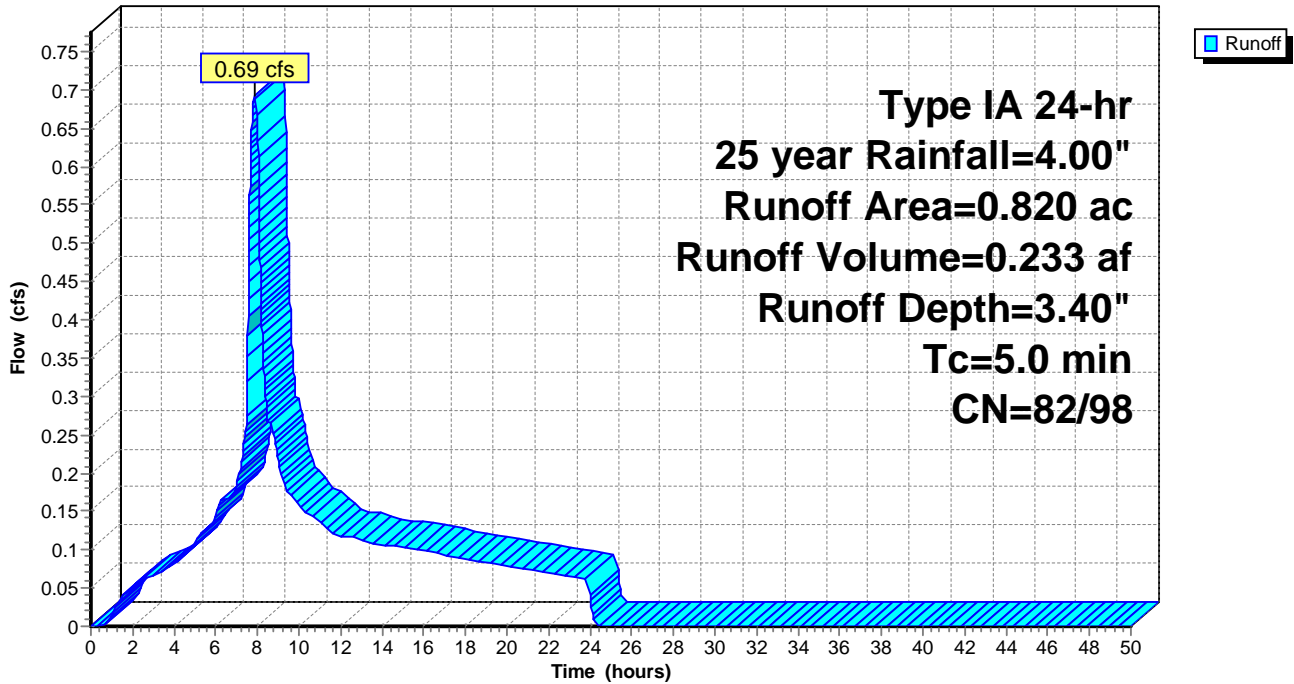
Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-50.00 hrs, dt= 0.01 hrs
 Type IA 24-hr 25 year Rainfall=4.00"

Area (ac)	CN	Description
* 0.190	82	
* 0.630	98	
0.820	94	Weighted Average
0.190	82	23.17% Pervious Area
0.630	98	76.83% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					Direct Entry,

Subcatchment 2S: Developed (On Site)

Hydrograph



12129_Detention_7x7

Type IA 24-hr 25 year Rainfall=4.00"

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Hydrograph for Subcatchment 2S: Developed (On Site)

Time (hours)	Precip. (inches)	Perv.Excess (inches)	Imp.Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Perv.Excess (inches)	Imp.Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00	0.00	27.00	4.00	2.20	3.77	0.00
0.50	0.04	0.00	0.00	0.00	27.50	4.00	2.20	3.77	0.00
1.00	0.08	0.00	0.01	0.01	28.00	4.00	2.20	3.77	0.00
1.50	0.14	0.00	0.03	0.04	28.50	4.00	2.20	3.77	0.00
2.00	0.20	0.00	0.07	0.05	29.00	4.00	2.20	3.77	0.00
2.50	0.26	0.00	0.12	0.06	29.50	4.00	2.20	3.77	0.00
3.00	0.33	0.00	0.17	0.07	30.00	4.00	2.20	3.77	0.00
3.50	0.39	0.00	0.22	0.07	30.50	4.00	2.20	3.77	0.00
4.00	0.46	0.00	0.29	0.08	31.00	4.00	2.20	3.77	0.00
4.50	0.54	0.00	0.35	0.09	31.50	4.00	2.20	3.77	0.00
5.00	0.62	0.01	0.43	0.11	32.00	4.00	2.20	3.77	0.00
5.50	0.72	0.03	0.52	0.13	32.50	4.00	2.20	3.77	0.00
6.00	0.82	0.06	0.62	0.14	33.00	4.00	2.20	3.77	0.00
6.50	0.95	0.10	0.74	0.17	33.50	4.00	2.20	3.77	0.00
7.00	1.07	0.14	0.86	0.18	34.00	4.00	2.20	3.77	0.00
7.50	1.24	0.21	1.02	0.27	34.50	4.00	2.20	3.77	0.00
8.00	1.70	0.46	1.48	0.67	35.00	4.00	2.20	3.77	0.00
8.50	1.92	0.60	1.70	0.26	35.50	4.00	2.20	3.77	0.00
9.00	2.08	0.70	1.85	0.22	36.00	4.00	2.20	3.77	0.00
9.50	2.20	0.78	1.97	0.17	36.50	4.00	2.20	3.77	0.00
10.00	2.31	0.86	2.08	0.16	37.00	4.00	2.20	3.77	0.00
10.50	2.40	0.93	2.18	0.14	37.50	4.00	2.20	3.77	0.00
11.00	2.50	1.00	2.27	0.14	38.00	4.00	2.20	3.77	0.00
11.50	2.58	1.06	2.35	0.13	38.50	4.00	2.20	3.77	0.00
12.00	2.66	1.11	2.43	0.12	39.00	4.00	2.20	3.77	0.00
12.50	2.73	1.17	2.50	0.12	39.50	4.00	2.20	3.77	0.00
13.00	2.80	1.23	2.57	0.11	40.00	4.00	2.20	3.77	0.00
13.50	2.88	1.28	2.64	0.11	40.50	4.00	2.20	3.77	0.00
14.00	2.94	1.34	2.71	0.11	41.00	4.00	2.20	3.77	0.00
14.50	3.01	1.39	2.78	0.10	41.50	4.00	2.20	3.77	0.00
15.00	3.08	1.44	2.84	0.10	42.00	4.00	2.20	3.77	0.00
15.50	3.14	1.49	2.91	0.10	42.50	4.00	2.20	3.77	0.00
16.00	3.20	1.54	2.97	0.10	43.00	4.00	2.20	3.77	0.00
16.50	3.26	1.59	3.03	0.10	43.50	4.00	2.20	3.77	0.00
17.00	3.32	1.64	3.09	0.09	44.00	4.00	2.20	3.77	0.00
17.50	3.38	1.69	3.15	0.09	44.50	4.00	2.20	3.77	0.00
18.00	3.44	1.73	3.21	0.09	45.00	4.00	2.20	3.77	0.00
18.50	3.49	1.78	3.26	0.09	45.50	4.00	2.20	3.77	0.00
19.00	3.55	1.82	3.31	0.08	46.00	4.00	2.20	3.77	0.00
19.50	3.60	1.87	3.37	0.08	46.50	4.00	2.20	3.77	0.00
20.00	3.65	1.91	3.42	0.08	47.00	4.00	2.20	3.77	0.00
20.50	3.70	1.95	3.47	0.08	47.50	4.00	2.20	3.77	0.00
21.00	3.75	1.99	3.51	0.07	48.00	4.00	2.20	3.77	0.00
21.50	3.79	2.03	3.56	0.07	48.50	4.00	2.20	3.77	0.00
22.00	3.84	2.06	3.60	0.07	49.00	4.00	2.20	3.77	0.00
22.50	3.88	2.10	3.65	0.07	49.50	4.00	2.20	3.77	0.00
23.00	3.92	2.14	3.69	0.07	50.00	4.00	2.20	3.77	0.00
23.50	3.96	2.17	3.73	0.06					
24.00	4.00	2.20	3.77	0.06					
24.50	4.00	2.20	3.77	0.00					
25.00	4.00	2.20	3.77	0.00					
25.50	4.00	2.20	3.77	0.00					
26.00	4.00	2.20	3.77	0.00					
26.50	4.00	2.20	3.77	0.00					

12129_Detention_7x7

Type IA 24-hr 25 year Rainfall=4.00"

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Summary for Pond 3P: Detention Chambers

[44] Hint: Outlet device #2 is below defined storage

Inflow Area = 0.820 ac, 76.83% Impervious, Inflow Depth = 3.40" for 25 year event
 Inflow = 0.69 cfs @ 7.89 hrs, Volume= 0.233 af
 Outflow = 0.30 cfs @ 8.40 hrs, Volume= 0.233 af, Atten= 57%, Lag= 30.6 min
 Primary = 0.30 cfs @ 8.40 hrs, Volume= 0.233 af

Routing by Stor-Ind method, Time Span= 0.00-50.00 hrs, dt= 0.01 hrs
 Peak Elev= 198.87' @ 8.40 hrs Surf.Area= 1,685 sf Storage= 2,538 cf

Plug-Flow detention time= 239.9 min calculated for 0.233 af (100% of inflow)
 Center-of-Mass det. time= 239.9 min (918.2 - 678.4)

Volume	Invert	Avail.Storage	Storage Description
#1A	196.58'	1,094 cf	32.75'W x 51.46'L x 3.50'H Field A 5,898 cf Overall - 2,251 cf Embedded = 3,647 cf x 30.0% Voids
#2A	197.08'	2,251 cf	ADS_StormTech SC-740 +Cap x 49 Inside #1 Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap 49 Chambers in 7 Rows
		3,345 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	195.96'	12.0" Round Culvert L= 31.0' RCP, rounded edge headwall, Ke= 0.100 Inlet / Outlet Invert= 195.96' / 195.65' S= 0.0100 '/ Cc= 0.900 n= 0.013, Flow Area= 0.79 sf
#2	Device 1	193.96'	1.2" Vert. Orifice/Grate C= 0.600
#3	Device 1	198.00'	3.0" Vert. Orifice/Grate C= 0.600
#4	Device 1	198.86'	5.0' long x 0.5' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32

Primary OutFlow Max=0.29 cfs @ 8.40 hrs HW=198.87' (Free Discharge)

- ↑ **1=Culvert** (Passes 0.29 cfs of 6.53 cfs potential flow)
- ↑ **2=Orifice/Grate** (Orifice Controls 0.06 cfs @ 8.22 fps)
- ↑ **3=Orifice/Grate** (Orifice Controls 0.20 cfs @ 4.16 fps)
- ↑ **4=Broad-Crested Rectangular Weir** (Weir Controls 0.02 cfs @ 0.31 fps)

12129_Detention_7x7

Type IA 24-hr 25 year Rainfall=4.00"

Prepared by {enter your company name here}

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Pond 3P: Detention Chambers - Chamber Wizard Field A

Chamber Model = ADS_StormTech SC-740 +Cap (ADS StormTech® SC-740 with cap length)

Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf

Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap

51.0" Wide + 6.0" Spacing = 57.0" C-C Row Spacing

7 Chambers/Row x 7.12' Long +0.81' Cap Length x 2 = 51.46' Row Length

7 Rows x 51.0" Wide + 6.0" Spacing x 6 = 32.75' Base Width

6.0" Base + 30.0" Chamber Height + 6.0" Cover = 3.50' Field Height

49 Chambers x 45.9 cf = 2,251.1 cf Chamber Storage

5,898.2 cf Field - 2,251.1 cf Chambers = 3,647.2 cf Stone x 30.0% Voids = 1,094.1 cf Stone Storage

Chamber Storage + Stone Storage = 3,345.2 cf = 0.077 af

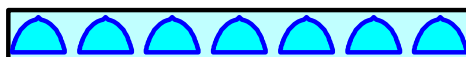
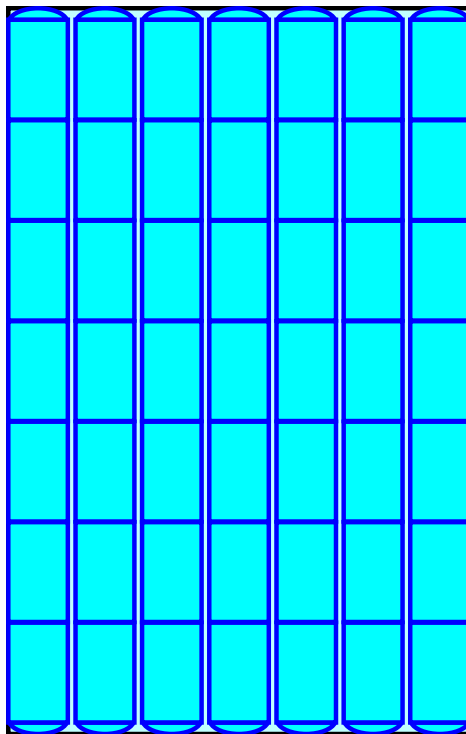
Overall Storage Efficiency = 56.7%

Overall System Size = 51.46' x 32.75' x 3.50'

49 Chambers

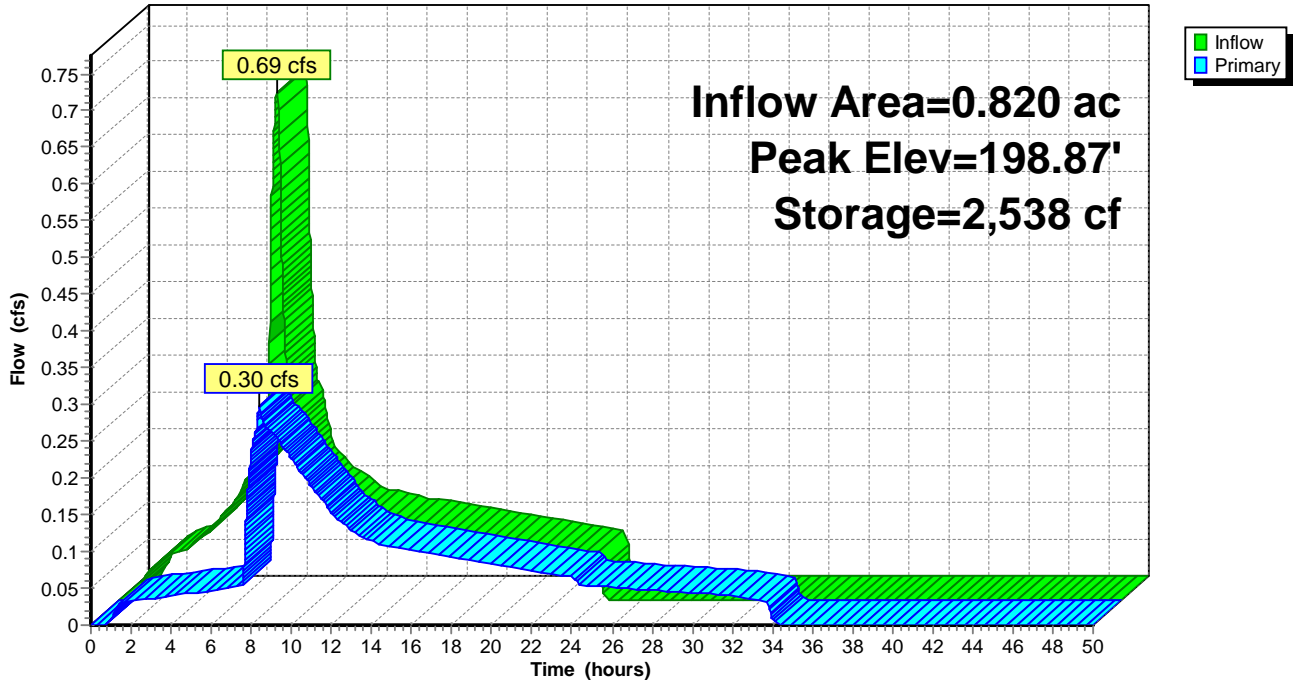
218.5 cy Field

135.1 cy Stone



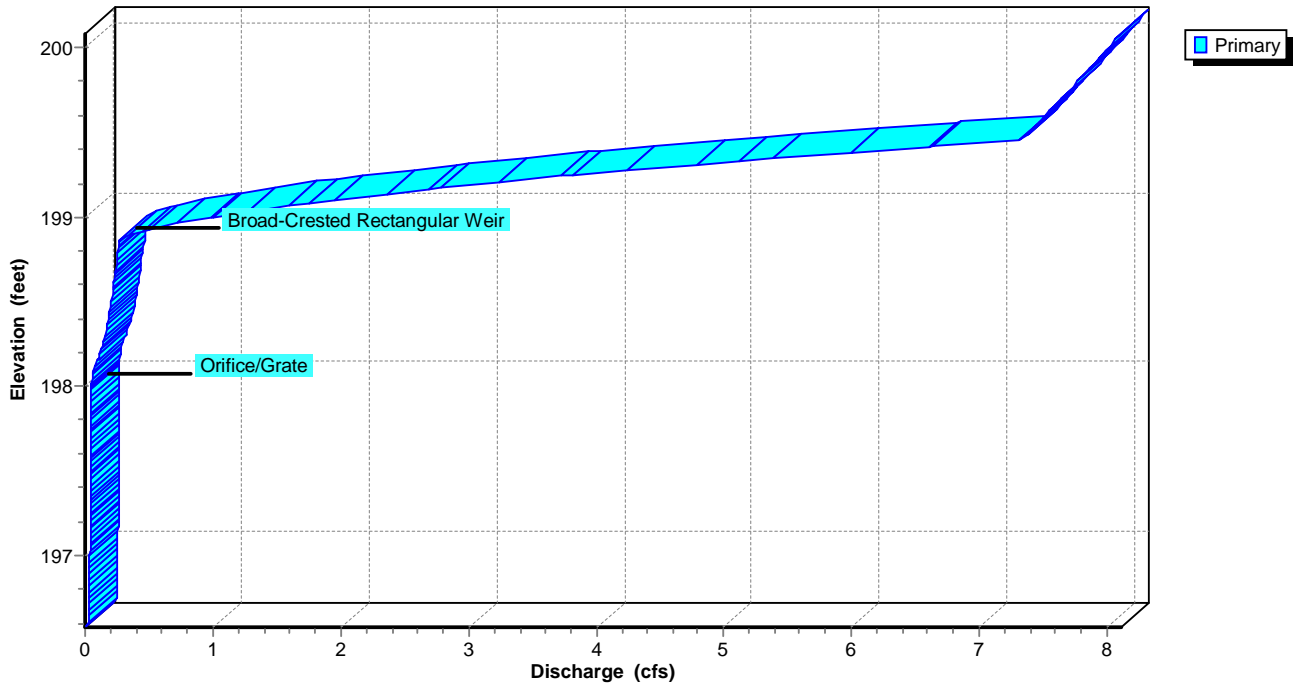
Pond 3P: Detention Chambers

Hydrograph

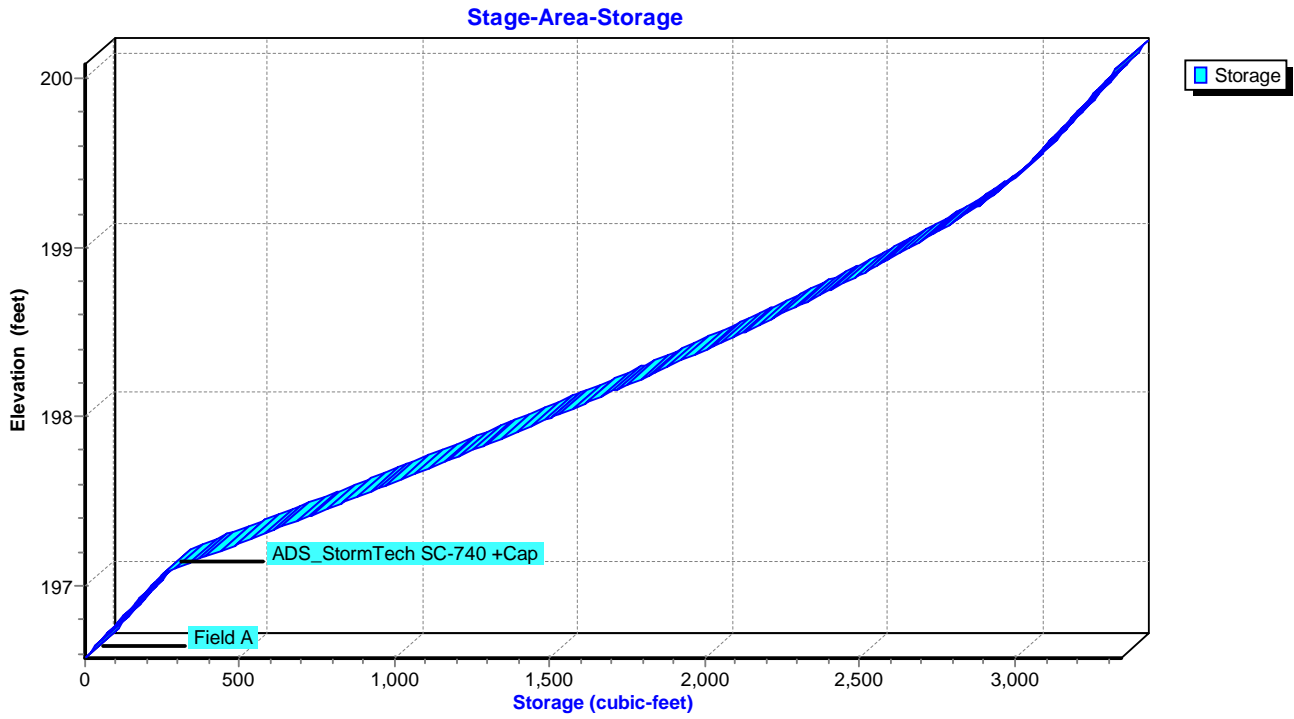


Pond 3P: Detention Chambers

Stage-Discharge



Pond 3P: Detention Chambers



12129_Detention_7x7

Type IA 24-hr 25 year Rainfall=4.00"

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Hydrograph for Pond 3P: Detention Chambers

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
0.00	0.00	0	196.58	0.00
1.00	0.01	5	196.59	0.01
2.00	0.05	45	196.67	0.03
3.00	0.07	143	196.86	0.04
4.00	0.08	270	197.09	0.04
5.00	0.11	458	197.23	0.04
6.00	0.14	750	197.43	0.05
7.00	0.18	1,170	197.74	0.05
8.00	0.67	2,298	198.65	0.23
9.00	0.22	2,497	198.83	0.26
10.00	0.16	2,257	198.61	0.23
11.00	0.14	2,039	198.43	0.19
12.00	0.12	1,875	198.29	0.15
13.00	0.11	1,786	198.22	0.13
14.00	0.11	1,746	198.19	0.11
15.00	0.10	1,727	198.17	0.11
16.00	0.10	1,714	198.16	0.10
17.00	0.09	1,702	198.15	0.10
18.00	0.09	1,689	198.14	0.09
19.00	0.08	1,676	198.13	0.09
20.00	0.08	1,663	198.12	0.08
21.00	0.07	1,649	198.11	0.08
22.00	0.07	1,634	198.10	0.07
23.00	0.07	1,618	198.08	0.07
24.00	0.06	1,601	198.07	0.07
25.00	0.00	1,417	197.93	0.05
26.00	0.00	1,229	197.79	0.05
27.00	0.00	1,049	197.65	0.05
28.00	0.00	875	197.53	0.05
29.00	0.00	708	197.40	0.05
30.00	0.00	548	197.29	0.04
31.00	0.00	394	197.18	0.04
32.00	0.00	247	197.07	0.04
33.00	0.00	113	196.80	0.03
34.00	0.00	5	196.59	0.01
35.00	0.00	0	196.58	0.00
36.00	0.00	0	196.58	0.00
37.00	0.00	0	196.58	0.00
38.00	0.00	0	196.58	0.00
39.00	0.00	0	196.58	0.00
40.00	0.00	0	196.58	0.00
41.00	0.00	0	196.58	0.00
42.00	0.00	0	196.58	0.00
43.00	0.00	0	196.58	0.00
44.00	0.00	0	196.58	0.00
45.00	0.00	0	196.58	0.00
46.00	0.00	0	196.58	0.00
47.00	0.00	0	196.58	0.00
48.00	0.00	0	196.58	0.00
49.00	0.00	0	196.58	0.00
50.00	0.00	0	196.58	0.00

12129 Detention 7x7

Type IA 24-hr 25 year Rainfall=4.00"

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Stage-Discharge for Pond 3P: Detention Chambers

Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)
196.58	0.00	197.66	0.05	198.74	0.25	199.82	7.79
196.60	0.03	197.68	0.05	198.76	0.25	199.84	7.82
196.62	0.03	197.70	0.05	198.78	0.25	199.86	7.84
196.64	0.03	197.72	0.05	198.80	0.26	199.88	7.87
196.66	0.03	197.74	0.05	198.82	0.26	199.90	7.89
196.68	0.03	197.76	0.05	198.84	0.26	199.92	7.92
196.70	0.03	197.78	0.05	198.86	0.27	199.94	7.94
196.72	0.03	197.80	0.05	198.88	0.31	199.96	7.96
196.74	0.03	197.82	0.05	198.90	0.38	199.98	7.99
196.76	0.03	197.84	0.05	198.92	0.48	200.00	8.01
196.78	0.03	197.86	0.05	198.94	0.60	200.02	8.04
196.80	0.03	197.88	0.05	198.96	0.72	200.04	8.06
196.82	0.04	197.90	0.05	198.98	0.87	200.06	8.08
196.84	0.04	197.92	0.05	199.00	1.02	200.08	8.11
196.86	0.04	197.94	0.05	199.02	1.19		
196.88	0.04	197.96	0.05	199.04	1.36		
196.90	0.04	197.98	0.05	199.06	1.55		
196.92	0.04	198.00	0.05	199.08	1.75		
196.94	0.04	198.02	0.06	199.10	1.96		
196.96	0.04	198.04	0.06	199.12	2.18		
196.98	0.04	198.06	0.06	199.14	2.42		
197.00	0.04	198.08	0.07	199.16	2.66		
197.02	0.04	198.10	0.08	199.18	2.91		
197.04	0.04	198.12	0.08	199.20	3.17		
197.06	0.04	198.14	0.09	199.22	3.44		
197.08	0.04	198.16	0.10	199.24	3.72		
197.10	0.04	198.18	0.11	199.26	4.01		
197.12	0.04	198.20	0.12	199.28	4.32		
197.14	0.04	198.22	0.13	199.30	4.63		
197.16	0.04	198.24	0.14	199.32	4.96		
197.18	0.04	198.26	0.14	199.34	5.29		
197.20	0.04	198.28	0.15	199.36	5.64		
197.22	0.04	198.30	0.16	199.38	5.99		
197.24	0.04	198.32	0.16	199.40	6.35		
197.26	0.04	198.34	0.17	199.42	6.73		
197.28	0.04	198.36	0.17	199.44	7.11		
197.30	0.04	198.38	0.18	199.46	7.34		
197.32	0.04	198.40	0.18	199.48	7.36		
197.34	0.04	198.42	0.19	199.50	7.39		
197.36	0.04	198.44	0.19	199.52	7.42		
197.38	0.05	198.46	0.20	199.54	7.44		
197.40	0.05	198.48	0.20	199.56	7.47		
197.42	0.05	198.50	0.21	199.58	7.49		
197.44	0.05	198.52	0.21	199.60	7.52		
197.46	0.05	198.54	0.21	199.62	7.54		
197.48	0.05	198.56	0.22	199.64	7.57		
197.50	0.05	198.58	0.22	199.66	7.59		
197.52	0.05	198.60	0.22	199.68	7.62		
197.54	0.05	198.62	0.23	199.70	7.64		
197.56	0.05	198.64	0.23	199.72	7.67		
197.58	0.05	198.66	0.24	199.74	7.69		
197.60	0.05	198.68	0.24	199.76	7.72		
197.62	0.05	198.70	0.24	199.78	7.74		
197.64	0.05	198.72	0.25	199.80	7.77		

12129 Detention 7x7

Type IA 24-hr 25 year Rainfall=4.00"

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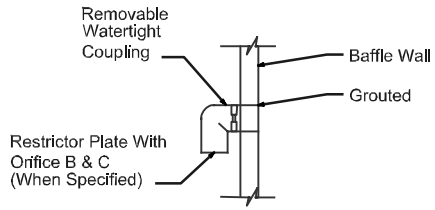
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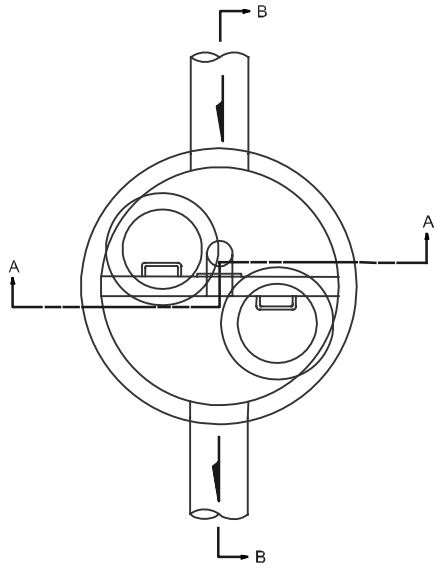
Stage-Area-Storage for Pond 3P: Detention Chambers

Elevation (feet)	Storage (cubic-feet)	Elevation (feet)	Storage (cubic-feet)
196.58	0	199.28	2,911
196.63	25	199.33	2,947
196.68	51	199.38	2,980
196.73	76	199.43	3,010
196.78	101	199.48	3,039
196.83	126	199.53	3,066
196.88	152	199.58	3,092
196.93	177	199.63	3,118
196.98	202	199.68	3,143
197.03	228	199.73	3,168
197.08	253	199.78	3,194
197.13	323	199.83	3,219
197.18	394	199.88	3,244
197.23	465	199.93	3,269
197.28	535	199.98	3,295
197.33	605	200.03	3,320
197.38	675	200.08	3,345
197.43	744		
197.48	813		
197.53	882		
197.58	950		
197.63	1,019		
197.68	1,086		
197.73	1,154		
197.78	1,220		
197.83	1,287		
197.88	1,353		
197.93	1,418		
197.98	1,484		
198.03	1,548		
198.08	1,612		
198.13	1,676		
198.18	1,739		
198.23	1,801		
198.28	1,863		
198.33	1,924		
198.38	1,985		
198.43	2,044		
198.48	2,104		
198.53	2,162		
198.58	2,220		
198.63	2,276		
198.68	2,332		
198.73	2,387		
198.78	2,441		
198.83	2,494		
198.88	2,546		
198.93	2,596		
198.98	2,646		
199.03	2,694		
199.08	2,741		
199.13	2,786		
199.18	2,830		
199.23	2,872		

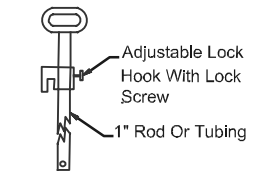
APPENDIX 'C' – FLOW CONTROL MANHOLE DETAIL



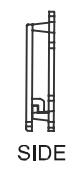
ELBOW DETAIL



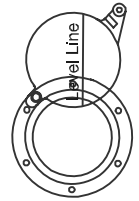
PLAN



LIFT HANDLE DETAIL



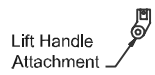
SIDE



MAXIMUM OPENING OF GATE DETAIL

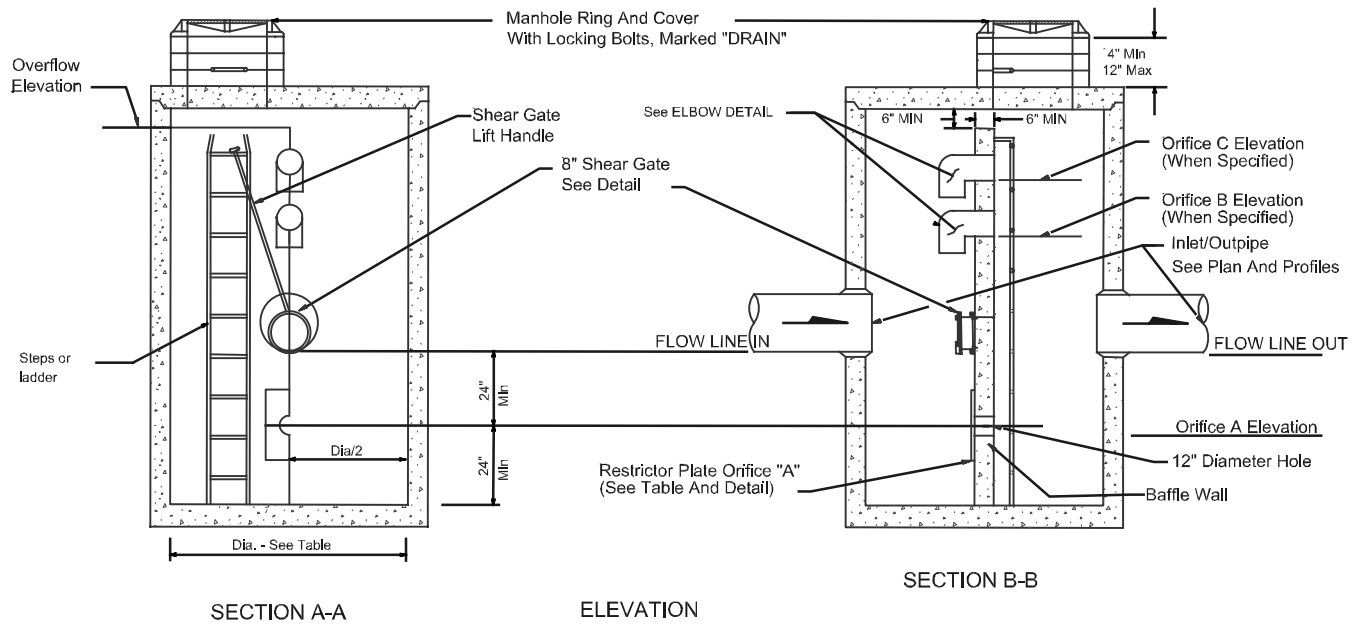


FRONT



Lift Handle Attachment

SHEAR GATE AS MANUFACTURED BY KENNEDY VALVE OR EQUAL



SECTION A-A

ELEVATION

SECTION B-B

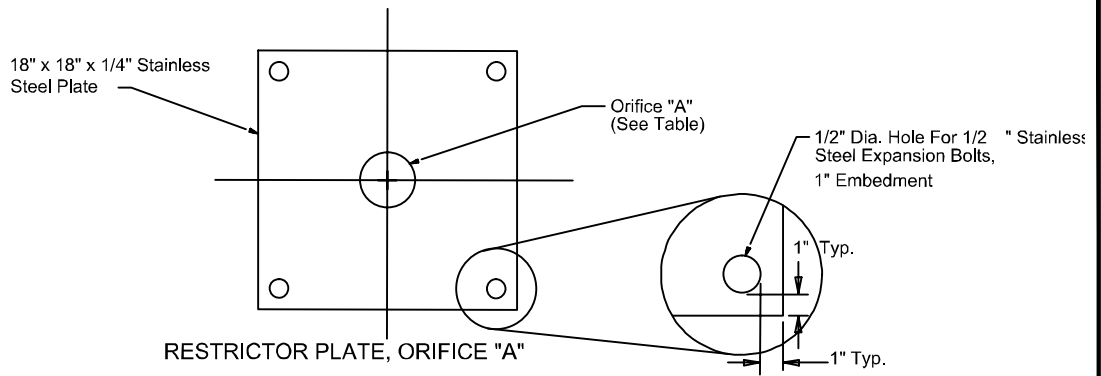
FLOW CONTROL STRUCTURE DETAIL NTS

City of Newberg
 PUBLIC WORKS ENGINEERING DIVISION
 414 E. FIRST STREET NEWBERG, OR 97132
 PHONE: 503-537-1240
 FAX: 503-537-1277

REVISIONS:

FLOW CONTROL STRUCTURE

SCALE:	N.T.S.
DATE:	MARCH 2014
APPROVED BY:	JAY H.
STANDARD DRAWING	416A



FLOW CONTROL STRUCTURE TABLE-
DESIGN ENGINEER TO SPECIFY

Diameter Of Manhole (In.)	
FLOW LINE (In)	
FLOW LINE (Out)	
Outlet Pipe Diameter (In.)	
Number Of Orifice	
Orifice A Elevation	
Diameter Of Orifice A (In.)	
Orifice B Elevation	
Diameter Of Orifice B (In.)	
Orifice C Elevation	
Diameter Of Orifice C (In)	
Overflow Elevation	
Rim Elevation	
Riser Diameter (In.)	

NOTES:

1. BAFFLE WALL SHALL HAVE #4 BAR AT 12" SPACING EACH WAY.
2. PRECAST BAFFLE SHALL BE KEYED AND GROUTED IN PLACE. JOINT BETWEEN CONCRETE BAFFLE AND MANHOLE WALL SHALL BE WATERTIGHT.
3. UPPER FLOW ORIFICE SHALL BE STAINLESS STEEL OR ALUMINUM.
4. FRAME AND LADDER OR STEPS ARE TO BE OFFSET SO THAT: SHEAR GATE IS VISIBLE FROM THE TOP; CLIMB-DOWN SPACE IS CLEAR OF RISER AND GATE; FRAME IS CLEAR OF CURB.
5. MULTI-ORIFICE ELBOWS SHALL BE PRE INSTALLED TO INSURE LADDER CLEARANCE.
6. RESTRICTOR PLATE WITH ORIFICE AS SPECIFIED IN THE CONTRACT. OPENING IS TO BE CUT ROUND AND SMOOTH. NEOPRENE GASKET SHALL BE INSTALLED BETWEEN THE ORIFICE PLATE AND CONCRETE BAFFLE TO PROVIDE A WATERTIGHT SEAL.
7. SHEAR GATE SHALL BE MADE OF ALUMINUM ALLOY IN ACCORDANCE WITH ASTM B 26M AND ASTM B 275, DESIGNATION Zg32A OR CAST IRON IN ACCORDANCE WITH ASTM A 48, CLASS 30B. LIFT HANDLE MAY BE SOLID ROD OR HOLLOW TUBING WITH ADJUSTABLE HOOK AS REQUIRED. NEOPRENE RUBBER GASKET REQUIRED BETWEEN RISER MOUNTING FLANGE AND GATE FLANGE. MATING SURFACES OF LID AND BODY SHALL BE MACHINED FOR PROPER FIT.
8. FLANGE MOUNTING BOLTS SHALL BE 1/2" DIAMETER STAINLESS STEEL.
9. SHEAR GATE MAXIMUM OPENING SHALL BE CONTROLLED BY LIMITED HINGE MOVEMENT, STOP TAB OR SOME OTHER DEVICE.
10. ALTERNATE SHEAR GATES DESIGNS ARE ACCEPTABLE, IF MATERIAL SPECIFICATIONS ARE MET AND FLANGE BOLT PATTERN MATCHES.
11. MANHOLE CERTIFICATION REQUIRED FOR TRAFFIC LOADING.

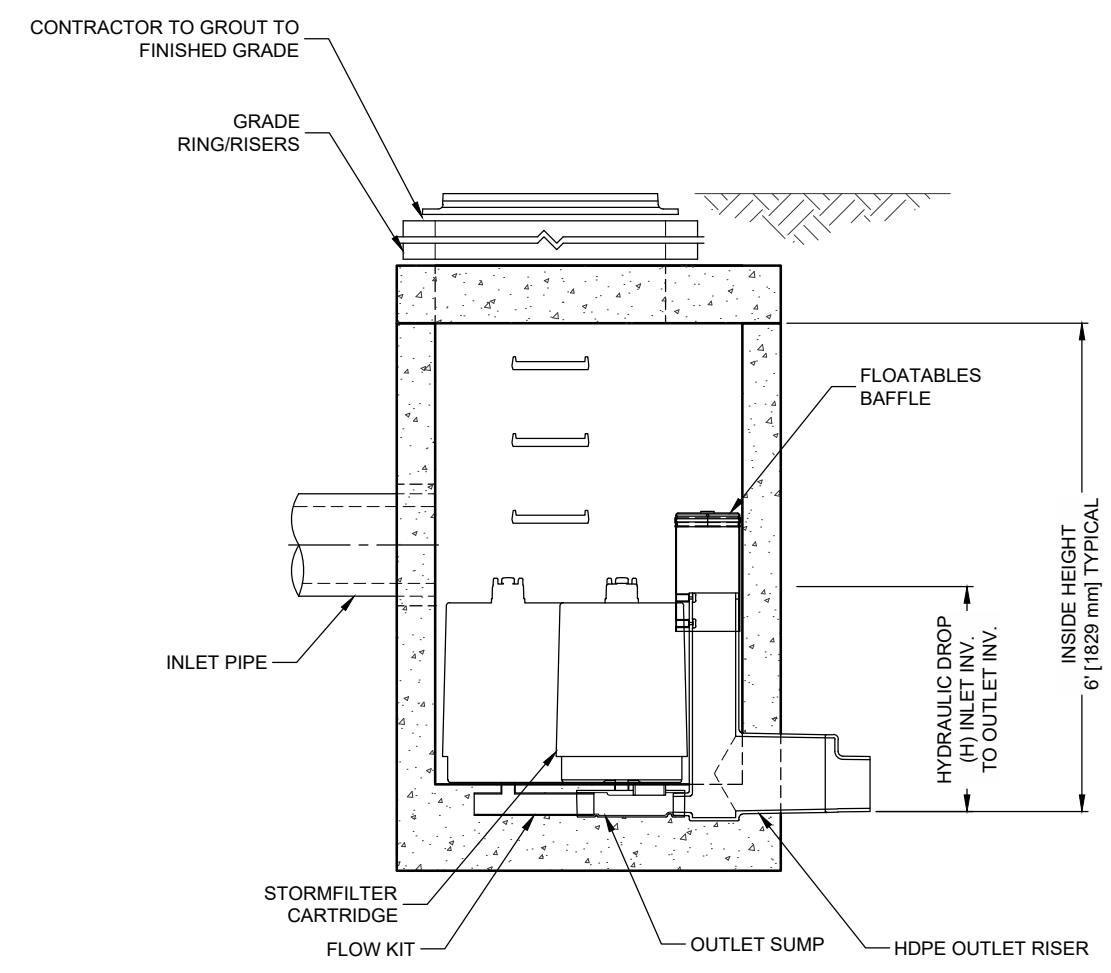
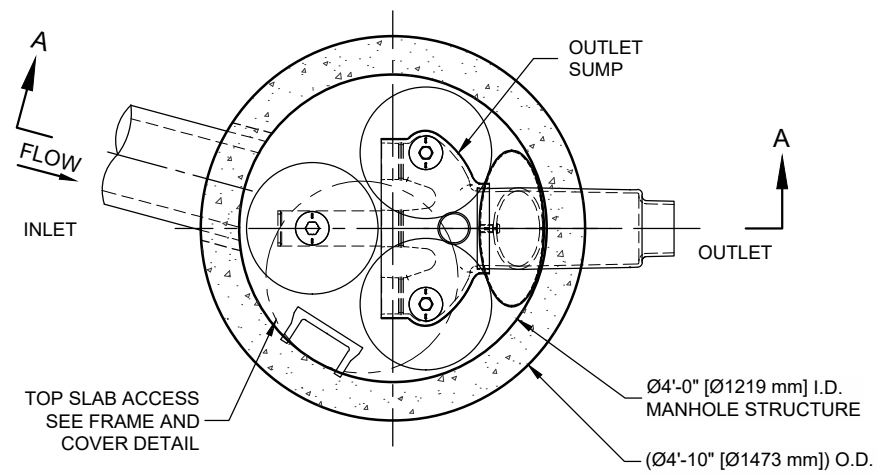
City of Newberg
PUBLIC WORKS ENGINEERING DIVISION
414 E. FIRST STREET NEWBERG, OR 97132
PHONE: 503-537-1240
FAX: 503-537-1277

REVISIONS:
05/05/2015 - ASM

**FLOW CONTROL
STRUCTURE NOTES &
ORIFICE**

SCALE:	N.T.S.
DATE:	May 2015
APPROVED BY:	K. Hofmann
STANDARD DRAWING	416B

APPENDIX 'D' – STORMFILTER MANHOLE DETAIL



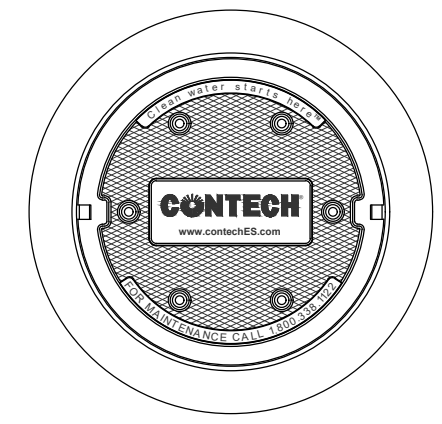
STORMFILTER DESIGN NOTES

STORMFILTER TREATMENT CAPACITY IS A FUNCTION OF THE CARTRIDGE SELECTION AND THE NUMBER OF CARTRIDGES. THE STANDARD MANHOLE STYLE IS SHOWN WITH THE MAXIMUM NUMBER OF CARTRIDGES (3). VOLUME SYSTEM IS ALSO AVAILABLE WITH MAXIMUM 3 CARTRIDGES. Ø4 [1219 mm] MANHOLE STORMFILTER PEAK HYDRAULIC CAPACITY IS 1.0 CFS [28.3 L/s] . IF THE SITE CONDITIONS EXCEED 1.0 CFS [28.3 L/s] AN UPSTREAM BYPASS STRUCTURE IS REQUIRED.

CARTRIDGE SELECTION

CARTRIDGE HEIGHT	27" [686 mm]			18" [458 mm]			LOW DROP		
RECOMMENDED HYDRAULIC DROP (H)	3.05' [930 mm]			2.3' [700 mm]			1.8' [550 mm]		
SPECIFIC FLOW RATE (gpm/sf) [L/s/m ²]	2 [1.30]	1.67* [1.08]	1 [0.65]	2 [1.30]	1.67* [1.08]	1 [0.65]	2 [1.30]	1.67* [1.08]	1 [0.65]
CARTRIDGE FLOW RATE (gpm) [L/s]	22.5 [1.42]	18.79 [1.19]	11.25 [0.71]	15 [0.95]	12.53 [0.79]	7.5 [0.44]	10 [0.63]	8.35 [0.54]	5 [0.32]

* 1.67 gpm/sf [1.08 L/s/m²] SPECIFIC FLOW RATE IS APPROVED WITH PHOSPHOSORB® (PSORB) MEDIA ONLY



SITE SPECIFIC DATA REQUIREMENTS	
STRUCTURE ID	*
WATER QUALITY FLOW RATE (cfs) [L/s]	*
PEAK FLOW RATE (cfs) [L/s]	*
RETURN PERIOD OF PEAK FLOW (yrs)	*
CARTRIDGE HEIGHT (SEE TABLE ABOVE)	*
NUMBER OF CARTRIDGES REQUIRED	*
CARTRIDGE FLOW RATE	*
MEDIA TYPE (PERLITE, ZPG, PSORB)	*
PIPE DATA:	
	I.E. MATERIAL DIAMETER
INLET PIPE #1	* * *
INLET PIPE #2	* * *
OUTLET PIPE	* * *
RIM ELEVATION	
*	
ANTI-FLOTATION BALLAST	WIDTH HEIGHT
	* *
NOTES/SPECIAL REQUIREMENTS:	
* PER ENGINEER OF RECORD	

GENERAL NOTES

- CONTECH TO PROVIDE ALL MATERIALS UNLESS NOTED OTHERWISE.
- DIMENSIONS MARKED WITH () ARE REFERENCE DIMENSIONS. ACTUAL DIMENSIONS MAY VARY.
- FOR SITE SPECIFIC DRAWINGS WITH DETAILED VAULT DIMENSIONS AND WEIGHTS, PLEASE CONTACT YOUR CONTECH ENGINEERED SOLUTIONS LLC REPRESENTATIVE. www.ContechES.com
- STORMFILTER WATER QUALITY STRUCTURE SHALL BE IN ACCORDANCE WITH ALL DESIGN DATA AND INFORMATION CONTAINED IN THIS DRAWING.
- STRUCTURE SHALL MEET AASHTO HS-20 LOAD RATING, ASSUMING EARTH COVER OF 0' - 5' [1524 mm] AND GROUNDWATER ELEVATION AT, OR BELOW, THE OUTLET PIPE INVERT ELEVATION. ENGINEER OF RECORD TO CONFIRM ACTUAL GROUNDWATER ELEVATION. CASTINGS SHALL MEET AASHTO M306 AND BE CAST WITH THE CONTECH LOGO.
- FILTER CARTRIDGES SHALL BE MEDIA-FILLED, PASSIVE, SIPHON ACTUATED, RADIAL FLOW, AND SELF CLEANING. RADIAL MEDIA DEPTH SHALL BE 7-INCHES [178 mm]. FILTER MEDIA CONTACT TIME SHALL BE AT LEAST 38 SECONDS.
- SPECIFIC FLOW RATE IS EQUAL TO THE FILTER TREATMENT CAPACITY (gpm) [L/s] DIVIDED BY THE FILTER CONTACT SURFACE AREA (sq ft)[m²].
- STORMFILTER STRUCTURE SHALL BE PRECAST CONCRETE CONFORMING TO ASTM C-478 AND AASHTO LOAD FACTOR DESIGN METHOD.

INSTALLATION NOTES

- ANY SUB-BASE, BACKFILL DEPTH, AND/OR ANTI-FLOTATION PROVISIONS ARE SITE-SPECIFIC DESIGN CONSIDERATIONS AND SHALL BE SPECIFIED BY ENGINEER OF RECORD.
- CONTRACTOR TO PROVIDE EQUIPMENT WITH SUFFICIENT LIFTING AND REACH CAPACITY TO LIFT AND SET THE STORMFILTER STRUCTURE.
- CONTRACTOR TO INSTALL JOINT SEALANT BETWEEN ALL STRUCTURE SECTIONS AND ASSEMBLE STRUCTURE.
- CONTRACTOR TO PROVIDE, INSTALL, AND GROUT INLET PIPE(S).
- CONTRACTOR TO PROVIDE AND INSTALL CONNECTOR TO THE OUTLET RISER STUB. STORMFILTER EQUIPPED WITH A DUAL DIAMETER HDPE OUTLET STUB AND SAND COLLAR. IF OUTLET PIPE IS LARGER THAN 8 INCHES [200 mm], CONTRACTOR TO REMOVE THE 8 INCH [200 mm] OUTLET STUB AT MOLDED-IN CUT LINE. COUPLING BY FERNCO OR EQUAL AND PROVIDED BY CONTRACTOR.
- CONTRACTOR TO TAKE APPROPRIATE MEASURES TO PROTECT CARTRIDGES FROM CONSTRUCTION-RELATED EROSION RUNOFF.

I:\STORMWATER\COMPS\10 STORMFILTER\40 STANDARD DRAWINGS\MANHOLE\SFMH48-DTL.DWG 4/5/2019 10:54 AM

The Stormwater Management
StormFilter

THIS PRODUCT MAY BE PROTECTED BY ONE OR MORE OF THE FOLLOWING U.S. PATENTS: 5,322,629; 5,524,576; 5,707,527; 5,985,157; 6,027,639; 6,649,048; RELATED FOREIGN PATENTS, OR OTHER PATENTS PENDING.

CONTECH
ENGINEERED SOLUTIONS LLC

www.contechES.com
9025 Centre Pointe Dr., Suite 400, West Chester, OH 45069
800-338-1122 513-645-7000 513-645-7993 FAX

SFMH48
STORMFILTER
STANDARD DETAIL



**SANTA BARBARA URBAN HYDROGRAPHS
(Water Quality Flow Rate - Number of Cartridges)**

JOB NUMBER: 121-029
 PROJECT: Newberg Apartments
 FILE: 12129_hydro_planning

DESCRIPTION	DESIGN STORM (YR)	DURATION (HR)	PRECIP (IN)	AREA TOTAL (AC)	% IMP	AREA PERV. (AC)	CN PER.	AREA IMP. (AC)	CN IMP.	TIME (MIN)	Q (CFS)
DEVELOPED WQ-YEAR PEAK DISCHARGE	WQ	24	1	0.41	76.90	0.09	82.3	0.32	98	5.00	0.07

Assumptions:

Each storm filter manhole treats half of the site

1.67 gmp/sf

SF treated/cartridge = 5,936

18" Cartridge Height

Cartridge Flow Rate = 12.53 gpm (0.0278 cfs)

Number of cartridges required: .07 cfs/0.0278 cfs = 2.5 cartridges (use 3 cartridges)

APPENDIX 'E' – PRELIMINARY OPERATIONS & MAINTENANCE PLAN

Preliminary Operations & Maintenance Plan

The Haworth

Newberg, OR 97132

November 7, 2022

Prepared For:

Grove Development, Inc.
7570 SW 74th Avenue
Portland, Oregon 97223
503.793.3299

Prepared By:

Pioneer Design Group, Inc.
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Portland, Oregon 97223
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STORMWATER FACILITIES

Water quality and quantity treatment will occur through trapped catch basins, filtration manholes and underground detention chambers.

- Underground Storage Chamber
 - Underground storage chambers are a proprietary structure made of corrugated plastics by ADS. Stormwater from the roof of the apartment building is piped to the facility where it is detained and released at the respective predeveloped rate.

- Stormfilter Manholes
 - Stormfilter manholes are proprietary treatment device made by Contech Engineering Solutions that use cartridges to filter and treat stormwater runoff. Two manholes will treat runoff from the building roof, sidewalks and parking lot.

FACILITY DESCRIPTION TABLE					
Facility Name	Type	Size (SF)	Area Treated	IA Treated (SF)	Discharge Point
Chamber	Underground Storage Chamber	(7 Rows of 7 Chambers)	Roof, Sidewalk, Parking Lot, Landscape Area	27,472	Existing Public Storm System
SFMH-1	Stormfilter Cartridge Manhole	48" Dia. (3 cartridges)	Roof, Sidewalk, Parking Lot	13,736	Existing Public Storm System
SFMH-2	Stormfilter Cartridge Manhole	48" Dia. (3 cartridges)	Roof, Sidewalk, Parking Lot	13,736	Existing Public Storm System

RESPONSIBILITY

The facility is to be maintained by Grove Development, Inc. (owner). The preparer has worked closely with the owner to design a system that can be easily maintained by their maintenance staff and employees.

Under The City of Newberg’s surface water code, responsibilities include:

- Maintain stormwater management facilities in good condition, with facilities operating at design capacity and performing the function for which they were designed while in continuous working order.

- Inspect and maintain at an appropriate frequency and level to avoid nuisance conditions in or adjacent to the stormwater management facility that suggest that the facility is not

in good working order, such as uncontrolled runoff and overflow, stagnant water with concomitant algae growth, insect breeding, odors, discarded debris, or safety hazards created by the facility's operation.

- Inspect stormwater facilities according to the schedule included in the maintenance checklists provided in this manual or a facility-specific OMP.
- Promptly repair and restore stormwater management facilities in accordance with the maintenance checklists provided in this manual.
- Provide and maintain all necessary access routes from the public right-of-way in accordance with this manual or the OMP.

A copy of this O&M Plan shall be provided to all property owners and tenants.

I. DESCRIPTION

Stormwater runoff from the apartment roof, sidewalk, parking lot and landscape areas will be conveyed to the Stormfilter Manholes for treatment prior to being discharged into the underground storage chambers for via a piped storm system network. A flow control manhole will attenuate developed flows to their respective predeveloped flow rates before being discharged to a public 24-inch storm main located on the north boundary of the subject site. Stormwater from the parking lot will be collected in trapped catch basins for pretreatment upstream of the filtration manholes. *See attached site plan.*

II. INSPECTION and VISUAL INDICATORS OF DIMINISHED PERFORMANCE

The underground storage facilities shall be inspected and maintained quarterly for the first two years, after which they shall be inspected twice a year thereafter. The facilities shall also be inspected within 48 hours after each major storm event (defined as more than one inch of rain over a 24-hour period).

All components of the storm system must be inspected and maintained frequently or they will cease to function effectively. The property owner shall keep a facility log, recording all inspection dates, observations, and maintenance activities. Receipts shall be saved when maintenance is performed and there is a record of expense.

For at least the first two years, inspections shall be conducted with the facility drawings and the O&M Plan in hand to assist the inspector in recognizing signs of diminished performance.

Typical visual indicators of diminished performance are listed below:

- Clogged inlets, catch basins, or silt traps.

- Cracked drain pipes or catch basins.
- Vegetation encroachment.
- Ponding water.

III. MAINTENANCE ACTIVITIES

The following items shall be inspected and maintained as stated:

Underground Storage Chambers

- The underground storage chambers should initially be inspected immediately after completion of the site's construction.
- Remove sediment and debris from all accessible components.
- See attached Storage ADS StormTech Chamber Inspection and Stormfilter Maintenance Guide.

Catch Basins, Inlets, Gutters, and Piped Storm System

- Sediment shall be removed biannually.
- Debris shall be removed from catch basins quarterly or after any large rain event (more than one inch of rain over a 24-hour period).
- Quarterly inspection for clogging shall be performed. Remove sediment, debris and blockages to maintain at least 50% conveyance at all times.
- Repair or seal cracks in drain pipes, catch basins, or silt traps. Replace when repair is insufficient.

Source Control

- Remove trash, debris and sediment from driveway or surrounding property as required.
- Identify sources of visible pollutants and clean up immediately.
- Sweep or vacuum ground level surfaces biannually.
- Rake and remove fallen or dead leaves and vegetation seasonally.

Spill Prevention

- Releases of pollutants or pollutant source shall be corrected within 12 hours.
- Remove and replace contaminated soil. Call Metro (503-797-1700) to determine proper disposal requirements of spill response materials and contaminated soil.
- Report spills of hazardous materials to City staff (503-635-0238).
- Record the date and spill response measures in the inspection log.
- Clean up spills immediately.

Insects and Rodents

- Pest control measures shall be taken when insects are problematic.

- If sprays are considered, they shall be applied only by a licensed contractor. Only sprays approved by the City of Newberg shall be allowed.
- If rodents are found, remove plant debris, fruits or nuts that provide food and shelter and contact the appropriate county vector control office for trapping and removal.

Access

- Access shall be provided to the facility so operations and maintenance can be performed as regularly scheduled.

IV. FINANCIAL RESPONSIBILITY

The party listed below shall be fiscally responsible for operating and maintaining the stormwater facility:

Grove Development, Inc.
7570 SW 74th Avenue
Portland, Oregon 97223
(p) 503-793-3299

V. INSPECTION AND MAINTENANCE LOGS

Infiltration/Flow Control – All facilities shall drain within 48 hours. Time/date, weather, and site conditions shall be recorded when ponding occurs.

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 Maintenance Department (503-538-8321) for immediate assistance with responding to spills. Record time/date, weather, and site conditions if site activities are found to contaminate sanitary or storm system.

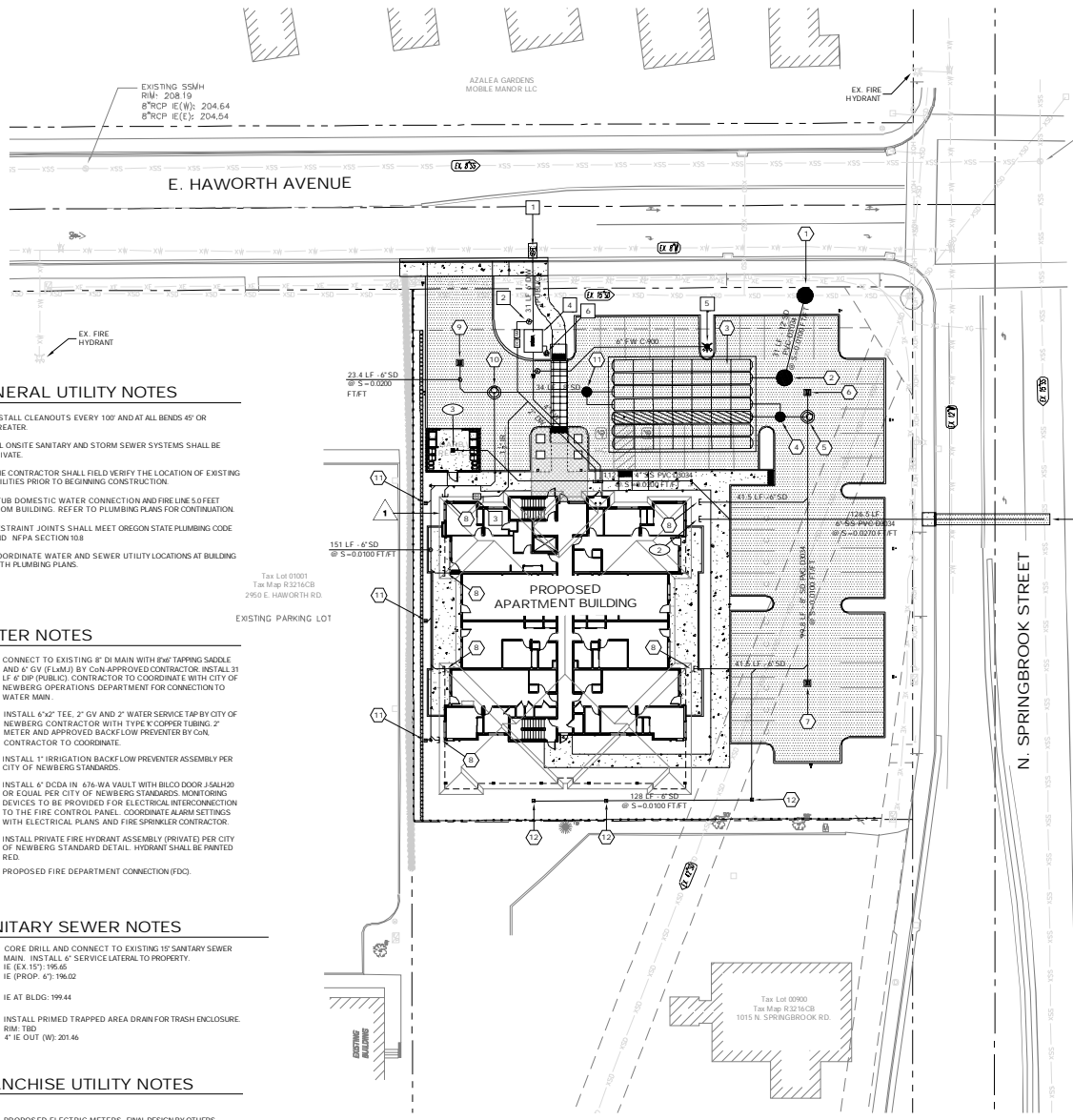
Vectors (mosquitoes and rodents) – Stormwater facilities shall not harbor mosquito larvae or rats that pose a threat to public health or that undermine the facility structure. Note holes/burrows in and around facilities. Record time/date, weather, and site conditions when vector activity is observed.

Maintenance – Record date, description, and contractor (if applicable) for all structural repairs, landscape maintenance, and facility cleanout services.

General Annual Maintenance Schedule

- Make structural repairs. Clean drains, inlets, and catch basins (**Summer**)
- Clean downspouts and rain drains; remove sediment and plant debris (**Fall**)
- Clear inlets and outlets to maintain conveyance (**Winter**)
- Clean gutters and rain drains (**Spring**)

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GENERAL UTILITY NOTES

1. INSTALL CLEANOUTS EVERY 100' AND AT ALL BENDS 45' OR GREATER.
2. ALL ON-SITE SANITARY AND STORM SEWER SYSTEMS SHALL BE PRIVATE.
3. THE CONTRACTOR SHALL FIELD VERIFY THE LOCATION OF EXISTING UTILITIES PRIOR TO BEGINNING CONSTRUCTION.
4. STUB DOMESTIC WATER CONNECTION AND FIRE LINE 5.0 FEET FROM BUILDING. REFER TO PLUMBING PLANS FOR CONTINUATION.
5. RESTRAINT JOINTS SHALL MEET OREGON STATE PLUMBING CODE AND NFPA SECTION 108.
6. COORDINATE WATER AND SEWER UTILITY LOCATIONS AT BUILDING WITH PLUMBING PLANS.

WATER NOTES

1. CONNECT TO EXISTING 8" DI MAIN WITH 6" TAPPING SADDLE AND 4" GV (FLMJ) BY CON APPROVED CONTRACTOR. INSTALL 31 LF 6" DIP (PUBLIC) CONTRACTOR TO COORDINATE WITH CITY OF NEWBERG OPERATIONS DEPARTMENT FOR CONNECTION TO WATER MAIN.
2. INSTALL 6"x2" TEE, 2" GV AND 2" WATER SERVICE TAP BY CITY OF NEWBERG CONTRACTOR WITH TYPE K COPPER TUBING 2" METER AND APPROVED BACKFLOW PREVENTER BY CON CONTRACTOR TO COORDINATE.
3. INSTALL 1" IRRIGATION BACKFLOW PREVENTER ASSEMBLY PER CITY OF NEWBERG STANDARDS.
4. INSTALL 6" DCDA IN 676 WA VAULT WITH BILCO DOOR, J5ALH20 OR EQUAL PER CITY OF NEWBERG STANDARDS. MONITORING DEVICES TO BE PROVIDED FOR ELECTRICAL INTERCONNECTION TO THE FIRE CONTROL PANEL. COORDINATE ALARM SETTINGS WITH ELECTRICAL PLANS AND FIRE SPRINKLER CONTRACTOR.
5. INSTALL PRIVATE FIRE HYDRANT ASSEMBLY (PRIVATE) PER CITY OF NEWBERG STANDARD DETAIL. HYDRANT SHALL BE PAINTED RED.
6. PROPOSED FIRE DEPARTMENT CONNECTION (FDC).

SANITARY SEWER NOTES

1. CORE DRILL AND CONNECT TO EXISTING 15" SANITARY SEWER MAIN. INSTALL 6" SERVICE LATERAL TO PROPERTY. IE (EX. 15') 196.60 IE (PROP. 4') 196.62
2. IE AT BLDG. 199.44
3. INSTALL PRIMED TRAPPED AREA DRAIN FOR TRASH ENCLOSURE. RM: TBD 4" IE OUT (W) 201.46

FRANCHISE UTILITY NOTES

1. PROPOSED ELECTRIC METERS. FINAL DESIGN BY OTHERS.

LEGEND

	PROPOSED DOMESTIC WATER LINE
	PROPOSED FIRE SERVICE LINE
	PROPOSED DOUBLE CHECK DETECTOR ASSEMBLY
	PROPOSED CLEANOUT
	PROPOSED TRAPPED CATCH BASIN
	PROPOSED LANDSCAPE DRAIN
	PROPOSED SANITARY SEWER LINE
	PROPOSED STORM DRAIN LINE
	PROPOSED FIRE DEPARTMENT CONNECTION (FDC)
	PROPOSED WATER AND IRRIGATION METER
	PROPOSED DOUBLE CHECK DETECTOR ASSEMBLY
	PROPOSED STORM SEWER MANHOLE
	PROPOSED STORM FILTER MANHOLE
	PROPOSED UNDERGROUND DETENTION CHAMBERS

STORM SEWER NOTES

1. INSTALL 60" DI MANHOLE OVER EXISTING 24" STORM SEWER LINE. RM = 208.87 EX. 24" IE (E) = 193.85 12" IE IN (SW) = 194.65 EX. 24" IE OUT (W) = 193.65
2. INSTALL 60" FLOW CONTROL MANHOLE. RM = TBD 12" IE IN (W) = 194.06 12" IE OUT (NE) = 194.96
3. 7 ROWS OF 1' UNDERGROUND DETENTION CHAMBERS (STORMTECH ADS SC 743) 6" ROCK BASE, 4" ROCK COVER, ROCK BOTTOM ELEV = 196.58 CHAMBER BOTTOM ELEV = 197.08
4. INSTALL 30" DI NYLOPLAST DRAIN BASIN (STANDARD AASHTO H-20 GRATE) INSTALL 11 LF 24" ACCESS PIPE WITH 10" MANFOLD RM = TBD 10" IE IN (E) = 198.35 10" IE OUT (N) = 198.35 24" IE OUT (W) = 197.38
5. CONSTRUCT 48" WATER QUALITY STORM FILTER MANHOLE (SFMH-1). (3-18" CARTRIDGES) RM: TBD 6" IE IN (N) 200.75 8" IE IN (S) 200.75 10" IE OUT (W) 198.45
6. CONSTRUCT TRAPPED CATCH BASIN INSTALL 8 LF 6" PVC D304 RM: 204.06 6" IE OUT (S) 200.54
7. CONSTRUCT TRAPPED CATCH BASIN INSTALL 180 LF 8" PVC D304 RM: 204.43 8" IE OUT (N) 201.75
8. CONNECT TO BUILDING ROOF DRAIN WITH 6" SD AT 2.0% MIN.
9. CONSTRUCT TRAPPED CATCH BASIN INSTALL 23.4 LF 6" PVC D304 RM: 206.02 6" IE OUT (S) 201.63
10. CONSTRUCT 48" WATER QUALITY STORM FILTER MANHOLE (SFMH-2). (3-18" CARTRIDGES) RM: TBD 6" IE IN (W) 201.16 6" IE IN (S) 201.16 10" IE OUT (E) 198.86
11. INSTALL 30" DI NYLOPLAST DRAIN BASIN (STANDARD AASHTO H-20 GRATE) INSTALL 11 LF 24" ACCESS PIPE WITH 10" MANFOLD RM = TBD 8" IE IN (W) = 198.52 10" IE OUT (S) = 198.35 24" IE OUT (E) = 197.38
12. CONSTRUCT 12" S.Q. LANDSCAPE AREA DRAIN WITH ATRUM GRATE (ADS PART NOS. 1200, 1290, AND 1242 OR EQUAL).
13. CONSTRUCT 12" S.Q. LANDSCAPE AREA DRAIN WITH ATRUM GRATE (ADS PART NOS. 1200, 1290, AND 1242 OR EQUAL).



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PRELIMINARY

PRELIMINARY COMPOSITE UTILITY PLAN

THE HAWORTH APARTMENTS
 NEWBERG, OREGON

Designed by	UL	Date	10/2022
Drawn by	UL	Date	10/2022
Reviewed by	MS	Date	10/2022
Project No.	121029	REF.	
NPL Scale:		WFL Scale:	

Project: NEWBERG APARTMENTS
 No. 121-029
 Type: PLANNING
 Sheet: P5.0

13.0 Inspection and Maintenance



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.

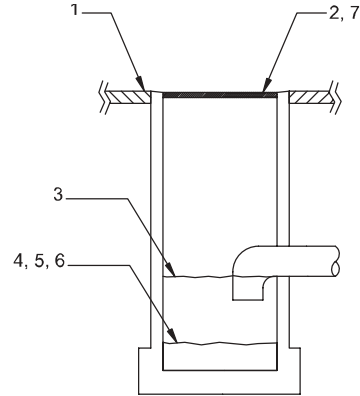
13.2 CATCHBASIN/MANHOLE I&M

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.

