***City of Newberg***
***Department of Planning***

***Development Review Application For:***

# *Friendsview University Village*

## ***TYPE II APPLICATION –***
## ***CONCEPT MASTER PLAN DESIGN REVIEW***
## ***PHASE I DESIGN REVIEW***

**Owner:**
Friendsview Retirement Community
1301 Fulton St.
Newberg, OR 97132
503-538-3144

**Owner's Representatvie (Applicant):**
LRS Architects
720 NW Davis St, Suite 300
Portland, OR 97214
Dean Masukawa, Associate
503-221-1121

*December 2015*

# TYPE II APPLICATION (LAND USE) -- 2015

File #: _____

**TYPES – PLEASE CHECK ONE:**

X **Design review**
___ **Tentative Plan for Partition**
___ **Tentative Plan for Subdivision**
___ **Type II Major Modification**
___ **Variance** _____
___ **Other: (Explain)** _____

**APPLICANT INFORMATION:**

APPLICANT: LRS Architects, Dean Masukawa
ADDRESS: 720 NW Davis St., Suite 300, Portland, OR 97209
EMAIL ADDRESS: dmasukawa@lrsarchitects.com
PHONE: 503-221-1121 MOBILE: _____ FAX: 503.221.2077
OWNER (if different from above): Friendsview Retirement Community, Todd Engle PHONE: 503-563-6151
ADDRESS: 3301 East Fulton Street, Newberg, OR 97132
ENGINEER/SURVEYOR: AKS Engineering & Forestry, Chuck Gregory PHONE: 503-563-6151
ADDRESS: 12965 SW Herman Road, Suite 100, Tualatin, OR 97062

**GENERAL INFORMATION:**

PROJECT NAME: Friendsview University Village PROJECT LOCATION: 1301 East Fulton Street
PROJECT DESCRIPTION/USE: Independent Living Apartments as a part of the Continuing Care Retirement Community of Freindsview
MAP/TAX LOT NO. (i.e.3200AB-400): See attached Tax Lots Diagram ZONE: (I)/ R-2w/(IO) SITE SIZE: 2.5 SQ. FT. ☐ ACRE ■
COMP PLAN DESIGNATION: PQ (Quasi Public) TOPOGRAPHY: _____
CURRENT USE: Single Family Residential, duplexes, medium density residential
SURROUNDING USES:
NORTH: Railroad/R-3 SOUTH: R-2/I with Institutional Overlay
EAST: Institutional WEST: M-2

**SPECIFIC PROJECT CRITERIA AND REQUIREMENTS ARE ATTACHED**

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

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


**Design Review** ..... **p. 12**
**Partition Tentative Plat** ..... **p. 14**
**Subdivision Tentative Plat** ..... **p. 17**
**Variance Checklist** ..... **p. 20**


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.

Dean Masukawa 10/23/15
Applicant Signature Date

10-27-15
Owner Signature Date

Dean Masukawa, LRS Architects
Print Name

Todd Engle, Friendsview Retirement Community
Print Name

Attachments: General Information, Fee Schedule, Criteria, Checklists

# TYPE II APPLICATION (LAND USE) -- 2015

File #: _____

**TYPES – PLEASE CHECK ONE:**

___ **Design review**
___ **Tentative Plan for Partition**
___ **Tentative Plan for Subdivision**
___ **Type II Major Modification**
X **Variance** 2 variances - Building Height setback & Front Yard (see T.O.C.)
___ **Other: (Explain)** _____

**APPLICANT INFORMATION:**

APPLICANT: LRS Architects, Dean Masukawa
ADDRESS: 720 NW Davis St., Suite 300, Portland, OR 97209
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COMP PLAN DESIGNATION: PQ (Quasi Public) TOPOGRAPHY: _____
CURRENT USE: Single Family Residential, duplexes, medium density residential
SURROUNDING USES:
NORTH: Railroad/R-3 SOUTH: R-2 w/ IO and I (Phase I) /Institutional (I) (Master Plan)
EAST: Institutional WEST: M-2/ R-2

**SPECIFIC PROJECT CRITERIA AND REQUIREMENTS ARE ATTACHED**

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

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Dean Masukawa 12/23/15
Applicant Signature Date

12-23-15
Owner Signature Date

Dean Masukawa, LRS Architects
Print Name

Todd Engle, Friendsview Retirement Community
Print Name

Attachments: General Information, Fee Schedule, Criteria, Checklists

***City of Newberg***
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720 NW Davis St, Suite 300
Portland, OR 97214
Dean Masukawa, Associate
503-221-1121

*December 2015*

## *DESIGN TEAM*
## *Phase I – Administrative Zone Change*

| | |
|---|---|
| **Owner/Applicant** | Friendsview Retirement Community<br>1301 Fulton St.<br>Newberg, OR 97132<br>Todd Engle, Executive Director<br>503-538-3144 |
| **Architect** | LRS Architects<br>720 NW Davis St, Suite 300<br>Portland, OR 97214<br>Dean Masukawa, Project Manager<br>503-221-1121 |
| **Civil Engineer** | AKS Engineering & Forestry, LLC<br>12965 SW Herman Road, Suite 100<br>Tualatin, OR 97062<br>Chuck Gregory<br>503.563-6151 |
| **Landscape Architect** | Christopher Freshley Landscape Architects ASLA<br>3944 SW 36th Place<br>Portland, OR 97221<br>Chris Freshley<br>503.222-9881 |

## *FEE CALCULATIONS*

Based on the City of Newberg's Fee schedule effective April 1, 2015

| **Process** | **Fees Due with Application** |
|---|---|
| Concept Master Plan / Site Design Review | $784 |
| Phase I Design Review<br>Est Blg. Cost x 0.6% = Fee<br>$10,600,000 x 0.6% = $63,600 | $63,600 |
| Land Use Process Fees | Rcv'd on 11/17/15: $64,384 |
| **Concept Master Plan / Site Design Review – Engineering Fee**<br>2.5 acres = $353 (1st) + $203x2 (2nd and 3rd) = $761 | **$761** |
| **Variance Application Fee**<br>Building Height Setback Variance Request<br>Front Yard Variance Request | **$784** |
| **Remaining Land Use Process Fees** | **$1,545** |

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Landscape Diagram – Phase I D2
Building C Front Yard Diagram D3
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**Site Development Plan Set (Reduced Size)** **Exhibit B**

**Attachments**
Title Reports Attachment 1

Traffic Impact Analysis Attachment 2
- Dated: October 8, 2015

Stormwater Report Attachment 3
- Dated: October 30, 2015

# *PROJECT DESCRIPTION*

***Project Location:***
805, 814, and 815 Center St Newberg, OR 97132
801, 1003, 1006, 1007, 1012, 1014, and 1100 Cherry St. Newberg, OR 97132

***Zoning Base Zones:***
Institutional (I) per zone change approval ZMA1-15-002 on 7/31/15

***Lots:***
Tax lots 00500-00900, 01001, 01700-02000,

***Map:***
3217CB

***Owner:***
Friendsview Retirement Community
1301 Fulton St.
Newberg, OR 97132

***Comprehensive Plan:***
PQ – Public/Quasi Public

***School District:***
Newberg School District

***General Description***:
Friendsview Retirement Community (Friendsview) is an active and established contributor to the City of Newberg, serving the needs of seniors looking for a comfortable, secure, friendly, faith-based retirement home community since 1961. As a not-for-profit community, Friendsview operates with the needs and best interests of the residents in mind. The senior community of Friendview is growing and with a larger, more active community Friendsview is proposing to expand the campus in a way that is consistent with their values of integrity, stewardship, compassion, community, excellence, dignity, service, and Quaker heritage.

Friendsview has developed a master plan to continue to care for their community and welcome new senior friends. As a part of the master plan Friendsview proposes the development of University Village, a phased development of a series of Independent Living units, a type of Group Care Facility. At its final stage, University Village will be approximately 175 units with approximately 230 parking spaces. Covered pedestrian walkways, pathways, and pedestrian parks will connect these buildings to the main campus of Friendsview and the community.

Phase I of University Village will include the demolition of 3 existing single family or duplex homes and the construction of an approximately 77,500 SF, four story building with 38 independent living units. In Phase I, the building will include 38 resident parking spaces in the ground floor garage and 7 new surface parking spaces. Phase I, Building C will affect approximately 2.5 acres of land. There is an existing parking lot along Center Street that will be re-stripped and utilized for over-flow guest parking of 6 spaces.

***Friendsview Retirement Community is requesting:***
1) University Village Concept Master Plan Design Review and approval
2) University Village Phase I Design Review and approval
    a. Building Height Setback Variance
    b. Front Yard Variance

# ***MASTER PLAN AND PHASE I***
# ***DESIGN REVIEW WRITTEN CRITERIA RESPONSE***

## *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:

Design Compatibility responses for ***Building Architecture, Materials, Colors***, and ***Roof Design***, apply to both Concept Master Plan and Phase I. ***Landscape Design***, ***Signage***, and ***Connection to the Community*** have features that differ and are answered accordingly.

**Building Architecture:** The form of the proposed University Village will be in keeping with Friendsview's existing Manor and Creekside structures in that it will be four stories from grade. It will use the pattern language forms of residential buildings nearby to the west and north, having pitched gable and hipped roofs, covered outdoor decks and window bays. The condo development to the north with 2-story multi-unit buildings provide a transition from the single family residences further to the north and the new University village that will have a taller form. The final phases University Village will also speak to the more commercial form of the George Fox Athletic center to the south, with its campus-like configuration and similar scale.

**Materials:** Phase I and each of the buildings in the Concept Master Plan will have a brick veneer base of the same color family and size as the existing Manor building, upper floors will have cementitious siding of the lap style and panel style. Brick and lap siding are very prevalent in the community of Newberg and the residences directly adjacent to University Village. Panel style siding is reminiscent of stucco and provides visual interest in the field of lap siding.

**Colors:** Earth-tones in keeping with the colors of the main Friendsview Campus and brick at the base of buildings and canopy posts. Creams and browns for a majority of the building provide a tying element in the neighborhood as well as the composition of the cluster of buildings. Earth-tone accents at bays and/or trim of a stronger hue may be added for building identification and providing a unique component to each building.

**Roof Design:** Medium slope roof pitches (3:12-5:12) with asphalt shingles will compose the roof line, which will be a balance of gable ends and hip-roof styles, much like the surrounding residential neighborhood to the north and west. For Buildings B, C, and D, portions of the second floor roof will be used as patios; where patios are not desirable, green roofs will be employed to bring interest and connection to nature for residents viewing the roof from the upper floors.

**Landscape Design:**

**Phase I:** will have similar plantings to the existing Friendsview campus with a focus on native and low maintenance vegetation. There is an outdoor patio at ground level and an outdoor terrace at the second level, both facing north in anticipation of the expansion of the Friendsview resident gardens (see A101 and A201). Two large trees are being preserved at the West border of the site, nearest the R-2 district. Where University Village meets the public way, city standards for landscaping, buffers, and street trees will be applied.

See L1 drawing sheet.

**Concept Master Plan:** There will be three focal landscape areas in the completion of the Master Plan of University Village (please refer to Landscape Diagram – Concept Master Plan):

1. Outdoor Living Room: Located along Fulton St. the outdoor living room will be an extension of the Bistro/café space. Residents with ground floor units will have direct access to the green space from their patios. Upper floors will overlook the crisscrossing paths and landscape areas that will act as the welcome mat for visitors

to University Village. There will be very few reminders to those enjoying this outdoor space that a parking garage is below the plaza.

2. Grand Plaza: at the gateway of Friendsview Retirement Community there will be a transformation of the yard in front of the Manor into a gateway that welcomes residents and visitors alike that flows into an outdoor plaza with a rain garden featured as a crescent gem wrapping the plaza.

3. 'Backyard' gardens: An extension of the current community, the area for resident gardens will be expanded in two areas in the final phases of the University Village Master Plan. The "East Garden" will be an extension of the current gardens to the South and east. The "West Garden" will be a new garden area to the north of Building C, and the West of Building B.

The remainder of the University Village expansion will have similar plantings to the existing Friendsview campus with a focus on native and low maintenance vegetation. The row of trees flanking the main campus entry are planned to be preserved as long as these trees remain healthy. Where University Village meets the public way, city standards for landscaping, buffers, and street trees will be applied.

See also L1M drawing sheet.

**Signage:**

**Phase I:** The building will an identifying building sign, mounted on the building for way finding. Code compliant signage for accessibility will be included with each phase.

**Concept Master Plan:** Each building will have an identifying building sign, mounted on the building for way finding. A refreshed monument sign is planned for one of the later phases of the Master Plan. The application cover image provides a sketch of the concept of the sign which will be submitted for permitting separately. Code compliant signage for accessibility will be included with each phase.

**Connection to the community:**

**Phase I:** A covered walkway will extend from the stairwells along the south side of Building C as the beginning of the connection to the main campus. The area of construction for Phase I has a very limited connection to the community as a whole as it's set the furthest away from Fulton.

**Concept Master Plan:** Covered walkways from each building will lead back to the main Friendsview campus. Walkways will be provided from the public way throughout the site. Although Cherry Street and Center street will be converted to private drives, University Village will be connected to the public sidewalks and roads without barriers as an extension of the community. A bistro/café at the street level is planned for the central portion of Phase II. This will be a gathering place for residents and their guests to enjoy the outdoor living room facing south along E Fulton St.

The table below demonstrates this project's compliance with *§15.22.060 Additional requirements for multifamily residential projects.* Reference Site Development Plan Set, Exhibit B.

| MULTIFAMILY RESIDENTIAL DESIGN ELEMENTS POINT TABLE | | | | |
|---|---|---|---|---|
| **CRITERIA – 20 PTS REQ.** | **Points Possible** | **CMP POINTS** | **DR POINTS** | **Comments / Referenced Documents** |
| **Site Design** | | | | |
| 1. Consolidate Green Space | 3 | 3 | -- | Landscape Diagrams D1 & D3 |
| 2. Preserve Existing Natural Features | 3 | 3 | 3 | Civil Plans |
| 3. "Pedestrian Friendly" Street Edge | 3 | 3 | 3 | Aph1-4, A101, Diagrams D5-D10 |
| 4. Parking at side or rear | 3 | 3 | 3 | Aph1-4, A101 and Civil Plans |
| 5. Outdoor Rooms | 2 | 2 | 2 | Landscape Diagrams D1 & D3, Written Criteria Response Item 4 |
| 6. Quality/Coordinated Landscaping | 2 | 2 | 2 | Landscape Plans: L1-M, L1 |
| 7. Landscape at edges of parking lots at | 2 | 2 | 2 | A101, A201, Aph1, Aph4, L1-M, |

| | | | | |
|---|---|---|---|---|
| streets and property edges | | | | L1 |
| 8. Street Trees and vegetative screens at front property line | 1 | 1 | -- | Landscape Plans: L1-M, L1 |
| 9. Site Furnishings | 1 | 1 | -- | TBD at later stages in design |
| 10. "Neighborly" Fences | 1 | -- | -- | |
| 11. Entry Accents | 1 | -- | -- | |
| 12. Outdoor lighting | 1 | 1 | 1 | Photometric plans |
| **Site Design Sub-Total** | **23** | **21** | **16** | |
| **Building Design Elements** | | | | |
| 1. Orient building toward street (10% units face street) | 3 | -- | -- | |
| 2. Respect the scale and patterns of nearby buildings | 3 | 3 | 3 | A501, A502, Diagrams D5-D10 |
| 3. Break up Façade (Vary planes at least every 50') | 3 | 3 | 3 | A201, A202, A501, A502 |
| 4. Variation in repeated units | 3 | -- | -- | |
| 5. Building Material Selection | | | | |
| a. Wood or wood-like siding | 1 | 1 | 1 | A501, A502 |
| b. Shingles, as roofing or upper portions of walls | 1 | 1 | 1 | A501, A502 |
| c. Brick at base of walls or chimneys | 1 | 1 | 1 | A501, A502 |
| d. Wood or wood-like sash windows | 1 | -- | -- | |
| e. Wood or wood-like trim | 1 | 1 | 1 | A501, A502 |
| 6. Incorporate architectural elements of historic style | 2 | -- | -- | |
| 7. Car shelters secondary to building | 2 | 2 | 2 | A201, A202, A501, A502 |
| 8. Front porch at every main entry | 2 | -- | -- | |
| 9. Sloped roof 3:12 or steeper | 2 | 2 | 2 | A501, A502 |
| **Building Design Sub-Total** | **25** | **14** | **14** | |
| **Grand Total** | **48** | **35** | **30** | **CMP & DR(PHASE I) COMPLY** |

## *2) Parking and On-site Circulation*

*Parking areas shall meet the requirements of § 15.440.010. Parking studies may be required to determine if adequate parking and circulation are provided for uses not specifically identified in § 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:

**§ 15.440.010 Requirements:** §15.440.010 does not apply to Institutional Districts. Per "Friendsview pre-application – Planning notes" email notes from Steve Olson on April 8, 2015 and §15.440.030 *Parking Spaces Required*, parking requirements for "Continuing Care Retirement Community" = 1 space per living unit.

| | | | | |
|---|---|---|---|---|
| University Village Master Plan: | 175 units | / | 230 parking | Complies |
| University Village Phase I: | 38 units | / | 8 new +6 existing parking | Complies |

**On-site circulation:**

Design Compatibility responses for ***On-site circulation*** apply to both Concept Master Plan and Phase I.

***§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 storm water over the public sidewalk or onto any abutting public or private property.*

**Response:** Asphalt service drives provided. Parking garages have concrete drive aisles and parking spaces. Outdoor parking spaces are asphalt or "grasscrete" type paving system. See Site Plan A101 and Civil plans for more information.

*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:** Complies. See Site Plan A101 and Civil plans.

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

**Response**: Parking curb bumpers will be provided for parking spaces.

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

**Response**: Screening for parking and service drives provided per §15.420.010(B). See Landscape plans.

*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:** Complies. See Photmetric Plan

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

**Response:** Complies. Typical parking spaces are 90 degrees 18'-0" deep, 9'-0" min to 10'-0" wide,. Drive aisles 24'min. For "grascrete" parking stripping, a concrete curb, flush with the sod level, is proposed. See Site Plan A101.

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

*1. Attached or detached single-family or two-family: parking is authorized in a front yard on a service drive which provides access to an improved parking area outside the front yard.*

*2. Three- or four-family: parking is authorized in a front yard on a service drive which is adjacent to a door at least seven feet wide intended and used for entrance of a vehicle (see Appendix A, Figure 12).*

**Response:** Complies. See Site Plan A101.

*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:** Complies. Currently 0% of parking stalls are compact. Friendsview would like to reserve the option for compact stalls.

*I. Affordable housing projects may use a tandem parking design, subject to approval of the planning and building director. [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.]*

**Response:** Does not apply.

**Public Street Impact:**
**Phase I:** At the completion of Phase I, in which Building C will be constructed, the access to the public way will be from the private drive that is currently Cherry Street to Center Street as the required access to the public way.

**Concept Master Plan:** At the completion of Building A (proposed as Phase II), both Cherry St and Center St will be converted to private drives and the public access for University Village will be where Center St. currently meets Fulton St. During the construction of Building B (proposed as Phase III), Cherry Street will be disconnected from the main Friendsview Campus access by a pedestrian park.

See Phasing Plans.

## *3) Setbacks and General Requirements*

*The proposal shall comply with §§ 15.415.010 through 15.415.060 dealing with height restrictions and public access; and §§ 15.410.010 through 15.410.040 dealing with setbacks, coverage, vision clearance, and yard requirements*.

## Response:

**§§ 15.410.010-15.410.040 Requirements:**
Reference Site Plan A101, Landscape Plans and Civil Plans in conjunction with response items below.

***§15.410.020(D)Front yard setback - Institutional and Community Facility.***

*All lots or development sites in the I and CF district shall have a front yard of 25 feet. Outdoor activity facilities, such as pools, basketball courts, tennis courts, or baseball diamonds, including any accessory structures and uses, are not permitted within the required setback. [Ord. 2720 § 1(12), 11-2-09; Ord. 2647, 6-5-06; Ord. 2564, 4-15-02; Ord. 2561, 4-1-02; Ord. 2550, 5-21-01; Ord. 2451, 12-2-96. Code 2001 § 151.551.]*
**Response:**

**Concept Master Plan: In Compliance.** A 25' front yard provided at E Fulton St. and Meridian St. See Concept Master Plan, Aph4.

**Phase I: Requesting a Variance, see *Front Yard Variance Written Criteria Response*.**

***§15.410.030(D) Interior yard setback - Institutional and Community Facility.***
*All lots or development sites in the I and CF district shall have interior yards of not less than 10 feet, except outdoor activity facilities, such as pools, basketball courts, tennis courts, or baseball diamonds, including any accessory structures and uses, shall have an interior yard setback of 25 feet when abutting a residential district. [Ord. 2720 § 1(13), 11-2-09; Ord. 2647, 6-5-06; Ord. 2564, 4-15-02; Ord. 2550, 5-21-01; Ord. 2451, 12-2-96. Code 2001 § 151.552.]*
**Response:** 10' interior yard provided at all interior yards that do not abut a residential district. No outdoor activity facilities planned. See Site Plan A101 and Concept Master Plan Phase Plans.

***§15.410.040 Setback and yard restrictions as to schools, churches, public buildings.***

*A. Building Setback. No buildings shall be erected, used or maintained for a school, church or public or semi-public building or use, institution or similar use under the regulations of this code unless such building is removed at least 25 feet from every boundary line of any property included in any residential district.*

*B. Required Yard. No required front or interior yard of the lot on which such building or use is located shall be used for play or parking purposes. [Ord. 2451, 12-2-96. Code 2001 § 151.553.]*
**Response:** Concept Master Plan and Phase I comply.

***§15.348.060(B)***

*B. Setbacks.*

*1. A minimum 15-foot building setback for all boundary lines of the property will be required for all schools, churches, public and semi-public buildings and other institutional uses in residential districts. IO designated property is not subject to the setback standards identified within NMC 15.410.040.*

**Response: Phase I:** the property is in an Institutional District, not residential. Institutional District yards will be applied per §§15.410.020-15.410.030.

**Concept Master Plan:** A majority of the property is currently in an Institutional district, the remaining properties that are not currently Institutional are R-2 with an Institutional Overlay and will be converted prior to permitting. Phase II, Building A and Phase IV, Building D are currently dependent on this conversion.

*2. Parking in setbacks will be permitted per NMC 15.420.010(B)(3)(b).*

**Response:** Parking setbacks will be applied per standard for Concept Master Plan and Phase I, see Written Criteria Response Item 2, Site Plan A101 and Phase Plans.

*3. No variances are required where existing buildings or site improvements are converted to institutional uses and do not meet these standards.*

**Response:** Noted.

***§15.410.050 Special setback requirements to planned rights-of-way.***

*A. Yard Requirements for Property Abutting Partial or Future Street Rights-of-Way.*

*1. Except as provided in subsection (A)(2) of this section, no building shall be erected on a lot which abuts a street having only a portion of its required width dedicated, unless the yards provided and maintained in connection with such building have a width and/or depth needed to complete the street width plus the width and/or depths of the yards required on the lot by this code.*

*2. Where a comprehensive plan street design or a future street plan exists, the placement of buildings and the establishment of yards where required by this code shall relate to the future street boundaries as determined by said plans.*

*B. Planned Street Right-of-Way Widths. Planned street right-of-way widths are established as indicated in subsection (C) of this section for the various categories of streets shown in the transportation system plan.*

*C. A lot or parcel of land in any district adjoining a street for which the planned right-of-way width and alignment have been determined shall have a building setback line equal to the yard required in the district, plus a distance of:*

*1. Fifty feet from and parallel with the centerline of expressways.*

*2. Thirty-five feet from and parallel with the centerline of major and minor arterials.*

*3. Thirty feet from and parallel with the centerline of multifamily, commercial and industrial streets and single-family collector streets.*

*4. Thirty feet from and parallel with the centerline of single-family local streets.*

*5. Twenty-five feet from and parallel with the centerline of single-family hillside, cul-de-sacs and local streets which will never be extended more than 2,400 feet in length and which will have a relatively even division of traffic to two or more exits.*

*Exceptions to the above five classifications are shown in the transportation system plan.*

*D. The centerline of planned streets shall be either the officially surveyed centerline or a centerline as on a precise plan. In the event of conflict between the two, the latter-described line shall prevail. In all other cases, a line midway between properties abutting the right-of-way shall be the centerline for the purposes of this code. [Ord. 2763 § 1 (Exh. A § 13), 9-16-13; Ord. 2602, 9-20-04; Ord. 2451, 12-2-96. Code 2001 § 151.554.]*

*Penalty: See NMC 15.05.120.*

**Response:** Right-of-ways already developed, right-of-way widths applied to public streets at each phase as applicable. See Phase Plans.
**Phase I:** Widths for center street shown and complied with. No development in this area. Vacation of Cherry Street in process, right-of-way widths will not apply when the vacation is complete
**Concept Master Plan:** Vacation of Center Street is Planned for Phase II, thus right-of-way widths would not be applied. Right-of way widths for Fulton and Meridian shown on Phase Plans and will be adhered to.

***§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.*

**Response:** Vision clearances applied at public way intersections at each phase. See Site Plan A101 and Landscape Plans.

***§15.415.020 Building height limitation.*** **R-2 properities with IO modified by §§15.348.060(A)**

***D. Institutional. The maximum height of any building or structure will be 75 feet*** **(45' feet at R-2 (IO))** ***except as follows:***

*1. Within 50 feet of an interior property line abutting a C-1, R-1, R-2 or R-P district, no main building may exceed 30 feet.*

*2. Within 50 feet of an interior property line abutting an R-3 district, no main building may exceed 45 feet.*

*3. Within 100 feet of a property line abutting a public street or railroad right-of-way, or within 100 feet of property lines abutting parcels with an R-1, R-2, R-3, R-P, C-1, C-2, C-3, M-1, M-2, or M-3 zoning designation, no main building may exceed 50 feet in height.*

*4. To utilize the maximum permitted height standard, at least 80 percent of the building's ground coverage must be beyond the setback area designated in subsection (D)(3) of this section. The maximum encroachment may not exceed 25 feet.*

**Response:** §15.348.060(A) not applied see Written Criteria Response Item 8 – Sub-district Compliance. See Architectural Elevations for building form and Aph1 and "Building C R-2 Zone Height Setback Diagram" for applied yards and setbacks. Building height limitations applied as follows:
***"Building height"*** *means the vertical distance from the grade to the highest point of the coping of a flat roof or the deck line of a mansard roof or to the average height of the highest gable of a pitch or hip roof. See Appendix A, Figures 23 and 24.*

| | | |
|---|---|---|
| Building Height | Allowed | 75' |
| Proposed Blg Ht: | Building A | 49' |
| | Building B | 49' |
| | Building C | 49' |

| | | |
|---|---|---|
| | Building D | 39’ |
| §15.415.020(D)(1): | Allowed | 30’ building height within 50’ of property line abutting R-2 |
| Proposed | **Building A** (Phase IV) | **Complies** – beyond 50’ abutting R-2 of property line |
| | **Building B** (Phase II) | **Complies**– beyond 50’ abutting R-2 of property line |
| | **Building C** (Phase I) | **Not in Compliance, Requesting Variance**<br>**See “*Building Height Variance Written Criteria Response”***<br>• Yard Determination: line of effect of abutting R-2 property taken directly parallel to the abutting R-2 property line and having no affect beyond the property line.<br>• 75 SF at ground level within 50’ of a property zoned R-2 with an Institutional Overlay<br>• 0.3% of the building footprint at ground level (75 SF/22,795 SF = 0.3%)<br>• 0.35% of the building footprint at floors 2-4 (65 SF/18,410 SF = 0.35%)<br>• Building C is at an oblique angle to the residential property, which would lessen presence of the building as observed from the adjacent property.<br>• Building C is positioned appx 96’-10” to the nearest residential building. Zoning ordinances allow for an institutional building greater than 30’ to be as close as 55’ to a residential building.<br>• The full allowed building height for the Institutional District is not being exercised or sought. The scale of these buildings is very similar to the dormitories recently built at George Fox University.<br>• The adjacent property is in the institutional overlay, indicating the city encourages this property to be an institutional use in the future. |
| | **Building D** (Phase IV) | **Not in Compliance, will potentially request variance at time of building specific Design Review**<br>• 2,630 SF within 50’ of a property zoned R-2 with an Institutional Overlay<br>• 16.7% of the building footprint (2,630/15,765 SF = 16.7%)<br>• Building D is proposed as 3 stories, stepping down the edge of University Village to meet the more residential use along Meridian.<br>• The full allowed building height for the Institutional District is not being exercised or sought. The scale of Building D is slightly smaller than the dormitories recently built at George Fox University.<br>• The adjacent property is in the institutional overlay, indicating the city encourages this property to be an institutional use in the future. |
| §15.415.020(D)(2): | Does not apply | |
| §15.415.020(D)(3): | All buildings comply – no proposed building exceeds 50’ in height. | |
| §15.415.020(D)(4): | Does not apply | |

***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. [Ord. 2730 § 1 (Exh. A (4)), 10-18-10; Ord. 2451, 12-2-96. Code 2001 § 151.537.]*

**Response:** Noted, will comply.

***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. [Ord. 2720 § 1(11), 11-2-09; Ord. 2647, 6-5-06; Ord. 2507, 3-1-99; Ord. 2451, 12-2-96. Code 2001 § 151.538.]*

**Response:** Master Plan: Public access will be from Center Street (converted to private drive) where it connects with Fulton St.

Phase I: Public access maintained in Lot consolidation (PLC-15-002). Cherry Street will be converted to a private drive, and public access will be from Center street and available at Fulton St. Cherry Street will be maintained as a private drive access way.

***§ 15.415.050 Rules and exceptions governing single-family attached dwellings* –**

**Response:** Sections not quoted. Does not apply.

***§ 15.415.060 Home occupation –***

**Response:** Sections not quoted. The intent of this development is not for the direct purpose of home occupation. If home occupation occurs on the premises, Friendsview will comply with city standards.

## *4) Landscaping Requirements*

*The proposal shall comply with § 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.*

**Response: Concept Master Plan and Phase I-** Each ground-level living unit has a minimum 84 SF (7'x12') patio, covered above, and sheltered by the building on two sides, defensible space created with low landscaping while sidewalk access is maintained

> *2. Individual and Shared Areas. Usable outdoor recreation space shall be provided for the individual and/or shared use of residents and their guests in any duplex or multifamily residential development, as follows:*
>
> > *a. One- or two-bedroom units: 200 square feet per unit.*
> >
> > *b. Three- or more bedroom units: 300 square feet per unit.*
> >
> > *c. Storage areas are required in residential developments. Convenient areas shall be provided in residential developments for the storage of articles such as bicycles, barbecues, luggage, outdoor furniture, and the like. These shall be entirely enclosed.*

**Response:** a. see chart below for summary and Landscape Diagrams, "Landscape Diagram – Concept Master Plan" and "Landscape Diagram – Phase I".

**Master Plan** Required usable outdoor recreation space for the individual and/or shared use :

| | | |
|---|---|---|
| | 200 SFx 175 units = | **35,000 SF Required** |
| Provided: | 175 decks/ patios = | 21,175 SF |
| | Outdoor Living Room | 34,935 SF |
| | Pedestrian Plaza | 8,720 SF |
| | Grand Plaza | 14,325 SF |

| | |
|---|---|
| East Garden | 8,500 SF |
| West Garden | 13,700 SF |
| Bldg B Community patio | 970 SF |
| Bldg C Community patio | 665 SF |
| Bldg C - 2nd Flr Terrace | 1,560 SF |
| Bldg D Open Space | 5,360 SF |
| Walking paths (non req.) | 1,055 SF |
| Total | **110,965 SF Provided** |

**Phase I** Required usable outdoor recreation space for the individual and/or shared use :

| | | |
|---|---|---|
| | 200 SFx 38 units = | **7,600 SF Required** |
| Provided: | 38 decks/ patios = | 4,600 SF |
| | Bldg C Community patio | 665 SF |
| | 2nd Floor Terrace | 1,560 SF |
| | North Outdoor Space | 2,275 SF |
| | South Outdoor Space | 4,410 SF |
| | Walking paths (non req.) | 1,055 SF |
| | Total | **14,565 SF Provided** |

b. Does not apply.
c. Storage ares: 4'x 9' minium, one per unit, located in the parking garage

*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:** Does not apply.

*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.*

**Response:** See Landscape Plans L1 and L1M for Phase I and Concept master plan landscape percentages.

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

**Response:** All areas improved are landscaped.

*3. The following landscape requirements shall apply to the parking and loading areas:*

*a. A parking or loading area providing 10 or more spaces shall be improved with defined landscaped areas totaling no less than 25 square feet per parking space.*

*b. A parking, loading area, or drive aisle which runs adjacent to a property line shall be separate from any lot line adjacent to a street by a landscaped strip at least 10 feet in interior width or the width of the required yard, whichever is greater, and any other lot line by a landscaped strip of at least five feet in interior width. See subsections (B)(3)(c) and (d) of this section for material to plant within landscape strips.*

*c. A landscaped strip separating a parking area, loading area, or drive aisle from a street shall contain street trees spaced as appropriate to the species, not to exceed 50 feet apart on average, and a combination of shrubs and ground cover, or lawn. This landscaping shall provide partial screening of these areas from the street.*

*d. A landscaped strip separating a parking area, loading area, or drive aisle from an interior lot line shall contain any combination of trees, shrubs, ground cover or lawn. Plant material shall be selected from at least two different plant material groups (example: trees and shrubs, or lawn and shrubs, or lawn and trees and shrubs).*

*e. Landscaping in a parking or loading area shall be located in defined landscaped areas which are uniformly distributed throughout the parking or loading area.*

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

*g. All multifamily, institutional, commercial, or industrial parking areas, service drives, or loading zones which abut a residential district shall be enclosed with a 75 percent opaque, site-obscuring fence, wall or evergreen hedge along and immediately adjacent to any interior property line which abuts the residential district. Landscape plantings must be large enough to provide the required minimum screening requirement within 12 months after initial installation. Adequate provisions shall be maintained to protect walls, fences or plant materials from being damaged by vehicles using said parking areas.*

*h. An island of landscaped area shall be located to separate blocks of parking spaces. At a minimum, one deciduous shade tree per seven parking spaces shall be planted to create a partial tree canopy over and around the parking area. No more than seven parking spaces may be grouped together without an island separation unless otherwise approved by the director based on the following alternative standards:*

*i. Provision of a continuous landscaped strip, with a five-foot minimum width, which runs perpendicular to the row of parking spaces (see Appendix A, Figure 13).*

*ii. Provision of tree planting landscape islands, each of which is at least 16 square feet in size, and spaced no more than 50 feet apart on average, within areas proposed for back-to-back parking (see Appendix A, Figure 14).*

**Response:**

a. NA - less than 10 outdoor parking spaces per parking area provide.
b. All parking, loading areas and drive aisle do not run adjacent to streets. Parking and loading areas are separated from the adjacent Southern Pacific RR property line with 5' landscaped areas.
c. NA – parking area is not adjacent to a street.
d. Parking is separated from the adjacent Southern Pacific RR property line with trees and evergreen shrubs.
e. Landscape is distributed throughout the parking area. Parking stalls include grass-crete.
f. Landscape areas adjacent to aisle and loading exceed 5 feet.
g. Existing parking south of Phase I is screened from residential to the west by an existing wood fence.
h. The number of surface parking stalls is 7 of which 3 stalls are covered. 1 tree is provided adjacent to 4 stalls.