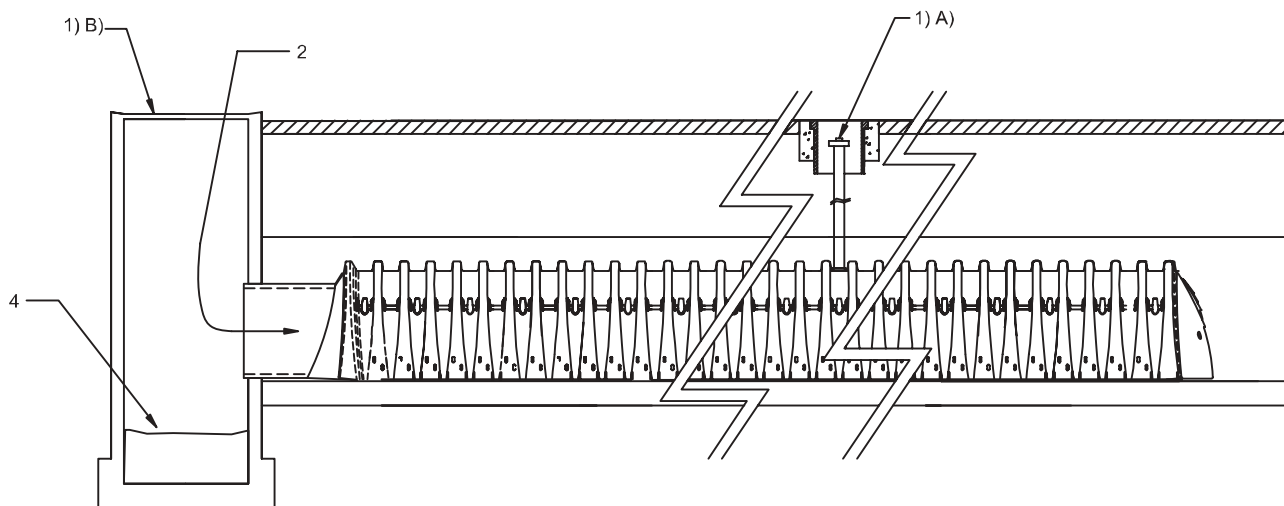
Step 2) Clean out Isolator Row using the JetVac process

- 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

These 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.

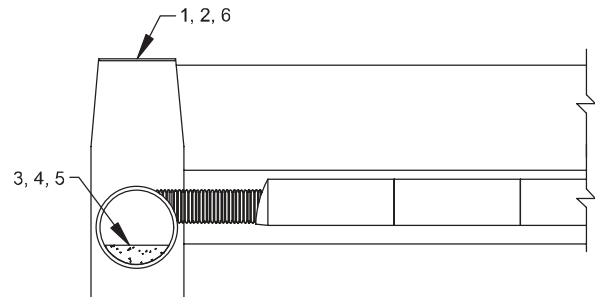
13.7 ECCENTRIC PIPE HEADER MAINTENANCE

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



StormFilter Inspection and Maintenance Procedures



Maintenance Guidelines

The primary purpose of the Stormwater Management StormFilter® is to filter and prevent pollutants from entering our waterways. Like any effective filtration system, periodically these pollutants must be removed to restore the StormFilter to its full efficiency and effectiveness.

Maintenance requirements and frequency are dependent on the pollutant load characteristics of each site. Maintenance activities may be required in the event of a chemical spill or due to excessive sediment loading from site erosion or extreme storms. It is a good practice to inspect the system after major storm events.

Maintenance Procedures

Although there are many effective maintenance options, we believe the following procedure to be efficient, using common equipment and existing maintenance protocols. The following two-step procedure is recommended::

1. Inspection

- Inspection of the vault interior to determine the need for maintenance.

2. Maintenance

- Cartridge replacement
- Sediment removal

Inspection and Maintenance Timing

At least one scheduled inspection should take place per year with maintenance following as warranted.

First, an inspection should be done before the winter season. During the inspection the need for maintenance should be determined and, if disposal during maintenance will be required, samples of the accumulated sediments and media should be obtained.

Second, if warranted, a maintenance (replacement of the filter cartridges and removal of accumulated sediments) should be performed during periods of dry weather.

In addition to these two activities, it is important to check the condition of the StormFilter unit after major storms for potential damage caused by high flows and for high sediment accumulation that may be caused by localized erosion in the drainage area. It may be necessary to adjust the inspection/maintenance schedule depending on the actual operating conditions encountered by the system. In general, inspection activities can be conducted at any time, and maintenance should occur, if warranted, during dryer months in late summer to early fall.

Maintenance Frequency

The primary factor for determining frequency of maintenance for the StormFilter is sediment loading.

A properly functioning system will remove solids from water by trapping particulates in the porous structure of the filter media inside the cartridges. The flow through the system will naturally decrease as more and more particulates are trapped. Eventually the flow through the cartridges will be low enough to require replacement. It may be possible to extend the usable span of the cartridges by removing sediment from upstream trapping devices on a routine as-needed basis, in order to prevent material from being re-suspended and discharged to the StormFilter treatment system.

The average maintenance lifecycle is approximately 1-5 years. Site conditions greatly influence maintenance requirements. StormFilter units located in areas with erosion or active construction may need to be inspected and maintained more often than those with fully stabilized surface conditions.

Regulatory requirements or a chemical spill can shift maintenance timing as well. The maintenance frequency may be adjusted as additional monitoring information becomes available during the inspection program. Areas that develop known problems should be inspected more frequently than areas that demonstrate no problems, particularly after major storms. Ultimately, inspection and maintenance activities should be scheduled based on the historic records and characteristics of an individual StormFilter system or site. It is recommended that the site owner develop a database to properly manage StormFilter inspection and maintenance programs..





Inspection Procedures

The primary goal of an inspection is to assess the condition of the cartridges relative to the level of visual sediment loading as it relates to decreased treatment capacity. It may be desirable to conduct this inspection during a storm to observe the relative flow through the filter cartridges. If the submerged cartridges are severely plugged, then typically large amounts of sediments will be present and very little flow will be discharged from the drainage pipes. If this is the case, then maintenance is warranted and the cartridges need to be replaced.

Warning: In the case of a spill, the worker should abort inspection activities until the proper guidance is obtained. Notify the local hazard control agency and Contech Engineered Solutions immediately.

To conduct an inspection:

Important: Inspection should be performed by a person who is familiar with the operation and configuration of the StormFilter treatment unit and the unit's role, relative to detention or retention facilities onsite.

1. If applicable, set up safety equipment to protect and notify surrounding vehicle and pedestrian traffic.
2. Visually inspect the external condition of the unit and take notes concerning defects/problems.
3. Open the access portals to the vault and allow the system vent.
4. Without entering the vault, visually inspect the inside of the unit, and note accumulations of liquids and solids.
5. Be sure to record the level of sediment build-up on the floor of the vault, in the forebay, and on top of the cartridges. If flow is occurring, note the flow of water per drainage pipe. Record all observations. Digital pictures are valuable for historical documentation.
6. Close and fasten the access portals.
7. Remove safety equipment.
8. If appropriate, make notes about the local drainage area relative to ongoing construction, erosion problems, or high loading of other materials to the system.
9. Discuss conditions that suggest maintenance and make decision as to whether or not maintenance is needed.

Maintenance Decision Tree

The need for maintenance is typically based on results of the inspection. The following Maintenance Decision Tree should be used as a general guide. (Other factors, such as Regulatory Requirements, may need to be considered).

Please note Stormwater Management StormFilter devices installed downstream of, or integrated within, a stormwater storage facility typically have different operational parameters (i.e. draindown time). In these cases, the inspector must understand the relationship between the retention/detention facility and the treatment system by evaluating site specific civil engineering plans, or contacting the engineer of record, and make adjustments to the below guidance as necessary. Sediment deposition depths and patterns within the StormFilter are likely to be quite different compared to systems without upstream storage and therefore shouldn't be used exclusively to evaluate a need for maintenance.

1. Sediment loading on the vault floor.
 - a. If >4 " of accumulated sediment, maintenance is required.
2. Sediment loading on top of the cartridge.
 - a. If $>1/4$ " of accumulation, maintenance is required.
3. Submerged cartridges.
 - a. If >4 " of static water above cartridge bottom for more than 24 hours after end of rain event, maintenance is required. (Catch basins have standing water in the cartridge bay.)
4. Plugged media.
 - a. While not required in all cases, inspection of the media within the cartridge may provide valuable additional information.
 - b. If pore space between media granules is absent, maintenance is required.
5. Bypass condition.
 - a. If inspection is conducted during an average rain fall event and StormFilter remains in bypass condition (water over the internal outlet baffle wall or submerged cartridges), maintenance is required.
6. Hazardous material release.
 - a. If hazardous material release (automotive fluids or other) is reported, maintenance is required.
7. Pronounced scum line.
 - a. If pronounced scum line (say $\geq 1/4$ " thick) is present above top cap, maintenance is required.

Maintenance

Depending on the configuration of the particular system, maintenance personnel will be required to enter the vault to perform the maintenance.

Important: If vault entry is required, OSHA rules for confined space entry must be followed.

Filter cartridge replacement should occur during dry weather. It may be necessary to plug the filter inlet pipe if base flows is occurring.

Replacement cartridges can be delivered to the site or customers facility. Information concerning how to obtain the replacement cartridges is available from Contech Engineered Solutions.

Warning: In the case of a spill, the maintenance personnel should abort maintenance activities until the proper guidance is obtained. Notify the local hazard control agency and Contech Engineered Solutions immediately.

To conduct cartridge replacement and sediment removal maintenance:

1. If applicable, set up safety equipment to protect maintenance personnel and pedestrians from site hazards.
2. Visually inspect the external condition of the unit and take notes concerning defects/problems.
3. Open the doors (access portals) to the vault and allow the system to vent.
4. Without entering the vault, give the inside of the unit, including components, a general condition inspection.
5. Make notes about the external and internal condition of the vault. Give particular attention to recording the level of sediment build-up on the floor of the vault, in the forebay, and on top of the internal components.
6. Using appropriate equipment offload the replacement cartridges (up to 150 lbs. each) and set aside.
7. Remove used cartridges from the vault using one of the following methods:

Method 1:

- A. This activity will require that maintenance personnel enter the vault to remove the cartridges from the under drain manifold and place them under the vault opening for lifting (removal). Disconnect each filter cartridge from the underdrain connector by rotating counterclockwise 1/4 of a turn. Roll the loose cartridge, on edge, to a convenient spot beneath the vault access.

Using appropriate hoisting equipment, attach a cable from the boom, crane, or tripod to the loose cartridge. Contact Contech Engineered Solutions for suggested attachment devices.

- B. Remove the used cartridges (up to 250 lbs. each) from the vault.



Important: Care must be used to avoid damaging the cartridges during removal and installation. The cost of repairing components damaged during maintenance will be the responsibility of the owner.

- C. Set the used cartridge aside or load onto the hauling truck.
- D. Continue steps a through c until all cartridges have been removed.

Method 2:

- A. This activity will require that maintenance personnel enter the vault to remove the cartridges from the under drain manifold and place them under the vault opening for lifting (removal). Disconnect each filter cartridge from the underdrain connector by rotating counterclockwise 1/4 of a turn. Roll the loose cartridge, on edge, to a convenient spot beneath the vault access.
- B. Unscrew the cartridge cap.
- C. Remove the cartridge hood and float.
- D. At location under structure access, tip the cartridge on its side.
- E. Empty the cartridge onto the vault floor. Reassemble the empty cartridge.
- F. Set the empty, used cartridge aside or load onto the hauling truck.
- G. Continue steps a through e until all cartridges have been removed.

8. Remove accumulated sediment from the floor of the vault and from the forebay. This can most effectively be accomplished by use of a vacuum truck.
9. Once the sediments are removed, assess the condition of the vault and the condition of the connectors.
10. Using the vacuum truck boom, crane, or tripod, lower and install the new cartridges. Once again, take care not to damage connections.
11. Close and fasten the door.
12. Remove safety equipment.
13. Finally, dispose of the accumulated materials in accordance with applicable regulations. Make arrangements to return the used **empty** cartridges to Contech Engineered Solutions.

Related Maintenance Activities - Performed on an as-needed basis

StormFilter units are often just one of many structures in a more comprehensive stormwater drainage and treatment system.

In order for maintenance of the StormFilter to be successful, it is imperative that all other components be properly maintained. The maintenance/repair of upstream facilities should be carried out prior to StormFilter maintenance activities.

In addition to considering upstream facilities, it is also important to correct any problems identified in the drainage area. Drainage area concerns may include: erosion problems, heavy oil loading, and discharges of inappropriate materials.

Material Disposal

The accumulated sediment found in stormwater treatment and conveyance systems must be handled and disposed of in accordance with regulatory protocols. It is possible for sediments to contain measurable concentrations of heavy metals and organic chemicals (such as pesticides and petroleum products). Areas with the greatest potential for high pollutant loading include industrial areas and heavily traveled roads.

Sediments and water must be disposed of in accordance with all applicable waste disposal regulations. When scheduling maintenance, consideration must be made for the disposal of solid and liquid wastes. This typically requires coordination with a local landfill for solid waste disposal. For liquid waste disposal a number of options are available including a municipal vacuum truck decant facility, local waste water treatment plant or on-site treatment and discharge.



Inspection Report

Date: _____ Personnel: _____

Location: _____ System Size: _____ Months in Service: _____

System Type: Vault Cast-In-Place Linear Catch Basin Manhole Other: _____

Sediment Thickness in Forebay: _____ Date: _____

Sediment Depth on Vault Floor: _____

Sediment Depth on Cartridge Top(s): _____

Structural Damage: _____

Estimated Flow from Drainage Pipes (if available): _____

Cartridges Submerged: Yes No Depth of Standing Water: _____

StormFilter Maintenance Activities (check off if done and give description)

Trash and Debris Removal: _____

Minor Structural Repairs: _____

Drainage Area Report _____

Excessive Oil Loading: Yes No Source: _____

Sediment Accumulation on Pavement: Yes No Source: _____

Erosion of Landscaped Areas: Yes No Source: _____

Items Needing Further Work: _____

Owners should contact the local public works department and inquire about how the department disposes of their street waste residuals.

Other Comments:

Review the condition reports from the previous inspection visits.

StormFilter Maintenance Report

Date: _____ Personnel: _____

Location: _____ System Size: _____

System Type: Vault Cast-In-Place Linear Catch Basin Manhole Other: _____

List Safety Procedures and Equipment Used: _____

System Observations

Months in Service: _____

Oil in Forebay (if present): Yes No

Sediment Depth in Forebay (if present): _____

Sediment Depth on Vault Floor: _____

Sediment Depth on Cartridge Top(s): _____

Structural Damage: _____

Drainage Area Report

Excessive Oil Loading: Yes No Source: _____

Sediment Accumulation on Pavement: Yes No Source: _____

Erosion of Landscaped Areas: Yes No Source: _____

StormFilter Cartridge Replacement Maintenance Activities

Remove Trash and Debris: Yes No Details: _____

Replace Cartridges: Yes No Details: _____

Sediment Removed: Yes No Details: _____

Quantity of Sediment Removed (estimate?): _____

Minor Structural Repairs: Yes No Details: _____

Residuals (debris, sediment) Disposal Methods: _____

Notes:



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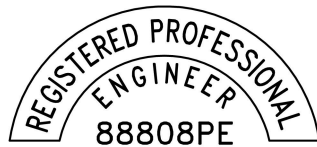
Support

- Drawings and specifications are available at www.conteches.com.
- Site-specific design support is available from our engineers.

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RENEWS: 6/30/2024

Haworth Avenue Apartments

Transportation Impact
Study

Newberg, Oregon

Date:

October 31, 2022

Prepared for:

Grove Hunt

Grove Development, Inc.

Prepared by:

Daniel Stumpf, PE

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Executive Summary

1. The proposed Haworth Avenue Apartments project will include the construction of a 24-to-30-unit apartment complex with access onto Haworth Avenue near west edge of the site. The site is located on a single property (tax lot R3216CB-00800) north of Portland Road (OR-99W), south of Haworth Avenue, east of N Deborah Road, and west of N Springbrook Road in Newberg, Oregon.
2. Assuming the development of 30 units, the trip generation calculations show that the proposed project is projected to generate 12 morning peak hour trips, 15 evening peak hour trips, and 202 average weekday trips.
3. No significant trends or crash patterns were identified at any of the study intersections that are indicative of safety concerns with the exception of the intersection of N Springbrook Road at Haworth Avenue which exhibits a crash rate in excess of 1.00 CMEV. Following installation of a traffic signal at the intersection once sufficient proportionate share contributions have been collected (TSP project I09), it is expected the crash rate will decrease to levels below 1.00 CMEV. Accordingly, no other safety mitigation is recommended per the crash data analysis.
4. Adequate sight distance is available to the east of the proposed site access intersection to allow safe operation along Haworth Avenue. To the west of the access intersection, sight distances are limited by trees which act as a barrier delineating the property line between the project site and the adjacent shopping center to the west. Provided this obstructing foliage is removed, adequate intersection sight distance of 240 feet or greater can be obtained to the west. No other sight distance related mitigation is necessary or recommended at the access intersection.
5. Left-turn lane warrants are not projected to be met for the site access intersection along Haworth Avenue under any analysis scenario through year 2029. Accordingly, no new turn lanes are necessary or recommended.
6. Traffic signal warrants are not projected to be met at any of the unsignalized study intersections by the 2029 planning year based on a review of traffic volumes. Specific to the intersection of N Springbrook Road at Haworth Avenue, Warrant 7 is triggered due to the number of recurring crashes at the intersection that could be mitigated by the installation of a traffic signal. Per the City of Newberg's TSP project I09, a traffic signal is planned for installation at the intersection after sufficient proportionate share contributions have been collected. No other traffic signals are necessary or warranted.
7. All study intersections are currently operating acceptably per jurisdictional standards and are projected to continue operating acceptably through the 2024 site buildout year and the future 2029 planning year, with the exception of the N Springbrook Road at Haworth Avenue intersection under existing all-way stop-controls. Once a traffic signal is installed at the intersection, City of Newberg mobility targets will be met for the intersection. No additional operational mitigation is necessary or recommended at the study intersections.

8. No queuing related mitigations are recommended at the intersections of N Springbrook Road at Haworth Avenue and N Springbrook Road at OR-99W which are projected to experience occasional 95th percentile queues which exceed available lane storages. All other study intersections and their respective turning movements are provided adequate vehicle storage space. Accordingly, no intersection queuing related mitigation is necessary or recommended as part of the proposed development project.
9. Given sufficient space between the site access and the 95th percentile eastbound queues at the N Springbrook Road at Haworth Avenue intersection are available and the potential for circulation/safety issues which could occur with a single restricted access point to the site, it is recommended that the proposed apartment complex be allowed an unrestricted full movement access onto Haworth Avenue.



Project Description

Introduction

The proposed Haworth Avenue Apartments project will include the construction of a 24-to-30-unit apartment complex with access onto Haworth Avenue near west edge of the site. The site is located on a single property (tax lot R3216CB-00800) north of Portland Road (OR-99W), south of Haworth Avenue, east of N Deborah Road, and west of N Springbrook Road in Newberg, Oregon.

Based on correspondence with City of Newberg and Oregon Department of Transportation (ODOT) staff, the report conducts safety and capacity/level of service analyses at the following intersections during the morning and evening peak hours:

1. N Deborah Road at Haworth Avenue
2. Site Access at Haworth Avenue
3. N Springbrook Road at Haworth Avenue
4. N Springbrook Road at OR-99W

The purpose of this study is to determine whether the transportation system within the vicinity of the site is capable of safely and efficiently supporting the existing and proposed uses, and to determine any mitigation that may be necessary to do so. Detailed information on traffic counts, trip generation calculations, safety analyses, and level of service calculations is included in the appendix to this report.

Location Description

As described in the *Introduction*, the site is located north of OR-99W, south of Haworth Avenue, east of N Deborah Road, and west of N Springbrook Road in Newberg, Oregon. The subject site is located within a mixed-use area of the City, with residential uses to the north and commercial retail uses to the south, east and west.

The project site includes a single property (tax lot R3216CB-00800) which encompasses an approximate 0.8 acres. The project site is currently undeveloped but following buildout of the proposed development the site will take access onto Haworth Avenue near west edge of the site.

Figure 1 presents an aerial image of the nearby vicinity with the project site outlined in yellow.



Figure 1: Aerial Photo of Site Vicinity (Image from Google Earth)

Vicinity Streets

The proposed development is expected to impact four roadways near the site. Table 1 provides a description of each roadway within the immediate site vicinity.

Table 1: Vicinity Roadway Descriptions

Street Name	Jurisdiction	Functional Classification	Speed (MPH)	On-Street Parking	Curbs & Sidewalks	Bicycle Lanes
Haworth Avenue	City of Newberg	Major Collector	25	Partially Permitted	Both Sides	None
Portland Road (OR-99W)	ODOT	Major Arterial/ Statewide Hwy	35	Not Permitted	Both Sides	Both Sides
N Deborah Road	City of Newberg	Minor Collector	25	Partially Permitted	Both Sides	None
N Springbrook Road	City of Newberg	Minor Arterial	25/35	Not Permitted	Both Sides	Partial Both Sides

Table Notes: Functional Classification & Jurisdiction based on City of Newberg TSP.

Study Intersections

Based on coordination with City of Newberg and ODOT staff, three existing intersections were identified for analysis. A summarized description of these study intersections, under their existing lane and control configurations, is provided in Table 2.

Table 2: Study Intersection Descriptions

Number	Intersection	Geometry	Traffic Control	Phasing/Stopped Approaches
1	N Deborah Road at Haworth Avenue	Four-Legged	Stop-Controlled	All-Way Stop-Controlled
3	N Springbrook Road at Haworth Avenue	Four-Legged	Stop-Controlled	All-Way Stop-Controlled
4	N Springbrook Road at OR-99W	Four-Legged	Signalized	Protected NB/SB/EB/WB Left-turns, Channliezed Yield-Controlled EB/WB Right-turns, Overlap NB Right-turn

Planned Improvements at N Springbrook Road at Haworth Avenue

According to the project's pre-application meeting notes, dated November 10, 2021, and the City of Newberg's Transportation System Plan (TSP) project I09, a traffic signal is planned for installation at the intersection of N Springbrook Road at Haworth Avenue. Additionally, it is expected that existing eastbound travel lanes will be restriped to a dedicated left-turn lane and shared through/right-turn lane.

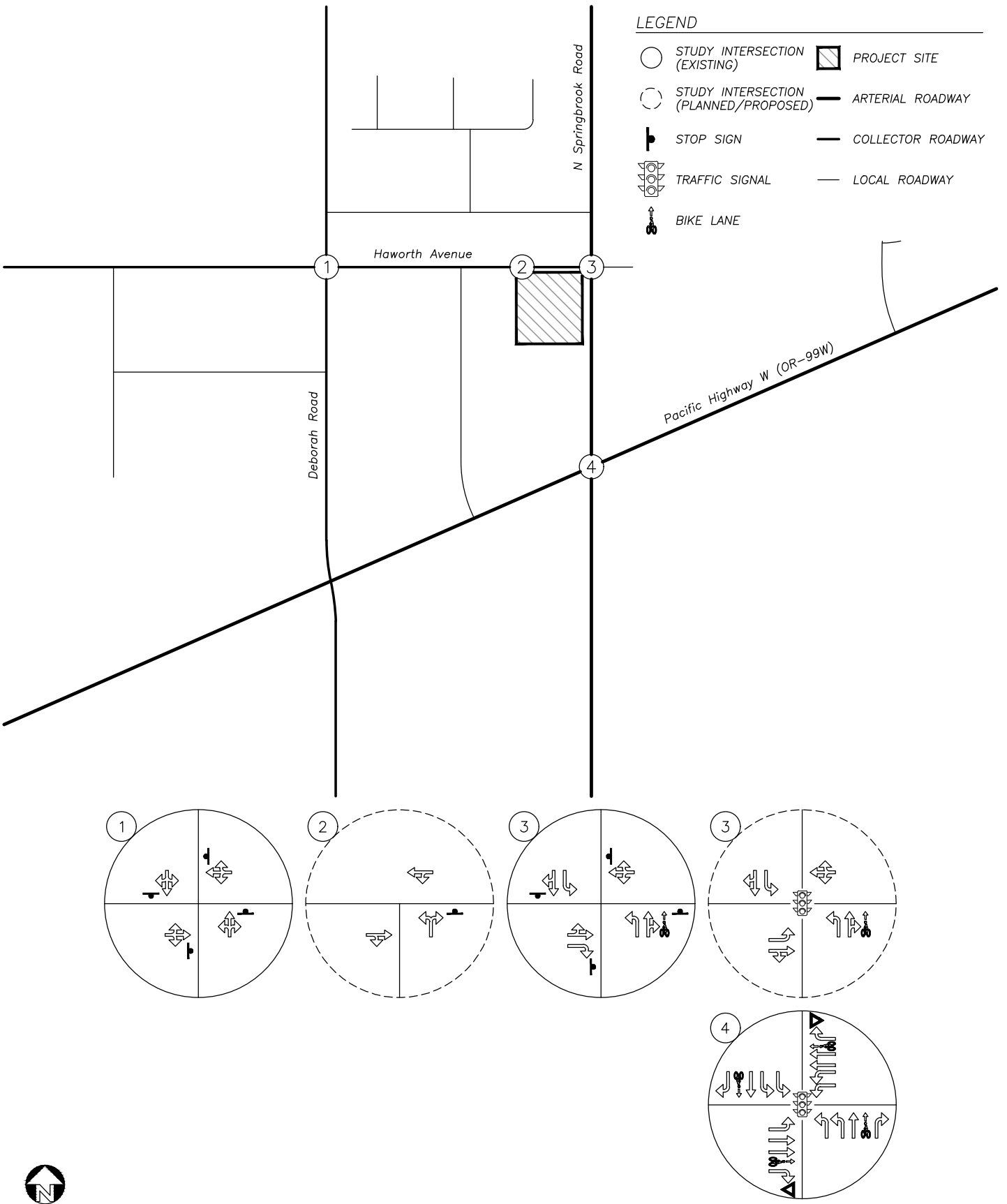
Proportionate share fees are currently being collected at the intersection for these improvements. Based on the impact fees required for the in-process Meadow Creek Apartment development, it was estimated that the proportionate share fee rate is approximately \$342.47 per morning peak hour trip impact. The proposed development is projected to add up to 10 morning peak hour site trip impacts to this intersection (see the *Site Trips* section of this report) whereby a proportionate share contribution of \$3,424.70 may be attributable to the Haworth Avenue Apartments project.

For the purposes of this analysis, the intersection was analyzed assuming operation under both all-way stop-control and with the traffic signal/westbound lane configurations installed/revised for future year 2024 and 2029 conditions.

Transit

The project site is located near bus line 7 – *Newberg-Providence*, which has stops located within a quarter-mile walking/biking distance of the project site. The nearest transit stops to the site are located along/near OR-99W, where complete sidewalks and marked crossings at intermittent public intersections are available between the site and these transit stops. Weekday service is scheduled from approximately 7:05 AM to 6:25 PM with typical headways of approximately 65 minutes. Weekend and holiday bus service is not provided for this transit route.

A vicinity map showing the project site, vicinity streets, and study intersection configurations is shown in Figure 2.



no scale

Site Trips

Trip Generation

The proposed development will include the construction of between 24 to 30 apartment units on a currently undeveloped property. To estimate the number of trips that are currently and will be generated by the proposed use, trip rates from the *Trip Generation Manual*¹ were used. Specifically, data from land use code 220, *Multifamily Housing (Low-Rise)*, was used to estimate site trip generation based on the number of dwelling units.

Assuming the development of 30 units, the trip generation calculations show that the proposed project is projected to generate 12 morning peak hour trips, 15 evening peak hour trips, and 202 average weekday trips. The trip generation estimates associated with the proposed development are summarized in Table 3 and detailed trip generation calculations are included in the appendix.

Table 3: Trip Generation Summary

	ITE Code	Size	Morning Peak Hour			Evening Peak Hour			Weekday Total
			Enter	Exit	Total	Enter	Exit	Total	
Proposed Apartment	220	30 units	3	9	12	9	6	15	202

Trip Distribution

The directional distribution of site trips to/from the project site was estimated based on the locations of likely trip destinations and locations of major transportation facilities in the site vicinity. Based on correspondence with City of Newberg staff, the following trip distribution was confirmed and utilized:

- Approximately 35 percent of site trips will travel to/from the east along OR-99W;
- Approximately 25 percent of site trips will travel to/from the west along OR-99W;
- Approximately 15 percent of site trips will travel to/from the south along N Springbrook Road;
- Approximately 10 percent of site trips will travel to/from the west along Haworth Avenue;
- Approximately 10 percent of site trips will travel to/from the north along N Springbrook Road; and
- Approximately 5 percent of site trips will travel to/from the north along Deborah Road.

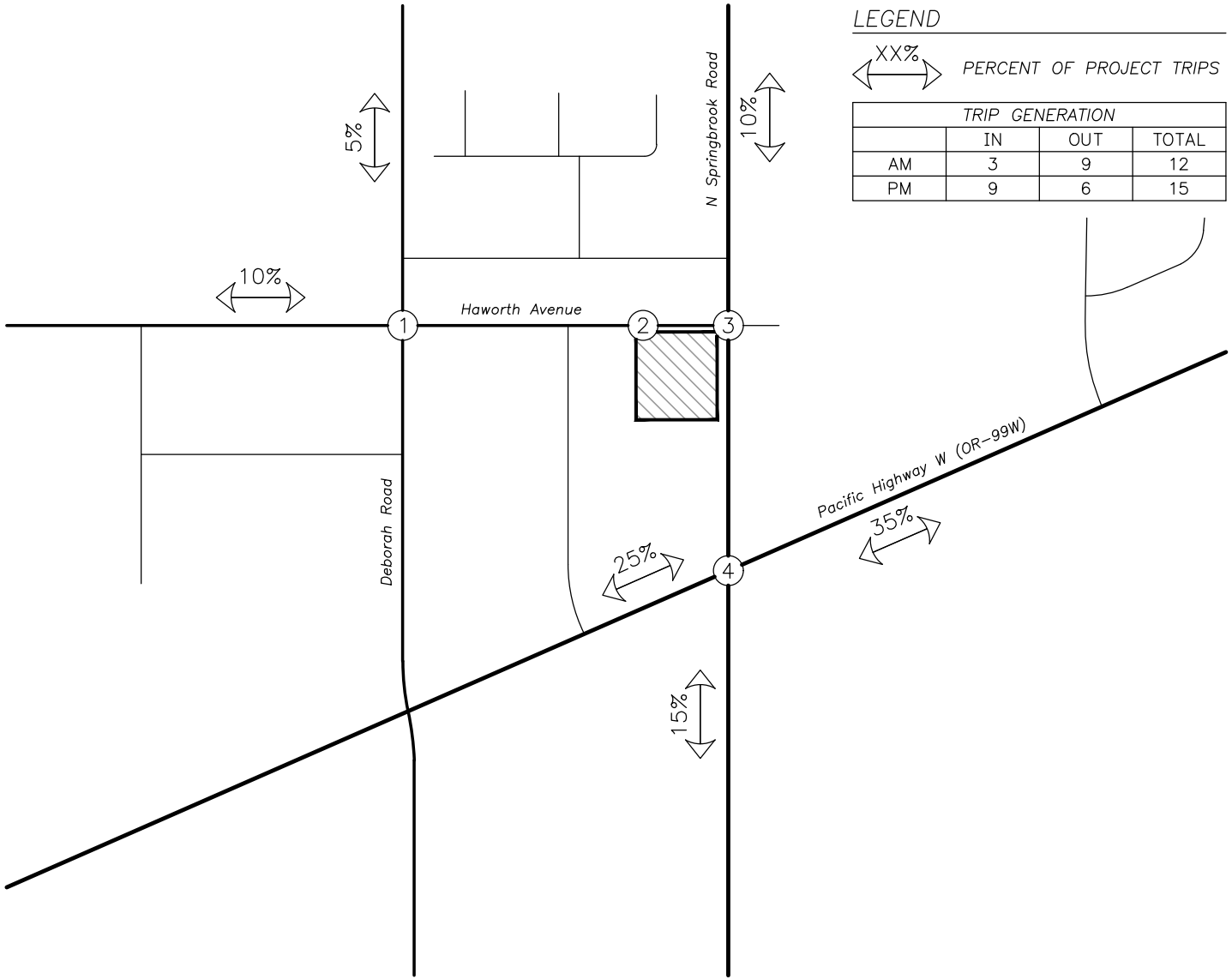
The trip distribution and assignment for the site trips generated during the morning and evening peak hours is shown in the Figure 3.

¹ Institute of Transportation Engineers (ITE), *Trip Generation Manual*, 11th Edition, 2021.

LEGEND

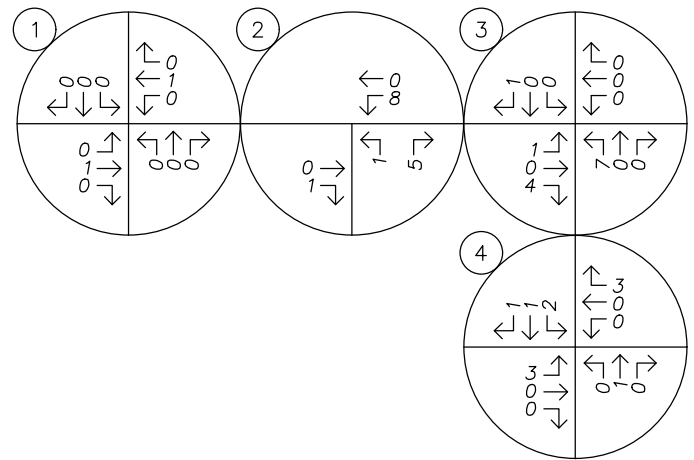
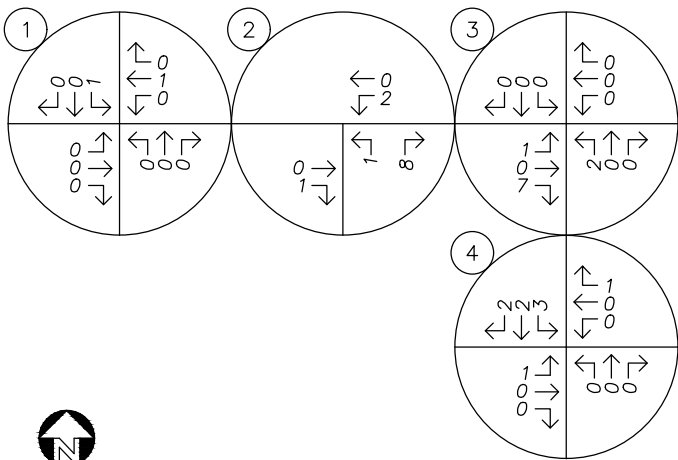
XX% PERCENT OF PROJECT TRIPS

TRIP GENERATION			
	IN	OUT	TOTAL
AM	3	9	12
PM	9	6	15



AM PEAK HOUR

PM PEAK HOUR



Traffic Volumes

2022 Existing Conditions

Due to the ongoing COVID-19 viral pandemic, traffic volumes around Oregon have been depressed relative to normal conditions. However, at the time of writing schools and businesses have generally been operating at normal capacities, mask mandates have generally been lifted, and Oregon COVID-19 infection rates had decreased significantly since January 2022. Therefore, at the direction of City of Newberg staff new intersection traffic counts were collected at the study intersections and utilized for analysis.

Traffic counts were conducted at the study intersections on Tuesday, April 19, 2022, from 6:00/7:00 AM to 9:00 AM and from 3:00/4:00 PM to 6:00 PM. Data was used from each intersection's respective morning and evening peak hours.

Per the requirements established in ODOT's *Analysis Procedures Manual (APM)*, a seasonal adjustment factor of 1.0540 was calculated for the April counts, utilizing the *On-site Automatic Traffic Recorder (ATR) Method*. This method referenced average weekday traffic volumes along OR-99W at a location approximately 0.01 miles west of Brutscher Street (ATR Station 36-004) from years 2016 through 2020. Given this ATR Station is located within approximately a quarter mile of the N Springbrook Road at OR-99W intersection and there are no major intermittent intersections between the two locations, the use of the *On-site ATR Method* is appropriate to determine a seasonal adjustment factor.

Figure 4 shows the existing traffic volumes at the study intersections during the morning and evening peak hours.

2024 Background Conditions

To provide analysis of the impact of the proposed development on the nearby transportation facilities, an estimate of future traffic volumes is required. It is expected that the proposed development will be constructed and in operation by year 2024. In order to approximate the future year 2024 traffic volumes at the study intersections, a compounded growth rate of two percent per year for an assumed buildout condition of two years was applied to the measured 2022 existing traffic volumes. Specific to the study intersection of N Springbrook Road at OR-99W, the through movement volumes along OR-99W were grown utilizing a 0.01413 percent per year linear growth rate, derived from ODOT's 2040 Future Volumes Table. When determining this ODOT growth rate, volume/growth projections at the following two locations were compared and the higher growth rate of the two locations was used:

- 0.01 miles west of Brutscher Steet (ATR Station 36-004, Milepost 21.81).
- 0.10 miles west of Springbrook Road (Milepost 22.15).

In addition to the traffic volume growth described above, there with several in-process developments within the site vicinity that are currently approved but not yet fully constructed or occupied. The following projects were assumed to be completed and occupied prior to year 2024:

- Crestview Crossing: 260 single-family detached houses and 48 apartment units at tax lots 1100 and 13800 north of Providence Newberg Medical Center addressed at 1001 Providence Drive.
- Meadow Creek Apartments: 47 apartment units located at tax lots 100 and 200 addressed at 1306 N Springbrook Road.
- Meadow Creek Apartments (Phase 2): 74 apartment units at located at tax lots 100 and 200 addressed at 1306 N Springbrook Road.

The in-process developments are currently not fully contributing trips to the transportation system but may potentially be by the assumed 2024 buildout year of the proposed development. Additional trips corresponding to each in-process development were added to the 2022 existing year traffic volumes in addition to the two years of traffic growth at each of the applicable study intersections. To maintain a conservative analysis of operation at the study intersections, the in-process developments were assumed to be fully built-out by year 2024.

Figure 5 shows the projected year 2024 background traffic volumes at the study intersections during the morning and evening peak hours. A figure depicting in-process trips is included in the appendix to this report.

2024 Buildout Conditions

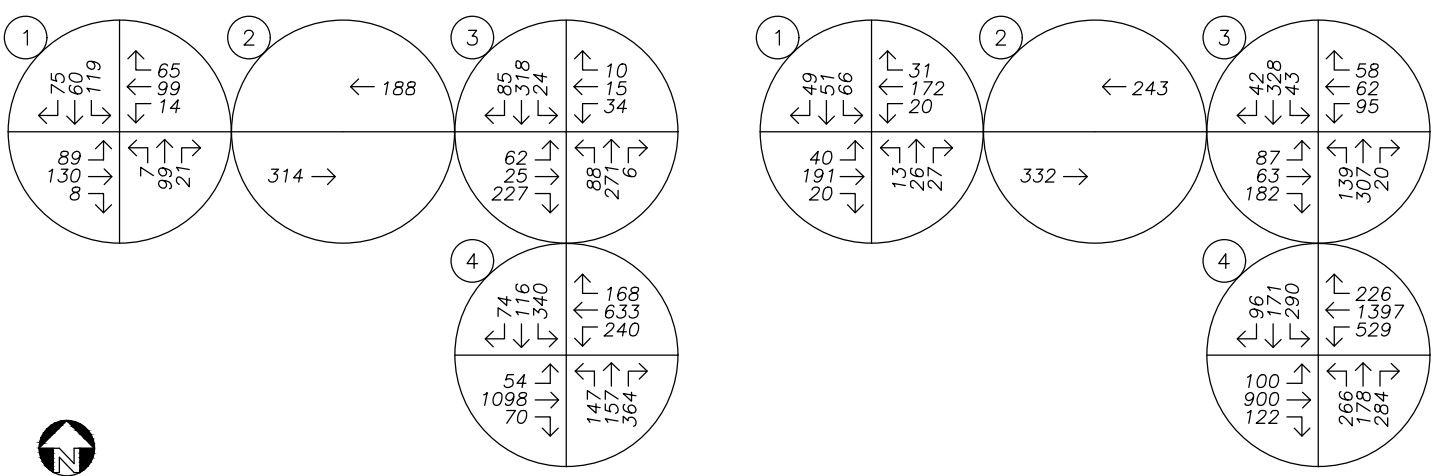
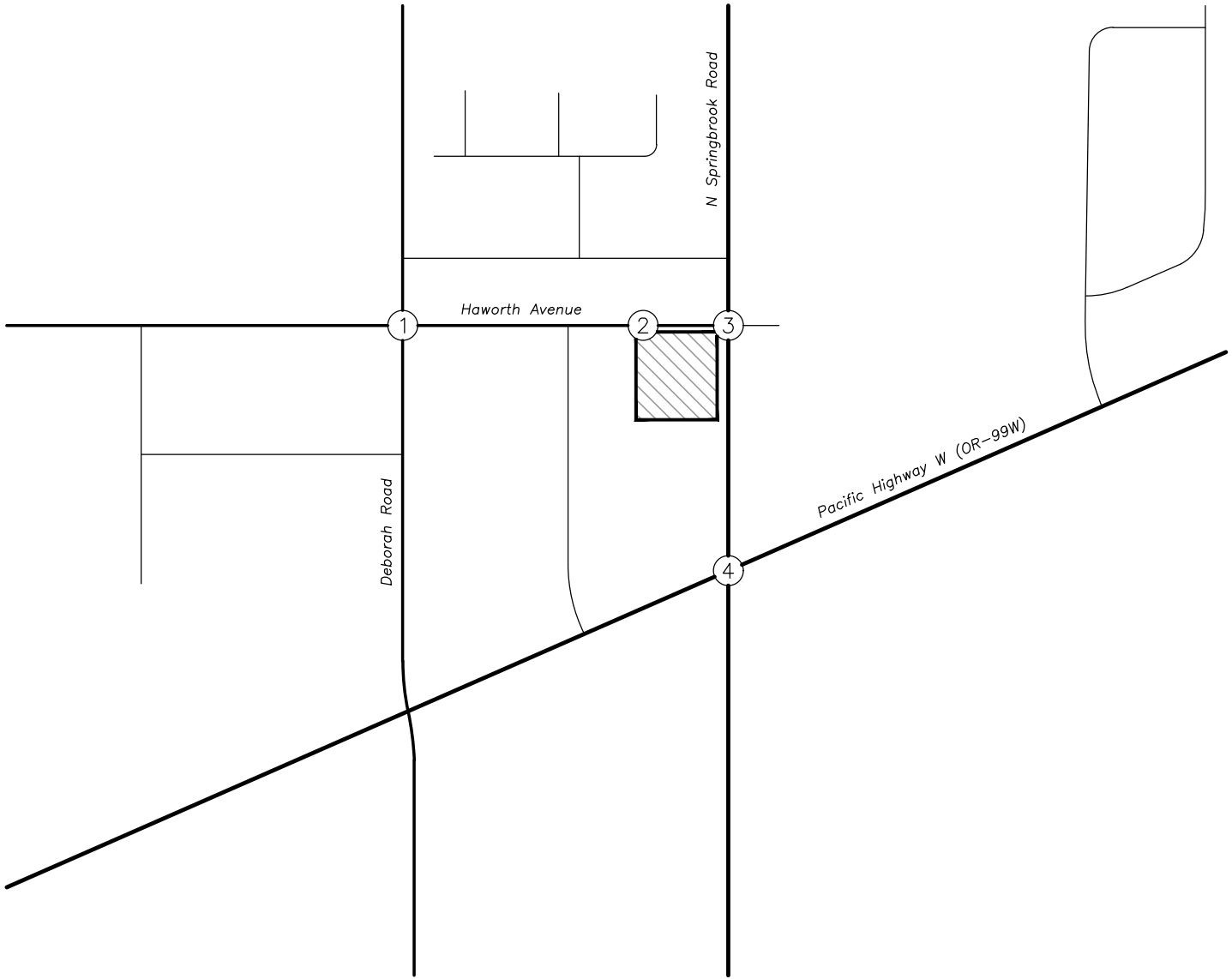
Peak hour trips calculated to be generated by the proposed development, as described earlier within the *Site Trips* section, were added to the projected year 2024 background traffic volumes to obtain the expected 2024 site buildout volumes.

Figure 6 shows year 2024 buildout traffic volumes at the study intersections during the morning and evening peak hours.

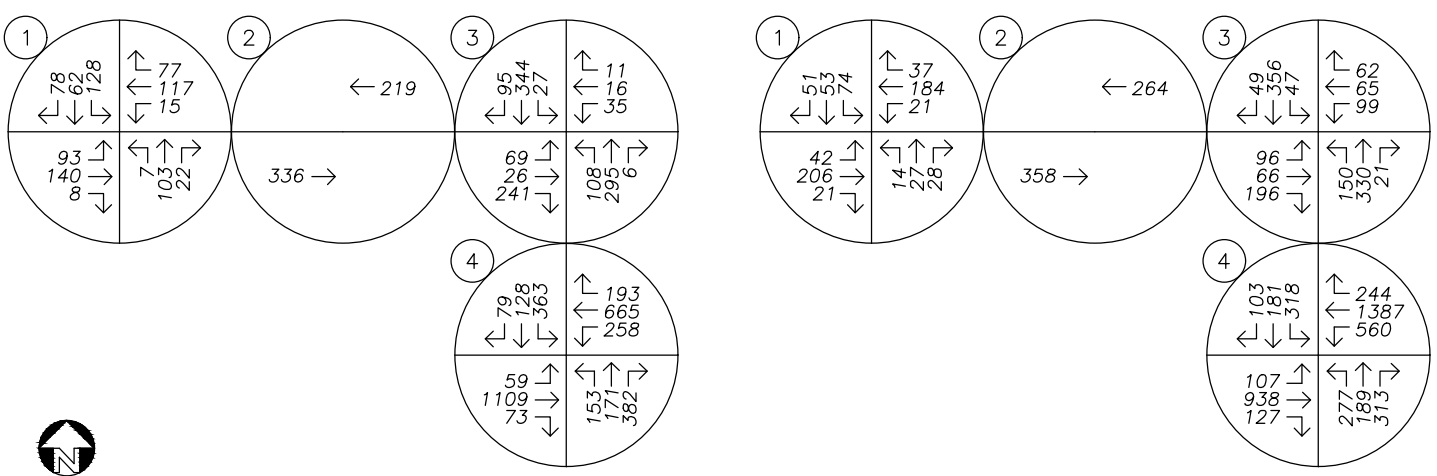
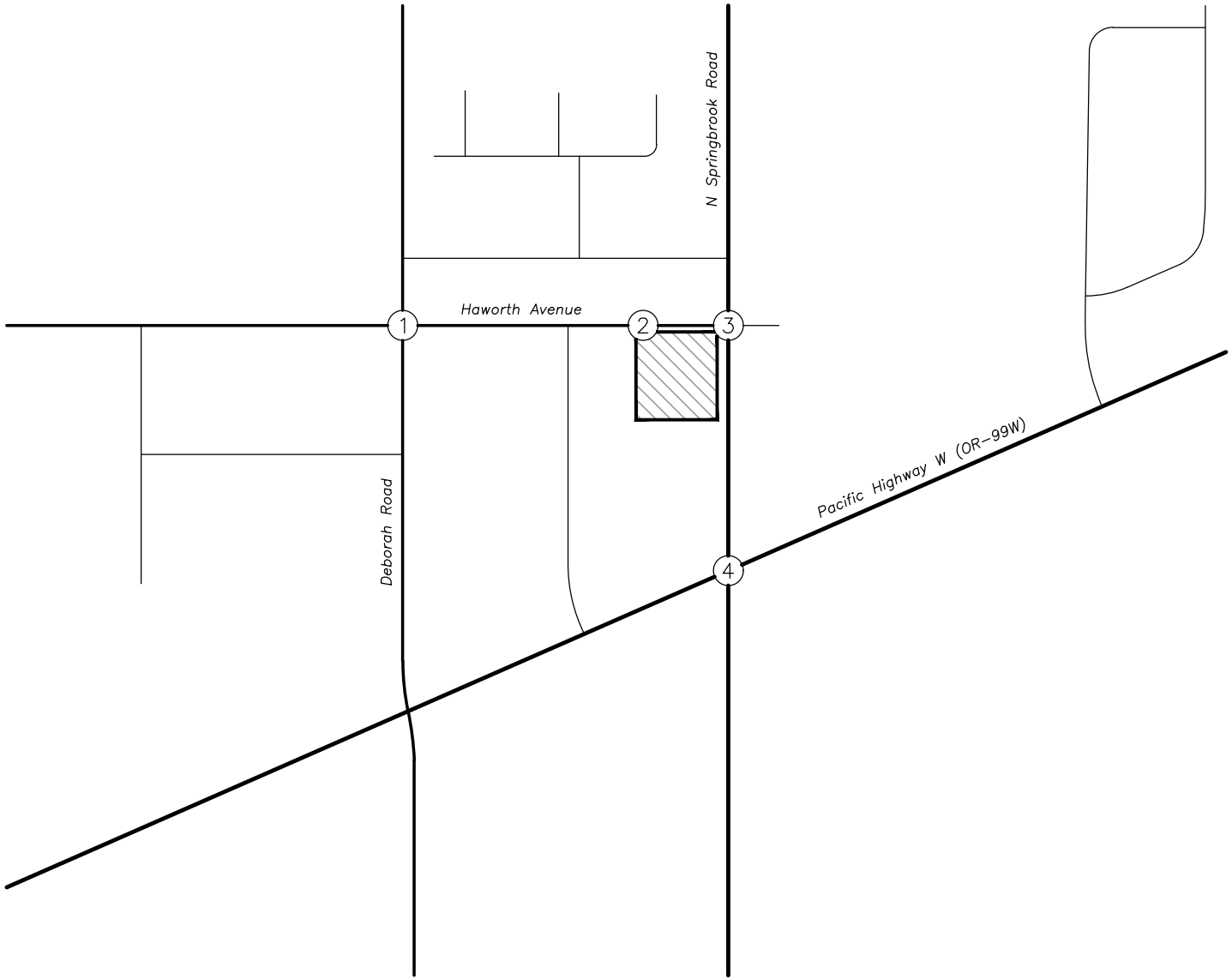
2029 Planning Year Conditions

At the direction of City of Newberg staff, an additional future year analysis scenario was prepared which reviews traffic conditions five years beyond the assumed 2024 buildout year of the site. The traffic volumes were estimated in a manner consistent with the methodologies discussed in the aforementioned sections, with the exception that growth rates were applied to the existing year traffic volumes over a seven-year period to estimate 2029 traffic conditions.

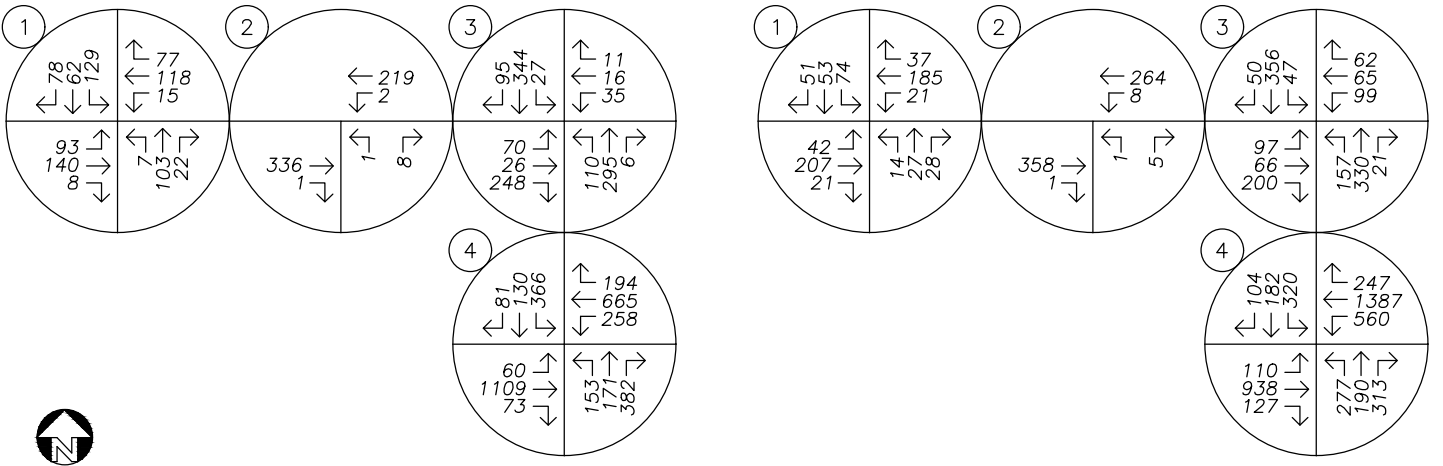
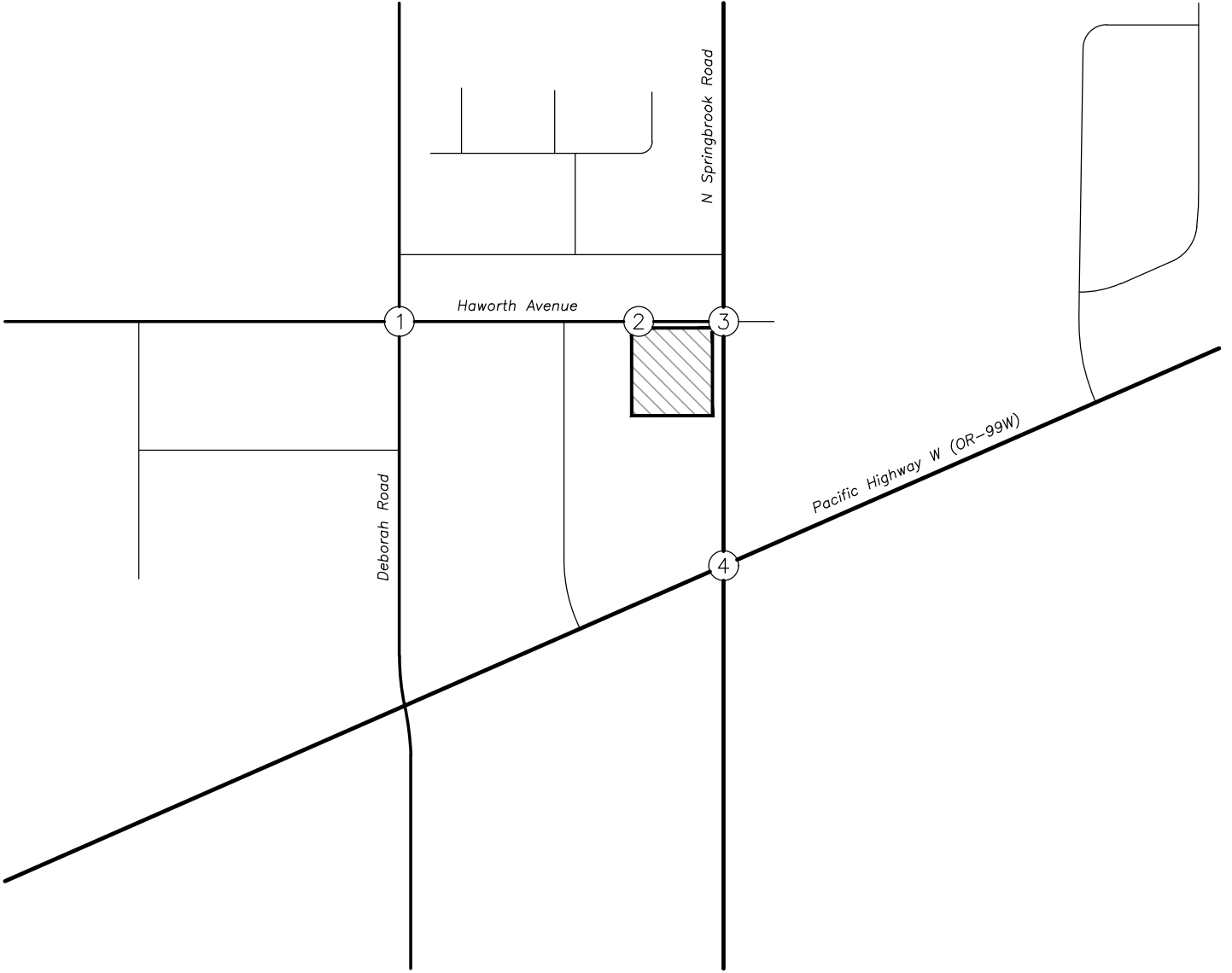
Figure 7 shows year 2029 planning year traffic volumes at the study intersections during the morning and evening peak hours.



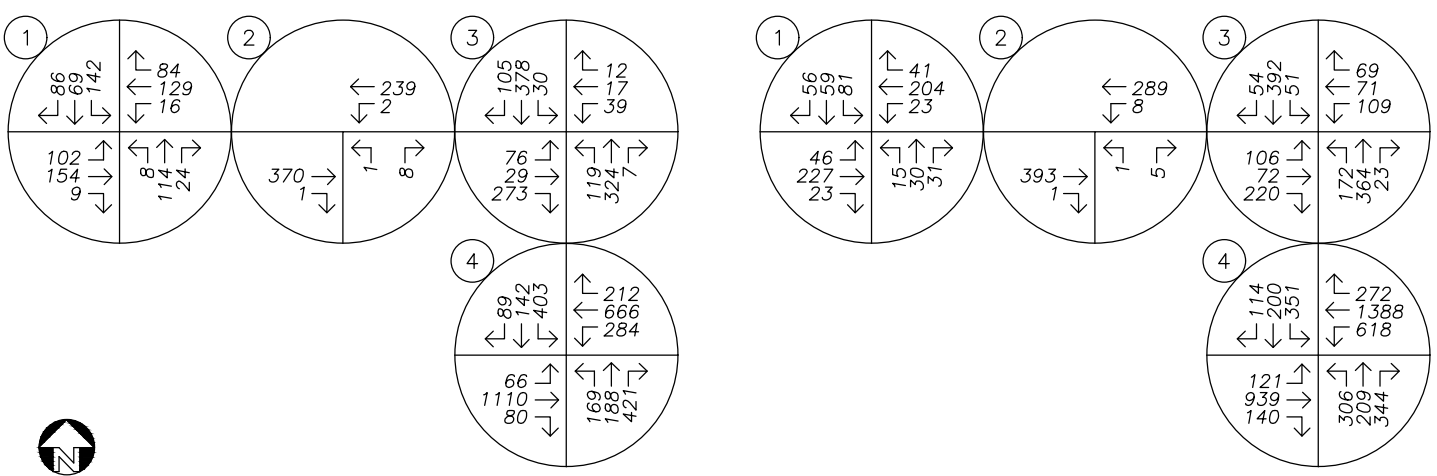
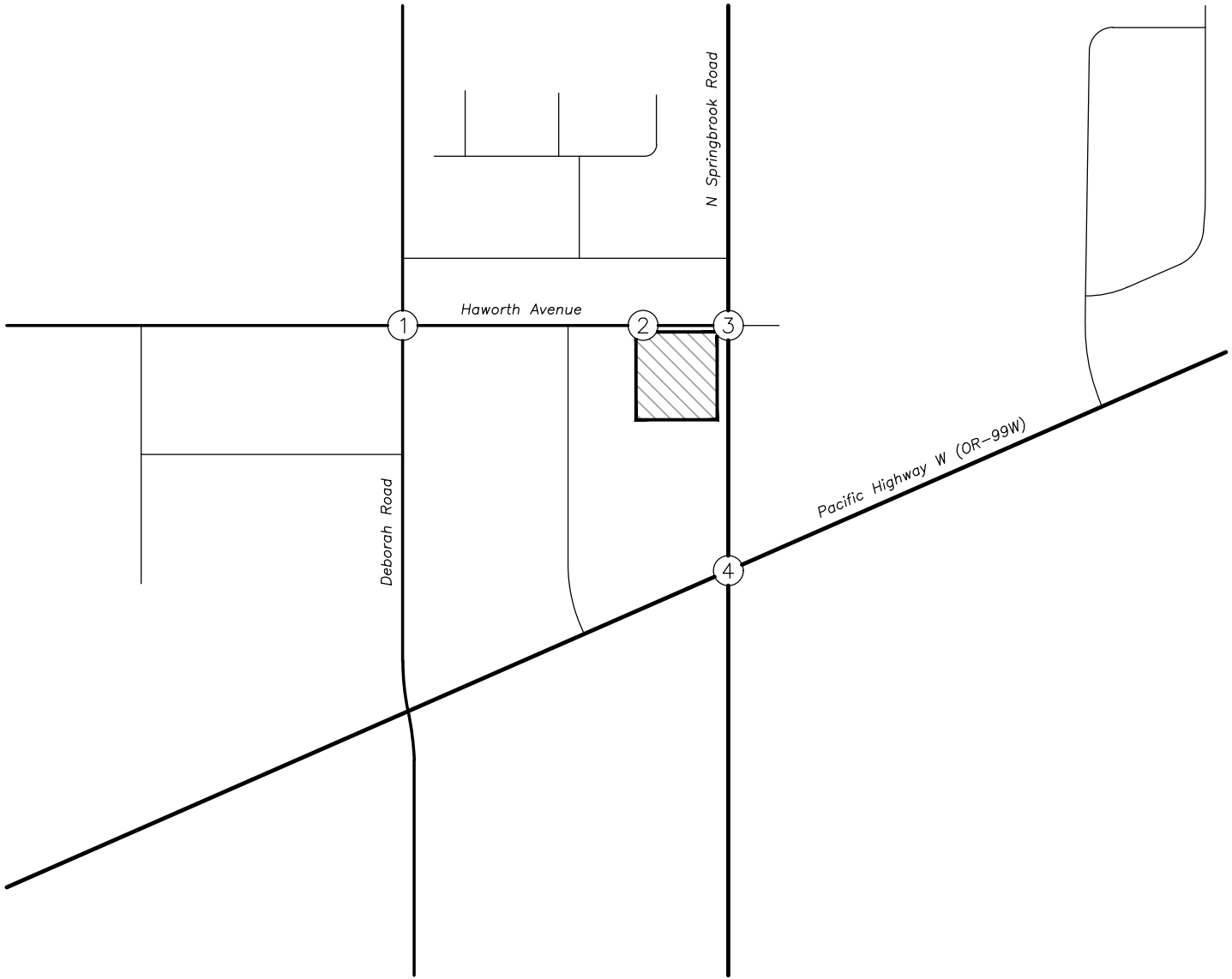
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Safety Analysis

Crash History Review

Using data obtained from ODOT's Crash Analysis and Reporting Unit, a review was performed of the most recent five years of available crash data at the study intersections (January 2016 through December 2020). The crash data was evaluated based on the number of crashes, the type of collisions, the severity of the collisions, and the resulting crash rate for each intersection. Crash rates provide the ability to compare safety risks at different intersections by accounting for both the number of crashes that have occurred during the study period and the number of vehicles that typically travel through the intersection. Crash rates were calculated under the common assumption that traffic counted during the evening peak hour represents approximately ten percent of annual average daily traffic (AADT) at each intersection. Crash rates in excess of 1.00 crashes per million entering vehicles (CMEV) may be indicative of design deficiencies and therefore require a need for further investigation and possible mitigation.

With regard to crash severity, ODOT classifies crashes in the following categories:

- Property Damage Only (PDO);
- Possible Injury – Complaint of Pain (Injury C);
- Non-Incapacitating Injury (Injury B);
- Incapacitating Injury – Bleeding, Broken Bones (Injury A); and
- Fatality or Fatal Injury.

The intersection of N Springbrook Road at OR-99W is an ODOT facility which adheres to the crash analysis methodologies in ODOT's APM. According to *Exhibit 4-1: Intersection Crash Rates per MEV by Land Type and Traffic Control* of the APM, intersections which experience crash rates in excess of their respective 90th percentile crash rates should be "flagged for further analysis". For intersections in urban settings, the following average and 90th percentile rates are applicable to the study intersection:

- Signalized, Four-Legged Intersections:
 - Average rate of 0.477 CMEV.
 - 90th percentile rate of 0.860 CMEV.

Table 4 provides a summary of crash types while Table 5 summarizes crash severities and rates for each of the study intersections. Detailed crash data is provided in the appendix to this report (note the crashes highlighted in yellow in the appendix were determined to not be related to the associated with operations or infrastructure at the intersection).

Table 4: Crash Type Summary

Number	Intersection	Crash Type						Total
		Rear End	Turn/ Angle	Fixed Object	Side swipe	Ped/ Bike	Other	
1	N Deborah Road at Haworth Avenue	0	2	0	0	1	0	3
3	N Springbrook Road at Haworth Avenue	1	23	0	1	1	1	27
4	N Springbrook Road at OR-99W	51	5	0	5	2	0	63

Table 5: Crash Severity and Rate Summary

Number	Intersection	Crash Severity						Total Crashes	AADT	Crash Rate
		PDO	C	B	A	Fatal	Unknown			
1	N Deborah Road at Haworth Avenue	1	1	1	0	0	0	3	7,060	0.233
3	N Springbrook Road at Haworth Avenue	13	9	4	1	0	0	27	14,260	1.037
4	N Springbrook Road at OR-99W	30	27	5	1	0	0	63	45,290	0.762

Table Notes: **BOLDED** text indicates a crash rate in excess of 1.00 CMEV or ODOT's 90th percentile rate.

Based on a review of the crash data, there were several crashes that involved either a pedestrian/bicyclist or was classified as Injury A. Additionally, the intersection of N Springbrook Road at Haworth Avenue exhibits a crash rate in excess of 1.00 CMEV. A detailed description of these crashes and intersections is provided below.

N Deborah Road at Haworth Avenue

The intersection of N Deborah Road at Haworth Avenue had one crash that involved a bicyclist. The crash occurred when the east/west crossing bicyclist disregarded intersection traffic controls, failed to yield right-of-way to a westbound left-turning passenger car which had initially stopped at the intersection, and collided with the motor vehicle. The bicyclist sustained injuries consistent with Injury B classification while the driver of the passenger car was uninjured.

N Springbrook Road at Haworth Avenue

The intersection of N Springbrook Road at Haworth Avenue had two crashes that either involved a bicyclist or was classified as Injury A.

- The bicycle-related collision occurred when an east/west crossing bicyclist failed to yield right-of-way to a southbound passenger car and collided with the motor vehicle. The bicyclist sustained injuries consistent with Injury B classification while the driver of the passenger car was uninjured.



- The crash that was classified as Injury A occurred when the driver of a northbound passenger car disregarded intersection traffic controls and collided with a westbound right-turning passenger car. A third passenger car that was stopped in the eastbound direction of travel was struck by one of the other vehicles after the initial collision. The driver of the vehicle that instigated the collision sustained injuries consistent with Injury B classification while a passenger in the same vehicle sustained injuries consistent with Injury A classification. The occupants of the two other vehicles did not sustain any reported injuries.

Additionally the intersection was identified to have a crash rate in excess of 1.00 CMEV. Upon closer inspection of the crash data, 23 of the 27 crashes reported at the intersection (i.e. approximately 85 percent of all reported crashes) were classified as angle/turning movement collisions. Per the City of Newberg’s TSP project I09, a traffic signal is planned for installation at the intersection. Following installation of the traffic signal after sufficient proportionate share contributions have been collected, it is expected that the number of recurring angle/turning movement collisions at the intersection will decrease sufficiently to levels below 1.00 CMEV. No additional mitigation is necessary or recommended at the intersection.

N Springbrook Road at OR-99W

The intersection of N Springbrook Road at OR-99W had three crashes that either involved a pedestrian or was classified as Injury A.

- One of the crashes that involved a pedestrian occurred when the driver of a northbound right-turning passenger car failed to yield right-of-way to a north/south crossing pedestrian who was utilizing an intersection crosswalk. The pedestrian sustained injuries consistent with Injury B classification while the driver of the passenger car was uninjured.
- The second pedestrian-related collision occurred when the driver of a northbound left-turning passenger car was driving carelessly and failed to yield right-of-way to a north/south crossing pedestrian who was utilizing an intersection crosswalk. The pedestrian sustained injuries consistent with Injury C classification while the driver of the passenger car was uninjured.
- The crash that was classified as Injury A occurred when the driver of a southwest-bound passenger car disregarded intersection traffic controls and collided with a southbound passenger car. All occupants of the southbound vehicle sustained injuries consistent with Injury C classification. The driver of the southwest-bound vehicle sustained no injuries while the two other passengers of the vehicle sustained injuries classified as Injury C and Injury A.

Analysis Findings

Based on a review of available crash data, no significant trends or crash patterns were identified at any of the study intersections that are indicative of safety concerns with the exception of the intersection of N Springbrook Road at Haworth Avenue which exhibits a crash rate in excess of 1.00 CMEV. Following installation of a traffic signal at the intersection once sufficient proportionate share contributions have been collected (TSP project I09), it is expected the crash rate will decrease to levels below 1.00 CMEV. Accordingly, no other safety mitigation is recommended per the crash data analysis.

Sight Distance Evaluation

Intersection sight distances were measured at the proposed site access location along Haworth Avenue and evaluated in accordance with the standards established in *A Policy of Geometric Design of Highways and Streets*².

Methodology

According to AASHTO, the driver's eye is assumed to be approximately 15 feet from the near edge of the nearest travel lane of the intersecting street and at a height of 3.5 feet above the minor-street approach pavement. The vehicle driver's eye height along the major-street approach is assumed to be 3.5 feet above the cross-street pavement. Based on a posted speed of 25 mph along Haworth Avenue, the minimum recommended intersection sight distances include the following:

- 280 feet to the east for left-turn vehicles.
- 240 feet to the west for right-turn vehicles.

Per the AASHTO manual intersection sight distance is an operation measure intended to provide sufficient line of sight along the major-street so that a driver could turn from the minor-street approach without impeding traffic flow. Conversely, stopping sight distance is considered the minimum requirement to ensure safe operation of an intersection. This is the distance that allows an oncoming driver to see a hazard on the roadway, react, and come to a complete stop, if necessary, to avoid a collision. Based on the posted speed of 25 mph along Haworth Avenue, the minimum required stopping sight distance is 155 feet, assuming a major-street approach roadway grade of 3 percent or less.

Field Measurements

At the proposed access intersection along Haworth Avenue, sight distance to the east was measured back to the intersection of N Springbrook Road at Haworth Avenue, approximately 170 feet away, noting that sight distances extend back into the shopping center parking lot at distances greater than 280 feet. Given the intersection currently operates under all-way stop-controls (i.e. vehicles will be approach the proposed access intersection from a stopped position) and in the future will operate with a traffic signal (i.e. vehicles may reasonably turn from N Springbrook Road onto Haworth Avenue at speeds no greater than 20 mph), there is more than sufficient stopping sight distance to safely accommodate vehicles approaching the access intersection from this direction.

Sight distance to the west of the proposed access intersection was measured to be approximately 60 feet, limited by trees which act as a barrier delineating the property line between the project site and the adjacent shopping center to the west. Provided this obstructing foliage is removed, adequate intersection sight distance of 240 feet or greater can be obtained to the west.

Analysis Findings

Based on the above measurements, adequate sight distance is available to the east of the proposed site access intersection to allow safe operation along Haworth Avenue. To the west of the access intersection, sight distances are limited by trees which act as a barrier delineating the property line between the project site and

² American Association of State Highway and Transportation Officials (AASHTO), *A Policy on Geometric Design of Highways and Streets*, 6th Edition, 2011.

the adjacent shopping center to the west. Provided this obstructing foliage is removed, adequate intersection sight distance of 240 feet or greater can be obtained to the west. No other sight distance related mitigation is necessary or recommended at the access intersection.

Warrant Analysis

Left-turn lane and preliminary traffic signal warrants were examined at the study intersections where such treatments would be applicable.

Left-turn Lane Warrant

A left-turn refuge lane is primarily a safety consideration for the major-street, removing left-turning vehicles from the through traffic stream at unsignalized one/two-way stop-controlled intersections. The left-turn lane warrants used were developed from the *National Cooperative Highway Research Project's (NCHRP) Report 457*. Turn lane warrants were evaluated based on the number of advancing and opposing vehicles as well as the number of turning vehicles, the travel speed, and the number of through lanes.

Left-turn lane warrants are not projected to be met for the site access intersection along Haworth Avenue under any analysis scenario through year 2029. Accordingly, no new turn lanes are necessary or recommended.

Preliminary Traffic Signal Warrant

Preliminary traffic signal warrants were examined for the unsignalized study intersections along Haworth Avenue to determine whether the installation of a new traffic signal will be warranted at the intersections by the 2029 planning year with the proposed development constructed. Based on the analysis, traffic signal warrants are not projected to be met at any of the unsignalized study intersections by the 2029 planning year based on a review of traffic volumes (i.e. Warrant 1).

Specific to the intersection of N Springbrook Road at Haworth Avenue and referring to the *Crash History Review* section, Warrant 7 Crash Experience is triggered given the number of recurring crashes at the intersection over a single 12-month period that could be mitigated by the installation of a traffic signal. Per the City of Newberg's TSP project I09, a traffic signal is planned for installation at the intersection after sufficient proportionate share contributions have been collected.

Intersection Capacity Analysis

A capacity and delay analysis were conducted for each of the study intersections per the signalized and unsignalized intersection analysis methodologies in the *Highway Capacity Manual (HCM)*³. Intersections are generally evaluated based on the average control delay experienced by vehicles and are assigned a grade according to their operation. The level of service (LOS) of an intersection can range from LOS A, which indicates very little or no delay experienced by vehicles, to LOS F, which indicates a high degree of congestion and delay. The volume-to-capacity (v/c) ratio is a measure that compares the traffic volumes (demand) against the available capacity of an intersection.

Performance Standards

The operating standards adopted by the City of Newberg and ODOT are summarized below.

City of Newberg

According to the City of Newberg's TSP and Public Works Design and Construction Standards, intersections under City jurisdiction are required to operate at a minimum LOS D or better with a v/c ratio no greater than 0.90.

ODOT

Per an Oregon Highway Plan (OHP) amendment, the Oregon Transportation Commission (OTC) has adopted alternative mobility targets for OR-99W at a location from N Springbrook Road to the eastern City limits, as described in the *Alternative Mobility Targets for OR 99W and OR 219 in Newberg* memorandum, dated February 13, 2020. As part of these alternative mobility standards, the intersection of N Springbrook Road at OR-99W is required to operate with a v/c ratio no greater than 1.0.

Delay & Capacity Analysis

According to the project's pre-application meeting notes, dated November 10, 2021, and the City of Newberg's TSP project I09, a traffic signal is planned for installation at the intersection of N Springbrook Road at Haworth Avenue. Additionally, it is expected that that existing eastbound travel lanes will be restriped to a dedicated left-turn lane and shared through/right-turn lane. For the purposes of this analysis, the intersection was analyzed assuming operation under both all-way stop-control and with the traffic signal/westbound lane configurations installed/revised for future year 2024 and 2029 conditions.

The LOS, delay, and v/c results of the capacity analysis are shown in Table 6 for the morning and evening peak hours. The TrafficWare Synchro software utilized for analysis does not report the overall v/c ratio of signalized intersections in the HCM 6th Edition capacity reports. For these intersections, the v/c ratio was calculated based on methods detailed in ODOT's *APM Section 13 Signalized Intersection Analysis*. Detailed calculations as well as tables showing the relationship between delay and LOS are included in the appendix to this report.

³ Transportation Research Board, *Highway Capacity Manual 6th Edition*, 2016.

Table 6: Capacity Analysis Summary

		AM Peak Hour			PM Peak Hour		
		LOS	Delay (s)	v/c	LOS	Delay (s)	v/c
1. N Deborah Road at Haworth Avenue							
	2022 Existing Conditions	B	12	0.47	B	11	0.41
	2024 Background Conditions	B	14	0.52	B	12	0.45
	2024 Buildout Conditions	B	14	0.52	B	12	0.46
	2029 Future Conditions	C	16	0.61	B	13	0.52
2. Site Access at Haworth Avenue							
	2024 Buildout Conditions	B	11	0.02	B	12	0.01
	2029 Future Conditions	B	11	0.02	B	12	0.01
3. N Springbrook Road at Haworth Avenue							
	2022 Existing Conditions	C	20	0.78	D	27	0.84
	2024 Background Conditions (AWSC)	D	26	0.89	E	38	0.97
	2024 Background Conditions (Signal)	B	10	0.50	B	12	0.59
	2024 Buildout Conditions (AWSC)	D	26	0.89	E	38	0.98
	2024 Buildout Conditions (Signal)	B	10	0.50	B	12	0.60
	2029 Future Conditions (AWSC)	E	40	1.02	F	58	1.12
	2029 Future Conditions (Signal)	B	10	0.53	B	12	0.67
4. N Springbrook Road at OR-99W							
	2022 Existing Conditions	D	37	0.78	D	40	0.81
	2024 Background Conditions	D	40	0.81	D	43	0.85
	2024 Buildout Conditions	D	40	0.82	D	43	0.85
	2029 Future Conditions	D	47	0.85	D	49	0.88

Table Notes: **BOLDED** text indicates intersection operation above jurisdictional standards.

Based on the results of the operational analysis, all study intersections are currently operating acceptably per jurisdictional standards and are projected to continue operating acceptably through the 2024 site buildout year and the future 2029 planning year, with the exception of the N Springbrook Road at Haworth Avenue intersection under existing all-way stop-controls. Once a traffic signal is installed at the intersection, City of Newberg mobility targets will be met for the intersection. Accordingly, no additional operational mitigation is necessary or recommended at the study intersections.



Intersection Queuing Analysis

A queuing analysis was conducted at the study intersections to determine whether sufficient storage is available at applicable turning movements to accommodate projected queues. Additionally, the analysis was performed to demonstrate whether eastbound queues at the intersection of N Springbrook Road at Haworth Avenue will extend back to the proposed site access intersection along Haworth Avenue. Based on correspondence with City of Newberg staff, if queues from the N Springbrook Road at Haworth Avenue intersection obstruct turning movements at the site access intersection, turning movements at the site access may need to be restricted.

Queuing Analysis

The queue lengths were projected based on the results of a Synchro/SimTraffic simulation, with the reported values representing the 95th percentile queue length. The 95th percentile queue is a statistical measurement which indicates there is a 5 percent chance, that the queue may exceed this length during the analysis period; however, given this is a probability, the 95th percentile queue length may theoretically never be met or observed in the field.

The projected 95th percentile queue lengths reported in the simulation are presented in Table 7 for the morning and evening peak hours. Note the reported queue lengths were rounded up to the nearest five feet. Detailed queuing analysis worksheets are included in the technical appendix to this report.

Table 7: Queuing Analysis Summary

		Available Storage (ft)	AM Peak Hour	PM Peak Hour
			95th (ft)	95th (ft)
1. N Deborah Road at Haworth Avenue				
2022 Existing Conditions	EB Lane	-	90	85
	WB Lane	-	75	75
	NB Lane	-	80	65
	SB Lane	-	105	85
2024 Background Conditions	EB Lane	-	95	85
	WB Lane	-	75	75
	NB Lane	-	85	65
	SB Lane	-	105	85
2024 Buildout Conditions	EB Lane	-	95	90
	WB Lane	-	75	75
	NB Lane	-	85	65
	SB Lane	-	115	85
2024 Future Conditions	EB Lane	-	105	95
	WB Lane	-	90	75
	NB Lane	-	85	65
	SB Lane	-	120	85
2. Site Access at Haworth Avenue				
2024 Buildout Conditions	WB Lane	150*	5	25
	NB Lane	-	30	30
2024 Future Conditions	WB Lane	150*	10	30
	NB Lane	-	30	30

Table Notes: **BOLDED** text indicates queue length exceeds available storage.

* The distance between Haworth/Springbrook Intersection's marked crosswalk and the site access.

Table 7: Queuing Analysis Summary (Continued)

		Available Storage (ft)	AM Peak Hour	PM Peak Hour
			95th (ft)	95th (ft)
3. N Springbrook Road at Haworth Avenue (AWSC)				
2022 Existing Conditions	EB Th/LT Lane	150*	55	85
	EB RT Lane	150*	85	85
	WB Lane	-	55	110
	NB LT Lane	90	70	95
	NB Th/RT Lane	-	120	160
	SB LT Lane	95	45	100
	SB Th/RT Lane	-	180	220
2024 Background Conditions	EB Th/LT Lane	150*	60	85
	EB RT Lane	150*	95	85
	WB Lane	-	60	120
	NB LT Lane	90	70	100
	NB Th/RT Lane	-	130	200
	SB LT Lane	95	70	180
	SB Th/RT Lane	-	210	410
2024 Buildout Conditions	EB Th/LT Lane	150*	65	85
	EB RT Lane	150*	100	100
	WB Lane	-	60	130
	NB LT Lane	90	65	120
	NB Th/RT Lane	-	135	205
	SB LT Lane	95	90	175
	SB Th/RT Lane	-	260	390
2024 Future Conditions	EB Th/LT Lane	150*	70	110
	EB RT Lane	150*	110	115
	WB Lane	-	60	150
	NB LT Lane	90	75	170
	NB Th/RT Lane	-	150	290
	SB LT Lane	95	145	285
	SB Th/RT Lane	-	405	895
3. N Springbrook Road at Haworth Avenue (Traffic Signal)				
2024 Background Conditions	EB LT Lane	150*	70	85
	EB Th/RT Lane	150*	120	115
	WB Lane	-	70	170
	NB LT Lane	90	95	125
	NB Th/RT Lane	-	175	190
	SB LT Lane	95	70	75
	SB Th/RT Lane	-	210	195
2024 Buildout Conditions	EB LT Lane	150*	70	90
	EB Th/RT Lane	150*	115	145
	WB Lane	-	65	180
	NB LT Lane	90	95	130
	NB Th/RT Lane	-	160	200
	SB LT Lane	95	55	70
	SB Th/RT Lane	-	210	200

Table Notes: **BOLDED** text indicates queue length exceeds available storage.

* The distance between Haworth/Springbrook Intersection's marked crosswalk and the site access.



Table 7: Queuing Analysis Summary (Continued)

		Available Storage (ft)	AM Peak Hour	PM Peak Hour
			95th (ft)	95th (ft)
3. N Springbrook Road at Haworth Avenue (Traffic Signal)				
2024 Future Conditions	EB LT Lane	150*	80	100
	EB Th/RT Lane	150*	140	145
	WB Lane	-	75	225
	NB LT Lane	90	110	125
	NB Th/RT Lane	-	180	195
	SB LT Lane	95	70	95
	SB Th/RT Lane	-	215	235
4. N Springbrook Road at OR-99W				
2022 Existing Conditions	EB LT Lane	350	105	160
	EB Th Lanes	-	405	340
	EB RT Lane	340	45	45
	WB LT Lanes	450	215	350
	WB Th Lanes	-	215	465
	WB RT Lane	335	0	200
	NB LT Lanes	245	175	260
	NB Th Lane	-	195	205
	NB RT Lane	260	260	200
	SB LT Lanes	115	185	170
	SB Th Lane	-	140	190
	SB RT Lane	125	55	105
2024 Background Conditions	EB LT Lane	350	80	150
	EB Th Lanes	-	430	365
	EB RT Lane	340	95	0
	WB LT Lanes	450	215	350
	WB Th Lanes	-	225	445
	WB RT Lane	335	0	200
	NB LT Lanes	245	195	265
	NB Th Lane	-	250	220
	NB RT Lane	260	315	215
	SB LT Lanes	115	205	175
	SB Th Lane	-	145	190
	SB RT Lane	125	70	120
2024 Buildout Conditions	EB LT Lane	350	125	155
	EB Th Lanes	-	445	370
	EB RT Lane	340	95	45
	WB LT Lanes	450	235	345
	WB Th Lanes	-	230	450
	WB RT Lane	335	0	175
	NB LT Lanes	245	215	255
	NB Th Lane	-	290	235
	NB RT Lane	260	340	225
	SB LT Lanes	115	205	195
	SB Th Lane	-	160	225
	SB RT Lane	125	65	135

Table Notes: **BOLDED** text indicates queue length exceeds available storage.



Table 7: Queuing Analysis Summary (Continued)

		Available Storage (ft)	AM Peak Hour	PM Peak Hour
			95th (ft)	95th (ft)
4. N Springbrook Road at OR-99W				
2024 Future Conditions	EB LT Lane	350	155	190
	EB Th Lanes	-	455	395
	EB RT Lane	340	145	45
	WB LT Lanes	450	225	395
	WB Th Lanes	-	240	495
	WB RT Lane	335	0	240
	NB LT Lanes	245	255	285
	NB Th Lane	-	370	265
	NB RT Lane	260	380	235
	SB LT Lanes	115	230	195
	SB Th Lane	-	170	220
	SB RT Lane	125	70	145

Table Notes: **BOLDED** text indicates queue length exceeds available storage.

Based on the intersection queuing analysis, the projected 95th percentile queues at the following turning movements are projected to exceed their respective available striped lane storage:

3. N Springbrook Road at Haworth Avenue (with Traffic Signal Installed)
 - a. Northbound left-turn Lane – 130-foot maximum queue
4. N Springbrook Road at OR-99W
 - a. Northbound left-turn lanes – 285-foot maximum queue
 - b. Northbound right-turn lane – 380-foot maximum queue
 - c. Southbound left-turn lanes – 230-foot maximum queue
 - d. Southbound right-turn lane – 145-foot maximum queue

N Springbrook Road at Haworth Avenue

At the intersection of N Springbrook Road at Haworth Avenue with a traffic signal installed, the northbound left-turn lane is projected to have a maximum queue length of 130 feet by year 2024 buildout conditions. The existing striping of the turn lane allows for approximately 90 feet of storage whereby approximately 40 feet of the 95th percentile queue will extend beyond this space. Although not striped as storage space, there is an additional 50 feet of space beyond the striped queue area that could accommodate this queue without obstructing northbound through traffic at the intersection. Therefore, no queuing related mitigation is necessary at the intersection to accommodate this queue.

Note that all other extended queues that are projected at the intersection when operating under all-way stop-controls are expected to be mitigated following installation of traffic signal. No additional mitigation is necessary or recommended as part of the proposed development application.



N Springbrook Road at OR-99W

At the intersection of N Springbrook Road at OR-99W the northbound/southbound left-turn and right-turn lanes experienced 95th percentile queues in excess of available striped lane storages under the 2029 planning year.

For the northbound left-turn lanes, the maximum queue length of 285 feet exceeds the available striped queue storage of 245 feet by approximately 40 feet. Beyond this striped storage area there is approximately 80 feet of additional storage space for both left-turn lanes that could accommodate this excess queue. Note that the proposed development is not expected to add any trips to the northbound left-turn movement at the intersection. Therefore, no queuing related mitigation is necessary at the intersection to accommodate this queue.

For the northbound right-turn lane, the maximum queue length of 380 feet exceeds the available striped queue storage of 260 feet by approximately 120 feet. Beyond this striped storage area there is approximately 60 feet of additional storage space for the right turn lane prior to extending into a nearby right-in/right-out shopping center intersection along N Springbrook Road. The remaining 60 feet of storage space (which can be equated to the approximate length of 2-3 queued vehicles) can be accommodated within the northbound through lane without significant impact to the through moving traffic or having the total northbound queue extend back to the intersection of N Springbrook Road at Hayes Street. Note that the proposed development is not expected to add any trips to the northbound right-turn movement at the intersection. Therefore, no queuing related mitigation is necessary at the intersection to accommodate this queue.

For the southbound left-turn lanes, the maximum queue length of 230 feet exceeds the available striped queue storage of 115 feet by approximately 115 feet. Beyond this striped storage area there is approximately 50 feet of additional storage space for both left-turn lanes and approximately 90 additional feet of storage for a single left-turn vehicle queue without having queues obstruct the southbound through movement at the intersection. The effective remaining excess queue length is 40 feet which can be equated to a queue of approximately 2 vehicles. This excess 40 feet can be accommodated by the southbound through movement without significant impact to the through moving traffic or having total southbound queues extend back to the adjacent intersection of N Springbrook Road at Haworth Avenue. No queuing related mitigation is necessary at the intersection to accommodate this queue.

For the southbound right-turn lane, the maximum queue length of 145 feet exceeds the available striped queue storage of 125 feet by approximately 20 feet. Beyond this striped storage area there is approximately 50 feet of additional storage space for the right-turn lane before the queue extends into the southbound through lane. Accordingly, this excess 20 feet can be accommodated without impact to the southbound through movement; however, the right-turn queue may partially obstruct the southbound bicycle lane for a short period of time during the evening peak hour under year 2029 conditions. No queuing related mitigation is necessary at the intersection to accommodate this queue.

Analysis Summary

Based on the above review of 95th percentile queues at the study intersections, no queuing related mitigations are recommended at the intersections of N Springbrook Road at Haworth Avenue and N Springbrook Road at OR-99W which are projected to experience occasional 95th percentile queues which exceed available lane storages. All other study intersections and their respective turning movements are provided adequate vehicle storage space. No intersection queuing related mitigation is necessary or recommended as part of the proposed development project.

Turning Movements at Site Access

Based on the queuing analysis, adequate spacing between the proposed site access intersection and the intersection of Haworth Avenue at N Springbrook Road is available to allow un-restricted turning movements at the site access intersection without creating safety issues (i.e. approximately 5 to 10 feet of space will be available between the access intersection and the longest 95th percentile queue).

It should be noted that from a site circulation and safety perspective, allowing un-restricted turning movements at an access point is preferable when only a single driveway serves a land use(s) for the following reasons:

- If served by a single restricted access, significant out of direction travel for vehicles entering and exiting the site will potentially be created. This out of direction travel may increase turning movement volumes at nearby intersections along Haworth Avenue, OR-99W, Deborah Road, and N Springbrook Road.
- Emergency vehicle access to/from the site will be limited, where emergency vehicles would either need to enter/exit the site in the eastbound direction of travel along Haworth Avenue or would be required to make U-turns along Haworth Avenue (U-turn would potentially require multiple forward and backward motions for larger vehicles like a fire truck). This could potentially create extended emergency response times and subsequently unsafe conditions for tenants living in the apartment complex if an emergency incident were to occur.

Given sufficient space between the site access and the 95th percentile eastbound queues at the N Springbrook Road at Haworth Avenue intersection are available and the potential for circulation/safety issues which could occur with a single restricted access point to the site, it is recommended that the proposed apartment complex be allowed an unrestricted full movement access onto Haworth Avenue.

Conclusions

No significant trends or crash patterns were identified at any of the study intersections that are indicative of safety concerns with the exception of the intersection of N Springbrook Road at Haworth Avenue which exhibits a crash rate in excess of 1.00 CMEV. Following installation of a traffic signal at the intersection once sufficient proportionate share contributions have been collected (TSP project I09), it is expected the crash rate will decrease to levels below 1.00 CMEV. Accordingly, no other safety mitigation is recommended per the crash data analysis.

Adequate sight distance is available to the east of the proposed site access intersection to allow safe operation along Haworth Avenue. To the west of the access intersection, sight distances are limited by trees which act as a barrier delineating the property line between the project site and the adjacent shopping center to the west. Provided this obstructing foliage is removed, adequate intersection sight distance of 240 feet or greater can be obtained to the west. No other sight distance related mitigation is necessary or recommended at the access intersection.

Left-turn lane warrants are not projected to be met for the site access intersection along Haworth Avenue under any analysis scenario through year 2029. Accordingly, no new turn lanes are necessary or recommended.

Traffic signal warrants are not projected to be met at any of the unsignalized study intersections by the 2029 planning year based on a review of traffic volumes. Specific to the intersection of N Springbrook Road at Haworth Avenue, Warrant 7 is triggered due to the number of recurring crashes at the intersection that could be mitigated by the installation of a traffic signal. Per the City of Newberg's TSP project I09, a traffic signal is planned for installation at the intersection after sufficient proportionate share contributions have been collected. No other traffic signals are necessary or warranted.

All study intersections are currently operating acceptably per jurisdictional standards and are projected to continue operating acceptably through the 2024 site buildout year and the future 2029 planning year, with the exception of the N Springbrook Road at Haworth Avenue intersection under existing all-way stop-controls. Once a traffic signal is installed at the intersection, City of Newberg mobility targets will be met for the intersection. No additional operational mitigation is necessary or recommended at the study intersections.

No queuing related mitigations are recommended at the intersections of N Springbrook Road at Haworth Avenue and N Springbrook Road at OR-99W which are projected to experience occasional 95th percentile queues which exceed available lane storages. All other study intersections and their respective turning movements are provided adequate vehicle storage space. Accordingly, no intersection queuing related mitigation is necessary or recommended as part of the proposed development project.

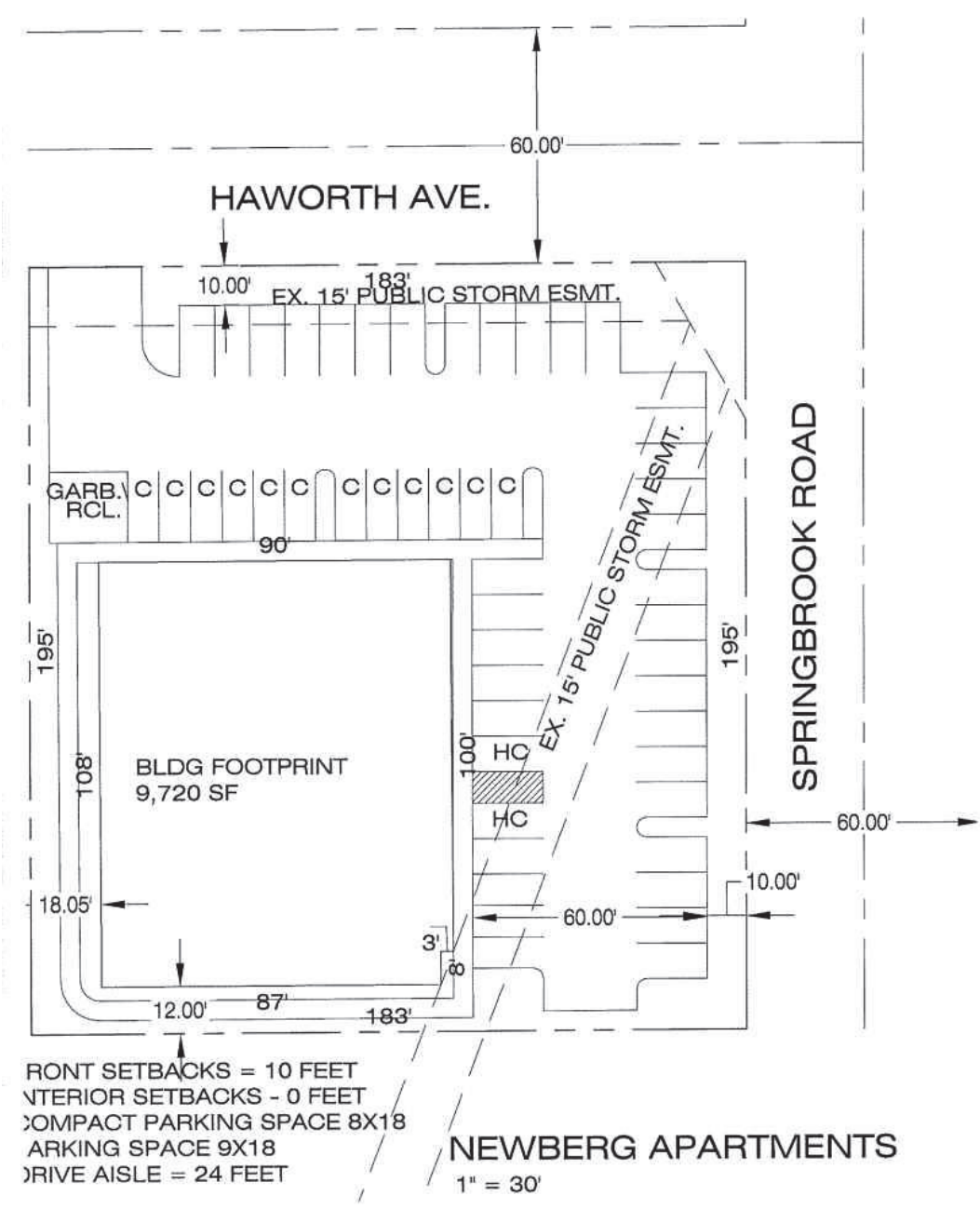
Given sufficient space between the site access and the 95th percentile eastbound queues at the N Springbrook Road at Haworth Avenue intersection are available and the potential for circulation/safety issues which could occur with a single restricted access point to the site, it is recommended that the proposed apartment complex be allowed an unrestricted full movement access onto Haworth Avenue.

Appendix A

Site Plan



Site Plan



TUALATIN VALLEY FIRE & RESCUE COMMENTS:

Appendix B

Trip Generation Calculations





TRIP GENERATION CALCULATIONS
Source: Trip Generation Manual, 11th Edition

Land Use: Multifamily Housing (Low-Rise)
Land Use Code: 220
Land Use Subcategory: Not Close to Rail Transit
Setting/Location: General Urban/Suburban
Variable: Dwelling Units
Trip Type: Vehicle
Variable Quantity: 30

AM PEAK HOUR

Trip Rate: 0.4

	Enter	Exit	Total
Directional Split	24%	76%	
Trip Ends	3	9	12

PM PEAK HOUR

Trip Rate: 0.51

	Enter	Exit	Total
Directional Split	63%	37%	
Trip Ends	9	6	15

WEEKDAY

Trip Rate: 6.74

	Enter	Exit	Total
Directional Split	50%	50%	
Trip Ends	101	101	202

SATURDAY

Trip Rate: 4.55

	Enter	Exit	Total
Directional Split	50%	50%	
Trip Ends	68	68	136

Caution: Small Sample Size

Appendix C

Traffic Counts

In-Process Development Trips





ALL TRAFFIC DATA SERVICES

(303) 216-2439

www.alltrafficdata.net

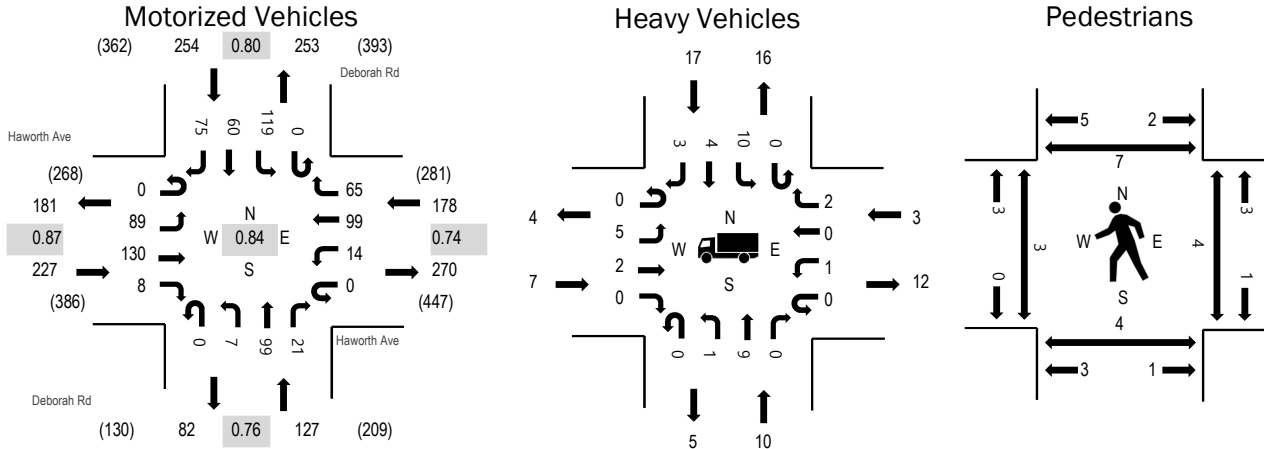
Location: 1 Deborah Rd & Haworth Ave AM

Date: Tuesday, April 19, 2022

Peak Hour: 07:45 AM - 08:45 AM

Peak 15-Minutes: 08:30 AM - 08:45 AM

Peak Hour



Note: Total study counts contained in parentheses.

	HV%	PHF
EB	3.1%	0.87
WB	1.7%	0.74
NB	7.9%	0.76
SB	6.7%	0.80
All	4.7%	0.84

Traffic Counts - Motorized Vehicles

Interval Start Time	Haworth Ave Eastbound				Haworth Ave Westbound				Deborah Rd Northbound				Deborah Rd Southbound				Total	Rolling Hour
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right		
7:00 AM	0	2	6	0	0	0	4	2	0	0	0	0	0	6	0	1	21	505
7:05 AM	0	3	8	0	0	0	3	3	0	0	9	2	0	2	1	1	32	552
7:10 AM	0	3	10	0	0	0	5	3	0	0	3	2	0	2	2	1	31	587
7:15 AM	0	3	5	3	0	2	6	4	0	0	5	3	0	1	4	1	37	607
7:20 AM	0	0	11	1	0	0	4	4	0	1	5	1	0	1	3	2	33	612
7:25 AM	0	6	6	2	0	0	4	5	0	0	5	1	0	6	1	0	36	637
7:30 AM	0	2	11	0	0	1	5	4	0	0	2	1	0	1	3	3	33	675
7:35 AM	0	10	8	1	0	1	6	1	0	0	10	0	0	6	3	0	46	720
7:40 AM	0	4	14	0	0	1	3	4	0	2	6	2	0	2	3	4	45	752
7:45 AM	0	11	9	1	0	1	6	7	0	0	7	1	0	8	2	2	55	786
7:50 AM	0	7	6	0	0	0	5	4	0	0	7	4	0	17	6	7	63	784
7:55 AM	0	9	7	1	0	2	3	8	0	1	10	4	0	14	7	7	73	764
8:00 AM	0	10	12	1	0	1	7	6	0	0	6	3	0	8	5	9	68	733
8:05 AM	0	6	16	0	0	1	7	4	0	0	6	0	0	14	5	8	67	
8:10 AM	0	4	11	2	0	0	8	6	0	1	7	1	0	3	2	6	51	
8:15 AM	0	3	11	1	0	1	8	2	0	1	6	0	0	3	3	3	42	
8:20 AM	0	11	5	1	0	2	8	6	0	1	7	2	0	7	2	6	58	
8:25 AM	0	5	18	1	0	0	11	4	0	1	13	2	0	9	6	4	74	
8:30 AM	0	10	16	0	0	1	13	4	0	2	11	1	0	10	5	5	78	
8:35 AM	0	5	7	0	0	2	11	6	0	0	10	2	0	18	6	11	78	
8:40 AM	0	8	12	0	0	3	12	8	0	0	9	1	0	8	11	7	79	
8:45 AM	0	1	15	1	0	0	8	2	0	2	5	2	0	5	8	4	53	
8:50 AM	0	4	11	0	0	0	5	5	0	0	3	0	0	8	3	4	43	
8:55 AM	0	3	5	0	0	2	4	2	0	0	7	3	0	10	2	4	42	
Count Total	0	130	240	16	0	21	156	104	0	12	159	38	0	169	93	100	1,238	
Peak Hour	0	89	130	8	0	14	99	65	0	7	99	21	0	119	60	75	786	

Location: 1 Deborah Rd & Haworth Ave AM

Traffic Counts - Heavy Vehicles, Bicycles on Road, and Pedestrians/Bicycles on Crosswalk

Interval Start Time	Heavy Vehicles					Interval Start Time	Bicycles on Roadway					Interval Start Time	Pedestrians/Bicycles on Crosswalk				
	EB	NB	WB	SB	Total		EB	NB	WB	SB	Total		EB	NB	WB	SB	Total
7:00 AM	0	0	0	0	0	7:00 AM	0	0	0	0	0	7:00 AM	0	0	0	0	0
7:05 AM	0	0	0	0	0	7:05 AM	0	0	0	0	0	7:05 AM	0	0	0	0	0
7:10 AM	0	0	0	0	0	7:10 AM	0	0	0	0	0	7:10 AM	0	0	0	0	0
7:15 AM	0	1	1	0	2	7:15 AM	0	0	0	0	0	7:15 AM	0	1	0	1	2
7:20 AM	1	0	0	1	2	7:20 AM	0	0	0	0	0	7:20 AM	0	0	0	0	0
7:25 AM	0	0	1	0	1	7:25 AM	0	0	0	0	0	7:25 AM	0	0	0	0	0
7:30 AM	0	1	1	0	2	7:30 AM	0	0	0	1	1	7:30 AM	0	0	0	0	0
7:35 AM	1	1	0	0	2	7:35 AM	0	0	0	0	0	7:35 AM	0	0	0	1	1
7:40 AM	0	1	0	2	3	7:40 AM	0	0	0	0	0	7:40 AM	0	0	0	0	0
7:45 AM	1	1	0	2	4	7:45 AM	0	0	0	0	0	7:45 AM	2	0	0	0	2
7:50 AM	0	0	0	1	1	7:50 AM	0	0	0	0	0	7:50 AM	0	0	0	3	3
7:55 AM	0	1	1	0	2	7:55 AM	0	0	0	0	0	7:55 AM	2	0	0	0	2
8:00 AM	0	0	0	0	0	8:00 AM	0	0	0	0	0	8:00 AM	0	1	0	1	2
8:05 AM	0	1	0	1	2	8:05 AM	0	0	0	0	0	8:05 AM	0	0	0	1	1
8:10 AM	0	1	0	0	1	8:10 AM	0	0	0	0	0	8:10 AM	0	0	2	1	3
8:15 AM	2	1	0	0	3	8:15 AM	0	0	0	0	0	8:15 AM	0	2	1	0	3
8:20 AM	2	2	0	1	5	8:20 AM	0	0	0	0	0	8:20 AM	0	1	0	0	1
8:25 AM	0	2	1	1	4	8:25 AM	0	0	0	0	0	8:25 AM	0	0	0	1	1
8:30 AM	0	1	0	4	5	8:30 AM	0	0	0	0	0	8:30 AM	0	0	1	0	1
8:35 AM	0	0	1	4	5	8:35 AM	0	0	0	0	0	8:35 AM	1	0	0	0	1
8:40 AM	2	0	0	3	5	8:40 AM	0	0	0	0	0	8:40 AM	0	0	0	0	0
8:45 AM	0	0	0	0	0	8:45 AM	0	0	0	0	0	8:45 AM	0	0	0	0	0
8:50 AM	0	0	0	1	1	8:50 AM	0	0	0	0	0	8:50 AM	0	0	1	0	1
8:55 AM	0	1	0	1	2	8:55 AM	0	0	0	0	0	8:55 AM	0	0	2	0	2
Count Total	9	15	6	22	52	Count Total	0	0	0	1	1	Count Total	5	5	7	9	26
Peak Hour	7	10	3	17	37	Peak Hour	0	0	0	0	0	Peak Hour	5	4	4	7	20

Location: 2 N Springbrook Rd & Haworth Ave AM



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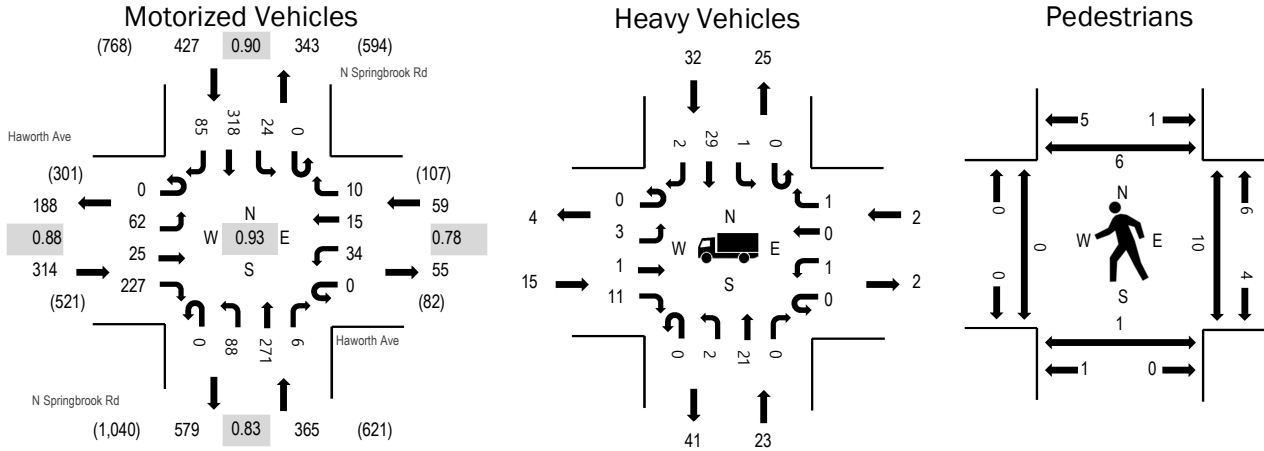
Location: 2 N Springbrook Rd & Haworth Ave AM

Date: Tuesday, April 19, 2022

Peak Hour: 07:45 AM - 08:45 AM

Peak 15-Minutes: 08:30 AM - 08:45 AM

Peak Hour



Note: Total study counts contained in parentheses.

	HV%	PHF
EB	4.8%	0.88
WB	3.4%	0.78
NB	6.3%	0.83
SB	7.5%	0.90
All	6.2%	0.93

Traffic Counts - Motorized Vehicles

Interval Start Time	Haworth Ave Eastbound				Haworth Ave Westbound				N Springbrook Rd Northbound				N Springbrook Rd Southbound				Total	Rolling Hour
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right		
7:00 AM	0	0	0	5	0	1	1	0	0	4	9	0	0	1	19	6	46	943
7:05 AM	0	6	0	14	0	1	1	0	0	1	12	0	0	1	21	0	57	990
7:10 AM	0	3	0	20	0	2	1	2	0	5	19	0	0	2	21	11	86	1,027
7:15 AM	0	3	0	8	0	4	1	0	0	3	12	0	0	1	21	4	57	1,023
7:20 AM	0	2	0	18	0	0	2	1	0	6	13	0	0	1	23	6	72	1,064
7:25 AM	0	4	0	13	0	4	0	0	0	12	26	0	0	0	27	1	87	1,081
7:30 AM	0	2	1	16	0	3	0	1	0	1	19	0	0	0	21	8	72	1,087
7:35 AM	0	4	1	14	0	0	1	0	0	4	20	0	0	0	28	4	76	1,119
7:40 AM	0	5	1	12	0	2	2	0	0	5	25	0	0	1	33	2	88	1,147
7:45 AM	0	3	0	16	0	1	1	0	0	5	30	1	0	0	24	8	89	1,165
7:50 AM	0	5	2	25	0	2	0	0	0	11	33	0	0	2	24	8	112	1,152
7:55 AM	0	7	2	20	0	5	1	2	0	8	20	0	0	2	32	2	101	1,115
8:00 AM	0	5	1	22	0	3	0	0	0	5	22	1	0	0	27	7	93	1,074
8:05 AM	0	2	2	20	0	1	1	1	0	6	18	1	0	1	30	11	94	
8:10 AM	0	6	2	18	0	3	1	1	0	9	20	0	0	1	19	2	82	
8:15 AM	0	8	2	11	0	1	1	1	0	7	25	0	0	6	29	7	98	
8:20 AM	0	4	1	16	0	2	2	2	0	4	28	0	0	3	18	9	89	
8:25 AM	0	6	6	14	0	3	2	1	0	4	21	0	0	4	23	9	93	
8:30 AM	0	4	2	23	0	4	1	0	0	10	18	1	0	3	34	4	104	
8:35 AM	0	6	1	24	0	5	3	2	0	11	18	0	0	0	28	6	104	
8:40 AM	0	6	4	18	0	4	2	0	0	8	18	2	0	2	30	12	106	
8:45 AM	0	4	2	12	0	4	1	1	0	3	18	1	0	2	26	2	76	
8:50 AM	0	5	3	15	0	3	0	5	0	5	16	0	0	2	18	3	75	
8:55 AM	0	3	3	8	0	3	1	0	0	4	11	2	0	2	21	2	60	
Count Total	0	103	36	382	0	61	26	20	0	141	471	9	0	37	597	134	2,017	
Peak Hour	0	62	25	227	0	34	15	10	0	88	271	6	0	24	318	85	1,165	

Location: 2 N Springbrook Rd & Haworth Ave AM

Traffic Counts - Heavy Vehicles, Bicycles on Road, and Pedestrians/Bicycles on Crosswalk

Interval Start Time	Heavy Vehicles					Interval Start Time	Bicycles on Roadway					Interval Start Time	Pedestrians/Bicycles on Crosswalk				
	EB	NB	WB	SB	Total		EB	NB	WB	SB	Total		EB	NB	WB	SB	Total
7:00 AM	0	2	0	0	2	7:00 AM	0	0	0	0	0	7:00 AM	0	0	0	0	0
7:05 AM	0	3	0	2	5	7:05 AM	0	0	0	0	0	7:05 AM	0	0	0	0	0
7:10 AM	0	0	0	1	1	7:10 AM	0	0	0	0	0	7:10 AM	0	0	0	0	0
7:15 AM	0	0	0	0	0	7:15 AM	0	0	0	0	0	7:15 AM	0	0	0	1	1
7:20 AM	0	1	0	2	3	7:20 AM	0	0	0	0	0	7:20 AM	1	0	0	0	1
7:25 AM	0	4	0	1	5	7:25 AM	0	0	0	0	0	7:25 AM	0	0	0	0	0
7:30 AM	1	3	1	0	5	7:30 AM	0	0	0	0	0	7:30 AM	0	0	0	0	0
7:35 AM	0	1	0	0	1	7:35 AM	0	0	0	0	0	7:35 AM	0	0	0	0	0
7:40 AM	1	1	1	2	5	7:40 AM	0	0	0	0	0	7:40 AM	0	1	0	0	1
7:45 AM	0	4	0	0	4	7:45 AM	0	0	0	0	0	7:45 AM	0	0	4	2	6
7:50 AM	1	0	0	2	3	7:50 AM	0	0	0	0	0	7:50 AM	0	0	0	1	1
7:55 AM	0	3	0	1	4	7:55 AM	0	0	0	0	0	7:55 AM	0	0	0	0	0
8:00 AM	2	1	0	1	4	8:00 AM	0	0	0	0	0	8:00 AM	0	1	0	0	1
8:05 AM	0	4	0	1	5	8:05 AM	0	0	0	0	0	8:05 AM	0	0	1	0	1
8:10 AM	2	2	0	1	5	8:10 AM	0	0	0	0	0	8:10 AM	0	0	0	0	0
8:15 AM	0	1	0	4	5	8:15 AM	0	0	0	0	0	8:15 AM	0	0	1	1	2
8:20 AM	1	4	0	1	6	8:20 AM	0	0	0	0	0	8:20 AM	0	0	0	0	0
8:25 AM	3	2	1	5	11	8:25 AM	0	0	0	0	0	8:25 AM	0	0	2	0	2
8:30 AM	1	2	1	8	12	8:30 AM	0	0	0	0	0	8:30 AM	0	0	2	0	2
8:35 AM	5	0	0	3	8	8:35 AM	0	0	0	0	0	8:35 AM	0	0	0	1	1
8:40 AM	0	0	0	5	5	8:40 AM	0	0	0	0	0	8:40 AM	0	0	0	1	1
8:45 AM	0	0	1	2	3	8:45 AM	0	0	0	0	0	8:45 AM	0	0	1	0	1
8:50 AM	1	2	0	1	4	8:50 AM	0	0	0	0	0	8:50 AM	0	0	0	0	0
8:55 AM	0	1	0	2	3	8:55 AM	0	0	0	0	0	8:55 AM	0	1	1	0	2
Count Total	18	41	5	45	109	Count Total	0	0	0	0	0	Count Total	1	3	12	7	23
Peak Hour	15	23	2	32	72	Peak Hour	0	0	0	0	0	Peak Hour	0	1	10	6	17



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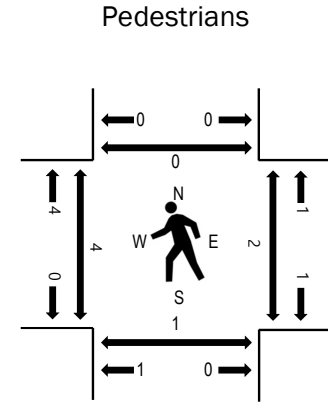
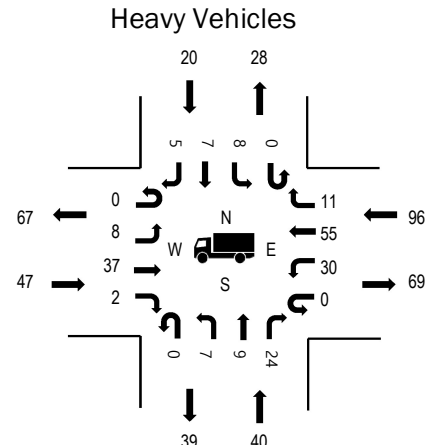
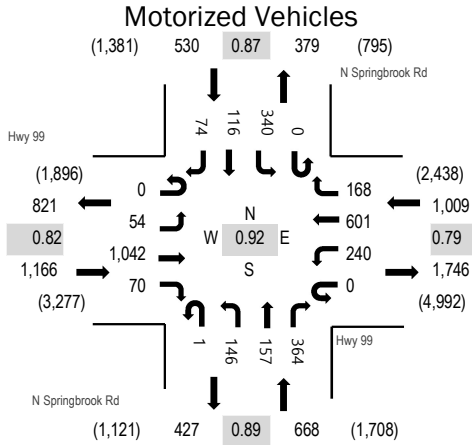
Location: 1 N Springbrook Rd & Hwy 99 AM

Date: Tuesday, April 19, 2022

Peak Hour: 07:25 AM - 08:25 AM

Peak 15-Minutes: 07:45 AM - 08:00 AM

Peak Hour



Note: Total study counts contained in parentheses.

	HV%	PHF
EB	4.0%	0.82
WB	9.5%	0.79
NB	6.0%	0.89
SB	3.8%	0.87
All	6.0%	0.92

Traffic Counts - Motorized Vehicles

Interval Start Time	Hwy 99 Eastbound				Hwy 99 Westbound				N Springbrook Rd Northbound				N Springbrook Rd Southbound				Total	Rolling Hour
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right		
6:00 AM	0	1	55	0	0	15	13	3	0	3	3	16	0	21	7	1	138	2,423
6:05 AM	0	0	97	0	0	9	18	2	0	3	2	14	0	19	0	2	166	2,487
6:10 AM	0	0	57	1	0	10	11	1	0	2	2	25	0	25	6	2	142	2,563
6:15 AM	0	0	99	1	0	15	15	4	0	3	3	24	0	16	1	1	182	2,684
6:20 AM	0	2	76	2	0	7	8	4	0	3	5	28	0	15	2	2	154	2,752
6:25 AM	0	1	125	5	0	15	22	6	0	4	7	31	0	17	6	2	241	2,828
6:30 AM	0	0	82	1	0	16	25	7	0	3	8	35	0	29	6	0	212	2,863
6:35 AM	0	0	124	3	0	14	28	3	0	0	7	40	0	19	8	1	247	2,928
6:40 AM	0	0	112	4	0	13	23	5	0	5	4	38	0	33	7	1	245	2,967
6:45 AM	0	0	122	2	0	16	28	4	0	5	5	29	0	21	10	4	246	3,015
6:50 AM	0	3	76	3	0	22	28	4	0	4	9	30	0	19	8	3	209	3,086
6:55 AM	0	2	95	2	0	16	56	7	0	4	6	24	0	19	7	3	241	3,168
7:00 AM	0	1	59	1	0	30	29	3	0	5	11	32	0	26	5	0	202	3,240
7:05 AM	0	1	103	3	0	22	38	5	0	8	5	24	0	25	5	3	242	3,289
7:10 AM	0	3	78	2	0	22	38	11	0	7	15	43	0	31	10	3	263	3,327
7:15 AM	0	1	105	7	0	18	46	11	0	7	6	17	0	25	4	3	250	3,325
7:20 AM	0	0	62	1	0	18	49	7	0	2	11	34	0	33	9	4	230	3,338
7:25 AM	0	3	107	7	0	19	36	24	0	9	12	23	0	22	9	5	276	3,373
7:30 AM	0	1	93	9	0	22	37	6	0	8	16	44	0	30	6	5	277	3,355
7:35 AM	0	5	105	5	0	22	57	8	0	11	4	34	0	23	4	8	286	3,353
7:40 AM	0	4	83	3	0	29	41	10	0	12	21	42	0	28	11	9	293	3,327
7:45 AM	0	5	92	5	0	14	75	22	0	16	11	28	0	35	9	5	317	3,288
7:50 AM	0	8	64	4	0	27	61	21	0	15	18	32	0	23	13	5	291	3,261
7:55 AM	0	5	97	4	0	27	62	15	0	12	11	25	0	33	13	9	313	3,218
8:00 AM	0	4	53	6	0	15	44	17	0	18	13	32	0	32	9	8	251	3,141
8:05 AM	0	5	88	10	0	26	40	11	1	6	9	30	0	28	19	7	280	
8:10 AM	0	3	88	10	0	9	39	15	0	13	13	31	0	32	5	3	261	
8:15 AM	0	6	68	3	0	20	51	10	0	14	12	27	0	33	12	7	263	

Location: 1 N Springbrook Rd & Hwy 99 AM

8:20 AM	0	5	104	4	0	10	58	9	0	12	17	16	0	21	6	3	265
8:25 AM	0	6	62	6	0	23	41	11	0	10	26	36	0	27	8	2	258
8:30 AM	0	5	82	5	0	20	56	12	0	20	5	20	0	25	20	5	275
8:35 AM	0	3	53	2	0	24	54	6	0	4	20	28	0	38	21	7	260
8:40 AM	0	6	82	4	0	19	52	12	0	12	10	12	0	30	8	7	254
8:45 AM	0	4	63	7	0	20	65	8	0	15	19	36	0	29	20	4	290
8:50 AM	0	3	67	5	0	23	59	13	0	13	7	27	0	16	7	8	248
8:55 AM	0	3	59	4	0	22	46	3	0	13	23	23	0	27	9	4	236
Count Total	0	99	3,037	141	0	669	1,449	320	1	301	376	1,030	0	925	310	146	8,804
Peak Hour	0	54	1,042	70	0	240	601	168	1	146	157	364	0	340	116	74	3,373

Location: 1 N Springbrook Rd & Hwy 99 AM

Traffic Counts - Heavy Vehicles, Bicycles on Road, and Pedestrians/Bicycles on Crosswalk

Interval Start Time	Heavy Vehicles					Interval Start Time	Bicycles on Roadway					Interval Start Time	Pedestrians/Bicycles on Crosswalk				
	EB	NB	WB	SB	Total		EB	NB	WB	SB	Total		EB	NB	WB	SB	Total
6:00 AM	1	1	0	0	2	6:00 AM	0	0	0	0	0	6:00 AM	0	0	0	0	0
6:05 AM	1	0	1	0	2	6:05 AM	0	0	0	0	0	6:05 AM	0	0	0	0	0
6:10 AM	2	1	0	1	4	6:10 AM	0	0	0	0	0	6:10 AM	1	0	0	0	1
6:15 AM	2	0	3	0	5	6:15 AM	0	0	0	0	0	6:15 AM	0	0	0	0	0
6:20 AM	0	2	2	2	6	6:20 AM	0	0	0	0	0	6:20 AM	0	0	0	0	0
6:25 AM	4	1	3	0	8	6:25 AM	0	0	0	0	0	6:25 AM	0	0	0	0	0
6:30 AM	4	1	7	0	12	6:30 AM	0	0	0	0	0	6:30 AM	0	0	0	0	0
6:35 AM	3	2	4	1	10	6:35 AM	0	0	0	0	0	6:35 AM	0	0	0	0	0
6:40 AM	1	1	5	2	9	6:40 AM	0	0	0	0	0	6:40 AM	0	0	0	0	0
6:45 AM	2	1	3	0	6	6:45 AM	0	0	0	0	0	6:45 AM	0	0	0	0	0
6:50 AM	1	2	2	1	6	6:50 AM	0	0	0	0	0	6:50 AM	0	0	0	0	0
6:55 AM	2	6	6	0	14	6:55 AM	0	0	0	0	0	6:55 AM	0	0	0	0	0
7:00 AM	4	5	5	2	16	7:00 AM	0	0	0	0	0	7:00 AM	0	0	0	0	0
7:05 AM	2	0	8	2	12	7:05 AM	0	0	0	0	0	7:05 AM	0	0	0	0	0
7:10 AM	2	2	5	0	9	7:10 AM	0	0	0	0	0	7:10 AM	0	0	0	0	0
7:15 AM	1	0	10	0	11	7:15 AM	0	0	0	0	0	7:15 AM	0	1	0	0	1
7:20 AM	1	1	6	2	10	7:20 AM	0	0	0	0	0	7:20 AM	0	0	0	0	0
7:25 AM	5	3	10	0	18	7:25 AM	0	0	0	0	0	7:25 AM	0	0	0	0	0
7:30 AM	1	5	7	1	14	7:30 AM	0	0	0	0	0	7:30 AM	0	0	0	0	0
7:35 AM	5	2	7	1	15	7:35 AM	0	0	0	0	0	7:35 AM	0	0	0	0	0
7:40 AM	1	1	11	4	17	7:40 AM	0	0	0	0	0	7:40 AM	2	0	1	0	3
7:45 AM	7	5	7	0	19	7:45 AM	0	0	0	0	0	7:45 AM	0	0	0	0	0
7:50 AM	4	4	6	2	16	7:50 AM	0	0	0	0	0	7:50 AM	0	0	0	0	0
7:55 AM	3	1	7	1	12	7:55 AM	0	0	0	0	0	7:55 AM	0	0	0	0	0
8:00 AM	0	2	8	1	11	8:00 AM	0	0	0	0	0	8:00 AM	0	0	0	0	0
8:05 AM	1	5	12	2	20	8:05 AM	0	0	0	0	0	8:05 AM	0	0	0	0	0
8:10 AM	7	4	7	2	20	8:10 AM	0	0	0	0	0	8:10 AM	1	1	1	0	3
8:15 AM	5	6	4	4	19	8:15 AM	0	0	0	0	0	8:15 AM	1	0	0	0	1
8:20 AM	8	2	10	2	22	8:20 AM	0	0	0	0	0	8:20 AM	0	0	0	0	0
8:25 AM	5	1	5	2	13	8:25 AM	0	0	0	0	0	8:25 AM	1	0	0	0	1
8:30 AM	5	1	4	9	19	8:30 AM	0	0	0	0	0	8:30 AM	0	0	0	0	0
8:35 AM	2	1	11	9	23	8:35 AM	0	0	0	0	0	8:35 AM	1	0	0	0	1
8:40 AM	5	1	6	5	17	8:40 AM	0	0	0	0	0	8:40 AM	1	0	1	0	2
8:45 AM	4	1	5	3	13	8:45 AM	0	0	0	0	0	8:45 AM	1	0	0	0	1
8:50 AM	4	2	4	2	12	8:50 AM	0	0	0	0	0	8:50 AM	0	0	0	0	0
8:55 AM	1	5	7	2	15	8:55 AM	0	0	0	0	0	8:55 AM	0	0	0	0	0
Count Total	106	78	208	65	457	Count Total	0	0	0	0	0	Count Total	9	2	3	0	14
Peak Hour	47	40	96	20	203	Peak Hour	0	0	0	0	0	Peak Hour	4	1	2	0	7



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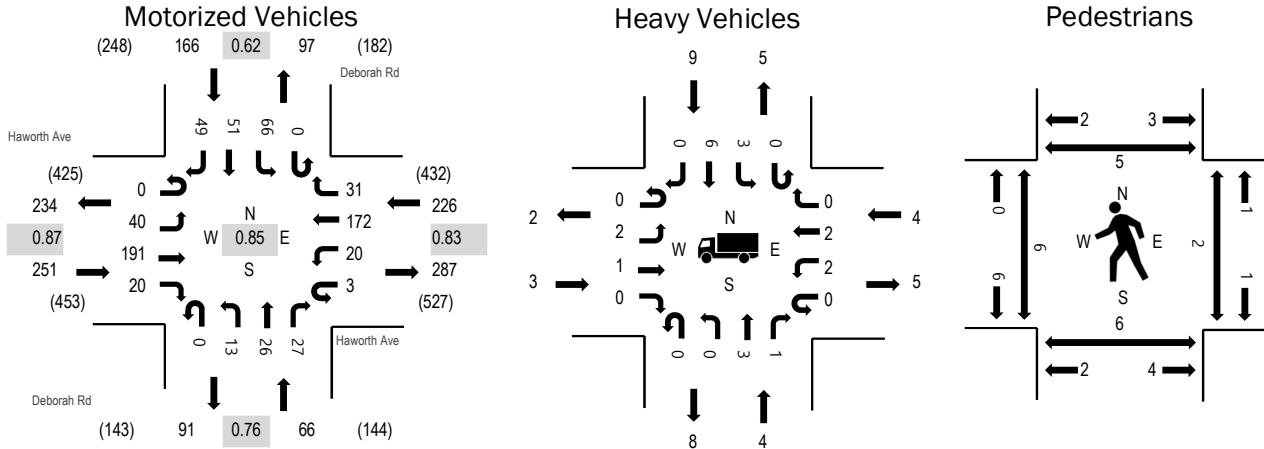
Location: 1 Deborah Rd & Haworth Ave PM

Date: Tuesday, April 19, 2022

Peak Hour: 04:00 PM - 05:00 PM

Peak 15-Minutes: 04:00 PM - 04:15 PM

Peak Hour



Note: Total study counts contained in parentheses.

	HV%	PHF
EB	1.2%	0.87
WB	1.8%	0.83
NB	6.1%	0.76
SB	5.4%	0.62
All	2.8%	0.85

Traffic Counts - Motorized Vehicles

Interval Start Time	Haworth Ave Eastbound				Haworth Ave Westbound				Deborah Rd Northbound			Deborah Rd Southbound				Total	Rolling Hour	
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru			Right
4:00 PM	0	6	17	3	0	1	12	4	0	1	1	2	0	9	13	11	80	709
4:05 PM	0	4	13	3	0	2	16	3	0	2	2	3	0	10	3	5	66	668
4:10 PM	0	1	16	0	3	1	21	0	0	3	0	1	0	5	3	8	62	647
4:15 PM	0	2	17	1	0	1	17	3	0	1	1	5	0	7	2	3	60	640
4:20 PM	0	2	11	2	0	1	12	0	0	1	2	2	0	5	7	3	48	621
4:25 PM	0	6	16	2	0	1	17	2	0	0	6	0	0	7	4	2	63	616
4:30 PM	0	4	12	2	0	2	14	9	0	1	4	2	0	4	5	3	62	594
4:35 PM	0	2	17	1	0	2	20	1	0	1	1	2	0	8	1	4	60	574
4:40 PM	0	3	14	2	0	4	9	1	0	1	2	1	0	3	2	1	43	575
4:45 PM	0	4	18	4	0	4	10	3	0	1	3	2	0	5	1	1	56	587
4:50 PM	0	6	19	0	0	1	13	2	0	0	4	5	0	0	4	4	58	581
4:55 PM	0	0	21	0	0	0	11	3	0	1	0	2	0	3	6	4	51	576
5:00 PM	0	5	6	2	0	1	12	1	0	0	3	3	0	2	1	3	39	568
5:05 PM	0	0	12	0	0	4	13	2	0	3	4	3	0	0	2	2	45	
5:10 PM	0	1	16	0	0	0	19	2	0	1	3	7	0	5	0	1	55	
5:15 PM	0	3	20	0	0	2	10	0	0	0	1	2	0	1	1	1	41	
5:20 PM	0	1	14	0	0	0	15	3	0	0	5	1	0	2	1	1	43	
5:25 PM	0	1	14	0	0	1	14	1	0	1	3	2	0	2	1	1	41	
5:30 PM	0	1	10	0	0	1	9	4	0	1	2	6	0	6	2	0	42	
5:35 PM	0	1	20	0	0	3	10	3	0	1	4	2	0	6	7	4	61	
5:40 PM	0	1	8	2	0	4	20	4	0	0	4	2	0	5	4	1	55	
5:45 PM	0	2	19	2	0	1	11	4	0	1	3	0	0	1	1	5	50	
5:50 PM	0	4	20	2	0	3	15	1	0	0	3	1	0	2	2	0	53	
5:55 PM	0	0	15	0	0	1	10	2	0	3	3	0	0	5	1	3	43	
Count Total	0	60	365	28	3	41	330	58	0	24	64	56	0	103	74	71	1,277	
Peak Hour	0	40	191	20	3	20	172	31	0	13	26	27	0	66	51	49	709	

Location: 1 Deborah Rd & Haworth Ave PM

Traffic Counts - Heavy Vehicles, Bicycles on Road, and Pedestrians/Bicycles on Crosswalk

Interval Start Time	Heavy Vehicles					Interval Start Time	Bicycles on Roadway					Interval Start Time	Pedestrians/Bicycles on Crosswalk				
	EB	NB	WB	SB	Total		EB	NB	WB	SB	Total		EB	NB	WB	SB	Total
4:00 PM	1	0	0	5	6	4:00 PM	0	0	0	0	0	4:00 PM	1	2	0	0	3
4:05 PM	0	1	1	1	3	4:05 PM	0	0	0	0	0	4:05 PM	2	0	1	1	4
4:10 PM	0	0	0	2	2	4:10 PM	1	0	0	0	1	4:10 PM	0	0	0	0	0
4:15 PM	0	0	1	0	1	4:15 PM	0	0	0	0	0	4:15 PM	0	0	0	1	1
4:20 PM	0	0	0	0	0	4:20 PM	0	0	0	0	0	4:20 PM	1	2	1	0	4
4:25 PM	0	0	0	0	0	4:25 PM	0	0	0	0	0	4:25 PM	0	0	0	0	0
4:30 PM	0	1	0	0	1	4:30 PM	0	0	1	0	1	4:30 PM	0	0	0	0	0
4:35 PM	0	0	1	1	2	4:35 PM	0	0	0	0	0	4:35 PM	0	0	0	0	0
4:40 PM	0	0	0	0	0	4:40 PM	0	0	0	0	0	4:40 PM	2	2	0	1	5
4:45 PM	2	1	0	0	3	4:45 PM	0	0	0	0	0	4:45 PM	0	0	0	2	2
4:50 PM	0	1	1	0	2	4:50 PM	0	0	0	0	0	4:50 PM	0	0	0	0	0
4:55 PM	0	0	0	0	0	4:55 PM	0	0	0	0	0	4:55 PM	0	0	0	0	0
5:00 PM	0	0	0	0	0	5:00 PM	0	0	0	0	0	5:00 PM	0	0	1	0	1
5:05 PM	0	0	0	1	1	5:05 PM	0	0	0	0	0	5:05 PM	1	0	1	0	2
5:10 PM	0	0	1	0	1	5:10 PM	0	0	0	0	0	5:10 PM	0	0	0	0	0
5:15 PM	0	0	0	0	0	5:15 PM	0	0	0	0	0	5:15 PM	0	0	0	0	0
5:20 PM	0	0	0	0	0	5:20 PM	0	0	0	0	0	5:20 PM	0	0	0	0	0
5:25 PM	0	0	0	0	0	5:25 PM	0	0	0	0	0	5:25 PM	0	2	0	0	2
5:30 PM	0	0	0	0	0	5:30 PM	0	0	0	0	0	5:30 PM	0	1	0	0	1
5:35 PM	0	0	0	0	0	5:35 PM	0	0	0	0	0	5:35 PM	0	0	1	1	2
5:40 PM	0	0	0	0	0	5:40 PM	0	1	0	0	1	5:40 PM	0	2	0	0	2
5:45 PM	0	0	0	0	0	5:45 PM	0	0	0	0	0	5:45 PM	0	0	2	0	2
5:50 PM	0	0	0	0	0	5:50 PM	0	0	0	0	0	5:50 PM	1	0	0	0	1
5:55 PM	0	0	0	0	0	5:55 PM	0	0	0	0	0	5:55 PM	0	0	0	0	0
Count Total	3	4	5	10	22	Count Total	1	1	1	0	3	Count Total	8	11	7	6	32
Peak Hour	3	4	4	9	20	Peak Hour	1	0	1	0	2	Peak Hour	6	6	2	5	19

Location: 2 N Springbrook Rd & Haworth Ave PM



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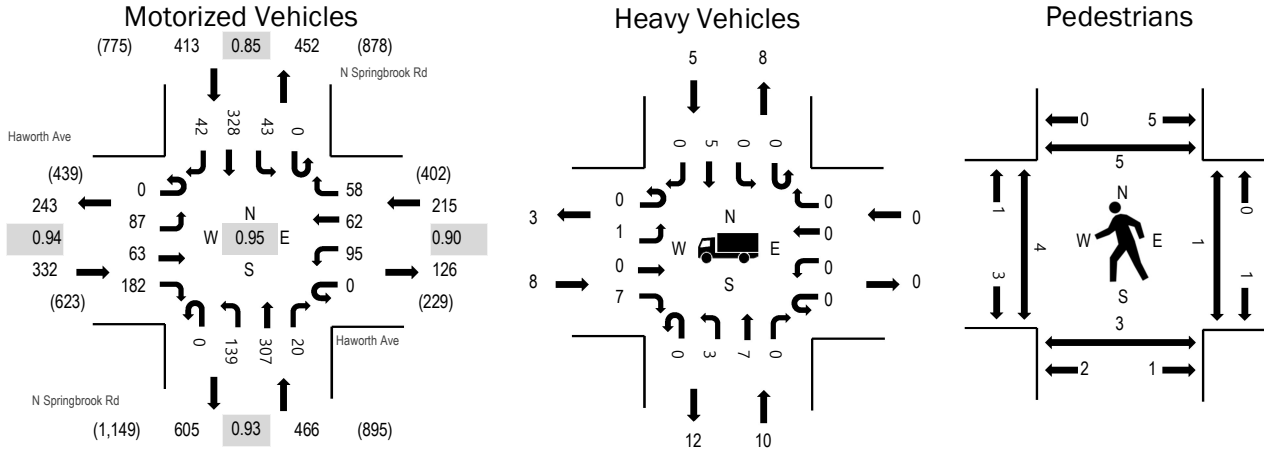
Location: 2 N Springbrook Rd & Haworth Ave PM

Date: Tuesday, April 19, 2022

Peak Hour: 04:00 PM - 05:00 PM

Peak 15-Minutes: 04:05 PM - 04:20 PM

Peak Hour



Note: Total study counts contained in parentheses.