*4. Trees, Shrubs and Ground Covers. The species of street trees required under this section shall conform to those authorized by the city council through resolution. The director shall have the responsibility for preparing and updating the street tree species list which shall be adopted in resolution form by the city council.*

*a. Arterial and minor arterial street trees shall have spacing of approximately 50 feet on center. These trees shall have a minimum two-inch caliper tree trunk or stalk at a measurement of two feet up from the base and shall be balled and burlapped or boxed.*

*b. Collector and local street trees shall be spaced approximately 35 to 40 feet on center. These trees shall have a minimum of a one and one-half or one and three-fourths inch tree trunk or stalk and shall be balled and burlapped or boxed.*

*c. Accent Trees. Accent trees are trees such as flowering cherry, flowering plum, crab-apple, Hawthorne and the like. These trees shall have a minimum one and one-half inch caliper tree trunk or stalk and shall be at least eight to 10 feet in height. These trees may be planted bare root or balled and burlapped. The spacing of these trees should be approximately 25 to 30 feet on center.*

*d. All broad-leafed evergreen shrubs and deciduous shrubs shall have a minimum height of 12 to 15 inches and shall be balled and burlapped or come from a two-gallon can. Gallon-can size shrubs will not be allowed except in ground covers. Larger sizes of shrubs may be required in special areas and locations as specified by the design review board. Spacing of these shrubs shall be typical for the variety, three to eight feet, and shall be identified on the landscape planting plan.*

*e. Ground Cover Plant Material. Ground cover plant material such as greening juniper, cotoneaster, minor Bowles, English ivy, hypericum and the like shall be one of the following sizes in specified spacing for that size:*

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

**Response:** Will comply.

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.*

**Response:** An automatic underground irrigation system will be provided. Plans will be submitted at building permit.

6. *Required landscaping shall be continuously maintained.*

**Response:** Landscaping will be continuously maintained.

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

**Response:** Maximum height of tree species - will comply.

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:** Master plan addresses parking and loading requirements as a schematic landscape plan.

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:** Does not apply.

*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. [Ord. 2720 § 1(16, 17), 11-2-09; Ord. 2647, 6-5-06; Ord. 2564, 4-15-02; Ord. 2561, 4-1-02; Ord. 2513, 8-2-99; Ord. 2451, 12-2-96. Code 2001 § 151.580.]*

*Penalty: See NMC 15.05.120.*
**Response:** Landscaping will be completed prior to 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.*

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

**Response:** Street trees provided

*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:** Low shrubs and groundcover are provided to enhance visibility and security.

a. Plantings will provide a combination of deciduous and evergreen shrubs for seasonal interest.
b. Plant placement allows for full vison clearance.

*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:** Will comply. Photometric Plans for Phase I provided. Phase I does not include development at E Fulton St or Meridian St., the final locations of the public way for University Village. The Concept Master Plan will be in kind to the Phase I plan submitted and a master plan photometric study will not be submitted. Friendsview seeks the safety if their residents and will provide lighting at least equal to their current campus site lighting. City Staff to indicate if specific fixtures, or lighting levels, required at the public ways of E Fulton St. and Meridian St.

*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:** Street furniture is planned for the "Outdoor Living Room" of Phase II specifically. (See Landscape Diagram – Concept Master Plan for general area). Patterns of use and focal points will be considered in the design.

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

**Response:** Master plan addresses parking and loading requirements as a schematic landscape plan. The existing crosswalk and curb cuts at the main entrance of Friendsview will be maintained. In Phase I a raised table type cross walk will be created across the main access to Friendsview. In Phase III the "Pedestrian Plaza" will connect with the Grand Plaza via this raised table. Cross walks will be added on the campus as appropriate for the functions of the space. If required, new crosswalks on E Fulton to be determined by Newberg City Staff.

*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:** Planting strips between sidewalks and streets are landscape with trees, shrubs and groundcover to buffer pedestrians from vehicular traffic.

*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.*

**Response:** Planting strips between sidewalks and streets are landscape with trees, shrubs and groundcover to buffer pedestrians from vehicular traffic.

*2. Street trees shall be provided in all planting strips as provided in NMC 15.420.010(B)(4).*

*a. Planting strips without adjacent parking or with infrequent adjacent parking shall have street trees in conjunction with ground covers and/or shrubs.*

*b. Planting strips with adjacent parking used frequently shall have only street trees protected by tree grates.*

**Response:** a. Planting strips are provided with street trees, shrubs and groundcover.
b. NA

*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.*

**Response:** a. Plantings will provide a combination of deciduous and evergreen shrubs for seasonal interest.
b. NA
c. Plant placement allows for full vison clearance.

*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:** All landscape will be maintained.

## *5) Signs*

*Signs shall comply with § 15.435.010 et seq. dealing with signs.*

## Response:

The University Village expansion will comply with signage regulations in full development and apply for signage permits separately. The full design is not determined at this time. Sign elements may include:

**Phase I:**

- Building signage to identify the University Village building designations “A”, “B”, etc. for residents’ way finding and emergency identification

**Concept Master Plan:**

- An updated monument sign refreshing or replacing the current monument sign
- Building signage to identify the University Village building designations “A”, “B”, etc. for residents’ way finding and emergency identification
- Possible building mounted or detached signage at the corner of Fulton and Meridian.

## *6) Manufactured home, mobile home, and RV parks*

*Manufactured home, mobile home, and recreational vehicle parks shall also comply with the standards listed in §§ 15.445.050 et seq., in addition to the other criteria listed in this section.*

## Response:

Neither Phase I or the Concept Master Plan will include manufactured homes, mobile homes, or RV parks.

## *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 §§ 15.304.010 through 15.328.040. 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:

Friendsview Retirement Community is a “CCRC” (Continuing Care Retirement Community) and classified as a “Group care facility (16+ people)” per the *Newberg Development Code – Zoning Use Table Revision* and is a permited use.

**Phase I:** The property proposed for development is zoned Institutional (I) per zone change approval ZMA1-15-002 on 7/31/15 and no longer is within the Institutional Overlay (IO) sub-district (regulated by §§ 15.348.010 - 15.348.060, see Written Criteria Response Item 8 – Sub-district Compliance).
Institutional Zone requirements are per Ordinance 2763.
No other special requirements noted.

**Concept Master Plan:** At each phase of the concept master plan, any property not yet zoned Institutional (I) lies within the Institutional Overlay (IO) sub-district (regulated by §§ 15.348.010 - 15.348.060, see Written Criteria Response Item 8 – Sub-district Compliance) and will be converted to Institutional (I) before permitting and follow the same processes as Phase I.

## *8) Sub-district Compliance*

*Properties located within sub-districts shall comply with the provisions of those sub-districts located in §§ 15.340.010 through 15.348.060.*

## Response:

**§§ 15.348.010 - 15.348.060 Requirements:**

***15.348.010 Purpose.***

*A. The institutional overlay (IO) subdistrict is intended to provide for the orderly development and expansion of George Fox University, Providence Newberg **Hospital**, and Friendsview Manor operating within the **City** of Newberg. The IO subdistrict is designed to incorporate specific regulations and standards that will support the expansion of the institutional **uses**, while protecting the existing **uses** of noninstitutionally owned property within the subdistrict until such time as the property may be acquired by the **institution** with the consent of the property**owners**. The IO subdistrict focuses primarily on development regulations and processes. Also, the IO subdistrict will provide a process for conversion of lands in the IO subdistrict to the institutional district as contiguous lands are purchased by the **institution**. The IO subdistrict may be applied to any existing zoning designation. Permitted **uses** include those permitted by the underlying zoning district and other institutional **uses** specifically allowed within the IO subdistrict that are compatible with the **uses** in the underlying zoning. The IO subdistrict is intended to be consistent with the public/quasi-public designation of the **comprehensive plan**.*

**Response:**

**Phase I:** The land has been converted per zone change approval ZMA1-15-002 on 7/31/15 and no longer is within the Institutional Overlay (IO) sub-district. No further comments on Phase I Sub-district Compliance will be made.

**Concept Master Plan:** A majority of the land been converted per zone change approval ZMA1-15-002 on 7/31/15 and no longer is within the Institutional Overlay (IO) sub-district. The remaining portion within the IO sub-district is owned by Friendsview Manor, DBA Friendsview Retirement Community.

All remaining comments pertain to the Concept Master Plan properties that are not yet converted.

*B. In addition, the purpose of the subdistrict is to:*

*1. Preserve and enhance the character of the areas surrounding the **institutions**, especially residential areas.*

**Response: Concept Master Plan -** University Village is intended to preserve and enhance the character of the area surrounding Friendsview Retirement Community. The buildings are planned as a medium-density size, under 50' in building height and not the maximum allowed height of 75'. The character of the buildings are residential in nature. In addition the planning of the open spaces and proximity to the streets allow for a pedestrian oriented development connecting to the Friendsview Campus and the community.

*2. Provide a process to enhance communication among the **institution**, neighborhood residents, and **city** officials concerning institutional change and expansion plans. [Ord. 2451, 12-2-96. Code 2001 § 151.520.]*

**Response: Concept Master Plan -** Friendsview is active in community and has followed and will continue to follow city procedures to communicate their intended development within city policies.

***15.348.020 General provisions.***

*The **uses**, procedures, and standards contained within this chapter apply only when the property is purchased by an **institution**. Development standards of the underlying zone apply to all other **parcels** within the district boundaries. [Ord. 2451, 12-2-96. Code 2001 § 151.521.]*

**Response:** A portion of the land proposed for the University Village Master Plan lies within the IO sub-district. Not all properties within the University Village Master Plan are currently owned by Friendsview, thus Friendsview has created a phased plan for development and land use processes. See Concept Master Plan Phasing Plans.

***15.348.030 Permitted buildings and uses.***

*A. All **uses** permitted in the underlying primary district.*

**Response: Concept Master Plan -** Proposed Use: Friendsview Retirement Community is a "CCRC" (Continuing Care Retirement Community) and classified as a "Group care facility (16+ people)" per the Newberg Development Code

Underlying districts of properties within University Village Master Plan:
Phase I:
Institutional – proposed use permitted, density permitted.
Phase II
Institutional – proposed use permitted, density permitted.
R-2 –use conditionally permitted, density exceeds allowed.
Phase III
Institutional – proposed use permitted, density permitted.
Phase IV
Institutional – proposed use permitted, density permitted.
R-2 –use conditionally permitted, density exceeds allowed.

Friendsview has and will continue to follow the process set forth by §15.348.040(C) to initiate an administrative zone change of the properties not already zoned Institutional prior to submitting development plans for permit for newly acquired properties.

*B. **Uses** that are directly related to the objectives of the **institution** and that are owned or operated by the **institution** that are not already permitted within the district, and may be subject to special conditions and standards including:*

*1. Group living facilities with a maximum of 10 residents per housing unit.*

*2. Office and administrative facilities subject to special conditions (NMC 15.348.050(A)).*

*3. Retail sales and services subject to special conditions (NMC 15.348.050(B)).*

**Response: Concept Master Plan** proposed use is directly related to the objectives of Friendsview.

*C. Where **uses** in the IO subdistrict and the underlying zone conflict, the IO subdistrict prevails. [Ord. 2451, 12-2-96. Code 2001 § 151.522.]*

**Response: Concept Master plan -** Conflicts between the IO subdistrict and underlying zone not anticipated as the properties in question plan to be converted to Institutional Zone and the overlay subdistrict repealed prior to permitting.

***15.348.040 Procedures.***

*A. Designation of Overlay Boundary. The IO subdistrict boundary is defined by the **institution** in cooperation with the **city**, based on the **institution**'s needs and acceptable areas for expansion. To amend an established boundary the **institution** will be required to submit a **comprehensive plan** amendment in accordance with established **city** procedures.*

**Response:** Noted. No revision requested.

*B. **Development Permits**.*

*1. Procedures for processing development applications and permits for projects within the IO subdistrict will follow existing **city** procedures. Regulations and standards set forth in NMC 15.348.060 will apply to the development applications in the subdistrict and will supersede other development standards in this **code**.*

*2. All new **buildings** and **structures** within the IO zone will follow the site design review criteria set forth in NMC 15.220.010 et seq. with the exception of the following:*

*a. An existing residential or commercial **structure** is converted to an institutional **use** permitted under NMC 15.348.030.*

*b. An existing institutional **use** is converted to a different institutional **use** permitted under NMC 15.348.030.*

**Response: Concept Master plan -** Noted.

*C. Conversion of Properties from IO Subdistrict to I Institutional District.*

*1. When the **institution** purchases property that is contiguous to the existing institutional district boundary, those properties can convert to the institutional district designation when the following applies:*

*a. The property contains or will be converted to an institutional **use**; and*

*b. The property is adjacent to the existing institutional boundary; and*

*c. The property meets either of the following locational factors:*

*i. In areas west of Hess Creek, more than 80 percent of the **block** is owned by the **institution**.*

*ii. The subject site is 100 percent owned by the **institution** and bounded on three sides by the **institution**; or when the subject site and abutting **parcels** on two sides of the site are owned by the **institution** and the third side of the site **abuts** the IO zone boundary.*

**Response: Concept Master plan -** Friendsview has and will continue to follow the process set forth by §15.348.040(C) to initiate an administrative zone change of the properties not already zoned Institutional prior to submitting development plans for permit for newly acquired properties.

*2. When properties are eligible for conversion to the institutional district subject to the conditions in subsection (C)(1) of this section, the **institution** will be required to submit the following information to the **director** for administrative Type I review and approval:*

*a. Submit a title report showing ownership of the property by the **institution**.*

*b. Provide a map and legal description showing where the property is located.*

*c. Provide information and a description of how the **institution** meets the requirements of subsection (C)(1) of this section.*

*3. With approval by the **director** for property conversion from the IO subdistrict to the institutional district, the **city** shall update the zoning map to reflect the change. [Ord. 2451, 12-2-96. Code 2001 § 151.523.]*

***15.348.050 Special conditions and limitations.***

*The following conditions and limitations are applicable only to IO designated **parcels**. Development standards of the underlying zone apply to all other **parcels** within the IO district boundaries.*

*A. Office and administrative facilities are allowed in residential districts within the IO subdistrict subject to the following requirements:*

*1. The office **use** is an **accessory use** to a permitted institutional district **use**.*

*2. The conversion of existing residential housing to office **uses** shall not substantially change the **structure** or scale of the **building**.*

**Response: Concept Master plan -** Administrative facilities that occur will be accessory.

*B. Retail sales and services are allowed in residential districts within the IO subdistrict subject to the following requirements:*

*1. The retail sales and service **use** is an **accessory use** to a permitted institutional district **use**.*

*2. The **use** is identified as part of the **institution**'s master plan.*

*3. Retail and service **uses** shall be conducted wholly within a completely enclosed **building**; a **restaurant**, delicatessen or coffee shop may include an outdoor eating area, provided the area consists of an all-weather surface not greater than 900 square feet in **gross floor area** and is screened from public rights-of-way and residential areas.*

*4. Drive-up windows and **drive-through restaurant** services shall not be permitted. [Ord. 2451, 12-2-96. Code 2001 § 151.524.]*

**Response: Concept Master plan -** Retail sales that occur will be accessory.

***15.348.060 Development standards.***

*A. Height. The maximum height for all **uses** will be 45 feet.*

**Response:** The project has applied to the procedures of §15.348.040(C) to convert the properties to the designated Institutional District and will apply these procedures to future phases. Because the district conversion process is initiated by the overlay district, it seems keeping the process would negate the limitation set by the overlay. This is also in keeping with the "Friendsview pre-application – Planning notes" email notes from Steve Olson on April 8, 2015 which cites the Institutional zone development standards, including "Height: 75 foot max".

*B. Setbacks.*

*1. A minimum 15-foot **building** setback for all boundary lines of the property will be required for all schools, churches, public and semi-public **buildings** and other institutional **uses**in residential districts. IO designated property is not subject to the setback standards identified within NMC 15.410.040.*

*2. Parking in setbacks will be permitted per NMC 15.420.010(B)(3)(b).*

*3. No **variances** are required where existing **buildings** or site improvements are converted to institutional **uses** and do not meet these standards.*

**Response: Concept Master plan -** Complies with setbacks of this section. See Written Criteria Response Item 2 for further setback requirements, application, and variance request.

*C. **Lot Coverage**. Combined maximum **lot** and **parking coverage** shall be 80 percent for R-2, R-3 and RP districts.*

**Response:** Does not apply to Institutional districts. Any work in areas that are currently R-2 will be converted to Institutional per §15.348.040(C) prior to permitting. For more information see Stormwater report.

*D. Parking.*

*1. Group living: one space per three beds (can be reduced by 50 percent if within 400 feet of an **institution** parking **lot**).*

*2. Office: one space per 400 square feet minimum (can be reduced by 50 percent if within 400 feet of an **institution** parking **lot**).*

**Response: Concept Master plan -** See Written Criteria Response Item 1, Parking and On-site Circulation

*E. Landscaping. Exemption to the **landscape** requirements of NMC 15.420.010 include the following:*

*1. No **street** tree improvements will be required for projects along the following streets:*

*a. River **Street** between Sheridan **Street** and Sherman **Street**.*

*b. Sherman **Street** and North **Street** between Meridian **Street** and Villa Road.*

*c. Sheridan **Street** east of Meridian **Street**.*

*d. Center **Street** between Sheridan **Street** and Sherman **Street**.*

**Response: Concept Master plan -** Does not apply

*2. With an approved master plan or functional plan for landscaping of institutional properties within the IO subdistrict, administrative Type I review will be required pursuant to NMC15.220.010 et seq.*

**Response:** Master Landscape Plan and Phase I Landscape Plan submitted as a part of this application.

*F. **Signs**. Exemption to the **sign** requirements of NMC 15.435.010 et seq. include the following: One **sign** with a maximum size of six square feet may be mounted on a **building** or erected freestanding on the property and does not require a **sign** permit; provided, that it meets the vision clearance requirements of NMC 15.410.060 and that it is less than five feet tall. [Ord. 2451, 12-2-96. Code 2001 § 151.525.]*

**Response: Concept Master plan -** Noted. Signs will be a part of a future submittal and will comply.

## *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:

Will comply. See A101 and Aph4

## *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:

Traffic study has been provided, see attached Traffic Impact Analysis University Village dated October 8, 2015. The analysis finds the studied intersections can convey the expected additional traffic without major changes.

# *BUILDING HEIGHT VARIANCE WRITTEN CRITERIA RESPONSE*

**Variance Request Applies to Phase I**

The applicant requests a variance to allow a 15 foot increase to the building height limitation for the portion of the building within 50 feet of an interior property line abutting a R-2 district. Criteria response as follows:

## *(A) That strict or literal interpretation and enforcement of the specified regulation would result in practical difficulty or unnecessary physical hardship inconsistent with the objectives of this code.*

## Response:

**§§ 15.415.020 Requirements:**

***§15.415.020 Building height limitation.***

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

*1. Within 50 feet of an interior property line abutting a C-1, R-1, R-2 or R-P district, no main building may exceed 30 feet.*

*2. Within 50 feet of an interior property line abutting an R-3 district, no main building may exceed 45 feet.*

*3. Within 100 feet of a property line abutting a public street or railroad right-of-way, or within 100 feet of property lines abutting parcels with an R-1, R-2, R-3, R-P, C-1, C-2, C-3, M-1, M-2, or M-3 zoning designation, no main building may exceed 50 feet in height.*

*4. To utilize the maximum permitted height standard, at least 80 percent of the building's ground coverage must be beyond the setback area designated in subsection (D)(3) of this section. The maximum encroachment may not exceed 25 feet.*

**Response:** See Architectural Elevations for building form and Aph1 and "Building C R-2 Zone Height Setback Diagram" for applied yards and setbacks. Building height limitations applied as follows:
***"Building height"*** *means the vertical distance from the grade to the highest point of the coping of a flat roof or the deck line of a mansard roof or to the average height of the highest gable of a pitch or hip roof. See Appendix A, Figures 23 and 24.*

| | | |
|---|---|---|
| Building Height | Allowed | 75' |
| §15.415.020(D)(1): | Allowed | 30' building height within 50' of property line abutting R-2 |
| Proposed Blg Ht: | Building C | 49' - **Not in Compliance at NW Corner of building, Requesting Variance** |

- Yard Determination: line of effect of abutting R-2 property taken directly parallel to the abutting R-2 property line and having no affect beyond the property line.
- 75 SF at ground level within 50' of a property zoned R-2 with an Institutional Overlay
- 0.3% of the building footprint at ground level (75 SF/22,795 SF = 0.3%). This portion is below the required 30' building height.
- 0.35% of the building footprint at floors 2-4 (65 SF/18,410 SF = 0.35%) encroaches on the building height limitation.

If the code were applied in strict adherence, either the quality of the proposed spaces would be compromised, more buildings would be demolished, and/or the pedestrian walkway would be compromised.

## *(B) That there are exceptional or extraordinary circumstances or conditions applicable to the property involved or to the intended use of the property*

## *which do not apply generally to other properties classified in the same zoning district.*

## Response:

The site for this project is bordered by the railroad to the north, which is at an angle to the typical lot lines. This results in an awkwardly shaped property and unique relationship to the adjacent property. In addition, the site is already developed and in active use by residents and developed with public streets converted to private drives. The location of the building takes this into consideration by the following factors:

- North: aligning as close as possible to the railroad with the NW portion of the building where the site is most narrow, while maintaining required distances from the R-2 district to the West. Also, keeping the East portion of the building as far from the rail road as possible to allow for the greatest chance of resident comfort with less disruption from the noise generated by the railroad. Allowing for more appropriate outdoor activities adjacent to the railroad.
- West: Shifting as far east as possible to not impact the R-2 district and two large existing coniferous trees, while not demolishing more existing buildings in operation to the east than required.
- South: Aligning with Cherry Street (private drive) with a pedestrian walkway to create a safe pedestrian environment and allow for necessary fire access and traffic flow.
- East: Align with existing drives and structures, so that residences to the east and south may remain occupied until later phases are ready to take place to cause the least disruption to the neighborhood.

## *(C) That strict or literal interpretation and enforcement of the specified regulation would deprive the applicant of privileges enjoyed by the owners of other properties classified in the same zoning district.*

## Response:

The adjacent properties have an Institutional District overlay, indicating the city encourages the conversion of the properties to the Institutional district. The shape of the properties and existing infrastructure create yards and setbacks that limit the development from the North, South and West when the codes are strictly applied. This has potential to create a 'dead zone' of under-utilized space.

Other properties with the opportunity to convert a district to Institutional have properties with orthogonal alignments and straight-forward application of codes. The placement of the building seeks to create an economically built and comfortable space, while accommodating the guidelines intended to protect the public.

## *(D) That the granting of the variance will not constitute a grant of special privilege inconsistent with the limitations on other properties classified in the same zoning district.*

## Response:

The adjacent property is in the institutional overlay, indicating the city encourages the abutting property to be an institutional use in the future. The site is an unusual shape, which adds interest as well as complication to the way the properties and structures relate to one another.

To grant this variance allows for a more constructible and usable building with negligible impact to adjacent properties.

## *(E) That the granting of the variance will not be detrimental to the public health, safety or welfare or materially injurious to properties or improvements in the vicinity.*

## Response:

The granting of this variance will have minimal, if any, impact to the adjacent property or to the general public for the following reasons:

- Building C is at an oblique angle to the residential property, which would lessen presence of the building as observed from the adjacent property.
- The building is sited to preserve two large, coniferous trees that currently, and will continue to, provide a landscape screen between Building C and the adjacent residential property.
- Building C is positioned appx 96'-10" to the nearest residential building. Zoning ordinances allow for an institutional building greater than 30' to be as close as 55' to a residential building.
- The full allowed building height for the Institutional District is not being exercised or sought. The scale of these buildings is very similar to the dormitories recently built at George Fox University.

# *FRONT YARD VARIANCE WRITTEN CRITERIA RESPONSE*

**Variance Request Applies to Phase I**

The applicant requests a variance to reduce the front setback for the Phase I property to 15 feet. Criteria response as follows:

## *(A) That strict or literal interpretation and enforcement of the specified regulation would result in practical difficulty or unnecessary physical hardship inconsistent with the objectives of this code.*

## Response:

***§15.410.020(D)Front yard setback - Institutional and Community Facility.***

*All lots or development sites in the I and CF district shall have a front yard of 25 feet. Outdoor activity facilities, such as pools, basketball courts, tennis courts, or baseball diamonds, including any accessory structures and uses, are not permitted within the required setback. [Ord. 2720 § 1(12), 11-2-09; Ord. 2647, 6-5-06; Ord. 2564, 4-15-02; Ord. 2561, 4-1-02; Ord. 2550, 5-21-01; Ord. 2451, 12-2-96. Code 2001 § 151.551.]*

***Definition:***

> ***"Yard, front"*** *means a yard extending between lot lines which intersect a street line, the depth of which is the minimum horizontal distance between the street line and a line parallel thereto on the lot. It includes a yard adjacent to a private street on any lot that accesses that private street. It does not include a yard adjacent to an alley only (see Appendix A, Figures 5 and 10).*

**Response:** See Architectural Elevations for building form and Aph1 and "Building C Front Yard Setback Diagram" for applied yards and setbacks. Front Yard setbacks applied as follows:

- Yard Determination: Line of effect of front yard per City diagram. 25' from each property line and connecting the lines of effect to form a continuous yard.
- At the property lines bordering center street and the private drive of Cherry Street, Center Street extends into the property by approximately 47'. This creates 3 front yards on the property just at the north end of Center Street.
- 0.4% of the building footprint at ground level (95 SF/22,795 SF = 0.4%) encroaches on the required setback

If the code were applied in strict adherence, either the quality of the proposed spaces would be compromised, more buildings would be demolished, and/or the pedestrian walkway would be compromised.

## *(B) That there are exceptional or extraordinary circumstances or conditions applicable to the property involved or to the intended use of the property which do not apply generally to other properties classified in the same zoning district.*

## Response:

The site for this project is unique in several aspects. Below is a description of the features surrounding the Proposed Building C for Phase I:

- North – the site is bordered by the railroad which is at an angle to the typical lot lines and creates a pinch-point at the Corner of Center Street and private drive "Cherry"
- West - an R-2 district with an Institutional Overlay requires 25' yards when adjacent to an Institutional district in addition to restricting the height to 30' within 50' of the property.
- Southwest –

  - Center Street remains a public way and extends into the property which technically requires an increased right-of-way width and 25' front yards on three sides of the street.
  - Center Street connects to the recently converted private drive of what was the public way of Cherry Street, which is to the south of the proposed Building C.
- East – Existing drives and dwellings are planned to remain, Building C is located to allow the maximum number of these buildings to continue to operate until future phases of the Master Plan are ready to commence.

The combination of these restrictions leave 40' of buildable width at the southwest portion of the 100' deep portion of the site, of which only 14' of the width is allowed to be greater than 30' in height. Very few building types can achieve full efficiency in this buildable area.

The yard extending to the north of Center Street is at what could technically be a dead end, but with the private drive of Cherry Street remaining, functions as a turning street.

## *(C) That strict or literal interpretation and enforcement of the specified regulation would deprive the applicant of privileges enjoyed by the owners of other properties classified in the same zoning district.*

## Response:

Generally, a front yard is used to create a place for the pedestrian, proper clearances for infrastructure, and create a street edge. With Center Street extending 47' into the property having one ownership, this would create an island of reserved land that does not accomplish the original intent of the regulation.

## *(D) That the granting of the variance will not constitute a grant of special privilege inconsistent with the limitations on other properties classified in the same zoning district.*

## Response:

The configuration of this property and the dead-end of Center Street create a non-typical intersection that does not lend to a typical street edge, thus the building location does not interrupt a potential street edge. Also, the end of the street in question is surrounded by one consolidated lot with one owner.

## *(E) That the granting of the variance will not be detrimental to the public health, safety or welfare or materially injurious to properties or improvements in the vicinity.*

## Response:

The design team has sought to create a space that meets the intent of the code by creating a defined street edge, green space, allow for maintenance of utilities, and a safe place for pedestrians to travel. Phase I, Building C will provide the first portion of a network of covered walks, which is a key element of the master plan. With the vacation of Cherry Street, only the water utility remains public. Care will be taken to coordinate within the design team and with the city utilities to maintain adequate clearances for maintenance. The configuration of this property and the dead-end of Center Street create a non-typical intersection that does not lend to a typical street edge, thus the building location does not interrupt a potential street edge. The design team proposes that the building bend with the shape of the site and engages with the street, allowing for a view down Center Street that supports an understanding of the campus.

FUTURE CONSIDERATION
The design team realizes that planning decisions need to be made with the current land conditions in mind, but in consideration of the Master Plan, the vacation of Center Street is the next planned land use process following Phase

I. In the vacation of Center Street a front yard will no longer be required at the location of Building C. Until that time, Building C allows for safe pedestrian travel, proper clearances for infrastructure, and does not interrupt a potential street edge. In fact, it's location supports a cohesive Master Plan.

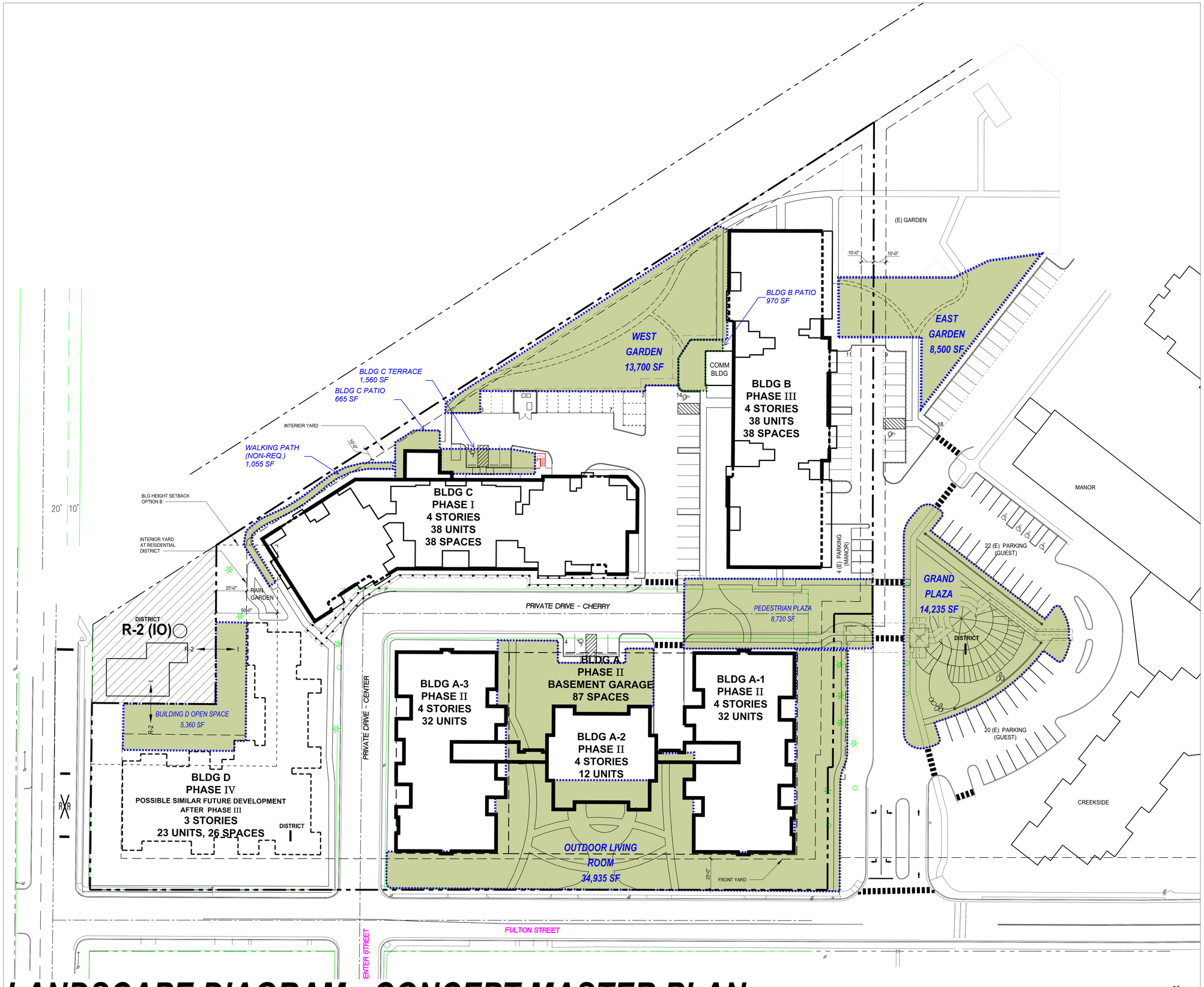
## *CONCLUSION*

Friendsview Retirement community seeks to expand in a way that is consistent with the character of their senior living community community that is an active part of the larger community of Newberg. University Village will play a large role in welcoming new residents to the Friendsview community within Newberg and is consistent with the design values of the city in connecting to the community as well as the building forms speaking to the pattern languages of the neighborhood.

The Design team respectfully requests approval of the project and looks forward to working with the City during the subsequent stages of the development.