	HV%	PHF
EB	2.4%	0.94
WB	0.0%	0.90
NB	2.1%	0.93
SB	1.2%	0.85
All	1.6%	0.95

Traffic Counts - Motorized Vehicles

Interval Start Time	Haworth Ave Eastbound				Haworth Ave Westbound				N Springbrook Rd Northbound				N Springbrook Rd Southbound				Total	Rolling Hour
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right		
4:00 PM	0	8	2	23	0	14	6	2	0	14	23	1	0	3	26	3	125	1,426
4:05 PM	0	8	7	20	0	9	9	0	0	17	29	0	0	0	32	2	133	1,402
4:10 PM	0	3	5	10	0	6	5	7	0	11	25	0	0	4	37	2	115	1,378
4:15 PM	0	5	3	20	0	8	5	6	0	11	28	4	0	1	31	5	127	1,380
4:20 PM	0	4	6	17	0	2	5	4	0	9	18	2	0	5	29	8	109	1,372
4:25 PM	0	3	7	13	0	4	3	6	0	19	21	2	0	3	27	2	110	1,361
4:30 PM	0	9	11	18	0	10	5	5	0	12	28	1	0	4	28	5	136	1,349
4:35 PM	0	10	4	11	0	7	6	4	0	7	26	2	0	5	24	7	113	1,330
4:40 PM	0	8	4	9	0	5	8	5	0	6	32	3	0	5	23	2	110	1,331
4:45 PM	0	13	3	16	0	11	5	5	0	14	26	3	0	4	25	2	127	1,328
4:50 PM	0	11	3	10	0	7	0	6	0	11	24	1	0	6	23	2	104	1,299
4:55 PM	0	5	8	15	0	12	5	8	0	8	27	1	0	3	23	2	117	1,292
5:00 PM	0	8	4	12	0	10	1	4	0	12	24	1	0	3	20	2	101	1,269
5:05 PM	0	8	2	10	0	7	7	6	0	9	22	5	0	4	26	3	109	
5:10 PM	0	7	8	18	0	6	4	3	0	12	25	2	0	3	26	3	117	
5:15 PM	0	3	4	19	0	8	4	2	0	9	26	0	0	1	39	4	119	
5:20 PM	0	7	1	13	0	8	4	3	0	7	26	2	0	1	25	1	98	
5:25 PM	0	6	2	13	0	8	5	4	0	6	27	2	0	4	15	6	98	
5:30 PM	0	10	4	16	0	11	4	7	0	10	24	3	0	3	22	3	117	
5:35 PM	0	6	5	14	0	5	5	8	0	9	26	1	0	2	31	2	114	
5:40 PM	0	3	4	10	0	8	7	3	0	13	22	1	0	2	30	4	107	
5:45 PM	0	6	6	13	0	7	4	4	0	7	24	1	0	4	21	1	98	
5:50 PM	0	4	4	19	0	2	2	3	1	9	26	1	0	5	15	6	97	
5:55 PM	0	5	6	11	0	6	4	3	0	3	31	0	0	2	19	4	94	
Count Total	0	160	113	350	0	181	113	108	1	245	610	39	0	77	617	81	2,695	
Peak Hour	0	87	63	182	0	95	62	58	0	139	307	20	0	43	328	42	1,426	

Location: 2 N Springbrook Rd & Haworth Ave PM

Traffic Counts - Heavy Vehicles, Bicycles on Road, and Pedestrians/Bicycles on Crosswalk

Interval Start Time	Heavy Vehicles					Interval Start Time	Bicycles on Roadway					Interval Start Time	Pedestrians/Bicycles on Crosswalk				
	EB	NB	WB	SB	Total		EB	NB	WB	SB	Total		EB	NB	WB	SB	Total
4:00 PM	1	3	0	1	5	4:00 PM	0	0	0	0	0	4:00 PM	1	0	0	0	1
4:05 PM	0	1	0	0	1	4:05 PM	1	0	0	0	1	4:05 PM	0	0	0	0	0
4:10 PM	0	0	0	0	0	4:10 PM	0	0	0	0	0	4:10 PM	0	0	0	1	1
4:15 PM	1	1	0	0	2	4:15 PM	0	0	0	2	2	4:15 PM	1	1	1	1	4
4:20 PM	0	0	0	0	0	4:20 PM	0	0	0	0	0	4:20 PM	0	0	0	0	0
4:25 PM	0	2	0	2	4	4:25 PM	0	1	0	0	1	4:25 PM	0	0	0	1	1
4:30 PM	1	1	0	0	2	4:30 PM	0	0	0	0	0	4:30 PM	1	0	0	0	1
4:35 PM	0	0	0	0	0	4:35 PM	0	0	0	0	0	4:35 PM	0	0	0	0	0
4:40 PM	0	0	0	0	0	4:40 PM	0	0	0	0	0	4:40 PM	0	1	0	0	1
4:45 PM	2	1	0	0	3	4:45 PM	0	0	0	0	0	4:45 PM	0	0	0	1	1
4:50 PM	1	1	0	0	2	4:50 PM	0	0	0	0	0	4:50 PM	1	1	0	0	2
4:55 PM	2	0	0	2	4	4:55 PM	0	0	0	0	0	4:55 PM	0	0	0	1	1
5:00 PM	0	1	0	0	1	5:00 PM	1	0	0	0	1	5:00 PM	0	1	0	1	2
5:05 PM	0	1	0	2	3	5:05 PM	0	0	0	0	0	5:05 PM	1	0	0	1	2
5:10 PM	0	0	0	0	0	5:10 PM	0	0	0	0	0	5:10 PM	0	0	0	0	0
5:15 PM	0	2	0	1	3	5:15 PM	0	0	0	0	0	5:15 PM	0	0	0	0	0
5:20 PM	0	1	0	1	2	5:20 PM	0	0	0	0	0	5:20 PM	0	0	0	0	0
5:25 PM	0	0	0	0	0	5:25 PM	0	0	0	1	1	5:25 PM	0	0	0	1	1
5:30 PM	0	1	0	0	1	5:30 PM	0	0	0	0	0	5:30 PM	0	0	0	1	1
5:35 PM	0	0	0	0	0	5:35 PM	0	0	0	0	0	5:35 PM	2	0	0	0	2
5:40 PM	0	1	0	1	2	5:40 PM	0	0	0	0	0	5:40 PM	0	0	0	0	0
5:45 PM	0	1	0	0	1	5:45 PM	0	0	0	0	0	5:45 PM	0	0	0	2	2
5:50 PM	0	1	0	0	1	5:50 PM	0	0	0	0	0	5:50 PM	0	0	0	0	0
5:55 PM	0	0	0	0	0	5:55 PM	0	0	0	0	0	5:55 PM	0	1	1	0	2
Count Total	8	19	0	10	37	Count Total	2	1	0	3	6	Count Total	7	5	2	11	25
Peak Hour	8	10	0	5	23	Peak Hour	1	1	0	2	4	Peak Hour	4	3	1	5	13



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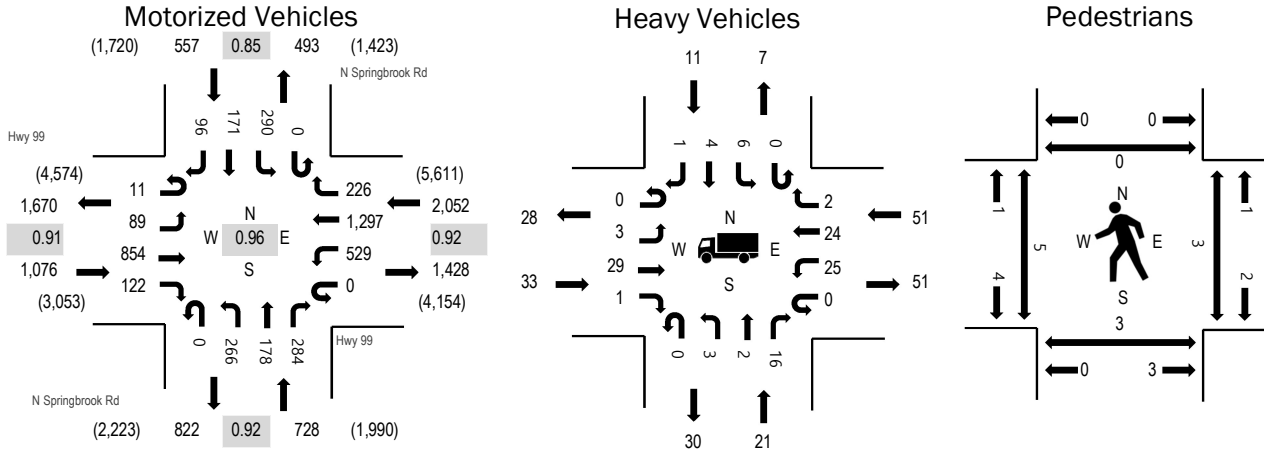
Location: 1 N Springbrook Rd & Hwy 99 PM

Date: Tuesday, April 19, 2022

Peak Hour: 04:15 PM - 05:15 PM

Peak 15-Minutes: 05:00 PM - 05:15 PM

Peak Hour



Note: Total study counts contained in parentheses.

	HV%	PHF
EB	3.1%	0.91
WB	2.5%	0.92
NB	2.9%	0.92
SB	2.0%	0.85
All	2.6%	0.96

Traffic Counts - Motorized Vehicles

Interval Start Time	Hwy 99 Eastbound				Hwy 99 Westbound				N Springbrook Rd Northbound				N Springbrook Rd Southbound				Total	Rolling Hour
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right		
3:00 PM	0	5	71	9	0	23	69	12	0	24	8	18	0	41	13	4	297	3,846
3:05 PM	2	9	69	7	0	31	79	24	0	18	10	21	0	28	12	3	313	3,923
3:10 PM	0	2	92	12	0	30	106	16	0	12	13	18	0	22	4	5	332	3,943
3:15 PM	0	9	76	4	0	39	94	17	0	18	9	9	0	20	10	12	317	3,983
3:20 PM	0	5	50	9	0	27	85	16	0	17	8	16	0	22	6	8	269	4,068
3:25 PM	0	9	53	5	0	24	97	17	0	17	19	25	0	16	11	6	299	4,131
3:30 PM	0	9	70	11	0	36	68	11	0	24	14	20	0	30	16	9	318	4,186
3:35 PM	1	6	61	6	0	42	89	18	0	20	11	22	0	38	14	8	336	4,251
3:40 PM	0	13	65	8	0	34	84	21	0	24	13	19	0	26	9	6	322	4,278
3:45 PM	0	10	62	9	0	32	100	16	0	19	7	23	0	20	17	7	322	4,291
3:50 PM	0	4	69	8	0	46	103	23	0	27	18	19	0	28	11	14	370	4,331
3:55 PM	0	7	67	13	0	40	95	29	0	14	12	16	0	26	19	13	351	4,330
4:00 PM	0	8	73	8	0	42	101	21	0	18	12	30	0	31	15	15	374	4,338
4:05 PM	0	11	59	9	0	46	72	27	0	20	12	20	0	26	23	8	333	4,368
4:10 PM	1	10	66	7	0	43	102	22	0	24	13	19	0	39	17	9	372	4,394
4:15 PM	0	12	65	3	0	60	103	25	0	26	13	25	0	39	22	9	402	4,413
4:20 PM	0	7	73	10	0	36	104	18	0	13	7	16	0	30	13	5	332	4,350
4:25 PM	3	9	59	11	0	47	102	20	0	21	13	27	0	21	19	2	354	4,371
4:30 PM	2	9	81	8	0	45	115	21	0	22	16	19	0	24	11	10	383	4,359
4:35 PM	0	5	77	11	0	38	107	17	0	16	22	30	0	19	12	9	363	4,323
4:40 PM	0	9	53	7	0	32	96	15	0	30	17	26	0	18	21	11	335	4,294
4:45 PM	0	4	76	11	0	53	82	20	0	23	14	22	0	37	13	7	362	4,338
4:50 PM	1	13	60	13	0	57	104	16	0	25	16	28	0	20	10	6	369	4,301
4:55 PM	0	7	68	10	0	35	129	17	0	21	15	19	0	23	8	7	359	4,227
5:00 PM	0	5	87	11	0	56	123	19	0	24	12	22	0	23	12	10	404	4,190
5:05 PM	0	2	76	15	0	36	115	14	0	21	18	17	0	20	14	11	359	
5:10 PM	5	7	79	12	0	34	117	24	0	24	15	33	0	16	16	9	391	
5:15 PM	0	8	57	12	0	36	87	21	0	23	13	22	0	32	18	10	339	

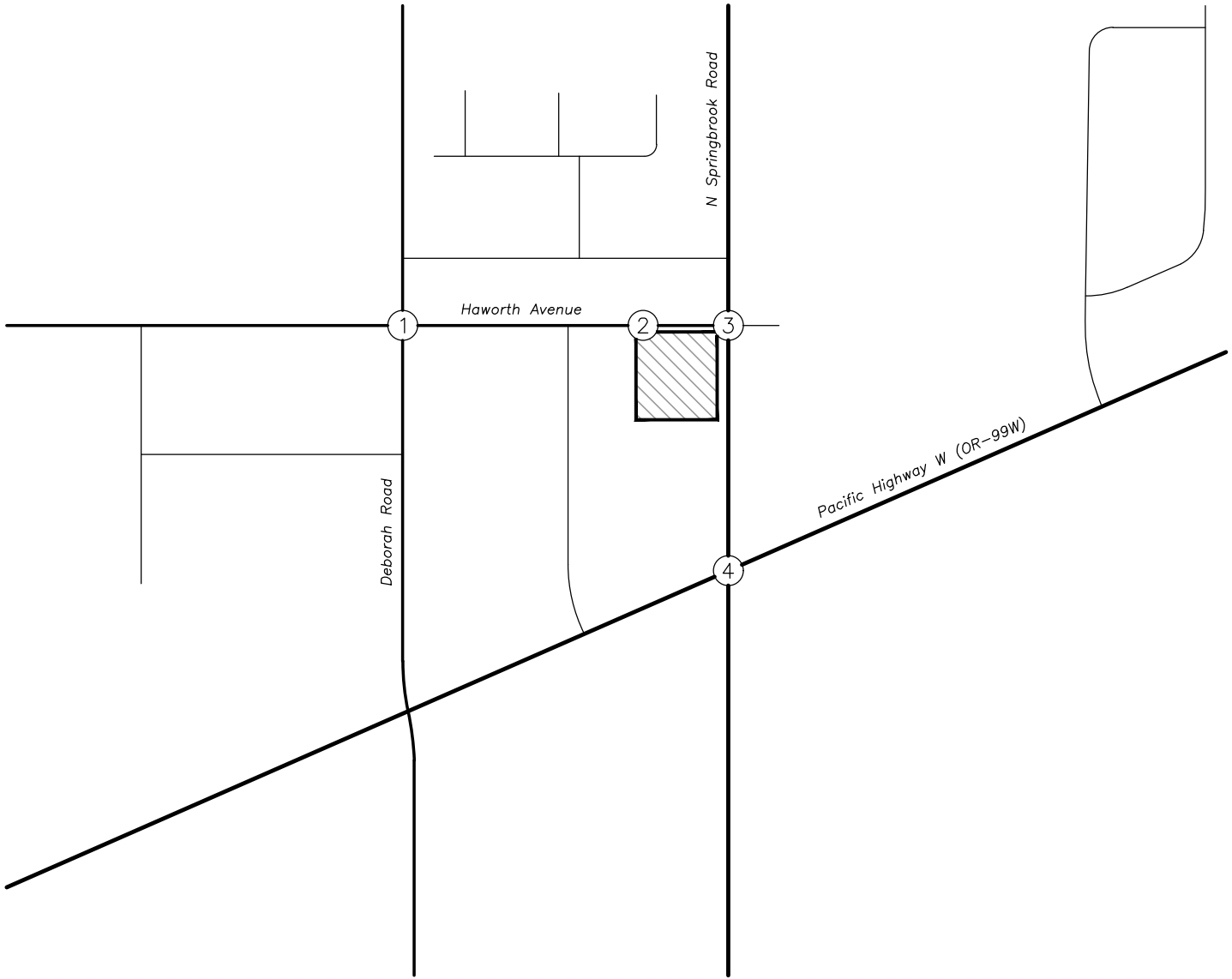
Location: 1 N Springbrook Rd & Hwy 99 PM

5:20 PM	0	9	67	6	0	37	109	15	0	24	12	19	0	35	13	7	353
5:25 PM	0	12	64	7	0	49	89	16	0	23	13	19	0	21	19	10	342
5:30 PM	0	8	80	10	0	45	107	15	0	11	13	25	0	16	14	3	347
5:35 PM	0	9	71	10	0	28	113	18	0	15	8	22	0	23	14	3	334
5:40 PM	1	4	87	3	0	52	105	19	0	18	18	19	0	30	14	9	379
5:45 PM	0	4	46	9	0	44	98	17	1	16	15	21	0	23	16	15	325
5:50 PM	0	8	51	7	0	24	91	20	0	25	13	19	0	27	6	4	295
5:55 PM	0	8	61	9	0	32	89	14	0	23	14	28	0	30	9	5	322
Count Total	16	276	2,441	320	0	1,411	3,529	671	1	740	476	773	0	940	491	289	12,374
Peak Hour	11	89	854	122	0	529	1,297	226	0	266	178	284	0	290	171	96	4,413

Location: 1 N Springbrook Rd & Hwy 99 PM

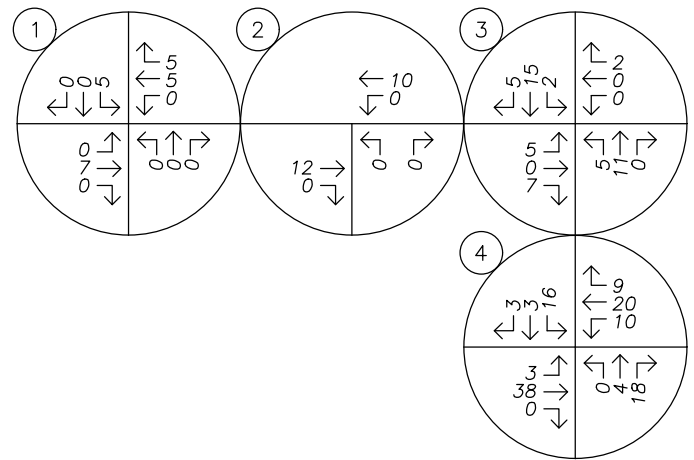
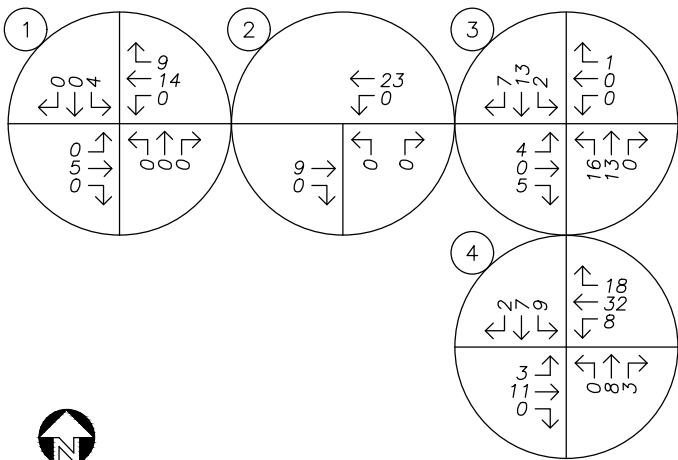
Traffic Counts - Heavy Vehicles, Bicycles on Road, and Pedestrians/Bicycles on Crosswalk

Interval Start Time	Heavy Vehicles					Interval Start Time	Bicycles on Roadway					Interval Start Time	Pedestrians/Bicycles on Crosswalk				
	EB	NB	WB	SB	Total		EB	NB	WB	SB	Total		EB	NB	WB	SB	Total
3:00 PM	4	0	5	3	12	3:00 PM	0	0	0	0	0	3:00 PM	0	0	1	0	1
3:05 PM	1	4	8	2	15	3:05 PM	0	0	0	0	0	3:05 PM	0	0	0	0	0
3:10 PM	5	0	4	1	10	3:10 PM	0	0	0	0	0	3:10 PM	0	0	0	0	0
3:15 PM	2	1	5	1	9	3:15 PM	0	0	0	0	0	3:15 PM	0	0	0	0	0
3:20 PM	2	0	10	2	14	3:20 PM	0	0	0	0	0	3:20 PM	0	0	0	0	0
3:25 PM	2	1	4	2	9	3:25 PM	0	0	0	0	0	3:25 PM	0	0	1	0	1
3:30 PM	4	1	8	3	16	3:30 PM	0	0	0	0	0	3:30 PM	0	0	0	0	0
3:35 PM	3	1	4	2	10	3:35 PM	0	0	0	0	0	3:35 PM	1	2	0	0	3
3:40 PM	4	3	2	3	12	3:40 PM	0	0	0	0	0	3:40 PM	0	0	0	0	0
3:45 PM	5	4	6	1	16	3:45 PM	0	0	0	0	0	3:45 PM	1	0	0	0	1
3:50 PM	3	1	8	0	12	3:50 PM	0	0	0	0	0	3:50 PM	0	0	1	0	1
3:55 PM	4	3	8	1	16	3:55 PM	0	0	0	0	0	3:55 PM	1	0	2	0	3
4:00 PM	4	1	5	3	13	4:00 PM	0	0	0	0	0	4:00 PM	2	0	0	0	2
4:05 PM	2	1	6	0	9	4:05 PM	0	0	0	0	0	4:05 PM	1	2	0	0	3
4:10 PM	2	1	5	0	8	4:10 PM	0	0	0	0	0	4:10 PM	0	1	1	0	2
4:15 PM	3	6	7	1	17	4:15 PM	0	0	0	0	0	4:15 PM	2	2	0	0	4
4:20 PM	4	0	2	0	6	4:20 PM	0	0	0	0	0	4:20 PM	0	1	1	0	2
4:25 PM	0	1	7	2	10	4:25 PM	0	0	1	0	1	4:25 PM	0	0	0	0	0
4:30 PM	4	0	9	0	13	4:30 PM	0	0	0	0	0	4:30 PM	1	0	0	0	1
4:35 PM	0	2	6	1	9	4:35 PM	0	0	0	0	0	4:35 PM	0	0	0	0	0
4:40 PM	5	2	3	0	10	4:40 PM	0	0	0	0	0	4:40 PM	0	0	0	0	0
4:45 PM	4	1	3	2	10	4:45 PM	0	0	0	0	0	4:45 PM	1	0	0	0	1
4:50 PM	3	4	4	0	11	4:50 PM	0	0	0	0	0	4:50 PM	0	0	0	0	0
4:55 PM	0	2	5	1	8	4:55 PM	0	0	0	0	0	4:55 PM	0	0	1	0	1
5:00 PM	5	1	2	3	11	5:00 PM	0	0	0	0	0	5:00 PM	0	0	0	0	0
5:05 PM	1	1	1	1	4	5:05 PM	0	0	0	0	0	5:05 PM	0	0	1	0	1
5:10 PM	4	1	2	0	7	5:10 PM	0	0	0	0	0	5:10 PM	1	0	0	0	1
5:15 PM	4	1	3	0	8	5:15 PM	0	0	0	0	0	5:15 PM	0	0	0	0	0
5:20 PM	0	1	1	1	3	5:20 PM	0	0	0	0	0	5:20 PM	0	0	0	0	0
5:25 PM	0	0	3	1	4	5:25 PM	0	0	0	0	0	5:25 PM	0	0	0	0	0
5:30 PM	0	2	1	0	3	5:30 PM	0	0	0	0	0	5:30 PM	0	0	0	0	0
5:35 PM	1	0	2	0	3	5:35 PM	0	0	0	0	0	5:35 PM	0	0	0	2	2
5:40 PM	1	1	1	1	4	5:40 PM	0	0	0	0	0	5:40 PM	0	0	1	0	1
5:45 PM	2	1	2	0	5	5:45 PM	0	0	0	0	0	5:45 PM	0	0	0	0	0
5:50 PM	1	2	3	0	6	5:50 PM	0	0	0	0	0	5:50 PM	0	0	0	0	0
5:55 PM	0	1	1	0	2	5:55 PM	0	0	0	0	0	5:55 PM	0	0	0	0	0
Count Total	89	52	156	38	335	Count Total	0	0	1	0	1	Count Total	11	8	10	2	31
Peak Hour	33	21	51	11	116	Peak Hour	0	0	1	0	1	Peak Hour	5	3	3	0	11



AM PEAK HOUR

PM PEAK HOUR



no scale

Appendix D

Crash History Data



URBAN NON-SYSTEM CRASH LISTING

CITY OF NEWBERG, YAMHILL COUNTY

HAWORTH AVE and SPRINGBROOK RD, City of Newberg, Yamhill County, 01/01/2016 to 12/31/2020

1 - 5 of 29 Crash records shown.

SER#	S D M	P R J S W DATE	CLASS	CITY STREET	INT-TYPE	SPCL USE																
INVEST	E A U I C O DAY	DIST	FIRST STREET	RD CHAR	(MEDIAN) INT-REL	OFFRD WTHR CRASH	TRLR QTY	MOVE									A S					
RD DPT	E L G N H R TIME	FROM	SECOND STREET	DIRECT	LEGS TRAF-	RNDBT SURF COLL	OWNER	FROM				PRTC INJ	G E LICNS	PED								
UNLOC?	D C S V L K LAT	LONG	LRS	LOCTN	(#LANES) CONTL	DRVWY LIGHT SVRTY	V# TYPE	TO			P# TYPE SVRTY	E X RES	LOC	ERROR	ACT	EVENT	CAUSE					
01443	N N N	11/28/2016	16	HAWORTH AVE	INTER	3-LEG N	Y	CLR	ANGL-OTH	01	NONE	0	TURN-L					08				
NONE		MO	0	SPRINGBROOK RD	N	STOP SIGN	N	DRY	TURN		PRVTE		W -N				000	00				
N		6P			05	0	N	DLIT	INJ		PSNGR	CAR		01	DRVR	INJC	17 F	OR-Y	001,080,024	000	08	
N		45 18 28.73	-122 56	48.98																		
										02	NONE	0	STRGHT									
											PRVTE		S -N				006	00				
											PSNGR	CAR		01	DRVR	NONE	64 F	OR-Y	000	000	00	
																OR<25						
00708	N N N	N N 06/27/2016	16	HAWORTH AVE	INTER	3-LEG N	N	CLR	BIKE	01	NONE	0	STRGHT					02				
CITY		MO	0	SPRINGBROOK RD	S	STOP SIGN	N	DRY	ANGL		PRVTE		N -S				015	00				
N		10A			05	0	N	DAY	INJ		PSNGR	CAR		01	DRVR	NONE	30 M	OR-Y	000	000	00	
N		45 18 28.73	-122 56	48.98																		
														01	BIKE	INJB	00 M		I XWLK	055,028	035	02
00608	N N N	06/01/2016	16	HAWORTH AVE	INTER	3-LEG N	N	CLR	O-1STOP	01	NONE	9	BACK					10				
NONE		WE	0	SPRINGBROOK RD	S	STOP SIGN	N	DRY	BACK		N/A		N -S				000	00				
N		8A			06	0	N	DAY	PDO		UNKNOWN			01	DRVR	NONE	00	Unk	UNK	000	000	00
N		45 18 28.73	-122 56	48.98																		
										02	NONE	9	STOP									
											N/A		S -N				011	00				
											PSNGR	CAR		01	DRVR	NONE	00	Unk	UNK	000	000	00
																UNK						
00165	N N N	N N 02/11/2016	16	HAWORTH AVE	INTER	3-LEG N	N	CLD	ANGL-OTH	01	NONE	0	TURN-L					08				
CITY		TH	0	SPRINGBROOK RD	W	STOP SIGN	N	WET	TURN		PRVTE		S -W				000	00				
N		7P			06	0	N	DARK	INJ		PSNGR	CAR		01	DRVR	NONE	44 F	OR-Y	007,002	000	08	
N		45 18 28.73	-122 56	48.98																		
										02	NONE	0	STOP									
											PRVTE		W -E				011	00				
											PSNGR	CAR		01	DRVR	INJB	29 F	OR-Y	000	000	00	
																OR<25						
00469	N N N	N N 04/24/2016	16	HAWORTH AVE	INTER	3-LEG N	N	CLR	ANGL-OTH	01	NONE	9	TURN-L					03				
CITY		SU	0	SPRINGBROOK RD	CN	STOP SIGN	N	DRY	TURN		N/A		W -N				000	00				
N		7P			03	0	N	DUSK	PDO		PSNGR	CAR		01	DRVR	NONE	00	Unk	UNK	000	000	00
N		45 18 28.73	-122 56	48.98																		
										02	NONE	9	STRGHT									
											N/A		N -S				000	00				
											PSNGR	CAR		01	DRVR	NONE	00	Unk	UNK	000	000	00
																UNK						

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CITY OF NEWBERG, YAMHILL COUNTY

HAWORTH AVE and SPRINGBROOK RD, City of Newberg, Yamhill County, 01/01/2016 to 12/31/2020

6 - 9 of 29 Crash records shown.

SER#	INVEST	RD DPT	UNLOC?	S P R J S W DATE	CLASS	CITY STREET	INT-TYPE	INT-REL	OFFRD	WTHR	CRASH	SPCL USE	MOVE	A S	PRTC	INJ	G E LICNS	PED	ERROR	ACT	EVENT	CAUSE		
RD DPT	E L G N H R TIME	E L G N H R TIME	D C S V L K LAT	LONG	FROM	SECOND STREET	LEGS	TRAF-	RNDBT	SURF	COLL	OWNER	FROM	P#	TYPE	SVRTY	E X RES	LOC						
UNLOC?	D C S V L K LAT	LONG	LRS	LOCTN	(#LANES)	CONTL	DRVWY	LIGHT	SVRTY	V#	TYPE	TO	P#	TYPE	SVRTY	E X RES	LOC	ERROR	ACT	EVENT	CAUSE			
00563	N N N N	05/21/2016	17	HAWORTH AVE	INTER	3-LEG	N	N	N	CLD	O-1 L-TURN	01 NONE	9	STRGHT								02		
CITY	SA	0	SPRINGBROOK RD	CN		STOP SIGN	N	DRY	TURN	N/A	N -S										000	00		
N	12P			01	0		N	DAY	PDO		PSNGR CAR			01	DRVR	NONE	00	Unk	UNK		000	000	00	
N	45 18 28.73	-122 56	48.98																					
												02 NONE	9	TURN-L										
											N/A	S -W										000	00	
											PSNGR CAR			01	DRVR	NONE	00	Unk	UNK		000	000	00	
																						UNK	00	
01381	N N N N	11/14/2016	16	HAWORTH AVE	INTER	3-LEG	N	N	N	RAIN	ANGL-OTH	01 NONE	9	STRGHT								03		
CITY	MO	0	SPRINGBROOK RD	CN		UNKNOWN	N	WET	ANGL	N/A	S -N											000	00	
N	5P			04	0		Y	DLIT	PDO		PSNGR CAR			01	DRVR	NONE	00	Unk	UNK		000	000	00	
N	45 18 28.73	-122 56	48.98																					
												02 NONE	9	STRGHT										
											N/A	W -E										015	00	
											PSNGR CAR			01	DRVR	NONE	00	Unk	UNK		000	000	00	
																						UNK	00	
00866	N N N N	08/15/2017	16	HAWORTH AVE	INTER	3-LEG	N	N	N	CLR	ANGL-OTH	01 NONE	0	STRGHT								03		
NO RPT	TU	0	SPRINGBROOK RD	CN		STOP SIGN	N	DRY	TURN		PRVTE	N -S										000	00	
N	4P			03	0		N	DAY	INJ		PSNGR CAR			01	DRVR	NONE	55	M	OR-Y		021	000	03	
N	45 18 28.73	-122 56	48.98																					
												02 NONE	0	TURN-L										
											PRVTE	W -N											000	00
											PSNGR CAR			01	DRVR	INJC	67	F	OR-Y		000	000	00	
																							OR<25	
00889	N N N N	08/20/2017	16	HAWORTH AVE	INTER	3-LEG	N	N	N	CLR	ANGL-OTH	01 NONE	0	TURN-R								013	03	
CITY	SU	0	SPRINGBROOK RD	CN		STOP SIGN	N	DRY	TURN		PRVTE	E -N										018	00	
N	8P			02	0		Y	DUSK	INJ		PSNGR CAR			01	DRVR	NONE	25	F	OTH-Y		000	000	00	
N	45 18 28.73	-122 56	48.98																					
												02 NONE	0	STRGHT										
											PRVTE	S -N											000	013
											PSNGR CAR			01	DRVR	INJB	23	F	NONE		021	000	03	
																							OR>25	
												02 NONE	0	STRGHT										
											PRVTE	S -N											000	013
											PSNGR CAR			02	PSNG	INJA	26	F			000	000	00	
												03 NONE	0	STOP										
											PRVTE	W -E											022	00
											PSNGR CAR			01	DRVR	NONE	46	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

HAWORTH AVE and SPRINGBROOK RD, City of Newberg, Yamhill County, 01/01/2016 to 12/31/2020

10 - 12 of 29 Crash records shown.

SER#	S P R J S W DATE	CLASS	CITY STREET	INT-TYPE	SPCL USE	A S																	
INVEST	E A U I C O DAY	DIST	FIRST STREET	RD CHAR	(MEDIAN) INT-REL	OFFRD WTHR CRASH	TRLR QTY	MOVE															
RD DPT	E L G N H R TIME	FROM	SECOND STREET	DIRECT	LEGS TRAF-	RNDBT SURF COLL	OWNER	FROM	PRTC	INJ	G E LICNS	PED											
UNLOC?	D C S V L K LAT	LONG	LRS	LOCTN	(#LANES) CONTL	DRVWY LIGHT SVRTY	V# TYPE	TO	P# TYPE	SVRTY	E X RES	LOC	ERROR	ACT	EVENT	CAUSE							
00983	Y N Y N N 09/12/2017	16	HAWORTH AVE	INTER	3-LEG	N	N	CLR	O-1 L-TURN	01 NONE	0	STRGHT											
CITY	TU	0	SPRINGBROOK RD	CN		STOP SIGN	N	DRY	TURN	PRVTE		N -S				000				00			
N	6P			01	0		N	DAY	INJ	PSNGR CAR			01 DRVR	NONE	34 M	OR-Y	028,050	000		02,30			
N	45 18 28.73	-122 56	48.98													OR>25							
										02 NONE	0	TURN-L											
										PRVTE		S -W								000	00		
										PSNGR CAR			01 DRVR	INJB	58 M	OR-Y	000	000		00	00		
																OR<25							
00188	N N N 02/24/2017	16	HAWORTH AVE	INTER	3-LEG	N	N	RAIN	ANGL-OTH	01 NONE	9	STRGHT									03		
NONE	FR	0	SPRINGBROOK RD	CN		STOP SIGN	N	WET	TURN	N/A		N -S								000	00		
N	12P			03	0		N	DAY	PDO	UNKNOWN			01 DRVR	NONE	00	Unk UNK	000	000		00	00		
N	45 18 28.73	-122 56	48.98													UNK							
										02 NONE	9	TURN-R									015	00	
										N/A		W -S									000	00	
										PSNGR CAR			01 DRVR	NONE	00	Unk UNK	000	000		000	00	00	
																UNK							
00599	N N N 06/16/2017	16	HAWORTH AVE	INTER	3-LEG	N	N	CLR	ANGL-OTH	01 NONE	9	STRGHT										02	
NONE	FR	0	SPRINGBROOK RD	CN		STOP SIGN	N	DRY	ANGL	N/A		S -N								000	00	00	
N	10A			04	0		N	DAY	PDO	PSNGR CAR			01 DRVR	NONE	00	Unk UNK	000	000		000	00	00	
N	45 18 28.73	-122 56	48.98													UNK							
										02 NONE	9	STRGHT									000	00	
										N/A		W -E									000	00	
										PSNGR CAR			01 DRVR	NONE	00	Unk UNK	000	000		000	000	00	
																UNK							
00098	N N N N N 01/19/2018	16	HAWORTH AVE	INTER	3-LEG	N	N	CLD	O-1 L-TURN	01 NONE	0	STRGHT										33,03,27	
CITY	FR	0	SPRINGBROOK RD	CN		STOP SIGN	N	WET	TURN	PRVTE		S -N								000	00	00	
N	7P			02	0		N	DLIT	INJ	PSNGR CAR			01 DRVR	INJC	17 M	OTH-Y	051,021,016	038		000	000	33,03,27	
N	45 18 28.73	-122 56	48.98													N-RES							
										01 NONE	0	STRGHT									000	00	
										PRVTE		S -N									000	00	
										PSNGR CAR			02 PSNG	INJB	16 F					000	000	00	00
										01 NONE	0	STRGHT									000	00	
										PRVTE		S -N									000	00	
										PSNGR CAR			03 PSNG	INJB	16 F					000	000	00	00
										01 NONE	0	STRGHT									000	00	
										PRVTE		S -N									000	00	
										PSNGR CAR			04 PSNG	INJB	18 M					000	000	00	00

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CITY OF NEWBERG, YAMHILL COUNTY

HAWORTH AVE and SPRINGBROOK RD, City of Newberg, Yamhill County, 01/01/2016 to 12/31/2020

13 - 17 of 29 Crash records shown.

SER#	P	R	J	S	W	DATE	CLASS	CITY STREET	RD CHAR	INT-TYPE	SPCL USE	MOVE	A	S	ACT	EVENT	CAUSE																	
INVEST	E	A	U	I	C	O	DIST	FIRST STREET		(MEDIAN)	INT-REL	OFFRD	WTHR	CRASH	TRLR QTY																			
RD DPT	E	L	G	N	H	R	FROM	SECOND STREET	DIRECT	LEGS	TRAF-	RNDBT	SURF	COLL	OWNER	FROM	PRTC	INJ	G	E	LICNS	PED												
UNLOC?	D	C	S	V	L	K	LONG	LRS	LOCTN	(#LANES)	CONTL	DRVWY	LIGHT	SVRTY	V#	TYPE	TO	P#	TYPE	SVRTY	E	X	RES	LOC	ERROR									
															02	NONE	0	TURN-L																
																PRVTE	N -E																	
																PSNGR	CAR		01	DRVR	INJB	21	F	OR-Y		000		015		00				
00146	N	N	N	N	N	02/03/2018	16	HAWORTH AVE	INTER	3-LEG	N	N	CLR	ANGL-OTH	01	NONE	0	STRGHT																
	CITY					SA	0	SPRINGBROOK RD	CN		STOP SIGN	N	DRY	ANGL		PRVTE	N -S																	
						10P			01	0		N	DLIT	INJ		PSNGR	CAR		01	DRVR	INJC	51	F	OR-Y		028		000		02				
						45 18 28.73	-122 56																											
							48.98																											
																02	NONE	0	STRGHT															
																PRVTE	E -W																	
																PSNGR	CAR		01	DRVR	NONE	33	F	OTH-Y		000		015		00				
00538	N	N	N			05/30/2018	16	HAWORTH AVE	INTER	3-LEG	N	N	CLR	ANGL-OTH	01	NONE	0	STRGHT																
	NONE					WE	0	SPRINGBROOK RD	CN		STOP SIGN	N	DRY	ANGL		PRVTE	N -S																	
						3P			01	0		Y	DAY	INJ		PSNGR	CAR		01	DRVR	NONE	30	M	OR-Y		000		000		00				
						45 18 28.73	-122 56																											
							48.98																											
																02	NONE	0	STRGHT															
																PRVTE	E -W																	
																PSNGR	CAR		01	DRVR	INJC	60	M	OTH-Y		028		018		00				
																02	NONE	0	STRGHT															
																PRVTE	E -W																	
																PSNGR	CAR		02	PSNG	INJC	53	F			000		018		00				
00838	N	N	N			08/17/2018	16	SPRINGBROOK RD	INTER	3-LEG	N	N	CLR	ANGL-OTH	01	NONE	9	STRGHT																
	NONE					FR	0	HAWORTH AVE	CN		STOP SIGN	N	DRY	ANGL		N/A		E -W																
						10A			01	0		Y	DAY	PDO		PSNGR	CAR		01	DRVR	NONE	00	Unk	UNK		000		000		00				
						45 18 28.8	-122 56 49																											
																02	NONE	9	STRGHT															
																N/A		S -N																
																PSNGR	CAR		01	DRVR	NONE	00	Unk	UNK		000		000		00				
01194	N	N	N			11/20/2018	16	HAWORTH AVE	INTER	CROSS	N	N	CLR	ANGL-OTH	01	NONE	9	STRGHT																
	NONE					TU	0	SPRINGBROOK RD	CN		STOP SIGN	N	DRY	ANGL		N/A		N -S																
						7P			03	0		N	DLIT	PDO		PSNGR	CAR		01	DRVR	NONE	00	Unk	UNK		000		000		00				
						45 18 28.77	-122 56 49																											
																02	NONE	9	TURN-L															
																N/A		W -N																
																PSNGR	CAR		01	DRVR	NONE	00	Unk	UNK		000		015		00				

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05/04/2022

TRANSPORTATION DATA SECTION - CRASH ANALYSIS AND REPORTING UNIT

URBAN NON-SYSTEM CRASH LISTING

CITY OF NEWBERG, YAMHILL COUNTY

HAWORTH AVE and SPRINGBROOK RD, City of Newberg, Yamhill County, 01/01/2016 to 12/31/2020

18 - 22 of 29 Crash records shown.

SER#	P	R	J	S	W	DATE	CLASS	CITY STREET	INT-TYPE	SPCL USE	A	S	ACT	EVENT	CAUSE													
INVEST	E	A	U	I	C	O	DIST	FIRST STREET	RD CHAR	(MEDIAN) INT-REL	OFFRD	WTHR	CRASH	TRLR	QTY	MOVE												
RD DPT	E	L	G	N	H	R	TIME	SECOND STREET	DIRECT	LEGS TRAF-	RNDBT	SURF	COLL	OWNER	FROM	PRTC	INJ	G	E	LICNS	PED							
UNLOC?	D	C	S	V	L	K	LAT	LONG	LRS	LOCTN	(#LANES) CONTL	DRVWY	LIGHT	SVRTY	V#	TYPE	TO	P#	TYPE	SVRTY	E	X	RES	LOC	ERROR			
01259	N	N	N			12/06/2018	17	HAWORTH AVE	INTER	CROSS	N	N	CLR	ANGL-OTH	01	NONE	9	STRGHT								02		
NO RPT						TH	0	SPRINGBROOK RD	CN		STOP SIGN	N	DRY	ANGL	N/A		S	-N							000	00		
N						6P			04	0		N	DLIT	PDO		PSNGR	CAR		01	DRVR	NONE	00	Unk	UNK		000	000	00
N						45 18 28.76	-122 56	48.96																				
																02	NONE	9	STRGHT									
																N/A		W	-E							015	00	
																PSNGR	CAR		01	DRVR	NONE	00	Unk	UNK		000	000	00
01330	N	N	N			12/25/2018	16	HAWORTH AVE	INTER	CROSS	N	N	RAIN	ANGL-OTH	01	NONE	9	STRGHT								02		
NONE						TU	0	SPRINGBROOK RD	CN		STOP SIGN	N	WET	ANGL	N/A		E	-W							015	00		
N						5P			01	0		N	DLIT	PDO		PSNGR	CAR		01	DRVR	NONE	00	Unk	UNK		000	000	00
N						45 18 28.73	-122 56	48.98																				
																02	NONE	9	STRGHT									
																N/A		N	-S							015	00	
																PSNGR	CAR		01	DRVR	NONE	00	Unk	UNK		000	000	00
00401	N	N	N			05/02/2019	16	HAWORTH AVE	INTER	3-LEG	N	N	CLR	ANGL-OTH	01	NONE		STRGHT								02		
NONE						TH	0	SPRINGBROOK RD	CN		STOP SIGN	N	DRY	ANGL	N/A		S	-N							015	00		
N						2P			04	0		N	DAY	INJ		PSNGR	CAR		01	DRVR	NONE	79	M	OR-Y	028	000	00	02
N						45 18 28.73	-122 56	48.98																				
																02	NONE		STRGHT									
																PRVTE		W	-E							000	00	
																PSNGR	CAR		01	DRVR	INJC	55	F	OR-Y	000	000	00	
90218	N	N	N	N		04/05/2019	16	HAWORTH AVE	INTER	3-LEG	N	N	RAIN	O-1 L-TURN	01	NONE	9	STRGHT								02		
CITY						FR	0	SPRINGBROOK RD	CN		STOP SIGN	N	WET	TURN	N/A		N	-S							015	00		
N						11A			01	0		N	DAY	PDO		PSNGR	CAR		01	DRVR	NONE	00	Unk	UNK		000	000	00
N						45 18 28.74	-122 56	49																				
																02	NONE	9	TURN-L									
																N/A		S	-W							000	00	
																PSNGR	CAR		01	DRVR	NONE	00	Unk	UNK		000	000	00
00750	N	N	N	N	N	08/07/2019	16	HAWORTH AVE	INTER	CROSS	N	N	CLR	ANGL-OTH	01	NONE	9	STRGHT								03		
CITY						WE	0	SPRINGBROOK RD	CN		STOP SIGN	N	DRY	ANGL	N/A		W	-E							000	00		
N						10A			03	0		N	DAY	PDO		PSNGR	CAR		01	DRVR	NONE	00	Unk	UNK		000	000	00
N						45 18 28.73	-122 56	49																				
																02	NONE	9	STRGHT									
																N/A		N	-S							000	00	
																PSNGR	CAR		01	DRVR	NONE	00	Unk	UNK		000	000	00

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TRANSPORTATION DATA SECTION - CRASH ANALYSIS AND REPORTING UNIT

URBAN NON-SYSTEM CRASH LISTING

CITY OF NEWBERG, YAMHILL COUNTY

HAWORTH AVE and SPRINGBROOK RD, City of Newberg, Yamhill County, 01/01/2016 to 12/31/2020

23 - 27 of 29 Crash records shown.

SER#	P	R	J	S	W	DATE	CLASS	CITY	STREET	INT-TYPE	SPCL USE																						
INVEST	E	A	U	I	C	DAY	DIST	FIRST STREET	RD CHAR	(MEDIAN)	INT-REL	OFFRD	WTHR	CRASH	TRLR QTY	MOVE	A	S															
RD DPT	E	L	G	N	H	TIME	FROM	SECOND STREET	DIRECT	LEGS	TRAF-	RNDBT	SURF	COLL	OWNER	FROM	PRTC	INJ	G	E	LICNS	PED											
UNLOC?	D	C	S	V	L	K	LAT	LONG	LRS	LOCTN	(#LANES)	CONTL	DRVWY	LIGHT	SVRTY	V#	TYPE	TO	P#	TYPE	SVRTY	E	X	RES	LOC	ERROR	ACT	EVENT	CAUSE				
00775	N	N	N	N		08/13/2019	16	HAWORTH AVE	INTER	3-LEG	N	N	CLR	ANGL-OTH	01	NONE	9	TURN-R															
						TU	0	SPRINGBROOK RD	CN		STOP SIGN	N	DRY	TURN	N/A		N -W							000	00								
						10A			01	0		N	DAY	PDO		SEMI TOW			01	DRVR	NONE	00	Unk	UNK	000	000	00						
						45 18 28.73	-122 56 49																										
																02	NONE	9	STRGHT														
																N/A		E -W							000	000	00						
																PSNGR	CAR			01	DRVR	NONE	00	Unk	UNK	000	000	00					
00726	N	N	N	N		09/22/2020	17	HAWORTH AVE	INTER	3-LEG	N	N	CLR	ANGL-OTH	01	NONE		STRGHT													03,02		
						TU	0	SPRINGBROOK RD	CN		STOP SIGN	N	DRY	ANGL		PRVTE		S -N							000	00							
						12P			04	0		Y	DAY	INJ		PSNGR	CAR			01	DRVR	NONE	68	F	OR-Y	028	000	000	03,02				
						45 18 28.73	-122 56 48.99																										
																02	NONE		STRGHT														
																PRVTE		W -E							000	000	00						
																PSNGR	CAR			01	DRVR	INJC	80	F	OR-Y	000	000	00					
01014	N	N	N			12/20/2020	16	HAWORTH AVE	INTER	3-LEG	N	N	RAIN	ANGL-OTH	01	NONE		STRGHT													02		
						SU	0	SPRINGBROOK RD	CN		STOP SIGN	N	WET	ANGL		PRVTE		E -W							018	00							
						10A			01	0		Y	DAY	INJ		PSNGR	CAR			01	DRVR	INJC	49	F	OR-Y	000,097	000	000	02				
						45 18 28.73	-122 56 48.99																										
																02	NONE		STRGHT														
																PRVTE		N -S							000	000	00						
																PSNGR	CAR			01	DRVR	INJC	49	F	OR-Y	000,097	000	000	02				
00407	N	N	N		Y	04/25/2017	16	SPRINGBROOK RD	ALLEY		N	N	RAIN	S-STRGHT	01	NONE	9	STRGHT													29		
						TU	168	HAWORTH AVE	S	(RSDMD)	UNKNOWN	N	WET	REAR		N/A		S -N							000	00							
						9P			08			N	DARK	PDO		PSNGR	CAR			01	DRVR	NONE	00	Unk	UNK	000	000	00					
						45 18 26.81	-122 56 48.97				(02)																						
																02	NONE	9	TURN-R														
																N/A		S -E								019	00						
																PSNGR	CAR			01	DRVR	NONE	00	Unk	UNK	000	000	00					
00549	N	N	N			05/06/2016	17	HAWORTH AVE	ALLEY		N	N	CLR	ANGL-OTH	01	NONE	9	TURN-R													32,02,08		
						FR	342	SPRINGBROOK RD	W	(NONE)	NONE	N	DRY	TURN		N/A		W -S							019	00							
						9A			08			N	DAY	PDO		PSNGR	CAR			01	DRVR	NONE	00	Unk	UNK	000	000	00					
						45 18 28.75	-122 56 54.23				(02)																						
																02	NONE	9	TURN-L														
																N/A		S -W								018	00						
																SCHL	BUS			01	DRVR	NONE	00	Unk	UNK	000	000	00					

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TRANSPORTATION DATA SECTION - CRASH ANALYSIS AND REPORTING UNIT

URBAN NON-SYSTEM CRASH LISTING

CITY OF NEWBERG, YAMHILL COUNTY

HAWORTH AVE and SPRINGBROOK RD, City of Newberg, Yamhill County, 01/01/2016 to 12/31/2020

28 - 29 of 29 Crash records shown.

SER#	S	D	M	P	R	J	S	W	DATE	CLASS	CITY STREET	INT-TYPE	SPCL USE																			
INVEST	E	A	U	I	C	O	DAY			DIST	FIRST STREET	RD CHAR	(MEDIAN)	INT-REL	OFFRD	WTHR	CRASH	TRLR QTY	MOVE	A	S											
RD DPT	E	L	G	N	H	R	TIME			FROM	SECOND STREET	DIRECT	LEGS	TRAF-	RNDBT	SURF	COLL	OWNER	FROM	PRTC	INJ	G	E	LICNS	PED							
UNLOC?	D	C	S	V	L	K	LAT			LONG	LRS	LOCTN	(#LANES)	CONTL	DRVWY	LIGHT	SVRTY	V#	TYPE	TO	P#	TYPE	SVRTY	E	X	RES	LOC	ERROR	ACT	EVENT	CAUSE	
01221	N	N	N	N	N	N	11/03/2017			16	SPRINGBROOK RD	STRGHT		N	N	CLD	S-1STOP	01	NONE	0	STRGHT											
CITY							FR			150	HAWORTH AVE	N	(NONE)	NONE	N	WET	REAR		PRVTE	N	-S								000		00	
N							7A					08			N	DAY	INJ		PSNGR	CAR		01	DRVR	INJC	53	F	OR-Y		043	000	07	
N							45 18 30.43			-122 56			(02)																			
							48.97												02	NONE	0	STOP										
																			PRVTE	N	-S								011		00	
																			PSNGR	CAR		01	DRVR	INJC	53	F	OR-Y		000	000	00	
00401	N	N	N	N	N	N	04/19/2018			16	SPRINGBROOK RD	STRGHT		Y	N	CLR	S-STRGHT	01	NONE	0	STRGHT											13,50
CITY							TH			200	HAWORTH AVE	N	(NONE)	L-TURN REF	N	DRY	SS-O		PRVTE	N	-S								000		00	
N							5P					08			N	DUSK	INJ		PSNGR	CAR		01	DRVR	INJC	59	F	OTH-Y		045	000	13,50	
N							45 18 30.9			-122 56			(03)																			
							48.97																									
																			02	NONE	0	STRGHT										
																			PRVTE	N	-S								000		00	
																			PSNGR	CAR		01	DRVR	NONE	23	F	OR-Y		000	000	50	

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TRANSPORTATION DATA SECTION - CRASH ANALYSIS AND REPORTING UNIT

URBAN NON-SYSTEM CRASH LISTING

SPRINGBROOK RD and PACIFIC HY 99W, City of Newberg, Yamhill County, 01/01/2016 to 12/31/2020

28 - 32 of 77 Crash records shown.

SER#	P R J S W DATE	CLASS	CITY STREET	INT-TYPE	SPCL USE	MOVES	A S																					
INVEST	E A U I C O DAY	DIST	FIRST STREET	RD CHAR	(MEDIAN)	INT-REL	OFFRD	WTHR	CRASH	TRLR QTY	MOVE		A S															
RD DPT	E L G N H R TIME	FROM	SECOND STREET	DIRECT	LEGS	TRAF-	RNDBT	SURF	COLL	OWNER	FROM		PRTC	INJ	G E	LICNS	PED											
UNLOC?	D C S V L K LAT	LONG	LRS	LOCTN	(#LANES)	CONTL	DRVWY	LIGHT	SVRTY	V#	TYPE	TO	P#	TYPE	SVRTY	E X	RES	LOC	ERROR	ACT	EVENT	CAUSE						
										02	NONE	0		STRGHT														
											PRVTE			NE-SW														
											PSNGR CAR		03	PSNG	INJC	91	F			000				000	000		00	
00499	N N N 05/17/2018	14	PACIFIC HY 99W	INTER	CROSS	N	N	CLR	ANGL-STP	01	NONE	1		TURN-L													08	
CITY	TH		SPRINGBROOK RD	CN		TRF SIGNAL	N	DRY	TURN		N/A			SW-N													000	00
N	2P			03	2		N	DAY	PDO		TRUCK		01	DRVR	NONE	00	Unk	UNK		000				000	000		00	
N	45 18 23.14	-122 56	009100100S00																									UNK
										02	NONE	9		STOP														
											N/A			N -NE													013	00
											PSNGR CAR		01	DRVR	NONE	00	Unk	UNK		000				000	000		00	
																												UNK
00299	N N N 04/04/2019	14	PACIFIC HY 99W	INTER	CROSS	N	N	CLD	S-1STOP	01	NONE			TURN-R													07,29	
CITY	TH		SPRINGBROOK RD	CN		TRF SIGNAL	N	DRY	REAR		PRVTE			S -NE													013	00
N	1P			04	2		N	DAY	INJ		PSNGR CAR		01	DRVR	NONE	63	M	OR-Y		043,026				000	000		07,29	
N	45 18 23.15	-122 56	009100100S00																									
										02	NONE			TURN-R														
											PRVTE			S -NE														
											PSNGR CAR		01	DRVR	INJC	63	F	OTH-Y		000				000	000		00	
																												N-RES
00303	N N N 04/05/2019	14	PACIFIC HY 99W	INTER	CROSS	N	N	RAIN	PED	01	NONE			TURN-L													02,32	
CITY	FR		SPRINGBROOK RD	CN		TRF SIGNAL	N	WET	PED		PRVTE			S -SW													000	00
N	10P			01	2		N	DLIT	INJ		PSNGR CAR		01	DRVR	NONE	19	M	OR-Y		029,052				000	000		02,32	
N	45 18 23.12	-122 56	009100100S00																									OR<25
00687	N N N 07/21/2019	14	PACIFIC HY 99W	INTER	CROSS	N	N	CLR	S-1STOP	01	NONE			STRGHT													07,29	
NO RPT	SU		SPRINGBROOK RD	CN		TRF SIGNAL	N	DRY	REAR		PRVTE			S -N													000	00
N	12P			06	2		N	DAY	INJ		PSNGR CAR		01	DRVR	NONE	70	M	OR-Y		026				000	000		07,29	
N	45 18 23.12	-122 56	009100100S00																									OR>25
00396	N N N N N 05/01/2019	14	PACIFIC HY 99W	INTER	CROSS	N	N	CLR	S-1STOP	01	NONE	9		TURN-L													07	
CITY	WE		SPRINGBROOK RD	CN		TRF SIGNAL	N	DRY	REAR		N/A			NE-S													000	00
N	9P			04	2		N	DLIT	PDO		PSNGR CAR		01	DRVR	NONE	00	Unk	UNK		000				000	000		00	
N	45 18 23.35	-122 56	009100100S00																									

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URBAN NON-SYSTEM CRASH LISTING
SPRINGBROOK RD and PACIFIC HY 99W, City of Newberg, Yamhill County, 01/01/2016 to 12/31/2020

46 - 50 of 77 Crash records shown.

SER#	P	R	J	S	W	DATE	CLASS	CITY	STREET	RD	CHAR	INT-TYPE	INT-REL	OFFRD	WTHR	CRASH	SPCL USE	TRLR	QTY	MOVE	A	S	G	E	LICNS	PED	ERROR	ACT	EVENT	CAUSE		
INVEST	E	A	U	I	C	O	DIST	FIRST STREET				(MEDIAN)		RNDBT	SURF	COLL	OWNER	FROM														
RD DPT	E	L	G	N	H	R	FROM	SECOND STREET		DIRECT		LEGS	TRAF-																			
UNLOC?	D	C	S	V	L	K	LONG	LRS		LOCTN		(#LANES)	CONTL	DRVWY	LIGHT	SVRTY	V#	TYPE	TO	P#	TYPE	SVRTY	E	X	RES	LOC						
																	02	NONE	0	STOP												
																		PRVTE	NE-SW										011	013	00	
																		PSNGR	CAR		01	DRVR	INJC	42	M	NONE	000	000		00		
																									OR<25							
																		03	NONE	0	STOP											
																			PRVTE	NE-SW									022		00	
																			PSNGR	CAR		01	DRVR	NONE	17	F	OR-Y	000	000		00	
																									OR<25							
01518	N	N	N			12/14/2016	14	PACIFIC HY 99W		STRGHT		Y		N	SNOW	S-1STOP	01	NONE	0	STRGHT										32,29,27		
CITY						WE		SPRINGBROOK RD		NE	(RSDMD)	NONE		N	SNO	REAR		PRVTE	NE-SW									000		00		
N						2P				04				N	DAY	INJ		PSNGR	CAR		01	DRVR	NONE	44	F	OR-Y	052,026,016	000		32,29,27		
N						45 18 25.28	-122 56	009100100S00		(04)															OR<25							
						42.01												02	NONE	0	STOP											
																			PRVTE	NE-SW									011		00	
																			PSNGR	CAR		01	DRVR	INJC	25	F	OR-Y	000	000		00	
																									OR<25							
00042	Y	N	N	N	N	01/10/2016	14	PACIFIC HY 99W		STRGHT		Y		N	CLD	S-1STOP	01	NONE	9	STRGHT										01,22		
CITY						SU		SPRINGBROOK RD		NE	(RSDMD)	UNKNOWN		N	DRY	REAR		N/A	NE-SW									000		00		
N						3P				06				N	DAY	PDO		PSNGR	CAR		01	DRVR	NONE	00	Unk	UNK	000	000		00		
N						45 18 23.4	-122 56	009100100S00		(04)															UNK							
						48.08												02	NONE	9	STOP											
																			N/A	NE-SW									011		00	
																			PSNGR	CAR		01	DRVR	NONE	00	Unk	UNK	000	000		00	
																									UNK							
00845	N	N	N			07/25/2016	14	PACIFIC HY 99W		STRGHT		Y		N	CLR	S-1STOP	01	NONE	9	STRGHT										29,27		
NONE						MO		SPRINGBROOK RD		NE	(RSDMD)	UNKNOWN		N	DRY	REAR		N/A	NE-SW									000		00		
N						11A				08				N	DAY	PDO		PSNGR	CAR		01	DRVR	NONE	00	Unk	UNK	000	000		00		
N						45 18 23.67	-122 56	009100100S00		(04)															UNK							
						47.21												02	NONE	9	STOP											
																			N/A	NE-SW									011		00	
																			PSNGR	CAR		01	DRVR	NONE	00	Unk	UNK	000	000		00	
																									UNK							
01239	N	N	N			10/09/2016	14	PACIFIC HY 99W		STRGHT		N		N	RAIN	S-1STOP	01	NONE	9	STRGHT										07,16		
CITY						SU		SPRINGBROOK RD		NE	(RSDMD)	UNKNOWN		N	WET	REAR		N/A	NE-SW									000		00		
N						7P				03				N	DLIT	PDO		PSNGR	CAR		01	DRVR	NONE	00	Unk	UNK	000	000		00		
N						45 18 23.94	-122 56	009100100S00		(04)															UNK							
						46.35												02	NONE	9	STOP											
																			N/A	NE-SW									011		00	
																			PSNGR	CAR		01	DRVR	NONE	00	Unk	UNK	000	000		00	
																									UNK							

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URBAN NON-SYSTEM CRASH LISTING
SPRINGBROOK RD and PACIFIC HY 99W, City of Newberg, Yamhill County, 01/01/2016 to 12/31/2020

70 - 74 of 77 Crash records shown.

SER#	S	D	M	P	R	J	S	W	DATE	CLASS	CITY	STREET	INT-TYPE	SPCL USE	A	S	E	LICNS	PED	ERROR	ACT	EVENT	CAUSE							
INVEST	E	A	U	I	C	O	D	A	Y	DIST	FIRST STREET	RD CHAR	(MEDIAN)	INT-REL	OFFRD	WTHR	CRASH	TRLR QTY	MOVE											
RD DPT	E	L	G	N	H	R	T	TIME	FROM	SECOND STREET	DIRECT	LEGS	TRAF-	RNDBT	SURF	COLL	OWNER	FROM	PRTC	INJ	G	E								
UNLOC?	D	C	S	V	L	K	LAT	LONG	LRS	LOCTN	(#LANES)	CONTL	DRVWY	LIGHT	SVRTY	V#	TYPE	TO	P#	TYPE	SVRTY	E	X							
83662	N	N	N				06/19/2017	14	PACIFIC HY 99W	STRGHT			N	N	CLR	O-OTHER	01 NONE	9	BACK											
NO RPT							MO		SPRINGBROOK RD	SW	(NONE)	UNKNOWN	N	DRY	BACK	N/A		SW-NE				000	00							
N							1P			03			N	DAY	PDO	SEMI TOW			01	DRVR	NONE	00	Unk UNK	000	000	00				
N				45	18	22.11	-122 56	52.38	009100100S00		(04)												000	000	00					
																02 NONE	9	STRGHT												
																N/A		NE-SW							000	00				
																PSNGR	CAR		01	DRVR	NONE	00	Unk UNK	000	000	00				
00082	N	N	N				01/25/2017	14	PACIFIC HY 99W	STRGHT			N	N	RAIN	S-STRGHT	01 NONE	9	STRGHT											
NONE							WE		SPRINGBROOK RD	SW	(RSDMD)	UNKNOWN	N	WET	SS-O	N/A		SW-NE					000	00						
N							7A			06			N	DAWN	PDO	PSNGR	CAR		01	DRVR	NONE	00	Unk UNK	000	000	00				
N				45	18	22.71	-122 56	50.35	009100100S00		(04)															000	000	00		
																02 NONE	9	STRGHT												
																N/A		SW-NE								000	00			
																PSNGR	CAR		01	DRVR	NONE	00	Unk UNK	000	000	00				
00956	N	N	N	N	N		09/17/2018	14	PACIFIC HY 99W	STRGHT			N	N	CLR	S-1STOP	01 NONE		STRGHT											
CITY							MO		SPRINGBROOK RD	SW	(RSDMD)	NONE	N	DRY	REAR	PRVTE		NE-SW					000	00						
N							9A			03			N	DAY	INJ	PSNGR	CAR		01	DRVR	NONE	20	M OR-Y	043	000	07,29				
N				45	18	21.92	-122 56	53	009100100S00		(04)																000	000	00	
																02 NONE		STOP												
																PRVTE		NE-SW		01	DRVR	INJC	17	F OR-Y	000	000	00			
																02 NONE		STOP												
																PRVTE		NE-SW		02	PSNG	INJC	18	M	000	000	00			
01130	N	N	N	N	N		10/25/2018	14	PACIFIC HY 99W	STRGHT			Y	N	RAIN	S-STRGHT	01 NONE	9	STRGHT											
CITY							TH		SPRINGBROOK RD	SW	(RSDMD)	TRF SIGNAL	N	WET	REAR	N/A		SW-NE					000	00						
N							5P			09			N	DAY	PDO	PSNGR	CAR		01	DRVR	NONE	00	Unk UNK	000	000	00				
N				45	18	22.71	-122 56	50.36	009100100S00		(04)																	000	000	00
																02 NONE	9	STRGHT												
																N/A		SW-NE									006	00		
																PSNGR	CAR		01	DRVR	NONE	00	Unk UNK	000	000	00				
00199	N	N	N	N	N		03/06/2020	14	PACIFIC HY 99W	STRGHT			N	Y	CLD	FIX OBJ	01 NONE	0	STRGHT				062	10						
CITY							FR		SPRINGBROOK RD	SW	(RSDMD)	NONE	N	WET	FIX	PRVTE		SW-NE					000	062	00					
Y							9A			08			N	DAY	INJ	PSNGR	CAR		01	DRVR	INJA	83	M OR-Y	081	000	10				
N				45	18	22.36	-122 56	51.54	009100100S00		(04)																	000	000	00

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CITY OF NEWBERG, YAMHILL COUNTY

URBAN NON-SYSTEM CRASH LISTING
SPRINGBROOK RD and PACIFIC HY 99W, City of Newberg, Yamhill County, 01/01/2016 to 12/31/2020
75 - 77 of 77 Crash records shown.

SER#	P	R	J	S	W	DATE	CLASS	CITY STREET	INT-TYPE	SPCL USE	MOVE	A	S																
														INVEST	E	A	U	I	C	O	DAY	DIST	FIRST STREET	RD CHAR	(MEDIAN)	INT-REL	OFFRD	WTHR	CRASH
RD DPT	E	L	G	N	H	R	TIME	FROM	SECOND STREET	DIRECT	LEGS	TRAF-	RNDBT	SURF	COLL	OWNER	FROM	PRTC	INJ	G	E	LICNS	PED						
UNLOC?	D	C	S	V	L	K	LAT	LONG	LRS	LOCTN	(#LANES)	CONTL	DRVWY	LIGHT	SVRTY	V#	TYPE	TO	P#	TYPE	SVRTY	E	X	RES	LOC	ERROR	ACT	EVENT	CAUSE
00886	N	N	N	N		11/06/2020	14	PACIFIC HY 99W	STRGHT					N	UNK	S-1STOP	01	NONE	STRGHT										07
NONE					FR			SPRINGBROOK RD	SW	(RSDMD)	UNKNOWN	N	WET	REAR		PRVTE	SW-NE									000		00	
N					12P				06			N	DAY	INJ		PSNGR CAR		01	DRVR	INJC	72	F	OR-Y		026	000		07	
N					45	18	22.19	-122 56	009100100S00		(04)																		
					52.16											01	NONE	STRGHT											
																PRVTE	SW-NE									000		00	
																PSNGR CAR		02	PSNG	INJC	53	F			000	000		00	
																02	NONE	STOP									011	00	
																PRVTE	SW-NE									000	000	00	
																PSNGR CAR		01	DRVR	NONE	25	M	OR-Y		000	000		00	
00358	N	N	N			05/23/2020	14	PACIFIC HY 99W	STRGHT		Y	N	CLR	S-STRGHT	01	NONE	9	STRGHT										06,13	
NONE					SA			SPRINGBROOK RD	SW	(RSDMD)	L-GRN-SIG	N	DRY	SS-0		N/A	SW-NE									052		00	
N					10A				05			N	DAY	PDO		PSNGR CAR		01	DRVR	NONE	00	Unk	UNK		000	000		00	
N					45	18	22.19	-122 56	009100100S00		(04)																		
					52.16											02	NONE	9	STRGHT									000	00
																N/A	SW-NE										000	000	00
																PSNGR CAR		01	DRVR	NONE	00	Unk	UNK		000	000		00	
00415	N	N	N			06/18/2020	14	PACIFIC HY 99W	STRGHT		N	N	CLR	O-STRGHT	01	NONE		STRGHT									044	15,10	
CITY					TH			SPRINGBROOK RD	SW	(RSDMD)	UNKNOWN	N	DRY	HEAD		PRVTE	NE-SW									029		00	
N					10A				04			N	DAY	INJ		PSNGR CAR		01	DRVR	INJB	26	M	OR-Y		039	017		15,10	
N					45	18	22.19	-122 56	009100100S00		(04)																		
					52.21											02	NONE	STRGHT											
																PRVTE	SW-NE										000	000	00
																PSNGR CAR		01	DRVR	INJA	65	M	OR-Y		000	000		00	

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Appendix E

Left-turn Lane Warrant Calculations

Traffic Signal Warrant Calculations



Left-Turn Lane Warrant Analysis



Project: Haworth Avenue Apartments
 Intersection: 2. Site Access at Haworth Avenue
 Date: 5/12/2022
 Scenario: 2029 Future Conditions - AM Peak Hour (WB)

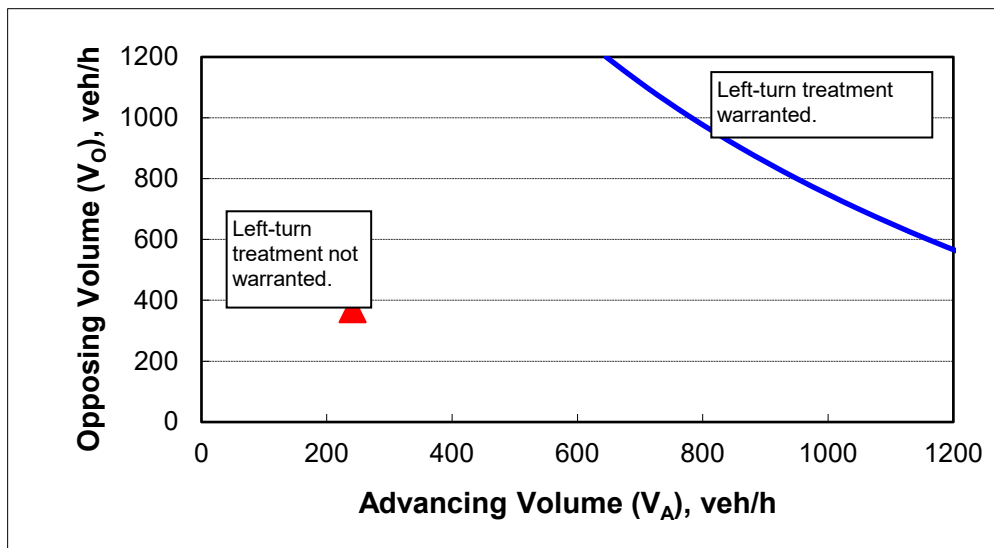
2-lane roadway (English)

INPUT

Variable	Value
85 th percentile speed, mph:	25
Percent of left-turns in advancing volume (V_A), %:	1%
Advancing volume (V_A), veh/h:	241
Opposing volume (V_O), veh/h:	371

OUTPUT

Variable	Value
Limiting advancing volume (V_A), veh/h:	1471
Guidance for determining the need for a major-road left-turn bay:	
Left-turn treatment NOT warranted.	



CALIBRATION CONSTANTS

Variable	Value
Average time for making left-turn, s:	3.0
Critical headway, s:	5.0
Average time for left-turn vehicle to clear the advancing lane, s:	1.9

Left-Turn Lane Warrant Analysis



Project: Haworth Avenue Apartments
 Intersection: 2. Site Access at Haworth Avenue
 Date: 5/12/2022
 Scenario: 2029 Future Conditions - PM Peak Hour (WB)

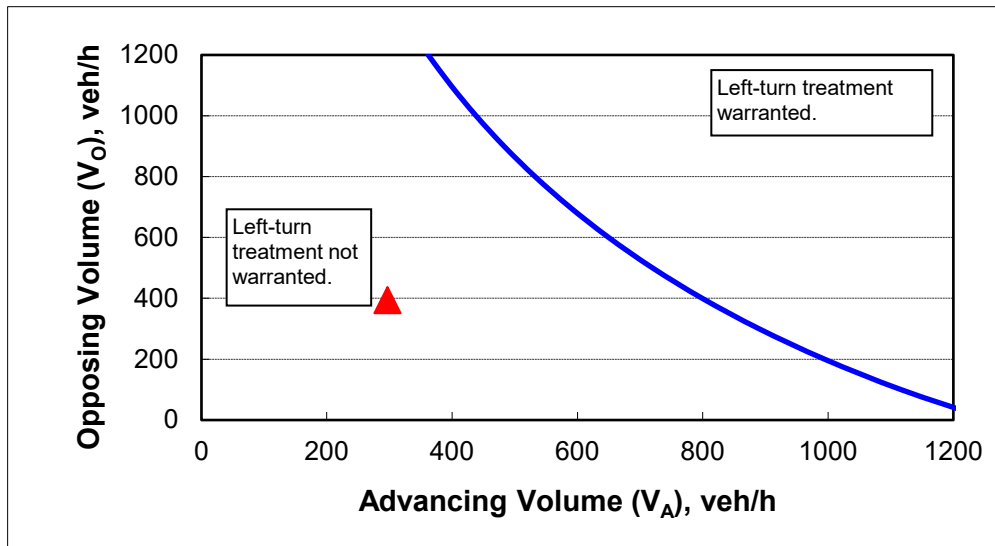
2-lane roadway (English)

INPUT

Variable	Value
85 th percentile speed, mph:	25
Percent of left-turns in advancing volume (V_A), %:	3%
Advancing volume (V_A), veh/h:	297
Opposing volume (V_O), veh/h:	394

OUTPUT

Variable	Value
Limiting advancing volume (V_A), veh/h:	804
Guidance for determining the need for a major-road left-turn bay:	
Left-turn treatment NOT warranted.	



CALIBRATION CONSTANTS

Variable	Value
Average time for making left-turn, s:	3.0
Critical headway, s:	5.0
Average time for left-turn vehicle to clear the advancing lane, s:	1.9

Traffic Signal Warrant Analysis



Project: Haworth Avenue Apartments
 Date: 5/12/2022
 Scenario: 2029 Future Conditions

Major Street:	Haworth Avenue	Minor Street:	N Deborah Road
Number of Lanes:	1	Number of Lanes:	1
PM Peak Hour Volumes:	564	PM Peak Hour Volumes:	182

Warrant Used:
 100 percent of standard warrants used
 70 percent of standard warrants used due to 85th percentile speed in excess of 40 mph or isolated community with population less than 10,000.

Number of Lanes for Moving Traffic on Each Approach:		ADT on Major St. (total of both approaches)	ADT on Minor St. (higher-volume approach)		
Major St.	Minor St.	100% Warrants	70% Warrants	100% Warrants	70% Warrants
WARRANT 1, CONDITION A					
1	1	8,850	6,200	2,650	1,850
2 or more	1	10,600	7,400	2,650	1,850
2 or more	2 or more	10,600	7,400	3,550	2,500
1	2 or more	8,850	6,200	3,550	2,500
WARRANT 1, CONDITION B					
1	1	13,300	9,300	1,350	950
2 or more	1	15,900	11,100	1,350	950
2 or more	2 or more	15,900	11,100	1,750	1,250
1	2 or more	13,300	9,300	1,750	1,250

Note: ADT volumes assume 8th highest hour is 5.6% of the daily volume

	Approach Volumes	Minimum Volumes	Is Signal Warrant Met?
Warrant 1			
<i>Condition A: Minimum Vehicular Volume</i>			
Major Street	5,640	8,850	
Minor Street*	1,820	2,650	No
<i>Condition B: Interruption of Continuous Traffic</i>			
Major Street	5,640	13,300	
Minor Street*	1,820	1,350	No
<i>Combination Warrant</i>			
Major Street	5,640	10,640	
Minor Street*	1,820	2,120	No

* Minor street right-turning traffic volumes reduced by 25%

Traffic Signal Warrant Analysis



Project: Haworth Avenue Apartments
 Date: 5/12/2022
 Scenario: 2029 Future Conditions

Major Street:	Haworth Avenue	Minor Street:	Site Access
Number of Lanes:	1	Number of Lanes:	1
PM Peak Hour Volumes:	691	PM Peak Hour Volumes:	7

Warrant Used:

 X 100 percent of standard warrants used
 70 percent of standard warrants used due to 85th percentile speed in excess of 40 mph or isolated community with population less than 10,000.

Number of Lanes for Moving Traffic on Each Approach:		ADT on Major St. (total of both approaches)	ADT on Minor St. (higher-volume approach)		
<u>Major St.</u>	<u>Minor St.</u>	<u>100% Warrants</u>	<u>70% Warrants</u>	<u>100% Warrants</u>	<u>70% Warrants</u>
WARRANT 1, CONDITION A					
1	1	8,850	6,200	2,650	1,850
2 or more	1	10,600	7,400	2,650	1,850
2 or more	2 or more	10,600	7,400	3,550	2,500
1	2 or more	8,850	6,200	3,550	2,500
WARRANT 1, CONDITION B					
1	1	13,300	9,300	1,350	950
2 or more	1	15,900	11,100	1,350	950
2 or more	2 or more	15,900	11,100	1,750	1,250
1	2 or more	13,300	9,300	1,750	1,250

Note: ADT volumes assume 8th highest hour is 5.6% of the daily volume

	Approach Volumes	Minimum Volumes	Is Signal Warrant Met?
<i>Warrant 1</i>			
<i>Condition A: Minimum Vehicular Volume</i>			
Major Street	6,910	8,850	
Minor Street*	70	2,650	No
<i>Condition B: Interruption of Continuous Traffic</i>			
Major Street	6,910	13,300	
Minor Street*	70	1,350	No
<i>Combination Warrant</i>			
Major Street	6,910	10,640	
Minor Street*	70	2,120	No

* Minor street right-turning traffic volumes reduced by 25%

Traffic Signal Warrant Analysis



Project: Haworth Avenue Apartments
 Date: 5/12/2022
 Scenario: 2029 Future Conditions

Major Street:	N Springbrook Road	Minor Street:	Haworth Avenue
Number of Lanes:	2	Number of Lanes:	2
PM Peak Hour Volumes:	1056	PM Peak Hour Volumes:	343

Warrant Used:
 X 100 percent of standard warrants used
 70 percent of standard warrants used due to 85th percentile speed in excess of 40 mph or isolated community with population less than 10,000.

Number of Lanes for Moving Traffic on Each Approach:		ADT on Major St. (total of both approaches)		ADT on Minor St. (higher-volume approach)	
Major St.	Minor St.	100% Warrants	70% Warrants	100% Warrants	70% Warrants
WARRANT 1, CONDITION A					
1	1	8,850	6,200	2,650	1,850
2 or more	1	10,600	7,400	2,650	1,850
2 or more	2 or more	10,600	7,400	3,550	2,500
1	2 or more	8,850	6,200	3,550	2,500
WARRANT 1, CONDITION B					
1	1	13,300	9,300	1,350	950
2 or more	1	15,900	11,100	1,350	950
2 or more	2 or more	15,900	11,100	1,750	1,250
1	2 or more	13,300	9,300	1,750	1,250

Note: ADT volumes assume 8th highest hour is 5.6% of the daily volume

	Approach Volumes	Minimum Volumes	Is Signal Warrant Met?
<i>Warrant 1</i>			
<i>Condition A: Minimum Vehicular Volume</i>			
Major Street	10,560	10,600	
Minor Street*	3,430	3,550	No
<i>Condition B: Interruption of Continuous Traffic</i>			
Major Street	10,560	15,900	
Minor Street*	3,430	1,750	No
<i>Combination Warrant</i>			
Major Street	10,560	12,720	
Minor Street*	3,430	2,840	No

* Minor street right-turning traffic volumes reduced by 25%

Appendix F

Level of Service Descriptions

Capacity Reports

Queuing Reports





Level of Service Definitions

Level of service is used to describe the quality of traffic flow. Levels of service A to C are considered good, and rural roads are usually designed for level of service C. Urban streets and signalized intersections are typically designed for level of service D. Level of service E is considered to be the limit of acceptable delay. For unsignalized intersections, level of service E is generally considered acceptable. Here is a more complete description of levels of service:

- *Level of service A:* Very low delay at intersections, with all traffic signal cycles clearing and no vehicles waiting through more than one signal cycle. On highways, low volume and high speeds, with speeds not restricted by other vehicles.
- *Level of service B:* Operating speeds beginning to be affected by other traffic; short traffic delays at intersections. Higher average intersection delay than for level of service A resulting from more vehicles stopping.
- *Level of service C:* Operating speeds and maneuverability closely controlled by other traffic; higher delays at intersections than for level of service B due to a significant number of vehicles stopping. Not all signal cycles clear the waiting vehicles. This is the recommended design standard for rural highways.
- *Level of service D:* Tolerable operating speeds; long traffic delays occur at intersections. The influence of congestion is noticeable. At traffic signals many vehicles stop, and the proportion of vehicles not stopping declines. The number of signal cycle failures, for which vehicles must wait through more than one signal cycle, are noticeable. This is typically the design level for urban signalized intersections.
- *Level of service E:* Restricted speeds, very long traffic delays at traffic signals, and traffic volumes near capacity. Flow is unstable so that any interruption, no matter how minor, will cause queues to form and service to deteriorate to level of service F. Traffic signal cycle failures are frequent occurrences. For unsignalized intersections, level of service E or better is generally considered acceptable.
- *Level of service F:* Extreme delays, resulting in long queues which may interfere with other traffic movements. There may be stoppages of long duration, and speeds may drop to zero. There may be frequent signal cycle failures. Level of service F will typically result when vehicle arrival rates are greater than capacity. It is considered unacceptable by most drivers.



Level of Service Criteria
For Signalized Intersections

Level of Service (LOS)	Control Delay per Vehicle (Seconds)
A	<10
B	10-20
C	20-35
D	35-55
E	55-80
F	>80

Level of Service Criteria
For Unsignalized Intersections

Level of Service (LOS)	Control Delay per Vehicle (Seconds)
A	<10
B	10-15
C	15-25
D	25-35
E	35-50
F	>50

HCM 6th AWSC
1: N Deborah Road & Haworth Avenue

05/03/2022

Intersection	
Intersection Delay, s/veh	12.4
Intersection LOS	B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	89	130	8	14	99	65	7	99	21	119	60	75
Future Vol, veh/h	89	130	8	14	99	65	7	99	21	119	60	75
Peak Hour Factor	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84
Heavy Vehicles, %	3	3	3	2	2	2	8	8	8	7	7	7
Mvmt Flow	106	155	10	17	118	77	8	118	25	142	71	89
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	12.9	11.2	10.9	13.5
HCM LOS	B	B	B	B

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	6%	39%	8%	47%
Vol Thru, %	78%	57%	56%	24%
Vol Right, %	17%	4%	37%	30%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	127	227	178	254
LT Vol	7	89	14	119
Through Vol	99	130	99	60
RT Vol	21	8	65	75
Lane Flow Rate	151	270	212	302
Geometry Grp	1	1	1	1
Degree of Util (X)	0.246	0.426	0.325	0.468
Departure Headway (Hd)	5.863	5.679	5.519	5.573
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	609	632	648	644
Service Time	3.93	3.738	3.582	3.631
HCM Lane V/C Ratio	0.248	0.427	0.327	0.469
HCM Control Delay	10.9	12.9	11.2	13.5
HCM Lane LOS	B	B	B	B
HCM 95th-tile Q	1	2.1	1.4	2.5

HCM 6th AWSC
3: N Springbrook Road & Haworth Avenue

05/03/2022

Intersection

Intersection Delay, s/veh 19.9

Intersection LOS C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕	↗		↕		↕	↗		↕	↗	
Traffic Vol, veh/h	62	25	227	34	15	10	88	271	6	24	318	85
Future Vol, veh/h	62	25	227	34	15	10	88	271	6	24	318	85
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Heavy Vehicles, %	2	2	2	2	2	2	7	7	7	6	6	6
Mvmt Flow	67	27	244	37	16	11	95	291	6	26	342	91
Number of Lanes	0	1	1	0	1	0	1	1	0	1	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	2	2	2
Conflicting Approach Left SB		NB	EB	WB
Conflicting Lanes Left	2	2	2	1
Conflicting Approach Right NB		SB	WB	EB
Conflicting Lanes Right	2	2	1	2
HCM Control Delay	13.8	12.4	16.4	28.4
HCM LOS	B	B	C	D

Lane	NBLn1	NBLn2	EBLn1	EBLn2	WBLn1	SBLn1	SBLn2
Vol Left, %	100%	0%	71%	0%	58%	100%	0%
Vol Thru, %	0%	98%	29%	0%	25%	0%	79%
Vol Right, %	0%	2%	0%	100%	17%	0%	21%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	88	277	87	227	59	24	403
LT Vol	88	0	62	0	34	24	0
Through Vol	0	271	25	0	15	0	318
RT Vol	0	6	0	227	10	0	85
Lane Flow Rate	95	298	94	244	63	26	433
Geometry Grp	7	7	7	7	6	7	7
Degree of Util (X)	0.192	0.561	0.198	0.442	0.142	0.052	0.789
Departure Headway (Hd)	7.305	6.779	7.605	6.525	8.046	7.214	6.553
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	491	533	472	552	445	499	555
Service Time	5.048	4.521	5.35	4.27	6.111	4.914	4.253
HCM Lane V/C Ratio	0.193	0.559	0.199	0.442	0.142	0.052	0.78
HCM Control Delay	11.8	17.9	12.2	14.4	12.4	10.3	29.5
HCM Lane LOS	B	C	B	B	B	B	D
HCM 95th-tile Q	0.7	3.4	0.7	2.2	0.5	0.2	7.4

HCM 6th Signalized Intersection Summary

4: N Springbrook Road & OR-99W

05/03/2022



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	54	1098	70	240	633	168	147	157	364	340	116	74
Future Volume (veh/h)	54	1098	70	240	633	168	147	157	364	340	116	74
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.99	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1695	1695	1695	1614	1614	1614	1668	1668	1668	1695	1695	1695
Adj Flow Rate, veh/h	59	1193	0	261	688	0	160	171	341	370	126	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	4	4	4	10	10	10	6	6	6	4	4	4
Cap, veh/h	74	1361		330	1495		220	285	396	437	406	344
Arrive On Green	0.05	0.42	0.00	0.11	0.49	0.00	0.07	0.17	0.17	0.14	0.24	0.00
Sat Flow, veh/h	1615	3221	1437	2981	3066	1367	3082	1668	1404	3132	1695	1437
Grp Volume(v), veh/h	59	1193	0	261	688	0	160	171	341	370	126	0
Grp Sat Flow(s),veh/h/ln	1615	1611	1437	1491	1533	1367	1541	1668	1404	1566	1695	1437
Q Serve(g_s), s	3.7	34.8	0.0	8.7	15.2	0.0	5.2	9.7	17.5	11.8	6.3	0.0
Cycle Q Clear(g_c), s	3.7	34.8	0.0	8.7	15.2	0.0	5.2	9.7	17.5	11.8	6.3	0.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	74	1361		330	1495		220	285	396	437	406	344
V/C Ratio(X)	0.80	0.88		0.79	0.46		0.73	0.60	0.86	0.85	0.31	0.00
Avail Cap(c_a), veh/h	166	1542		585	1755		346	285	396	532	406	344
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	48.4	27.1	0.0	44.4	17.3	0.0	46.6	39.2	34.9	43.0	32.0	0.0
Incr Delay (d2), s/veh	17.8	5.5	0.0	4.3	0.2	0.0	4.6	3.5	17.2	10.3	0.4	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.8	13.7	0.0	3.4	5.1	0.0	2.1	4.2	9.7	5.2	2.6	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	66.2	32.6	0.0	48.6	17.6	0.0	51.1	42.7	52.1	53.3	32.4	0.0
LnGrp LOS	E	C		D	B		D	D	D	D	C	A
Approach Vol, veh/h	1252		A	949		A	672		496			
Approach Delay, s/veh	34.2			26.1			49.4		48.0			
Approach LOS	C			C			D		D			
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	18.3	21.5	15.3	47.3	11.3	28.5	8.7	53.9				
Change Period (Y+Rc), s	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0				
Max Green Setting (Gmax), s	17.5	20.1	49.0	11.5	23.4	10.5	58.6					
Max Q Clear Time (g_c+1/3), s	19.5	10.7	36.8	7.2	8.3	5.7	17.2					
Green Ext Time (p_c), s	0.5	0.0	0.6	6.5	0.2	0.5	5.3					

Intersection Summary

HCM 6th Ctrl Delay	37.0
HCM 6th LOS	D

Notes

- User approved pedestrian interval to be less than phase max green.
- Unsignalized Delay for [EBR, WBR] is excluded from calculations of the approach delay and intersection delay.

HCM 6th AWSC
1: N Deborah Road & Haworth Avenue

05/03/2022

Intersection	
Intersection Delay, s/veh	11
Intersection LOS	B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	40	191	20	20	172	31	13	26	27	66	51	49
Future Vol, veh/h	40	191	20	20	172	31	13	26	27	66	51	49
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
Heavy Vehicles, %	1	1	1	2	2	2	6	6	6	5	5	5
Mvmt Flow	47	225	24	24	202	36	15	31	32	78	60	58
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	11.6	11	9.4	10.8
HCM LOS	B	B	A	B

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	20%	16%	9%	40%
Vol Thru, %	39%	76%	77%	31%
Vol Right, %	41%	8%	14%	30%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	66	251	223	166
LT Vol	13	40	20	66
Through Vol	26	191	172	51
RT Vol	27	20	31	49
Lane Flow Rate	78	295	262	195
Geometry Grp	1	1	1	1
Degree of Util (X)	0.12	0.416	0.369	0.295
Departure Headway (Hd)	5.574	5.077	5.064	5.442
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	642	715	711	660
Service Time	3.617	3.077	3.093	3.479
HCM Lane V/C Ratio	0.121	0.413	0.368	0.295
HCM Control Delay	9.4	11.6	11	10.8
HCM Lane LOS	A	B	B	B
HCM 95th-tile Q	0.4	2.1	1.7	1.2

HCM 6th AWSC
3: N Springbrook Road & Haworth Avenue

05/03/2022

Intersection												
Intersection Delay, s/veh	26.6											
Intersection LOS	D											

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔	↔		↔		↔	↔		↔	↔	
Traffic Vol, veh/h	87	63	182	95	62	58	139	307	20	43	328	42
Future Vol, veh/h	87	63	182	95	62	58	139	307	20	43	328	42
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles, %	1	1	1	1	1	1	2	2	2	1	1	1
Mvmt Flow	92	66	192	100	65	61	146	323	21	45	345	44
Number of Lanes	0	1	1	0	1	0	1	1	0	1	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	2	2	2
Conflicting Approach Left SB		NB	EB	WB
Conflicting Lanes Left	2	2	2	1
Conflicting Approach Right NB		SB	WB	EB
Conflicting Lanes Right	2	2	1	2
HCM Control Delay	16.2	21.7	26.3	38
HCM LOS	C	C	D	E

Lane	NBLn1	NBLn2	EBLn1	EBLn2	WBLn1	SBLn1	SBLn2
Vol Left, %	100%	0%	58%	0%	44%	100%	0%
Vol Thru, %	0%	94%	42%	0%	29%	0%	89%
Vol Right, %	0%	6%	0%	100%	27%	0%	11%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	139	327	150	182	215	43	370
LT Vol	139	0	87	0	95	43	0
Through Vol	0	307	63	0	62	0	328
RT Vol	0	20	0	182	58	0	42
Lane Flow Rate	146	344	158	192	226	45	389
Geometry Grp	7	7	7	7	6	7	7
Degree of Util (X)	0.342	0.752	0.382	0.409	0.545	0.106	0.848
Departure Headway (Hd)	8.425	7.864	8.716	7.691	8.675	8.436	7.837
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	427	461	414	467	416	425	463
Service Time	6.174	5.612	6.466	5.441	6.73	6.183	5.584
HCM Lane V/C Ratio	0.342	0.746	0.382	0.411	0.543	0.106	0.84
HCM Control Delay	15.5	30.9	16.8	15.7	21.7	12.2	41
HCM Lane LOS	C	D	C	C	C	B	E
HCM 95th-tile Q	1.5	6.3	1.8	2	3.2	0.4	8.5

HCM 6th Signalized Intersection Summary

4: N Springbrook Road & OR-99W

05/03/2022



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	100	900	122	529	1367	226	266	178	284	290	171	96
Future Volume (veh/h)	100	900	122	529	1367	226	266	178	284	290	171	96
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.99	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No		No		No		No		No		No
Adj Sat Flow, veh/h/ln	1709	1709	1709	1709	1709	1709	1709	1709	1709	1723	1723	1723
Adj Flow Rate, veh/h	104	938	0	551	1424	0	277	185	270	302	178	3
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
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	2	2	2
Cap, veh/h	127	1206		622	1592		337	290	529	364	305	256
Arrive On Green	0.08	0.37	0.00	0.20	0.49	0.00	0.11	0.17	0.17	0.11	0.18	0.18
Sat Flow, veh/h	1628	3247	1448	3158	3247	1448	3158	1709	1436	3183	1723	1448
Grp Volume(v), veh/h	104	938	0	551	1424	0	277	185	270	302	178	3
Grp Sat Flow(s),veh/h/ln	1628	1624	1448	1579	1624	1448	1579	1709	1436	1591	1723	1448
Q Serve(g_s), s	6.8	27.6	0.0	18.4	43.1	0.0	9.3	10.9	15.9	10.1	10.3	0.2
Cycle Q Clear(g_c), s	6.8	27.6	0.0	18.4	43.1	0.0	9.3	10.9	15.9	10.1	10.3	0.2
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	127	1206		622	1592		337	290	529	364	305	256
V/C Ratio(X)	0.82	0.78		0.89	0.89		0.82	0.64	0.51	0.83	0.58	0.01
Avail Cap(c_a), veh/h	165	1320		729	1740		408	316	550	441	334	281
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	49.1	30.1	0.0	42.3	25.0	0.0	47.3	41.9	26.8	46.9	40.9	36.7
Incr Delay (d2), s/veh	21.0	2.8	0.0	11.3	6.1	0.0	10.8	3.8	0.8	10.7	2.2	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	8.5	10.9	0.0	8.0	16.8	0.0	4.1	4.8	5.4	4.5	4.6	0.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	70.2	32.8	0.0	53.6	31.1	0.0	58.1	45.6	27.5	57.7	43.1	36.8
LnGrp LOS	E	C		D	C		E	D	C	E	D	D
Approach Vol, veh/h		1042	A		1975	A		732			483	
Approach Delay, s/veh		36.6			37.4			43.7			52.2	
Approach LOS		D			D			D			D	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	16.4	22.3	25.3	44.2	15.6	23.2	12.5	57.1				
Change Period (Y+Rc), s	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0				
Max Green Setting (Gmax), s	15.0	20.0	25.0	44.0	14.0	21.0	11.0	58.0				
Max Q Clear Time (g_c+1/2), s	11.0	17.9	20.4	29.6	11.3	12.3	8.8	45.1				
Green Ext Time (p_c), s	0.3	0.5	0.9	5.5	0.3	0.6	0.0	8.0				

Intersection Summary

HCM 6th Ctrl Delay	40.0
HCM 6th LOS	D

Notes

Unsignalized Delay for [EBR, WBR] is excluded from calculations of the approach delay and intersection delay.

HCM 6th AWSC
1: N Deborah Road & Haworth Avenue

05/03/2022

Intersection	
Intersection Delay, s/veh	13.6
Intersection LOS	B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	93	140	8	15	117	77	7	103	22	128	62	78
Future Vol, veh/h	93	140	8	15	117	77	7	103	22	128	62	78
Peak Hour Factor	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84
Heavy Vehicles, %	3	3	3	2	2	2	8	8	8	7	7	7
Mvmt Flow	111	167	10	18	139	92	8	123	26	152	74	93
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	14.1	12.5	11.5	14.9
HCM LOS	B	B	B	B

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	5%	39%	7%	48%
Vol Thru, %	78%	58%	56%	23%
Vol Right, %	17%	3%	37%	29%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	132	241	209	268
LT Vol	7	93	15	128
Through Vol	103	140	117	62
RT Vol	22	8	77	78
Lane Flow Rate	157	287	249	319
Geometry Grp	1	1	1	1
Degree of Util (X)	0.267	0.468	0.393	0.513
Departure Headway (Hd)	6.123	5.876	5.685	5.793
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	581	608	627	619
Service Time	4.219	3.957	3.769	3.871
HCM Lane V/C Ratio	0.27	0.472	0.397	0.515
HCM Control Delay	11.5	14.1	12.5	14.9
HCM Lane LOS	B	B	B	B
HCM 95th-tile Q	1.1	2.5	1.9	2.9

HCM 6th AWSC
3: N Springbrook Road & Haworth Avenue

05/03/2022

Intersection

Intersection Delay, s/veh25.7

Intersection LOS D

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕	↕		↕		↕	↕		↕	↕	
Traffic Vol, veh/h	69	26	241	35	16	11	108	295	6	27	344	95
Future Vol, veh/h	69	26	241	35	16	11	108	295	6	27	344	95
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Heavy Vehicles, %	2	2	2	2	2	2	7	7	7	6	6	6
Mvmt Flow	74	28	259	38	17	12	116	317	6	29	370	102
Number of Lanes	0	1	1	0	1	0	1	1	0	1	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	2	2	2
Conflicting Approach Left SB		NB	EB	WB
Conflicting Lanes Left	2	2	2	1
Conflicting Approach Right NB		SB	WB	EB
Conflicting Lanes Right	2	2	1	2
HCM Control Delay	15.2	13.2	19.1	40.7
HCM LOS	C	B	C	E

Lane	NBLn1	NBLn2	EBLn1	EBLn2	WBLn1	SBLn1	SBLn2
Vol Left, %	100%	0%	73%	0%	56%	100%	0%
Vol Thru, %	0%	98%	27%	0%	26%	0%	78%
Vol Right, %	0%	2%	0%	100%	18%	0%	22%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	108	301	95	241	62	27	439
LT Vol	108	0	69	0	35	27	0
Through Vol	0	295	26	0	16	0	344
RT Vol	0	6	0	241	11	0	95
Lane Flow Rate	116	324	102	259	67	29	472
Geometry Grp	7	7	7	7	6	7	7
Degree of Util (X)	0.245	0.634	0.225	0.492	0.158	0.06	0.889
Departure Headway (Hd)	7.582	7.055	7.924	6.834	8.511	7.446	6.779
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	474	511	453	526	420	481	533
Service Time	5.335	4.807	5.674	4.583	6.589	5.194	4.527
HCM Lane V/C Ratio	0.245	0.634	0.225	0.492	0.16	0.06	0.886
HCM Control Delay	12.8	21.3	13	16.1	13.2	10.7	42.5
HCM Lane LOS	B	C	B	C	B	B	E
HCM 95th-tile Q	1	4.4	0.9	2.7	0.6	0.2	10.1

HCM 6th Signalized Intersection Summary
 4: N Springbrook Road & OR-99W

05/03/2022



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	59	1109	73	258	665	193	153	171	382	363	128	79
Future Volume (veh/h)	59	1109	73	258	665	193	153	171	382	363	128	79
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.99	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1695	1695	1695	1614	1614	1614	1668	1668	1668	1695	1695	1695
Adj Flow Rate, veh/h	64	1205	0	280	723	0	166	186	361	395	139	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	4	4	4	10	10	10	6	6	6	4	4	4
Cap, veh/h	80	1344		348	1485		225	283	403	455	411	348
Arrive On Green	0.05	0.42	0.00	0.12	0.48	0.00	0.07	0.17	0.17	0.15	0.24	0.00
Sat Flow, veh/h	1615	3221	1437	2981	3066	1367	3082	1668	1404	3132	1695	1437
Grp Volume(v), veh/h	64	1205	0	280	723	0	166	186	361	395	139	0
Grp Sat Flow(s),veh/h/ln	1615	1611	1437	1491	1533	1367	1541	1668	1404	1566	1695	1437
Q Serve(g_s), s	4.2	36.9	0.0	9.7	16.9	0.0	5.6	11.0	18.0	13.1	7.2	0.0
Cycle Q Clear(g_c), s	4.2	36.9	0.0	9.7	16.9	0.0	5.6	11.0	18.0	13.1	7.2	0.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	80	1344		348	1485		225	283	403	455	411	348
V/C Ratio(X)	0.80	0.90		0.81	0.49		0.74	0.66	0.90	0.87	0.34	0.00
Avail Cap(c_a), veh/h	165	1460		591	1684		352	283	403	503	411	348
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	49.8	28.7	0.0	45.6	18.4	0.0	48.1	41.1	36.3	44.3	33.1	0.0
Incr Delay (d2), s/veh	16.4	7.3	0.0	4.4	0.2	0.0	4.7	5.4	21.8	14.0	0.5	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.0	14.9	0.0	3.7	5.8	0.0	2.3	4.9	11.1	6.0	3.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	66.2	36.0	0.0	50.0	18.7	0.0	52.8	46.5	58.1	58.3	33.6	0.0
LnGrp LOS	E	D		D	B		D	D	E	E	C	A
Approach Vol, veh/h		1269	A		1003	A		713			534	
Approach Delay, s/veh		37.5			27.4			53.8			51.9	
Approach LOS		D			C			D			D	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	19.4	22.0	16.4	48.2	11.7	29.7	9.3	55.3				
Change Period (Y+Rc), s	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0				
Max Green Setting (Gmax), s	18.0	21.0	18.0	48.0	12.1	22.9	10.8	58.2				
Max Q Clear Time (g_c+1/3g), s	20.0	11.7	38.9	7.6	9.2	6.2	18.9					
Green Ext Time (p_c), s	0.3	0.0	0.7	5.3	0.2	0.6	5.7					

Intersection Summary

HCM 6th Ctrl Delay	40.1
HCM 6th LOS	D

Notes

User approved pedestrian interval to be less than phase max green.
 Unsignalized Delay for [EBR, WBR] is excluded from calculations of the approach delay and intersection delay.

HCM 6th Signalized Intersection Summary

3: N Springbrook Road & Haworth Avenue

05/03/2022



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	69	26	241	35	16	11	108	295	6	27	344	95
Future Volume (veh/h)	69	26	241	35	16	11	108	295	6	27	344	95
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	0.98		0.98	0.99		0.98	0.99		0.99	0.99		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1796	1796	1796	1811	1811	1811
Adj Flow Rate, veh/h	74	28	86	38	17	4	116	317	5	29	370	86
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	2	2	2	2	2	2	7	7	7	6	6	6
Cap, veh/h	438	60	186	248	86	12	499	756	12	574	521	121
Arrive On Green	0.15	0.15	0.15	0.15	0.15	0.15	0.10	0.43	0.43	0.04	0.37	0.37
Sat Flow, veh/h	1370	398	1223	525	569	80	1711	1763	28	1725	1417	329
Grp Volume(v), veh/h	74	0	114	59	0	0	116	0	322	29	0	456
Grp Sat Flow(s),veh/h/ln	1370	0	1621	1173	0	0	1711	0	1791	1725	0	1746
Q Serve(g_s), s	0.0	0.0	2.3	0.1	0.0	0.0	1.4	0.0	4.4	0.4	0.0	7.9
Cycle Q Clear(g_c), s	1.3	0.0	2.3	2.3	0.0	0.0	1.4	0.0	4.4	0.4	0.0	7.9
Prop In Lane	1.00		0.75	0.64		0.07	1.00		0.02	1.00		0.19
Lane Grp Cap(c), veh/h	438	0	246	346	0	0	499	0	768	574	0	642
V/C Ratio(X)	0.17	0.00	0.46	0.17	0.00	0.00	0.23	0.00	0.42	0.05	0.00	0.71
Avail Cap(c_a), veh/h	936	0	835	859	0	0	602	0	1187	764	0	1138
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	0.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	13.2	0.0	13.6	13.1	0.0	0.0	6.4	0.0	7.0	6.4	0.0	9.5
Incr Delay (d2), s/veh	0.2	0.0	1.4	0.2	0.0	0.0	0.2	0.0	0.4	0.0	0.0	1.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.5	0.0	0.8	0.4	0.0	0.0	0.3	0.0	1.2	0.1	0.0	2.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	13.4	0.0	15.0	13.3	0.0	0.0	6.7	0.0	7.3	6.5	0.0	11.0
LnGrp LOS	B	A	B	B	A	A	A	A	A	A	A	B
Approach Vol, veh/h		188			59			438				485
Approach Delay, s/veh		14.3			13.3			7.2				10.7
Approach LOS		B			B			A				B
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	5.7	19.6		9.8	7.9	17.4		9.8				
Change Period (Y+Rc), s	4.5	4.5		4.5	4.5	4.5		4.5				
Max Green Setting (Gmax), s	5.1	23.3		18.1	5.5	22.9		18.1				
Max Q Clear Time (g_c+I1), s	2.4	6.4		4.3	3.4	9.9		4.3				
Green Ext Time (p_c), s	0.0	1.8		0.7	0.1	2.5		0.2				
Intersection Summary												
HCM 6th Ctrl Delay				10.1								
HCM 6th LOS				B								

Intersection	
Intersection Delay, s/veh	11.7
Intersection LOS	B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	42	206	21	21	184	37	14	27	28	74	53	51
Future Vol, veh/h	42	206	21	21	184	37	14	27	28	74	53	51
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
Heavy Vehicles, %	1	1	1	2	2	2	6	6	6	5	5	5
Mvmt Flow	49	242	25	25	216	44	16	32	33	87	62	60
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	12.5	11.8	9.7	11.3
HCM LOS	B	B	A	B

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	20%	16%	9%	42%
Vol Thru, %	39%	77%	76%	30%
Vol Right, %	41%	8%	15%	29%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	69	269	242	178
LT Vol	14	42	21	74
Through Vol	27	206	184	53
RT Vol	28	21	37	51
Lane Flow Rate	81	316	285	209
Geometry Grp	1	1	1	1
Degree of Util (X)	0.13	0.454	0.409	0.326
Departure Headway (Hd)	5.763	5.169	5.174	5.599
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	620	696	695	641
Service Time	3.813	3.204	3.21	3.64
HCM Lane V/C Ratio	0.131	0.454	0.41	0.326
HCM Control Delay	9.7	12.5	11.8	11.3
HCM Lane LOS	A	B	B	B
HCM 95th-tile Q	0.4	2.4	2	1.4

HCM 6th AWSC
 3: N Springbrook Road & Haworth Avenue

05/03/2022

Intersection

Intersection Delay, s/veh 37.6

Intersection LOS E

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕	↗		↕		↗	↘		↗	↘	
Traffic Vol, veh/h	96	66	196	99	65	62	150	330	21	47	356	49
Future Vol, veh/h	96	66	196	99	65	62	150	330	21	47	356	49
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles, %	1	1	1	1	1	1	2	2	2	1	1	1
Mvmt Flow	101	69	206	104	68	65	158	347	22	49	375	52
Number of Lanes	0	1	1	0	1	0	1	1	0	1	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	2	2	2
Conflicting Approach Left SB		NB	EB	WB
Conflicting Lanes Left	2	2	2	1
Conflicting Approach Right NB		SB	WB	EB
Conflicting Lanes Right	2	2	1	2
HCM Control Delay	18.4	25.8	36	60.6
HCM LOS	C	D	E	F

Lane	NBLn1	NBLn2	EBLn1	EBLn2	WBLn1	SBLn1	SBLn2
Vol Left, %	100%	0%	59%	0%	44%	100%	0%
Vol Thru, %	0%	94%	41%	0%	29%	0%	88%
Vol Right, %	0%	6%	0%	100%	27%	0%	12%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	150	351	162	196	226	47	405
LT Vol	150	0	96	0	99	47	0
Through Vol	0	330	66	0	65	0	356
RT Vol	0	21	0	196	62	0	49
Lane Flow Rate	158	369	171	206	238	49	426
Geometry Grp	7	7	7	7	6	7	7
Degree of Util (X)	0.39	0.855	0.436	0.468	0.61	0.122	0.976
Departure Headway (Hd)	8.89	8.326	9.194	8.158	9.229	8.848	8.24
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	404	436	391	442	390	405	439
Service Time	6.661	6.097	6.964	5.927	7.31	6.614	6.006
HCM Lane V/C Ratio	0.391	0.846	0.437	0.466	0.61	0.121	0.97
HCM Control Delay	17.3	44	18.9	18	25.8	12.8	66.2
HCM Lane LOS	C	E	C	C	D	B	F
HCM 95th-tile Q	1.8	8.5	2.2	2.4	3.9	0.4	12

HCM 6th Signalized Intersection Summary

4: N Springbrook Road & OR-99W

05/03/2022



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	107	938	127	560	1387	244	277	189	313	318	181	103
Future Volume (veh/h)	107	938	127	560	1387	244	277	189	313	318	181	103
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.99	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No		No		No		No		No		No
Adj Sat Flow, veh/h/ln	1709	1709	1709	1709	1709	1709	1709	1709	1709	1723	1723	1723
Adj Flow Rate, veh/h	111	977	0	583	1445	0	289	197	300	331	189	9
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
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	2	2	2
Cap, veh/h	135	1184		651	1584		346	281	534	390	305	256
Arrive On Green	0.08	0.36	0.00	0.21	0.49	0.00	0.11	0.16	0.16	0.12	0.18	0.18
Sat Flow, veh/h	1628	3247	1448	3158	3247	1448	3158	1709	1435	3183	1723	1448
Grp Volume(v), veh/h	111	977	0	583	1445	0	289	197	300	331	189	9
Grp Sat Flow(s),veh/h/ln	1628	1624	1448	1579	1624	1448	1579	1709	1435	1591	1723	1448
Q Serve(g_s), s	7.5	30.6	0.0	20.1	46.0	0.0	10.1	12.2	18.4	11.4	11.4	0.6
Cycle Q Clear(g_c), s	7.5	30.6	0.0	20.1	46.0	0.0	10.1	12.2	18.4	11.4	11.4	0.6
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	135	1184		651	1584		346	281	534	390	305	256
V/C Ratio(X)	0.82	0.83		0.90	0.91		0.84	0.70	0.56	0.85	0.62	0.04
Avail Cap(c_a), veh/h	171	1258		744	1681		403	281	534	449	306	257
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	50.6	32.4	0.0	43.3	26.5	0.0	48.9	44.2	28.1	48.2	42.6	38.2
Incr Delay (d2), s/veh	22.0	4.4	0.0	12.4	7.7	0.0	12.5	7.6	1.3	12.9	3.8	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	8.9	12.4	0.0	8.8	18.4	0.0	4.5	5.7	6.4	5.3	5.2	0.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	72.6	36.8	0.0	55.7	34.2	0.0	61.4	51.9	29.4	61.1	46.4	38.2
LnGrp LOS	E	D		E	C		E	D	C	E	D	D
Approach Vol, veh/h		1088	A		2028	A		786			529	
Approach Delay, s/veh		40.4			40.4			46.8			55.4	
Approach LOS		D			D			D			E	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	17.7	22.4	27.1	44.9	16.3	23.8	13.3	58.7				
Change Period (Y+Rc), s	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0				
Max Green Setting (Gmax), s	15.8	18.4	26.4	43.4	14.3	19.9	11.8	58.0				
Max Q Clear Time (g_c+1/3), s	11.4	20.4	22.1	32.6	12.1	13.4	9.5	48.0				
Green Ext Time (p_c), s	0.3	0.0	1.0	4.9	0.2	0.5	0.0	6.7				

Intersection Summary

HCM 6th Ctrl Delay	43.3
HCM 6th LOS	D

Notes

Unsignalized Delay for [EBR, WBR] is excluded from calculations of the approach delay and intersection delay.

HCM 6th Signalized Intersection Summary

3: N Springbrook Road & Haworth Avenue

05/03/2022



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	96	66	196	99	65	62	150	330	21	47	356	49
Future Volume (veh/h)	96	66	196	99	65	62	150	330	21	47	356	49
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	0.99		0.97	0.99		0.99	1.00		0.97	1.00		0.97
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1885	1885	1885	1885	1885	1885	1870	1870	1870	1885	1885	1885
Adj Flow Rate, veh/h	101	69	72	104	68	44	158	347	19	49	375	45
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	1	1	1	1	1	1	2	2	2	1	1	1
Cap, veh/h	499	197	205	254	139	66	479	644	35	493	519	62
Arrive On Green	0.24	0.24	0.24	0.24	0.24	0.24	0.10	0.37	0.37	0.05	0.32	0.32
Sat Flow, veh/h	1283	830	866	500	586	278	1781	1754	96	1795	1645	197
Grp Volume(v), veh/h	101	0	141	216	0	0	158	0	366	49	0	420
Grp Sat Flow(s),veh/h/ln	1283	0	1696	1363	0	0	1781	0	1850	1795	0	1843
Q Serve(g_s), s	0.0	0.0	2.7	3.2	0.0	0.0	2.2	0.0	6.1	0.7	0.0	7.9
Cycle Q Clear(g_c), s	2.4	0.0	2.7	6.0	0.0	0.0	2.2	0.0	6.1	0.7	0.0	7.9
Prop In Lane	1.00		0.51	0.48		0.20	1.00		0.05	1.00		0.11
Lane Grp Cap(c), veh/h	499	0	402	458	0	0	479	0	680	493	0	582
V/C Ratio(X)	0.20	0.00	0.35	0.47	0.00	0.00	0.33	0.00	0.54	0.10	0.00	0.72
Avail Cap(c_a), veh/h	798	0	797	801	0	0	541	0	1077	631	0	1054
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	0.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	12.4	0.0	12.5	13.7	0.0	0.0	8.2	0.0	9.8	8.3	0.0	11.9
Incr Delay (d2), s/veh	0.2	0.0	0.5	0.8	0.0	0.0	0.4	0.0	0.7	0.1	0.0	1.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.6	0.0	0.9	1.6	0.0	0.0	0.7	0.0	2.1	0.2	0.0	2.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	12.6	0.0	13.0	14.5	0.0	0.0	8.6	0.0	10.5	8.4	0.0	13.7
LnGrp LOS	B	A	B	B	A	A	A	A	B	A	A	B
Approach Vol, veh/h		242			216			524				469
Approach Delay, s/veh		12.8			14.5			9.9				13.1
Approach LOS		B			B			A				B
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	6.6	19.0		13.8	8.6	16.9		13.8				
Change Period (Y+Rc), s	4.5	4.5		4.5	4.5	4.5		4.5				
Max Green Setting (Gmax), s	5.1	22.9		18.5	5.5	22.5		18.5				
Max Q Clear Time (g_c+I1), s	2.7	8.1		4.7	4.2	9.9		8.0				
Green Ext Time (p_c), s	0.0	2.0		1.0	0.1	2.2		0.9				

Intersection Summary

HCM 6th Ctrl Delay	12.1
HCM 6th LOS	B

Intersection	
Intersection Delay, s/veh	13.6
Intersection LOS	B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	93	140	8	15	118	77	7	103	22	129	62	78
Future Vol, veh/h	93	140	8	15	118	77	7	103	22	129	62	78
Peak Hour Factor	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84
Heavy Vehicles, %	3	3	3	2	2	2	8	8	8	7	7	7
Mvmt Flow	111	167	10	18	140	92	8	123	26	154	74	93
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	14.1	12.5	11.5	15
HCM LOS	B	B	B	B

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	5%	39%	7%	48%
Vol Thru, %	78%	58%	56%	23%
Vol Right, %	17%	3%	37%	29%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	132	241	210	269
LT Vol	7	93	15	129
Through Vol	103	140	118	62
RT Vol	22	8	77	78
Lane Flow Rate	157	287	250	320
Geometry Grp	1	1	1	1
Degree of Util (X)	0.268	0.469	0.395	0.516
Departure Headway (Hd)	6.13	5.883	5.69	5.798
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	580	608	628	618
Service Time	4.229	3.968	3.779	3.879
HCM Lane V/C Ratio	0.271	0.472	0.398	0.518
HCM Control Delay	11.5	14.1	12.5	15
HCM Lane LOS	B	B	B	B
HCM 95th-tile Q	1.1	2.5	1.9	3

HCM 6th TWSC
2: Site Access & Haworth Avenue

05/03/2022

Intersection						
Int Delay, s/veh	0.2					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	336	1	2	219	1	8
Future Vol, veh/h	336	1	2	219	1	8
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	365	1	2	238	1	9

Major/Minor	Major1	Major2	Minor1		
Conflicting Flow All	0	0	366	0	608 366
Stage 1	-	-	-	-	366 -
Stage 2	-	-	-	-	242 -
Critical Hdwy	-	-	4.12	-	6.42 6.22
Critical Hdwy Stg 1	-	-	-	-	5.42 -
Critical Hdwy Stg 2	-	-	-	-	5.42 -
Follow-up Hdwy	-	-	2.218	-	3.518 3.318
Pot Cap-1 Maneuver	-	-	1193	-	459 679
Stage 1	-	-	-	-	702 -
Stage 2	-	-	-	-	798 -
Platoon blocked, %	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	1193	-	458 679
Mov Cap-2 Maneuver	-	-	-	-	458 -
Stage 1	-	-	-	-	702 -
Stage 2	-	-	-	-	796 -

Approach	EB	WB	NB
HCM Control Delay, s	0	0.1	10.7
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	644	-	-	1193	-
HCM Lane V/C Ratio	0.015	-	-	0.002	-
HCM Control Delay (s)	10.7	-	-	8	0
HCM Lane LOS	B	-	-	A	A
HCM 95th %tile Q(veh)	0	-	-	0	-

HCM 6th AWSC
3: N Springbrook Road & Haworth Avenue

05/03/2022

Intersection	
Intersection Delay, s/veh	26.1
Intersection LOS	D

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕	↕		↕		↕	↕		↕	↕	
Traffic Vol, veh/h	70	26	248	35	16	11	110	295	6	27	344	95
Future Vol, veh/h	70	26	248	35	16	11	110	295	6	27	344	95
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Heavy Vehicles, %	2	2	2	2	2	2	7	7	7	6	6	6
Mvmt Flow	75	28	267	38	17	12	118	317	6	29	370	102
Number of Lanes	0	1	1	0	1	0	1	1	0	1	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	2	2	2
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	2	2	2	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	2	2	1	2
HCM Control Delay	15.5	13.3	19.3	41.7
HCM LOS	C	B	C	E

Lane	NBLn1	NBLn2	EBLn1	EBLn2	WBLn1	SBLn1	SBLn2
Vol Left, %	100%	0%	73%	0%	56%	100%	0%
Vol Thru, %	0%	98%	27%	0%	26%	0%	78%
Vol Right, %	0%	2%	0%	100%	18%	0%	22%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	110	301	96	248	62	27	439
LT Vol	110	0	70	0	35	27	0
Through Vol	0	295	26	0	16	0	344
RT Vol	0	6	0	248	11	0	95
Lane Flow Rate	118	324	103	267	67	29	472
Geometry Grp	7	7	7	7	6	7	7
Degree of Util (X)	0.251	0.638	0.228	0.508	0.159	0.06	0.895
Departure Headway (Hd)	7.626	7.099	7.944	6.852	8.563	7.491	6.824
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	471	508	452	525	417	478	529
Service Time	5.38	4.852	5.695	4.603	6.643	5.239	4.572
HCM Lane V/C Ratio	0.251	0.638	0.228	0.509	0.161	0.061	0.892
HCM Control Delay	12.9	21.6	13	16.5	13.3	10.7	43.6
HCM Lane LOS	B	C	B	C	B	B	E
HCM 95th-tile Q	1	4.4	0.9	2.8	0.6	0.2	10.3

HCM 6th Signalized Intersection Summary

4: N Springbrook Road & OR-99W

05/03/2022



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	60	1109	73	258	665	194	153	171	382	366	130	81
Future Volume (veh/h)	60	1109	73	258	665	194	153	171	382	366	130	81
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.99	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No		No		No		No		No		No
Adj Sat Flow, veh/h/ln	1695	1695	1695	1614	1614	1614	1668	1668	1668	1695	1695	1695
Adj Flow Rate, veh/h	65	1205	0	280	723	0	166	186	360	398	141	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	4	4	4	10	10	10	6	6	6	4	4	4
Cap, veh/h	81	1351		349	1490		225	271	394	463	402	341
Arrive On Green	0.05	0.42	0.00	0.12	0.49	0.00	0.07	0.16	0.16	0.15	0.24	0.00
Sat Flow, veh/h	1615	3221	1437	2981	3066	1367	3082	1668	1403	3132	1695	1437
Grp Volume(v), veh/h	65	1205	0	280	723	0	166	186	360	398	141	0
Grp Sat Flow(s),veh/h/ln	1615	1611	1437	1491	1533	1367	1541	1668	1403	1566	1695	1437
Q Serve(g_s), s	4.2	36.2	0.0	9.6	16.6	0.0	5.5	11.0	17.0	13.0	7.2	0.0
Cycle Q Clear(g_c), s	4.2	36.2	0.0	9.6	16.6	0.0	5.5	11.0	17.0	13.0	7.2	0.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	81	1351		349	1490		225	271	394	463	402	341
V/C Ratio(X)	0.80	0.89		0.80	0.49		0.74	0.69	0.91	0.86	0.35	0.00
Avail Cap(c_a), veh/h	168	1480		599	1705		357	271	394	540	402	341
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	49.1	28.1	0.0	45.0	18.1	0.0	47.4	41.2	36.5	43.5	33.2	0.0
Incr Delay (d2), s/veh	16.2	6.8	0.0	4.3	0.2	0.0	4.6	7.0	25.5	11.8	0.5	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.0	14.5	0.0	3.7	5.6	0.0	2.2	5.0	11.4	5.8	3.1	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	65.3	34.9	0.0	49.3	18.3	0.0	52.1	48.2	62.0	55.3	33.7	0.0
LnGrp LOS	E	C		D	B		D	D	E	E	C	A
Approach Vol, veh/h		1270	A		1003	A		712			539	
Approach Delay, s/veh		36.5			27.0			56.1			49.7	
Approach LOS		D			C			E			D	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	19.4	21.0	16.2	47.8	11.6	28.8	9.3	54.8				
Change Period (Y+Rc), s	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0				
Max Green Setting (Gmax), s	17.0	17.0	21.0	48.0	12.1	22.9	10.9	58.1				
Max Q Clear Time (g_c+1/5), s	19.0	19.0	11.6	38.2	7.5	9.2	6.2	18.6				
Green Ext Time (p_c), s	0.5	0.0	0.7	5.6	0.2	0.6	0.0	5.7				

Intersection Summary

HCM 6th Ctrl Delay	39.7
HCM 6th LOS	D

Notes

- User approved pedestrian interval to be less than phase max green.
- Unsignalized Delay for [EBR, WBR] is excluded from calculations of the approach delay and intersection delay.

HCM 6th Signalized Intersection Summary

3: N Springbrook Road & Haworth Avenue

05/03/2022



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	70	26	248	35	16	11	110	295	6	27	344	95
Future Volume (veh/h)	70	26	248	35	16	11	110	295	6	27	344	95
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	0.99		0.98	0.99		0.98	0.99		0.99	0.99		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1796	1796	1796	1811	1811	1811
Adj Flow Rate, veh/h	75	28	89	38	17	4	118	317	5	29	370	86
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	2	2	2	2	2	2	7	7	7	6	6	6
Cap, veh/h	440	59	188	247	86	12	499	757	12	574	520	121
Arrive On Green	0.15	0.15	0.15	0.15	0.15	0.15	0.10	0.43	0.43	0.04	0.37	0.37
Sat Flow, veh/h	1370	388	1232	516	562	78	1711	1763	28	1725	1417	329
Grp Volume(v), veh/h	75	0	117	59	0	0	118	0	322	29	0	456
Grp Sat Flow(s),veh/h/ln	1370	0	1620	1156	0	0	1711	0	1791	1725	0	1746
Q Serve(g_s), s	0.0	0.0	2.3	0.1	0.0	0.0	1.4	0.0	4.4	0.4	0.0	7.9
Cycle Q Clear(g_c), s	1.3	0.0	2.3	2.4	0.0	0.0	1.4	0.0	4.4	0.4	0.0	7.9
Prop In Lane	1.00		0.76	0.64		0.07	1.00		0.02	1.00		0.19
Lane Grp Cap(c), veh/h	440	0	248	345	0	0	499	0	769	574	0	641
V/C Ratio(X)	0.17	0.00	0.47	0.17	0.00	0.00	0.24	0.00	0.42	0.05	0.00	0.71
Avail Cap(c_a), veh/h	933	0	831	852	0	0	599	0	1183	763	0	1134
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	0.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	13.2	0.0	13.6	13.1	0.0	0.0	6.5	0.0	7.0	6.5	0.0	9.6
Incr Delay (d2), s/veh	0.2	0.0	1.4	0.2	0.0	0.0	0.2	0.0	0.4	0.0	0.0	1.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.5	0.0	0.8	0.4	0.0	0.0	0.4	0.0	1.2	0.1	0.0	2.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	13.4	0.0	15.0	13.3	0.0	0.0	6.7	0.0	7.4	6.5	0.0	11.0
LnGrp LOS	B	A	B	B	A	A	A	A	A	A	A	B
Approach Vol, veh/h		192			59			440				485
Approach Delay, s/veh		14.4			13.3			7.2				10.8
Approach LOS		B			B			A				B
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	5.7	19.6		9.9	7.9	17.5		9.9				
Change Period (Y+Rc), s	4.5	4.5		4.5	4.5	4.5		4.5				
Max Green Setting (Gmax), s	5.1	23.3		18.1	5.5	22.9		18.1				
Max Q Clear Time (g_c+I1), s	2.4	6.4		4.3	3.4	9.9		4.4				
Green Ext Time (p_c), s	0.0	1.8		0.7	0.1	2.5		0.2				
Intersection Summary												
HCM 6th Ctrl Delay				10.1								
HCM 6th LOS				B								

HCM 6th AWSC
1: N Deborah Road & Haworth Avenue

05/03/2022

Intersection	
Intersection Delay, s/veh	11.8
Intersection LOS	B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	42	207	21	21	185	37	14	27	28	74	53	51
Future Vol, veh/h	42	207	21	21	185	37	14	27	28	74	53	51
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
Heavy Vehicles, %	1	1	1	2	2	2	6	6	6	5	5	5
Mvmt Flow	49	244	25	25	218	44	16	32	33	87	62	60
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	12.5	11.8	9.7	11.4
HCM LOS	B	B	A	B

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	20%	16%	9%	42%
Vol Thru, %	39%	77%	76%	30%
Vol Right, %	41%	8%	15%	29%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	69	270	243	178
LT Vol	14	42	21	74
Through Vol	27	207	185	53
RT Vol	28	21	37	51
Lane Flow Rate	81	318	286	209
Geometry Grp	1	1	1	1
Degree of Util (X)	0.13	0.456	0.411	0.326
Departure Headway (Hd)	5.771	5.171	5.177	5.606
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	619	696	695	641
Service Time	3.82	3.207	3.213	3.647
HCM Lane V/C Ratio	0.131	0.457	0.412	0.326
HCM Control Delay	9.7	12.5	11.8	11.4
HCM Lane LOS	A	B	B	B
HCM 95th-tile Q	0.4	2.4	2	1.4

HCM 6th TWSC
2: Site Access & Haworth Avenue

05/11/2022

Intersection						
Int Delay, s/veh	0.2					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	358	1	8	264	1	5
Future Vol, veh/h	358	1	8	264	1	5
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	389	1	9	287	1	5

Major/Minor	Major1	Major2	Minor1		
Conflicting Flow All	0	0	390	0	695 390
Stage 1	-	-	-	-	390 -
Stage 2	-	-	-	-	305 -
Critical Hdwy	-	-	4.12	-	6.42 6.22
Critical Hdwy Stg 1	-	-	-	-	5.42 -
Critical Hdwy Stg 2	-	-	-	-	5.42 -
Follow-up Hdwy	-	-	2.218	-	3.518 3.318
Pot Cap-1 Maneuver	-	-	1169	-	408 658
Stage 1	-	-	-	-	684 -
Stage 2	-	-	-	-	748 -
Platoon blocked, %	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	1169	-	404 658
Mov Cap-2 Maneuver	-	-	-	-	404 -
Stage 1	-	-	-	-	684 -
Stage 2	-	-	-	-	741 -

Approach	EB	WB	NB
HCM Control Delay, s	0	0.2	11.1
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	596	-	-	1169	-
HCM Lane V/C Ratio	0.011	-	-	0.007	-
HCM Control Delay (s)	11.1	-	-	8.1	0
HCM Lane LOS	B	-	-	A	A
HCM 95th %tile Q(veh)	0	-	-	0	-

HCM 6th AWSC
3: N Springbrook Road & Haworth Avenue

05/03/2022

Intersection	
Intersection Delay, s/veh	38.3
Intersection LOS	E

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔	↔		↔		↔	↔		↔	↔	
Traffic Vol, veh/h	97	66	200	99	65	62	157	330	21	47	356	50
Future Vol, veh/h	97	66	200	99	65	62	157	330	21	47	356	50
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles, %	1	1	1	1	1	1	2	2	2	1	1	1
Mvmt Flow	102	69	211	104	68	65	165	347	22	49	375	53
Number of Lanes	0	1	1	0	1	0	1	1	0	1	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	2	2	2
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	2	2	2	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	2	2	1	2
HCM Control Delay	18.7	26.1	36.3	62.4
HCM LOS	C	D	E	F

Lane	NBLn1	NBLn2	EBLn1	EBLn2	WBLn1	SBLn1	SBLn2
Vol Left, %	100%	0%	60%	0%	44%	100%	0%
Vol Thru, %	0%	94%	40%	0%	29%	0%	88%
Vol Right, %	0%	6%	0%	100%	27%	0%	12%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	157	351	163	200	226	47	406
LT Vol	157	0	97	0	99	47	0
Through Vol	0	330	66	0	65	0	356
RT Vol	0	21	0	200	62	0	50
Lane Flow Rate	165	369	172	211	238	49	427
Geometry Grp	7	7	7	7	6	7	7
Degree of Util (X)	0.41	0.858	0.44	0.479	0.613	0.122	0.983
Departure Headway (Hd)	8.925	8.362	9.224	8.186	9.275	8.889	8.28
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	403	432	389	440	388	403	436
Service Time	6.698	6.133	6.994	5.955	7.356	6.654	6.044
HCM Lane V/C Ratio	0.409	0.854	0.442	0.48	0.613	0.122	0.979
HCM Control Delay	17.8	44.6	19.1	18.3	26.1	12.9	68.1
HCM Lane LOS	C	E	C	C	D	B	F
HCM 95th-tile Q	2	8.5	2.2	2.5	3.9	0.4	12.2

HCM 6th Signalized Intersection Summary

4: N Springbrook Road & OR-99W

05/03/2022



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	110	938	127	560	1387	247	277	190	313	320	182	104
Future Volume (veh/h)	110	938	127	560	1387	247	277	190	313	320	182	104
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.99	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1709	1709	1709	1709	1709	1709	1709	1709	1709	1723	1723	1723
Adj Flow Rate, veh/h	115	977	0	583	1445	0	289	198	300	333	190	9
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
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	2	2	2
Cap, veh/h	139	1193		651	1585		346	275	529	391	300	252
Arrive On Green	0.09	0.37	0.00	0.21	0.49	0.00	0.11	0.16	0.16	0.12	0.17	0.17
Sat Flow, veh/h	1628	3247	1448	3158	3247	1448	3158	1709	1435	3183	1723	1447
Grp Volume(v), veh/h	115	977	0	583	1445	0	289	198	300	333	190	9
Grp Sat Flow(s),veh/h/ln	1628	1624	1448	1579	1624	1448	1579	1709	1435	1591	1723	1447
Q Serve(g_s), s	7.8	30.5	0.0	20.1	46.0	0.0	10.0	12.3	18.0	11.5	11.5	0.6
Cycle Q Clear(g_c), s	7.8	30.5	0.0	20.1	46.0	0.0	10.0	12.3	18.0	11.5	11.5	0.6
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	139	1193		651	1585		346	275	529	391	300	252
V/C Ratio(X)	0.83	0.82		0.90	0.91		0.84	0.72	0.57	0.85	0.63	0.04
Avail Cap(c_a), veh/h	177	1270		744	1681		403	275	529	449	300	252
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	50.4	32.1	0.0	43.3	26.4	0.0	48.9	44.6	28.4	48.1	42.9	38.4
Incr Delay (d2), s/veh	21.7	4.2	0.0	12.4	7.7	0.0	12.5	8.9	1.4	13.1	4.3	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.0	12.3	0.0	8.8	18.4	0.0	4.5	5.8	6.5	5.3	5.3	0.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	72.2	36.2	0.0	55.7	34.1	0.0	61.4	53.5	29.8	61.2	47.2	38.5
LnGrp LOS	E	D		E	C		E	D	C	E	D	D
Approach Vol, veh/h	1092		A		2028		A		787		532	
Approach Delay, s/veh	40.0				40.3				47.4		55.8	
Approach LOS	D				D				D		E	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	17.8	22.0	27.1	45.1	16.3	23.5	13.6	58.7				
Change Period (Y+Rc), s	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0				
Max Green Setting (Gmax), s	15.8	18.0	26.4	43.8	14.3	19.5	12.2	58.0				
Max Q Clear Time (g_c+1/3), s	11.5	20.0	22.1	32.5	12.0	13.5	9.8	48.0				
Green Ext Time (p_c), s	0.3	0.0	1.0	5.0	0.2	0.5	0.1	6.7				

Intersection Summary

HCM 6th Ctrl Delay	43.3
HCM 6th LOS	D

Notes

Unsignalized Delay for [EBR, WBR] is excluded from calculations of the approach delay and intersection delay.

HCM 6th Signalized Intersection Summary

3: N Springbrook Road & Haworth Avenue

05/03/2022



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	97	66	200	99	65	62	157	330	21	47	356	50
Future Volume (veh/h)	97	66	200	99	65	62	157	330	21	47	356	50
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	0.99		0.97	0.99		0.99	1.00		0.97	1.00		0.97
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1885	1885	1885	1885	1885	1885	1870	1870	1870	1885	1885	1885
Adj Flow Rate, veh/h	102	69	74	104	68	44	165	347	19	49	375	45
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	1	1	1	1	1	1	2	2	2	1	1	1
Cap, veh/h	498	194	208	253	139	66	480	646	35	494	518	62
Arrive On Green	0.24	0.24	0.24	0.24	0.24	0.24	0.11	0.37	0.37	0.05	0.32	0.32
Sat Flow, veh/h	1283	817	876	497	584	276	1781	1754	96	1795	1645	197
Grp Volume(v), veh/h	102	0	143	216	0	0	165	0	366	49	0	420
Grp Sat Flow(s),veh/h/ln	1283	0	1693	1357	0	0	1781	0	1850	1795	0	1843
Q Serve(g_s), s	0.0	0.0	2.8	3.2	0.0	0.0	2.3	0.0	6.2	0.7	0.0	8.0
Cycle Q Clear(g_c), s	2.5	0.0	2.8	6.0	0.0	0.0	2.3	0.0	6.2	0.7	0.0	8.0
Prop In Lane	1.00		0.52	0.48		0.20	1.00		0.05	1.00		0.11
Lane Grp Cap(c), veh/h	498	0	402	457	0	0	480	0	681	494	0	581
V/C Ratio(X)	0.21	0.00	0.36	0.47	0.00	0.00	0.34	0.00	0.54	0.10	0.00	0.72
Avail Cap(c_a), veh/h	794	0	793	795	0	0	539	0	1072	631	0	1049
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	0.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	12.4	0.0	12.5	13.8	0.0	0.0	8.3	0.0	9.8	8.3	0.0	12.0
Incr Delay (d2), s/veh	0.2	0.0	0.5	0.8	0.0	0.0	0.4	0.0	0.7	0.1	0.0	1.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.7	0.0	1.0	1.6	0.0	0.0	0.7	0.0	2.1	0.2	0.0	2.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	12.6	0.0	13.1	14.5	0.0	0.0	8.7	0.0	10.5	8.4	0.0	13.7
LnGrp LOS	B	A	B	B	A	A	A	A	B	A	A	B
Approach Vol, veh/h		245			216			531				469
Approach Delay, s/veh		12.9			14.5			9.9				13.2
Approach LOS		B			B			A				B
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	6.6	19.1		13.9	8.7	17.0		13.9				
Change Period (Y+Rc), s	4.5	4.5		4.5	4.5	4.5		4.5				
Max Green Setting (Gmax), s	5.1	22.9		18.5	5.5	22.5		18.5				
Max Q Clear Time (g_c+I1), s	2.7	8.2		4.8	4.3	10.0		8.0				
Green Ext Time (p_c), s	0.0	2.0		1.0	0.1	2.2		0.9				
Intersection Summary												
HCM 6th Ctrl Delay				12.2								
HCM 6th LOS				B								

HCM 6th AWSC
1: N Deborah Road & Haworth Avenue

05/03/2022

Intersection	
Intersection Delay, s/veh	16.2
Intersection LOS	C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	102	154	9	16	129	84	8	114	24	142	69	86
Future Vol, veh/h	102	154	9	16	129	84	8	114	24	142	69	86
Peak Hour Factor	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84
Heavy Vehicles, %	3	3	3	2	2	2	8	8	8	7	7	7
Mvmt Flow	121	183	11	19	154	100	10	136	29	169	82	102
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	16.9	14.5	12.8	18.5
HCM LOS	C	B	B	C

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	5%	38%	7%	48%
Vol Thru, %	78%	58%	56%	23%
Vol Right, %	16%	3%	37%	29%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	146	265	229	297
LT Vol	8	102	16	142
Through Vol	114	154	129	69
RT Vol	24	9	84	86
Lane Flow Rate	174	315	273	354
Geometry Grp	1	1	1	1
Degree of Util (X)	0.32	0.553	0.465	0.608
Departure Headway (Hd)	6.629	6.306	6.141	6.194
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	541	571	586	580
Service Time	4.693	4.357	4.196	4.247
HCM Lane V/C Ratio	0.322	0.552	0.466	0.61
HCM Control Delay	12.8	16.9	14.5	18.5
HCM Lane LOS	B	C	B	C
HCM 95th-tile Q	1.4	3.4	2.5	4.1

HCM 6th TWSC
2: Site Access & Haworth Avenue

05/03/2022

Intersection						
Int Delay, s/veh	0.2					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	370	1	2	239	1	8
Future Vol, veh/h	370	1	2	239	1	8
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	402	1	2	260	1	9

Major/Minor	Major1	Major2	Minor1	Minor2	Minor3
Conflicting Flow All	0	0	403	0	667
Stage 1	-	-	-	-	403
Stage 2	-	-	-	-	264
Critical Hdwy	-	-	4.12	-	6.42
Critical Hdwy Stg 1	-	-	-	-	5.42
Critical Hdwy Stg 2	-	-	-	-	5.42
Follow-up Hdwy	-	-	2.218	-	3.518
Pot Cap-1 Maneuver	-	-	1156	-	424
Stage 1	-	-	-	-	675
Stage 2	-	-	-	-	780
Platoon blocked, %	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	1156	-	423
Mov Cap-2 Maneuver	-	-	-	-	423
Stage 1	-	-	-	-	675
Stage 2	-	-	-	-	778

Approach	EB	WB	NB
HCM Control Delay, s	0	0.1	11
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	611	-	-	1156	-
HCM Lane V/C Ratio	0.016	-	-	0.002	-
HCM Control Delay (s)	11	-	-	8.1	0
HCM Lane LOS	B	-	-	A	A
HCM 95th %tile Q(veh)	0	-	-	0	-

HCM 6th AWSC
3: N Springbrook Road & Haworth Avenue

05/03/2022

Intersection	
Intersection Delay, s/veh	39.5
Intersection LOS	E

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔	↔		↔		↔	↔		↔	↔	
Traffic Vol, veh/h	76	29	273	39	17	12	119	324	7	30	378	105
Future Vol, veh/h	76	29	273	39	17	12	119	324	7	30	378	105
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Heavy Vehicles, %	2	2	2	2	2	2	7	7	7	6	6	6
Mvmt Flow	82	31	294	42	18	13	128	348	8	32	406	113
Number of Lanes	0	1	1	0	1	0	1	1	0	1	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	2	2	2
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	2	2	2	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	2	2	1	2
HCM Control Delay	17.8	14.3	23.9	72.6
HCM LOS	C	B	C	F

Lane	NBLn1	NBLn2	EBLn1	EBLn2	WBLn1	SBLn1	SBLn2
Vol Left, %	100%	0%	72%	0%	57%	100%	0%
Vol Thru, %	0%	98%	28%	0%	25%	0%	78%
Vol Right, %	0%	2%	0%	100%	18%	0%	22%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	119	331	105	273	68	30	483
LT Vol	119	0	76	0	39	30	0
Through Vol	0	324	29	0	17	0	378
RT Vol	0	7	0	273	12	0	105
Lane Flow Rate	128	356	113	294	73	32	519
Geometry Grp	7	7	7	7	6	7	7
Degree of Util (X)	0.279	0.723	0.255	0.575	0.181	0.07	1.036
Departure Headway (Hd)	8.059	7.529	8.358	7.263	9.246	7.848	7.179
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	449	484	432	499	390	459	509
Service Time	5.759	5.229	6.058	4.963	7.246	5.548	4.879
HCM Lane V/C Ratio	0.285	0.736	0.262	0.589	0.187	0.07	1.02
HCM Control Delay	13.8	27.5	13.9	19.3	14.3	11.1	76.4
HCM Lane LOS	B	D	B	C	B	B	F
HCM 95th-tile Q	1.1	5.8	1	3.6	0.7	0.2	15.1

HCM 6th Signalized Intersection Summary

4: N Springbrook Road & OR-99W

05/03/2022



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	66	1110	80	284	666	212	169	188	421	403	142	89
Future Volume (veh/h)	66	1110	80	284	666	212	169	188	421	403	142	89
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.99	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1695	1695	1695	1614	1614	1614	1668	1668	1668	1695	1695	1695
Adj Flow Rate, veh/h	72	1207	0	309	724	0	184	204	404	438	154	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	4	4	4	10	10	10	6	6	6	4	4	4
Cap, veh/h	90	1305		371	1453		241	284	415	490	422	357
Arrive On Green	0.06	0.41	0.00	0.12	0.47	0.00	0.08	0.17	0.17	0.16	0.25	0.00
Sat Flow, veh/h	1615	3221	1437	2981	3066	1367	3082	1668	1404	3132	1695	1437
Grp Volume(v), veh/h	72	1207	0	309	724	0	184	204	404	438	154	0
Grp Sat Flow(s),veh/h/ln	1615	1611	1437	1491	1533	1367	1541	1668	1404	1566	1695	1437
Q Serve(g_s), s	4.9	39.7	0.0	11.3	18.1	0.0	6.5	12.9	19.0	15.3	8.4	0.0
Cycle Q Clear(g_c), s	4.9	39.7	0.0	11.3	18.1	0.0	6.5	12.9	19.0	15.3	8.4	0.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	90	1305		371	1453		241	284	415	490	422	357
V/C Ratio(X)	0.80	0.92		0.83	0.50		0.76	0.72	0.97	0.89	0.37	0.00
Avail Cap(c_a), veh/h	165	1358		535	1529		354	284	415	506	422	357
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	52.0	31.5	0.0	47.7	20.2	0.0	50.4	43.7	38.9	46.1	34.6	0.0
Incr Delay (d2), s/veh	14.9	10.7	0.0	7.4	0.3	0.0	5.7	8.4	36.9	17.9	0.5	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.3	16.7	0.0	4.5	6.3	0.0	2.7	5.9	14.9	7.2	3.6	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	66.9	42.2	0.0	55.0	20.5	0.0	56.1	52.1	75.8	64.0	35.1	0.0
LnGrp LOS	E	D		E	C		E	D	E	E	D	A
Approach Vol, veh/h		1279	A		1033	A		792			592	
Approach Delay, s/veh		43.6			30.8			65.1			56.5	
Approach LOS		D			C			E			E	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	21.4	23.0	17.9	49.2	12.7	31.7	10.2	56.8				
Change Period (Y+Rc), s	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0				
Max Green Setting (Gmax), s	13.0	19.0	20.0	47.0	12.8	24.2	11.4	55.6				
Max Q Clear Time (g_c+11), s	11.3	21.0	13.3	41.7	8.5	10.4	6.9	20.1				
Green Ext Time (p_c), s	0.1	0.0	0.6	3.4	0.2	0.6	0.0	5.6				

Intersection Summary

HCM 6th Ctrl Delay	46.7
HCM 6th LOS	D

Notes

Unsignalized Delay for [EBR, WBR] is excluded from calculations of the approach delay and intersection delay.