Submitted By
**Dean Masukawa**
**LRS Architects, Inc.**
**720 NW Davis, Suite 300**
**Portland, Or 97209**
**503-221-1121**

Written By
**Julie Bradshaw**




# LANDSCAPE DIAGRAM - CONCEPT MASTER PLAN


LRS ARCHITECTS
720 NW Davis 503.221.1121
Suite 300 503.221.2077
Portland OR 97209 www.lrsarchitects.com


PRELIMINARY
NOT FOR
CONSTRUCTION

CONSULTANT:

PROJECT NUMBER: 211312

**FRIENDSVIEW RETIREMENT COMMUNITY**

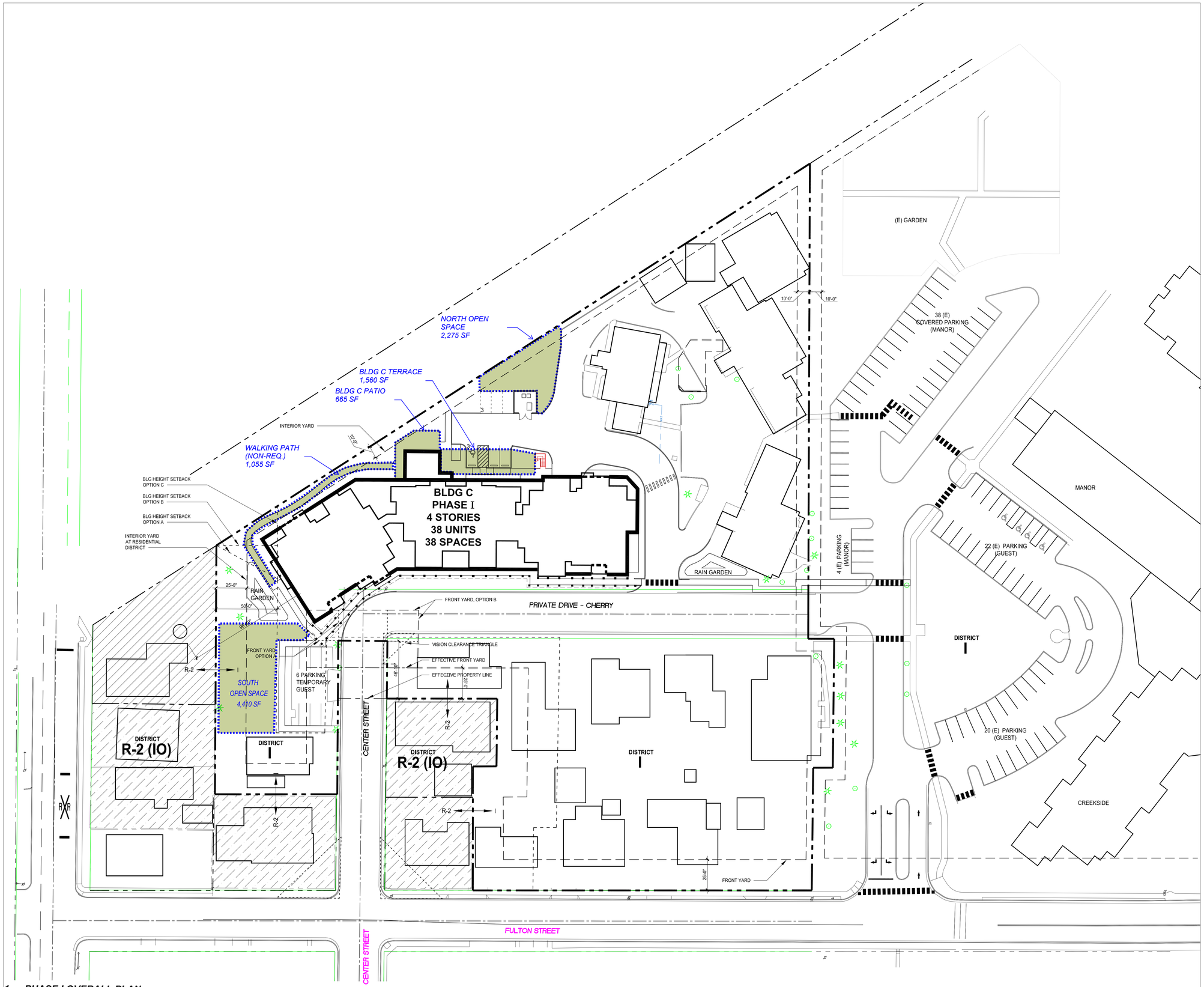
**CONCEPT MASTER PLAN / DESIGN REVIEW**

1301 East Fulton Street
Newberg, Oregon
97132

SHEET TITLE:

**CONCEPT MASTER PLAN / PHASE IV OVERALL**

# D1




## 1. PHASE I OVERALL PLAN

SCALE: 1" = 30'-0"

0 15' 30' 60'

## LEGEND

- PROPERTY CURRENTLY OWNE
- PROPERTY TO BE ACQUIRED BEFORE PHASE II BEGINS
- PROPERTY NOT PLANNED TO ACQUIRE
- EXISTING BUILDING


LRS ARCHITECTS
720 NW Davis 503.221.1121
Suite 300 503.221.2077
Portland OR 97209 www.lrsarchitects.com


PRELIMINARY NOT FOR CONSTRUCTION

CONSULTANT:

PROJECT NUMBER: 211312

**FRIENDSVIEW RETIREMENT COMMUNITY**

**CONCEPT MASTER PLAN / DESIGN REVIEW**

**1301 East Fulton Street**
**Newberg, Oregon**
**97132**

SHEET TITLE:

**PHASE I OVERALL SITE PLAN**

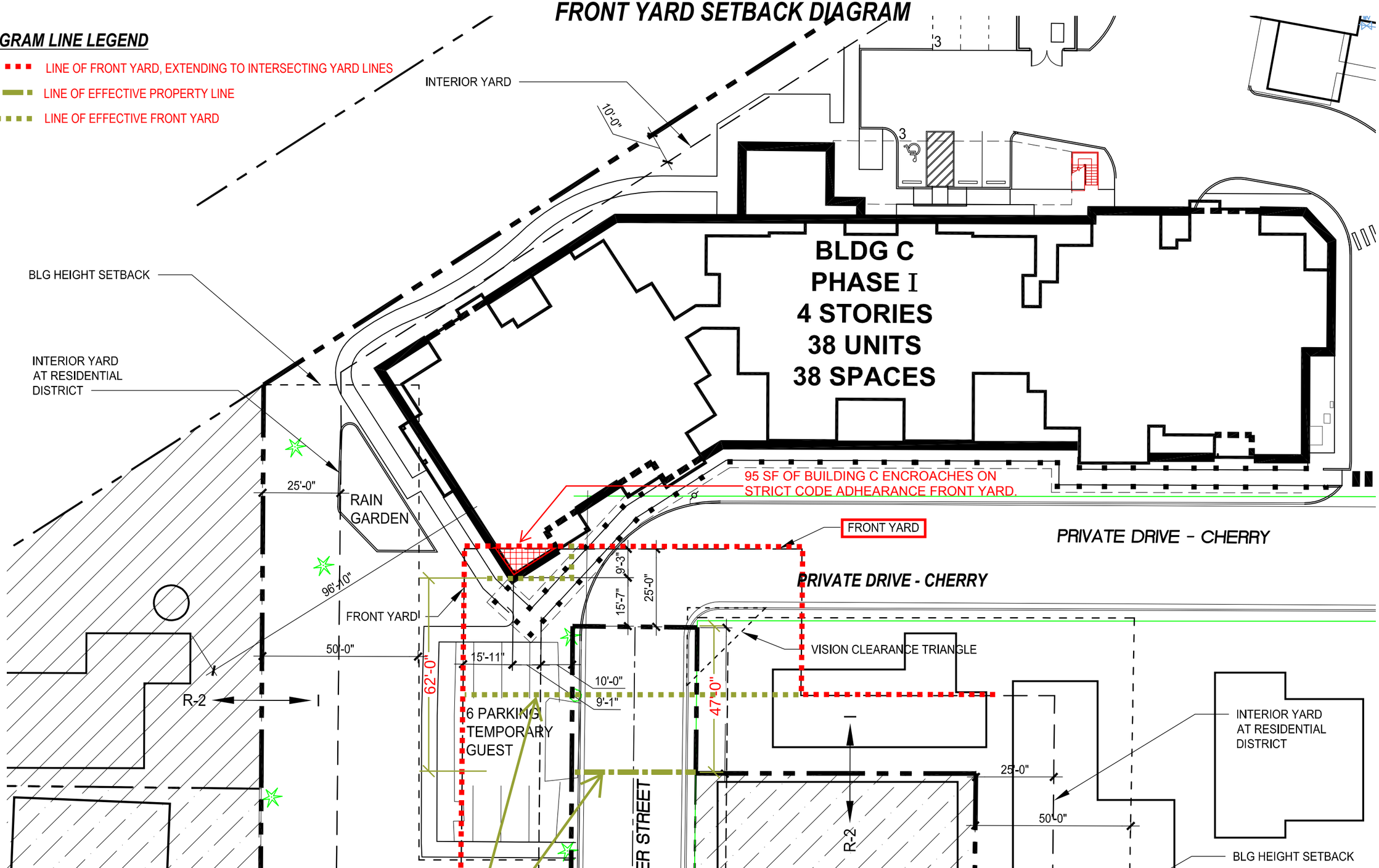
# D2

jbradshaw 3:55pm 22 October P:\Portland\2012\12047 Friendsview Phase 1A-2015\00 Documents\300 AutoCAD\12047 &nrg phase plan.dwg

# BUILDING C
# FRONT YARD SETBACK DIAGRAM

**DIAGRAM LINE LEGEND**

- LINE OF FRONT YARD, EXTENDING TO INTERSECTING YARD LINES
- LINE OF EFFECTIVE PROPERTY LINE
- LINE OF EFFECTIVE FRONT YARD



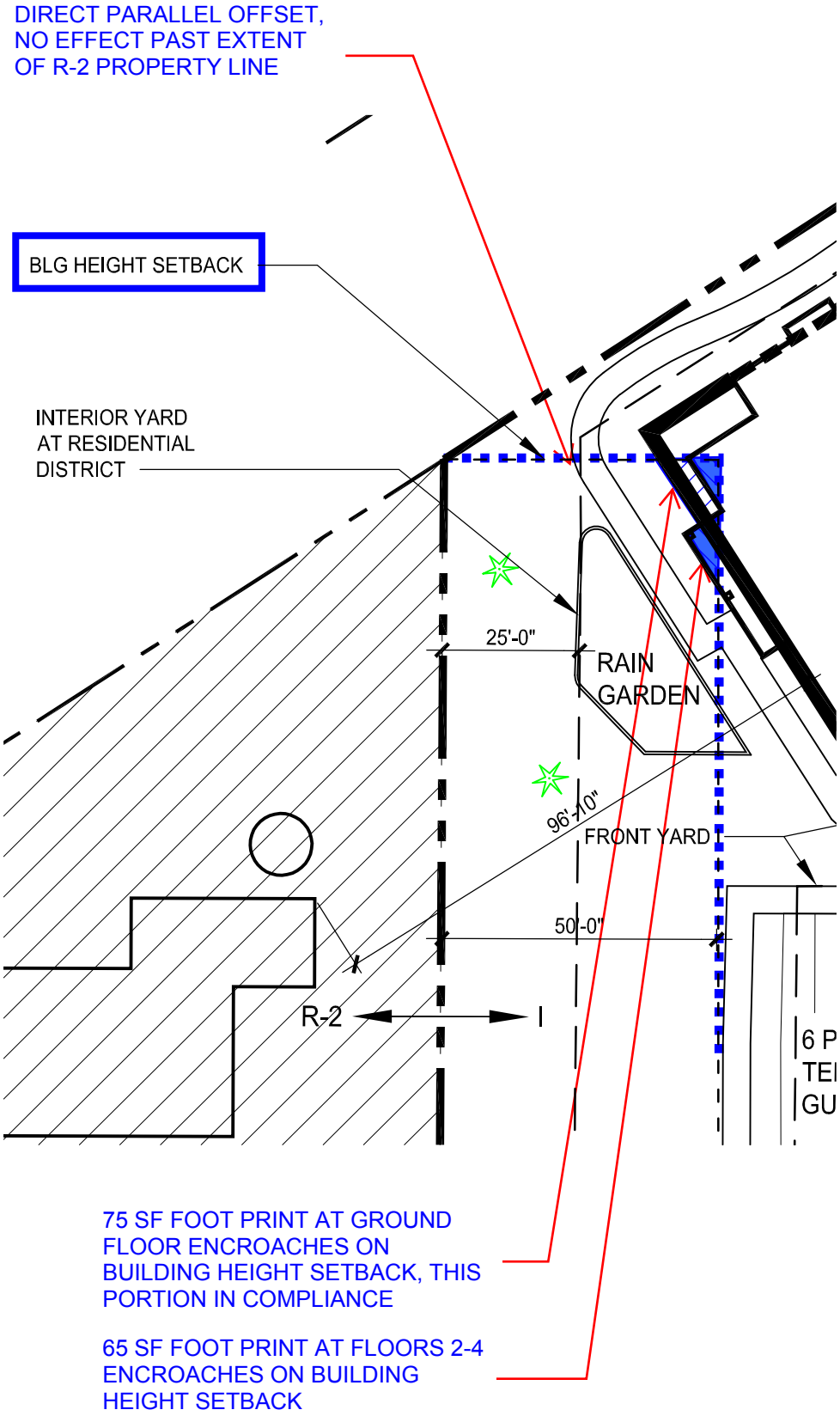

## PHASE I OVERALL PLAN

SCALE: 1" = 30'-0"

D3

# BUILDING C

# R-2 ZONE HEIGHT SETBACK DIAGRAM




N

## PHASE I OVERALL PLAN

SCALE: 1" = 30'-0"

D4

SCALE:

**AERIAL VIEW**

DATE ISSUED: 08/12/15

Friendsview RETIREMENT COMMUNITY

**University Village**
1301 Fulton St. Newberg, OR 97132

LRS ARCHITECTS
720 NW Davis Suite 300 Portland OR 97209
PH: 503.211.1121
FX: 503.211.2077
www.lrsarchitects.com
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# D5

SCALE:

**NORTH PERSPECTIVE**

DATE ISSUED: 08/12/15

Friendsview
RETIREMENT COMMUNITY

***University Village***
***1301 Fulton St. Newberg, OR 97132***

LRS ARCHITECTS
720 NW Davis Suite 300 Portland OR 97209
PH: 503.211.1121
FX: 503.211.2077
www.lrsarchitects.com
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# D6

Friendsview
RETIREMENT COMMUNITY

# View Down Center Street
# University Village - Phase I

D7

LRS ARCHITECTS
PORTLAND | SHANGHAI

# View Down Center Street
# University Village -Future

Friendsview
RETIREMENT COMMUNITY

D8

LRS ARCHITECTS
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Friendsview
RETIREMENT COMMUNITY

# View Down Cherry Street
# University Village - Phase I

D9

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# View Down Cherry Street
# University Village - Future

**D10**

LRS ARCHITECTS
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# FRIENDSVIEW UNIVERSITY VILLAGE

## 1301 FULTON STREET, NEWBERG OREGON 97132

## CONCEPT MASTER PLAN AND
## PHASE 1 DESIGN REVIEW SET
## NOVEMBER 17TH 2015


LRS ARCHITECTS
720 NW Davis 503.221.1121
Suite 300 503.221.2077
Portland OR 97209 www.lrsarchitects.com


***PRELIMINARY NOT FOR CONSTRUCTION***

215047

Friendsview RETIREMENT COMMUNITY

***University Village***

*1301 Fulton St. Newberg, OR 97132*

## *PROJECT DIRECTORY*

### *OWNER*

**FRIENDSVIEW RETIREMENT COMMUNITY**
1301 EAST FULTON STREET
NEWBERG, OREGON 97132

***CONTACT PERSON:***
TODD ENGLE, EXEC DIRECTOR
tengle@friendsview.org
friendsview.org
t: 503-538-3144
f: Contacts Fax

### *CONTRACTOR*

**YORKE & CURTIS**
4480 SW 101st Court
Beaverton, OR 97005

***CONTACT PERSON:***
Erik Timmons
Erikt@yorkeandcurtis.com
yorkeandcurtis.com
t: 503-646-2123
f: 503-643-5531

### *ARCHITECT*

**LRS ARCHITECTS**
720 NW Davis, Ste 300
Portland, Oregon 97209

***CONTACT PERSON:***
JULIE BRADSHAW
JBRADSHAW@lrsarchitects.com
www.lrsarchitects.com
t: 503-221-1121
f: 503.221.2077

### *CIVIL*

**AKS ENGINEERING & FORESTRY, LLC**
12965 SW HERMAN ROAD, SUITE 100
TUALATIN, OR 97062

***CONTACT PERSON:***
CHUCK GREGORY
chuckg@aks-eng.com
aks-eng.com
t: 503-563-6451
f: 503-563-6152

### *LANDSCAPE*

**FRESHLEY LANDSCAPING**
1020 SW TAYLOR STREET
PORTLAND, OR 97205

***CONTACT PERSON:***
CHRIS FRESHLEY
chris@freshleylandscapearchitect.com
freshleylandscapearchitects.com
t: 503-224-7069
f: Contacts Fax

### *STRUCTURAL*

**FROELICH CONSULTING ENGINEERS**
6969 SW HAMPTON STREET
TIGARD, OR 97223

***CONTACT PERSON:***
ROD HAMMERBERG
rhammerberg@froelich-engineers.com
froelich-engineers.com
t: 503-624-7005
f: Contacts Fax

### *MECHANICAL*

**DESIGN BUILD**
Address Line 1
Address Line 2

***CONTACT PERSON:***
Contacts name
Contacts Email
Company URL
Contacts Phone
f: Contacts Fax

### *ELECTRICAL*

**Interface Engineering**
100 SW Main Street, Suite 1600,
Portland, OR 97204

***CONTACT PERSON:***
Mark Jackson
markj@interfaceeng.com
interfaceeng.com
t: 503.382.2649
f: Contacts Fax

### *PLUMBING*

**DESIGN BUILD**
Address Line 1
Address Line 2

***CONTACT PERSON:***
Contacts Name
Contacts Email
Company URL
Contacts Phone
f: Contacts Fax

### *BUILDING*

**CITY OF NEWBERG**
414 E FIRST STREET
P.O. BOX 970

***CONTACT PERSON:***
CODY GARDNER, PLANS EXAMINER
cody.gardner@newbergoregon.gov
newbergoregon.gov
t: 503-537-1240
f: 503-537-1272

### *GEOTECHNICAL*

**GRI**
9750 SW NIMBUS AVENUE
BEAVERTON, OR 97008 - 7172

***CONTACT PERSON:***
NICK HATCH
nhatch@gri.com
gri.com
t: 503-708-5332
f: 503-644-8034

## *PROJECT SUMMARY*

**STREET ADDRESS:** 1301 FULTON STREET, NEWBERG OREGON 97132

**PROJECT DESCRIPTION:** 38 UNIT INDEPENDENT LIVING APARTMENTS OVER AN OPEN PARKING GARAGE ABOVE GRADE.

**APPLICABLE CODES:**

2014 OREGON STRUCTURAL SPECIALTY CODE, (OSSC)

2014 OREGON ENERGY EFFICIENCY SPECIALTY CODE

2014 OREGON MECHANICAL SPECIALTY CODE

2014 OREGON PLUMBING SPECIALTY CODE

2010 OREGON SOLAR INSTALLATION SPECIALTY CODE

2014 OREGON FIRE CODE

2011 OREGON ELEVATOR SPECIALTY CODE

IIC/ANSI 117.1-2009 (National Technical Standard) - 1101.2.2
Not all sections adopted by the State of Oregon as outlined below:
Section 407-Elevators, refer to OESC
Section 408-Limited Use Elevators, refer to OESC
Section 409-Residential Elevators, refer to OESC
Section 410-Private Lifts, refer to OESC
1101.2.2.5 Section 406.12 deleted; Sections 404.2.8 - Door Opening Force revised; install per OSSC.
1101.2.2.6 Section 406.12 deleted Section 406.12 Detectible warnings at raised crossing is deleted in entirety.

2010 ADA Standards for Accessible Design, (SAD)

FAIR HOUSING ACT 1988 OSSC 1101.2.1 Maybe considered an alternate method for mulit-family dwellings if approved by the AHJ.

## *ZONING INFORMATION*

**ZONE:** INSTITUTIONAL (I)
CONVERTED BY OVERLAY DESIGNATION AND CITY OF NEWBERG RULING

**LOADING & UNLOADING:** SEE SHEET A101 FOR LOADING AREAS,
AND SHEETS A201 FOR PARKING GARAGE DRAWINGS

**TRASH / RECYCLING AREA:** CMU WALLS REQUIRED
NO COVER REQUIRED

**FLOOR AREA RATIOS & HEIGHT LIMITATIONS:**
LOT COVERAGE NOT LIMITED
75' MAX
30' MAX WITHIN 50' OF R-2
50' MAX WITHING 100' OF PUBLIC STREET, RAILROAD RIGHT OF WAY OR ABUTTING PARCELS OF R-2 (15.415.020)

**STREET IMPROVEMENTS:** TBD BY DESIGN REVIEW / CONCEPT MASTER PLAN REVIEW
XXXXXXXXXXXXXXXXXXXXXXXXXXXX

**BICYCLE PARKING:** (4) COVERED SPACES PROVIDED AT ENTRY,
RESIDENT STORAGE AREAS (1 PER UNIT) ACCOMODATE BIKE PARKING

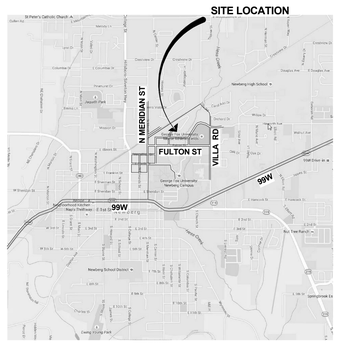
## *CONTRACTOR DESIGN BUILD*

### *ITEMS UNDER SEPARATE PERMIT:*

1. FIRE ALARM
2. FIRE SPRINKLER
3. MECHANICAL
4. ELECTRICAL
5. PLUMBING

### *DEFERRED SUBMITTAL ITEMS:*

1. ROOF TRUSSES
2. I-JOIST
3. FIRE STOP PRODUCTS
4. EMERGENCY ILLUMINATION INCLUDING EXIT SIGNAGE




## *VICINITY MAP*

**NOT TO SCALE**

N
True North

DRAWN BY: *CJH*
DATE ISSUED: *12/23/2015*

SHEET:
**CS**
*CMP/DR SET*

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*12/23/2015 1:20:27 PM*

# PROJECT ABBREVIATIONS

| | |
|---|---|
| # | NUMBER OR POUND |
| & | AND |
| @ | AT |
| [ | CHANNEL |
| CL or | CENTERLINE |
| DIA or | DIAMETER |
| ∠ | ANGLE |
| AB | ANCHOR BOLT |
| AC | ASPHALTIC CONCRETE |
| ACOUST | ACOUSTICAL |
| ACP | ACOUSTICAL CEILING PANEL |
| ACT | ACOUSTICAL CEILING TILE |
| AD | AREA DRAIN |
| ADD | ADDENDUM |
| ADJ | ADJUSTABLE |
| AES | ARCHITECTURAL EXPOSED STEEL |
| AF | ACCESS FLOORING |
| AFF | ABOVE FINISH FLOOR |
| AGG | AGGREGATE |
| AHU | AIR HANDLING UNIT |
| AIB | AIR INFILTRATION BARRIER |
| ALT | ALTERNATE |
| ALUM | ALUMINUM |
| ANOD | ANODIZED |
| AP | ACCESS PANEL |
| APPROX | APPROXIMATELY |
| ARCH | ARCHITECTURAL |
| ATB | ALUMINUM T-BAR GRID |
| AUTO | AUTOMATIC |
| AUX | AUXILIARY |
| AVG | AVERAGE |
| AWP | ACOUSTICAL WALL PANEL |
| AWT | ACOUSTICAL WALL TREATMENT |
| BB | BULLETIN BOARD |
| BD | BOARD |
| BITUM | BITUMINOUS |
| BL | BLINDS |
| BLDG | BUILDING |
| BLKG | BLOCKING |
| BM | BEAM |
| BNC | BENCHMARK |
| BO | BOTTOM OF |
| BOC | BOTTOM OF CONCRETE |
| BOD | BOTTOM OF DECK(ING) |
| BOF | BOTTOM OF FRAMING |
| BOS | BOTTOM OF STEEL |
| BP | BUILDING PAPER |
| BR | BED ROOM |
| BRK | BRICK |
| BTWN | BETWEEN |
| BUR | BUILT UP ROOFING |
| CAB | CABINET |
| CB | CATCH BASIN |
| CCTV | CLOSED CIRCUIT TELEVISION |
| CEM | CEMENT |
| CER | CERAMIC |
| CF | CUBIC FEET |
| CFLG | COUNTER FLASHING |
| CG | CORNER GUARD |
| CH | COAT HOOK |
| CI | CAST IRON |
| CIP | CAST IN PLACE |
| CJ | CONTROL JOINT |
| CL | CENTER LINE |
| CLG | CEILING |
| CLKG | CAULKING |
| CLOS | CLOSET |
| CLR | CLEAR |
| CMU | CONCRETE MASONRY UNIT |
| CO | CLEAN OUT |
| COL | COLUMN |
| CONC | CONCRETE |
| CONN | CONNECTION |
| CONST | CONSTRUCTION |
| CONT | CONTINUOUS |
| COORD | COORDINATE |
| CORR | CORRIDOR |
| CPT | CARPET |
| CS | CONCRETE SEALER |
| CSK | COUNTERSUNK |
| CT | CERAMIC TILE |
| CTR | CENTER |
| CW | COLD WATER |
| CY | CUBIC YARDS |
| (D) | DEMOLISH |
| D | DEPTH |
| DBL | DOUBLE |
| DEPT | DEPARTMENT |
| DF | DRINKING FOUNTAIN |
| DIA | DIAMETER |
| DIAG | DIAGONAL |
| DIM | DIAMETER |
| DISP | DISPENSER |
| DN | DOWN |
| DO | DOOR OPENING |
| DR | DOOR |
| DS | DOWNSPOUT |
| DSP | DRY STANDPIPE |
| DTL | DETAIL |
| DW | DISHWASHER |
| DWG | DRAWING |
| DWR | DRAWER |
| (E) | EXISTING |
| E | EAST |
| EA | EACH |
| EB | EXPANSION BOLT |
| EF | EXHAUST FAN |
| EIFS | EXTERIOR INSULATED FINISH SYSTEM |
| EJ | EXPANSION JOINT |
| EL | ELEVATION (TOPOGRAPHICAL) |
| ELDR | ELEVATION (DRAWING) |
| ELEC | ELECTRICAL |
| ELEV | ELEVATOR |
| EM | ENTRANCE MAT |
| EMER | EMERGENCY |
| ENCL | ENCLOSED |
| EP | ELECTRIC PANEL BOARD |
| EQ | EQUAL |
| EQUIP | EQUIPMENT |
| EW | EACH WAY |
| EXH | EXHAUST |
| EXIST | EXISTING |
| EXP | EXPANSION |
| EXPO | EXPOSED |
| EXT | EXTERIOR |
| (F) | FUTURE |
| FA | FIRE ALARM |
| FAF | FACTORY APPLIED FINISH |
| FCP | FIRE COMMAND POST |
| FD | FLOOR DRAIN |
| FDC | FIRE DEPT. CONN. |
| FDN | FOUNDATION |
| FE | FIRE EXTINGUISHER |
| FEC | FIRE EXTINGUISHER CABINET |
| FF | FINISHED FLOOR |
| FH | FIRE HYDRANT |
| FHC | FIRE HOSE CONNECTION |
| FIN | FINISH |
| FIXT | FIXTURE |
| FJ | FLOOR JOIST |
| FLAM | FLAMMABLE |
| FLASH | FLASHING |
| FLOR | FLOOR(ING) |
| FLUOR | FLUORESCENT |
| FO | FACE OF |
| FOC | FACE OF CONCRETE |
| FOF | FACE OF FINISH |
| FOHC | FREE OF HEART CENTERS |
| FOM | FACE OF MASONRY |
| FOS | FACE OF STUD |
| FOSH | FACE OF SHEATHING |
| FOW | FACE OF WALL |
| FPL | FIREPLACE |
| FR | FIRE-RATED |
| FRP | GLASS FIBER REINFORCED PANEL |
| FRPT | FIRE RETARDANT PRESSURE TREATED |
| FRT | FIRE RETARDANT TREATED |
| FS | FLOOR SINK |
| FSD | FIRE SMOKE DAMPER |
| FT | FOOT |
| FTG | FOOTING |
| FUR | FURRING |
| GA | GAUGE OR GAGE |
| GALV | GALVANIZED |
| GB | GRAB BAR |
| GFRC | GLASS FIBER REINFORCED CONCRETE |
| GFRG | GLASS FIBER REINFORCED GYPSUM |
| GL | GLASS |
| GLAM | GLUE LAMINATED |
| GND | GROUND |
| GR | GRADE |
| GYP | GYPSUM |
| GYPBD | GYPSUM WALL BOARD |
| H | HIGH |
| HB | HOSE BIBB |
| HC | HOLLOW CORE (MATERIAL) |
| HCP | HANDICAPPED |
| HD | HEAVY DUTY |
| HDR | HEADER |
| HDWD | HARDWOOD |
| HDWR | HARDWARE |
| HM | HOLLOW METAL |
| HORIZ | HORIZONTAL |
| HPL | HIGH PRESSURE LAMINATE |
| HR | HOUR |
| HT | HEIGHT |
| HVAC | HEATING, VENTING & AIR CONDITIONING |
| HW | HOT WATER |
| HWY | HIGHWAY |
| IBC | INTERNATIONAL BUILDING CODE |
| ID | INSIDE DIAMETER |
| IN | INCHES |
| INCAN | INCANDESCENT |
| INCL | INCLUDE (D) (ING) |
| INFO | INFORMATION |
| INSUL | INSULATE (D) (ION) |
| INT | INTERIOR |
| INV | INVERT |
| IRC | INTERNATIONAL RESIDENTIAL CODE |
| JAN | JANITOR |
| JST | JOIST |
| JT | JOINT |
| KB | KNOX BOX |
| KD | KNOCK DOWN |
| KIT | KITCHEN |
| KO | KNOCK OUT |
| KP | KICK PLATE |
| KS | KNEE SPACE |
| L | LENGTH |
| LAB | LABORATORY |
| LAM | LAMINATE (D) |
| LAV | LAVATORY |
| LB | POUND |
| LF | LINEAR FEET |
| LG | LARGE |
| LH | LEFT HAND |
| LHR | LEFT HAND REVERSE |
| LIN | LINEAR |
| LKR | LOCKER |
| LL | LIVE LOAD |
| LLV | LONG LEG VERTICAL |
| LNO | LINOLEUM |
| LR | LIVING ROOM |
| LSL | LAMINATED STRAND LUMBER |
| LSS | LIFE SAFETY SYSTEMS |
| LT | LIGHT |
| LVL | LEVEL |
| M | METER |
| MATL | MATERIAL |
| MAX | MAXIMUM |
| MB | MARKER BOARD |
| MBH | MOP AND BROOM HOLDER |
| MCB | MACHINE BOLT |
| MCJ | MASONRY CONTROL JOINT |
| MDH | MAGNETIC DOOR HOLDER |
| MDO | MEDIUM DENSITY OVERLAY |
| MECH | MECHANICAL |
| MEMB | MEMBRANE |
| MEZZ | MEZZANINE |
| MFR | MANUFACTURER |
| MH | MANHOLE |
| MIN | MINIMUM |
| MIR | MIRROR |
| MISC | MISCELLANEOUS |
| MM | MILLIMETER |
| MO | MASONRY OPENING |
| MOV | MICROWAVE OVEN |
| MP | METAL PANEL |
| MS | METAL STUD |
| MTD | MOUNTED |
| MTL | METAL |
| MUL | MULLION |
| MWP | METAL WALL PANEL (ING) |
| (N) | NEW |
| N | NORTH |
| N/A | NOT APPLICABLE |
| NF | NO FINISH |
| NFPA | NATIONAL FIRE PROTECTION ASSOCIATION |
| NIC | NOT IN CONTRACT |
| NO | NUMBER |
| NOM | NOMINAL |
| NRC | NOISE REDUCTION COEFFICIENT |
| NTS | NOT TO SCALE |
| O/ | OVER |
| OA | OVER ALL |
| OC | ON CENTER (S) |
| OD | OUTSIDE DIAMETER OR OVERFLOW DRAIN |
| OFCI | OWNER FURNISHED, CONTRACTOR INSTALLED |
| OFF | OFFICE |
| OFOI | OWNER FURNISHED, OWNER INSTALLED |
| OH | OVERHEAD |
| OPCI | OWNER PROVIDED, CONTRACTOR INSTALLED |
| OPNG | OPENING |
| OPOI | OWNER PROVIDED, OWNER INSTALLED |
| OPP | OPPOSITE |
| OSB | ORIENTATED STRAND BOARD |
| OSSC | OREGON (STATE) STRUCTURAL SPECIALTY CODE |
| P | PAINT SYSTEM COLOR |
| PCC | PRECAST CONCRETE |
| PERF | PERFORATED |
| PERP | PERPENDICULAR |
| PIPC | POURED IN PLACE CONCRETE |
| PL | PROPERTY LINE |
| PL | PLASTER |
| PLAM | PLASTIC LAMINATE |
| PLAS | PLASTIC |
| PLT | PLATE |
| PLWD | PLYWOOD |
| PNT | POINT |
| PNTD | PAINTED |
| PR | PAIR |
| PRCST | PRECAST |
| PREFAB | PRE-FABRICATED |
| PREFIN | PRE-FINISHED |
| PSF | POUNDS PER SQUARE FOOT |
| PSI | POUNDS PER SQUARE INCH |
| PSL | PARALLEL STRAND LUMBER |
| PT | PRESSURE TREATED |
| PTD | PAPER TOWEL DISPENSED |
| PTDWR | PAPER TOWEL DISPENSER AND WASTE RECEPTACLE |
| PTN | PARTITION |
| PVC | POLYVINYL CHLORIDE |
| PVG | PAVING |
| QLTY | QUALITY |
| QT | QUARRY TILE |
| QTY | QUANTITY |
| (R) | REMOVE |
| R | RISER |
| RA | RETURN AIR |
| RAD | RADIUS |
| RAF | RAISED ACCESS FLOORING |
| RB | RUBBER BASE |
| RCP | REFLECTED CEILING PLAN |
| RD | ROOF DRAIN |
| RDO | ROOF DRAIN OVERFLOW |
| REC | RECYCLE (D) (ING) |
| REF | REFERENCE |
| REFR | REFRIGERATOR |
| REG | REGISTER |
| REINF | REINFORCED (D) (ING) |
| REL | RELOCATE RISER |
| REQD | REQUIRED |
| RESIL | RESILIENT |
| RESILB | RESILIENT BASE |
| RESILC | RESILIENT CHANNEL |
| RET | RETAINING |
| REV | REVISE (D) (ION) |
| RF | RESINOUS FLOORING |
| RH | RIGHT HAND |
| RHR | RIGHT HAND REVERSE |
| RM | ROOM |
| RO | ROUGH OPENING |
| RS | ROOFING SYSTEM |
| RT | RUBBER TILE |
| RWL | RAIN WATER LEADER |
| (AS)SEAL | (ANTI-STAT) SEALER |
| (CO)SEAL | (COLORED) SEALER |
| S | SOUTH |
| S/HD | SEALER / HARDENER |
| SC | SOLID CORE |
| SCHED | SCHEDULE |
| SD | SOAP DISPENSER |
| SDF | STATIC DISSIPATIVE FLOORING |
| SECT | SECTION |
| SF | SQUARE FEET |
| SFT | STONE FLOOR TILE |
| SHFT | SHAFT |
| SHT | SHEET |
| SHTG | SHEATHING |
| SIM | SIMILAR |
| SK | SINK |
| SL | STRUCTURAL LEVEL |
| SM | SHEET METAL |
| SMF | SHEET METAL FLASHING |
| SMS | SHEET METAL SCREW |
| SND | SANITARY NAPKIN DISPENSER |
| SNR | SANITARY NAPKIN RECEPTACLE |
| SPEC | SPECIFICATION |
| SPKLR | SPRINKLER |
| SQ | SQUARE |
| SSF | SOLID SURFACING |
| SSK | SERVICE SINK |
| SST | STAINLESS STEEL |
| ST | STONE |
| ST-KD | STEEL (FRAME) - KNOCK DOWN |
| ST-W | STEEL (FRAME) - WELDED |
| STA | STATION |
| STB | STONE BASE |
| STC | SOUND TRANSMISSION CLASS |
| STD | STANDARD |
| STL | STEEL |
| STOR | STORAGE |
| STRUC | STRUCTURAL |
| SUSP | SUSPEND (ED) |
| SV | SHEET VINYL |
| SYM | SYMMETRICAL |
| T | TREAD |
| T&B | TOP AND BOTTOM |
| T&G | TONGUE & GROOVE |
| TA | TOILET ACCESSORY |
| TB | TOWEL BAR |
| TC | TOP OF CURB |
| TEL | TELEPHONE |
| TEMP | TEMPORARY |
| TERR | TERRAZZO |
| TFC | TRANSPARENT FINISH - CLEAR |
| TFMR | TRANSFORMER |
| TFOB | TO FACE OF BUILDING |
| TFS | TRANSPARENT FINISH - STAINED |
| THK | THICK (NESS) |
| TJ | TOOL (ED) JOINT |
| TKBD | TACK BOARD |
| TL | TILE |
| TO | TOP OF |
| TOC | TOP OF CONCRETE |
| TOD | TOP OF DECK (ING) |
| TOG | TOP OF FINISH GRADE |
| TOM | TOP OF MASONRY |
| TOP | TOP OF PARAPET |
| TOPL | TOP OF PLATE |
| TOR | TOP OF ROOF |
| TOS | TOP OF STEEL |
| TOW | TOP OF WALL |
| TP | TEMPERED |
| TPD | TOILET PAPER DISPENSER |
| TPG | TEMPERED GLASS |
| TS | TUBE STEEL |
| TSCD | TOILET SEAT COVER DISPENSER |
| TYP | TYPICAL |
| UG | UNDERGROUND |
| UL | UNDERWRITERS LABORATORY |
| UNFIN | UNFINISHED |
| UNO | UNLESS NOTED OTHERWISE |
| UPS | UNINTERRUPTIBLE POWER SUPPLY |
| UR | URINAL |
| USO | UNLESS SHOWN OTHERWISE |
| VCT | VINYL COMPOSITION TILE |
| VEN | VENEER |
| VERT | VERTICAL |
| VEST | VESTIBULE |
| VG | VERTICAL GRAIN |
| VIF | VERIFY IN FIELD |
| VT | VINYL TILE |
| VTR | VENT TO ROOF |
| (W) | WIDTH |
| W | WEST |
| W/ | WITH |
| W/O | WITHOUT |
| WB | WOOD BASE |
| WC | WATER CLOSET |
| WD | WOOD |
| WDW | WINDOW |
| WF - # | WOOD FLOORING (# DENOTES TYPE) |
| WH | WATER HEATER |
| WLCV | WALL COVERING |
| WLD | WELD (ED) |
| WOM | WALK OFF MAT |
| WP | WATERPROOF (ING) |
| WR | WASTE RECEPTACLE |
| WRB | WEATHER RESISTANT BARRIER |
| WSCT | WAINSCOT |
| WT | WEIGHT |
| WWF | WELDED WIRE FABRIC |
| WWP | WOOD WALL PANEL (ING) |
| YD | YARD |