HCM 6th Signalized Intersection Summary

3: N Springbrook Road & Haworth Avenue

05/03/2022



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	76	29	273	39	17	12	119	324	7	30	378	105
Future Volume (veh/h)	76	29	273	39	17	12	119	324	7	30	378	105
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	0.98		0.98	0.99		0.98	1.00		0.99	0.99		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1796	1796	1796	1811	1811	1811
Adj Flow Rate, veh/h	82	31	72	42	18	3	128	348	7	32	406	98
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	2	2	2	2	2	2	7	7	7	6	6	6
Cap, veh/h	411	69	159	240	78	8	493	801	16	578	556	134
Arrive On Green	0.14	0.14	0.14	0.14	0.14	0.14	0.10	0.46	0.46	0.04	0.40	0.40
Sat Flow, veh/h	1369	492	1143	552	559	56	1711	1754	35	1725	1406	339
Grp Volume(v), veh/h	82	0	103	63	0	0	128	0	355	32	0	504
Grp Sat Flow(s),veh/h/ln	1369	0	1635	1166	0	0	1711	0	1789	1725	0	1745
Q Serve(g_s), s	0.0	0.0	2.1	0.3	0.0	0.0	1.5	0.0	5.0	0.4	0.0	9.1
Cycle Q Clear(g_c), s	1.6	0.0	2.1	2.4	0.0	0.0	1.5	0.0	5.0	0.4	0.0	9.1
Prop In Lane	1.00		0.70	0.67		0.05	1.00		0.02	1.00		0.19
Lane Grp Cap(c), veh/h	411	0	228	325	0	0	493	0	817	578	0	690
V/C Ratio(X)	0.20	0.00	0.45	0.19	0.00	0.00	0.26	0.00	0.43	0.06	0.00	0.73
Avail Cap(c_a), veh/h	722	0	599	646	0	0	616	0	1354	751	0	1263
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	0.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	14.3	0.0	14.6	14.3	0.0	0.0	6.4	0.0	6.8	6.1	0.0	9.5
Incr Delay (d2), s/veh	0.2	0.0	1.4	0.3	0.0	0.0	0.3	0.0	0.4	0.0	0.0	1.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.6	0.0	0.8	0.4	0.0	0.0	0.4	0.0	1.4	0.1	0.0	2.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	14.6	0.0	16.0	14.6	0.0	0.0	6.7	0.0	7.2	6.2	0.0	11.0
LnGrp LOS	B	A	B	B	A	A	A	A	A	A	A	B
Approach Vol, veh/h		185			63			483				536
Approach Delay, s/veh		15.3			14.6			7.0				10.7
Approach LOS		B			B			A				B
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	5.9	21.3		9.6	8.2	19.1		9.6				
Change Period (Y+Rc), s	4.5	4.5		4.5	4.5	4.5		4.5				
Max Green Setting (Gmax), s	5.1	27.9		13.5	6.3	26.7		13.5				
Max Q Clear Time (g_c+I1), s	2.4	7.0		4.1	3.5	11.1		4.4				
Green Ext Time (p_c), s	0.0	2.2		0.5	0.1	3.1		0.1				

Intersection Summary

HCM 6th Ctrl Delay	10.2
HCM 6th LOS	B

Notes

User approved pedestrian interval to be less than phase max green.

HCM 6th AWSC
1: N Deborah Road & Haworth Avenue

05/03/2022

Intersection	
Intersection Delay, s/veh	13
Intersection LOS	B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	46	227	23	23	204	41	15	30	31	81	59	56
Future Vol, veh/h	46	227	23	23	204	41	15	30	31	81	59	56
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
Heavy Vehicles, %	1	1	1	2	2	2	6	6	6	5	5	5
Mvmt Flow	54	267	27	27	240	48	18	35	36	95	69	66
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	14.1	13.1	10.2	12.4
HCM LOS	B	B	B	B

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	20%	16%	9%	41%
Vol Thru, %	39%	77%	76%	30%
Vol Right, %	41%	8%	15%	29%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	76	296	268	196
LT Vol	15	46	23	81
Through Vol	30	227	204	59
RT Vol	31	23	41	56
Lane Flow Rate	89	348	315	231
Geometry Grp	1	1	1	1
Degree of Util (X)	0.15	0.519	0.47	0.373
Departure Headway (Hd)	6.048	5.363	5.372	5.831
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	589	672	668	616
Service Time	4.123	3.412	3.424	3.891
HCM Lane V/C Ratio	0.151	0.518	0.472	0.375
HCM Control Delay	10.2	14.1	13.1	12.4
HCM Lane LOS	B	B	B	B
HCM 95th-tile Q	0.5	3	2.5	1.7

HCM 6th TWSC
2: Site Access & Haworth Avenue

05/03/2022

Intersection						
Int Delay, s/veh	0.2					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	393	1	8	289	1	5
Future Vol, veh/h	393	1	8	289	1	5
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	427	1	9	314	1	5

Major/Minor	Major1	Major2	Minor1		
Conflicting Flow All	0	0	428	0	760
Stage 1	-	-	-	-	428
Stage 2	-	-	-	-	332
Critical Hdwy	-	-	4.12	-	6.42
Critical Hdwy Stg 1	-	-	-	-	5.42
Critical Hdwy Stg 2	-	-	-	-	5.42
Follow-up Hdwy	-	-	2.218	-	3.518
Pot Cap-1 Maneuver	-	-	1131	-	374
Stage 1	-	-	-	-	657
Stage 2	-	-	-	-	727
Platoon blocked, %	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	1131	-	370
Mov Cap-2 Maneuver	-	-	-	-	370
Stage 1	-	-	-	-	657
Stage 2	-	-	-	-	720

Approach	EB	WB	NB
HCM Control Delay, s	0	0.2	11.5
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	562	-	-	1131	-
HCM Lane V/C Ratio	0.012	-	-	0.008	-
HCM Control Delay (s)	11.5	-	-	8.2	0
HCM Lane LOS	B	-	-	A	A
HCM 95th %tile Q(veh)	0	-	-	0	-

HCM 6th AWSC
 3: N Springbrook Road & Haworth Avenue

05/03/2022

Intersection	
Intersection Delay, s/veh	57.8
Intersection LOS	F

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕	↕		↕		↕	↕		↕	↕	
Traffic Vol, veh/h	106	72	220	109	71	69	172	364	23	51	392	54
Future Vol, veh/h	106	72	220	109	71	69	172	364	23	51	392	54
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles, %	1	1	1	1	1	1	2	2	2	1	1	1
Mvmt Flow	112	76	232	115	75	73	181	383	24	54	413	57
Number of Lanes	0	1	1	0	1	0	1	1	0	1	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	2	2	2
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	2	2	2	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	2	2	1	2
HCM Control Delay	21.3	31.8	52.7	105.8
HCM LOS	C	D	F	F

Lane	NBLn1	NBLn2	EBLn1	EBLn2	WBLn1	SBLn1	SBLn2
Vol Left, %	100%	0%	60%	0%	44%	100%	0%
Vol Thru, %	0%	94%	40%	0%	29%	0%	88%
Vol Right, %	0%	6%	0%	100%	28%	0%	12%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	172	387	178	220	249	51	446
LT Vol	172	0	106	0	109	51	0
Through Vol	0	364	72	0	71	0	392
RT Vol	0	23	0	220	69	0	54
Lane Flow Rate	181	407	187	232	262	54	469
Geometry Grp	7	7	7	7	6	7	7
Degree of Util (X)	0.458	0.968	0.484	0.538	0.681	0.139	1.138
Departure Headway (Hd)	9.513	8.946	9.821	8.776	9.966	9.334	8.724
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	382	407	369	415	364	385	418
Service Time	7.213	6.646	7.521	6.476	7.966	7.06	6.449
HCM Lane V/C Ratio	0.474	1	0.507	0.559	0.72	0.14	1.122
HCM Control Delay	20	67.3	21.4	21.2	31.8	13.6	116.3
HCM Lane LOS	C	F	C	C	D	B	F
HCM 95th-tile Q	2.3	11.3	2.5	3.1	4.8	0.5	17.3

HCM 6th Signalized Intersection Summary
 4: N Springbrook Road & OR-99W

05/03/2022



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	121	939	140	618	1388	272	306	209	344	351	200	114
Future Volume (veh/h)	121	939	140	618	1388	272	306	209	344	351	200	114
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.99	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No		No		No		No		No		No
Adj Sat Flow, veh/h/ln	1709	1709	1709	1709	1709	1709	1709	1709	1709	1723	1723	1723
Adj Flow Rate, veh/h	126	978	0	644	1446	0	319	218	332	366	208	21
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
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	2	2	2
Cap, veh/h	150	1126		699	1545		369	279	555	418	306	257
Arrive On Green	0.09	0.35	0.00	0.22	0.48	0.00	0.12	0.16	0.16	0.13	0.18	0.18
Sat Flow, veh/h	1628	3247	1448	3158	3247	1448	3158	1709	1435	3183	1723	1448
Grp Volume(v), veh/h	126	978	0	644	1446	0	319	218	332	366	208	21
Grp Sat Flow(s),veh/h/ln	1628	1624	1448	1579	1624	1448	1579	1709	1435	1591	1723	1448
Q Serve(g_s), s	8.9	32.8	0.0	23.2	49.0	0.0	11.5	14.2	19.0	13.1	13.1	1.4
Cycle Q Clear(g_c), s	8.9	32.8	0.0	23.2	49.0	0.0	11.5	14.2	19.0	13.1	13.1	1.4
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	150	1126		699	1545		369	279	555	418	306	257
V/C Ratio(X)	0.84	0.87		0.92	0.94		0.86	0.78	0.60	0.88	0.68	0.08
Avail Cap(c_a), veh/h	168	1172		733	1591		380	279	555	438	311	261
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	52.0	35.5	0.0	44.3	28.8	0.0	50.5	46.7	28.7	49.6	44.7	39.9
Incr Delay (d2), s/veh	27.9	7.0	0.0	16.7	10.6	0.0	17.9	13.3	1.8	17.3	5.8	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.7	13.7	0.0	10.5	20.3	0.0	5.4	7.0	7.5	6.3	6.1	0.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	79.8	42.5	0.0	61.0	39.4	0.0	68.4	60.0	30.4	66.9	50.5	40.1
LnGrp LOS	E	D		E	D		E	E	C	E	D	D
Approach Vol, veh/h		1104	A		2090	A		869			595	
Approach Delay, s/veh		46.8			46.1			51.8			60.2	
Approach LOS		D			D			D			E	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	19.3	23.0	29.7	44.3	17.6	24.7	14.7	59.4				
Change Period (Y+Rc), s	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0				
Max Green Setting (Gmax), s	16.0	19.0	27.0	42.0	14.0	21.0	12.0	57.0				
Max Q Clear Time (g_c+1/3), s	11.0	21.0	25.2	34.8	13.5	15.1	10.9	51.0				
Green Ext Time (p_c), s	0.1	0.0	0.5	3.7	0.1	0.6	0.0	4.4				

Intersection Summary

HCM 6th Ctrl Delay	49.1
HCM 6th LOS	D

Notes

Unsignalized Delay for [EBR, WBR] is excluded from calculations of the approach delay and intersection delay.

HCM 6th Signalized Intersection Summary

3: N Springbrook Road & Haworth Avenue

05/03/2022



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	106	72	220	109	71	69	172	364	23	51	392	54
Future Volume (veh/h)	106	72	220	109	71	69	172	364	23	51	392	54
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	0.99		0.97	0.99		0.99	1.00		0.97	1.00		0.97
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1885	1885	1885	1885	1885	1885	1870	1870	1870	1885	1885	1885
Adj Flow Rate, veh/h	112	76	81	115	75	51	181	383	21	54	413	50
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	1	1	1	1	1	1	2	2	2	1	1	1
Cap, veh/h	504	211	225	259	146	73	476	679	37	493	552	67
Arrive On Green	0.26	0.26	0.26	0.26	0.26	0.26	0.11	0.39	0.39	0.06	0.34	0.34
Sat Flow, veh/h	1268	820	874	491	566	284	1781	1754	96	1795	1644	199
Grp Volume(v), veh/h	112	0	157	241	0	0	181	0	404	54	0	463
Grp Sat Flow(s),veh/h/ln	1268	0	1695	1341	0	0	1781	0	1850	1795	0	1843
Q Serve(g_s), s	0.0	0.0	3.0	3.9	0.0	0.0	2.5	0.0	6.9	0.8	0.0	9.0
Cycle Q Clear(g_c), s	2.9	0.0	3.0	6.9	0.0	0.0	2.5	0.0	6.9	0.8	0.0	9.0
Prop In Lane	1.00		0.52	0.48		0.21	1.00		0.05	1.00		0.11
Lane Grp Cap(c), veh/h	504	0	437	478	0	0	476	0	717	493	0	619
V/C Ratio(X)	0.22	0.00	0.36	0.50	0.00	0.00	0.38	0.00	0.56	0.11	0.00	0.75
Avail Cap(c_a), veh/h	777	0	801	791	0	0	594	0	1077	643	0	1009
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	0.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	12.2	0.0	12.2	13.7	0.0	0.0	8.1	0.0	9.6	8.0	0.0	11.8
Incr Delay (d2), s/veh	0.2	0.0	0.5	0.8	0.0	0.0	0.5	0.0	0.7	0.1	0.0	1.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.7	0.0	1.0	1.8	0.0	0.0	0.8	0.0	2.3	0.2	0.0	3.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	12.4	0.0	12.7	14.5	0.0	0.0	8.6	0.0	10.3	8.1	0.0	13.7
LnGrp LOS	B	A	B	B	A	A	A	A	B	A	A	B
Approach Vol, veh/h		269			241			585				517
Approach Delay, s/veh		12.6			14.5			9.8				13.1
Approach LOS		B			B			A				B
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	6.3	19.6		14.4	8.3	17.5		14.4				
Change Period (Y+Rc), s	4.0	4.0		4.0	4.0	4.0		4.0				
Max Green Setting (Gmax), s	5.6	23.4		19.0	7.0	22.0		19.0				
Max Q Clear Time (g_c+I1), s	2.8	8.9		5.0	4.5	11.0		8.9				
Green Ext Time (p_c), s	0.0	2.3		1.1	0.1	2.3		1.0				
Intersection Summary												
HCM 6th Ctrl Delay				12.0								
HCM 6th LOS				B								

3. N Springbrook Road at Haworth Avenue

Right Turns on Red
 APM Section 13.4.2: RTOR
 Equation: $vRTOR = sRTOR * (r/C)$

AM Peak Hour													
	sRTOR				r				C	vRTOR			
	EBR	WBR	NBR	SBR	EBR	WBR	NBR	SBR		EBR	WBR	NBR	SBR
2022 Existing Conditions	-	-	-	-	-	-	-	-	60	#VALUE!	#VALUE!	#VALUE!	#VALUE!
2024 Background Conditions	259	12	2	27	37.4	37.4	32.2	32.6	60	161	7	1	15
2024 Buildout Conditions	267	12	2	27	37.4	37.4	32.2	32.6	60	166	7	1	15
2029 Future Conditions	294	13	3	30	42	42	27.6	28.8	60	206	9	1	14

Intersection v/c
 APM Section 13.4.4: Critical Intersection v/c ratio
 Method: Determine Critical Movements in HCM 2000 reports & CMA Method
 HCM 6th reports, determine adjusted and sat flow rates
 Adjust Flow/Sat Flow
 Sum up Crit Movement Flow Rates
 $X_c \text{ of intersection} = \text{sum}(\text{crit.move. Flow rates} * (C/(C-L)))$

AM Peak Hour														
	Critical Movement	Adjust Flow			Saturated Flow			Adj/Sat Flows			C	L	Xc	
		EBTR	NBL	SBTR	EBTR	NBL	SBTR	EBTR	NBL	SBTR				Sum
2024 Background Conditions		114	116	456	1621	1711	1746	0.070327	0.067797	0.261168	0.399292	60	12	0.50
2024 Buildout Conditions	EBTR	117	118	456	1620	1711	1746	0.072222	0.068966	0.261168	0.402356	60	12	0.50
2029 Future Conditions		103	128	504	1635	1711	1745	0.062997	0.07481	0.288825	0.426632	60	12	0.53

4. N Springbrook Road at OR-99W

Right Turns on Red
 APM Section 13.4.2: RTOR
 Equation: $vRTOR = sRTOR * (r/C)$

AM Peak Hour													
	sRTOR				r				C	vRTOR			
	EBR	WBR	NBR	SBR	EBR	WBR	NBR	SBR		EBR	WBR	NBR	SBR
2022 Existing Conditions	155	183	82	118	67	57.4	74.4	92.6	120	87	88	51	91
2024 Background Conditions	155	210	82	118	68	57.8	73	93.1	120	88	101	50	92
2024 Buildout Conditions	155	211	82	118	68	57.9	74	93.1	120	88	102	51	92
2029 Future Conditions	155	230	82	118	69	60.4	73	91.8	120	89	116	50	90

Intersection v/c
 APM Section 13.4.4: Critical Intersection v/c ratio
 Method: Determine Critical Movements in HCM 2000 reports & CMA Method
 HCM 6th reports, determine adjusted and sat flow rates
 Adjust Flow/Sat Flow
 Sum up Crit Movement Flow Rates
 $X_c \text{ of intersection} = \text{sum}(\text{crit.move. Flow rates} * (C/(C-L)))$

AM Peak Hour																				
	Critical Movement				Adjust Flow				Saturated Flow				Adj/Sat Flows				C	L	Xc	
	EBT	WBL	NBT	SBL	EBT	WBL	NBT	SBL	EBT	WBL	NBT	SBL	EBT	WBL	NBT	SBL				Sum
2022 Existing Conditions					1193	261	171	370	3221	2981	1668	3132	0.370382	0.087555	0.102518	0.118135	0.67859	120	16	0.78
2024 Background Conditions	EBT	WBL	NBT	SBL	1205	280	186	395	3221	2981	1668	3132	0.374107	0.093928	0.111511	0.126117	0.705664	120	16	0.81
2024 Buildout Conditions					1205	280	186	398	3221	2981	1668	3132	0.374107	0.093928	0.111511	0.127075	0.706622	120	16	0.82
2029 Future Conditions					1207	309	204	438	3221	2981	1668	3132	0.374728	0.103656	0.122302	0.139847	0.740534	120	16	0.85

3. N Springbrook Road at Haworth Avenue

Right Turns on Red
 APM Section 13.4.2: RTOR
 Equation: $vRTOR = sRTOR * (r/C)$

PM Peak Hour													
	sRTOR				r				C	vRTOR			
	EBR	WBR	NBR	SBR	EBR	WBR	NBR	SBR		EBR	WBR	NBR	SBR
2022 Existing Conditions	-	-	-	-	-	-	-	-	60	#VALUE!	#VALUE!	#VALUE!	#VALUE!
2024 Background Conditions	206	33	6	13	37	37	32.6	33	60	127	20	3	7
2024 Buildout Conditions	211	33	6	14	37	37	32.6	33	60	130	20	3	8
2029 Future Conditions	232	34	6	13	37	37	32.6	34	60	143	21	3	7

Intersection v/c
 APM Section 13.4.4: Critical Intersection v/c ratio
 Method: Determine Critical Movements in HCM 2000 reports & CMA Method
 HCM 6th reports, determine adjusted and sat flow rates
 Adjust Flow/Sat Flow
 Sum up Crit Movement Flow Rates
 $X_c \text{ of intersection} = \text{sum}(\text{crit.move. Flow rates} * (C/(C-L)))$

PM Peak Hour														
	Critical Movement	Adjust Flow			Saturated Flow			Adj/Sat Flows				C	L	Xc
		WBLTR	NBL	SBTR	WBLTR	NBL	SBTR	WBLTR	NBL	SBTR	Sum			
2024 Background Conditions		216	158	420	1364	1781	1842	0.158358	0.088714	0.228013	0.475085	60	12	0.59
2024 Buildout Conditions	WBLTR NBL SBTR	216	165	420	1357	1781	1842	0.159175	0.092645	0.228013	0.479832	60	12	0.60
2029 Future Conditions		241	181	463	1341	1781	1843	0.179717	0.101628	0.251221	0.532566	60	12	0.67

4. N Springbrook Road at OR-99W

Right Turns on Red

APM Section 13.4.2: RTOR

Equation: $vRTOR = sRTOR * (r/C)$

PM Peak Hour														
	sRTOR				EBR	r				C	vRTOR			
	EBR	WBR	NBR	SBR		WBR	NBR	SBR	EBR		WBR	NBR	SBR	
2022 Existing Conditions	127	235	45	118	72	58	67	95	120	76	114	25	93	
2024 Background Conditions	132	254	45	118	72.6	58	67.2	96.1	120	80	123	25	94	
2024 Buildout Conditions	132	257	45	118	72.2	58	67.6	96.5	120	79	124	25	95	
2029 Future Conditions	146	283	45	119	74	59	66	95	120	90	139	25	94	

Intersection v/c

APM Section 13.4.4: Critical Intersection v/c ratio

Method: Determine Critical Movements in HCM 2000 reports & CMA Method
 HCM 6th reports, determine adjusted and sat flow rates
 Adjust Flow/Sat Flow
 Sum up Crit Movement Flow Rates
 $X_c \text{ of intersection} = \text{sum}(\text{crit.move. Flow rates} * (C/(C-L)))$

PM Peak Hour																				
	Critical Movement				Adjust Flow				Saturated Flow				Adj/Sat Flows				Sum	C	L	Xc
	EBL	WBT	NBT	SBL	EBL	WBT	NBT	SBL	EBL	WBT	NBT	SBL	EBL	WBT	NBT	SBL				
2022 Existing Conditions					104	1424	185	302	1628	3247	1709	3183	0.063882	0.438559	0.10825	0.094879	0.70557	120	16	0.81
2024 Background Conditions					111	1445	197	331	1628	3247	1709	3183	0.068182	0.445026	0.115272	0.10399	0.73247	120	16	0.85
2024 Buildout Conditions	EBL	WBT	NBT	SBL	115	1445	198	333	1628	3247	1709	3183	0.070639	0.445026	0.115857	0.104618	0.736141	120	16	0.85
2029 Future Conditions					126	1446	218	366	1628	3247	1709	3183	0.077396	0.445334	0.12756	0.114986	0.765276	120	16	0.88

Intersection: 1: N Deborah Road & Haworth Avenue

Movement	EB	WB	NB	SB
Directions Served	LTR	LTR	LTR	LTR
Maximum Queue (ft)	114	91	90	128
Average Queue (ft)	55	43	46	64
95th Queue (ft)	90	72	76	103
Link Distance (ft)	719	674	772	717
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 3: N Springbrook Road & Haworth Avenue

Movement	EB	EB	WB	NB	NB	SB	SB
Directions Served	LT	R	LTR	L	TR	L	TR
Maximum Queue (ft)	68	94	63	84	150	48	220
Average Queue (ft)	34	53	29	35	68	15	100
95th Queue (ft)	55	83	55	66	119	44	176
Link Distance (ft)		674	363		454		722
Upstream Blk Time (%)							
Queuing Penalty (veh)							
Storage Bay Dist (ft)	150			140		100	
Storage Blk Time (%)				0	0		10
Queuing Penalty (veh)				0	0		2

Queuing and Blocking Report
 2022 Existing Conditions - AM Peak Hour

05/03/2022

Intersection: 4: N Springbrook Road & 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)	143	442	419	45	211	244	242	218	155	205	235	294
Average Queue (ft)	38	279	257	2	74	136	129	105	28	100	101	147
95th Queue (ft)	102	405	393	45	182	213	213	190	112	173	193	258
Link Distance (ft)		1106	1106				817	817				358
Upstream Blk Time (%)										0	0	0
Queuing Penalty (veh)										0	0	0
Storage Bay Dist (ft)	400			350	500	500			300	300		300
Storage Blk Time (%)		1	2									1
Queuing Penalty (veh)		1	1									2

Intersection: 4: N Springbrook Road & OR-99W

Movement	SB	SB	SB	SB
Directions Served	L	L	T	R
Maximum Queue (ft)	189	202	163	74
Average Queue (ft)	107	125	73	25
95th Queue (ft)	168	185	137	54
Link Distance (ft)			454	
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)	220	220		125
Storage Blk Time (%)	0	0	3	
Queuing Penalty (veh)	0	0	11	

Network Summary

Network wide Queuing Penalty: 18

Queuing and Blocking Report
 2022 Existing Conditions - PM Peak Hour

05/03/2022

Intersection: 1: N Deborah Road & Haworth Avenue

Movement	EB	WB	NB	SB
Directions Served	LTR	LTR	LTR	LTR
Maximum Queue (ft)	103	84	71	101
Average Queue (ft)	53	45	34	49
95th Queue (ft)	85	71	61	81
Link Distance (ft)	719	674	772	717
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 3: N Springbrook Road & Haworth Avenue

Movement	EB	EB	WB	NB	NB	SB	SB
Directions Served	LT	R	LTR	L	TR	L	TR
Maximum Queue (ft)	97	99	129	135	202	156	278
Average Queue (ft)	49	51	65	47	88	33	114
95th Queue (ft)	81	83	107	93	160	97	217
Link Distance (ft)		674	363		454		722
Upstream Blk Time (%)							
Queuing Penalty (veh)							
Storage Bay Dist (ft)	150			140		100	
Storage Blk Time (%)				0	2		19
Queuing Penalty (veh)				0	3		8

Queuing and Blocking Report
 2022 Existing Conditions - PM Peak Hour

05/03/2022

Intersection: 4: N Springbrook Road & 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)	179	369	349	44	321	401	509	535	335	232	287	247
Average Queue (ft)	84	242	220	2	186	236	306	306	27	111	173	111
95th Queue (ft)	156	337	315	44	285	349	460	462	199	230	258	204
Link Distance (ft)		1106	1106				817	817				358
Upstream Blk Time (%)								0				0
Queuing Penalty (veh)								0				0
Storage Bay Dist (ft)	400			350	500	500			350	300	300	
Storage Blk Time (%)		0	0				1	4		0	0	0
Queuing Penalty (veh)		0	0				3	10		0	1	0

Intersection: 4: N Springbrook Road & OR-99W

Movement	NB	SB	SB	SB	SB
Directions Served	R	L	L	T	R
Maximum Queue (ft)	259	180	204	217	150
Average Queue (ft)	98	90	111	113	48
95th Queue (ft)	196	148	169	188	104
Link Distance (ft)				454	
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (ft)	300	220	220		125
Storage Blk Time (%)	0	0	0	9	0
Queuing Penalty (veh)	1	0	0	33	1

Network Summary

Network wide Queuing Penalty: 61

Queuing and Blocking Report
 2024 Background Conditions - AM Peak Hour

05/03/2022

Intersection: 1: N Deborah Road & Haworth Avenue

Movement	EB	WB	NB	SB
Directions Served	LTR	LTR	LTR	LTR
Maximum Queue (ft)	126	86	100	132
Average Queue (ft)	58	46	48	66
95th Queue (ft)	94	74	83	105
Link Distance (ft)	719	674	772	717
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 3: N Springbrook Road & Haworth Avenue

Movement	EB	EB	WB	NB	NB	SB	SB
Directions Served	LT	R	LTR	L	TR	L	TR
Maximum Queue (ft)	71	109	63	83	156	96	268
Average Queue (ft)	35	58	30	36	73	22	112
95th Queue (ft)	58	91	57	67	127	70	206
Link Distance (ft)		674	363		454		722
Upstream Blk Time (%)							
Queuing Penalty (veh)							
Storage Bay Dist (ft)	150			140		100	
Storage Blk Time (%)		0			1		14
Queuing Penalty (veh)		0			1		4

Queuing and Blocking Report
 2024 Background Conditions - AM Peak Hour

05/03/2022

Intersection: 4: N Springbrook Road & 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)	96	463	434	90	202	227	239	228	158	257	304	338
Average Queue (ft)	37	298	271	6	76	139	141	115	27	103	123	178
95th Queue (ft)	79	429	404	93	183	215	224	201	113	193	249	312
Link Distance (ft)		1106	1106				817	817				358
Upstream Blk Time (%)										0	1	0
Queuing Penalty (veh)										0	0	0
Storage Bay Dist (ft)	400			350	500	500			300	300		300
Storage Blk Time (%)		2	2							0	0	2
Queuing Penalty (veh)		1	2							0	2	8

Intersection: 4: N Springbrook Road & OR-99W

Movement	SB	SB	SB	SB
Directions Served	L	L	T	R
Maximum Queue (ft)	222	227	164	101
Average Queue (ft)	120	135	81	30
95th Queue (ft)	191	203	144	68
Link Distance (ft)			454	
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)	220	220		125
Storage Blk Time (%)	0	0	3	
Queuing Penalty (veh)	0	1	12	

Network Summary

Network wide Queuing Penalty: 31

Queuing and Blocking Report
 2024 Background Conditions w/ Mitigation - AM Peak Hour

05/03/2022

Intersection: 3: N Springbrook Road & Haworth Avenue

Movement	EB	EB	WB	NB	NB	SB	SB
Directions Served	L	TR	LTR	L	TR	L	TR
Maximum Queue (ft)	84	140	84	109	200	106	255
Average Queue (ft)	38	68	32	50	90	20	120
95th Queue (ft)	70	117	66	91	171	70	210
Link Distance (ft)		675	363		460		716
Upstream Blk Time (%)							
Queuing Penalty (veh)							
Storage Bay Dist (ft)	150			140		100	
Storage Blk Time (%)		0		0	2	0	10
Queuing Penalty (veh)		0		0	2	0	3

Queuing and Blocking Report
 2024 Background Conditions - PM Peak Hour

05/03/2022

Intersection: 1: N Deborah Road & Haworth Avenue

Movement	EB	WB	NB	SB
Directions Served	LTR	LTR	LTR	LTR
Maximum Queue (ft)	107	90	73	99
Average Queue (ft)	54	46	34	50
95th Queue (ft)	84	73	61	81
Link Distance (ft)	719	674	772	717
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 3: N Springbrook Road & Haworth Avenue

Movement	EB	EB	WB	NB	NB	SB	SB
Directions Served	LT	R	LTR	L	TR	L	TR
Maximum Queue (ft)	95	112	143	145	228	185	436
Average Queue (ft)	50	53	69	49	110	61	193
95th Queue (ft)	83	85	116	100	198	178	408
Link Distance (ft)		674	363		454		722
Upstream Blk Time (%)							
Queuing Penalty (veh)							
Storage Bay Dist (ft)	150			140		100	
Storage Blk Time (%)	0	0		0	6		45
Queuing Penalty (veh)	0	0		0	9		21

Queuing and Blocking Report
 2024 Background Conditions - PM Peak Hour

05/03/2022

Intersection: 4: N Springbrook Road & OR-99W

Movement	EB	EB	EB	WB	WB	WB	WB	WB	NB	NB	NB	NB
Directions Served	L	T	T	L	L	T	T	R	L	L	T	R
Maximum Queue (ft)	184	405	382	332	428	495	491	314	251	294	242	267
Average Queue (ft)	78	262	245	196	244	303	300	27	134	184	126	114
95th Queue (ft)	149	365	347	295	350	444	444	199	238	264	219	215
Link Distance (ft)		1106	1106			817	817					358
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	400			500	500			350	300	300		300
Storage Blk Time (%)		0	1			0	4		0	0	0	0
Queuing Penalty (veh)		0	1			2	10		0	1	1	0

Intersection: 4: N Springbrook Road & OR-99W

Movement	SB	SB	SB	SB
Directions Served	L	L	T	R
Maximum Queue (ft)	186	193	209	178
Average Queue (ft)	105	124	114	54
95th Queue (ft)	159	175	188	120
Link Distance (ft)			454	
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)	220	220		125
Storage Blk Time (%)	0	0	10	0
Queuing Penalty (veh)	0	0	42	2

Network Summary

Network wide Queuing Penalty: 89

Queuing and Blocking Report
 2024 Background Conditions w/ Mitigation - PM Peak Hour

05/03/2022

Intersection: 3: N Springbrook Road & Haworth Avenue

Movement	EB	EB	WB	NB	NB	SB	SB
Directions Served	L	TR	LTR	L	TR	L	TR
Maximum Queue (ft)	113	137	212	178	230	119	224
Average Queue (ft)	46	68	91	65	106	28	116
95th Queue (ft)	84	113	168	124	189	72	195
Link Distance (ft)		675	363		460		716
Upstream Blk Time (%)							
Queuing Penalty (veh)							
Storage Bay Dist (ft)	150			140		100	
Storage Blk Time (%)	0	0		0	3		11
Queuing Penalty (veh)	0	0		0	4		5

Queuing and Blocking Report
 2024 Buildout Conditions - AM Peak Hour

05/03/2022

Intersection: 1: N Deborah Road & Haworth Avenue

Movement	EB	WB	NB	SB
Directions Served	LTR	LTR	LTR	LTR
Maximum Queue (ft)	114	82	99	140
Average Queue (ft)	58	45	49	66
95th Queue (ft)	93	71	83	111
Link Distance (ft)	719	328	778	723
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 2: Site Access & Haworth Avenue

Movement	WB	NB
Directions Served	LT	LR
Maximum Queue (ft)	9	33
Average Queue (ft)	0	8
95th Queue (ft)	5	30
Link Distance (ft)	290	267
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 3: N Springbrook Road & Haworth Avenue

Movement	EB	EB	WB	NB	NB	SB	SB
Directions Served	LT	R	LTR	L	TR	L	TR
Maximum Queue (ft)	70	120	63	82	162	133	337
Average Queue (ft)	37	59	32	37	74	25	129
95th Queue (ft)	61	97	57	65	131	89	257
Link Distance (ft)		290	363		454		722
Upstream Blk Time (%)							
Queuing Penalty (veh)							
Storage Bay Dist (ft)	150			140		100	
Storage Blk Time (%)		0			1	0	20
Queuing Penalty (veh)		0			1	0	6

Queuing and Blocking Report
 2024 Buildout Conditions - AM Peak Hour

05/03/2022

Intersection: 4: N Springbrook Road & 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)	195	489	466	45	228	260	274	244	164	264	340	342
Average Queue (ft)	43	295	269	6	90	144	143	114	29	111	135	192
95th Queue (ft)	122	443	413	93	206	231	228	206	116	213	288	338
Link Distance (ft)		1106	1106				817	817				358
Upstream Blk Time (%)										0	2	1
Queuing Penalty (veh)										0	0	0
Storage Bay Dist (ft)	400			350	500	500			300	300		300
Storage Blk Time (%)		2	3								0	5
Queuing Penalty (veh)		1	2								1	18

Intersection: 4: N Springbrook Road & OR-99W

Movement	SB	SB	SB	SB
Directions Served	L	L	T	R
Maximum Queue (ft)	210	226	205	84
Average Queue (ft)	122	138	83	27
95th Queue (ft)	190	205	159	61
Link Distance (ft)			454	
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)	220	220		125
Storage Blk Time (%)	0	1	4	
Queuing Penalty (veh)	0	2	16	

Network Summary

Network wide Queuing Penalty: 47

Queuing and Blocking Report
 2024 Buildout Conditions w/ Mitigations - AM Peak Hour

05/03/2022

Intersection: 3: N Springbrook Road & Haworth Avenue

Movement	EB	EB	WB	NB	NB	SB	SB
Directions Served	L	TR	LTR	L	TR	L	TR
Maximum Queue (ft)	79	136	78	121	185	70	247
Average Queue (ft)	33	69	32	49	88	19	119
95th Queue (ft)	68	114	64	95	159	53	206
Link Distance (ft)		290	363		459		717
Upstream Blk Time (%)							
Queuing Penalty (veh)							
Storage Bay Dist (ft)	150			140		100	
Storage Blk Time (%)		0		0	1		10
Queuing Penalty (veh)		0		0	1		3

Queuing and Blocking Report
 2024 Buildout Conditions - PM Peak Hour

05/03/2022

Intersection: 1: N Deborah Road & Haworth Avenue

Movement	EB	WB	NB	SB
Directions Served	LTR	LTR	LTR	LTR
Maximum Queue (ft)	104	89	76	95
Average Queue (ft)	54	45	35	52
95th Queue (ft)	87	73	63	83
Link Distance (ft)	719	328	778	723
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 2: Site Access & Haworth Avenue

Movement	WB	NB
Directions Served	LT	LR
Maximum Queue (ft)	44	31
Average Queue (ft)	4	6
95th Queue (ft)	23	26
Link Distance (ft)	290	267
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 3: N Springbrook Road & Haworth Avenue

Movement	EB	EB	WB	NB	NB	SB	SB
Directions Served	LT	R	LTR	L	TR	L	TR
Maximum Queue (ft)	106	121	159	168	254	200	418
Average Queue (ft)	52	57	72	55	109	58	183
95th Queue (ft)	85	96	127	118	203	173	383
Link Distance (ft)		290	363		454		722
Upstream Blk Time (%)							0
Queuing Penalty (veh)							0
Storage Bay Dist (ft)	150			140		100	
Storage Blk Time (%)	0	0		0	6		45
Queuing Penalty (veh)	0	0		0	9		21

Queuing and Blocking Report
 2024 Buildout Conditions - PM Peak Hour

05/03/2022

Intersection: 4: N Springbrook Road & 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)	185	400	388	45	346	386	514	509	335	236	293	256	
Average Queue (ft)	79	264	245	2	197	243	304	303	21	119	176	133	
95th Queue (ft)	154	370	347	45	299	345	438	446	175	226	253	232	
Link Distance (ft)		1106	1106				817	817				358	
Upstream Blk Time (%)												0	0
Queuing Penalty (veh)												0	0
Storage Bay Dist (ft)	400			350	500	500			350	300	300		
Storage Blk Time (%)		0	1				0	4		0	0	0	0
Queuing Penalty (veh)		0	1				1	11		0	1	2	

Intersection: 4: N Springbrook Road & OR-99W

Movement	NB	SB	SB	SB	SB
Directions Served	R	L	L	T	R
Maximum Queue (ft)	274	184	221	256	198
Average Queue (ft)	118	106	127	129	58
95th Queue (ft)	224	163	193	225	133
Link Distance (ft)				454	
Upstream Blk Time (%)	0			0	
Queuing Penalty (veh)	0			0	
Storage Bay Dist (ft)	300	220	220		125
Storage Blk Time (%)	0	0	0	14	1
Queuing Penalty (veh)	1	0	1	58	3

Network Summary

Network wide Queuing Penalty: 109

Queuing and Blocking Report
 2024 Buildout Conditions w/ Mitigation - PM Peak Hour

05/03/2022

Intersection: 3: N Springbrook Road & Haworth Avenue

Movement	EB	EB	WB	NB	NB	SB	SB
Directions Served	L	TR	LTR	L	TR	L	TR
Maximum Queue (ft)	117	171	227	182	272	84	234
Average Queue (ft)	47	80	94	64	106	27	122
95th Queue (ft)	88	141	177	127	197	67	197
Link Distance (ft)		290	363		459		717
Upstream Blk Time (%)			0		0		
Queuing Penalty (veh)			0		0		
Storage Bay Dist (ft)	150			140		100	
Storage Blk Time (%)	0	1		0	2		12
Queuing Penalty (veh)	0	1		0	4		6

Queuing and Blocking Report
 2029 Future Conditions - AM Peak Hour

05/03/2022

Intersection: 1: N Deborah Road & Haworth Avenue

Movement	EB	WB	NB	SB
Directions Served	LTR	LTR	LTR	LTR
Maximum Queue (ft)	140	107	99	151
Average Queue (ft)	63	50	50	72
95th Queue (ft)	105	86	82	119
Link Distance (ft)	719	328	778	723
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 2: Site Access & Haworth Avenue

Movement	WB	NB
Directions Served	LT	LR
Maximum Queue (ft)	24	33
Average Queue (ft)	1	8
95th Queue (ft)	10	30
Link Distance (ft)	290	267
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 3: N Springbrook Road & Haworth Avenue

Movement	EB	EB	WB	NB	NB	SB	SB
Directions Served	LT	R	LTR	L	TR	L	TR
Maximum Queue (ft)	82	128	64	88	189	200	472
Average Queue (ft)	41	67	33	41	86	42	195
95th Queue (ft)	66	107	57	75	149	143	404
Link Distance (ft)		290	363		454		722
Upstream Blk Time (%)							0
Queuing Penalty (veh)							0
Storage Bay Dist (ft)	150			140		100	
Storage Blk Time (%)		0			1		42
Queuing Penalty (veh)		0			2		13

Queuing and Blocking Report
 2029 Future Conditions - AM Peak Hour

05/03/2022

Intersection: 4: N Springbrook Road & 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)	239	512	477	135	210	261	262	254	167	324	385	354
Average Queue (ft)	52	310	285	14	93	150	145	126	42	131	177	234
95th Queue (ft)	153	451	424	142	199	225	238	221	142	251	366	378
Link Distance (ft)		1106	1106				817	817				358
Upstream Blk Time (%)										0	5	3
Queuing Penalty (veh)										0	0	0
Storage Bay Dist (ft)	400			350	500	500			300	300		300
Storage Blk Time (%)		3	4					0		0	0	13
Queuing Penalty (veh)		2	3					0		0	2	46

Intersection: 4: N Springbrook Road & OR-99W

Movement	SB	SB	SB	SB
Directions Served	L	L	T	R
Maximum Queue (ft)	246	254	215	97
Average Queue (ft)	139	155	93	30
95th Queue (ft)	212	228	166	68
Link Distance (ft)			454	
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)	220	220		125
Storage Blk Time (%)	0	1	4	
Queuing Penalty (veh)	1	3	20	

Network Summary

Network wide Queuing Penalty: 91

Queuing and Blocking Report
 2029 Future Conditions w/ Mitigation - AM Peak Hour

05/03/2022

Intersection: 3: N Springbrook Road & Haworth Avenue

Movement	EB	EB	WB	NB	NB	SB	SB
Directions Served	L	TR	LTR	L	TR	L	TR
Maximum Queue (ft)	100	168	92	137	215	116	248
Average Queue (ft)	38	79	37	55	93	20	125
95th Queue (ft)	77	136	75	108	176	69	213
Link Distance (ft)		290	363		459		717
Upstream Blk Time (%)							
Queuing Penalty (veh)							
Storage Bay Dist (ft)	150			140		100	
Storage Blk Time (%)	0	1		0	2		10
Queuing Penalty (veh)	0	0		0	2		3

Queuing and Blocking Report
 2029 Future Conditions - PM Peak Hour

05/03/2022

Intersection: 1: N Deborah Road & Haworth Avenue

Movement	EB	WB	NB	SB
Directions Served	LTR	LTR	LTR	LTR
Maximum Queue (ft)	116	95	79	103
Average Queue (ft)	59	45	34	54
95th Queue (ft)	93	74	61	85
Link Distance (ft)	719	328	778	723
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 2: Site Access & Haworth Avenue

Movement	WB	NB
Directions Served	LT	LR
Maximum Queue (ft)	55	31
Average Queue (ft)	4	6
95th Queue (ft)	27	26
Link Distance (ft)	290	267
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 3: N Springbrook Road & Haworth Avenue

Movement	EB	EB	WB	NB	NB	SB	SB
Directions Served	LT	R	LTR	L	TR	L	TR
Maximum Queue (ft)	142	141	188	211	363	200	755
Average Queue (ft)	63	65	83	75	148	144	541
95th Queue (ft)	106	111	147	170	286	285	894
Link Distance (ft)		290	363		454		722
Upstream Blk Time (%)					0		35
Queuing Penalty (veh)					2		0
Storage Bay Dist (ft)	150			140		100	
Storage Blk Time (%)	0	1		1	16	0	93
Queuing Penalty (veh)	1	1		2	27	0	47

Queuing and Blocking Report
 2029 Future Conditions - PM Peak Hour

05/03/2022

Intersection: 4: N Springbrook Road & 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)	234	414	393	45	359	443	536	567	449	238	321	316
Average Queue (ft)	98	284	265	2	222	271	325	333	36	140	195	141
95th Queue (ft)	188	394	374	45	329	393	467	492	236	244	284	262
Link Distance (ft)		1106	1106				817	817				358
Upstream Blk Time (%)							0	0			0	0
Queuing Penalty (veh)							0	0			0	0
Storage Bay Dist (ft)	400			350	500	500			350	300	300	
Storage Blk Time (%)		1	1				0	6			0	1
Queuing Penalty (veh)		1	2				3	16			2	5

Intersection: 4: N Springbrook Road & OR-99W

Movement	NB	SB	SB	SB	SB
Directions Served	R	L	L	T	R
Maximum Queue (ft)	296	182	221	256	204
Average Queue (ft)	127	115	135	132	61
95th Queue (ft)	235	169	195	219	143
Link Distance (ft)				454	
Upstream Blk Time (%)	0				
Queuing Penalty (veh)	0				
Storage Bay Dist (ft)	300	220	220		125
Storage Blk Time (%)	0	0	0	15	1
Queuing Penalty (veh)	1	0	0	70	3

Network Summary

Network wide Queuing Penalty: 184

Queuing and Blocking Report
 2029 Future Conditions w/ Mitigation - PM Peak Hour

05/03/2022

Intersection: 3: N Springbrook Road & Haworth Avenue

Movement	EB	EB	WB	NB	NB	SB	SB
Directions Served	L	TR	LTR	L	TR	L	TR
Maximum Queue (ft)	128	177	277	189	257	159	288
Average Queue (ft)	52	84	118	71	116	34	143
95th Queue (ft)	98	143	224	125	195	95	234
Link Distance (ft)		290	363		459		717
Upstream Blk Time (%)			0				
Queuing Penalty (veh)			0				
Storage Bay Dist (ft)	150			140		100	
Storage Blk Time (%)	0	1		0	3	0	17
Queuing Penalty (veh)	0	1		1	6	0	9



Geotechnical Investigation and Consultation Services

Proposed Newberg Apartments Development Project

Tax Lot No. 800

E Haworth Avenue and N Springbrook Road

Newberg (Yamhill County), Oregon

for

Grove Development

**Project No. 1213.020.G
November 10, 2022**

November 10, 2022

Grove Hunt
Grove Development
6500 SW Beaverton Hillsdale Highway, Suite #3
Portland, Oregon 97255

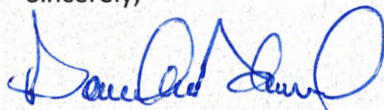
Dear Mr. Hunt:

**Re: Geotechnical Investigation and Consultation Services,
Proposed Newberg Apartments Development Site, Tax Lot No. 800,
E Haworth Avenue and N Springbrook Road, Newberg (Yamhill County), Oregon**

Submitted herewith is our report entitled "Geotechnical Investigation and Consultation Services, Proposed Newberg Apartments Development Site, Tax Lot No. 800, E Haworth Avenue and N Springbrook Road, Newberg (Yamhill County), Oregon". The scope of our services was outlined in our formal proposal to Mr. Grove Hunt of Grove Development on October 15, 2022. Authorization of our services was provided by Mr. Grove Hunt of Grove Development on October 18, 2020.

During the course of our investigation, we have kept you and/or others advised of our schedule and preliminary findings. We appreciate the opportunity to assist you with this phase of the project. Should you have any questions regarding this report, please do not hesitate to call.

Sincerely,



Daniel M. Redmond, P.E., G.E.
President/Principal Engineer

Cc: Mr. Curt Olson
Olson Group Architects



DR 12-31-22

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**GEOTECHNICAL INVESTIGATION AND CONSULTATION SERVICES
PROPOSED NEWBERG APARTMENTS DEVELOPMENT SITE
TAX LOT NO. 800, E HAWORTH AVENUE & N SPRINGBROOK ROAD
NEWBERG (YAMHILL COUNTY), OREGON**

INTRODUCTION

Redmond Geotechnical Services, LLC is please to submit to you the results of our Geotechnical Investigation at the site of the proposed new Newberg Apartments project located to the west of NE Lafayette Avenue and north of NE 9th Avenue in McMinnville (Yamhill County), Oregon. The general location of the subject site is shown on Site Vicinity Map, Figure No. 1. The purpose of our geotechnical investigation services at this time was to explore the existing subsurface soils and/or groundwater conditions across the subject site and to develop and/or provide appropriate geotechnical design and construction recommendations for the proposed new Newberg Apartments project.

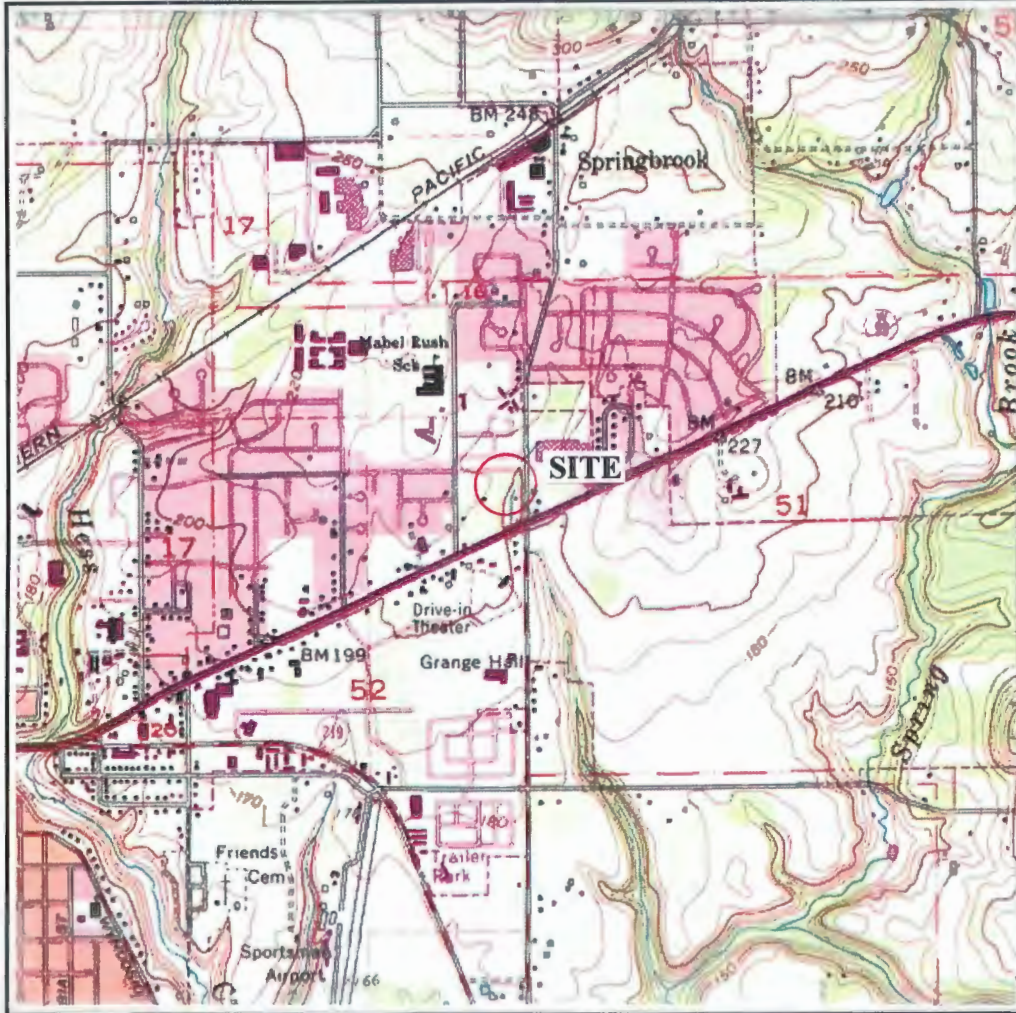
PROJECT DESCRIPTION

Based on a review of the proposed site development plan(s), we understand that present plans are to construct a new apartment building at the site. Reportedly, the proposed new apartment building will be a three-story wood-frame structure with a concrete slab-on-grade floor and will have a base and/or ground floor level footprint of approximately 7,500 square feet.

Support of the new apartment building structure is anticipated to include both conventional shallow continuous (strip) footings as well as individual (spread) column-type footings. Structural loading information, although unavailable at this time, is expected to result in maximum dead plus live continuous (strip) and individual (column) footing loads on the order of about 3.0 to 5.0 kips per lineal foot (klf) and 25 to 75 kips, respectively.

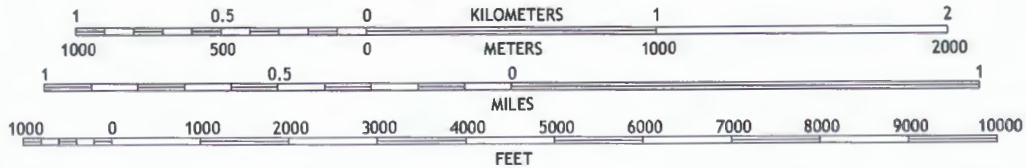
Other associated site improvements for the project will include new underground utility services, concrete curbs and sidewalks, and landscaping as well as new paved parking and drive areas.

Site grading and earthwork required to bring the subject property to finish design grades is anticipated to result in relatively minor cuts and/or fills of about one (1) to two (2) feet.



**NEWBERG QUADRANGLE
OREGON
7.5-MINUTE SERIES**

SCALE 1:24 000



CONTOUR INTERVAL 10 FEET
NORTH AMERICAN VERTICAL DATUM OF 1988

SITE VICINITY MAP

**NEWBERG APARTMENTS SITE
TL 800, EAST HAWORTH AVENUE**

Project No. 1213.020.G

Figure No. 1

SCOPE OF WORK

The purpose of our geotechnical studies was to evaluate the overall site subsurface soil and/or groundwater conditions underlying the site with regard to the proposed new apartment building construction at the site and any associated impacts or concerns with respect to the new commercial development as well as provide appropriate geotechnical design and construction recommendations for the project. Specifically, our geotechnical investigation included the following scope of work items:

1. A detailed field reconnaissance and subsurface exploration program of the soil and ground water conditions underlying the site by means of five (5) exploratory test holes. The exploratory test holes were excavated to depths of between four (4) and seven (7) feet beneath existing site grades at the approximate locations as shown on the Site Exploration Plan, Figure No. 2.
2. Laboratory testing to evaluate and identify pertinent physical and engineering properties of the subsurface soils encountered relative to the planned site development and construction at the site. The laboratory testing program included tests to help evaluate the natural (field) moisture content and dry density, maximum dry density and optimum moisture content, gradational characteristics and Atterberg Limits as well as consolidation and "R"-value tests.
3. A literature review and engineering evaluation and assessment of the regional seismicity to evaluate the potential ground motion hazard(s) at the subject site. The evaluation and assessment included a review of the regional earthquake history and sources such as potential seismic sources, maximum credible earthquakes, and reoccurrence intervals as well as a discussion of the possible ground response to the selected design earthquake(s), fault rupture, landsliding, liquefaction, and tsunami and seiche flooding.
4. Engineering analyses utilizing the field and laboratory data as a basis for furnishing recommendations for foundation support of the proposed new apartment building structure. Recommendations include maximum design allowable contact bearing pressure(s), depth of footing embedment, estimates of foundation settlement, lateral soil resistance, and foundation subgrade preparation. Additionally, construction and/or permanent subsurface water drainage considerations have also been prepared. Further, our report includes recommendations regarding site preparation, placement and compaction of structural fill materials, suitability of the on-site soils for use as structural fill, criteria for import fill materials, and preparation of foundation and/or floor slab subgrades.
5. Development of various flexible pavement design sections for paved access drives and vehicle parking areas as well as for any heavy vehicle traffic areas.

SITE CONDITIONS

Site Geology

Available geologic mapping of the area and/or subject site indicates that the near surface soils consist of Quaternary age terrace deposits (Qtm). Characteristics include semi-consolidated gravel, sand, silt and clay forming very flat terraces of major extent along the Yamhill River. Generally, 10 to 30 feet of medium brown silty clay interbedded with very fine sandy silt believed to be related to Willamette Valley Silt including associated glacial erratics consisting of tiny fragments and pebble up to boulders greater than 4 feet in diameter. Soils are poorly drained and subject to seasonal high groundwater and ponding.

Surface Conditions

The subject property is generally rectangular in shape and is comprised of one (1) separate tax lot (TL 800) encompassing a total area of approximately 0.82 acres. The subject property is roughly bounded to the east by N Springbrook Road, to the north by E Haworth Avenue, and to the south and west by existing and developed commercial properties.

The subject property is presently unimproved and void of existing structures and/or site improvements. However, the subject property reportedly contains an existing underground storm sewer line within an existing 15-foot wide storm sewer easement.

Topographically, the subject site is characterized as relatively flat-lying to gently sloping terrain descending downward towards the east/northeast with overall topographic relief across the entire site estimated at about five (5) feet and ranges from a high of about Elevation 208 feet to a low of about Elevation 203 feet. Vegetation across the site generally consists of a light to moderate growth of grass and weeds.

Subsurface Soil Conditions

Our understanding of the subsurface soil conditions underlying the site was developed by means of five (5) exploratory test holes excavated to depths of between four (4) and seven (7) feet beneath existing site grades on August 20, 2022 with tracked excavation equipment. The location of the exploratory test holes were located in the field by marking off distances from existing and/or known site features and are shown in relation to the existing and/or proposed new site improvements on the Site Exploration Plan, Figure No. 2. Detailed logs of the test hole explorations, presenting conditions encountered at each location explored, are presented in the Appendix, Figure No's. A-5 through A-7.

The exploratory test hole explorations performed during this study were observed by staff from Redmond Geotechnical Services, LLC who logged the test hole explorations and obtained representative samples of the subsurface soils encountered beneath the site. All subsurface soils encountered at the site and/or within the exploratory test hole explorations were logged and classified in general conformance with the Unified Soil Classification System (USCS) which is outlined on Figure No. A-4.

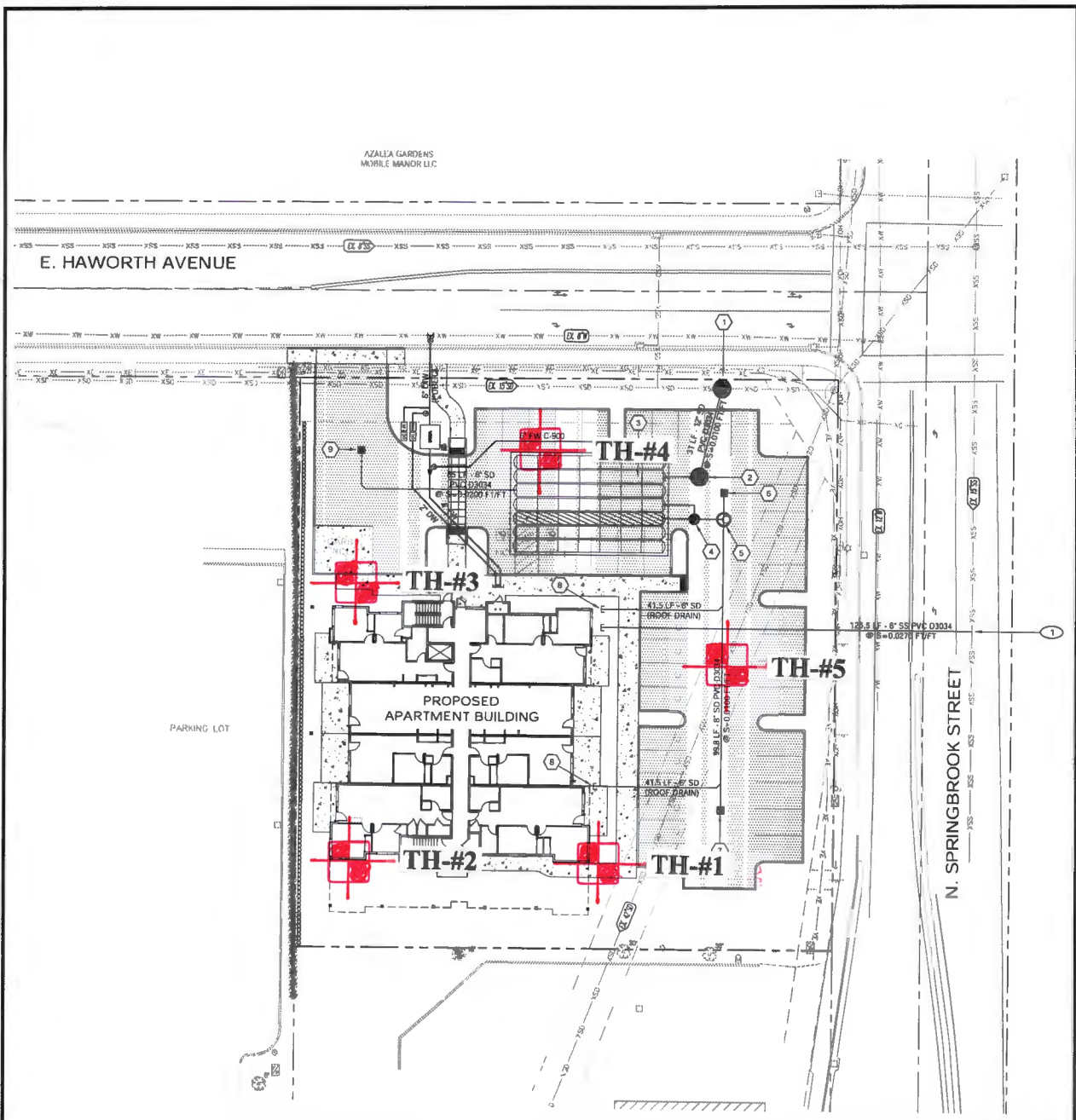
The test hole explorations revealed that the subject site is generally underlain at depth by native soil deposits comprised of terrace soil deposits (Q_{tm}) of Quaternary age. Specifically, the subsurface soils underlying the project area generally consists of a upper layer of topsoil materials comprised of dark brown, wet, soft, organic, sandy, clayey silt which extends to a depth of about 12 inches. These surficial topsoil materials were inturn underlain by medium to olive-brown, very moist, medium stiff, sandy, clayey silt to the maximum depth explored of about seven (7) feet beneath the existing site and/or surface grades. These underlying clayey, sandy silt subgrade soil materials become sandier with depth and are best characterized by relatively low to moderate strength and moderate compressibility. In addition to the above, localized fill soils were also encountered in test hole TH-#5 and/or within the existing storm sewer easement. The fill soils are believed to be trench excavation spoils which were found to be moderately well compacted.

Groundwater

Groundwater was not encountered within the exploratory test hole explorations at the time of excavating at a depth of at least seven (7) feet beneath existing site grades. Additionally, based on a review of available water wells in the area as well as a review of the Depth to Seasonal High Groundwater prepared by Yamhill County, the apparent depth to seasonal high groundwater in the area of the subject site is greater than 10 feet. However, groundwater elevations at and/or below the subject site may fluctuate seasonally in accordance with rainfall conditions and/or changes in the site utilization.

INFILTRATION TESTING

We performed one (1) field infiltration test at the site on August 20, 2022. The infiltration test was performed in test hole TH-#4 at a depth of between three (3) and four (4) feet beneath the existing site and/or surface grades. The subgrade soils encountered in the infiltration test hole consisted of sandy, clayey silt. The infiltration testing was performed in general conformance with current EPA and/or the City of Newberg/Yamhill County Encased Falling Head test method which consisted of advancing a 6-inch diameter PVC pipe approximately 6 inches into the exposed soil horizon at each test location. Using a steady water flow, water was discharged into the pipe and allowed to penetrate and saturate the subgrade soils. The water level was adjusted over a two (2) hour period and allowed to achieve a saturated subgrade soil condition consistent with the bottom elevation of the surrounding test pit excavation. Following the required saturating period, water was again added into the PVC pipe and the time and/or rate at which the water level dropped was monitored and recorded. Each measurable drop in the water level was recorded until a consistent infiltration rate was observed and/or repeated.



LEGEND
TH-#5 Indicates approximate location of exploratory test hole



SITE EXPLORATION PLAN

**NEWBERG APARTMENTS SITE
 TL 800, EAST HAWORTH AVENUE**

Project No. 1213.020.G

Figure No. 2

Based on the results of the field infiltration testing at the site, we have found that the native sandy, clayey silt subgrade soil deposits possess an ultimate infiltration rate on the order of about 0.4 inches per hour (in/hr).

LABORATORY TESTING

Representative samples of the on-site subsurface soils were collected at selected depths and intervals from the test hole explorations and returned to our laboratory for further examination and testing and/or to aid in the classification of the subsurface soils as well as to help evaluate and identify their engineering strength and compressibility characteristics. The laboratory testing consisted of visual and textural sample inspection, moisture content and dry density determinations, gradation analyses and Atterberg Limits as well as consolidation and "R"-value tests. Results of the various laboratory tests are presented in the Appendix on Figure No's. A-8 through A-12.

SEISMICITY AND EARTHQUAKE SOURCES

The seismicity of the southwest Washington and northwest Oregon area, and hence the potential for ground shaking, is controlled by three separate fault mechanisms. These include the Cascadia Subduction Zone (CSZ), the mid-depth intraplate zone, and the relatively shallow crustal zone. Descriptions of these potential earthquake sources are presented below.

The CSZ is located offshore and extends from northern California to British Columbia. Within this zone, the oceanic Juan de Fuca Plate is being subducted beneath the continental North American Plate to the east. The interface between these two plates is located at a depth of approximately 15 to 20 kilometers (km). The seismicity of the CSZ is subject to several uncertainties, including the maximum earthquake magnitude and the recurrence intervals associated with various magnitude earthquakes. Anecdotal evidence of previous CSZ earthquakes has been observed within coastal marshes along the Washington and Oregon coastlines. Sequences of interlayered peat and sands have been interpreted to be the result of large Subduction zone earthquakes occurring at intervals on the order of 300 to 500 years, with the most recent event taking place approximately 300 years ago. A study by Geomatrix (1995) and/or USGS (2008) suggests that the maximum earthquake associated with the CSZ is moment magnitude (M_w) 8 to 9. This is based on an empirical expression relating moment magnitude to the area of fault rupture derived from earthquakes that have occurred within Subduction zones in other parts of the world. An M_w 9 earthquake would involve a rupture of the entire CSZ. As discussed by Geomatrix (1995) this has not occurred in other subduction zones that have exhibited much higher levels of historical seismicity than the CSZ. However, the 2008 USGS report has assigned a probability of 0.67 for a M_w 9 earthquake and a probability of 0.33 for a M_w 8.3 earthquake. For the purpose of this study an earthquake of M_w 9.0 was assumed to occur within the CSZ.

The intraplate zone encompasses the portion of the subducting Juan de Fuca Plate located at a depth of approximately 30 to 50 km below western Washington and western Oregon. Very low levels of seismicity have been observed within the intraplate zone in western Oregon and western Washington. However, much higher levels of seismicity within this zone have been recorded in Washington and California. Several reasons for this seismic quiescence were suggested in the Geomatrix (1995) study and include changes in the direction of Subduction between Oregon, Washington, and British Columbia as well as the effects of volcanic activity along the Cascade Range. Historical activity associated with the intraplate zone includes the 1949 Olympia magnitude 7.1 and the 1965 Puget Sound magnitude 6.5 earthquakes. Based on the data presented within the Geomatrix (1995) report, an earthquake of magnitude 7.25 has been chosen to represent the seismic potential of the intraplate zone.

The third source of seismicity that can result in ground shaking within the Portland and southwest Washington area is near-surface crustal earthquakes occurring within the North American Plate. The historical seismicity of crustal earthquakes in this area is higher than the seismicity associated with the CSZ and the intraplate zone. The 1993 Scotts Mills (magnitude 5.6) and Klamath Falls (magnitude 6.0), Oregon earthquakes were crustal earthquakes.

Liquefaction

Seismic induced soil liquefaction is a phenomenon in which loose, granular soils and some silty soils, located below the water table, develop high pore water pressures and lose strength due to ground vibrations induced by earthquakes. Soil liquefaction can result in lateral flow of material into river channels, ground settlements and increased lateral and uplift pressures on underground structures. Buildings supported on soils that have liquefied often settle and tilt and may displace laterally. Soils located above the ground water table cannot liquefy, but granular soils located above the water table may settle during the earthquake shaking.

Our review of the subsurface soil test hole logs from our exploratory field explorations (TH-#1 through TH-#5) and laboratory test results indicates that the site is generally underlain by medium stiff, sandy, clayey silt to the maximum depth explored of about seven (7) feet beneath existing site grades. Additionally, groundwater was generally not encountered at the site during our field exploration work to depths of at least seven (7) feet.

As such, due to the anticipated depth to groundwater as well as the medium stiff and cohesive nature of the underlying sandy, clayey silt subgrade soil deposits beneath the site, it is our opinion that the native soil deposits located beneath the subject site do not have the potential for liquefaction during the design earthquake motions previously described. A more detailed liquefaction assessment was not part of the scope of work for this Geotechnical Investigation.

Landslides

No ancient and/or active landslides were observed or are known to be present on the subject site. Additionally, due to the relatively flat-lying to gently sloping nature of the subject site, the risk of seismic induced slope instability at the site resulting in landslides and/or lateral earth movements do not appear to present a potential geologic hazard.

Surface Rupture

Although the site is generally located within a region of the country known for seismic activity, no known faults exist on and/or immediately adjacent to the subject site. As such, the risk of surface rupture due to faulting is considered negligible.

Tsunami and Seiche

A tsunami, or seismic sea wave, is produced when a major fault under the ocean floor moves vertically and shifts the water column above it. A seiche is a periodic oscillation of a body of water resulting in changing water levels, sometimes caused by an earthquake. Tsunami and seiche are not considered a potential hazard at this site because the site is not near to the coast and/or there are no adjacent significant bodies of water.

Flooding and Erosion

Stream flooding is a potential hazard that should be considered in lowland areas of Yamhill County and the City of Newberg. The FEMA (Federal Emergency Management Agency) flood maps should be reviewed as part of the design for the proposed new apartment building structure and its associated site improvements. Elevations of structures on the site should be designed based upon consultants reports, FEMA (Federal Emergency Management Agency), and Yamhill County requirements for the 100-year flood levels of any nearby creeks and/or streams.

CONCLUSIONS AND RECOMMENDATIONS

General

Based on the results of our field explorations, laboratory testing, and engineering analyses, it is our opinion that the site is suitable for the proposed new Newberg Apartments building and the associated site improvements described herein provided that the recommendations contained within this report are properly incorporated into the design and construction of the project.

The primary features of concern at the site are 1) the moisture sensitivity of the near surface sandy, clayey silt subgrade soils, 2) the possible presence of old and/or abandoned building foundations and/or site improvements the site and 3) the presence of the existing storm sewer line and easement.

With regard to the moisture sensitivity of the near surface sandy, clayey silt subgrade soils, we are generally of the opinion that all site grading and earthwork operations be scheduled for the drier summer months which is typically June through September. In regard to the possible presence of old building foundations and/or site improvements across the site, we recommend that any old building foundations and/or basements as well as utility services located within the proposed new apartment building footprint be removed in their entirety down to an approved native subgrade soil. Additionally, we anticipate that the site may contain some existing undocumented fill materials. As such, we are of the opinion that all existing fill materials present and/or encountered at the site should be considered non-structural and, as such, should be removed in their entirety. Further, all abandoned drywells and/or septic tanks as well as prior underground heating oil tanks and/or UST tank cavity's encountered at the site should be filled with a controlled density fill (CDF) and/or structural fill materials as recommended by the Geotechnical Engineer. In regard to the presence of the existing storm sewer line and/or easement, we understand that the trench backfill materials may not be compacted to the requirements of structural fill. As such, we recommend that the building foundations for the proposed new apartment building be located at least five (5) feet or more from the edge of the existing easement. Additionally, we recommend that the upper 1 to 2 feet of the trench backfill materials located beneath the proposed new pavements be removed and/or recompacted to the requirement of structural fill. In this regard, we recommend that close monitoring of all site grading and earthwork operations be performed by the Geotechnical Engineer.

The following sections of this report provide specific recommendations regarding subgrade preparation and grading as well as foundation and floor slab design and construction for the new Newberg Apartments project.

Site Preparation

As an initial step in site preparation, we recommend that the proposed new apartment building area and any associated structural and/or site improvement area(s) be stripped and cleared of all existing site improvements, any existing fill materials, surface debris, existing vegetation, topsoil materials, and/or any other deleterious materials present at the time of construction. In general, we envision that the site stripping to remove existing vegetation and pavement materials will generally be about 6 to 12 inches. However, localized areas requiring deeper removals, such as any existing fill materials, existing and/or old foundation remnants and/or large tree root systems, will be encountered and should be evaluated at the time of construction by the Geotechnical Engineer. The stripped and cleared materials should be properly disposed of as they are generally considered unsuitable for use/reuse as fill materials.

Following the completion of the site stripping and clearing work and prior to the placement of any required structural fill materials and/or structural improvements, the exposed subgrade soils within the planned structural improvement area(s) should be inspected and approved by the Geotechnical Engineer and possibly proof-rolled with a half and/or fully loaded dump truck. Areas found to be soft or otherwise unsuitable should be over-excavated and removed or scarified and recompacted as structural fill. During wet and/or inclement weather conditions, proof rolling and/or scarification and recompaction as noted above may not be appropriate.

The on-site native silty subgrade soil materials are generally considered suitable for use/reuse as structural fill materials provided that they are free of organic materials, debris, and rock fragments in excess of about 6 inches in dimension. However, if site grading is performed during wet or inclement weather conditions, the use of some of the on-site native soil materials which contain significant silt and clay sized particles will be difficult at best. In this regard, during wet or inclement weather conditions, we recommend that an import structural fill material be utilized which should consist of a free-draining (clean) granular fill (sand & gravel) containing no more than about 5 percent fines. Representative samples of the materials which are to be used as structural fill materials should be submitted to the Geotechnical Engineer and/or laboratory for approval and determination of the maximum dry density and optimum moisture content for compaction.

In general, all site earthwork and grading activities should be scheduled for the drier summer months (June through September) if possible. However, if wet weather site preparation and grading is required, it is generally recommended that the stripping of topsoil materials be accomplished with a tracked excavator utilizing a large smooth-toothed bucket working from areas yet to be excavated. Additionally, the loading of strippings into trucks and/or protection of moisture sensitive subgrade soils will also be required during wet weather grading and construction. In this regard, we recommend that areas in which construction equipment will be traveling be protected by covering the exposed subgrade soils with a woven geotextile fabric such as Mirafi FW404 followed by at least 12 inches or more of crushed aggregate base rock. Further, the geotextile fabric should have a minimum Mullen burst strength of at least 250 pounds per square inch for puncture resistance and an apparent opening size (AOS) between the U.S. Standard No. 70 and No. 100 sieves.

All structural fill materials placed within the new dental building and/or pavement areas should be moistened or dried as necessary to near (within 3 percent) optimum moisture conditions and compacted by mechanical means to a minimum of 92 percent of the maximum dry density as determined by the ASTM D-1557 (AASHTO T-180) test procedures. Structural fill materials should be placed in lifts (layers) such that when compacted do not exceed about 8 inches. Additionally, all fill materials placed within three (3) lineal feet of the perimeter (limits) of the proposed apartment structure and/or pavements should be considered as structural fill. All aspects of the site grading and earthwork operations should be monitored and approved by a representative of Redmond Geotechnical Services, LLC.

Foundation Support

Based on the results of our investigation, it is our opinion that the site of the proposed new Newberg Apartments building is suitable for support of the three-story wood-frame structure provided that the following foundation design recommendations are followed. The following section(s) of this report present specific foundation design and construction recommendations for the planned new apartment building structure.

Shallow Foundations

In general, conventional shallow continuous (strip) footings and individual (spread) column footings may be supported by approved native (untreated) sandy, clayey silt subgrade soil materials and/or structural fill soils based on an allowable contact bearing pressure of about 2,000 pounds per square foot (psf). However, where higher allowable contact bearing pressures are desired and/or required, an allowable contact bearing pressure of up to 2,500 psf may be used for design where foundations are supported by a minimum of at least 6 inches or more of properly compacted (structural fill) crushed aggregate base rock (granular) fill material placed directly above and/or by the existing and approved native medium stiff, sandy, clayey silt subgrade soil materials. These recommended allowable contact bearing pressures are intended for dead loads and sustained live loads and may be increased by fifty percent (50%) for the total of all loads including short-term wind or seismic loads. In general, continuous strip footings should have a minimum width of at least 16 inches and be embedded at least 18 inches below the lowest adjacent finish grade (includes frost protection). Individual column footings (where required) should be embedded at least 18 inches below grade and have a minimum width of at least 24 inches.

Total and differential settlements of foundations constructed as recommended above and supported by approved native subgrade soils or by properly compacted structural fill materials are expected to be well within the tolerable limits for this type of three-story wood-frame structure and should generally be less than about 1-inch and 1/2-inch, respectively.

Allowable lateral frictional resistance between the base of the footing element and the supporting subgrade bearing soil can be expressed as the applied vertical load multiplied by a coefficient of friction of 0.35 and 0.50 for native silty subgrade soils and/or import gravel fill materials, respectively. In addition, lateral loads may be resisted by passive earth pressures on footings poured "neat" against in-situ (native) subgrade soils or properly backfilled with structural fill materials based on an equivalent fluid density of 250 pounds per cubic foot (pcf). This recommended value includes a factor of safety of approximately 1.5 which is appropriate due to the amount of movement required to develop full passive resistance.

Floor Slab Support

In order to provide uniform subgrade reaction beneath concrete slab-on-grade floors, we recommend that the floor slab area be underlain by a minimum of 6 inches of free-draining (less than 5 percent passing the No. 200 sieve), well-graded, crushed rock. The crushed rock should help provide a capillary break to prevent migration of moisture through the slab. Additional moisture protection, where needed, can be provided by using a 10-mil polyolefin geo-membrane sheeting such as StegoWrap.

The base course materials should be compacted to at least 95 percent of the maximum dry density as determined by the ASTM D-1557 (AASHTO T-180) test procedures. Where floor slab subgrade materials are undisturbed, firm and stable and where the underslab aggregate base rock section has been prepared and compacted as recommended above, we recommend that a modulus of subgrade reaction of 200 pounds per square inch per inch be used for design.

Retaining/Below Grade Walls

Retaining and/or below grade walls should be designed to resist lateral earth pressures imposed by native soils or granular backfill materials as well as any adjacent surcharge loads. For walls which are unrestrained at the top and free to rotate about their base, we recommend that active earth pressures be computed on the basis of the following equivalent fluid densities:

Non-Restrained Retaining Wall Pressure Design Recommendations

Slope Backfill (Horizontal/Vertical)	Equivalent Fluid Density/Silt (pcf)	Equivalent Fluid Density/Gravel (pcf)
Level	35	30
3H:1V	60	50
2H:1V	90	80

For walls which are fully restrained at the top and prevented from rotation about their base, we recommend that at-rest earth pressures be computed on the basis of the following equivalent fluid densities:

Restrained Retaining Wall Pressure Design Recommendations

Slope Backfill (Horizontal/Vertical)	Equivalent Fluid Density/Silt (pcf)	Equivalent Fluid Density/Gravel (pcf)
Level	55	50
3H:1V	75	70
2H:1V	95	90

The above recommended values assume that the walls will be adequately drained to prevent the buildup of hydrostatic pressures. Where wall drainage will not be present and/or if adjacent surcharge loading is present, the above recommended values will be significantly higher.

Backfill materials behind walls should be compacted to 90 percent of the maximum dry density as determined by the ASTM D-1557 (AASHTO T-180) test procedures. Special care should be taken to avoid over-compaction near the walls which could result in higher lateral earth pressures than those indicated herein. In areas within three (3) to five (5) feet behind walls, we recommend the use of hand-operated compaction equipment.

Pavements

Flexible pavement design for the project was determined on the basis of projected (anticipated) traffic volume and loading conditions relative to an assumed subgrade soil strength ("R"-value). Based on a laboratory subgrade "R"-value of 32 (Resilient Modulus = 5,000 to 10,000) and utilizing the Asphalt Institute Flexible Pavement Design Procedures and/or the American Association of State Highway and Transportation Officials (AASHTO) 1993 "Design of Pavement Structures" manual, we recommend that the asphaltic concrete pavement section(s) for the new residential development areas at the site consist of the following:

	<u>Asphaltic Concrete Thickness (inches)</u>	<u>Crushed Base Rock Thickness (inches)</u>
Automobile Parking Areas	3.0	8.0
Automobile Drive Areas	3.0	10.0

Note: Where heavy vehicle traffic is anticipated such as those required for fire and/or garbage trucks, we recommend that the automobile drive area pavement section be increased by adding 0.5 inches of asphaltic concrete and 2.0 inches of aggregate base rock. Additionally, for wet weather construction, we recommend a minimum gravel base rock thickness of at least 12 inches. Further, the above recommended flexible pavement section(s) assumes a design life of 20 years.

Pavement Subgrade, Base Course & Asphalt Materials

The above recommended pavement section(s) were based on the design assumptions listed herein and on the assumption that construction of the pavement section(s) will be completed during an extended period of reasonably dry weather. All thicknesses given are intended to be the minimum acceptable. Increased base rock sections and the use of geotextile fabric may be required during wet and/or inclement weather conditions and/or in order to adequately support construction traffic and protect the subgrade during construction. Additionally, the above recommended pavement section(s) assume that the subgrade will be prepared as recommended herein, that the exposed subgrade soils will be properly protected from rain and construction traffic, and that the subgrade is firm and unyielding at the time of paving. Further, it assumes that the subgrade is graded to prevent any ponding of water which may tend to accumulate in the base course.

Pavement base course materials should consist of well-graded 1-1/2 inch and/or 3/4-inch minus crushed base rock having less than 5 percent fine materials passing the No. 200 sieve. The base course and asphaltic concrete materials should conform to the requirements set forth in the latest edition of the Oregon Department of Transportation, Standard Specifications for Highway Construction. The base course materials should be compacted to at least 95 percent of the maximum dry density as determined by the ASTM D-1557 (AASHTO T-180) test procedures. The asphaltic concrete paving materials should be compacted to at least 92 percent of the theoretical maximum density as determined by the ASTM D-2041 (Rice Gravity) test method.

Excavation/Slopes

Temporary excavations of up to about four (4) feet in depth may be constructed with near vertical inclinations. Temporary excavations greater than about four (4) feet but less than eight (8) feet should be excavated with inclinations of at least 1 to 1 (horizontal to vertical) or properly braced/shored. Where excavations are planned to exceed about eight (8) feet, this office should be consulted. All shoring systems and/or temporary excavation bracing for the project should be the responsibility of the excavation contractor.

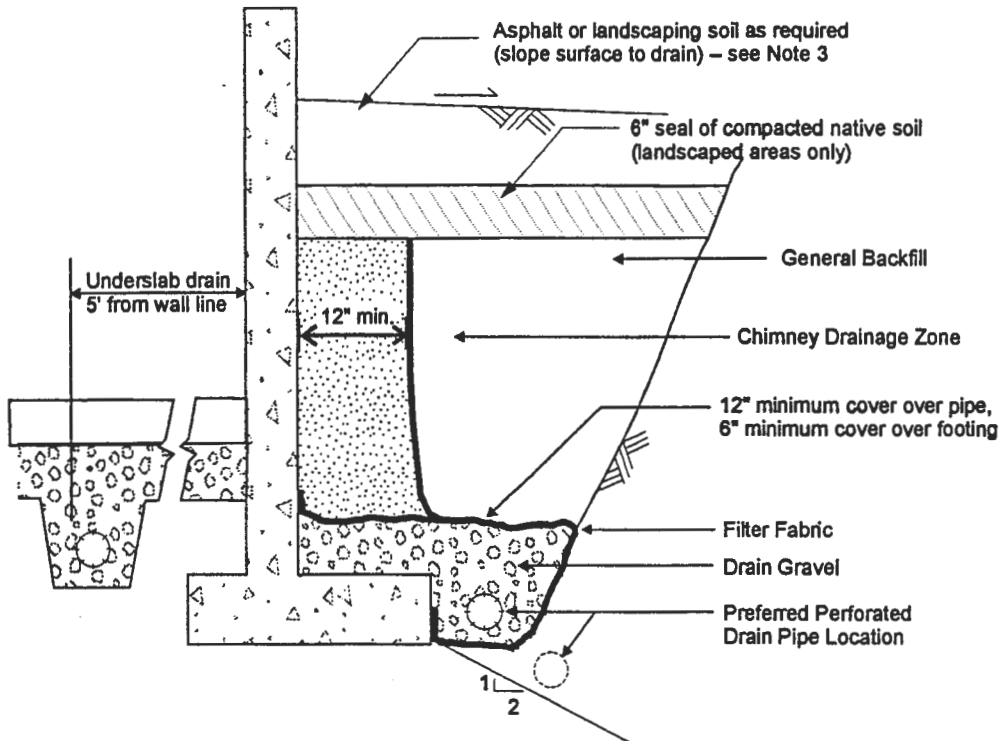
Depending on the time of year in which trench excavations occur, trench dewatering may be required in order to maintain dry working conditions if the invert elevations of the proposed utilities are located at and/or below the groundwater level. If groundwater is encountered during utility excavation work, we recommend placing trench stabilization materials along the base of the excavation. Trench stabilization materials should consist of 1-foot of well-graded gravel, crushed gravel, or crushed rock with a maximum particle size of 4 inches and less than 5 percent fines passing the No. 200 sieve. The material should be free of organic matter and other deleterious material and placed in a single lift and compacted until well keyed.

Surface Drainage/Groundwater

We recommend that positive measures be taken to properly finish grade the site so that drainage waters from the office building and landscaping areas as well as adjacent properties or buildings are directed away from the new apartment structures foundations and/or floor slabs. All roof drainage should be directed into conduits that carry runoff water away from the new apartment building to a suitable outfall. Roof downspouts should not be connected to foundation drains. A minimum ground slope of about 2 percent is generally recommended in unpaved areas around the apartment building.

Groundwater was not encountered at the site within any of the exploratory test holes (TH-#1 through TH-#5) at the time of excavating to a depth of at least seven (7) feet beneath existing site grades. However, although groundwater elevations in the area may fluctuate seasonally and may temporarily pond/perch near the ground surface during periods of prolonged and/or heavy rainfall, based on our current understanding of the project, we are generally of the opinion that the reported static groundwater levels in the area of the subject site represent the seasonal high groundwater elevation(s) at and/or near to the subject site.

As such, based on our current understand of the site grading required to bring the subject site to finish design grades, we are of the opinion that an underslab drainage system is not required for the proposed new apartment building structure. However, due to the presence of sandy, clayey silt subgrade soils within the foundation bearing level of the proposed new apartment building structure, we are generally of the opinion that a perimeter footing/foundation drainage system should be used around the perimeter of the proposed apartment structure. Additionally, a foundation drain is recommended for any below grade footing and/or retaining walls. A typical recommended perimeter footing and/or retaining wall drain detail is shown on Figure No. 3.



SCHEMATIC - NOT TO SCALE

NOTES:

1. Filter Fabric to be non-woven geotextile (Amoco 4545, Mirafi 140N, or equivalent)
2. Lay perforated drain pipe on minimum 0.5% gradient, widening excavation as required. Maintain pipe above 2:1 slope, as shown.
3. All-granular backfill is recommended for support of slabs, pavements, etc. (see text for structural fill).
4. Drain gravel to be clean, washed ¾" to 1½" gravel.
5. General backfill to be on-site gravels, or ¾"-0 or 1½"-0 crushed rock compacted to 92% Modified Proctor (AASHTO T-180).
6. Chimney drainage zone to be 12" wide (minimum) zone of clean washed, medium to coarse sand or drain gravel if protected with filter fabric. Alternatively, prefabricated drainage structures (Miradrain 6000 or similar) may be used.

TYPICAL PERIMETER FOOTING/RETAINING WALL DRAIN DETAIL

Project No. 1213.020.G

**NEWBERG APARTMENTS SITE
TL 800, EAST HAWORTH AVENUE**

Figure No. 3

Design Infiltration Rates

Based on the results of our field infiltration testing, we recommend using the following infiltration rate to design any on-site near surface storm water infiltration and/or disposal systems for the project:

Subgrade Soil Type	Recommended Infiltration Rate
Sandy, clayey SILT (ML)	0.2 inches per hour (in/hr)

Note: A safety factor of two (2) was used to calculate the above recommended design infiltration rate. Additionally, given the gradational variability of the on-site sandy, clayey sit subgrade soils beneath the site as well as the anticipation of some site grading for the project, it is generally recommended that field testing be performed during and/or following construction of any on-site storm water infiltration system(s) in order to confirm that the above recommended design infiltration rates are appropriate.

Seismic Design Considerations

Structures at the site should be designed to resist earthquake loading in accordance with the methodology described in the 2019 and/or latest edition of the State of Oregon Structural Specialty Code (OSSC), ASCE 7-16 and/or Amendments to the 2018 International Building Code (IBC). The maximum considered earthquake ground motion for short period and 1.0 period spectral response may be determined from the Oregon Structural Specialty Code, ASCE 7-16 and/or the 2015 National Earthquake Hazard Reduction Program (NEHRP) "Recommended Provisions for Seismic Regulations for New Buildings and Other Structures" published by the Building Seismic Safety Council. We recommend Site Class "D" be used for design.

Using this information, the structural engineer can select the appropriate site coefficient values (Fa and Fv) from ASCE 7-17 or the 2018 IBC to determine the maximum considered earthquake spectral response acceleration for the project. However, we have assumed the following response spectrum for the project:

Table 1. IBC Seismic Design Parameters

Site Class	S _s	S ₁	F _a	F _v	S _{M5}	S _{M1}	S _{D5}	S _{D1}
D	0.850	0.410	1.160	1.890	0.986	0.776	0.658	0.517

Notes: 1. S_s and S₁ were established based on the USGS 2015 mapped maximum considered earthquake spectral acceleration maps for 2% probability of exceedence in 50 years.

2. F_a and F_v were established based on ASCE 7-16 using the selected S_s and S₁ values.

CONSTRUCTION MONITORING AND TESTING

We recommend that **Redmond Geotechnical Services, LLC** be retained to provide construction monitoring and testing services during all earthwork operations for the proposed new Newberg Apartments building project. The purpose of our monitoring services would be to confirm that the site conditions reported herein are as anticipated, provide field recommendations as required based on the actual conditions encountered, document the activities of the grading contractor and assess his/her compliance with the project specifications and recommendations. It is important that our representative meet with the contractor prior to grading to help establish a plan that will minimize costly over-excavation and site preparation work. Of primary importance will be observations made during site preparation, structural fill placement, footing excavations and construction as well as any retaining wall backfill.

CLOSURE AND LIMITATIONS

This report is intended for the exclusive use of the addressee and/or their representative(s) to use to design and construct the proposed new Newberg Apartments structure and the associated site improvements described herein as well as to prepare any related construction documents. The conclusions and recommendations contained in this report are based on site conditions as they presently exist and assume that the explorations are representative of the subsurface conditions between the explorations and/or across the study area. The data, analyses, and recommendations herein may not be appropriate for other structures and/or purposes. We recommend that parties contemplating other structures and/or purposes contact our office. In the absence of our written approval, we make no representation and assume no responsibility to other parties regarding this report. Additionally, the above recommendations are contingent on Redmond Geotechnical Services, LLC being retained to provide all site inspections and construction monitoring services for this project. Redmond Geotechnical Services, LLC will not assume any responsibility and/or liability for any engineering judgment, inspection and/or testing services performed by others.

It is the owners/developers responsibility for insuring that the project designers and/or contractors involved with this project implement our recommendations into the final design plans, specifications and/or construction activities for the project. Further, in order to avoid delays during construction, we recommend that the final design plans and specifications for the project be reviewed by our office to evaluate as to whether our recommendations have been properly interpreted and incorporated into the project. If during any future site grading and construction, subsurface conditions different from those encountered in the explorations are observed or appear to be present beneath excavations, we should be advised immediately so that we may review these conditions and evaluate whether modifications of the design criteria are required. We also should be advised if significant modifications of the proposed site development are anticipated so that we may review our conclusions and recommendations.

LEVEL OF CARE

The services performed by the Geotechnical Engineer for this project have been conducted with that level of care and skill ordinarily exercised by members of the profession currently practicing in the area under similar budget and time restraints. No warranty or other conditions, either expressed or implied, is made.

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Appendix A

Test Pit Logs and Laboratory Data

APPENDIX

FIELD EXPLORATIONS AND LABORATORY TESTING

FIELD EXPLORATION

Subsurface conditions at the site were explored by excavating five (5) exploratory test holes on August 20, 2022. The approximate location of the test hole explorations are shown in relation to the proposed and/or existing site improvements on the Site Exploration Plan, Figure No. 2.

The test holes were excavated using tracked excavating equipment in general conformance with ASTM Methods in Vol. 4.08, D-1586-94 and D-1587-83. The test holes were excavated to a depth of between four (4) and seven (7) feet beneath existing site grades. Detailed logs of the test holes are presented on the Log of Test Pits, Figure No's. A-5 through A-7. The soils were classified in accordance with the Unified Soil Classification System (USCS), which is outlined on Figure No. A-4.

The exploration program was coordinated by a field engineer who monitored the excavating and exploration activity, obtained representative samples of the subsurface soils encountered, classified the soils by visual and textural examination, and maintained a continuous log of the subsurface conditions. Disturbed and/or undisturbed samples of the subsurface soils were obtained at appropriate depths and/or intervals and placed in plastic bags and/or with a thin walled ring sample.

Groundwater was not encountered within any of the exploratory test holes at the time of excavating to depths of up to seven (7) feet beneath existing site grades.

LABORATORY TESTING

Pertinent physical and engineering characteristics of the soils encountered during our subsurface investigation were evaluated by a laboratory testing program to be used as a basis for selection of soil design parameters and for correlation purposes. Selected tests were conducted on representative soil samples. The program consisted of tests to evaluate the existing (in-situ) moisture-density, maximum density and optimum moisture content, gradational characteristics and Atterberg Limits as well as consolidation and "R"-value tests.

Dry Density and Moisture Content Determinations

Density and moisture content determinations were performed on both disturbed and relatively undisturbed samples from the test hole exploration in general conformance with ASTM Vol. 4.08 Part D-216. The results of these tests were used to calculate existing overburden pressures and to correlate strength and compressibility characteristics of the soils. Test results are shown on the test pit log at the appropriate sample depths.

Maximum Dry Density

One (1) Maximum Dry Density and Optimum Moisture Content test was performed on a representative sample of the on-site sandy, clayey silt subgrade soils in accordance with ASTM Vol. 4.08 Part D-1557. The test was conducted to help establish various engineering properties for use as structural fill materials at the site. The test results are shown on Figure No. A-8.

Gradation Analysis

Gradation analyses were performed on a representative sample of the sandy, clayey silt subgrade soils in accordance with ASTM Vol. 4.08 Part D-422. The test results were used to help classify the soil in accordance with the Unified Soil Classification System (USCS). The test results are shown graphically on Figure No. A-9.

Atterberg Limits

One (1) Liquid Limit (LL) and Plastic Limit (PL) test was performed on a representative sample of the sandy, clayey silt subgrade soils in accordance with ASTM Vol. 4.08 Part D-4318-85. These tests were conducted to facilitate classification of the soils and for correlation purposes. The test results appear on Figure No. A-10.

Consolidation Test

One (1) Consolidation test was performed on a representative sample of the sandy, clayey silt subgrade soil to assess the compressibility characteristics of the underlying subgrade soils in accordance with ASTM Vol. 4.08 Part D-2435-80.

Conventional loading increments of 100, 200, 400, ... 12,800 psf were applied after the 100 percent time of primary consolidation was identified for each loading increment. The samples were unloaded and allowed to rebound after the completion of the loading sequence. Deflection versus time readings were recorded for all load increments from 100 through 12,800 psf. The deflection corresponding to 100 percent primary consolidation was plotted on the consolidation strain versus consolidation pressure curve, which is presented on Figure No. A-11.

"R"-Value Tests

One (1) "R"-value test was performed on a remolded subgrade soil sample in accordance with ASTM Vol. 4.08 Part D-2844. The test results were used to help evaluate the subgrade soils supporting and performance capabilities when subjected to traffic loading. The test results are shown on Figure No. A-12.

A-3

The following figures are attached and complete the Appendix:

Figure No. A-4	Key To Exploratory Boring Logs
Figure No's. A-5 through A-7	Log of Test Pits
Figure No. A-8	Maximum Dry Density Test Results
Figure No. A-9	Gradation Test Results
Figure No. A-10	Atterberg Limits Test Results
Figure No. A-11	Consolidation Test Results
Figure No. A-12	"R" Resistance Test Results

PRIMARY DIVISIONS			GROUP SYMBOL	SECONDARY DIVISIONS
COARSE GRAINED SOILS MORE THAN HALF OF MATERIAL IS LARGER THAN NO. 200 SIEVE SIZE	GRAVELS MORE THAN HALF OF COARSE FRACTION IS LARGER THAN NO. 4 SIEVE	CLEAN GRAVELS (LESS THAN 5% FINES)	GW	Well graded gravels, gravel-sand mixtures, little or no fines.
		GRAVEL WITH FINES	GP	Poorly graded gravels or gravel-sand mixtures, little or no fines.
			GM	Silty gravels, gravel-sand-silt mixtures, non-plastic fines.
		GC	Clayey gravels, gravel-sand-clay mixtures, plastic fines.	
	SANDS MORE THAN HALF OF COARSE FRACTION IS SMALLER THAN NO. 4 SIEVE	CLEAN SANDS (LESS THAN 5% FINES)	SW	Well graded sands, gravelly sands, little or no fines.
		SANDS WITH FINES	SP	Poorly graded sands or gravelly sands, little or no fines.
			SM	Silty sands, sand-silt mixtures, non-plastic fines.
			SC	Clayey sands, sand-clay mixtures, plastic fines.
FINE GRAINED SOILS MORE THAN HALF OF MATERIAL IS SMALLER THAN NO. 200 SIEVE SIZE	SILTS AND CLAYS LIQUID LIMIT IS LESS THAN 50%		ML	Inorganic silts and very fine sands, rock flour, silty or clayey fine sands or 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 IS GREATER THAN 50%		MH	Inorganic silts, micaceous or diatomaceous fine sandy or silty soils, elastic silts.
			CH	Inorganic clays of high plasticity, fat clays.
			OH	Organic clays of medium to high plasticity, organic silts.
HIGHLY ORGANIC SOILS			Pt	Peat and other highly organic soils.

DEFINITION OF TERMS

SILTS AND CLAYS	SAND			GRAVEL		COBBLES	BOULDERS
	FINE	MEDIUM	COARSE	FINE	COARSE		
	200	40	10	4	3/4"	3"	12"

GRAIN SIZES

SANDS, GRAVELS AND NON-PLASTIC SILTS	BLOWS/FOOT †
VERY LOOSE	0 - 4
LOOSE	4 - 10
MEDIUM DENSE	10 - 30
DENSE	30 - 50
VERY DENSE	OVER 50

CLAYS AND PLASTIC SILTS	STRENGTH ‡	BLOWS/FOOT †
VERY SOFT	0 - 1/4	0 - 2
SOFT	1/4 - 1/2	2 - 4
FIRM	1/2 - 1	4 - 8
STIFF	1 - 2	8 - 16
VERY STIFF	2 - 4	16 - 32
HARD	OVER 4	OVER 32

RELATIVE DENSITY

† Number of blows of 140 pound hammer falling 30 inches to drive a 2 inch O.D. (1-3/8 inch I.D.) split spoon (ASTM D-1586).

‡ Unconfined compressive strength in tons/sq. ft. as determined by laboratory testing or approximated by the standard penetration test (ASTM D-1586), pocket penetrometer, torvane, or visual observation.

CONSISTENCY



**REDMOND
GEOTECHNICAL
SERVICES**
PO Box 20547 • PORTLAND, OREGON 97294

KEY TO EXPLORATORY TEST PIT LOGS
Unified Soil Classification System (ASTM D-2487)

NEWBERG APARTMENTS SITE
TL 800, EAST HAWORTH AVENUE

PROJECT NO.	DATE	Figure A-4
!@!#.)@).G	11/09/22	

DEPTH (FEET)	BAG SAMPLE	DENSITY TEST	DRY DENSITY (pcf)	MOISTURE CONTENT (%)	SOIL CLASS. (U.S.C.S.)	SOIL DESCRIPTION
						TEST PIT NO. TH-#1 ELEVATION 205'±
0					ML	Dark brown, wet, soft, organic, sandy, clayey SILT (Topsoil)
X				21.1	ML	Medium to olive-brown with gray mottling, very moist, medium stiff, sandy, clayey SILT
5	X			20.6		
						Total Depth = 6.0 feet No groundwater encountered at time of exploration
10						
15						

						TEST PIT NO. TH-#2 ELEVATION 207'±
0					ML	Dark brown, wet, soft, organic, sandy, clayey SILT (Topsoil)
					ML	Medium to olive-brown with gray mottling, very moist, medium stiff, sandy, clayey SILT
5						
						Total Depth = 7.0 feet No groundwater encountered at time of exploration
10						
15						

LOG OF TEST PITS

PROJECT NO. 1213.020.G	NEWBERG APARTMENTS SITE	FIGURE NO. A-5
------------------------	-------------------------	----------------

DEPTH (FEET)	BAG SAMPLE	DENSITY TEST	DRY DENSITY (pcf)	MOISTURE CONTENT (%)	SOIL CLASS. (U.S.C.S.)	SOIL DESCRIPTION
						TEST PIT NO. TH-#3 ELEVATION 207'±
0					ML	Dark brown, wet, soft, organic, sandy, clayey SILT (Topsoil)
	X			20.7	ML	Medium to olive-brown with gray mottling, very moist, medium stiff, sandy, clayey SILT
5	X			19.8		
						Total Depth = 6.0 feet No groundwater encountered at time of exploration

						TEST PIT NO. TH-#4 ELEVATION 206'±
0					ML	Dark brown, wet, soft, organic, sandy, clayey SILT (Topsoil)
	X			19.8	ML	Medium to olive-brown with gray mottling, very moist, medium stiff, sandy, clayey SILT
5						
						Total Depth = 7.0 feet No groundwater encountered at time of exploration

LOG OF TEST PITS

PROJECT NO. 1213_020_C	NEWBERG APARTMENTS SITE	FIGURE NO. A-6
------------------------	-------------------------	----------------

BACKHOE COMPANY: Blackhorn Excavation BUCKET SIZE: 24 inches DATE: 10/20/22

DEPTH (FEET)	BAG SAMPLE	DENSITY TEST	DRY DENSITY (pcf)	MOISTURE CONTENT (%)	SOIL CLASS. (U.S.C.S.)	SOIL DESCRIPTION
						TEST PIT NO. TH-#5 ELEVATION 205'±
0					ML	FILL" Medium to olive-brown, very moist to wet, medium stiff (moderately Compacted), sandy, clayey SILT
5						Total Depth = 4.0 feet No groundwater encountered at time of exploration
10						
15						

TEST PIT NO.						ELEVATION					
0											
5											
10											
15											

LOG OF TEST PITS

PROJECT NO. 1213.020.G NEWBERG APARTMENTS SITE FIGURE NO. A-7

MAXIMUM DENSITY TEST RESULTS

SAMPLE LOCATION	SOIL DESCRIPTION	MAXIMUM DRY DENSITY (pcf)	OPTIMUM MOISTURE CONTENT (%)
TH-#3 @ 2.5'	Medium to olive-brown, sandy, clayey, SILT (ML)	108.0	15.0

EXPANSION INDEX TEST RESULTS

SAMPLE LOCATION	INITIAL MOISTURE (%)	COMPACTED DRY DENSITY (pcf)	FINAL MOISTURE (%)	VOLUMETRIC SWELL (%)	EXPANSION INDEX	EXPANSIVE CLASS.

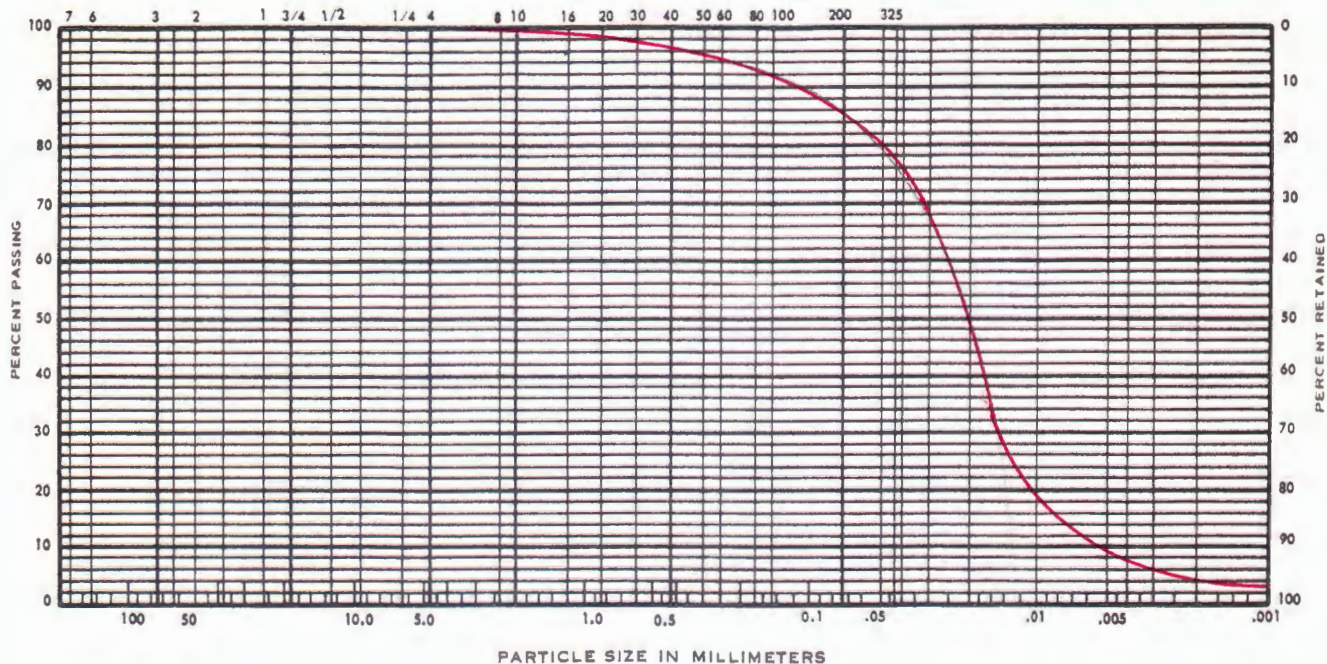
MAXIMUM DENSITY & EXPANSION INDEX TEST RESULTS

PROJECT NO.: 1213.020.G	NEWBERG APARTMENTS SITE	FIGURE NO.: A-8
-------------------------	-------------------------	-----------------

UNIFIED SOIL CLASSIFICATION SYSTEM

(ASTM D 422-72)

U. S. STANDARD SIEVE SIZES



COBBLES	GRAVEL		SAND			SILT AND CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

KEY SYMBOL	BORING NO.	SAMPLE DEPTH (feet)	ELEV. (feet)	UNIFIED SOIL CLASSIFICATION SYMBOL	SAMPLE DESCRIPTION
—	TH-#3	2.5		ML	Medium to olive-brown, sandy, clayey SILT

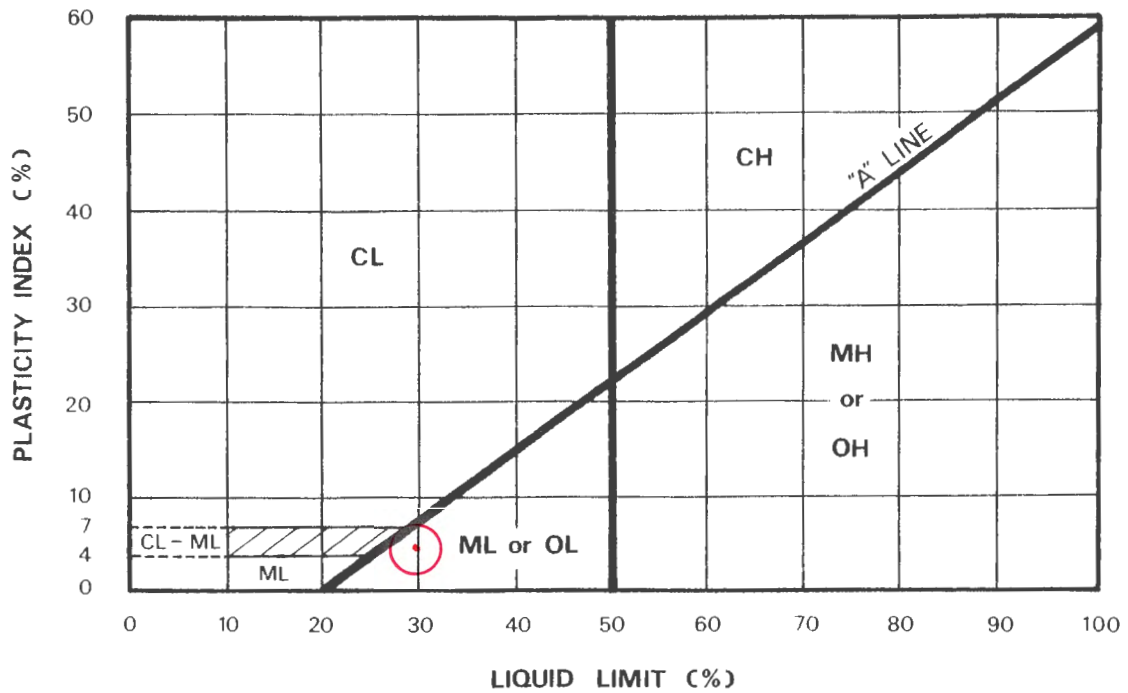


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GRADATION TEST DATA

NEWBERG APARTMENTS SITE
TL 800, EAST HAWORTH AVENUE

PROJECT NO.	DATE	FIGURE
1213.020.G	11/09/22	A-9



KEY SYMBOL	BORING NO.	SAMPLE DEPTH (feet)	NATURAL WATER CONTENT %	LIQUID LIMIT %	PLASTICITY INDEX %	PASSING NO. 200 SIEVE %	LIQUIDITY INDEX	UNIFIED SOIL CLASSIFICATION SYMBOL
●	TH-#3	2.5	20.7	29.9	5.3	85.3		ML

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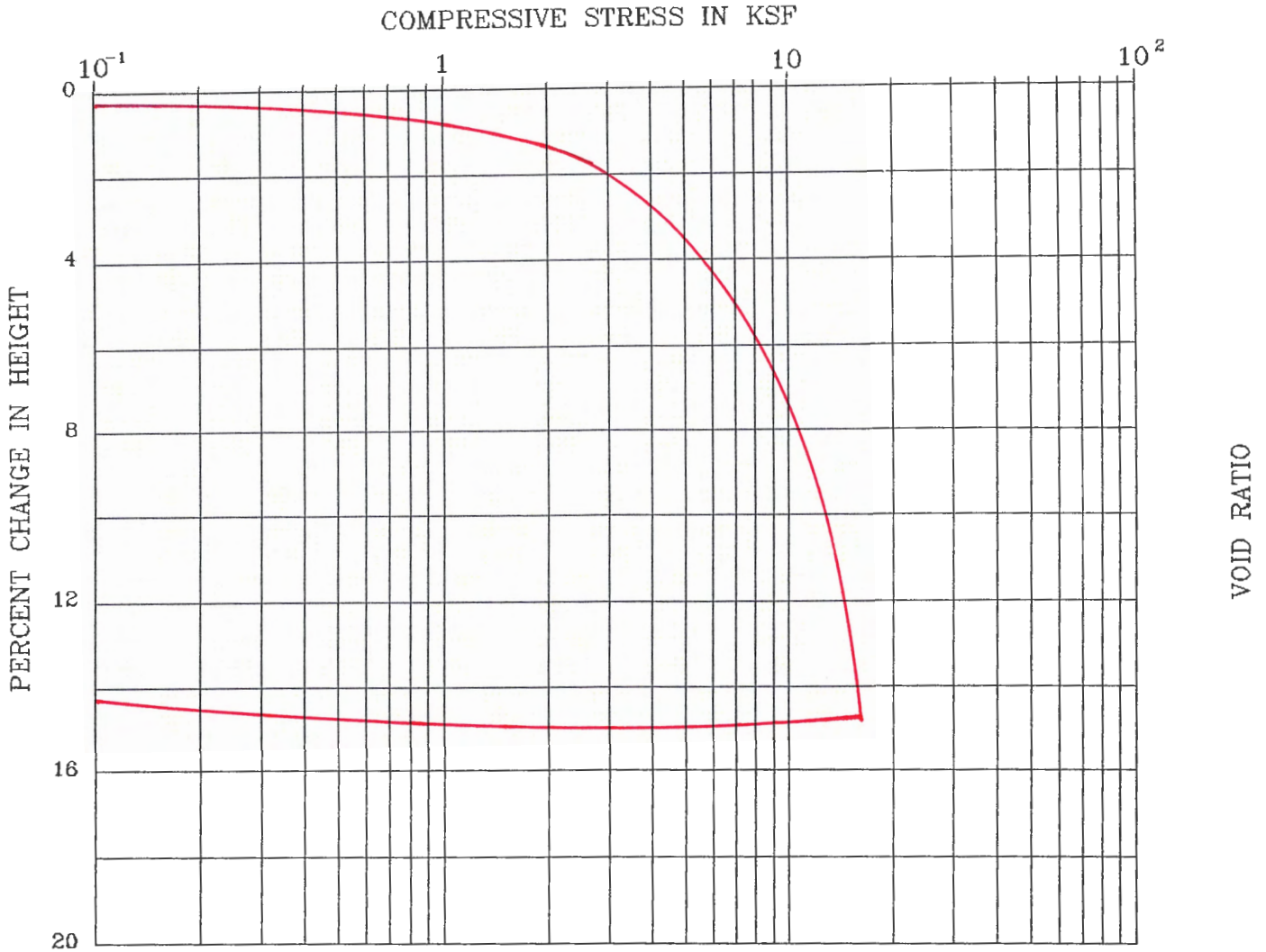
PLASTICITY CHART AND DATA

NEWBERG APARTMENTS SITE
TL 800, east haworth avenue

PROJECT NO.
1213.020.G

DATE
11/09/22

Figure A-10



BORING : TH-#3	DESCRIPTION : sandy, clayey SILT (ML)
DEPTH (ft) : 2.5	LIQUID LIMIT : 29.9
SPEC. GRAVITY : 2.5 (assumed)	PLASTIC LIMIT : 24.6

	<u>MOISTURE CONTENT (%)</u>	<u>DRY DENSITY (pcf)</u>	<u>PERCENT SATURATION</u>	<u>VOID RATIO</u>
INITIAL	20.7	88.4	81.1	
FINAL	13.3	107.7	93.6	



CONSOLIDATION TEST DATA

NEWBERG APARTMENTS SITE
TL 800, EAST HAWORTH AVENUE

PROJECT NO.	DATE	Figure A-11
1213.020.G	11/09/22	

RESULTS OF R (RESISTANCE) VALUE TESTS

SAMPLE LOCATION: TH-#4

SAMPLE DEPTH: 2.0 feet bgs

Specimen	A	B	C
Exudation Pressure (psi)	214	328	436
Expansion Dial (0.0001")	0	0	1
Expansion Pressure (psf)	0	0	3
Moisture Content (%)	20.6	16.4	12.1
Dry Density (pcf)	103.7	107.2	111.5
Resistance Value, "R"	18	33	45
"R"-Value at 300 psi Exudation Pressure = 32			

SAMPLE LOCATION:

SAMPLE DEPTH:

Specimen	A	B	C
Exudation Pressure (psi)			
Expansion Dial (0.0001")			
Expansion Pressure (psf)			
Moisture Content (%)			
Dry Density (pcf)			
Resistance Value "R"			
"R"-Value at 300 psi Exudation Pressure =			

Figure No. A-12

FIRE FLOW

SITE: Haworth and N Springbrook Rd

Newberg, Oregon

November 8, 2022 @ 09:30

Whitnessed by Vance Barton, City of Newberg

FLOW RESULTS ARE AS FOLLOWS:

91psi Static

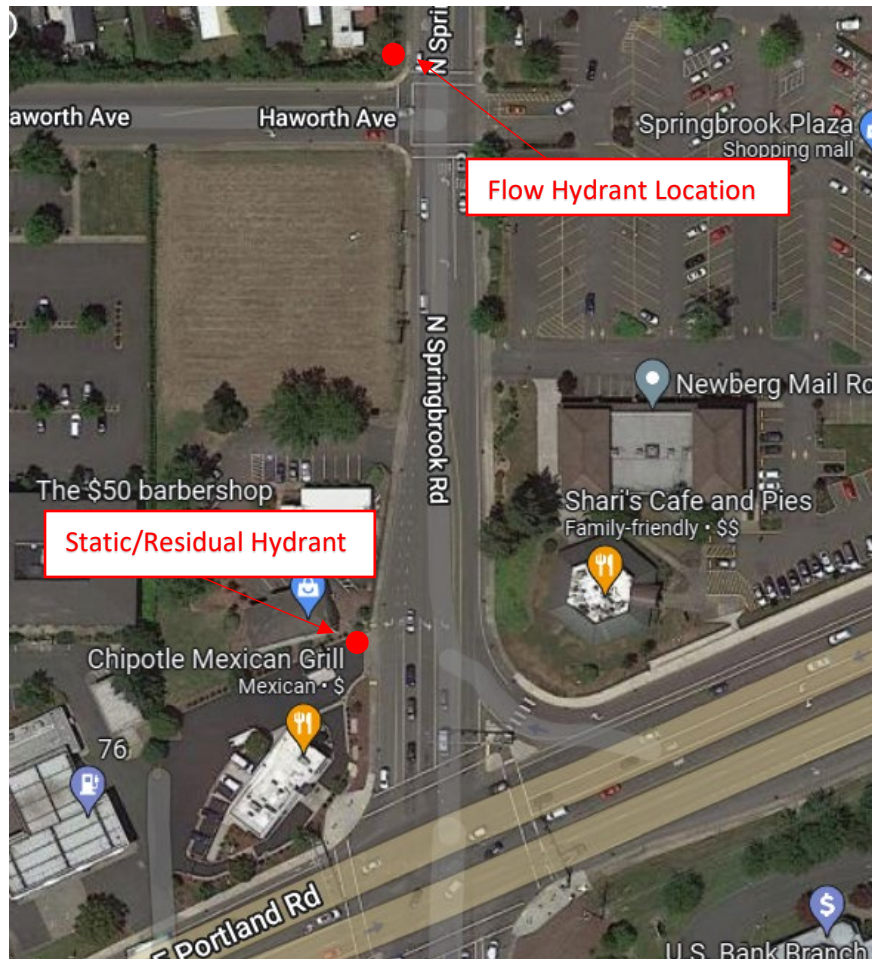
90psi Residual

85psi Pitot

1547 GPM

2.5" Nozzle I.D.

0.90 Nozzle Coefficient



THE HAWORTH

A 28-UNIT MULTI-FAMILY RESIDENTIAL DEVELOPMENT

TAX LOT 00800, MAP R3216CB
NEWBERG, OR 97132

SITE INFORMATION

ADDRESS: NO ADDRESS
1/4 SECTION MAP: R3216CB
TAX LOT: 00800
TOTAL SITE AREA: 0.82 AC
ZONING: C-2 (COMMUNITY COMMERCIAL)

VERTICAL DATUM

BASIS OF BEARING: ELEVATIONS ARE BASED ON GEODETIC CONTROL POINT STATION NO. 22, A BRASS DISC ON 1" IP IN MONUMENT CASE. DISC IS 4" BELOW PAVEMENT SURFACE. POINT IS THE NORTHEAST CORNER OF THE RICHARD EVEREST DONATION LAND CLAIM #52, ON THE WESTERLY LINE OF THE SEBASTIAN BRUTSCHER DONATION LAND CLAIM #51.

ELEVATION: 223.444'

BASIS OF ELEVATION: NAVD 88

UTILITY COMPANIES

WATER - CITY OF NEWBERG
SEWER - CITY OF NEWBERG
STORM - CITY OF NEWBERG
GAS - NORTHWEST NATURAL
ELECTRIC - PORTLAND GENERAL ELECTRIC
TELEPHONE - FRONTIER
CABLE TV - COMCAST/FRONTIER

PROJECT CONTACTS

APPLICANT
GROVE DEVELOPMENT, INC.
7570 SW 74th AVENUE
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CONTACT: GROVE HUNT

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9020 SW WASHINGTON SQ. RD., STE 170
PORTLAND, OR 97223
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CONTACT: MATTHEW SPRAGUE

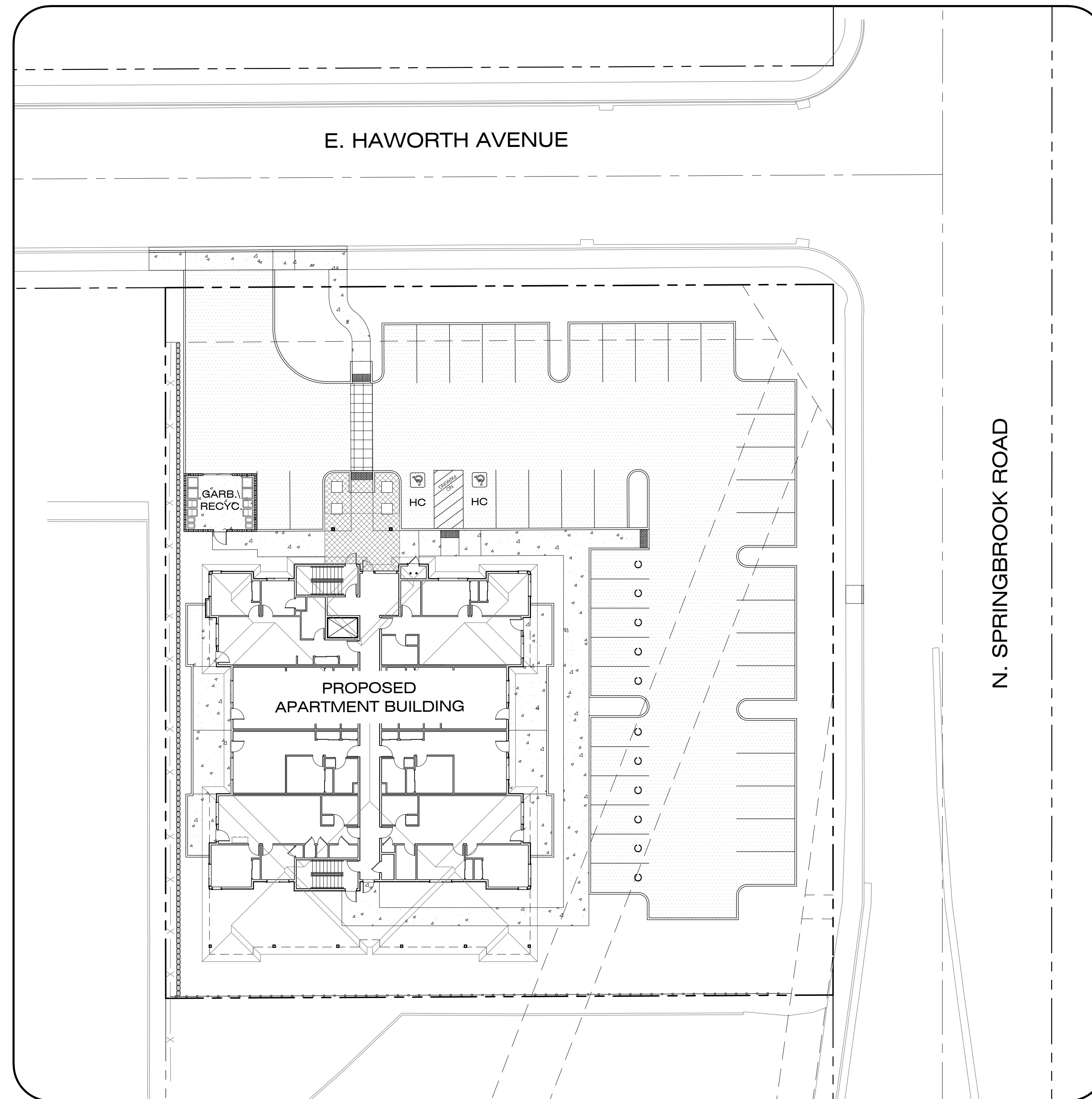
ARCHITECT
OLSON GROUP ARCHITECTS PC
17150 SW UPPER BOONES FERRY ROAD
DURHAM, OR 97224
P: (503) 620-9870
E: design@olsongrouparchitects.com
CONTACT: CURT OLSON

LANDSCAPE ARCHITECT
PIONEER DESIGN GROUP, INC.
9020 SW WASHINGTON SQ. RD., STE 170
PORTLAND, OR 97223
P: (503) 643-8286
E: bholmes@pd-grp.com
CONTACT: BEN HOLMES

OWNER
PATRICK R. AND ELAINE A. MAVEETY
4604 COOPERS HAWK ROAD
KLAMATH FALLS, OR 97601

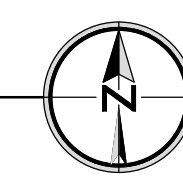
ATTENTION: Oregon law requires you to follow rules adopted by the Oregon Utility Notification Center. Those rules are set forth in OAR 952-001-0001 through 952-001-0090. You may obtain copies of the rules by calling the center.

NOTE: The telephone number for the Oregon Utility Notification Center is (503) 232-1987.



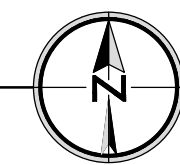
SITE MAP

1"=20'



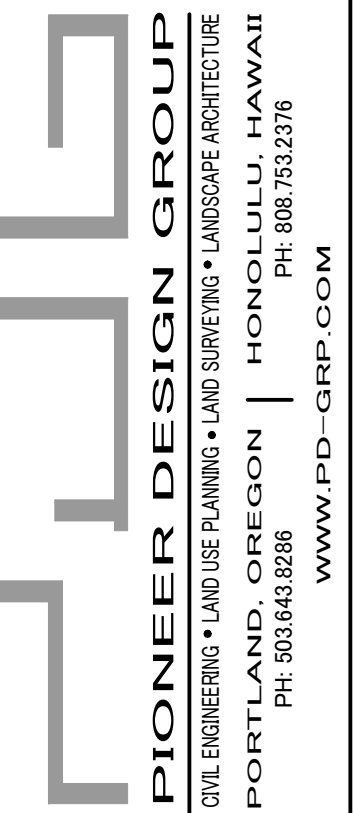
VICINITY MAP

NTS



SHEET INDEX

SHEET NUMBER	SHEET DESCRIPTION
P1.0	COVER SHEET
P2.0	EXISTING CONDITIONS AND DEMOLITION PLAN
P3.0	PRELIMINARY GRADING AND EROSION CONTROL PLAN
P4.0	PRELIMINARY SITE PLAN
P5.0	PRELIMINARY COMPOSITE UTILITY PLAN
P6.0	AERIAL AND CIRCULATION PLAN (SITE ANALYSIS DIAGRAM)
L1.0 - L1.1	PRELIMINARY LANDSCAPE PLAN, LEGENDS, DETAILS & NOTES



PRELIMINARY

COVER SHEET

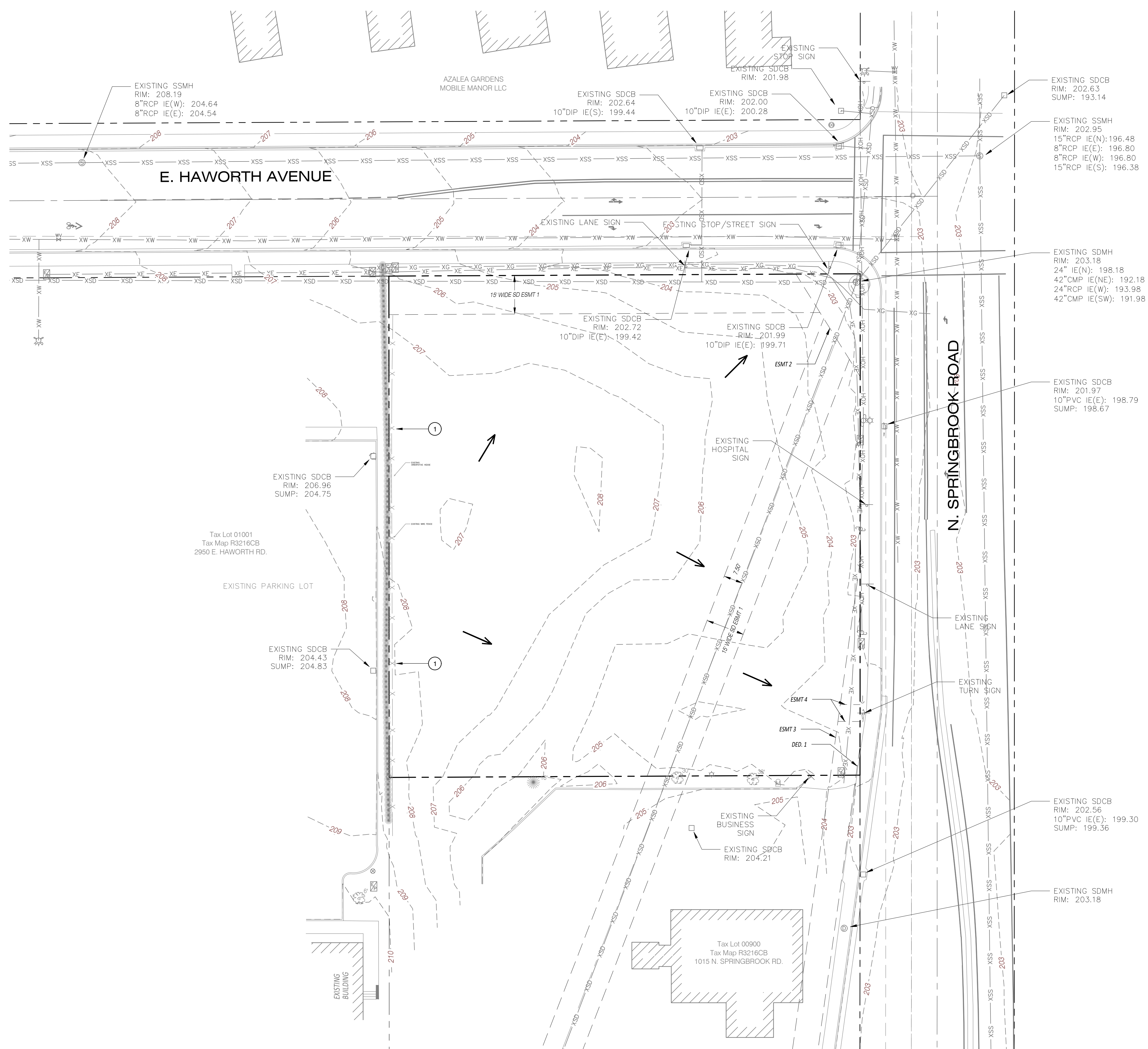
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		11/2022			11/2022			11/2022	

Project No. 121-029
Horiz. Scale:
Vert. Scale:

By	Revision	Date

Project
THE HAWORTH
No.
121-029
Type
PLANNING
Sheet

P1.0



LEGEND

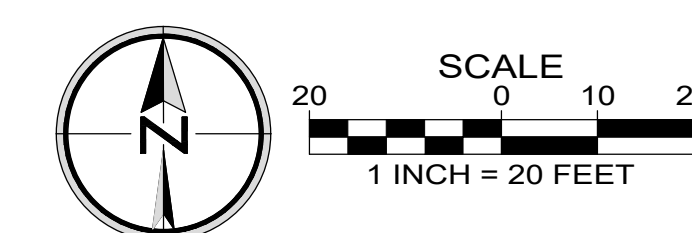
	RIGHT-OF-WAY LINE
	BOUNDARY LINE
	EXISTING LOT LINE
	CENTER LINE
	EASEMENT LINE
	STORM DRAINAGE LINE
	SANITARY SEWER LINE
	WATER LINE
	GAS LINE
	COMMUNICATION LINE
	UNDERGROUND POWER LINE
	OVERHEAD WIRE
	WOOD FENCE (AS NOTED)
	EXISTING 2' CONTOUR
	EXISTING 10' CONTOUR
	CONIFEROUS TREE (DBH)
	DECIDUOUS TREE (DBH)
	EXISTING TREES TO BE REMOVED
	EXISTING CONCRETE
	EXISTING ASPHALT PAVEMENT
	EXISTING BUILDING
	CATCH BASIN/DRAIN INLET
	STORM MANHOLE
	SANITARY MANHOLE
	WATER VALVE
	FIRE HYDRANT ASSEMBLY
	WATER METER
	GAS VALVE
	GAS METER
	STREET SIGN
	MAILBOX
	ELECTRIC PEDESTAL
	ELECTRIC VAULT
	TELECOMMUNICATION VAULT
	TELECOMMUNICATION PEDESTAL
	UTILITY VAULT
	UTILITY PEDESTAL
	POWER POLE
	GUY WIRE
	POWER POLE W/LIGHT
	DRAINAGE FLOW DIRECTION

CONSTRUCTION NOTES

① EXISTING FENCE TO REMAIN.

EASEMENT AND DEDICATION LEGEND

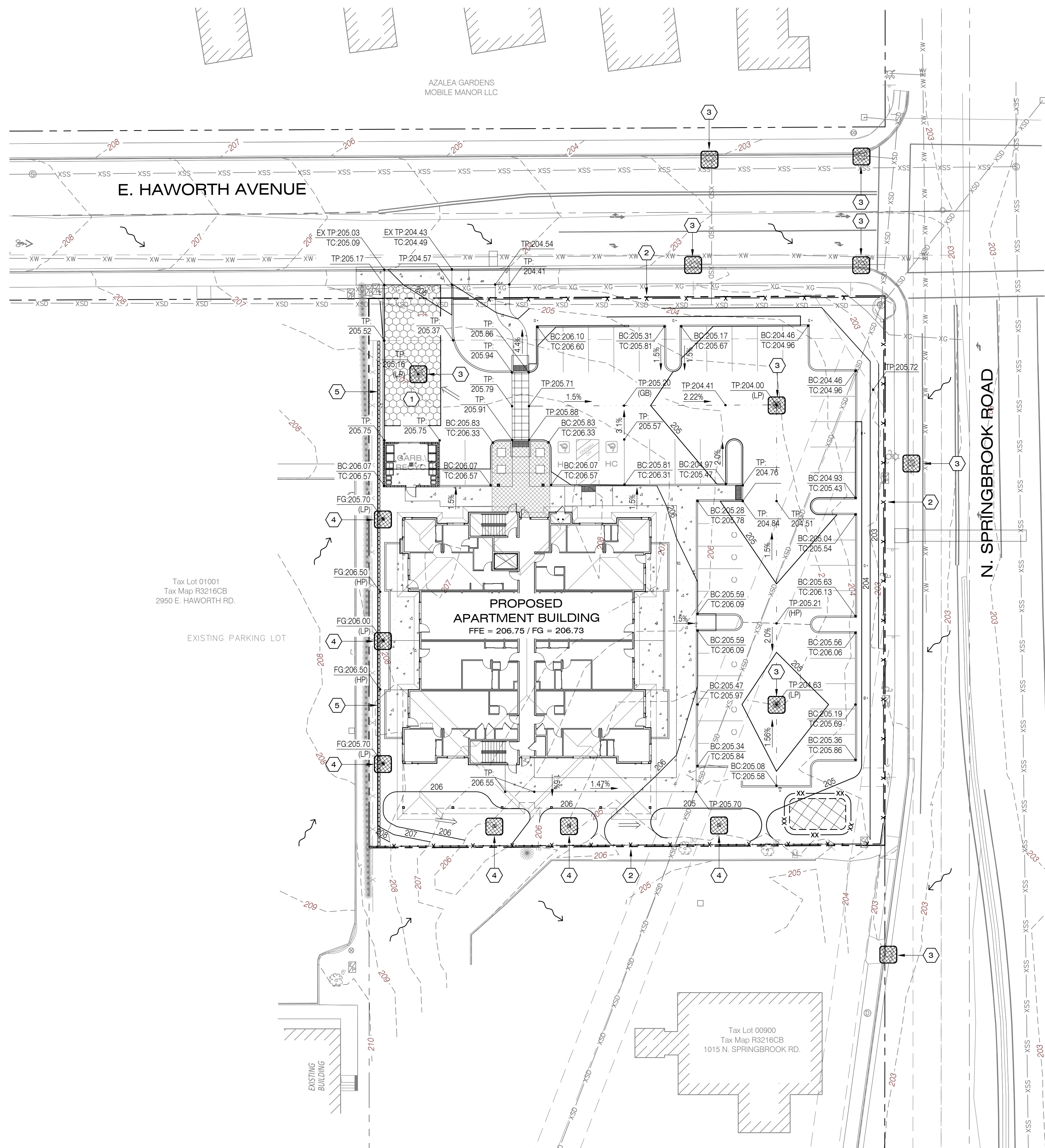
ESMT. 1	15' WIDE PUBLIC STORM SEWER EASEMENTS PER PARTITION PLAT NO. 97-5
ESMT. 2	SLOPE AND DRAINAGE FACILITY EASEMENT PER FILM VOL 146, PG 430
ESMT. 3	EASEMENT AS DESCRIBED BY PARCEL 2 OF RECORD DOCUMENT #200015895, BEING A PERMANENT EASEMENT FOR SLOPES, WATER, GAS, ELECTRIC AND COMMUNICATION SERVICE LINES, FIXTURES AND FACILITIES TO ODOT.
ESMT. 4	EASEMENT AS DESCRIBED BY PARCEL 3 OF RECORD DOCUMENT #200015895, BEING A PERMANENT EASEMENT FOR SIGN TO ODOT
DED. 1	DEDICATION TO ODOT AS DESCRIBED BY PARCEL 1 OF RECORD DOCUMENT #200015895



Designed by	Date	URL
Drawn by	11/2022	
Reviewed by	11/2022	
Project No.	121-029	REF.
Horiz. Scale:		
Vert. Scale:		

No.	Date	Revision

Project: THE HAWORTH
 No.: 121-029
 Type: PLANNING
 Sheet: **P2.0**



LEGEND

- 171 EXISTING 1' CONTOUR
- 175 EXISTING 5' CONTOUR
- 171 PROPOSED 1' CONTOUR
- 175 PROPOSED 5' CONTOUR
- PROPOSED EROSION CONTROL FENCING
- PROPOSED CONSTRUCTION ENTRANCE
- PROPOSED STOCKPILE LOCATION
- PROPOSED INLET PROTECTION (SILT SACK)
- TC: 201.50 TC = TOP OF CURB ELEVATION
- BC: 201.00 BC = BOTTOM OF CURB ELEVATION
- TP: 201.50 TP = TOP OF PAVEMENT ELEVATION
- FG 201.50 FG = FINISH GRADE ELEVATION
- EG: 201.00 EG = EXISTING GROUND ELEVATION
- TW: 201.50 TW = TOP OF WALL ELEVATION
- DRAINAGE FLOW DIRECTION

GRADING NOTES

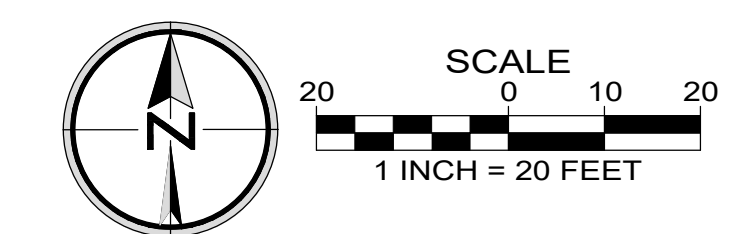
- 1 PROPOSED CONSTRUCTION ENTRANCE. SEE CoN STD. DWG. NO. 601.
- 2 PROPOSED PERIMETER SILT FENCE, TYP. SEE CoN STD. DWG. NO. 602.
- 3 PROPOSED INLET PROTECTION (SILT SACK), TYP. SEE CoN STD. DWG. NO. 604.
- 4 PROPOSED INLET PROTECTION, TYP. SEE CoN STD. DWG. NO. 605.
- 5 PROPOSED ±2.5 FOOT BLOCK LANDSCAPE RETAINING WALL, KEystone OR APPROVED EQUAL.

Tax Lot 01001
Tax Map R3216CB
2950 E. HAWORTH RD.

EXISTING PARKING LOT

PROPOSED APARTMENT BUILDING
FFE = 206.75 / FG = 206.73

Tax Lot 00900
Tax Map R3216CB
1015 N. SPRINGBROOK RD.



PRELIMINARY

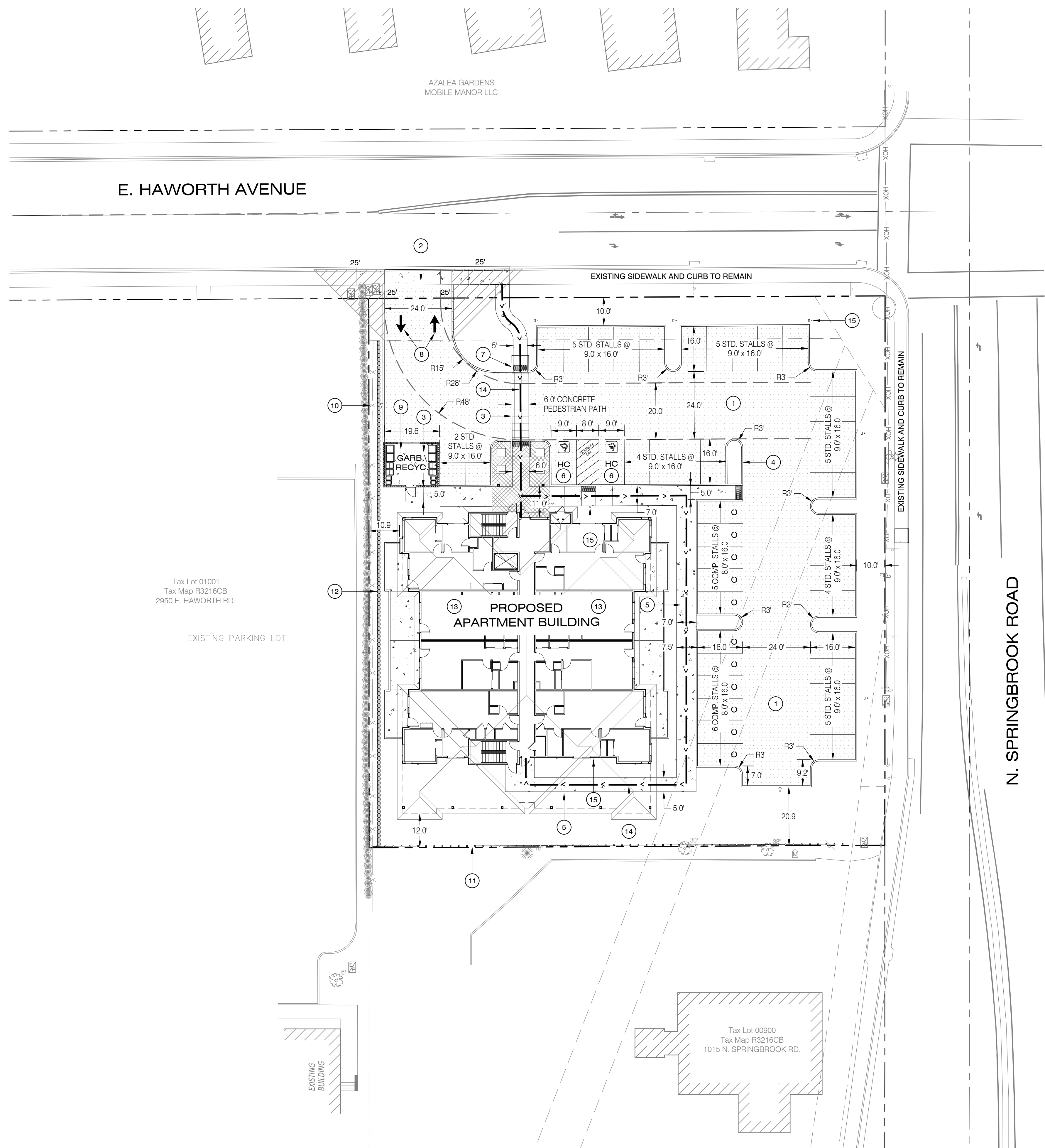
PRELIMINARY GRADING AND EROSION CONTROL PLAN

THE HAWORTH
NEWBERG, OREGON

Designed by	URL	Date	Reviewed by	URL	Date
		11/2022			11/2022
Drawn by			MIS		
Project No.	121-029	REF.			
Horiz. Scale:					
Vert. Scale:					

No.	Date	Revision

Project: THE HAWORTH
No.: 121-029
Type: PLANNING
Sheet:



Tax Lot 01001
Tax Map R3216CB
2950 E. HAWORTH RD.