# ARCHITECTURAL SYMBOLS

- Rough Lumber Section (Continuous)
- Rough Lumber Section (Blocking)
- Hardboard (Section)
- Particleboard (Section)
- Plywood (Section)
- Millwork (Section)
- Glue Laminate Beam (Section)

# ARCHITECTURAL MATERIALS

- ABC Fill
- Alluminum
- Concrete Fill
- Disturbed Soil
- Un-Disturbed Soil
- Expanded Metal
- Fiber Cement Board
- Gypsum Board
- Fire Stop Material
- LRS - Masonry - Brick
- Masonry - Concrete Block
- Plywood
- Rigid Insulation
- Sand
- Steel
- Tactile Warning
- Wood - Endgrain
- Pavement

# STRUCTURAL SYMBOLS

- Steel Decking (Section)
- Steel Pipe Column (Plan)
- Steel Tube Column (Plan/Section)
- Steel Channel (Section)
- Wide Flange Column (Plan)
- Steel Girder (Section)
- Concrete Shear Wall (Plan/Section)

# FIRE PROTECTION SYMBOLS

**SPRINKLER HEADS**

- PENDANT
- PENDANT WITH GUARD
- PENDANT ON DROP
- PENDANT ON DROP WITH GUARD

**FIRE EXTINGUISHERS**

- BRACKET MOUNTED FIRE EXTINGUISHER
- RECESSED MOUNTED FIRE EXTINGUISHER CAB
- SURFACE MOUNTED FIRE EXTINGUISHER CAB

**FIRE DEPARTMENT CONNECTIONS**

- DOUBLE SIAMESE CONNECTION
- TRIPLE SIAMESE CONNECTION
- DOUBLE STANDPIPE CONNECTION
- QUAD STANDPIPE CONNECTION

# PLUMBING SYMBOLS

- ROOF DRAIN AND OVERFLOW COMBINATION
- ROOF DRAIN
- FLOOR DRAIN ROUND
- FLOOR DRAIN SQUARE
- LAVITORY - COUNTER MOUNTED
- LAVATORY - WALL MOUNTED
- WATER CLOSET - FLOOR MOUNTED
- WATER CLOSET - WALL MOUNTED
- URINAL - WALL MOUNTED
- WATER HEATER

# ANNOTATION SYMBOLS

- 101 — Single Door Number
- 101 — Double Door Number; Number Indicates Active Leaf
- A — Column Grid
- 1 A400 — Wall/Detail Section
- 1 A400 — Building Section
- A400D — Exterior Building Elevation
- 1 4 A400 2 3 — Interior Elevation
- 1 A202 — Enlarged Plan Callout
- 1 A400 — Detail Callout
- Sheet Matchline Designator
- P-1 — Finish Tag
- B3 a / 2 b — Wall Tag
- 1 RFS — Revision Cloud and Tag
- 2 — Keyed Note
- W — Window Tag
- L1 — Louver Tag
- OFFICE 106 — Room Tag
- Elevation 0'-0" Æ 0'-0" Œ — Elevation/Level Mark; Architectural Elevation; Civil Elevation
- Exit Sign
- 9'-0" — Ceiling Elevation Tag

# PROJECT PHASING

- OFOI - OWNER FURNISHED, OWNER INSTALLED
  OFCI - OWNER FURNISHED, CONTRACTOR INSTALLED
  NIC - NOT IN CONTRACT
  (REFER TO KEYED NOTES FOR MORE INFORMATION)
- EXISTING TO REMAIN
  (REFER TO KEYED NOTES FOR MORE INFORMATION)
- DEMOLISHED OR TO BE RELOCATED
  (REFER TO KEYED NOTES FOR MORE INFORMATION)
- NEW SCOPE OF WORK
  (REFER TO KEYED NOTES FOR MORE INFORMATION)


LRS ARCHITECTS
720 NW Davis 503.221.1121
Suite 300 503.221.2077
Portland OR 97209 www.lrsarchitects.com


CONSULTANT:

PROJECT NUMBER: 215047

**University Village**

*1301 Fulton St. Newberg, OR 97132*

SHEET TITLE:

**ARCHITECTURAL SYMBOLS AND ABBREVIATIONS**

DRAWN BY: Author
DATE CREATED: 08/10/15

SHEET:

Ai

LRS Master Template
Issue Date

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# SIGNAGE VISUAL CHARACTER HEIGHT

| Height above Floor to Baseline of Character | Horizontal Viewing Distance | Minimum Character Height |
|---|---|---|
| 40 inches to less than or equal to 70 inches | Less than 6 feet | 5/8 inch |
| | 6 feet and greater | 5/8inch, plus 1/8 inch per foot of viewing distance above 6 feet |
| Greater than 70 inches to less than or equal to 120 inches | Less than 15 feet | 2 inches |
| | 15 feet and greater | 2 inches, plus 1/8 inch per foot of viewing distance above 15 feet |
| Greater than 120 inches | Less than 21 feet | 3 inches |
| | 21 feet and greater | 3 inches, plus 1/8 inch per foot of viewing distance above 21 feet |

# Plumbing Code Calculations

Refer to IBC Chapter 29 and Table 29-A "Minimum Plumbing Fixtures" for specifics, exceptions, and footnotes.

| OCCUPANCY: Residential R-2 | | | OCCUPANTS: 70 | | | (35 MALE 35 FEMALE) | |
|---|---|---|---|---|---|---|---|
| Apartment House | WATER CLOSET | | LAVATORIES | | BATHTUBS OR SHOWERS | DRINKING FOUNTAINS | OTHER |
| | MALE | FEMALE | MALE | FEMALE | | | |
| REQUIRED: | 1 / Unit | | 1 / Unit | | 1 / Unit | – | * |

* 1 kitchen sink per dwelling unit; 1 automatic clothes washer connection per 20 dwelling units

***NOTE:***
MINIMUM PLUMBING FIXTURES CALCULATIONS BASED ON NON-SEPARATED UNSES

*IN ADDITION:*
*2 UNISEX RESTROOMS PROVIDED FOR ASSEMBLY SPACES. 1 PER SPACE*
*4 DRINKING FOUNTAINS PROVIDED. 1 PER FLOOR*
*4 SERVICE SINKS PROVIDED. 1 PER FLOOR*

# BUILDING UNIT AREA SCHEDULE

| UNIT NAME | UNIT TYPE | # OF BEDS | # OF BATHS | AVERAGE AREA | TOTAL UNIT COUNT | TOTAL UNIT AREA | TOTAL UNIT BEDS |
|---|---|---|---|---|---|---|---|
| Level 1 | | | | | | | |
| (none) | | | | | 1 | 0 SF | 0 |
| 260 IL UNIT 1 TYPE A | 2 BEDROOM | 2 | 2 | 1256 SF | 1 | 1256 SF | 2 |
| 260 IL UNIT 1 TYPE B | 2 BEDROOM | 2 | 2 | 1277 SF | 1 | 1277 SF | 2 |
| Level 2 | | | | | | | |
| 260 IL UNIT 1 TYPE B | 2 BEDROOM | 2 | 2 | 1277 SF | 1 | 1277 SF | 2 |
| 260 IL UNIT 2 TYPE B | 2 BEDROOM | 2 | 2 | 1241 SF | 3 | 3723 SF | 6 |
| 260 IL UNIT 3 TYPE B | 2 BEDROOM | 2 | 2 | 1154 SF | 4 | 4616 SF | 8 |
| 260 IL UNIT 4 TYPE B | 2 BEDROOM | 2 | 2 | 1008 SF | 2 | 2016 SF | 4 |
| 260 IL UNIT 5 TYPE B | 1 BEDROOM, W/ DEN | 1 | 2 | 889 SF | 2 | 1778 SF | 2 |
| Level 3 TOP OF GYP CRETE | | | | | | | |
| 260 IL UNIT 1 TYPE B | 2 BEDROOM | 2 | 2 | 1277 SF | 2 | 2554 SF | 4 |
| 260 IL UNIT 2 TYPE B | 2 BEDROOM | 2 | 2 | 1241 SF | 2 | 2482 SF | 4 |
| 260 IL UNIT 3 TYPE B | 2 BEDROOM | 2 | 2 | 1154 SF | 4 | 4616 SF | 8 |
| 260 IL UNIT 4 TYPE B | 2 BEDROOM | 2 | 2 | 1008 SF | 2 | 2016 SF | 4 |
| 260 IL UNIT 5 TYPE B | 1 BEDROOM, W/ DEN | 1 | 2 | 889 SF | 2 | 1778 SF | 2 |
| Level 4 TOP OF GYP CRETE | | | | | | | |
| 260 IL UNIT 1 TYPE B | 2 BEDROOM | 2 | 2 | 1277 SF | 2 | 2554 SF | 4 |
| 260 IL UNIT 2 TYPE B | 2 BEDROOM | 2 | 2 | 1241 SF | 2 | 2482 SF | 4 |
| 260 IL UNIT 3 TYPE B | 2 BEDROOM | 2 | 2 | 1154 SF | 4 | 4616 SF | 8 |
| 260 IL UNIT 4 TYPE B | 2 BEDROOM | 2 | 2 | 1008 SF | 2 | 2016 SF | 4 |
| 260 IL UNIT 5 TYPE B | 1 BEDROOM, W/ DEN | 1 | 2 | 889 SF | 2 | 1778 SF | 2 |
| Grand total | | | | | 39 | 42835 SF | 70 |

# BUILDING CODE INFORMATION

**APPLICABLE BUILDING CODE:**
STATE OF OREGON 2014 EDITION STRUCTURAL SPECIALTY CODE. BASED ON 2012 INTERNATIONAL BUILDING CODE W/ OREGON AMENDMENTS.

IN ADDITION, SEE LIST OF APPLICABLE CODES ON COVER SHEET

**2014 ENERGY EFICIENCY BUILDING CODE:**
SEE A020 FOR COM CHECK REQUIREMENTS

**BUILDING AGENCY/JURISDICTION:**
CITY OF NEWBERG, OREGON

**SEISMIC ZONE:**
D

**WIND EXPOSURE:**
B

**TOTAL PROPOSED IBC NEW BUILDING AREA:**
85,013 SF

# BUILDING CODE AREA CALCULATIONS

**NOTES:**

**NOTES:**
1. SEE CODE ANALYSIS PLANS FOR ACCOMPANYING INFORMATION. CODE INFORMATION INDICATED BELOW ONLY LISTS SOME SPECIFIC REQUIREMENTS BUT DOES NOT LIST ALL BUILDING CODE REQUIREMENTS.
2. NONSEPARATED USES ARE PROPOSED FOR ALL OCCUPANCIES IN ACCORDANCE WITH SECTION 508.3.1. (BASED ON THE R-2 OCCUPANCY)

**OCCUPANCY GROUP(S):** (Chapter 5)
**R-2, S-2, A-2**

Incidential use areas per Table 508.2 where occur. Accessory use areas per Section 508.3.1 where occur. See Code Analysis Plans.

**NON-SEPARATED USES:** (Sect 302.3.1)
Nonseparated uses are proposed for all buildings. No separation among different uses within each building required. Buildings built to the most restrictive type of construction requirements based on area & height limitations of each use.

**CONSTRUCTION TYPE:**
Required: **Type V-A**
Propose: **Type V-A**

**ALLOWABLE FLOOR AREA (At):** (Table 503)
Bldg 1 **R-2 - 12,000** sf

**FRONTAGE INCREASE (If):** (Sect 506.2)
100 x (F/P-0.25) x W / 30

| | F | P | W | If |
|---|---|---|---|---|
| Bldg 1 | **838'** | **838'** | **30'** | **75%** |

**SPRINKLER INCREASE (Is):** (Sect 506.3)

| | No. of stories | Sprinklers | Is |
|---|---|---|---|
| Bldg 1 | **4** | **NFPA13** | **200%** |

**ALLOWABLE FLR AREA PER FLR (Aa):**(Sect 506.1)
Aa = At + (At x If) + (At x Is)
Bldg 1 - **45,000 sf**

**AREA DETERMINATION ALL FLOORS:** (Sect 506.4)
Bldg 1 - Aa x 3 (4 story) = **135,000 sf**

**ACTUAL FLR AREA (LARGEST FLOOR):**
Bldg 1 - **27,211 sf**

**ACTUAL FLR AREA (ALL FLOORS):**
Bldg 1 - **85,013 sf**

**ALLOWABLE NO. OF STORIES/ HEIGHT:** (Table 503)
Bldg 1 - **R-2 - 3 stories and 50'**

**SPRINKLER INCREASE FOR HEIGHT:** (Sect 504.2)
Bldg 1 - **R-2 - 4 stories and 70'**

**ACTUAL NO. OF STORIES/ HEIGHT:**
Bldg 1 - **4 stories/ 53 feet, OK**

**OCCUPANT LOAD:** (Sect 1004 & Table 1004.1)
**See code analyis plans**

**SPECIAL DETAILED REQUIREMENTS: (CHAPTER 4):**
SECTION 420 - GROUP R-2 OCCUPANCY

**OCCUPANT LOAD: (SEC. 1004 & TABLE 1004.1.1)**
SEE CODE ANALYSIS PLANS.

**TYPE OF CONSTRUCTION: FIRE RESISTIVE REQUIREMENTS**:

| | |
|---|---|
| STRUCTURAL FRAME | 1HR |
| EXTERIOR BEARING WALLS | 1HR |
| INTERIOR BEARING WALLS | 1HR |
| EXT. NONBEARING WALLS | TABLE 602 |
| INTERIOR NONBEARING WALLS | 0HR |
| FLOOR/CEILING | 1HR |
| ROOF/CEILING | 1HR |
| STAIR ENCLOSURES | 2HR |
| ELEVATOR SHAFT | 2HR |

**PENETRATIONS: (SEE PENETRATION DETAILS AND MECHANICAL PLANS FOR LOCATIONS)**
ALL WALLS, SHAFTS AND FLOOR AND ROOF/ CEILING ASSEMBLIES

**OPENING PROTECTION: (SEE PLANS FOR LOCATIONS)**
(OPENINGS ARE DEFINED AS DOORS, WINDOW, AND DUCTS. SEE DOOR & WINDOW SCHEDULES
SEE MECHANICAL DRAWINGS FOR SMOKE AND FIRE DAMPERS

**SMOKE DETECTION AND FIRE ALARMS:**
PROVIDED PER IBC SECTION 907

# ACCESSIBILITY REQUIREMENTS

***SITE:***
1 PUBLIC ENTRY IS PROVIDED, AND IS ACCESSIBLE
EXTERIOR EXIT DOORS ARE PROVIDED, AND ARE ACCESSIBLE
1 EXTERIOR ACCESSIBLE ROUTE IS PROVIDED TO THE PUBLIC WAY FROM ALL EXIT DOORS
PER VESTING AUTHORITY REQUIREMENTS LISTED BELOW

***BUILDING COMMON AREAS:***
***(ALL AREAS EXCEPT MAINTENANCE ROOMS AND LIVING UNITS)***
ALL ARE ACCESSIBLE PER VESTING AUTHORITY, REQUIREMENTS LISTED BELOW

***BUILDING COMMON WORK AREAS:***
***(USED BY MORE THAN 1 PERSON)***
ALL ARE ACCESSIBLE PER VESTING AUTHORITY, REQUIREMENTS LISTED BELOW

***LIVING UNIT:***
ALL ARE ACCESSIBLE PER VESTING AUTHORITY, REQUIREMENTS LISTED BELOW

***VESTING AUTHORITIES:***
ALL LIVING UNITS AND THE SITE CONFORM TO THE DEPT OF HOUSING AND URBAN DEVELOPMENT FAIR HOUSING ACT (REVISED 1998 DESIGN GUIDELINES)

ALL PUBLIC, COMMON AND WORK AREAS, AND SITE, CONFORM
TO THE AMERICANS WITH DISABILITIES ACT TITLE III

THE BUILDING AND SITE CONFORM TO CHAPTER 11 OF THE CURRENT APPLICABLE BUILDING CODE PER LOCAL BUILDING DEPARTMENT OF THE JURISDICTION HAVING AUTHORITY OVER THIS PROJECT

***ACCESSIBLE PARKING (SECTION 1106.2):***
***(2% ACCESSIBLE SEE SITE PLAN)***
38 GARAGE SPACES (INCLUDES 1 VAN)
4 SURFACE PARKING (INCLUDES 1 VAN)
= 42 TOTAL ACCESSIBLE SPACES
PROVIDED THIS PHASE

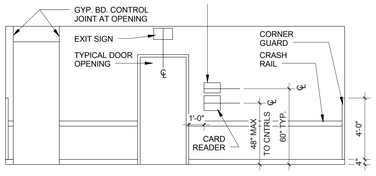
***AREA OF REFUGE REQUIREMENTS:***
EXEMPT WHEN AUTOMATIC SPRINKLERS
ARE PROVIDED THROUGHOUT
ALL DWELLING UNITS CONFORM

***ADAPTABLE LIVING UNITS PER F.H.A. AND STATE BUILDING CODE:***
(REQUIRED ALL)
TOTAL PROVIDED ALL

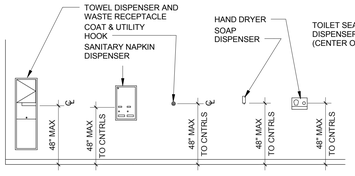
***ADAPTABLE TYPE A LIVING UNITS PER STATE BUILDING CODE:***
(REQUIRED: 2% = 1 UNIT)
TOTAL PROVIDED: 1 UNIT

***ADAPTABLE TYPE B LIVING UNITS PER STATE BUILDING CODE:***
(REQUIRED: ALL OTHERS)
TOTAL PROVIDED: ALL OTHERS

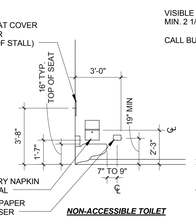
**ACCESSIBLE SIGNAGE**- INSTALL ON WALL ADJACENT TO THE LATCH SIDE OF DOOR OR NEAREST ADJACENT WALL. MOUNT SIGN SUCH THAT PERSONS APPROACHING WITHIN 3" OF SUCH SIGNAGE WILL NOT ENCOUNTER PROTRUDING OBJECTS OR BE STANDING WITHIN THE SWING OF THE DOOR. SEE ADJACENT CHART.



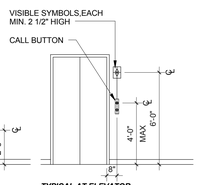

***TYPICAL AT DOOR AT CORRIDOR***



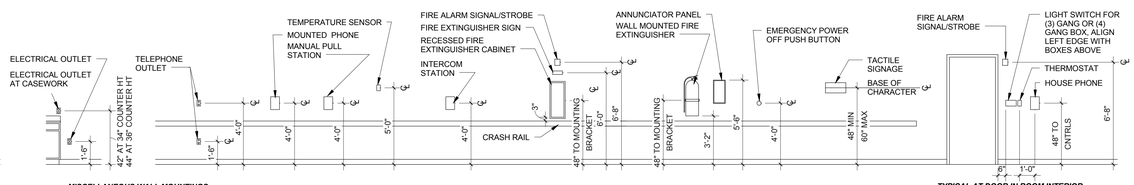

***TOILET ROOM MOUNTINGS***




***NON-ACCESSIBLE TOILET***




***TYPICAL AT ELEVATOR***

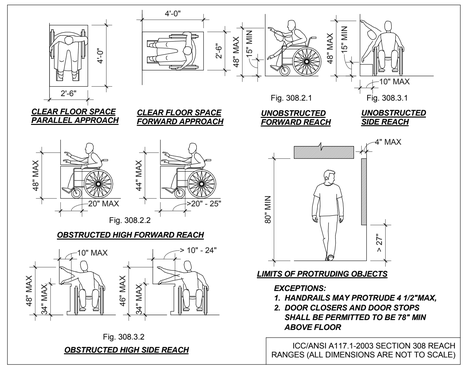


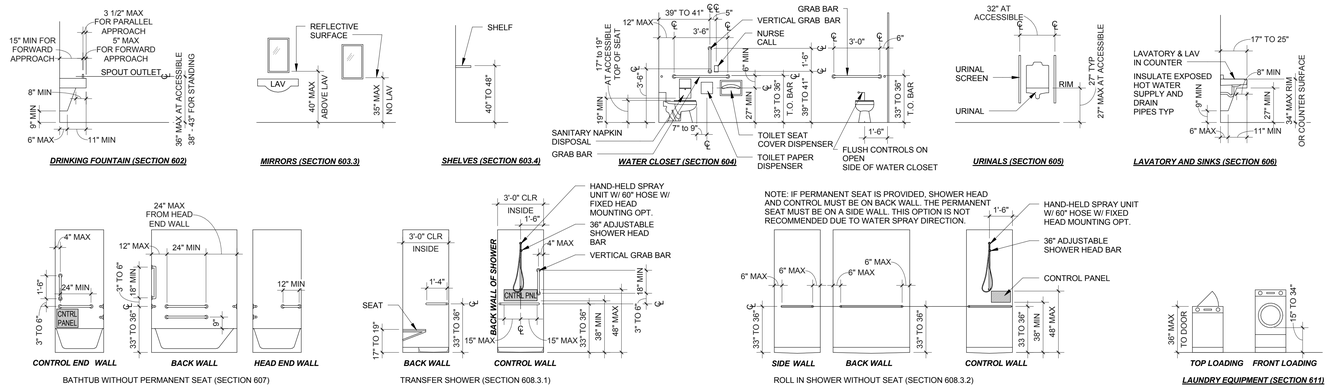

***MISCELLANEOUS WALL MOUNTINGS***

***TYPICAL AT DOOR IN ROOM INTERIOR***

# COMMON FIXTURE MOUNTING HEIGHTS

1. ALL DIMENSIONS INDICATED ON THIS SHEET ARE **CLEAR MINIMUM TO FACE OF FINISH**. DIMENSIONS TO TOILET ROOM ACCESSORIES ARE TO THE CENTER LINE AS NOTED OR TO THE HIGHEST PORTION OF THE OPENING OR OPERATING DEVICE.
2. ALL ITEMS INDICATED BELOW MAY NOT OCCUR ON THIS PROJECT. SEE PROJECT PLANS AND ELEVATIONS FOR ITEMS THAT OCCUR.
3. SEE ARCHITECTURAL PLANS FOR ACCESSIBILITY AND/OR ADAPTABILITY CONFORMANCE IN THE HORIZONTAL PLAN LAYOUT.
4. SEE ARCHITECTURAL INTERIOR ELEVATIONS FOR DWELLING UNIT F.H.A. ADAPTABLE, AND/OR A.N.S.I. TYPE A OR B DWELLING UNIT FIXTURE MOUNTING HEIGHTS, IF THEY OCCUR ON THIS PROJECT.
5. CONFORMANCE TO FIXTURE MOUNTING HEIGHT REQUIREMENTS ARE APPLICABLE IN ANY SPACE SERVING MORE THAN ONE EMPLOYEE. ALL RESIDENTIAL AND MULTIPLE EMPLOYEE COMMON SPACES, AND SPACES ACCESSIBLE TO THE PUBLIC, AS THEY OCCUR PER PROJECT.
6. VERIFY ACCESSORY SIZE WITH MANUFACTURER TO ENSURE CONFORMANCE WITH REQUIRED MOUNTING HEIGHTS.
7. PROVIDE CODE-COMPLIANT BLOCKING WITHIN WALLS AS REQUIRED FOR MOUNTING FIXTURES.
8. PROVIDE GYPSUM BOARD WRAP BEHIND FIXTURES AT WALLS DESIGNATED ON FLOOR PLANS AS OPENING-PROTECTED WALLS.
9. FLOOR DRAINS:
10. ACCESSIBLE FIXTURES REQUIRE A CLEAR FLOOR SPACE CONTIGUOUS OR OVERLAPPING THE ACCESSIBLE ROUTE. FLOOR DRAINS SHOULD NOT BE PLACED IN THIS CLEAR FLOOR SPACE. EXCEPTION: DRAINS MAY RESIDE IN CLEAR FLOOR SPACE PROVIDED DRAIN HOLES DO NOT EXCEED 1/2" DIA. MAXIMUM; FLOOR SLOPE DOES NOT EXCEED 2% IN ANY DIRECTION; AND THE ELEVATION CHANGE AT THE DRAIN LIP DOES NOT EXCEED 1/8".
11.




# ACCESSIBLE FIXTURE MOUNTING REQUIREMENTS (PER ICC/ANSI A117.1-2003)

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LRS ARCHITECTS
720 NW Davis Suite 300 Portland OR 97209
503.221.1121
503.221.2077
www.lrsarchitects.com


***PRELIMINARY NOT FOR CONSTRUCTION***

CONSULTANT:

PROJECT NUMBER: *215047*

Friendsview RETIREMENT COMMUNITY

***University Village***

*1301 Fulton St. Newberg, OR 97132*

SHEET TITLE:
***CODE INFORMATION***

DRAWN BY: *CJH, JAB*
DATE ISSUED: *12/23/2015*

SHEET:
***A00i***
*CMP/DR SET*


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## DRAWING INDEX LEGEND

- ◘ ISSUED
- ● REVISED
- * ISSUED UNCHANGED
- / DELETED
- ® ISSUED FOR REFERENCE ONLY

| Sheet Number | Sheet Name | CMP/DR SET(11.16.2015) | CMP/DR SET(12.23.2015) |
|---|---|---|---|
| CS | COVER SHEET | ◘ | ● |
| Ai | ARCHITECTURAL SYMBOLS AND ABBREVIATIONS | ◘ | * |
| Ai2 | DRAWING INDEX | | ● |
| A00i | CODE INFORMATION | ◘ | ● |
| Aph0 | EXISTING CONDITIONS OVERALL SITE PLAN | ◘ | ● |
| Aph1 | PHASE I OVERALL SITE PLAN | ◘ | ● |
| Aph2 | PHASE II OVERALL SITE PLAN | ◘ | ● |
| Aph3 | PHASE III OVERALL SITE PLAN | ◘ | ● |
| Aph4 | CONCEPT MASTER PLAN/ PHASE IV OVERALL SITE PLAN | ◘ | ● |
| C1M | MASTER GRADING PLAN | ◘ | * |
| C2M | MASTER UTILITY PLAN | ◘ | * |
| L1M | MASTER LANDSCAPE PLAN | ◘ | ● |
| C1 | COVER WITH VICINITY AND SITE MAP AND LEGEND | ◘ | * |
| C2 | EXISTING CONDITIONS | ◘ | * |
| C3 | PRELIMINARY DEMOLITION PLAN | ◘ | * |
| C4 | PRELIMINARY EROSION AND SEDIMENTATION CONTROL PLANS | ◘ | * |
| C5 | PRELIMINARY GRADING PLAN | ◘ | * |
| C6 | PRELIMINARY SITE PLAN | ◘ | * |
| C7 | PRELIMINARY STORMWATER PLAN | ◘ | * |
| C8 | PRELIMINARY SANITARY SEWER AND WATER PLAN | ◘ | * |
| L1 | LANDSCAPE PLAN | ◘ | ● |
| A101 | SITE PLAN | ◘ | ● |
| A150 | WALL ASSEMBLIES | ◘ | ● |
| A151 | FLOOR AND CEILING ASSEMBLIES | ◘ | ● |
| A201 | OVERALL FLOOR PLANS | ◘ | ● |
| A202 | OVERALL FLOOR PLANS | ◘ | ● |
| A301 | OVERALL ROOF PLAN | ◘ | ● |
| A501 | EXTERIOR ELEVATIONS | ◘ | ● |
| A502 | EXTERIOR ELEVATIONS | ◘ | ● |
| PH1 | PHASE I PHOTOMETRIC SITE PLAN | ◘ | * |
| PH2 | PHASE I PHOTOMETRIC GARAGE PLAN | ◘ | * |


LRS ARCHITECTS
720 NW Davis 503.221.1121
Suite 300 503.221.2077
Portland OR 97209 www.lrsarchitects.com


CONSULTANT:

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Friendsview RETIREMENT COMMUNITY

***University Village***

*1301 Fulton St. Newberg, OR 97132*

SHEET TITLE:

***DRAWING INDEX***

DRAWN BY: *CJH*
DATE ISSUED: *12/23/2015*

SHEET:

***Ai2***

*CMP/DR SET*

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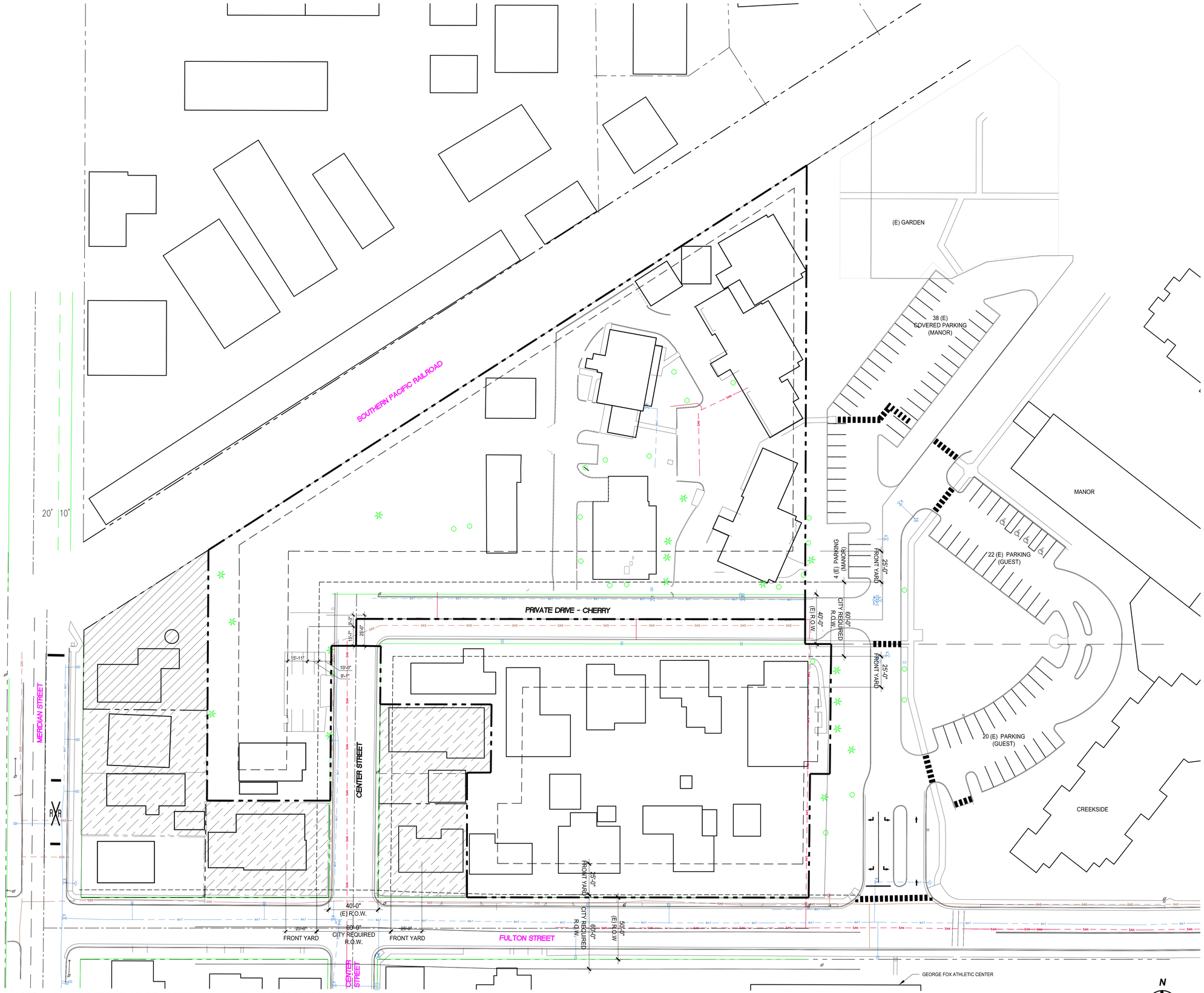


## 0. EXISTING CONDITIONS AT CONCEPT MASTER PLAN SUBMISSION - NOVEMBER 2015

SCALE: 1" = 30'-0"

## LAND USE PROCESSES

COMPLETED:
ADMINISTRATIVE ZONE CHANGE
LOT CONSOLIDATION
IN PROCESS:
R.O.W. VACATION - CHERRY STREET

## LEGEND

- PROPERTY CURRENTLY OWNED
- PROPERTY TO BE ACQUIRED BEFORE PHASE II BEGINS
- PROPERTY NOT PLANNED TO ACQUIRE
- EXISTING BUILDING


LRS ARCHITECTS
720 NW Davis 503.221.1121
Suite 300 503.221.2077
Portland OR 97209 www.lrsarchitects.com


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CONSULTANT:

PROJECT NUMBER: 211312

**FRIENDSVIEW UNIVERSITY VILLAGE**

**CONCEPT MASTER PLAN/ DESIGN REVIEW**

1301 East Fulton Street
Newberg, Oregon
97132

SHEET TITLE:

**EXISTING CONDTITIONS OVERALL SITE PLAN**

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DATE ISSUED: 12.23.2015

SHEET: Aph0

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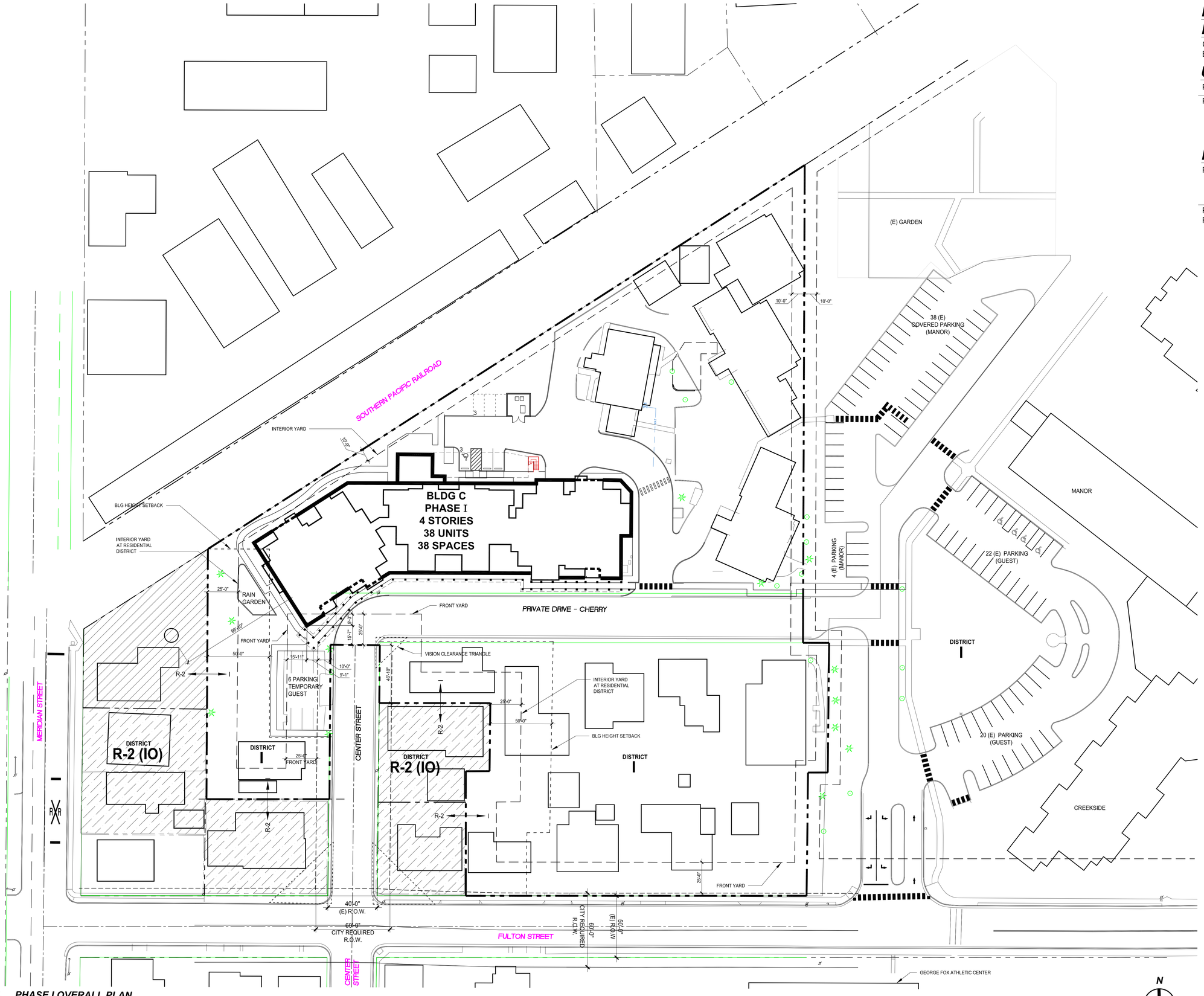


## 1. PHASE I OVERALL PLAN

SCALE: 1" = 30'-0"

## LAND USE PROCESSES

CONCEPT MASTER PLAN / DESIGN REVIEW
BUILDING HEIGHT VARIANCE

## UNITS

| | |
|---|---|
| PHASE I | 38 UNITS |
| PHASE I TOTAL | 38 UNITS |

## PARKING

| | |
|---|---|
| PHASE I | 38 GARAGE<br>3 COVERED<br>3 UNCOVERED<br>6 EXISTING |
| PHASE I TOTAL | 50 SPACES |
| RATIO 1.3 SPACES/UNIT | |

## LEGEND

- PROPERTY CURRENTLY OWNED
- PROPERTY TO BE ACQUIRED BEFORE PHASE II BEGINS
- PROPERTY NOT PLANNED TO ACQUIRE
- EXISTING BUILDING
- NEW BUILDING


LRS ARCHITECTS
720 NW Davis 503.221.1121
Suite 300 503.221.2077
Portland OR 97209 www.lrsarchitects.com


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**FRIENDSVIEW UNIVERSITY VILLAGE**

**CONCEPT MASTER PLAN/ DESIGN REVIEW**

1301 East Fulton Street
Newberg, Oregon
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SHEET TITLE:

**PHASE I OVERALL SITE PLAN**

DRAWN BY: JAB
DATE ISSUED: 12.23.2015

SHEET: Aph1

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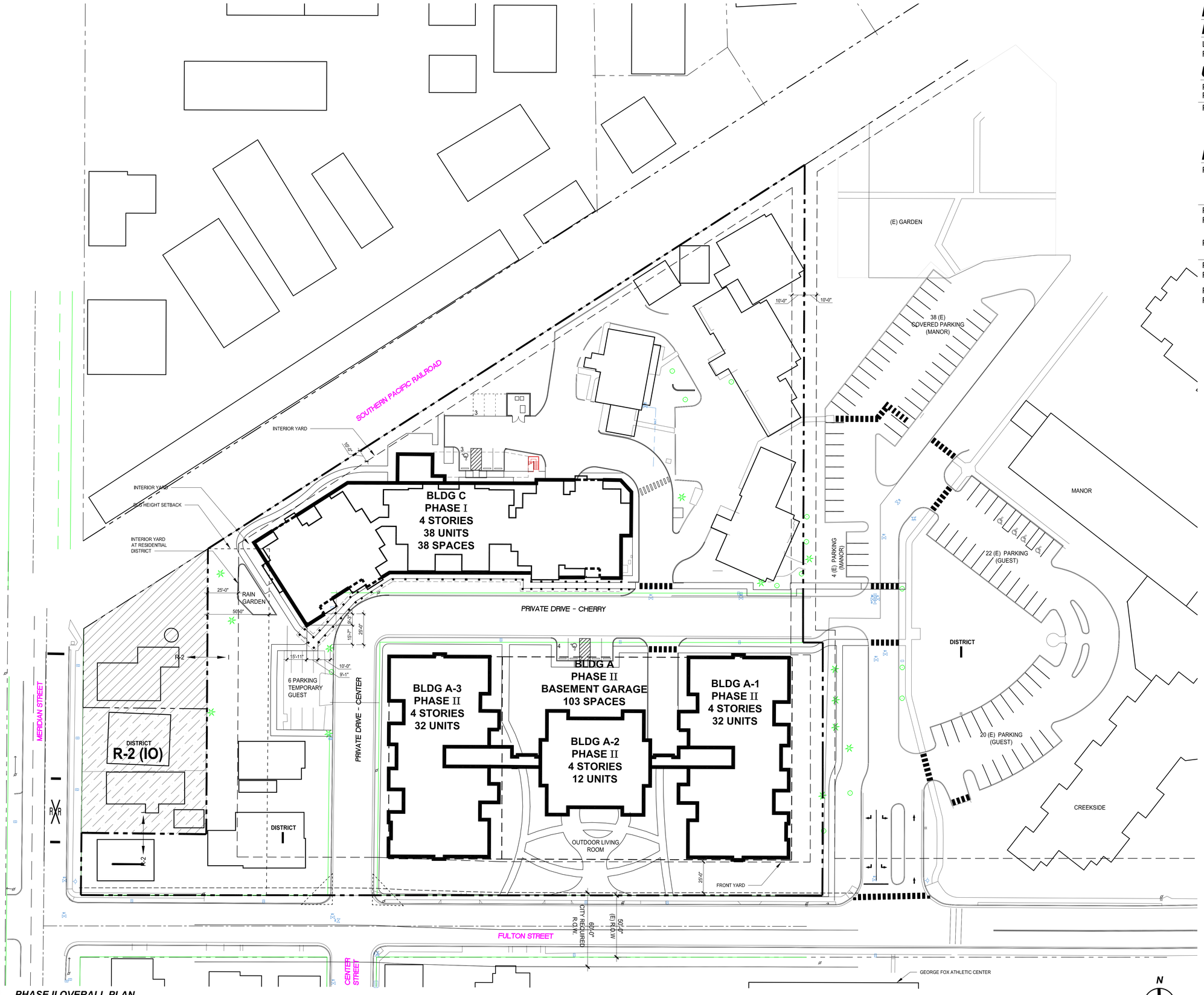


## 2. PHASE II OVERALL PLAN

SCALE: 1" = 30'-0"

## LAND USE PROCESSES

LOT CONSOLIDATION
R.O.W. VACATION - CENTER STREET

## UNITS

| | |
|---|---|
| PHASE I | 38 UNITS |
| PHASE II | 76 UNITS |
| PHASE IV TOTAL | 114 UNITS |

## PARKING

| | |
|---|---|
| PHASE I | 38 GARAGE<br>3 COVERED<br>3 UNCOVERED<br>6 EXISTING |
| PHASE I TOTAL<br>RATIO 1.3 SPACES/UNIT | 50 SPACES |
| PHASE II | 103 GARAGE<br>4 UNCOVERED |
| PHASE II TOTAL<br>RATIO: 1.4 SPACES/UNIT | 107 SPACES |
| PHASE II CUMULATIVE TOTAL:<br>RATIO: 1.37 SPACES/UNIT | 157 SPACES |

## LEGEND

- PROPERTY CURRENTLY OWNED
- PROPERTY TO BE ACQUIRED BEFORE PHASE II BEGINS
- PROPERTY NOT PLANNED TO ACQUIRE
- EXISTING BUILDING
- NEW BUILDING


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Portland OR 97209 www.lrsarchitects.com


PRELIMINARY NOT FOR CONSTRUCTION

CONSULTANT:

PROJECT NUMBER: 211312

**FRIENDSVIEW UNIVERSITY VILLAGE**

**CONCEPT MASTER PLAN/ DESIGN REVIEW**

**1301 East Fulton Street**
**Newberg, Oregon**
**97132**

SHEET TITLE:

**PHASE II OVERALL SITE PLAN**

DRAWN BY: JAB
DATE ISSUED: 12.23.2015

SHEET: **Aph2**

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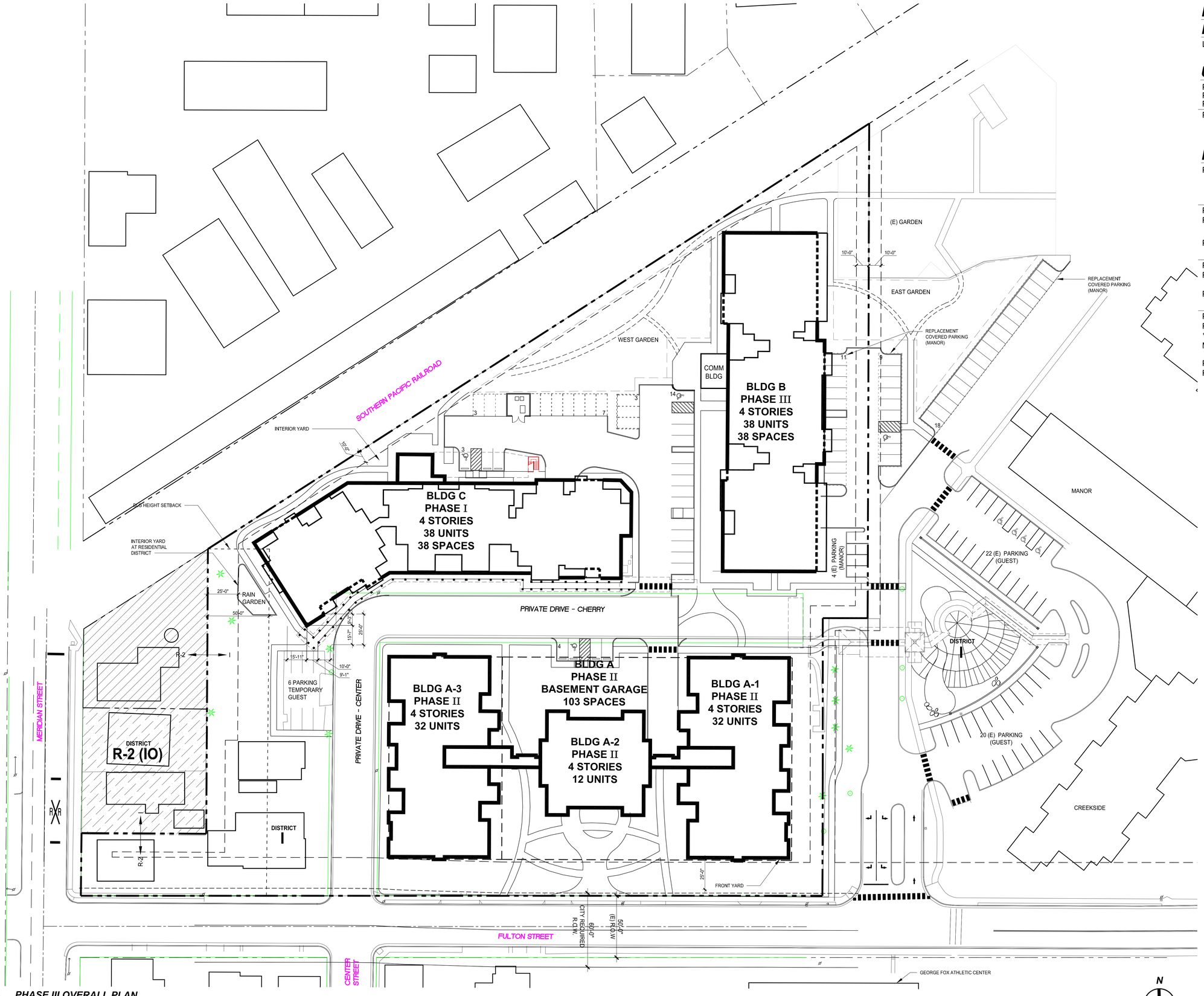


## 3. PHASE III OVERALL PLAN

SCALE: 1" = 30'-0"

## LAND USE PROCESSES

LOT LINE ADJUSTMENT

## UNITS

| | |
|---|---|
| PHASE I | 38 UNITS |
| PHASE II | 76 UNITS |
| PHASE III | 38 UNITS |
| PHASE IV TOTAL | 152 UNITS |

## PARKING

| | |
|---|---|
| PHASE I | 38 GARAGE<br>3 COVERED<br>3 UNCOVERED<br>6 EXISTING |
| PHASE I TOTAL<br>RATIO 1.3 SPACES/UNIT | 50 SPACES |
| PHASE II | 103 GARAGE<br>4 UNCOVERED |
| PHASE II TOTAL<br>RATIO: 1.4 SPACES/UNIT | 107 SPACES |
| PHASE III | 38 GARAGE<br>24 UNCOVERED |
| PHASE III TOTAL<br>RATIO: 1.63 SPACES/UNIT<br>*38 COVERED SPACES REPLACED FOR MANOR PARKING | 62 SPACES |
| PHASE III CUMULATIVE TOTAL:<br>RATIO: 1.35 SPACES/UNIT | 219 SPACES |

## LEGEND

- PROPERTY CURRENTLY OWNED
- PROPERTY TO BE ACQUIRED BEFORE PHASE II BEGINS
- PROPERTY NOT PLANNED TO ACQUIRE
- EXISTING BUILDING
- NEW BUILDING


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PRELIMINARY NOT FOR CONSTRUCTION

CONSULTANT:

PROJECT NUMBER: 211312

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**CONCEPT MASTER PLAN/ DESIGN REVIEW**

**1301 East Fulton Street Newberg, Oregon 97132**

SHEET TITLE:

**PHASE III OVERALL SITE PLAN**

DRAWN BY: JAB

DATE ISSUED: 12.23.2015

SHEET: **Aph3**

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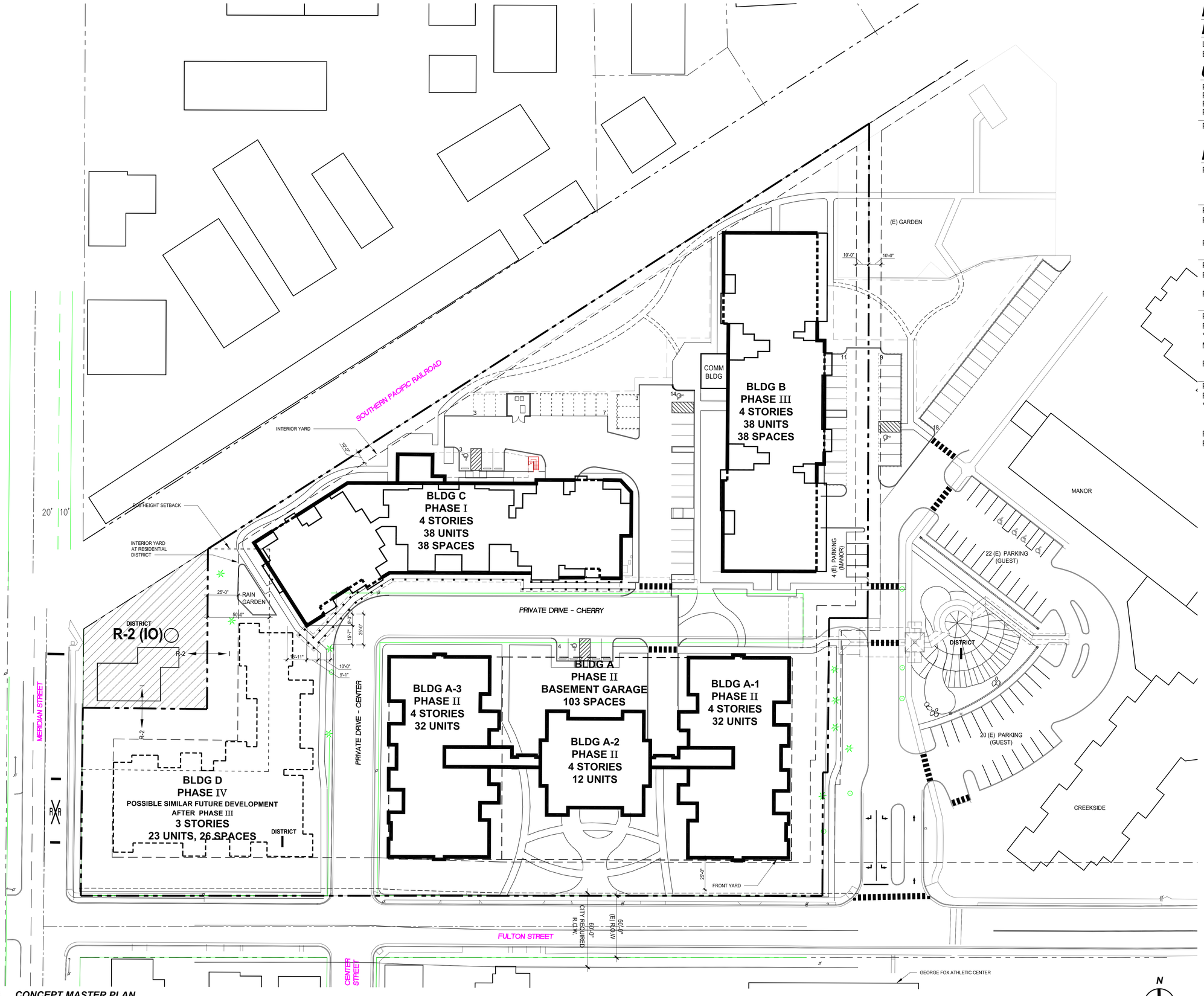
jbradshaw 11:28am 23 December P:\Portland\2015\211047 Friendsview Phase 1A 2015\300 Documents\300 AutoCAD\211047 Bldg phase plan.dwg




## 4. CONCEPT MASTER PLAN

SCALE: 1" = 30'-0"

## LAND USE PROCESSES

LOT CONSOLIDATION
BUILDING HEIGHT VARIANCE

## UNITS

| | |
|---|---|
| PHASE I | 38 UNITS |
| PHASE II | 76 UNITS |
| PHASE III | 38 UNITS |
| PHASE IV | 23 UNITS |
| PHASE IV TOTAL | 175 UNITS |

## PARKING

| | |
|---|---|
| PHASE I | 38 GARAGE<br>3 COVERED<br>3 UNCOVERED<br>6 EXISTING |
| PHASE I TOTAL<br>RATIO 1.3 SPACES/UNIT | 50 SPACES |
| PHASE II | 103 GARAGE<br>4 UNCOVERED |
| PHASE II TOTAL<br>RATIO: 1.4 SPACES/UNIT | 107 SPACES |
| PHASE III | 38 GARAGE<br>24 UNCOVERED |
| PHASE III TOTAL<br>RATIO: 1.63 SPACES/UNIT<br>*38 COVERED SPACES REPLACED FOR MANOR PARKING | 62 SPACES |
| PHASE IV | 26 GARAGE<br>-6 UNCOVERED |
| PHASE IV TOTAL<br>RATIO: 1.13 SPACES/UNIT<br>*6 UNCOVERED SPACES REMOVED | 20 SPACES |
| PHASE IV CUMULATIVE TOTAL:<br>RATIO: 1.36 SPACES/UNIT | 239 SPACES |

## LEGEND

- PROPERTY CURRENTLY OWNED
- PROPERTY TO BE ACQUIRED BEFORE PHASE II BEGINS
- PROPERTY NOT PLANNED TO ACQUIRE
- EXISTING BUILDING
- NEW BUILDING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CONSTRUCTION

CONSULTANT:

PROJECT NUMBER: 211312

**FRIENDSVIEW UNIVERSITY VILLAGE**

**CONCEPT MASTER PLAN/ DESIGN REVIEW**

1301 East Fulton Street
Newberg, Oregon
97132

SHEET TITLE:

**CONCEPT MASTER PLAN / PHASE IV OVERALL SITE PLAN**

DRAWN BY: JAB
DATE ISSUED: 12.23.2015

SHEET: Aph4

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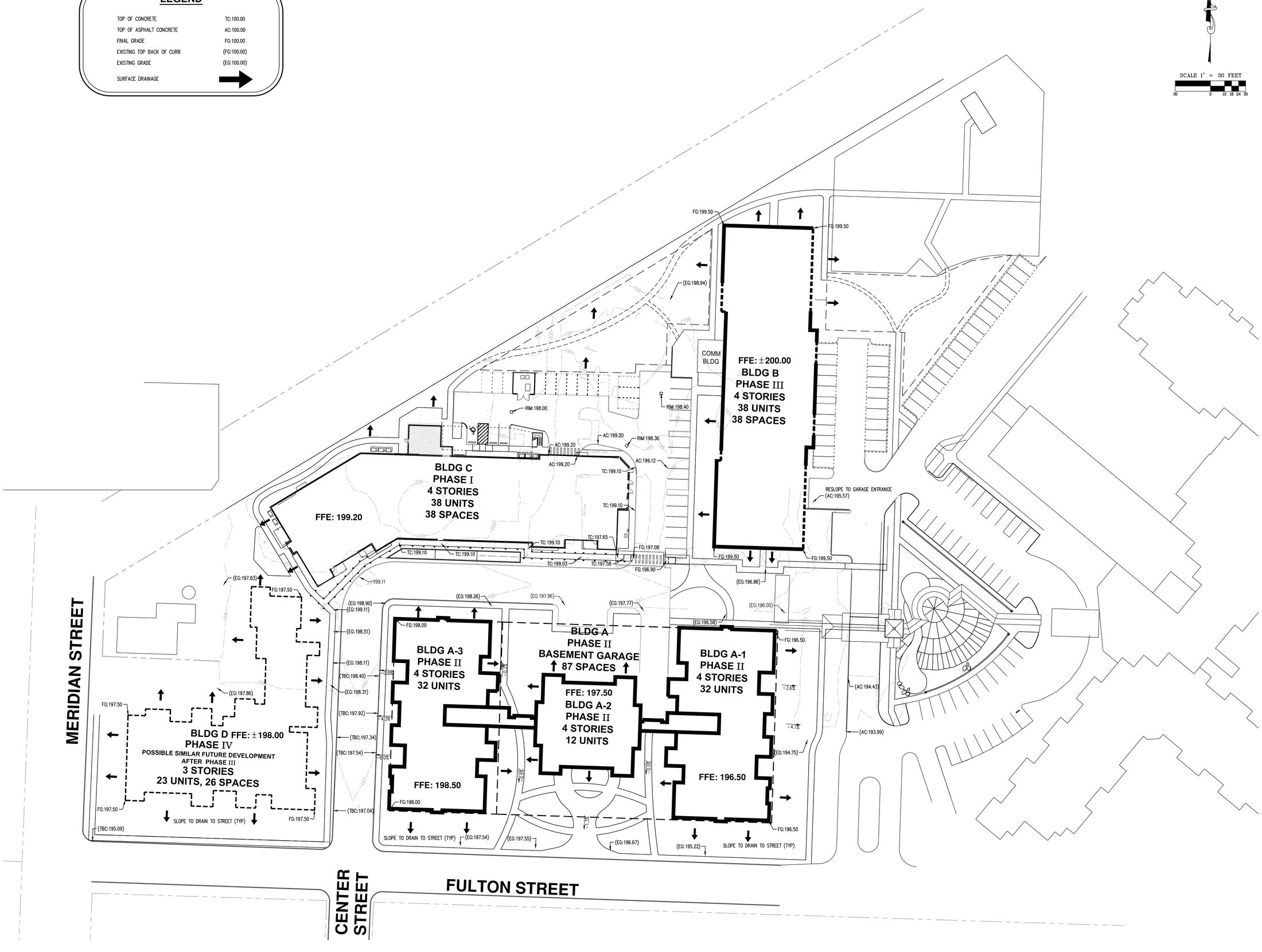
## LEGEND

| | |
|---|---|
| TOP OF CONCRETE | TC:100.00 |
| TOP OF ASPHALT CONCRETE | AC:100.00 |
| FINAL GRADE | FG:100.00 |
| EXISTING TOP BACK OF CURB | (FG:100.00) |
| EXISTING GRADE | (EG:100.00) |
| SURFACE DRAINAGE | |





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PROJECT NUMBER: 215047

***University Village Master Plan***

*1301 Fulton St.*
*Newberg, OR 97132*

SHEET TITLE:

***MASTER GRADING PLAN***

KEY PLAN:

PLAN
4
3
2
1
SECTION

N
True North

DRAWN BY: CAK
DATE CREATED: 10/29/15

SHEET:

**C1M**

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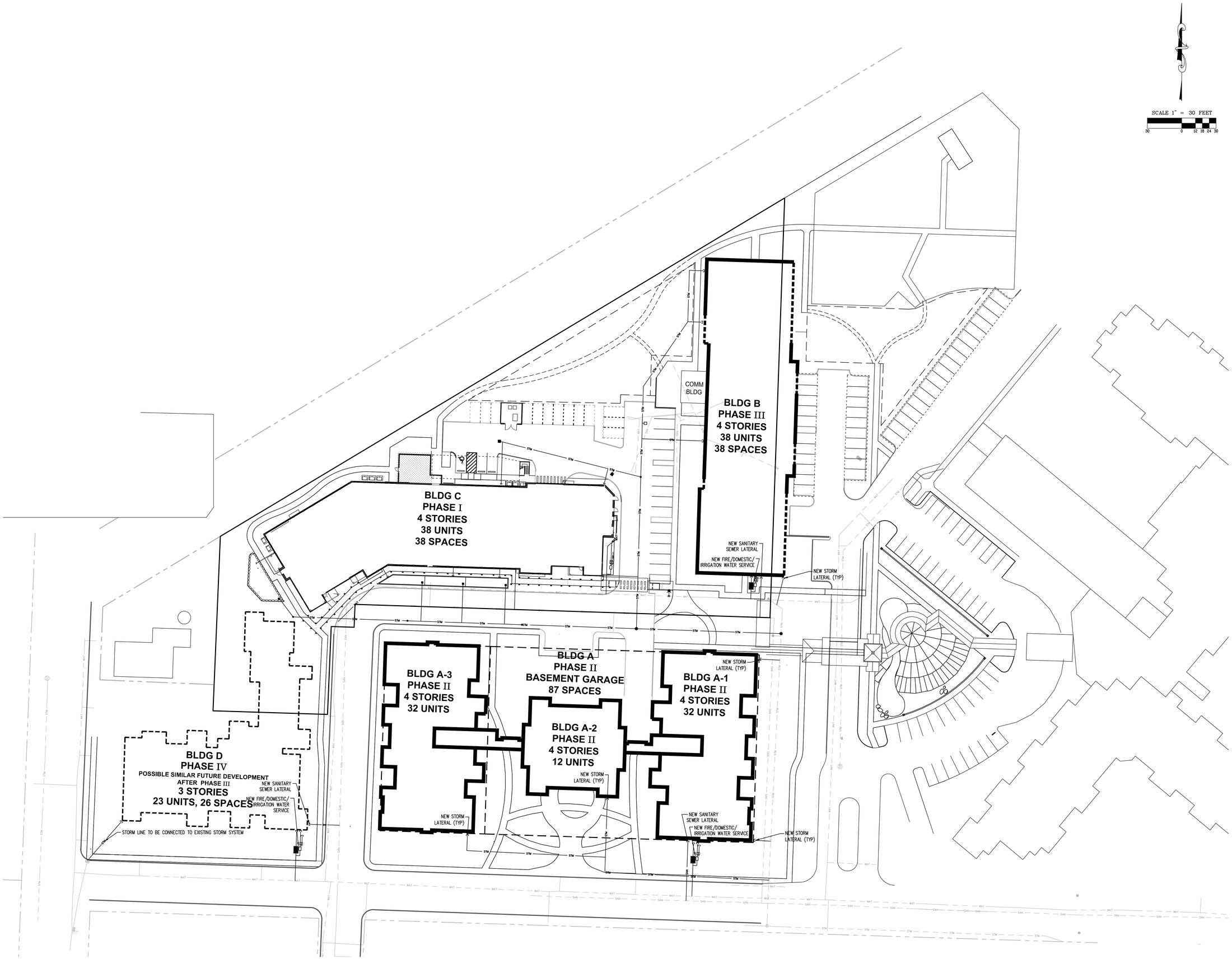


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PROJECT NUMBER: *215047*

***University Village Master Plan***

*1301 Fulton St.*
*Newberg,OR 97132*

SHEET TITLE:

***MASTER UTILITY PLAN***

KEY PLAN:

PLAN
4
3
2
1
SECTION

N
True North

DRAWN BY: *CAK*
DATE CREATED: *10/29/15*

SHEET:
**C2M**

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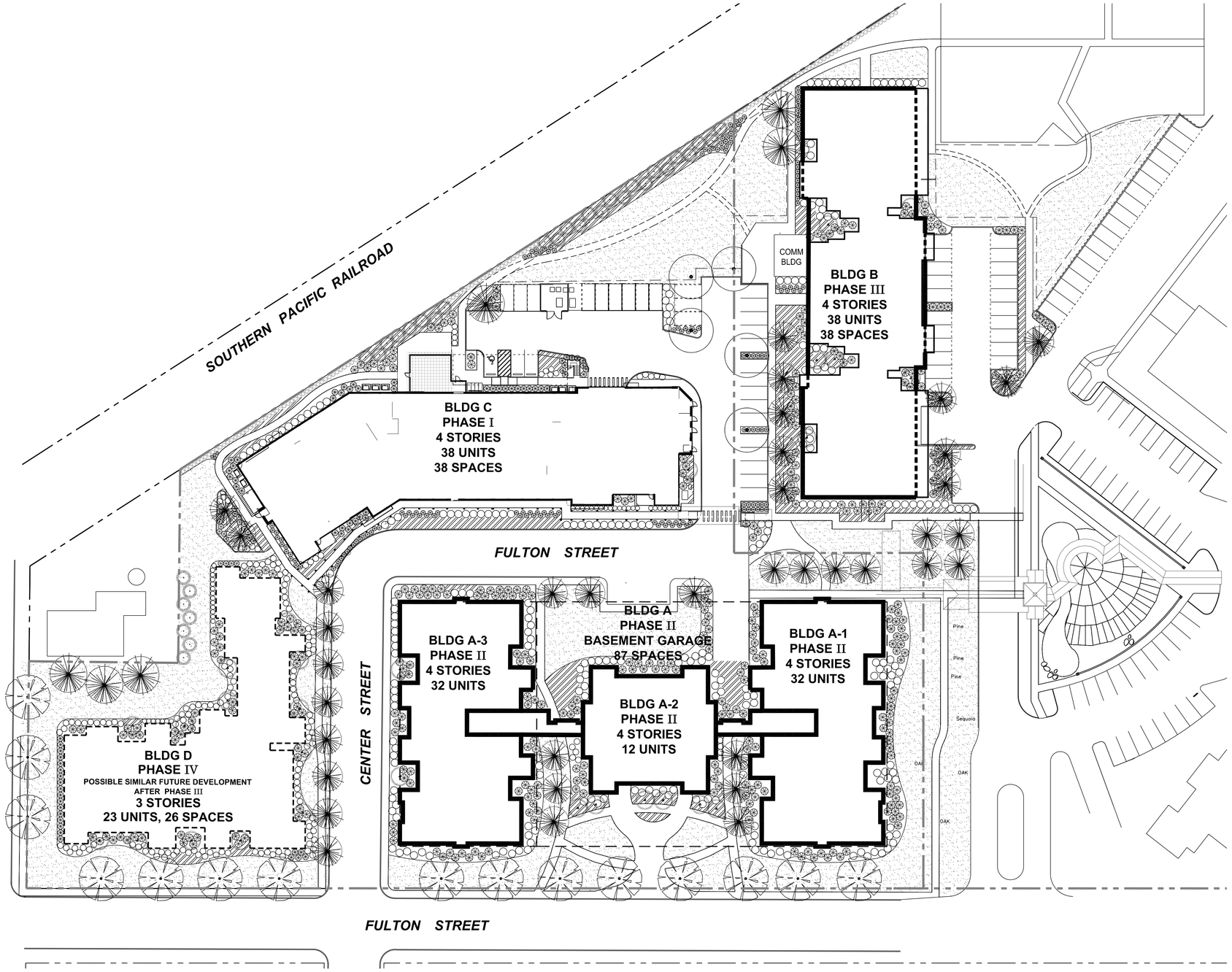


# LANDSCAPE PLAN

SCALE: 1"=30'-0"

N

## LANDSCAPE LEGEND

SYMBOL

STREET TREES – TYPICAL OF BUT NOT LIMITED TO:
Patmore Ash, Redmond Linden, Northern Red Oak, Red Maple
2" Caliper size

DECIDUOUS SHADE TREES – TYPICAL OF BUT NOT LIMITED TO:
Katsura Tree, Oak, Elm, Ash, Maple
2" Caliper size

ORNAMENTAL TREES – TYPICAL OF BUT NOT LIMITED TO:
Flowering Pear, Japanese Maple, Crape Myrtle, Magnolia
2" Caliper size

CONIFER TREES – TYPICAL OF BUT NOT LIMITED TO:
Hogan Cedar, Incense Cedar
6'–7' Height

EXISTING TREES TO REMAIN

ORNAMENTAL SHRUBS – TYPICAL OF BUT NOT LIMITED TO:
Heavenly Bamboo, Clethra, Abelia, Pieris, Japanese Holly, Korean Spice Viburum, Dwarf Winged Euonymus, Goldflame Spirea, Oregon Grape, Mugho Pine, Ornamental Grasses, Rose.
1, 2, and 5 Gal. size

GROUNDCOVER – TYPICAL OF BUT NOT LIMITED TO:
Kinnikinnick, Bearberry Cotoneaster, Lily Turf
4" pot @ 12" o.c. and 1 Gal. size @ 24" o.c.

LAWN

NOTES:

1. This plan is schematic and is meant to portray a landscape character. Final detailed landscape planting plans will be submitted upon approval of preliminary site and landscape plans at each phase.
2. All plans will comply with the City of Newberg landscape requirements.
3. Irrigation to be provided by a fully automatic underground system.

## LANDSCAPE CALCULATIONS

| | | |
|---|---|---|
| LIMIT OF WORK AREA: | 276,988 S.F. | |
| BUILDING AREA: | 90,495 S.F. | |
| GREEN ROOF AREA | 2,480 S.F. | |
| TOTAL BUILDING AREA: (90,495 S.F. – 2,480 S.F.) | 88,015 S.F. | 31.8% |
| HARDSCAPE AREA: | 79,708 S.F. | 28..8% |
| LANDSCAPE AREA: (INCLUDES GREEN ROOF) | 109,265 S.F. | 39.4% |


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CONSULTANT:
CHRISTOPHER FRESHLEY
LANDSCAPE ARCHITECT

PROJECT NUMBER: 211312

**FRIENDSVIEW RETIREMENT COMMUNITY CONCEPT MASTER PLAN**

1301 East Fulton Street
Newberg, Oregon
97132

SHEET TITLE:
**LANDSCAPE PLAN**

DRAWN BY: CF
DATE ISSUED: 12.23.2015

SHEET: **L1M**

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# FRIENDSVIEW

## 1301 FULTON STREET NEWBERG OREGON

### PHASE I DESIGN REVIEW

Friendsview RETIREMENT COMMUNITY


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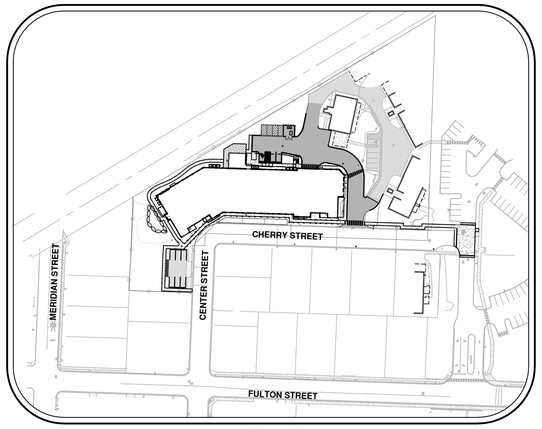
*ISSUED FOR DESIGN REVIEW*

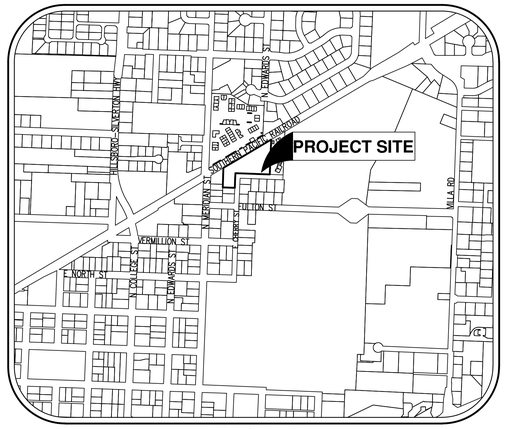
## LEGEND

| | EXISTING | PROPOSED | | EXISTING | PROPOSED |
|---|---|---|---|---|---|
| DECIDUOUS TREE | | | STORM SEWER CLEAN OUT | | |
| CONIFEROUS TREE | | | STORM SEWER CATCH BASIN | | |
| FIRE HYDRANT | | | STORM SEWER AREA DRAIN | | |
| WATER BLOWOFF | | | STORM SEWER MANHOLE | | |
| WATER METER | | | GAS METER | | |
| WATER VALVE | | | GAS VALVE | | |
| DOUBLE CHECK VALVE | | | GUY WIRE ANCHOR | | |
| AIR RELEASE VALVE | | | POWER POLE | | |
| SANITARY SEWER CLEAN OUT | | | POWER VAULT | P | P |
| SANITARY SEWER MANHOLE | | | POWER JUNCTION BOX | | |
| SIGN | | | POWER PEDESTAL | | |
| STREET LIGHT | | | COMMUNICATIONS VAULT | C | C |
| MAILBOX | MB | MB | COMMUNICATIONS JUNCTION BOX | | |
| | | | COMMUNICATIONS RISER | | |

| | EXISTING | PROPOSED |
|---|---|---|
| RIGHT-OF-WAY LINE | | |
| BOUNDARY LINE | | |
| PROPERTY LINE | | |
| CENTERLINE | | |
| DITCH | | |
| CURB | | |
| EDGE OF PAVEMENT | | |
| EASEMENT | | |
| FENCE LINE | | |
| GRAVEL EDGE | | |
| POWER LINE | PWR | PWR |
| OVERHEAD WIRE | OHW | OHW |
| COMMUNICATIONS LINE | COM | COM |
| FIBER OPTIC LINE | CFO | CFO |
| GAS LINE | GAS | GAS |
| STORM SEWER LINE | STM | STM |
| SANITARY SEWER LINE | SAN | SAN |
| WATER LINE | WAT | WAT |




SITE MAP
NTS




VICINITY MAP
NTS

### SHEET SET


C1 COVER WITH VICINITY MAP, SITE MAP, AND LEGEND

C2 EXISTING CONDITIONS

C3 PRELIMINARY DEMOLITION PLAN

C4 PRELIMINARY EROSION AND SEDIMENTATION CONTROL PLAN

C5 PRELIMINARY GRADING PLAN

C6 PRELIMINARY SITE PLAN

C7 PRELIMINARY STORMWATER PLAN

C8 PRELIMINARY SANITARY SEWER AND WATER PLAN


### NOTICE TO EXCAVATORS:

OREGON LAW REQUIRES YOU TO FOLLOW RULES ADOPTED BY THE OREGON UTILITY NOTIFICATION CENTER. THOSE RULES ARE SET FORTH IN OAR 952-001-0010 THROUGH OAR 952-001-0090. YOU MAY OBTAIN COPIES OF THESE RULES FROM THE CENTER BY CALLING 503-232-1987. IF YOU HAVE ANY QUESTIONS ABOUT THE RULES, YOU MAY CONTACT THE CENTER. YOU MUST NOTIFY THE CENTER AT LEAST TWO BUSINESS DAYS BUT NOT MORE THAN TEN BUSINESS DAYS, BEFORE COMMENCING AN EXCAVATION. CALL 503-246-6699.


### ARCHITECT
DAN PURGIEL
LRS ARCHITECTS
720 NW DAVIS, SUITE 300
PORTLAND, OR 97209
PH: 503-221-1121
EMAIL: DPURGIEL@LRSARCHITECTS.COM

### CIVIL ENGINEERING, SURVEYING:
AKS ENGINEERING & FORESTRY, LLC
CONTACT: CHUCK GREGORY, PE
12965 SW HERMAN ROAD, SUITE 100
TUALATIN, OR 97062
P: (503) 563-6151
E: chuckg@aks-eng.com


### PROPERTY DESCRIPTION
TAX LOTS 500, 600, 700, 800 AND 900, YAMHILL COUNTY TAX MAP 3S 2W 17CB, LOCATED IN THE SOUTHWEST ONE-QUARTER SECTION OF SECTION 17DB, TOWNSHIP 3 SOUTH, RANGE 2 WEST, WILLAMETTE MERIDIAN, CITY OF NEWBERG, YAMHILL COUNTY, OREGON.

### EXISTING LAND USE
R-2, I

### PROJECT PURPOSE
CONSTRUCTION OF NEW RETIREMENT FACILITY

### VERTICAL DATUM
VERTICAL DATUM: ELEVATIONS ARE BASED ON CITY OF NEWBERG BENCHMARK NO. 89 WITH A NAVD 88 ELEVATION OF 202.05 FEET.

CONSULTANT: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PROJECT NUMBER: 215047

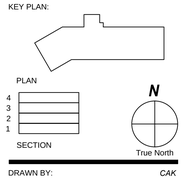
***University Village Master Plan***

*1301 Fulton St.*
*Newberg,OR 97132*

SHEET TITLE:

***COVER WITH VICINITY MAP, SITE MAP, AND LEGEND***

KEY PLAN:




DRAWN BY: CAK
DATE CREATED: 10/29/15

SHEET:

**C1**

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## NOTES:

1. UTILITIES SHOWN ARE BASED ON UNDERGROUND UTILITY LOCATE MARKINGS AS PROVIDED BY OTHERS. THE SURVEYOR MAKES NO GUARANTEE THAT THE UNDERGROUND LOCATES REPRESENT THE ONLY UTILITIES IN THE AREA OR ARE AT THE LOCATION SHOWN HEREON. CONTRACTORS ARE RESPONSIBLE FOR VERIFYING ALL EXISTING CONDITIONS PRIOR TO BEGINNING CONSTRUCTION.
2. FIELD WORK WAS CONDUCTED MAY 7–12, 2015 BY AKS AND NOVEMBER 2011 BY THE SAUNDERS COMPANY.
3. VERTICAL DATUM: ELEVATIONS ARE BASED ON CITY OF NEWBERG BENCHMARK NO. 89 WITH A NAVD 88 ELEVATION OF 202.05 FEET.
4. THIS MAP DOES NOT CONSTITUTE A PROPERTY BOUNDARY SURVEY.
5. SURVEY IS ONLY VALID WITH SURVEYOR'S STAMP AND SIGNATURE.
6. BUILDING FOOTPRINTS ARE MEASURED TO SIDING UNLESS NOTED OTHERWISE. CONTACT SURVEYOR WITH QUESTIONS REGARDING BUILDING TIES.
7. CONTOUR INTERVAL IS 1 FOOT.
8. ONLY TREES HAVING A DIAMETER OF 6" AND GREATER, MEASURED AT BREAST HEIGHT, WERE SURVEYED AT THIS TIME.

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***ISSUED FOR DESIGN REVIEW***


CONSULTANT:
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PROJECT NUMBER: *215047*

# *University Village Master Plan*

*1301 Fulton St.*
*Newberg, OR 97132*

SHEET TITLE:

## *EXISTING CONDITIONS*

KEY PLAN:

PLAN
4
3
2
1
SECTION

N
True North

DRAWN BY:
DATE CREATED: *10/29/15*

SHEET:

# *C2*

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## LEGEND

- EXISTING AC TO BE REMOVED
- EXISTING PCC TO BE REMOVED
- EXISTING AC TO REMAIN
- EXISTING PCC TO REMAIN
- EXISTING PCC TO REMAIN
- EXISTING TREE TO BE REMOVED
- EXISTING TREE TO REMAIN

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PROJECT NUMBER: *215047*

***University Village Master Plan***

*1301 Fulton St.*
*Newberg,OR 97132*

SHEET TITLE:

***PRELIMINARY DEMOLITION PLAN***

KEY PLAN:

PLAN

4
3
2
1

SECTION

N

True North

DRAWN BY: *CAK*

DATE CREATED: *10/29/15*

SHEET:

***C3***


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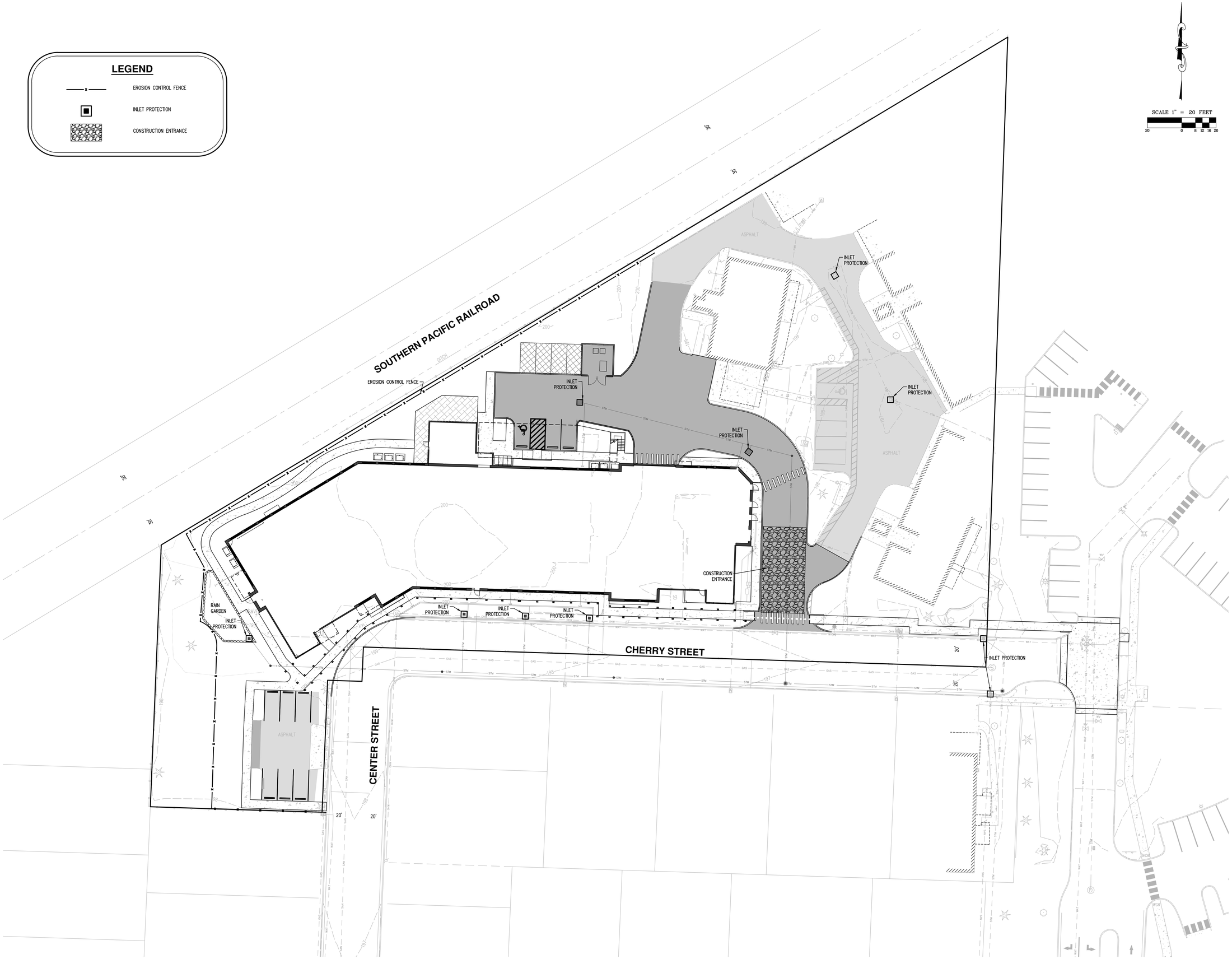


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PROJECT NUMBER: *215047*

***University Village Master Plan***

*1301 Fulton St.*
*Newberg,OR 97132*

SHEET TITLE:

***PRELIMINARY EROSION AND SEDIMENTATION CONTROL PLAN***

KEY PLAN:

PLAN
4
3
2
1
SECTION

N
True North

DRAWN BY: *CAK*
DATE CREATED: *10/29/15*

SHEET:

***C4***

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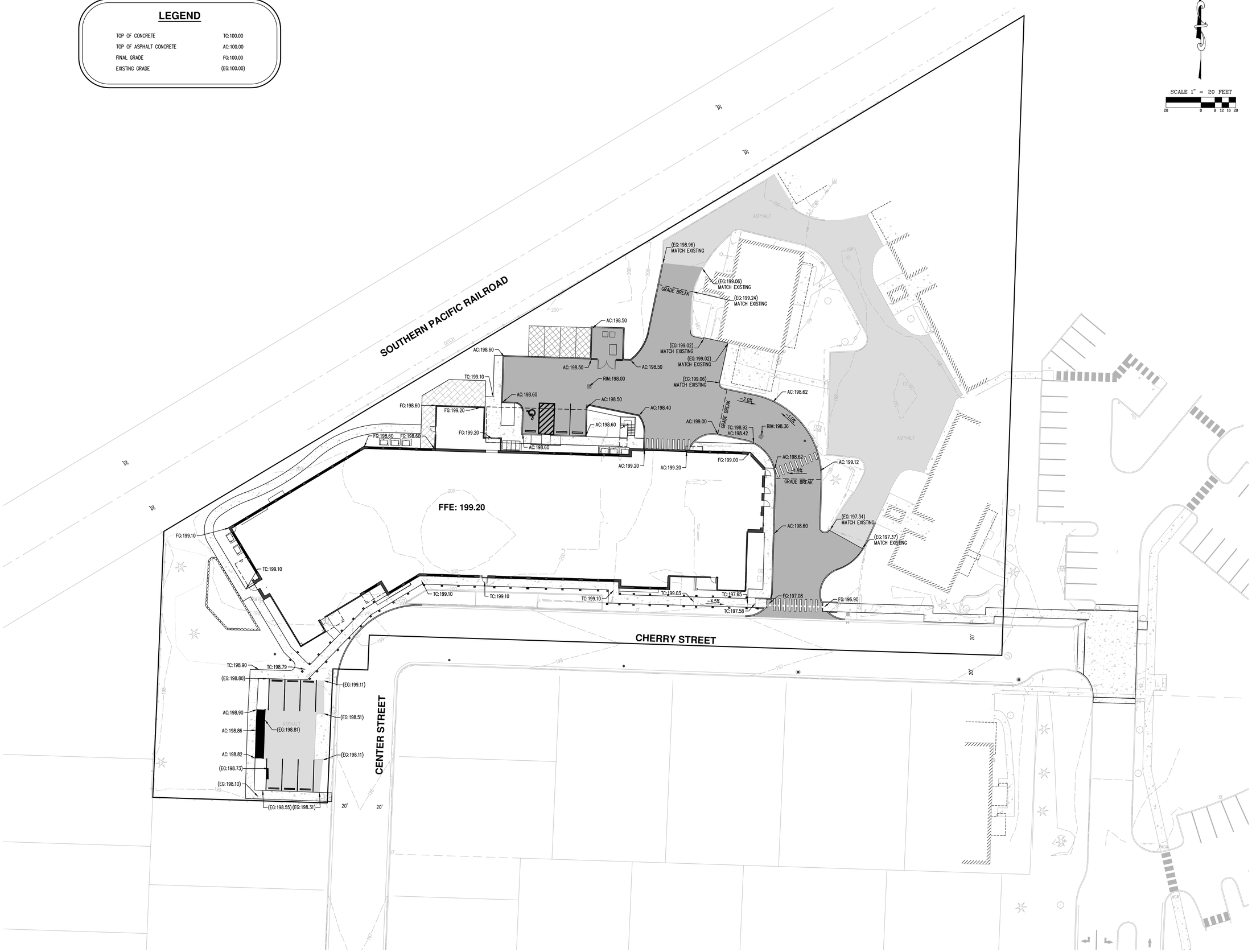
## LEGEND

| | |
|---|---|
| TOP OF CONCRETE | TC:100.00 |
| TOP OF ASPHALT CONCRETE | AC:100.00 |
| FINAL GRADE | FG:100.00 |
| EXISTING GRADE | (EG:100.00) |





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PROJECT NUMBER: *215047*

***University Village Master Plan***

*1301 Fulton St.*
*Newberg,OR 97132*

SHEET TITLE:

***PRELIMINARY GRADING PLAN***

KEY PLAN:

PLAN
4
3
2
1
SECTION

N
True North

DRAWN BY: *CAK*
DATE CREATED: *10/29/15*

SHEET:

***C5***


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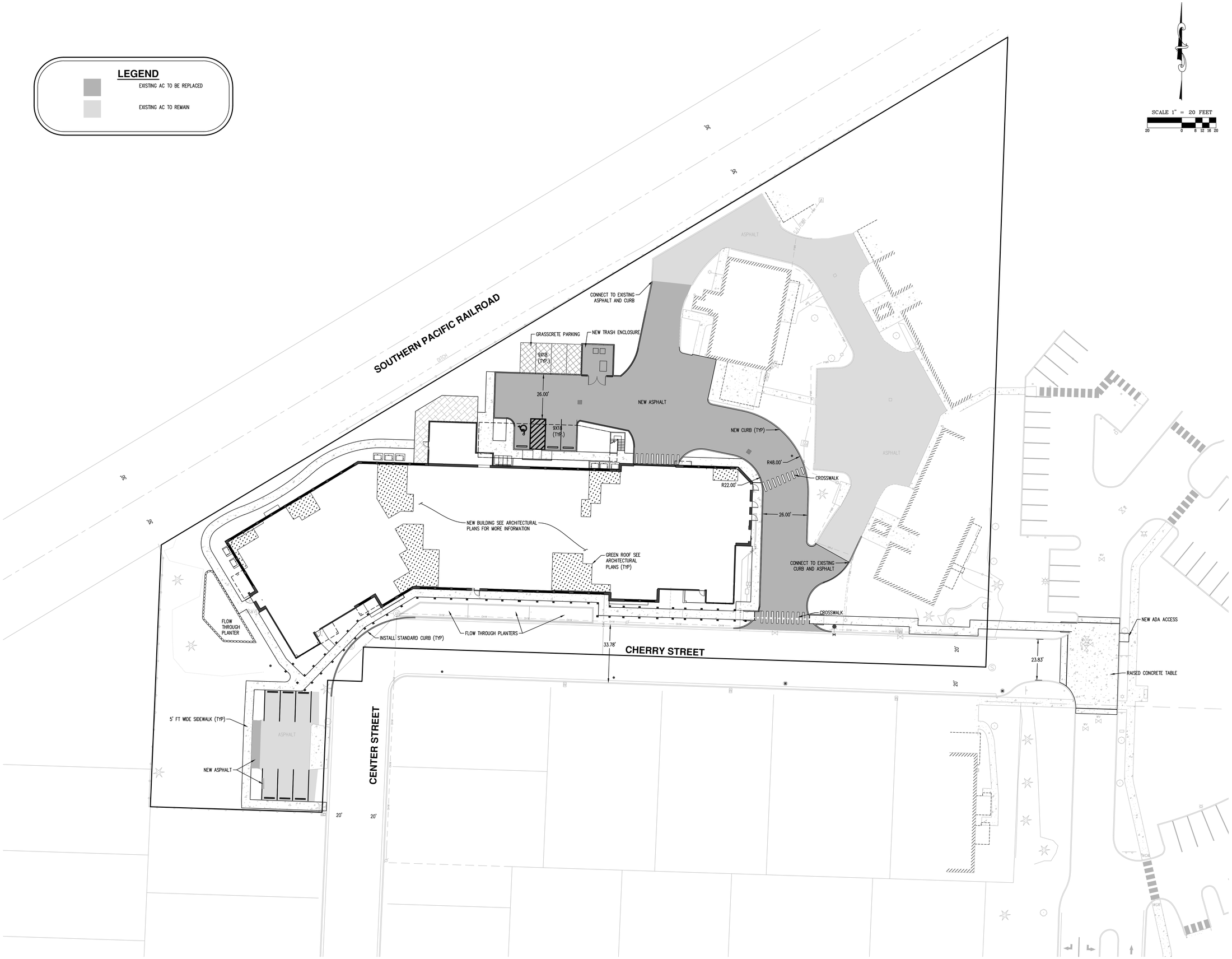


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PROJECT NUMBER: *215047*

***University Village Master Plan***

*1301 Fulton St.*
*Newberg,OR 97132*

SHEET TITLE:

***PRELIMINARY SITE PLAN***

KEY PLAN:

PLAN
4
3
2
1
SECTION

N
True North

DRAWN BY: *CAK*
DATE CREATED: *10/29/15*

SHEET:

***C6***

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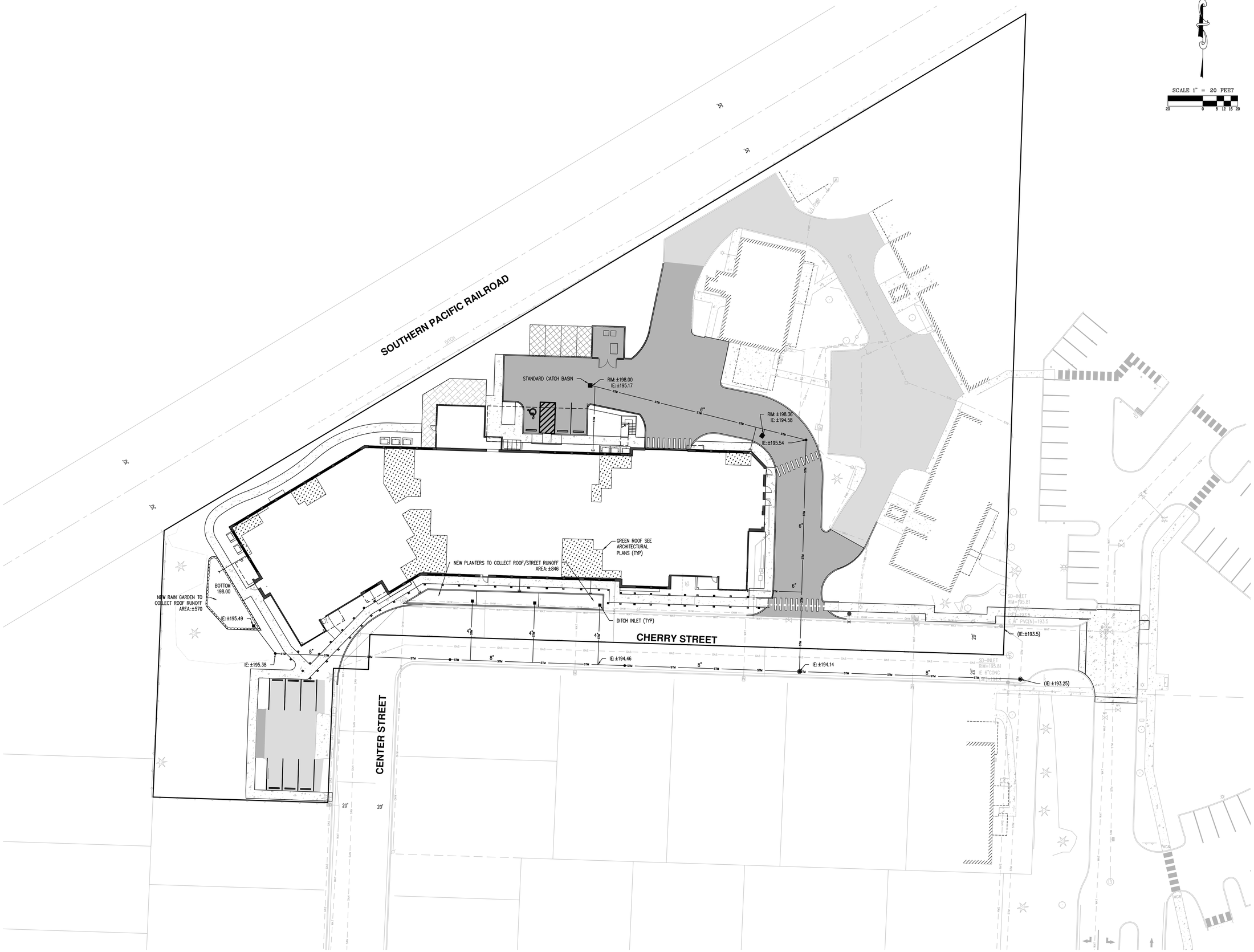



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720 NW Davis 503.221.1121
Suite 300 503.221.2077
Portland OR 97209 www.lrsarchitects.com


***ISSUED FOR DESIGN REVIEW***

CONSULTANT:


AKS ENGINEERING & FORESTRY, LLC
12965 SW HERMAN RD STE 100
TUALATIN, OR 97062
P: 503.563.6151
F: 503.563.6152
aks-eng.com
ENGINEERING · SURVEYING · NATURAL RESOURCES
FORESTRY · PLANNING · LANDSCAPE ARCHITECTURE


PROJECT NUMBER: *215047*

***University Village Master Plan***

*1301 Fulton St.*
*Newberg,OR 97132*

SHEET TITLE:

***PRELIMINARY STORMWATER PLAN***

KEY PLAN:

PLAN
4
3
2
1
SECTION

N
True North

DRAWN BY: *CAK*
DATE CREATED: *10/29/15*

SHEET:

***C7***

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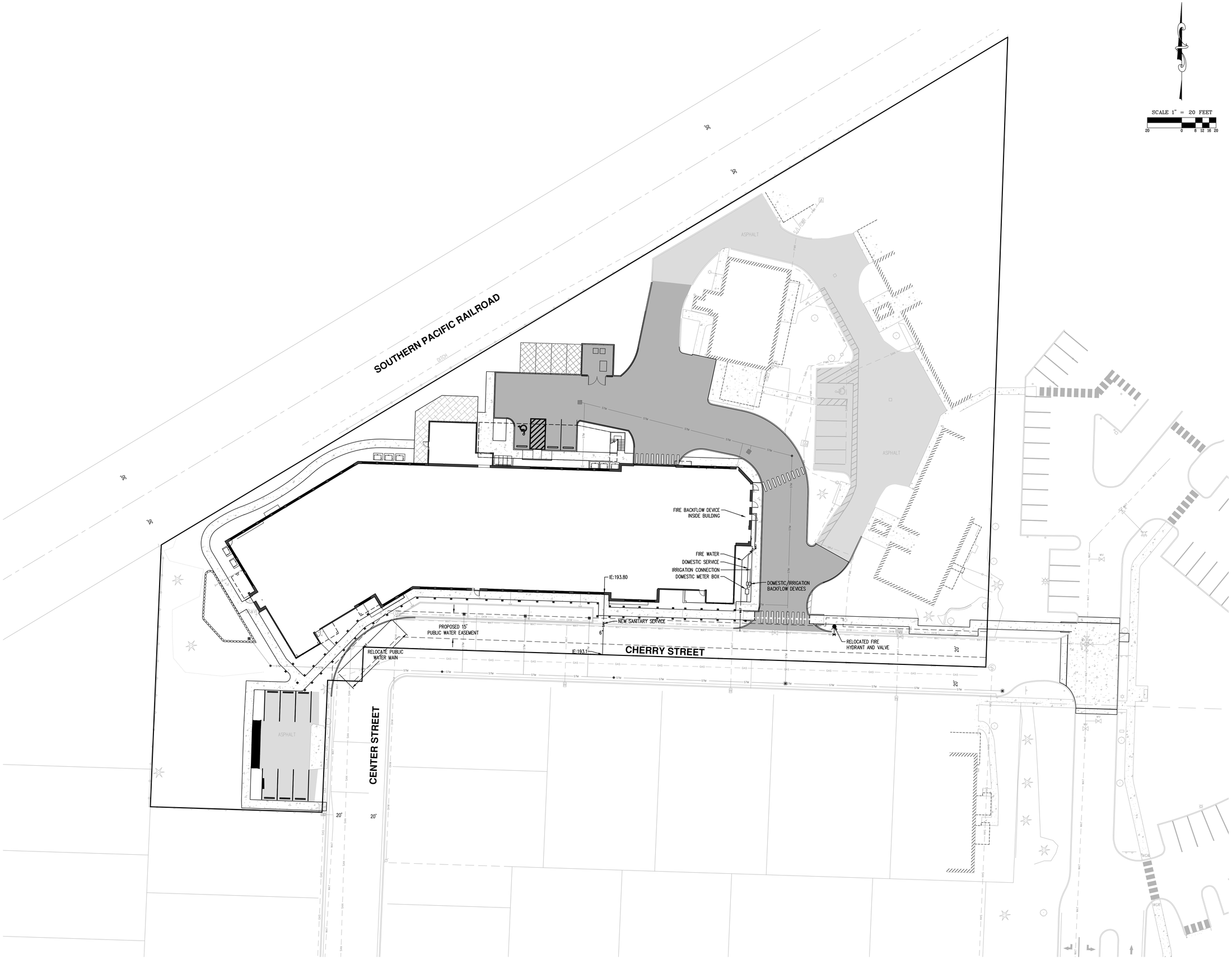


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P: 503.563.6151
F: 503.563.6152
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PROJECT NUMBER: *215047*

***University Village Master Plan***

*1301 Fulton St.*
*Newberg,OR 97132*

SHEET TITLE:

***PRELIMINARY SANITARY SEWER AND WATER PLAN***

KEY PLAN:

PLAN
4
3
2
1
SECTION

N
True North

DRAWN BY: *CAK*
DATE CREATED: *10/29/15*

SHEET:

***C8***

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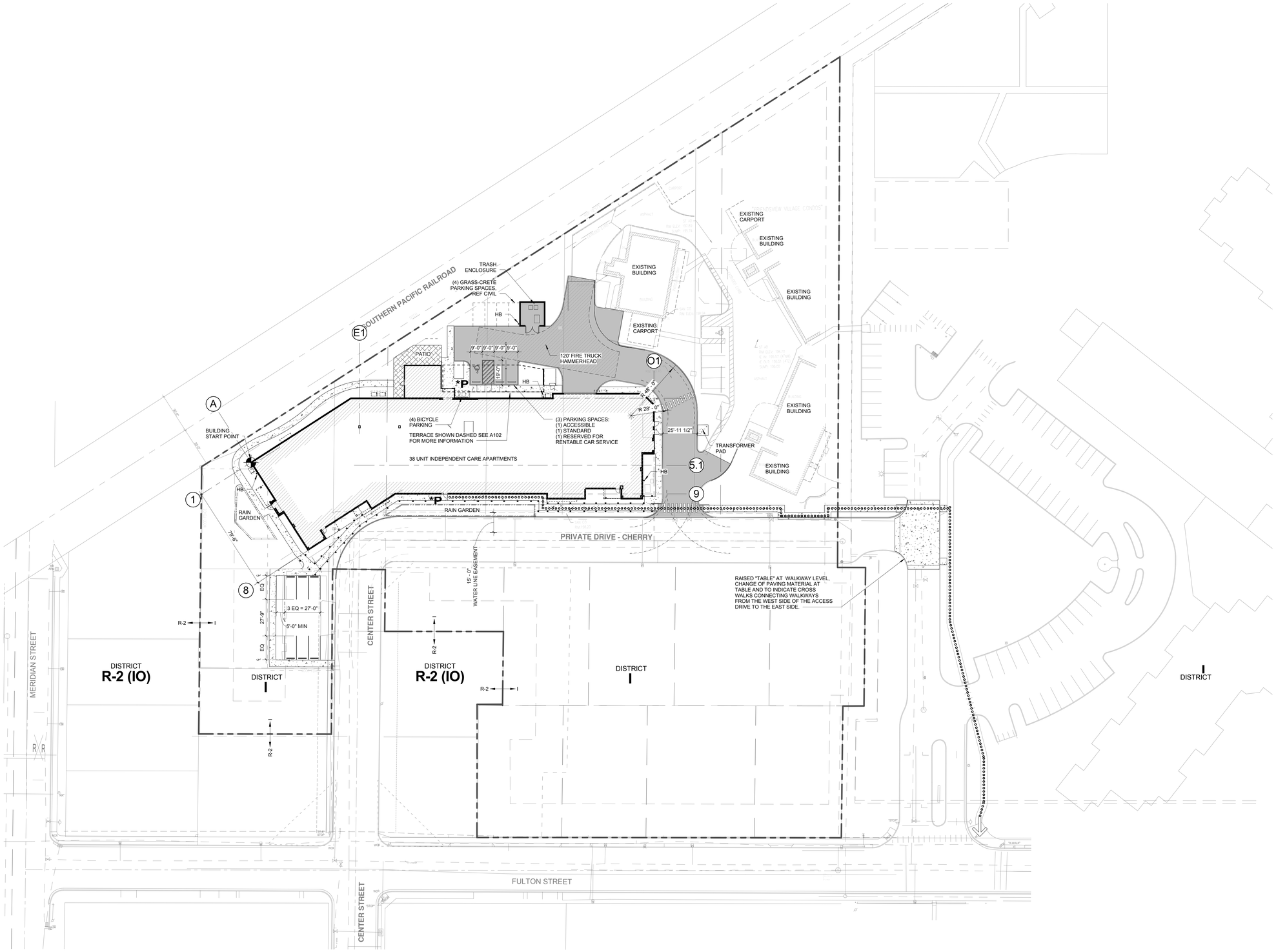



## 1. SITE PLAN

***SCALE: 1" = 30'-0"***

## LEGEND

- SITE EASEMENTS
- SITE SETBACKS
- SITE RIGHT OF WAY
- SITE PROPERTY BOUNDRY
- SITE BUILDING ENVELOPE
- SITE PAVEMENT ZONES
- SITE LANDSCAPE ZONES
- SITE CONCRETE SIDEWALKS
- SITE EGRESS PATH TO RIGHT OF WAY
- ELEVATOR USED AS AN ACCESSIBLE MEANS OF EGRESS
- *P PUBLIC ENTRY ON ACCESSIBLE ROUTE

PROJECT NUMBER: *215047*

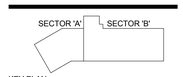
Friendsview RETIREMENT COMMUNITY

***University Village***

*1301 Fulton St. Newberg, OR 97132*

SHEET TITLE:

***SITE PLAN***




KEY PLAN

KEY SECTION

DRAWN BY: *CJH*

DATE ISSUED: *12/23/2015*

SHEET:

# A101

*CMP/DR SET*

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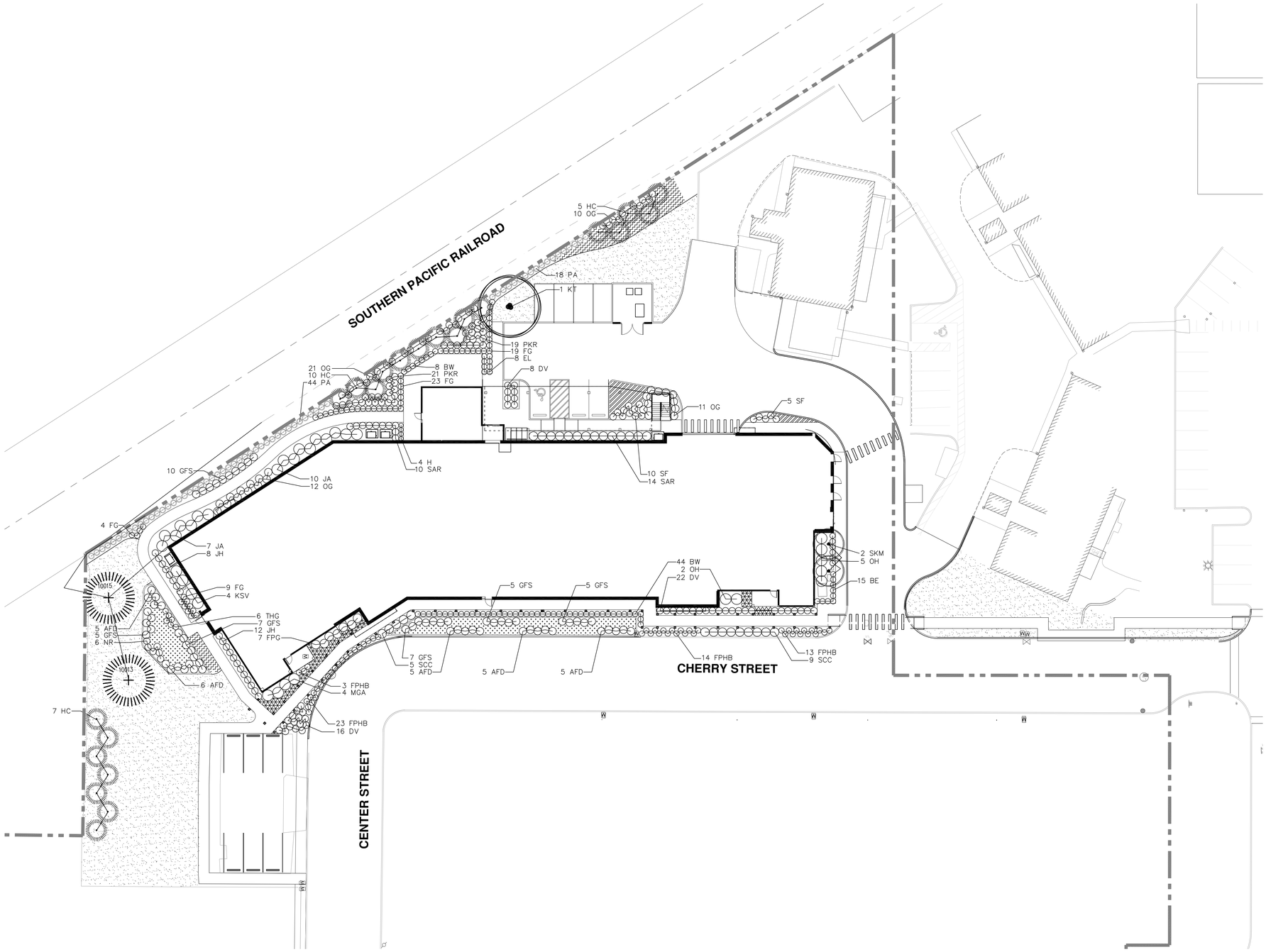


# LANDSCAPE PLAN

**SCALE: 1"=20'-0"**

N

## LANDSCAPE LEGEND

| SYMBOL | COMMON NAME / BOTANICAL NAME | SIZE/COND. | SPACING |
|---|---|---|---|
| TREES | | | |
| BG | Black Gum<br>Nyssa sylvatica | 2" Cal. | 30' o.c. |
| HC | Hogan Cedar<br>Thuja plicata 'Hogan' | 6'–8" | 10' o.c. |
| KT | Katsura Tree<br>Cercidiphyllum japonicum | 2" Cal. | as shown |
| SKM | Sango Kaku Maple<br>Acer palmatum 'Sango Kaku' | 2" Cal. | 14' o.c. |
| SHRUBS | | | |
| BE | Vaiegated Boxleaf Euonymus<br>Euonymus japonicus 'Microphyllus Variegatus' | 24"–30" | 2.5' o.c. |
| BOG | Blue Oat Grass<br>Helictotrichon sempervirens | 1 Gal. | 2' o.c. |
| BW | Dwarf Common Boxwood<br>Buxus sempervirens 'Suffruticosa' | 18"–24" | 2.5' o.c. |
| DV | David Viburnum<br>Virburnum davidii | 3 Gal. | 3' o.c. |
| EL | English Lavender<br>Lavendula angustifolia 'Munstead' | 1 Gal. | 2.5' o.c. |
| FG | Fountain Grass<br>Pennisetum alopecuroides 'Hamelin' | 1 Gal. | 2.5' o.c. |
| FPG | Frostproof Gardenia<br>Gardenia jasminoides 'Frostproof' | 5 Gal. | 4' o.c. |
| FPHB | Fire Power Heavenly Bamboo<br>Nandina domestica 'Fire Power' | 2 Gal. | 2.5' o.c. |
| GFS | Goldflame Spirea<br>Spirea bumalda 'Goldflame' | 3 Gal. | 3.5' o.c. |
| H | Variegated Hosta<br>Hosta 'Variegata' | 1 Gal. | 2' o.c. |
| JA | Japanese Andromeda<br>Pieris japonica 'Passion' | 5 Gal. | 5' o.c. |
| JH | Japanese Holly<br>Ilex crenata 'Compacta' | 5 Gal. | 3' o.c. |
| KD | Kelsey Dogwood<br>Cornus sericea 'Kelseyii' | 2 Gal. | 3' o.c. |
| KSV | Korean Spice Viburnum<br>Virburnum carlesii | 5 Gal. | 5' o.c. |
| MGA | Mardi Gras Abelia<br>Abelia x 'Mardi Gras' | 5 Gal. | 5' o.c. |
| NR | Noatka Rose<br>Rosa nutkana | 2 Gal. | 3" o.c. |
| OG | Oregon Grape<br>Mahonia aquifolium | 5 Gal. | 3.5' o.c. |
| OH | Oakleaf Hydrangea<br>Hydrangea quercifolia | 5 Gal. | 5' o.c. |
| PA | Pyramidal Arborvitae<br>Thuja occidentalis 'Pyramidalis' | 5 Gal. | 5' o.c. |
| PKR | Pink Knockout Rose<br>Rosa Radcon PPAF | 2 Gal. | 3' o.c. |
| RR | Rugosa Rose<br>Rosa rugosa 'Purple Pavement' | 2 Gal. | 3.5' o.c. |
| SAR | Sarcococca<br>Sarcococca rusifolia | 5 Gal. | 4' o.c. |
| SCC | Sixteen Candles Clethra<br>Clethra alnifolia 'Sixteen Candles' | 5 Gal. | 4' o.c. |
| SF | Sword Fern<br>Polystichum munitum | 2 Gal. | 3' o.c. |
| THG | Tufted Hair Grass<br>Deschampsia caespitosa | 1 Gal. | 2.5' o.c. |
| GROUNDCOVER | | | |
| | Kinnikinnick<br>Arctostyphlos uva–ursi 'Emerald Carpet' | 1 Gal. | 18" o.c. |
| | Big BLue Lily Turf<br>Liriope muscari 'Big Blue' | 4" Pot | 12" o.c. |
| | Japanese Spurge<br>Pachysandra terminalis | 4" Pot | 12" o.c. |
| | Lawn | | |
| | Rain Garden Mix: | | |
| | Carmen's Grey Juncus<br>Juncus patens 'Carmen's Grey' | 4" Pot | 12" o.c. |
| | Soft Stem Bulrush<br>Scirpus validus | 4" Pot | 12" o.c. |
| | Slough Sedge<br>Carex obnupta | 4" Pot | 12" o.c. |

NOTE:
1. Plant Rushes and Sedges in equal quantity, plant randomly.

## LANDSCAPE SYMBOLS LEGEND

10"L — Existing Deciduous Tree to Remain
Caliper DBH and Tree Variety

10"L — Existing Conifer Tree to Remain
Caliper DBH and Tree Variety

10"L — Existing Deciduous Tree to be Removed
Caliper DBH and Tree Variety

10"L — Existing Conifer Tree to be Removed
Caliper DBH and Tree Variety

NOTES
1. Installation must fully comply with all City of Newberg landscape code requirements.
2. Irrigation to be provided by a fully automatic underground system, fully detailed plans to be submitted at building permit.

## LANDSCAPE CALCULATIONS

| | | |
|---|---|---|
| LIMIT OF PHASE 1 AREA: | 65,354 S.F. | |
| BUILDING AREA: | 22,962 S.F. | |
| GREEN ROOF AREA | 2,480 S.F. | |
| TOTAL BUILDING AREA:<br>(22,962 S.F. – 2,480 S.F.) | 20,482 S.F. | 31.4% |
| HARDSCAPE AREA: | 21,767 S.F. | 33.3% |
| LANDSCAPE AREA:<br>(INCLUDES GREEN ROOF) | 23,105 S.F. | 35.3% |


LRS ARCHITECTS
720 NW Davis 503.221.1121
Suite 300 503.221.2077
Portland OR 97209 www.lrsarchitects.com


*PRELIMINARY NOT FOR CONSTRUCTION*

CONSULTANT:
CHRISTOPHER FRESHLEY LANDSCAPE ARCHITECT

PROJECT NUMBER: 211312

**FRIENDSVIEW RETIREMENT COMMUNITY PHASE 1**

**1301 East Fulton Street**
**Newberg, Oregon**
**97132**

SHEET TITLE:
**LANDSCAPE PLAN**

DRAWN BY: CF
DATE ISSUED: 12.23.2015

SHEET: **L1**

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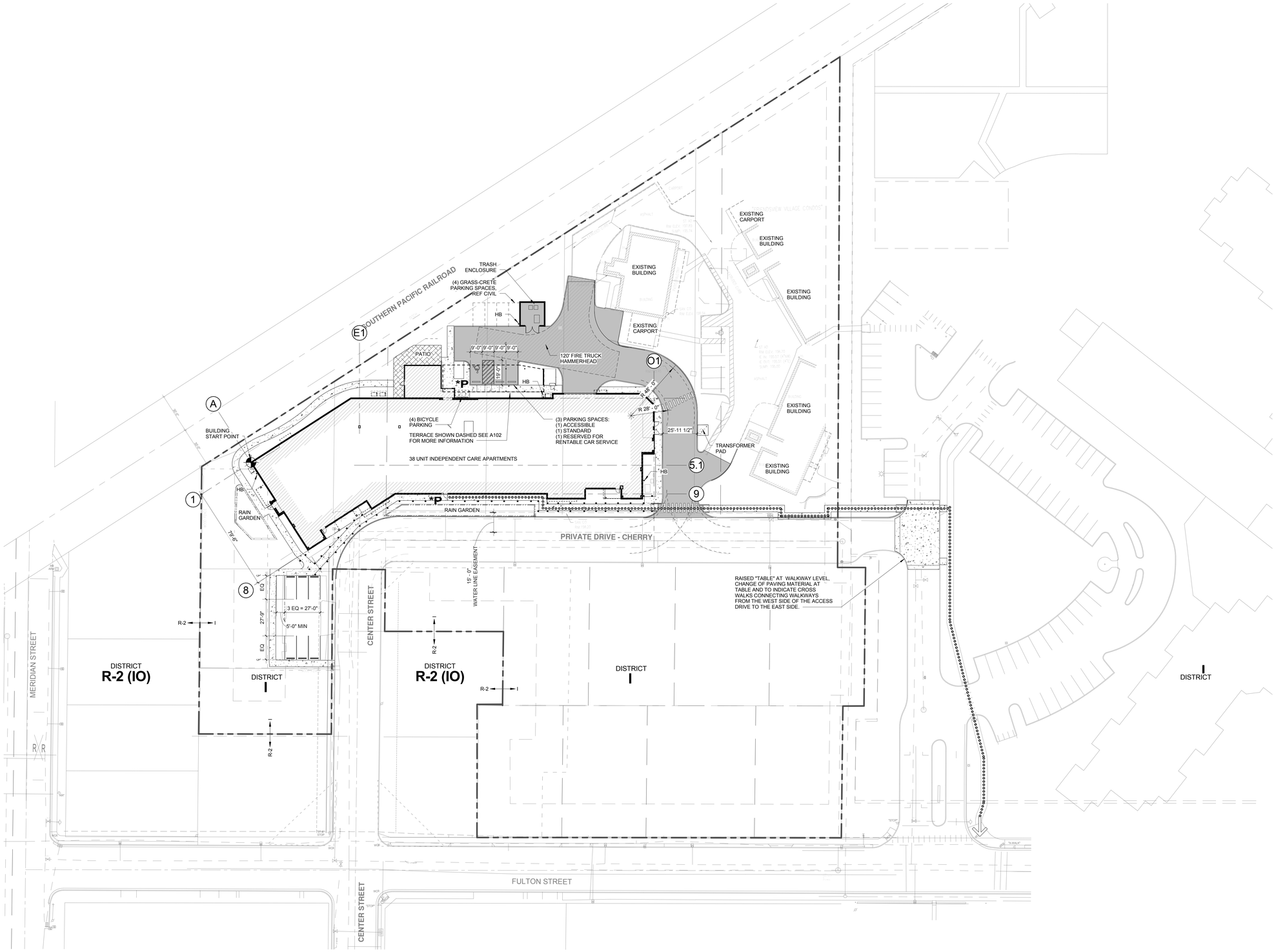



## 1. SITE PLAN

***SCALE: 1" = 30'-0"***

## LEGEND

- SITE EASEMENTS
- SITE SETBACKS
- SITE RIGHT OF WAY
- SITE PROPERTY BOUNDRY
- SITE BUILDING ENVELOPE
- SITE PAVEMENT ZONES
- SITE LANDSCAPE ZONES
- SITE CONCRETE SIDEWALKS
- SITE EGRESS PATH TO RIGHT OF WAY
- ELEVATOR USED AS AN ACCESSIBLE MEANS OF EGRESS
- *P PUBLIC ENTRY ON ACCESSIBLE ROUTE

PROJECT NUMBER: *215047*

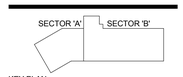
Friendsview RETIREMENT COMMUNITY

***University Village***

*1301 Fulton St. Newberg, OR 97132*

SHEET TITLE:

***SITE PLAN***




KEY PLAN

KEY SECTION

DRAWN BY: *CJH*

DATE ISSUED: *12/23/2015*

SHEET:

# A101

*CMP/DR SET*

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*12/23/2015 1:41:26 PM*

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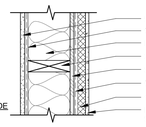
# EXTERIOR WALL TYPE

1 - 1
1 E

*1-HR FIRE RATED, LOAD BEARING, EXT SIDING SYSTEM*

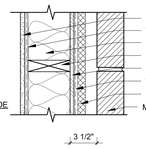
OCCURS @ TYP EXT WALLS W/
FIRE SEPARATION DISTANCE > 10'-0"
PER IBC CHAPTER 7 SHALL BE RATED
FOR EXPOSURE TO FIRE FROM INSIDE




2 - 1
1 E

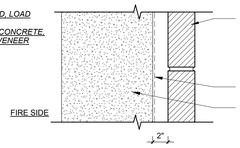
*1-HR FIRE RATED, LOAD BEARING, EXT MASONRY VENEER*

OCCURS @ TYP EXT WALLS W/
FIRE SEPARATION DISTANCE > 10'-0"
PER IBC CHAPTER 7 SHALL BE RATED
FOR EXPOSURE TO FIRE FROM INSIDE



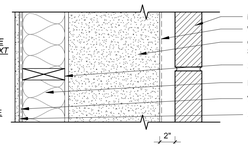

3 - 1
1 E

*1-HR FIRE RATED, LOAD BEARING, CAST IN PLACE CONCRETE, EXT MASONRY VENEER*



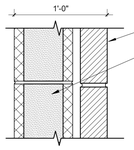

4 - 1
1 E

*1-HR FIRE RATED, LOAD BEARING, CAST IN PLACE CONCRETE, EXT MASONRY VENEER, FURRED INT*




5 - 
N E

*LOAD BEARING, CMU, EXT MASONRY VENEER*




**CREATE 2TNE WALL ASSEMBLY DETAIL TO MATCH LEVEL 1 UNITS EXTERIOR WALLS.**

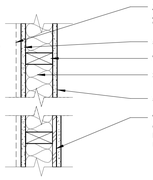
# INTERIOR WALL TYPE

A - 
N | -

INTERIOR PARITION - *NON-FIRE RATED, NON-BEARING*

- BASED ON GA FILE NO. WP 3510

- STC: 35-39 WITHOUT INSULATION
- STC: 46 WITH INSULATION




**GYPSUM WALLBOARD, WOOD STUDS**
One layer 5/8" type X gypsum wallboard or gypsum veneer base applied parallel or at right angles to each side of 2 x 4 wood studs 16" o.c. with 1 1/4" Type W drywall screws 12" o.c.

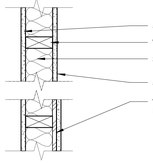
3" Acoustic mineral wool batt insulation added to assembly, where specified.

A - 
1 S

INTERIOR PARITION - *1-HR RATED, NON-BEARING*

- BASED ON GA FILE NO. WP 3510

- STC: 35-39 WITHOUT INSULATION
- STC: 46 WITH INSULATION



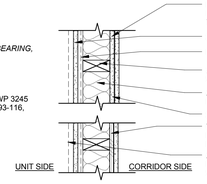

**GYPSUM WALLBOARD, WOOD STUDS**
One layer 5/8" type X gypsum wallboard or gypsum veneer base applied parallel or at right angles to each side of 2 x 4 wood studs 16" o.c. with 1 1/4" Type W drywall screws 12" o.c.

3" Acoustic mineral wool batt insulation added to assembly, where specified.

B - A
1 S

*INTERIOR PARTITION - 1-HR FIRE RATED, LOAD BEARING, @ TYP. UNIT / CORRIDOR*

- BASED ON GA FILE NO. WP 3245
- SOUND TEST: NRCC TL-93-116, 53 STC




**GYP WALLBOARD, RESILIENT CHANNELS, MINERAL OR GLASS FIBER INSULATION, WOOD STUDS**
Resilient channels 24" OC attached at right angles to ONE SIDE of 2x wood studs 16" OC with 11/4" Type S drywall screws. One layer 5/8" TYPE "X" GYP wallboard or GYP veneer base applied at right angles to channels with 1" Type S drywall screws 8" OC with vertical joints located midway BTWN studs. 3" mineral or glass fiber insulation in stud space.

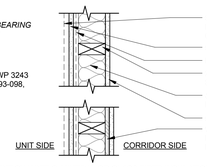
OPPOSITE SIDE: Base layer 5/8" TYPE "X" GYP wallboard or GYP veneer base applied parallel or at right angles to studs with 6d cement coated nails, 17/8" long, 0.0915" shank,15/64" heads, 7" OC Face layer 5/8" TYPE "X" GYP wallboard or GYP veneer base applied at parallel or at right angles to studs with 8d cement coated nails, 23/8" long, 8" OC Face layer joints offset 16" from base layer joints.

Vertical joints staggered 16" on opposite sides.
Note: Increase nail length for additional layers added for structural or sound.

B - A
1 S
**ALTERNATE**

*INTERIOR PARTITION - 1-HR FIRE RATED, LOAD BEARING @ TYP. UNIT / CORRIDOR*

- BASED ON GA FILE NO. WP 3243
- SOUND TEST: NRCC TL-93-098, 50 STC




**GYP WALLBOARD, RESILIENT CHANNELS, MINERAL OR GLASS FIBER INSULATION, WOOD STUDS**
Resilient channels 24" OC attached at right angles to ONE SIDE of 2x wood studs 24" OC with 11/4" Type S drywall screws. One layer 5/8" TYPE "X" GYP wallboard or GYP veneer base applied at right angles to channels with 1" Type S drywall screws 8" OC with vertical joints located midway BTWN studs. 3" mineral or glass fiber insulation in stud space.

OPPOSITE SIDE: One layer 5/8" TYPE "X" GYP wallboard or GYP veneer base applied parallel or at right angles to studs with 6d cement coated nails, 17/8" long, 0.0915" shank, 15/64" heads, 7" OC

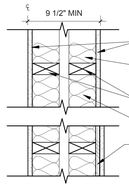
Vertical joints staggered 24" on opposite sides.
Note: Increase nail length for additional layers added for structural or sound.

C - 
1 S

*INTERIOR DOUBLE WALL - 1-HR FIRE RATED, LOAD BEARING @ UNIT PARTY WALL*

- BASED ON GA FILE NO. WP 3370
(W/ STUDS @ 16" OC)
- 54 STC
- SOUND TEST: NRCC TL-93-273, IRC-IR-693

(W/ STUDS @ 24" OC)
- 59 STC
- SOUND TEST: NRCC TL-93-281



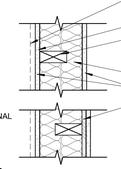

**GYP WALLBOARD, WOOD STUDS**
One layer 5/8" TYPE "X" GYP wallboard or GYP veneer base applied parallel or at right angles to each side of double row of 2x wood studs 16" OC on separate plates 1" apart with 6d coated nails, 17/8" long, 0.0915" shank, 1/4" heads, 7" OC

Joints staggered 16" on opposite sides. Horizontal bracing required at mid-height.
Note: Increase nail length for additional layers added for structural or sound.

C - A
1 S
**ALTERNATE**

*INTERIOR PARTITION - 1-HR FIRE RATED, LOAD BEARING @ UNIT PARTY WALL*

- BASED ON GA FILE NO. WP 3380
- SOUND TEST: TL 93-249, 50 STC; NRCC TL 93-250, 53 STC (W/ ADDITIONAL LAYER GYP)




**GYPSUM WALLBOARD, WOOD STUDS**
One layer 5/8" TYPE "X" gypsum wallboard or gypsum veneer base parallel or at right angles to each side of 2x4 wood studs 16" o.c. staggered 8" o.c. on 2 x 6 wood plates with 6d coated nails, 1 7/8" long, 0.0915" shank, 1/4" heads, 7" o.c.

Joints staggered 24" on opposite sides. Horizontal bracing required at mid-height.

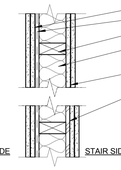
Accoustical batt insulation added to assembly where noted.
Note: Increase nail length for additional layers added for structural or sound.

D6 A
2 | A

*INTERIOR PARTITION - 2-HR FIRE RATED, LOAD BEARING, @ STAIR*

BASED ON UL DESIGN U334 (WOOD SHEATHING ADDED, WHERE OCCURS, ATTACH SHEATHING PER STRUCT SHEAR WALL SCHED)

STC: 58 (USG-810219)

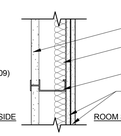



Face layer of 5/8" thick, 4' wide, Type C gypsum board installed horizontally with butt joints offset 16" from base layer and attached with 1-5/8" long Type S steel screws spaced max 12" o.c.; Base layer of 5/8" thick, 4' wide, Type C gypsum board installed vertically and attached to furring channels with 1" long Type S steel screws spaced max 24" o.c. Resilient channel, 25 MSG galv steel, nom 2-1/2" wide by 1/2" deep, placed perpindicular to studs, spaced vertically max 24" o.c. flange portion attached to each intersecting stud with 1" long Type S steel screws. Wood studs, nom 2x4, spaced 16" o.c. cross braced at mid-height and effectively fire stopped at top and bottom of wall. At wall cavities formed by the studs friction fit with R-19 unfaced fiberglass insulation batts measuring 6-1/4" thick by 15-1/4" wide. Attach a base layer of 5/8" thick, 4' wide, Type C gypsum wall board vertically to wood studs with 1-7/8" long 6d coated nails spaced max 14" o.c. Attach a face layer of 5/8" thick, 4' wide, Type C gypsum wall board horizontally with butt joints offset 16" from base layers with 2-3/8" long 6d coated nails spaced max 7" o.c. Where occurs, sheathing shall be installed and fastened according to structural in addition to the layers mentioned above. Where sheathing occurs, fastener type and spacing at gypsum wall boards to be extended 1/2" min. Vinyl, dry or premixed joint compound, applied to joints, screw heads and nail heads (2 applications) and paper tape embedded in first layer of compound all over joints. Apply a bead of acoustical sealant around all parition perimeters for sound control.

E 4
2 | X

*INTERIOR SHAFT WALL 2-HR FIRE RATED, LOAD BEARING @ ELEVATOR*

- BASED ON GA FILE NO. WP 7054.4
- SOUND TEST: RAL TL 09-060 (12-8-09) 50 TO 54 STC




**GYP PANEL PRODUCTS, STEEL C-H, C-T / I STUDS**
*Georgia-Pacific Gypsum LLC* DensGlass® Ultra Shaftliner TM

One layer 1" x 24" proprietary TYPE "X" GYP panels inserted BTWN 2 1/2" floor and ceiling J runners with T section of 4" steel C-H, C-T, or I studs BTWN panels.

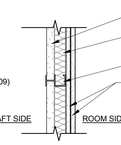
OPPOSITE SIDE: Base layer 1/2" proprietary TYPE "X" GYP wallboard applied at right angles to stud with 1" Type S drywall screws 24" OC and 6" from floor and ceiling runners. Face layer 1/2" proprietary TYPE "X" GYP wallboard applied parallel to studs with 1 5/8" Type S drywall screws 12" OC and 3" from floor and ceiling runners. Joints offset 24" from base layer joints.

Sound tested with 1 1/2" glass fiber insulation friction fit in stud space. **(NLB)**

E 2
2 | X

*INTERIOR SHAFT WALL 2-HR FIRE RATED, NON-BEARING*

- BASED ON GA FILE NO. WP 7054.4
- SOUND TEST: RAL TL 09-060 (12-8-09) 50 TO 54 STC




**GYP PANEL PRODUCTS, STEEL C-H, C-T / I STUDS**
*Georgia-Pacific Gypsum LLC* DensGlass® Ultra Shaftliner TM

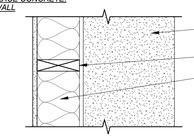
One layer 1" x 24" proprietary TYPE "X" GYP panels inserted BTWN 2 1/2" floor and ceiling J runners with T section of 2 1/2" steel C-H, C-T, or I studs BTWN panels.

OPPOSITE SIDE: Base layer 1/2" proprietary TYPE "X" GYP wallboard applied at right angles to stud with 1" Type S drywall screws 24" OC and 6" from floor and ceiling runners. Face layer 1/2" proprietary TYPE "X" GYP wallboard applied parallel to studs with 1 5/8" Type S drywall screws 12" OC and 3" from floor and ceiling runners. Joints offset 24" from base layer joints.