EXISTING PARKING LOT

AZALEA GARDENS
MOBILE MANOR LLC

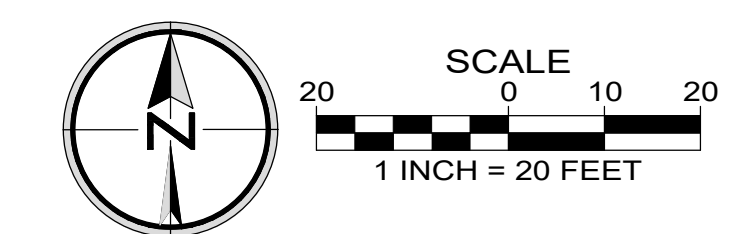
Tax Lot 00900
Tax Map R3216CB
1015 N. SPRINGBROOK RD.

LEGEND

- PROPERTY LINE / BOUNDARY
- ADJACENT PROPERTY LINE / RIGHT-OF-WAY
- CENTERLINE
- PROPOSED BUILDING
- PROPOSED STANDARD CURB
- PROPOSED WOOD FENCE
- PROPOSED AC PAVEMENT
- PROPOSED ON-SITE SIDEWALK
- EXISTING CONCRETE CURB
- EXISTING AC PAVEMENT
- VISION CLEARANCE AREA
- SITE AND BUILDING LIGHTING
- FIRE VEHICLE TURNING RADIUS

CONSTRUCTION NOTES

- 1 STANDARD DUTY AC PAVEMENT
- 2 INSTALL COMMERCIAL DRIVEWAY PER CITY OF NEWBERG STANDARD DETAIL.
- 3 CONCRETE PAVEMENT.
- 4 INSTALL STANDARD VERTICAL CONCRETE CURB.
- 5 CONCRETE SIDEWALK WITH CONTRACTION JOINTS, TYP.
- 6 HANDICAP PARKING STALLS AND SIGNAGE.
- 7 DETECTABLE WARNING.
- 8 DIRECTIONAL ARROWS.
- 9 TRASH ENCLOSURE. SEE ARCHITECTURAL PLANS FOR DETAILS.
- 10 EXISTING WIRE FENCE TO REMAIN.
- 11 72-INCH HIGH SOLID WOOD FENCE
- 12 BLOCK RETAINING WALL.
- 13 SEE ARCHITECTURAL AND STRUCTURAL DRAWINGS FOR BUILDING SPECIFICATIONS AND DETAILS.
- 14 ACCESSIBLE ROUTE.
- 15 SITE LIGHTING (BY OTHERS)



PRELIMINARY

PRELIMINARY SITE PLAN

THE HAWORTH
NEWBERG, OREGON

Designed by	Date	URL	Reviewed by	Date	REF.
	11/2022			11/2022	
Drawn by			MIS		
Project No.	121-029				
Horiz. Scale:					
Vert. Scale:					

No.	Date	Revision

Project
THE HAWORTH
No.
121-029
Type
PLANNING
Sheet

Designed by	URL	Date	Drawn by	URL	Date	Reviewed by	MIS	Date	Project No.	REF.	Horiz. Scale:	Vert. Scale:
		11/2022			11/2022			11/2022	121-029			

No.	Date	Revision

No.	Date	Project
		THE HAWORTH

No.	Date	Type	Sheet
		PLANNING	P5.0

LEGEND

- DW — PROPOSED DOMESTIC WATER LINE
- FW — PROPOSED FIRE SERVICE LINE
- DCDA — PROPOSED DOUBLE CHECK DETECTOR ASSEMBLY
- — PROPOSED CLEANOUT
- — PROPOSED TRAPPED CATCH BASIN
- — PROPOSED LANDSCAPE DRAIN
- SS — PROPOSED SANITARY SEWER LINE
- SD — PROPOSED STORM DRAIN LINE
- ⊙ — PROPOSED FIRE HYDRANT
- ⊙ — PROPOSED FIRE DEPARTMENT CONNECTION (FDC)
- ⊙ — PROPOSED WATER AND IRRIGATION METER
- ⊙ — PROPOSED DOUBLE CHECK ASSEMBLY
- ⊙ — PROPOSED DOUBLE CHECK DETECTOR ASSEMBLY
- — PROPOSED STORM SEWER MANHOLE
- ⊙ — PROPOSED STORMFILTER MANHOLE
- ⊙ — PROPOSED UNDERGROUND DETENTION CHAMBERS

STORM SEWER NOTES

1. INSTALL 60" Ø MANHOLE OVER EXISTING 24" STORM SEWER LINE.
RIM = 203.87
EX. 24" IE IN (E) = 193.85
12" IE IN (SW) = 194.65
EX. 24" IE OUT (W) = 193.65
2. INSTALL 60" FLOW CONTROL MANHOLE.
RIM = TBD
12" IE IN (W) = 194.96
12" IE OUT (NE) = 194.96
3. 7 ROWS OF 7 UNDERGROUND DETENTION CHAMBERS (STORMTECH ADS SC-740)
6" ROCK BASE, 6" ROCK COVER
ROCK BOTTOM ELEV = 198.58
CHAMBER BOTTOM ELEV = 197.08
4. INSTALL 30" Ø NYLOPLAST DRAIN BASIN (STANDARD AASHTO H-20 GRATE)
INSTALL 11 LF 24" ACCESS PIPE WITH 10" MANIFOLD
RIM = TBD
10" IE IN (E) = 198.35
10" IE OUT (N) = 198.35
24" IE OUT (W) = 197.18
5. CONSTRUCT 48" Ø WATER QUALITY STORMFILTER MANHOLE (SFMH-1).
(3-18" CARTRIDGES)
RIM: TBD
6" IE IN (N): 200.75
8" IE IN (S): 200.75
10" IE OUT (W): 198.45
6. CONSTRUCT TRAPPED CATCH BASIN
INSTALL 8 LF 6" PVC D3034
RIM: 204.06
6" IE OUT (S): 200.56
7. CONSTRUCT TRAPPED CATCH BASIN
INSTALL 180 LF 6" PVC D3034
RIM: 204.63
8" IE OUT (N): 201.75
8. CONNECT TO BUILDING ROOF DRAIN WITH 6" SD AT 2.0% MIN.
9. CONSTRUCT TRAPPED CATCH BASIN
INSTALL 23.4 LF 6" PVC D3034
RIM: 205.02
6" IE OUT (S): 201.63
10. CONSTRUCT 48" Ø WATER QUALITY STORMFILTER MANHOLE (SFMH-2).
(3-18" CARTRIDGES)
RIM: TBD
6" IE IN (W): 201.16
6" IE IN (S): 201.16
10" IE OUT (E): 198.86
11. INSTALL 30" Ø NYLOPLAST DRAIN BASIN (STANDARD AASHTO H-20 GRATE)
INSTALL 11 LF 24" ACCESS PIPE WITH 10" MANIFOLD
RIM = TBD
8" IE IN (W) = 198.52
10" IE OUT (S) = 198.35
24" IE OUT (E) = 197.18
12. CONSTRUCT 12" SQ. LANDSCAPE AREA DRAIN WITH ATRIUM GRATE (ADS PART NOS. 1200, 1290, AND 1242 OR EQUAL).
13. CONSTRUCT 12" SQ. LANDSCAPE AREA DRAIN WITH ATRIUM GRATE (ADS PART NOS. 1200, 1290, AND 1242 OR EQUAL).

GENERAL UTILITY NOTES

1. INSTALL CLEANOUTS EVERY 100' AND AT ALL BENDS 45° OR GREATER.
2. ALL ONSITE SANITARY AND STORM SEWER SYSTEMS SHALL BE PRIVATE.
3. THE CONTRACTOR SHALL FIELD VERIFY THE LOCATION OF EXISTING UTILITIES PRIOR TO BEGINNING CONSTRUCTION.
4. STUB DOMESTIC WATER CONNECTION AND FIRE LINE 5.0 FEET FROM BUILDING. REFER TO PLUMBING PLANS FOR CONTINUATION.
5. RESTRAINT JOINTS SHALL MEET OREGON STATE PLUMBING CODE AND NFPA SECTION 10.8
6. COORDINATE WATER AND SEWER UTILITY LOCATIONS AT BUILDING WITH PLUMBING PLANS.

WATER NOTES

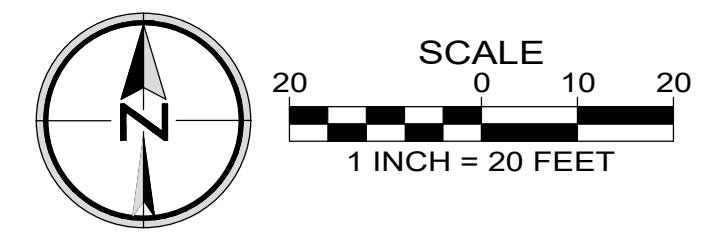
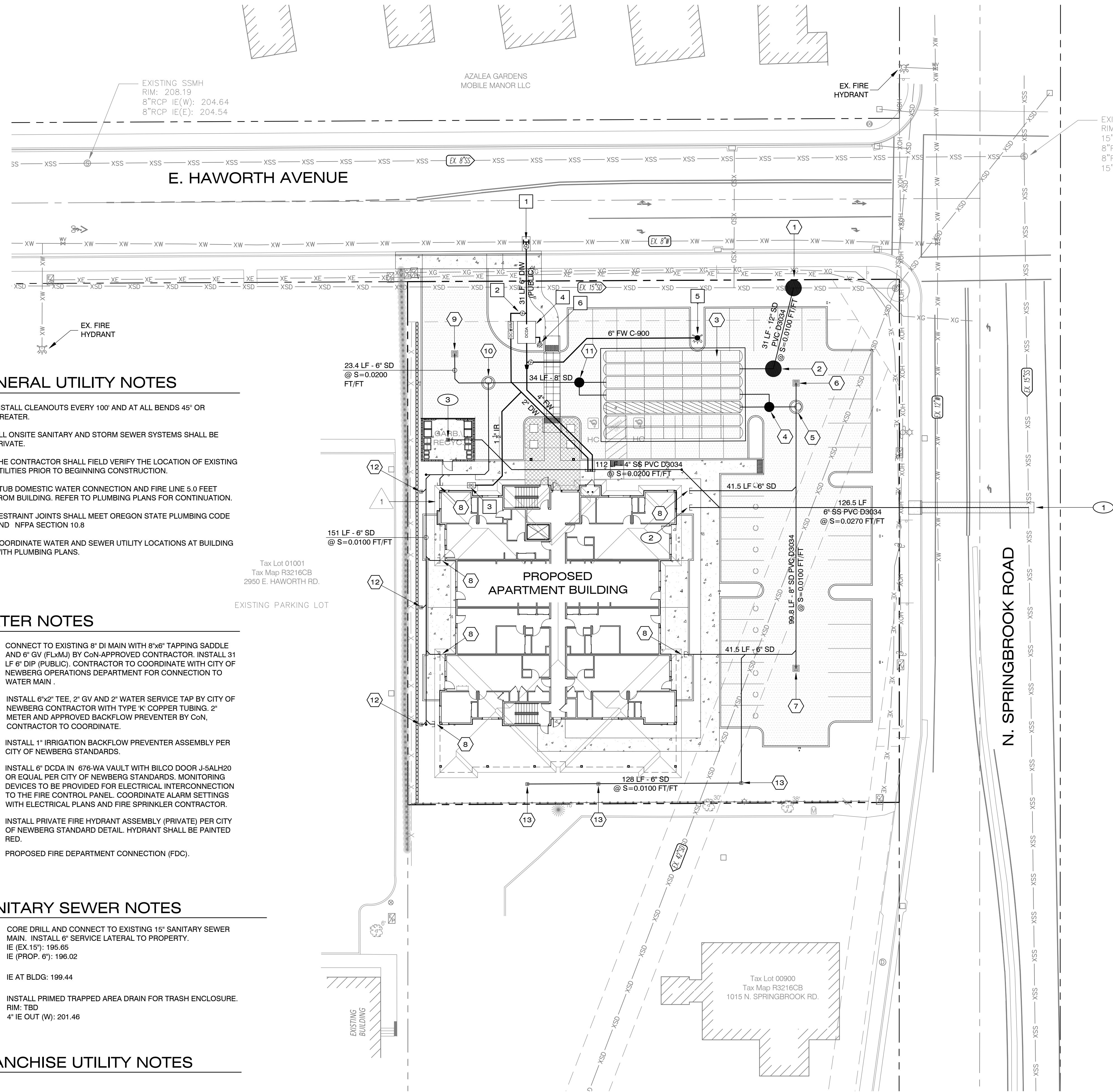
1. CONNECT TO EXISTING 8" DI MAIN WITH 8"x6" TAPPING SADDLE AND 6" GV (FLxM) BY CoN-APPROVED CONTRACTOR. INSTALL 31 LF 6" DIP (PUBLIC). CONTRACTOR TO COORDINATE WITH CITY OF NEWBERG OPERATIONS DEPARTMENT FOR CONNECTION TO WATER MAIN.
2. INSTALL 6"x2" TEE, 2" GV AND 2" WATER SERVICE TAP BY CITY OF NEWBERG CONTRACTOR WITH TYPE 'K' COPPER TUBING. 2" METER AND APPROVED BACKFLOW PREVENTER BY CoN, CONTRACTOR TO COORDINATE.
3. INSTALL 1" IRRIGATION BACKFLOW PREVENTER ASSEMBLY PER CITY OF NEWBERG STANDARDS.
4. INSTALL 6" DCDA IN 676-WA VAULT WITH BILCO DOOR J-5ALH20 OR EQUAL PER CITY OF NEWBERG STANDARDS. MONITORING DEVICES TO BE PROVIDED FOR ELECTRICAL INTERCONNECTION TO THE FIRE CONTROL PANEL. COORDINATE ALARM SETTINGS WITH ELECTRICAL PLANS AND FIRE SPRINKLER CONTRACTOR.
5. INSTALL PRIVATE FIRE HYDRANT ASSEMBLY (PRIVATE) PER CITY OF NEWBERG STANDARD DETAIL. HYDRANT SHALL BE PAINTED RED.
6. PROPOSED FIRE DEPARTMENT CONNECTION (FDC).

SANITARY SEWER NOTES

1. CORE DRILL AND CONNECT TO EXISTING 15" SANITARY SEWER MAIN. INSTALL 6" SERVICE LATERAL TO PROPERTY.
IE (EX. 15"): 195.65
IE (PROP. 6"): 196.02
2. IE AT BLDG: 199.44
3. INSTALL PRIMED TRAPPED AREA DRAIN FOR TRASH ENCLOSURE.
RIM: TBD
4" IE OUT (W): 201.46

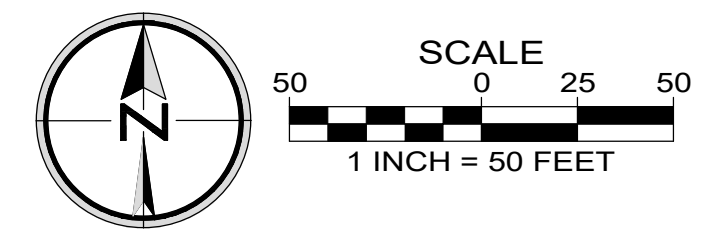
FRANCHISE UTILITY NOTES

1. PROPOSED ELECTRIC METERS. FINAL DESIGN BY OTHERS.





- LEGEND**
- ● ● ● PROPOSED PEDESTRIAN CIRCULATION
 - ○ ○ ○ EXISTING PEDESTRIAN CIRCULATION
 - ➔ ➔ ➔ ➔ PROPOSED VEHICULAR / BICYCLE CIRCULATION
 - ➔ ➔ ➔ ➔ EXISTING VEHICULAR / BICYCLE CIRCULATION
 - - - - - PROPOSED SUBDIVISION PROPERTY LINES
 - — — — PROPOSED SUBDIVISION BOUNDARY



PRELIMINARY

**AERIAL AND CIRCULATION PLAN
 (SITE ANALYSIS DIAGRAM)**

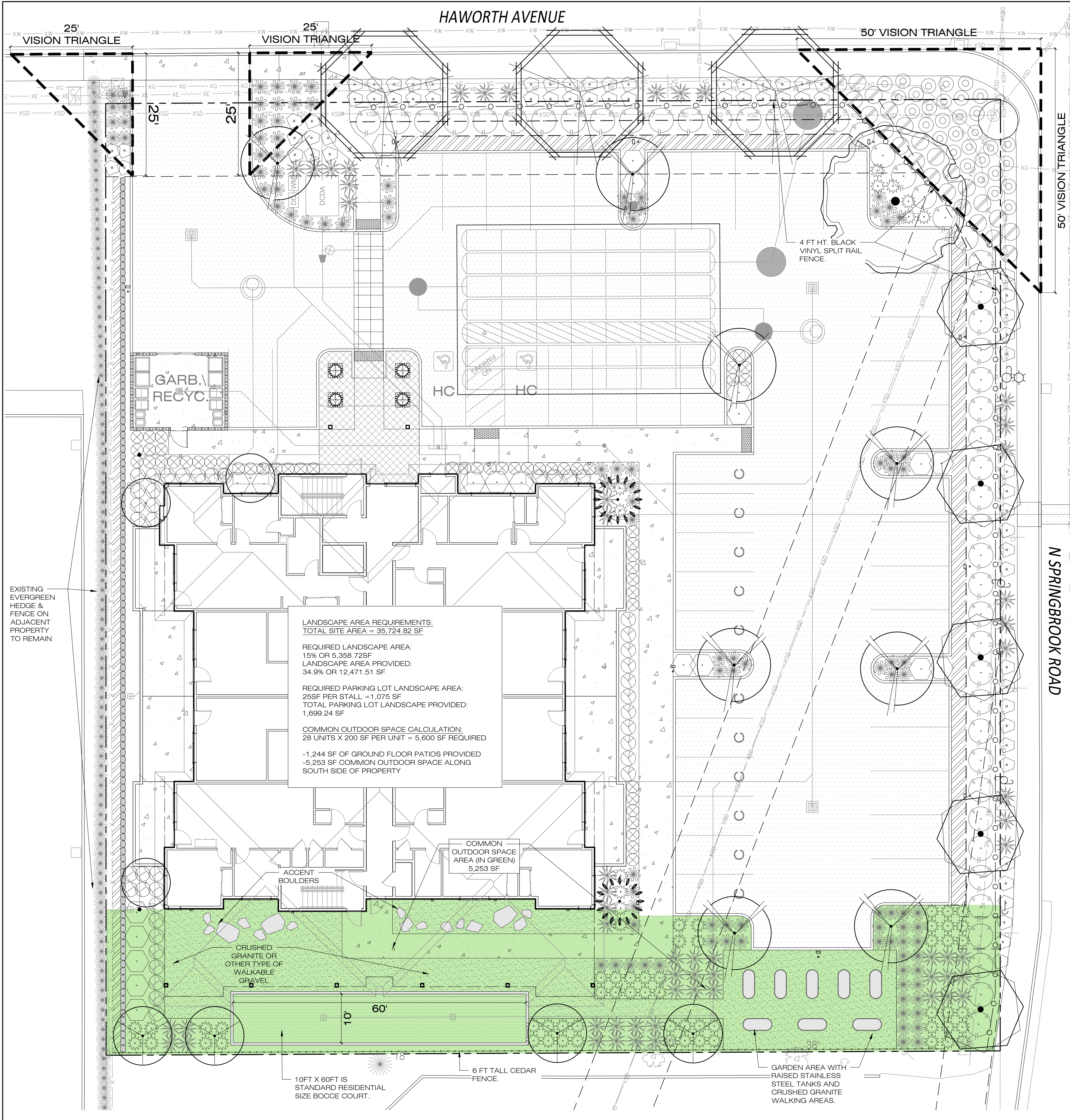
THE HAWORTH
 NEWBERG, OREGON

Designed by	URL	Date	Reviewed by	MIS	Date	REF.
		11/2022			11/2022	
Drawn by	URL	Date	Reviewed by	MIS	Date	REF.
Project No.	121-029					
Horiz. Scale:						
Vert. Scale:						

No.	Date	Revision

Project
 THE HAWORTH
 No.
 121-029
 Type
 PLANNING
 Sheet

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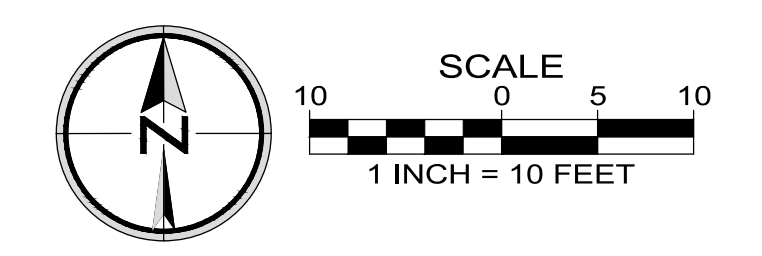
NOTES:

- SEE SHEET L1.1.1 FOR PLANTING DETAILS AND NOTES.
- SEE CIVIL PLANS FOR ALL UTILITIES AND GRADING.
- A PERMANENT UNDERGROUND IRRIGATION SYSTEM WILL BE PROVIDED FOR ALL STREET TREES AND LAWN AREAS.
- ALL STREET TREES TO BE INSTALLED PER CITY OF NEWBERG STREET TREES STANDARD DETAIL. SEE SHEET L1.1.
- LANDSCAPE AREAS WILL BE PROVIDED WITH AN AUTOMATIC UNDERGROUND IRRIGATION SYSTEM DESIGNED BY CONTRACTOR. CONTRACTOR WILL PROVIDE MATERIALS AND INSTALL ALL IRRIGATION DOWNSTREAM OF THE WATER METER.

PLANTING LEGEND

TREES	
SYMBOL	QUANTITY COMMON NAME / BOTANICAL NAME: SIZE AND DESCRIPTION
	5 GOLDEN DESERT ASH / FRAXINUS EXCELSIOR GLOBOSUM: 2' CAL., B&B
	8 AUTUMN GOLD GINKGO / GINKGO BILOBA 'AUTUMN GOLD': 2' CAL., B&B
	1 SHADEMASTER HONEYLOCUST / GLEDITSIA TRIACANTHOS: 2' CAL., B&B
	3 BLACK GUM / NYSSA SYLVATICA: 2' CAL., B&B
	2 CORAL BARK MAPLE / ACER PALMATUM: MULTI TRUNK, B&B
	4 COLUMNAR GINKGO TREE / GINKGO BILOBA 'PRINCETON SENTRY': 2' CAL., B&B
	2 VINE MAPLE / ACER CIRCINATUM: 8' HT., MULTI-TRUNK
SHRUBS	
SYMBOL	QUANTITY COMMON NAME / BOTANICAL NAME: SIZE AND DESCRIPTION
	58 GOLDEN SWORD YUCCA / YUCCA FILAMENTOSA 'GOLDEN SWORD': 2 GAL.
	68 SHIRAZ NEW ZEALAND FLAX / PHORMIUM TENAX SHIRAZ: 2 GAL.
	105 SILVER STREAK FLAX LILY / DIANELLA TASMANICA 'SILVER STREAK': 2 GAL.
	52 LILY TURF / LIRIOPE MUSCARI (WHITE): 2 GAL.
	11 SKY PENCIL JAPANESE HOLLY / ILEX CRENATA 'SKY PENCIL': 2 GAL.
	49 SCHIPKA CHERRY LAUREL / PRUNUS LAUROCERASUS 'SCHIPKAENSIS': 5 GAL.
	16 BLACK MONDO GRASS / OPHIOPOGON PLANISCAPUS 'NIGRESCENS': 1 GAL.
	31 CRYSTAL FALLS MONDO GRASS / OPHIOPOGON JABURAN: 1 GAL.
	31 BRAKELIGHTS RED YUCCA / HESPERALOE PARVIFLORA 'PERPA': 2 GAL.
	22 MOPS MUGO PINE PINUS MUGO 'MOPS': 2 GAL.
	23 'CRIMSON PYGMY' BARBERRY / BERBERIS THUNBERGII 'CRIMSON PYGMY': 2 GAL.
	4 TINY TOWER ITALIAN CYPRESS / CUPRESSUS SEMPERVIRENS 'MONSHEL': 2 GAL.
	69 CASSA BLUE FLAX LILY / DIANELLA CAERULEA: 2 GAL.
LAWN AND GROUND COVER	
SYMBOL	QUANTITY COMMON NAME / BOTANICAL NAME: SIZE AND DESCRIPTION
	587 BLUE PACIFIC SHORE JUNIPER / JUNIPERUS CONFERTA 'BLUE PACIFIC': 1 GAL., 18" O.C.

SITE DESIGN ELEMENTS:



PIONEER DESIGN GROUP
 CIVIL ENGINEERING • LAND USE PLANNING • LAND SURVEYING • LANDSCAPE ARCHITECTURE
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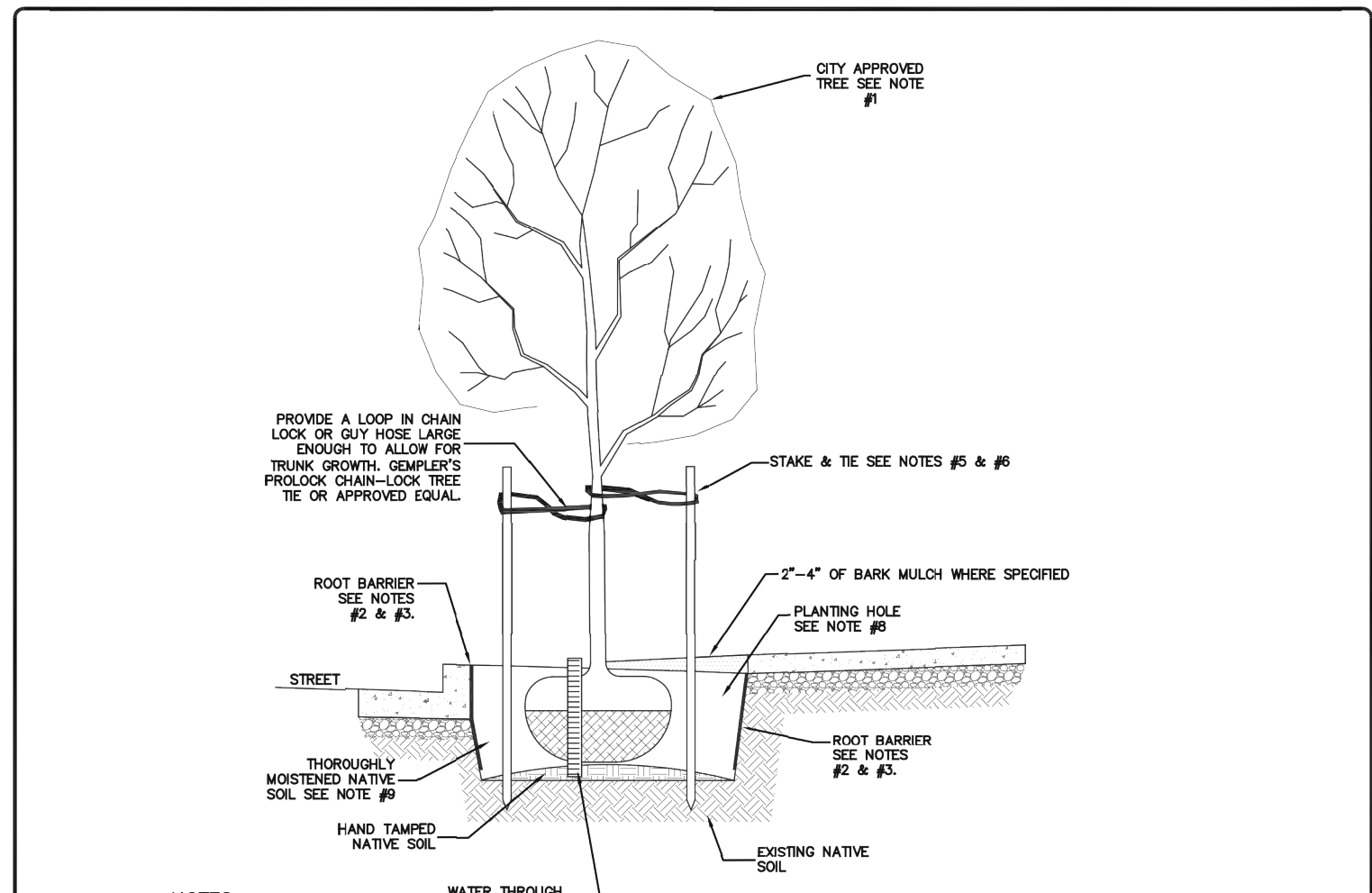
STREET TREE & OPEN SPACE PLANTING PLAN

THE HAWORTH
NEWBERG, OREGON

Designed by	BDH	Date	11/2022
Drawn by	BDH	Date	11/2022
Reviewed by	BDH	Date	11/2022
Project No.	121-029	REF.	
Horiz. Scale:		Vert. Scale:	

No.	Date	Revision

Project	THE HAWORTH
No.	121-029
Type	PLANNING - LANDSCAPE
Sheet	L1.0



NOTES:

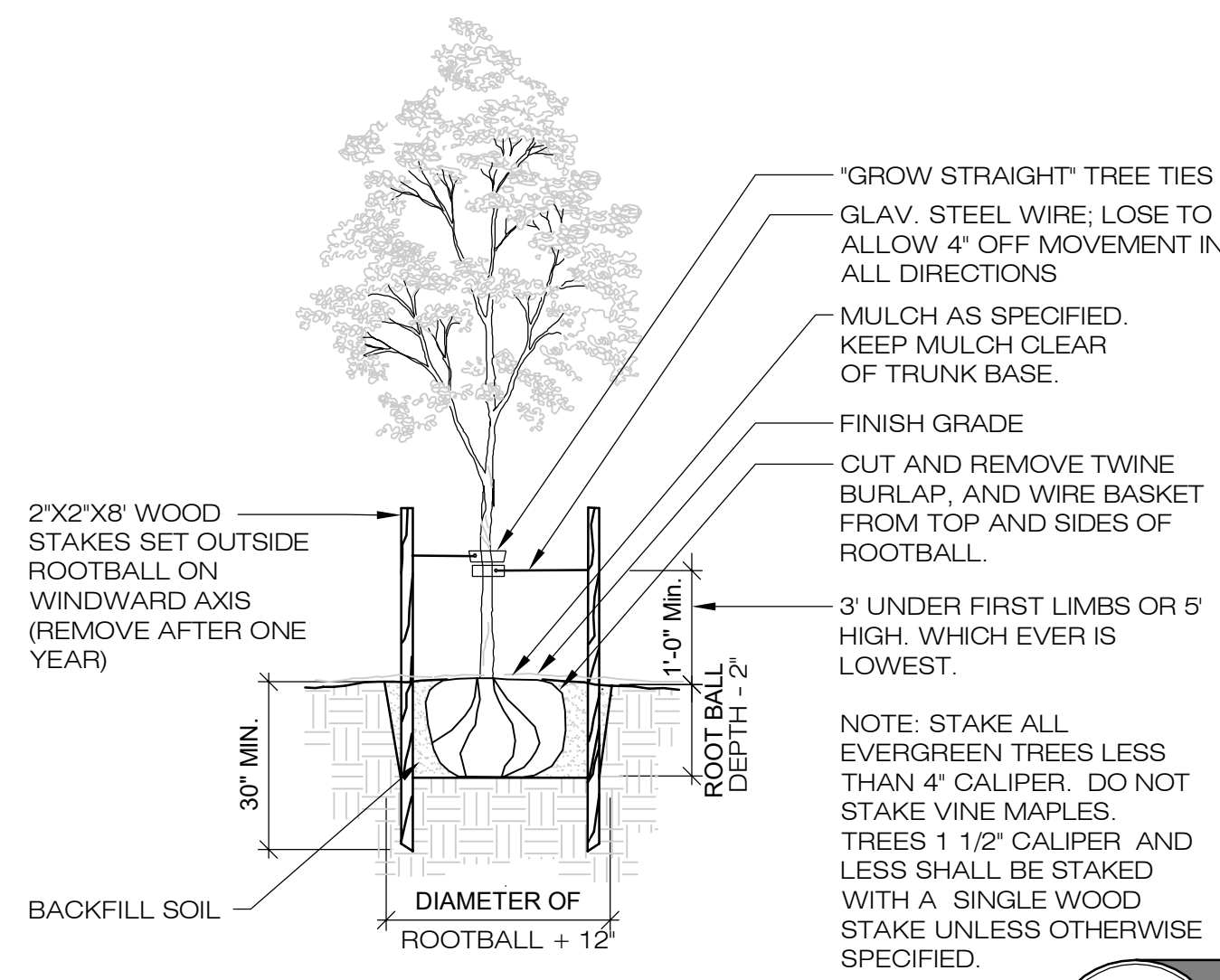
- REFER TO THE CITY PLANNING DEPARTMENT APPROVED STREET TREE PLANTING LIST.
- ROOT BARRIER REQUIRED WHEN HARDSCAPE OR STRUCTURE IS LOCATED WITHIN A 6' RADIUS FROM CENTER OF TREE. ROOT BARRIER TO BE 18" DEEP AND SHALL BE INSTALLED ALONG ALL BOUNDARIES WITH HARDSCAPE, e.g. SIDEWALK & CURB.
- LINEAR OR CIRCULAR APPLICATION OF ROOT BARRIER PERMITTED. ROOT BARRIER TO EXTEND AT MINIMUM 24" EAST CENTER OF TREE IN ALL DIRECTIONS OR HAVE A MINIMUM RADIUS OF 24" FOR CIRCULAR APPLICATION. USE CENTURY CP-SERIES ROOTBARRIER PANELS WITH INTERLOCKING JOINTS OR NDS RP SERIES ROOT BARRIER PANELS WITH INTERLOCKING JOINTS. ALL ROOT BARRIER INSTALLATIONS SHALL BE IN CONFORMANCE WITH MANUFACTURERS RECOMMENDATIONS.
- OPPOSITE TREE STAKES, PROVIDE TWO, 3" DIAMETER HDPE PERFORATED PIPE WATERING THROUGH, FILLED WITH CLEAN PEA GRAVEL.
- REMOVE NURSERY STAKES & INSTALL 2" DIAMETER TREATED STAKES, SET OUTSIDE ROOTBALL AND DRIVE A MINIMUM OF 12" INTO UNDISTURBED SOIL BELOW PLANTING HOLE. TRIM STAKE 6" ABOVE HIGHEST TREE TIE TO AVOID INTERFERENCE WITH CANOPY.
- FLEXIBLE NON-ABRASIVE TREE TIE SECURED TO STAKE WITH A NAIL. PLACE TIES 6" ABOVE THE LOWEST POINT ON THE TRUNK WHERE IT CAN BE HELD SUCH THAT THE TOP OF THE TREE SPRINGS BACK TO THE UPRIGHT POSITION WHEN BENT OR DEFLECTED.
- SET CROWN OF ROOTBALL 1-2" ABOVE FINISHED GRADE.
- PLANTING HOLE TO BE TWICE THE DIAMETER OF ROOTBALL, WITH ROOTBALL RESTING ON FIRM SOIL. SCARIFY SIDES OF PLANTING HOLE.
- BACKFILL WITH A MIXTURE OF 2/3 NATIVE SOIL AND 1/3 ORGANIC COMPOST. AREAS WITH POOR OR HEAVILY COMPACTED SOIL MAY REQUIRE ADDITIONAL AMENDMENT.

City of Newberg
PUBLIC WORKS ENGINEERING DIVISION
414 E. FIRST STREET NEWBERG, OR 97132
PHONE: 503-537-1849
FAX: 503-537-1277

REVISIONS
MAY 2014

STREET TREE & ROOT BARRIER

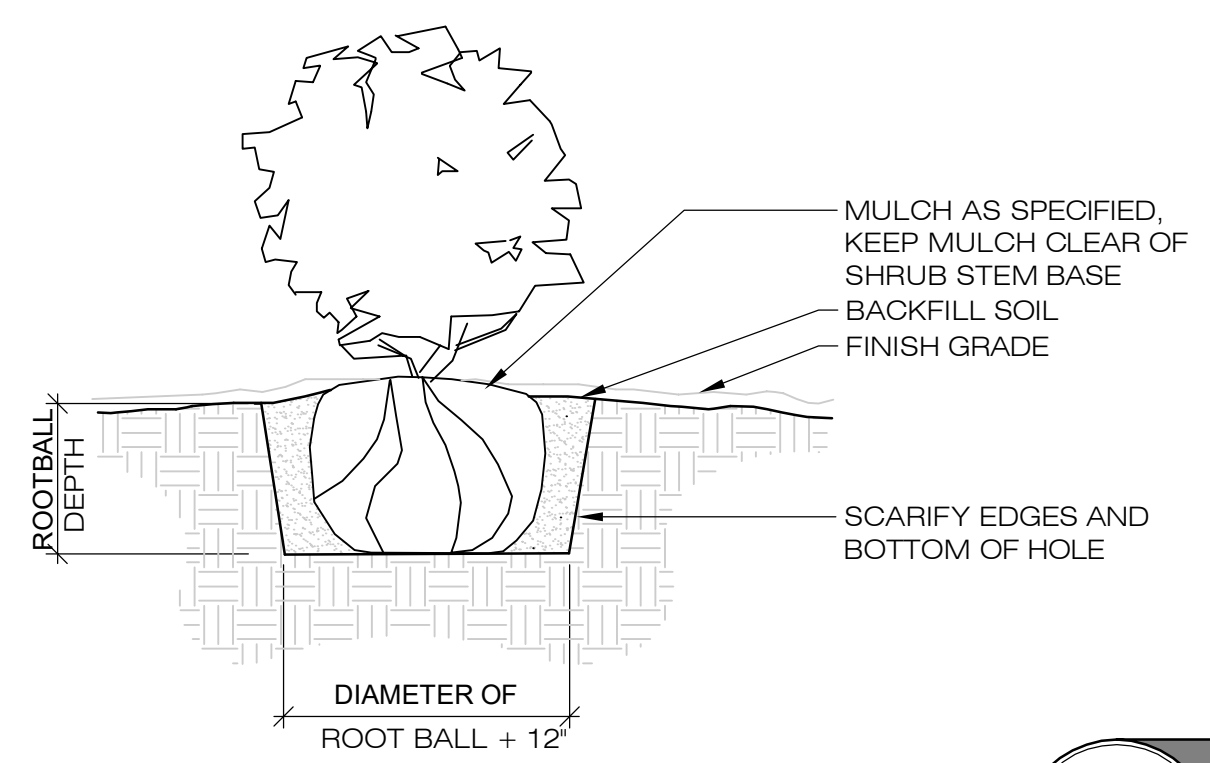
SCALE: N.T.S.
DATE: MARCH 2014
APPROVED BY: JAY H.
STANDARD DRAWING: 108



TREE STAKING DETAIL

SCALE: N.T.S.

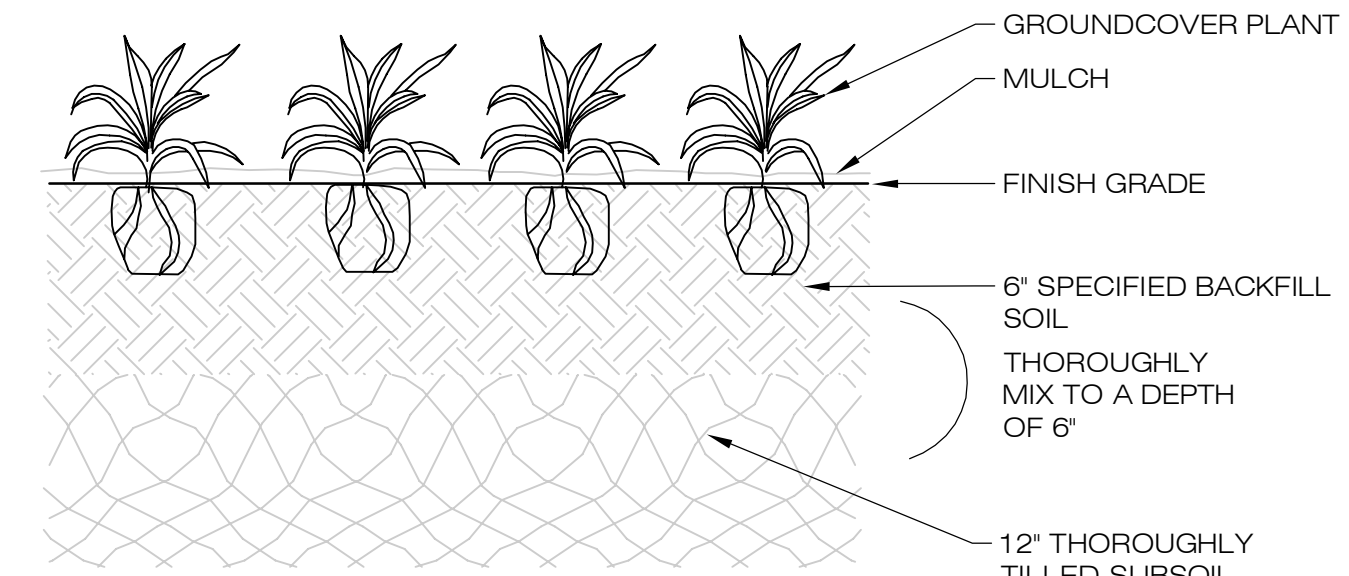
1
L1.1



SHRUB PLANTING DETAIL

SCALE: N.T.S.

2
L1.1



NOTE: TILL SOIL SO THAT THERE ARE NO CLOUDS OR CLUMPS LARGER THAN 1 1/2\"/>

GROUNDCOVER PLANTING DETAIL

SCALE: N.T.S.

3
L1.1

GENERAL NOTES: LANDSCAPE PLAN

- THE CONTRACTOR SHALL VERIFY WITH OWNER AND UTILITY COMPANIES THE LOCATIONS OF ALL UTILITIES PRIOR TO CONSTRUCTION. THE CONTRACTOR SHALL DETERMINE IN THE FIELD THE ACTUAL LOCATIONS AND ELEVATIONS OF ALL EXISTING UTILITIES WHETHER SHOWN ON THE PLANS OR NOT. THE CONTRACTOR SHALL CALL UTILITY PROTECTION SERVICE 72 HOURS PRIOR TO CONSTRUCTION.
- THE CONTRACTOR SHALL EXAMINE FINISH SURFACE, GRADES, TOPSOIL QUALITY AND DEPTH. DO NOT START ANY WORK UNTIL UNSATISFACTORY CONDITIONS HAVE BEEN CORRECTED. VERIFY LIMITS OF WORK BEFORE STARTING.
- CONTRACTOR TO REPORT ALL DAMAGES TO EXISTING CONDITIONS AND INCONSISTENCIES WITH PLANS TO ODR.
- ALL PLANT MASSES TO BE CONTAINED WITHIN A BARK MULCH BED, UNLESS NOTED OTHERWISE.
- BED EDGE TO BE NO LESS THAN 12" AND NO MORE THAN 18" FROM OUTER EDGE OF PLANT MATERIAL BRANCHING. WHERE GROUND-COVER OCCURS, PLANT TO LIMITS OF AREA AS SHOWN.
- CONTRACTOR SHALL MAINTAIN POSITIVE DRAINAGE IN ALL LANDSCAPE BEDS AND ALL LAWN AREAS.
- CONTRACTOR TO FINE GRADE AND ROCK-HOUND ALL TURF AREAS PRIOR TO SEEDING, TO PROVIDE A SMOOTH AND CONTINUAL SURFACE, FREE OF IRREGULARITIES (BUMPS OR DEPRESSIONS) & EXTRANEIOUS MATERIAL OR DEBRIS.
- QUANTITIES SHOWN ARE INTENDED TO ASSIST CONTRACTOR IN EVALUATING THEIR OWN TAKE-OFFS AND ARE NOT GUARANTEED AS ACCURATE REPRESENTATIONS OF REQUIRED MATERIALS. THE CONTRACTOR SHALL BE RESPONSIBLE FOR HIS BID QUANTITIES AS REQUIRED BY THE PLANS AND SPECIFICATIONS. IF THERE IS A DISCREPANCY BETWEEN THE NUMBER LABELED ON THE PLANT TAG AND THE QUANTITY OF GRAPHIC SYMBOLS SHOWN, THE GRAPHIC SYMBOL QUANTITY SHALL GOVERN.
- COORDINATE LANDSCAPE INSTALLATION WITH INSTALLATION OF UNDERGROUND SPRINKLER AND DRAINAGE SYSTEMS.
- WITH THE EXCEPTION OF THOSE TREES INDICATED ON THE TREE REMOVAL PLAN, CONTRACTOR SHALL NOT REMOVE ANY TREES DURING CONSTRUCTION WITHOUT THE EXPRESS WRITTEN CONSENT OF THE ODR. EXISTING VEGETATION TO REMAIN SHALL BE PROTECTED AS DIRECTED BY THE ODR.
- WHERE PROPOSED TREE LOCATIONS OCCUR UNDER EXISTING OVERHEAD UTILITIES OR CROWD EXISTING TREES, NOTIFY ODR TO ADJUST TREE LOCATIONS.
- LANDSCAPE MAINTENANCE PERIOD BEGINS IMMEDIATELY AFTER THE COMPLETION OF ALL PLANTING OPERATIONS AND WRITTEN NOTIFICATION TO THE ODR. MAINTAIN TREES, SHRUBS, LAWNS AND OTHER PLANTS UNTIL FINAL ACCEPTANCE OR 90 DAYS AFTER NOTIFICATION AND ACCEPTANCE, WHICHEVER IS LONGER.
- REMOVE EXISTING WEEDS FROM PROJECT SITE PRIOR TO THE ADDITION OF ORGANIC AMENDMENTS AND FERTILIZER. APPLY AMENDMENTS AND FERTILIZER PER THE RECOMMENDATIONS OF THE SOIL ANALYSIS FROM THE SITE.
- BACK FILL MATERIAL FOR TREE AND SHRUB PLANTING SHALL CONTAIN: ONE PART FINE GRADE COMPOST TO ONE PART TOPSOIL BY VOLUME, BONE MEAL PER MANUFACTURERS RECOMMENDATION, AND SLOW RELEASE FERTILIZER PER MANUFACTURERS RECOMMENDATION.
- GROUND COVERS AND PERENNIALS SHALL BE PLANTED WITH A MAXIMUM 2 INCH COVER OF BARK MULCH WITH NO FOLIAGE COVERED.
- 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.
- ALL PLANT MATERIALS SHALL BE NURSERY GROWN WITH HEALTHY ROOT SYSTEMS AND FULL BRANCHING, DISEASE AND INSECT FREE AND WITHOUT DEFECTS SUCH AS SUN SCALD, ABRASIONS, INJURIES AND DISFIGUREMENT.
- ALL PLANT MATERIAL SHALL BE INSTALLED AT THE SIZE AND QUANTITY SPECIFIED. THE LANDSCAPE ARCHITECT IS NOT RESPONSIBLE FOR SUB-STANDARD RESULTS CAUSED BY REDUCTION IN SIZE AND/OR QUANTITY OF PLANT MATERIALS.
- LANDSCAPE AREAS WILL BE PROVIDED WITH AN AUTOMATIC UNDERGROUND IRRIGATION SYSTEM DESIGNED BY CONTRACTOR. CONTRACTOR WILL PROVIDE MATERIALS AND INSTALL ALL IRRIGATION DOWNSTREAM OF THE WATER METER.

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PLANTING DETAILS & NOTES

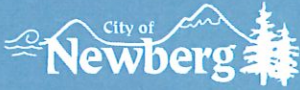
Designed by	Date	BDH	11/2022
Drawn by	Date	BDH	11/2022
Reviewed by	Date	BDH	11/2022
Project No.	121-029	REF.	
Horiz. Scale:			
Vert. Scale:			

Revision	Date

Project
THE HAWORTH
No.
121-029
Type
PLANNING - LANDSCAPE
Sheet

L1.1

Attachment 2: Agency Comments



COMMUNITY DEVELOPMENT
LAND USE APPLICATION REFERRAL

Brooks Bateman

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: Jan 5, 2023
Please refer questions and comments to: Ashley Smith.

NOTE: Full size plans are available at the Community Development Department Office.

APPLICANT: Grove Development
REQUEST: 28 unit multifamily residential building on 0.822 acre
SITE ADDRESS:
LOCATION: SW corner of the intersection of E Haworth Avenue and N Springbrook Road
TAX LOT: R3216CB 00800
FILE NO: DR222-0011/CUP22-0016
ZONE: C-2 (Community Commercial)
HEARING DATE: 2/9/2023



Review Project Information here:

<https://www.newbergoregon.gov/planning/page/cup22-0016-dr222-0011-haworth-apartments-e-haworth-ave-and-n-springbrook-rd>

- 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)

Brooks Bateman
Reviewed By:

12-22-22
Date:

BUILDING
Organization:



COMMUNITY DEVELOPMENT LAND USE APPLICATION REFERRAL

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Please refer questions and comments to: Ashley Smith.

NOTE: Full size plans are available at the Community Development Department Office.

APPLICANT: Grove Development
REQUEST: 28 unit multifamily residential building on 0.822 acre
SITE ADDRESS:
LOCATION: SW corner of the intersection of E Haworth Avenue and N Springbrook Road
TAX LOT: R3216CB 00800
FILE NO: DR222-0011/CUP22-0016
ZONE: C-2 (Community Commercial)
HEARING DATE: 2/9/2023



Review Project Information here:

<https://www.newbergoregon.gov/planning/page/cup22-0016-dr222-0011-haworth-apartments-e-haworth-ave-and-n-springbrook-rd>

_____ 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)

Reviewed By:

Date:

Organization:



COMMUNITY DEVELOPMENT
LAND USE APPLICATION REFERRAL

Doug Rux

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- 1. Check street trees to see if on approved list
- 2. Design of fence & setback?
- 3. Check parking stall dimensions
- 4. Check photometric for .5 foot curbside at property line

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Doug Rux
Reviewed By:

12/26/22
Date:

City of Newberg
Organization:

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Reviewed By:

12/28/22

Date:

Kenanee
Organization:

City of Newberg Interest In Real Property

**Internal Municipality Use Only,
Not Valid for Commercial Title Search**

Planning

This document serves as constructive notice of the
City of Newberg's interest in the real property identified below.

Property Address	2251 E HANCOCK ST 107
Zone	C-2
Maptaxlot Number	03S02W20AB00500

Search performed by Barbara Davis of City of Newberg on Dec 29, 2022 at 09:18:35 A.M. PST

Tracking Number: 2192404

Access PIN: 22942

No items found for this property



COMMUNITY DEVELOPMENT
LAND USE APPLICATION REFERRAL



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J. Thiel
Reviewed By:

12/30/2022
Date:

Newberg-Dundee Police Dept.
Organization:



COMMUNITY DEVELOPMENT LAND USE APPLICATION REFERRAL

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All Public Utility plans, fees, and costs to be approved by Public Works Engineering Prior to Construction, NOTE, Private Fire Hydrants are NOT permitted in the City of Newberg(Preliminary Plans, Sheet P5.0, Water Note 5)

Reviewed By:

Date:

Organization:



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Reviewed By:

Date:

Organization:

HAWORTH AVENUE

Move tree back to help pedestrian site lines for intersection

- SITE DESIGN ELEMENTS SUMMARY:**
POINTS TOTAL
- ADDITIONAL REQUIREMENTS FOR MULTIFAMILY RESIDENTIAL PROJECTS (PER CHAPTER 15.220.060):**
- SITE DESIGN ELEMENTS:**
- ITEM #1 (3 POINTS) - CONSOLIDATE GREEN SPACE TO INCREASE VISUAL IMPACT & FUNCTIONAL UTILITY.
 - ITEM #1 (2 POINTS) - LANDSCAPE AT THE EDGES OF PARKING LOTS TO MINIMIZE VISUAL IMPACTS UPON THE STREET AND SURROUNDING PROPERTIES.
 - ITEM #8 (1 POINT) - USE STREET TREES AND VEGETATIVE SCREENS AT THE FRONT PROPERTY LINE TO SOFTEN VISUAL IMPACTS FROM THE STREET AND PROVIDE SHADE.
 - ITEM #9 (1 POINT) - USE SITE FURNISHINGS TO ENHANCE OPEN SPACE. PROVIDE COMMUNAL AMENITIES SUCH AS BENCHES / COMMUNAL PLANTERS TO ENHANCE THE OUTDOOR ENVIRONMENT.
 - ITEM #10 (1 POINT) - KEEP FENCES NEIGHBORLY BY KEEPING THEM LOW, PLACING THEM BACK FROM THE SIDEWALK, AND USING COMPATIBLE BUILDING MATERIALS
 - ITEM #11 (1 POINT) - USE ENTRY ACCENTS SUCH AS DISTINCTIVE BUILDING OR PAVING MATERIALS TO MARK MAJOR ENTRIES TO MULTIFAMILY BUILDINGS.
 - ITEM #12 (1 POINT) - USE APPROPRIATE OUTDOOR LIGHTING WHICH ENHANCES THE NIGHTTIME SAFETY AND SECURITY OF PEDESTRIANS WITHOUT CAUSING GLARE IN NEARBY BUILDINGS.

All on site stormwater will be maintained by owner. Reports will be provided to Public works Maintenance each year including maintenance records and that designed detention rates are still being maintained.

There should be a study done to see if there should be any alterations to the length of the turn lanes on Hawthorn to minimize congestion in front of the entrance.

I would like to see them relocate the city storm main out on to Springbrook as it is a major line and having it run under a property like this create a huge liability for the city that could be mitigated by relocation.

NEW APARTMENTS FOR :
GROVE DEVELOPMENT
1075 N. SPRINGBROOK RD.
NEWBERG, OREGON

CONTRACTOR:
GROVE DEVELOPMENT, INC.
6500 SW BEAVERTON-
HILLSDALE HWY. #3
PORTLAND, OR 97225
(503) 793-3299
CCB# 129694

SURVEY:
PIONEER DESIGN GROUP, INC.
92020 SW WASHINGTON SQUARE RD.
SUITE 170
PORTLAND, OR 97223
(503) 643-8286

CIVIL ENGINEER:
PIONEER DESIGN GROUP, INC.
92020 SW WASHINGTON SQUARE RD.
SUITE 170
PORTLAND, OR 97223
(503) 643-8286

DESIGN REVIEW SUBMITTAL

SITE INFORMATION

ZONE: C-2
SITE AREA: 35,124 SQ. FT.

SETBACKS

MINIMUM REQUIRED
FRONT: 10 FT.
STREET SIDE: 10 FT.
INTERIOR: 0 FT.

HEIGHT

MAXIMUM ALLOWED TO EAVE: 30 FT.
PROPOSED EAVE HEIGHT: 29.9 FT.
PROPOSED HIGHEST RIDGE: 43.4 FT.

LOT COVERAGE

NOT APPLICABLE IN C-2 ZONE

FLOOR AREA RATIO

NOT APPLICABLE IN C-2 ZONE

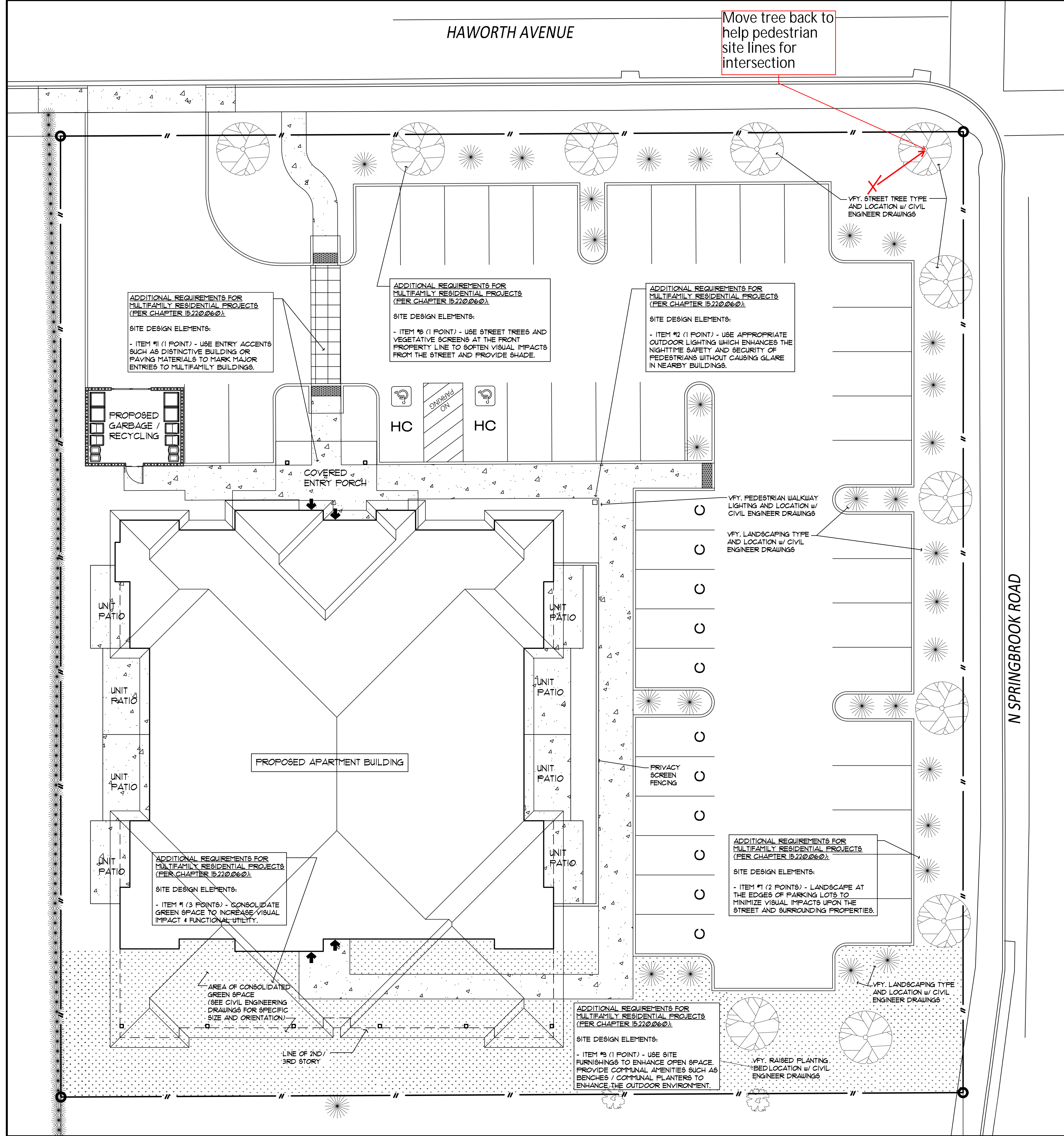
ADDITIONAL NOTES

- * FOOTINGS TO BEAR ON FIRM, UNDISTURBED NATIVE SOIL OR PROPERLY COMPACTED ENGINEERED FILL (95% PROCTOR)
- * VERIFY LOCATION OF ELECTRIC, CABLE T.V., TELEPHONE, AND NATURAL GAS SERVICE RUNS TO BUILDING. ALL SERVICE TO BE UNDERGROUND.
- * VERIFY LOCATION OF EXISTING WATER METER, PROVIDE SERVICE TO BUILDING BY OTHERS. PROVIDE P.R.V. IF OVER 80 P.S.I.
- * VERIFY LOCATION OF EXISTING SANITARY SEWER STUB OUT. PROVIDE 4" A.B.S. SERVICE TO BUILDING.

AS SITE DESIGN ELEMENTS PLAN

SCALE: 1:10

LEGAL DESCRIPTION:
TAX LOT 800,
CITY OF NEWBERG
SEC. 16, T.35, R.2W, W.M. YAMHILL COUNTY, OREGON



ADDITIONAL REQUIREMENTS FOR MULTIFAMILY RESIDENTIAL PROJECTS (PER CHAPTER 15.220.060):

SITE DESIGN ELEMENTS:

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- ITEM #8 (1 POINT) - USE STREET TREES AND VEGETATIVE SCREENS AT THE FRONT PROPERTY LINE TO SOFTEN VISUAL IMPACTS FROM THE STREET AND PROVIDE SHADE.

ADDITIONAL REQUIREMENTS FOR MULTIFAMILY RESIDENTIAL PROJECTS (PER CHAPTER 15.220.060):

SITE DESIGN ELEMENTS:

- ITEM #12 (1 POINT) - USE APPROPRIATE OUTDOOR LIGHTING WHICH ENHANCES THE NIGHTTIME SAFETY AND SECURITY OF PEDESTRIANS WITHOUT CAUSING GLARE IN NEARBY BUILDINGS.

VERIFY PEDESTRIAN WALKWAY LIGHTING AND LOCATION w/ CIVIL ENGINEER DRAWINGS

VERIFY LANDSCAPING TYPE AND LOCATION w/ CIVIL ENGINEER DRAWINGS

ADDITIONAL REQUIREMENTS FOR MULTIFAMILY RESIDENTIAL PROJECTS (PER CHAPTER 15.220.060):

SITE DESIGN ELEMENTS:

- ITEM #1 (2 POINTS) - LANDSCAPE AT THE EDGES OF PARKING LOTS TO MINIMIZE VISUAL IMPACTS UPON THE STREET AND SURROUNDING PROPERTIES.

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- ITEM #9 (1 POINT) - USE SITE FURNISHINGS TO ENHANCE OPEN SPACE. PROVIDE COMMUNAL AMENITIES SUCH AS BENCHES / COMMUNAL PLANTERS TO ENHANCE THE OUTDOOR ENVIRONMENT.

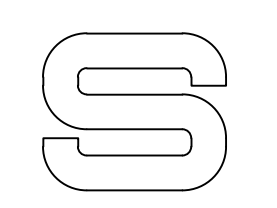
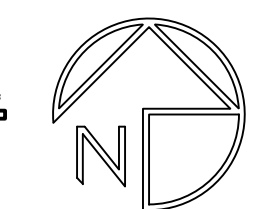
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AREA OF CONSOLIDATED GREEN SPACE (SEE CIVIL ENGINEERING DRAWINGS FOR SPECIFIC SIZE AND ORIENTATION)

LINE OF 2ND/3RD STORY





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12/22/22

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_____ Comments. (Attach additional pages as needed)

Daniel L Wilson

Reviewed By:

Date:

Organization:



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Reviewed By:

Zipty Fiber - Scott Albert Network Engineer

Organization:

12/22/22

Date:

**FIRE CODE / LAND USE / BUILDING REVIEW
APPLICATION**



North Operating Center
11945 SW 70th Avenue
Tigard, OR 97223
Phone: 503-649-8577

South Operating Center
8445 SW Elligsen Rd
Wilsonville, OR 97070
Phone: 503-649-8577

REV 6-30-20

Project Information

Applicant Name: Grove Development
Address: 7570 SW 74th Avenue, Portland, OR 97223
Phone: 503-793-3299
Email: grove@grovedevelopment.com
Site Address: None Assigned (SW cnr Haworth/Springbrook)
City: Newberg
Map & Tax Lot #: 3S2 16CB 00800
Business Name: _____
Land Use/Building Jurisdiction: City of Newberg
Land Use/ Building Permit # CUP22-0016/DR22-0011

Choose from: Beaverton, Tigard, Newberg, Tualatin, North Plains, West Linn, Wilsonville, Sherwood, Rivergrove, Durham, King City, Washington County, Clackamas County, Multnomah County, Yamhill County

Project Description

The Applicant seeks approval of a Type III CUP (Residential in C-2 Zone) and Site Design Review (companion to CUP) for a 28-unit multi-family apartment building. The 28 units are proposed to be developed within a single, 3-story multi-family building with 16 one-bedroom units and 12-two-bedroom units. The ground floor will contain 8 units (4 one-bedroom and 4 two-bedroom), while the 2nd and 3rd floors will each contain 10 units (6 one-bedroom and 4 two-bedroom).

The site has frontages on E Haworth Avenue (north side) and N Springbrook Road (east side). Access is required to be from E Haworth Avenue, at the north west corner of the site.

Permit/Review Type (check one):

- Land Use / Building Review - Service Provider Permit
- Emergency Radio Responder Coverage Install/Test
- LPG Tank (Greater than 2,000 gallons)
- Flammable or Combustible Liquid Tank Installation (Greater than 1,000 gallons)
 - * Exception: Underground Storage Tanks (UST) are deferred to DEQ for regulation.
- Explosives Blasting (Blasting plan is required)
- Exterior Toxic, Pyrophoric or Corrosive Gas Installation (in excess of 810 cu.ft.)
- Tents or Temporary Membrane Structures (in excess of 10,000 square feet)
- Temporary Haunted House or similar
- OLCC Cannabis Extraction License Review
- Ceremonial Fire or Bonfire (For gathering, ceremony or other assembly)

For Fire Marshal's Office Use Only

TVFR Permit # 2022-0144
Permit Type: SPP
Submittal Date: 12/2
Assigned To: DARBY
Due Date: 12/9
Fees Due: _____
Fees Paid: _____

Approval/Inspection Conditions

(For Fire Marshal's Office Use Only)

This section is for application approval only

[Signature] 12/9/22
Fire Marshal or Designee Date

Conditions:

See Attached Conditions: Yes No

Site Inspection Required: Yes No

This section used when site inspection is required

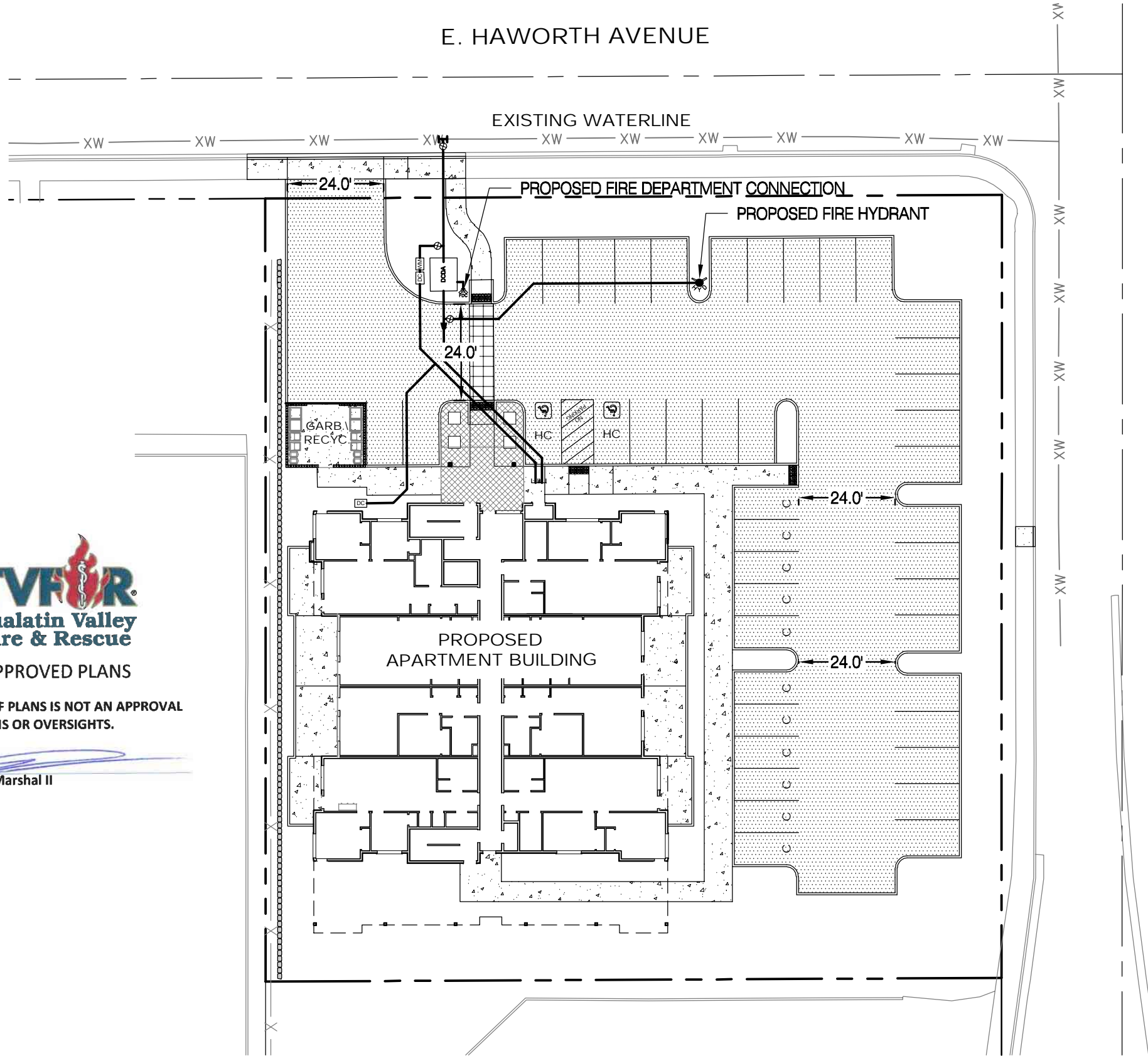
Inspection Comments:

Final TVFR Approval Signature & Emp ID Date

FS1 PLAN

THE HAWORTH

E. HAWORTH AVENUE

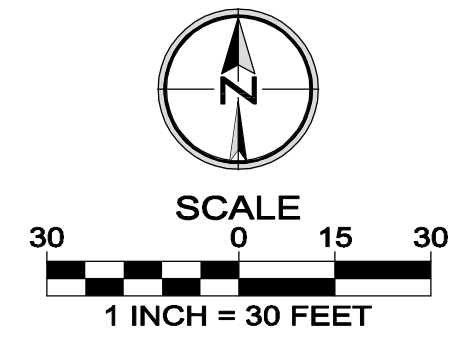


N. SPRINGBROOK ROAD



APPROVAL OF PLANS IS NOT AN APPROVAL OF OMISSIONS OR OVERSIGHTS.

[Signature]
Deputy Fire Marshal II



PIONEER DESIGN GROUP
CIVIL ENGINEERING • LAND USE PLANNING • LAND SURVEYING • LANDSCAPE ARCHITECTURE
PORTLAND, OREGON | HONOLULU, HAWAII
PH: 503.643.8286 | PH: 808.753.2376
WWW.PD-GRP.COM

Designed by	LRL	Date	12/2022
Drawn by	CFS	Date	12/2022
Reviewed by	LRL	Date	12/2022
Project No.	121-029	REF.	N/A
Horiz. Scale:	1"=30'		
Vert. Scale:	N/A		

121-029 FS1.DWG

Project
THE HAWORTH
No.
121-029
Type
EXHIBIT
Sheet

FIRE FLOW

SITE: Haworth and N Springbrook Rd

Newberg, Oregon

November 8, 2022 @ 09:30

Whitnessed by Vance Barton, City of Newberg

FLOW RESULTS ARE AS FOLLOWS:

91psi Static

90psi Residual

85psi Pitot

1547 GPM

2.5" Nozzle I.D.

0.90 Nozzle Coefficient