Sound tested with 1 1/2" glass fiber insulation friction fit in stud space. **(NLB)**

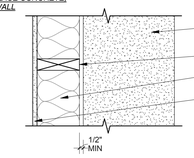
F 6 -
N | S

*NON-FIRE RATED, LOAD BEARING, CAST IN PLACE CONCRETE, FURRED WALL*



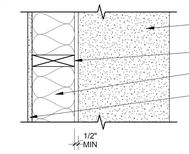

F 6 -
1 | S

*1-HR FIRE RATED, LOAD BEARING, CAST IN PLACE CONCRETE, FURRED WALL*



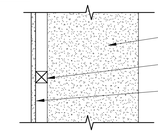

F 6 -
2 | S

*2-HR FIRE RATED, LOAD BEARING, CAST IN PLACE CONCRETE, FURRED WALL @ STAIR*



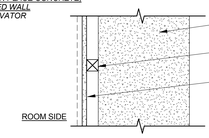

F 2
1 | S

*1-HR FIRE RATED, NON-LOAD BEARING, CAST IN PLACE CONCRETE, FURRED WALL*



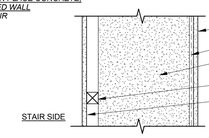

F 2
2 | x

*2-HR FIRE RATED, LOAD BEARING, CAST IN PLACE CONCRETE, FURRED WALL @ ELEVATOR*



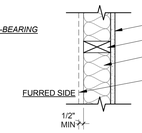

F 2
2 | S

*2-HR FIRE RATED, LOAD BEARING, CAST IN PLACE CONCRETE, FURRED WALL @ STAIR*




F -
N | -

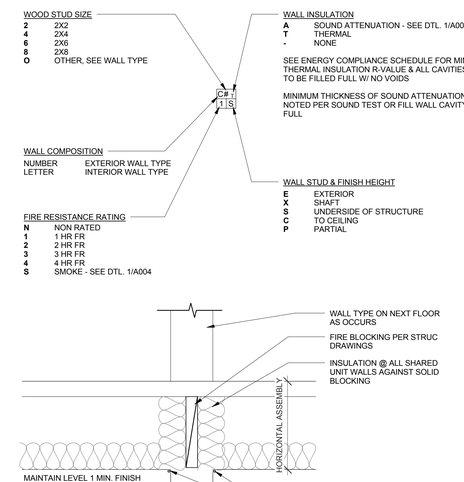
*NON-FIRE RATED & NON-BEARING FURRED WALL*

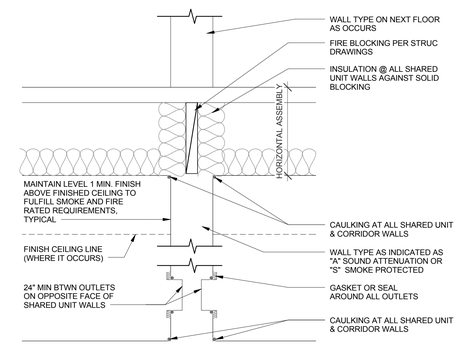



# WALL TYPE NOTES

1. TYPE "X" GYP WALL BOARD SPECIFIED THROUGHOUT UNLESS OTHERWISE SPECIFIED. PROVIDE TILE BACKER BOARD ON ALL WALLS WITH TILE.
2. CONFORM TO DETAILED REQUIREMENTS OF DESIGNATED TESTING AUTHORITY NUMBERS AT ALL WALLS. WALLS DESIGNATED AS "BASED ON" VARY AS NOTED IN PARENTHESIS.
3. SEE STRUC SHEAR WALLS SCHEDULE FOR SHEAR WALL ATTACHMENT AND EDGE BLOCKING REQUIREMENTS WHERE APPLICABLE. STRUC SHEAR WALL SCHEDULE OVERRIDES LISTED ASSEMBLY ATTACHMENT AND BLOCKING REQUIREMENTS ONLY WHEN MORE RESTRICTIVE.
4. REFER TO WALL TYPE LEGEND ON CODE ANALYSIS PLANS FOR IBC DESIGNATION OF FIRE RESISTIVE WALLS WITH OPENING PROTECTION (FIRE RESISTIVE RATED DOORS AND GLAZING), DUCTS AND AIR TRANSFER OPENING PROTECTION, AND FIRE STOPPING PENETRATION PROTECTION.SEE DOOR/ WINDOW SCHEDULES, MECHANICAL DRAWINGS, AND PENETRATION DETAILS.
5. WALL TYPES STATED AS "BASED ON" A LISTED ASSEMBLY MIGHT VARY IN STUD SIZE. NO EXACT LISTED ASSEMBLY EXISTS. PER GA-600-2012 P.9 ITEM 16, "GREATER STUD SIZES (DEPTHS) SHALL BE PERMITTED TO BE USED IN METAL- OR WOOD-STUD SYSTEMS." THESE WALLS CAN ALSO BE SHOWN TO MEET THE REQUIRED FIRE RESISTIVE RATING BY THE CALCULATION METHOD PER SECTION 703.3.3 AND SECTION 721 IF REQUESTED.
6. WALL TYPES STATED AS "BASED ON" A LISTED ASSEMBLY MIGHT VARY DUE TO THE ADDITION OF EXTRA LAYER(S) OF ELEMENTS. NO EXACT LISTED ASSEMBLY EXISTS. PER GA-600-2012 P.9 ITEM 22, "ADDITIONAL LAYERS OF TYPE "X" OR REGULAR GYP BOARD SHALL BE PERMITTED TO BE ADDED TO ANY SYSTEM." FASTENERS SPECIFIED FOR THE ATTACHMENT OF GYP BOARD APPLIED OVER THE ADDITIONAL LAYER(S) OF ELEMENTS SHALL BE INCREASED BY NOT LESS THAN THE THICKNESS OF THE ADDITIONAL LAYER(S).
7. SEE SPECIFICATIONS FOR APPLICATION OF FINISH REQUIREMENTS.
8. SEE SHEET A001 FOR ENERGY CODE COMPLIANCE SUMMARY FOR THERMAL VALUES OF INSULATION

# WALL TYPE LEGEND




*1. WALL SECTION SMOKE OR SOUND REQUIREMENTS*
*SCALE: NTS*


LRS ARCHITECTS
720 NW Davis 503.221.1121
Suite 300 503.221.2077
Portland OR 97209 www.lrsarchitects.com


***PRELIMINARY NOT FOR CONSTRUCTION***

CONSULTANT:

PROJECT NUMBER: *215047*

Friendsview RETIREMENT COMMUNITY

***University Village***

*1301 Fulton St. Newberg, OR 97132*

SHEET TITLE:
***WALL ASSEMBLIES***

DRAWN BY: *Author*
DATE ISSUED: *12/23/2015*

SHEET:
***A150***
*CMP/DR SET*


*LRS Architects, Inc. © 2015*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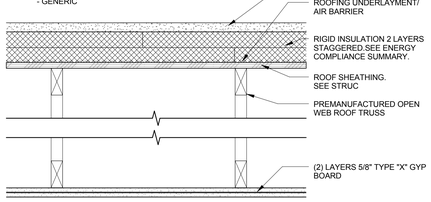
*12/23/2015 1:41:57 PM*

# ROOF-CEILING ASSEMBLY

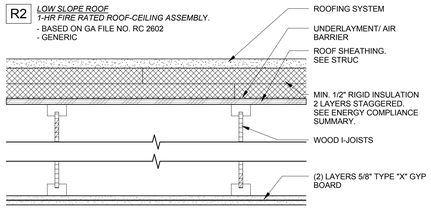
R1 *LOW SLOPE ROOF*
*1-HR FIRE RATED ROOF-CEILING ASSEMBLY.*
- BASED ON GA FILE NO. RC 2602
- GENERIC




**WOOD TRUSSES, GYP WALLBOARD**
Base layer 5/8" TYPE "X" GYP wallboard applied at right angles to wood roof trusses 24" OC with 11/4" Type W or S drywall screws 24" OC Face layer 5/8" TYPE "X" GYP wallboard or GYP veneer base applied at right angles to trusses with 17/8" Type W or S drywall screws 12" OC at joints and intermediate trusses and 11/2" Type G drywall screws 12" OC placed 2" back on either side of end joints. Joints offset 24" from base layer joints. Wood trusses supporting 1/2" wood STRUC panels applied at right angles to trusses with 8d nails. Appropriate roof covering.

Ceiling provides one HR fire resistance protection for trusses.

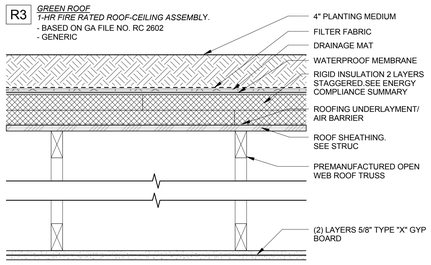
R2 *LOW SLOPE ROOF*
*1-HR FIRE RATED ROOF-CEILING ASSEMBLY.*
- BASED ON GA FILE NO. RC 2602
- GENERIC




**WOOD TRUSSES, GYP WALLBOARD**
Base layer 5/8" TYPE "X" GYP wallboard applied at right angles to wood roof trusses 24" OC with 11/4" Type W or S drywall screws 24" OC Face layer 5/8" TYPE "X" GYP wallboard or GYP veneer base applied at right angles to trusses with 17/8" Type W or S drywall screws 12" OC at joints and intermediate trusses and 11/2" Type G drywall screws 12" OC placed 2" back on either side of end joints. Joints offset 24" from base layer joints. Wood trusses supporting 1/2" wood STRUC panels applied at right angles to trusses with 8d nails. Appropriate roof covering.

Ceiling provides one HR fire resistance protection for trusses.

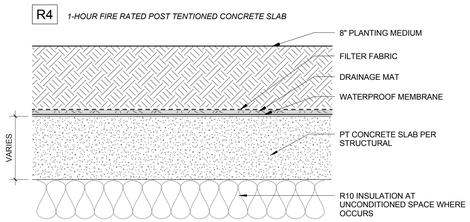
R3 *GREEN ROOF*
*1-HR FIRE RATED ROOF-CEILING ASSEMBLY.*
- BASED ON GA FILE NO. RC 2602
- GENERIC



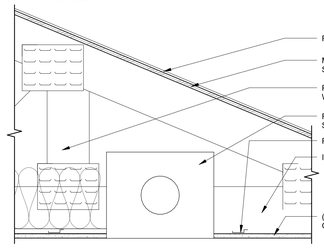

**WOOD TRUSSES, GYP WALLBOARD**
Base layer 5/8" TYPE "X" GYP wallboard applied at right angles to wood roof trusses 24" OC with 11/4" Type W or S drywall screws 24" OC Face layer 5/8" TYPE "X" GYP wallboard or GYP veneer base applied at right angles to trusses with 17/8" Type W or S drywall screws 12" OC at joints and intermediate trusses and 11/2" Type G drywall screws 12" OC placed 2" back on either side of end joints. Joints offset 24" from base layer joints. Wood trusses supporting 1/2" wood STRUC panels applied at right angles to trusses with 8d nails. Appropriate roof covering.

Ceiling provides one HR fire resistance protection for trusses.

R4 *1-HOUR FIRE RATED POST TENTIONED CONCRETE SLAB*

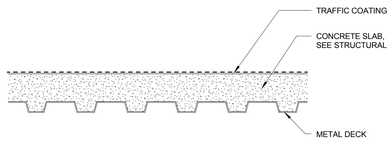



R5 *1-HR FIRE RATED ROOF-CEILING ASSEMBLY*
- BASED ON GA FILE NO. RC 2603, 2604, 2606, 2608, 2609, 26010, 2611
- PROPRIETARY



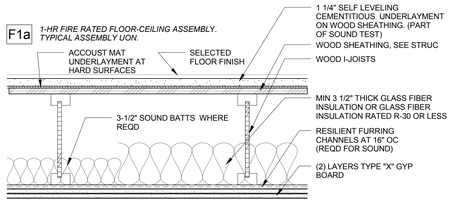

**WOOD ROOF TRUSSES, RESILIENT CHANNELS, GLASS OR MINERAL FIBER INSULATION, CEILING DAMPER, GYP WALLBOARD PER GA FILE NO. RC 2603** *(Other Test Assembly - SIM.)*
One layer 5/8" proprietary TYPE "X" GYP wallboard or GYP veneer base applied at right angles to resilient furring channels 12" OC with 11/8" Type S drywall screws 8" OC
GYP board end joints attached with screws 8" OC to additional pieces of channel 60" long located 3" back on either side of end joint. Resilient channels applied at right angles to bottom chord of pitched wood trusses 24" OC with 11/4" Type S or W screws. Glass fiber or mineral fiber batt or loose fill insulation applied directly over GYP board. Trusses supporting 15/32" plywood or OSB roof sheathing applied at right angles to trusses with construction adhesive and 6d ring shank nails 12" OC Optional ceiling damper (refer to manufacturer for information on the type of damper).

R6 *NON-FIRE RATED CONCRETE SLAB OVER METAL DECK*




# FLOOR-CEILING ASSEMBLY

F1a *1-HR FIRE RATED FLOOR-CEILING ASSEMBLY.*
*TYPICAL ASSEMBLY UON.*




BOISE CASCADE WOOD I - JOISTS -INSTALL PER FIGURE 2 (09/13 to 09/15) - ESR-1336 an acceptable and equivalent to the assembly below.

TRUSS JOIST ASSEMBLY B - ESR-1153 (04/13 to 04/15)

Sheating
*Component Specifications:*
- Single layer of 48/24 span-rated, tongue-and-groove, sheating (Exposure 1).
*Installation:*
- Nailed and glued to the top of the TJI joists.
- Construction adhesive conforming to ASTM D3498 must be applied to the top of the joists prior to placing sheathing
- All butt joints of the sheathing must be located over framing members.

Gypsum Board
*Component specifications:*
- Two layers of 1/2" thick NGC Gold Bond ® Fire-Shield C gypsum board
- Two layers of 1/2" thick USG SHEETROCK ® Brand FIRECODE ® C gypsum panels
- Two layers of 5/8" thick, Type X gypsum board complying with ASTM C36
*Installation:*
- For TJI joists spaced 24" oc or less, attach ceiling to joist bottom flange.
- The first layer of gypsum board must be installed perpendicular to the TJI joists and attached using 1 5/8" long, Type S screws spaced 12" oc. The second layer must be installed with the joints staggered from the first layer.
- The second layer must be fastened to the TJI joists with 2" long. Type Sscrews spaced 12" oc in the field and 8" in-center at the butt joints.
- Type G screws, 1 1/2" long, must spaced 8" oc and 6" from each side of the transverse joints of the second layer. The second layer must be finished with joint tape and compound.

TJI Joist
*Component specifications:*
- TJI joist.
*Installation:*
- Installed in accordance with this report, with a maximum spacing of 24" oc for floor ceiling assemblies.

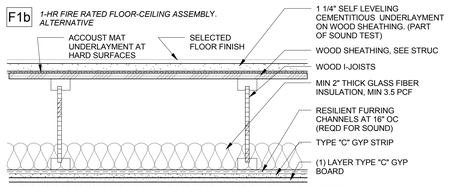
Glass Fiber Insulation
*Component specifications:*
- Maximum 3 1/2" thick glass fiber insulation or glass fiber insulation rated R-30 or less.
*Installation:*
- May be installed in the joist plenum when resilient channels are used.
- The insulation must be placed above the resilient channels between the joists bottom flanges.

Resilient Channels
*Component specifications:*
- RC-1 resilient channels spaced 16" oc (may be increased to 24" oc if the joists are spaced 16" oc).
*Installation:*
- Fasten perpendicular to the TJI joists using 1" long, Type S screws. When resilient channels are used, the first layer of ceiling membrane must be installed perpendicular to the channels and attached to the resilient channels using 1" long, Type S screws spaced 12' oc.
- The second layer must be installed with the joints staggered from the first layer and attached using 1 5/8" long, Type S screws. The screw spacing for the second layer of gypsum board must be a maximum of 12" oc in the field and 8" oc at the butt joints.
- Type G screws, 1 1/2" long, must be spaced 8" oc and 6" from eacg side of the transverse joints of the second layer.
The second layer must be finished with joint tape and compound.

Sound Rating
- STC = 58 Min with 3/4" Min thick floor topping of gypsum concrete
- IIC = 54 with 40 oz/yd carpet pad and 56 oz/yd carpet
- IIC = 54 with Tarkett Acoustiflor or equivalent (provide sound test)

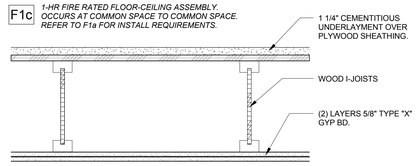
If similar flooring products are not provided install Acoustical mat underlayment.

F1b *1-HR FIRE RATED FLOOR-CEILING ASSEMBLY.*
*ALTERNATIVE*



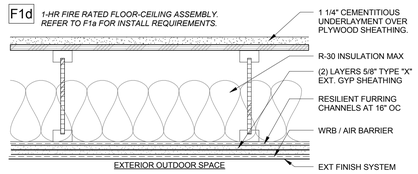

ALTERNATE: BOISE CASCADE WOOD I - JOISTS -INSTALL PER FIGURE 6 (09/13 to 09/15)

F1c *1-HR FIRE RATED FLOOR-CEILING ASSEMBLY.*
*OCCURS AT COMMON SPACE TO COMMON SPACE.*
*REFER TO F1a FOR INSTALL REQUIREMENTS.*



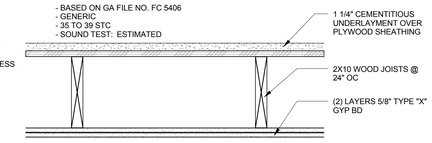

COMMON SPACE

F1d *1-HR FIRE RATED FLOOR-CEILING ASSEMBLY.*
*REFER TO F1a FOR INSTALL REQUIREMENTS.*




EXTERIOR OUTDOOR SPACE

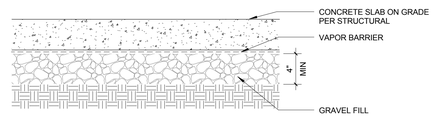
F2 *1-HR FIRE RATED FLOOR-CEILING ASSEMBLY.*
*OCCURS @ COMMON SPACE TO COMMON SPACE.*
- BASED ON GA FILE NO. FC 5406
- GENERIC
- 35 TO 39 STC
- SOUND TEST: ESTIMATED



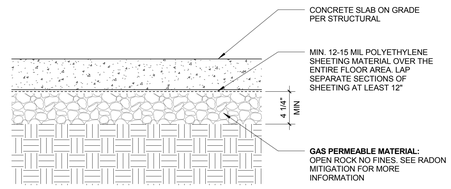

**WOOD JOISTS, GYP WALL BOARD**
Base layer 5/8" TYPE "X" GYP wallboard applied at right angles to 2 x 10 wood joists 24" OC with 11/4" Type W or S drywall screws 24" OC Face layer 5/8" TYPE "X" GYP wallboard or GYP veneer base applied at right angles to joists with 17/8" Type W or S drywall screws 12" OC at joints and intermediate joists and 11/2" Type G drywall screws 12" OC placed 2" back on either side of end joints. Joints offset 24" from base layer joints. Wood joists supporting 1/2" plywood with exterior glue applied at right angles to joists with 8d nails.

Ceiling provides 1 HR fire resistance protection for framing, including trusses.

F4 *SLAB ON GRADE*

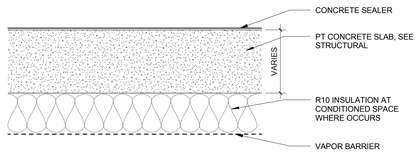



F5 *SLAB ON GRADE @ APARTMENT LIVING SPACE*




- SEE RADON MITIGATION DRAWINGS FOR MORE INFORMATION

F6 *1-HOUR FIRE RATED POST TENTIONED CONCRETE SLAB*




# NOTES

1. TYPE "X" GYP WALL BOARD SPECIFIED THROUGHOUT UNLESS OTHERWISE SPECIFIED. PROVIDE TILE BACKER BOARD ON ALL WALLS WITH TILE.
2. CONFORM TO DETAILED REQUIREMENTS OF DESIGNATED TESTING AUTHORITY NUMBERS AT ALL WALLS. WALLS DESIGNATED AS "BASED ON" VARY AS NOTED IN PARENTHESIS.
3. SEE STRUC SHEAR WALLS SCHEDULE FOR SHEAR WALL ATTACHMENT AND EDGE BLOCKING REQUIREMENTS WHERE APPLICABLE. STRUC SHEAR WALL SCHEDULE OVERRIDES LISTED ASSEMBLY ATTACHMENT AND BLOCKING REQUIREMENTS ONLY WHEN MORE RESTRICTIVE.
4. REFER TO WALL TYPE LEGEND ON CODE ANALYSIS PLANS FOR IBC DESIGNATION OF FIRE RESISTIVE WALLS WITH OPENING PROTECTION (FIRE RESISTIVE RATED DOORS AND GLAZING), DUCTS AND AIR TRANSFER OPENING PROTECTION, AND FIRE STOPPING PENETRATION PROTECTION.SEE DOOR/ WINDOW SCHEDULES, MECHANICAL DRAWINGS, AND PENETRATION DETAILS.
5. WALL TYPES STATED AS "BASED ON" A LISTED ASSEMBLY MIGHT VARY IN STUD SIZE. NO EXACT LISTED ASSEMBLY EXISTS. PER GA-600-2012 P.9 ITEM 16, "GREATER STUD SIZES (DEPTHS) SHALL BE PERMITTED TO BE USED IN METAL- OR WOOD-STUD SYSTEMS." THESE WALLS CAN ALSO BE SHOWN TO MEET THE REQUIRED FIRE RESISTIVE RATING BY THE CALCULATION METHOD PER SECTION 703.3.3 AND SECTION 721 IF REQUESTED.
6. WALL TYPES STATED AS "BASED ON" A LISTED ASSEMBLY MIGHT VARY DUE TO THE ADDITION OF EXTRA LAYER(S) OF ELEMENTS. NO EXACT LISTED ASSEMBLY EXISTS. PER GA-600-2012 P.9 ITEM 22, "ADDITIONAL LAYERS OF TYPE "X" OR REGULAR GYP BOARD SHALL BE PERMITTED TO BE ADDED TO ANY SYSTEM." FASTENERS SPECIFIED FOR THE ATTACHMENT OF GYP BOARD APPLIED OVER THE ADDITIONAL LAYER(S) OF ELEMENTS SHALL BE INCREASED BY NOT LESS THAN THE THICKNESS OF THE ADDITIONAL LAYER(S).
7. SEE SPECIFICATIONS FOR APPLICATION OF FINISH REQUIREMENTS.
8. SEE SHEET A001 FOR ENERGY CODE COMPLIANCE SUMMARY FOR THERMAL VALUES OF INSULATION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Suite 300 503.221.2077
Portland OR 97209 www.lrsarchitects.com


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CONSULTANT:

PROJECT NUMBER: *215047*

Friendsview RETIREMENT COMMUNITY

***University Village***

*1301 Fulton St. Newberg, OR 97132*

SHEET TITLE:
***FLOOR AND CEILING ASSEMBLIES***

DRAWN BY: *CJH*
DATE ISSUED: *12/23/2015*

SHEET:
***A151***
*CMP/DR SET*


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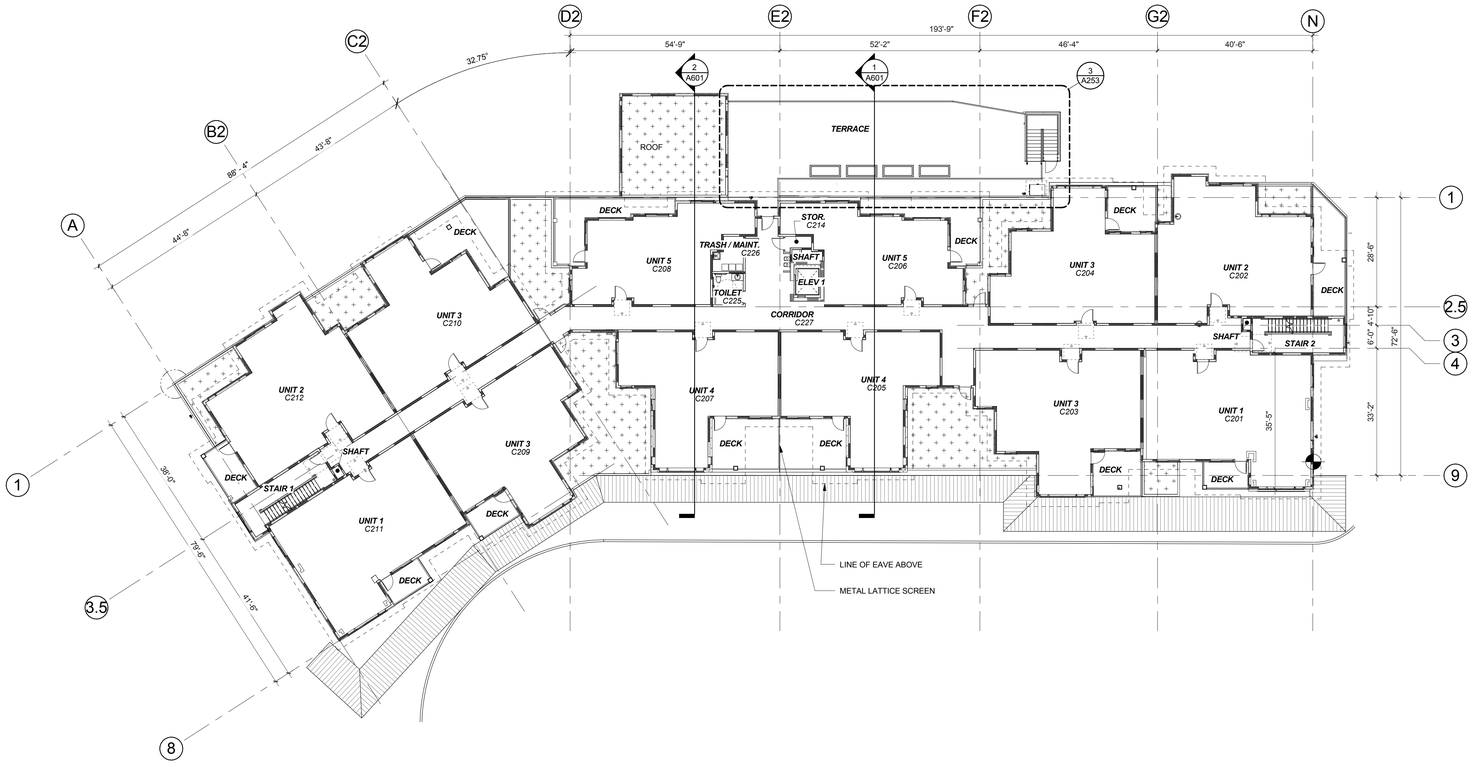
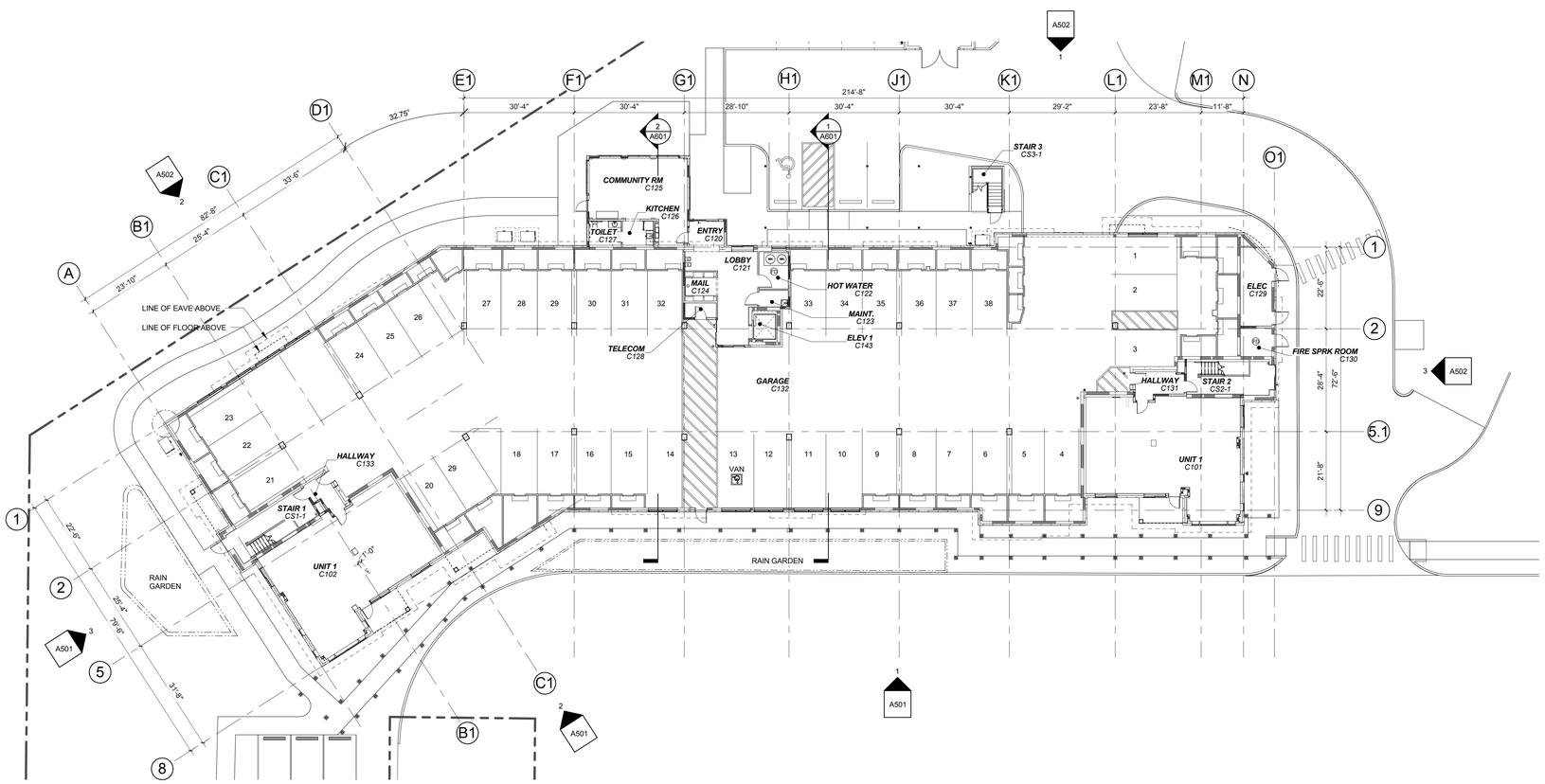
*12/23/2015 2:00:52 PM*




## 1. OVERALL SECOND FLOOR PLAN

SCALE: 1/16" = 1'-0"




## 2. OVERALL FIRST FLOOR PLAN

SCALE: 1/16" = 1'-0"

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## GENERAL NOTES:

A. ALL DIMENSIONS ARE TO FACE OF FRAMING OR CENTER OF WINDOW OPENING, COLUMN OR GRID. EXTERIOR DIMENSIONS ARE TO FACE OF FOUNDATION/ FACE OF FRAMING. DIMENSIONS INDICATED AS "CLEAR MINIMUM" ARE TO FACE OF FINISH.

B. ALL DOOR OPENINGS PERPENDICULAR TO WALL ARE 5" TO THE WALL UON.

C. SEE SHEET A00i FOR STANDARD FIXTURE MOUNTING HEIGHTS AND REQUIREMENTS.

D. SEE A005 FOR WALL TYPES AND ASSEMBLIES

E. SEE A006 FOR PENETRATION REQUIREMENTS

F. SEE A007 FOR RECESSED WALL FIXTURE WRAP DETAILS AND OTHER FIRE RATED ASSEMBLY DETAILS.

G. SEE 1/8" PLANS AND WINDOW SCHEDULE FOR SIZE AND TYPE OF WINDOWS.

I. SEE 1/8" PLANS FOR LOCATIONS OF WALLS WITH WOOD SHEATHING FOR STRUCTURAL SHEAR.

J. SEE 1/8" PLANS FOR ACTUAL ROOM ORIENTATION AND OVERALL DIMENSIONS.

K. FURNITURE NIC SHOWN FOR REFERENCE ONLY

L. DASHED BOXES AND CIRCLES DESIGNATE ACCESSIBLE CLEAR FLOOR AREA SPACES FOR REFERENCE.

M. SEE INTERIOR ELEVATIONS FOR LOCATION OF LOW VOLTAGE AND THERMOSTAT CONTROLS.

N. ELECTRICAL OUTLETS SHOWN FOR COORDINATION. CONTRACTOR SHALL PROVIDE ADDITIONAL OUTLETS TO MEET CODE. SEPARATE OUTLETS ON SHARED UNITS WALLS BY AT LEAST ONE STUD BAY, SEE DETAIL

O. LOCATE CABLE AND ASSOCIATED ELECTRICAL OUTLET WITHIN THE SAME STUD BAY

P. SEE UNIT TYPE 1 ON THIS SHEET FOR TYPICAL CBC ACCESSIBILITY REQUIREMENTS

R. PLACE CLOSET DOORS TO ALLOW EVEN ACCESS TO BOTH SIDES OF CLOSET SPACE, UNO.

## KEYED NOTES:

## WALL TYPES LEGEND

- 2-HOUR FIRE BARRIER WOOD WALL OR COMBINATION WITH A FIRE PARTITION WALL. SEE CODE ANALYSIS PLANS FOR SPECIFIC NAMES OF IBC WALL DESIGNATIONS
- 2-HOUR FIRE BARRIER CONCRETE WALL OR COMBINATION WITH A FIRE PARTITION WALL. SEE CODE ANALYSIS PLANS FOR SPECIFIC NAMES OF IBC WALL DESIGNATIONS
- 1-HOUR FIRE BARRIER WOOD WALL, FIRE PARTITION, OR SMOKE BARRIER WALL: SEE CODE ANALYSIS PLANS FOR SPECIFIC NAMES OF IBC WALL DESIGNATIONS
- 1-HOUR FIRE BARRIER CONCRETE WALL, FIRE PARTITION, OR SMOKE BARRIER WALL: SEE CODE ANALYSIS PLANS FOR SPECIFIC NAMES OF IBC WALL DESIGNATIONS
- NON RATED WALL: SEE WALL TYPES & STRUCTURAL

## FIRE APPARATUS

**SPRINKLER HEADS**

- PENDANT
- PENDANT WITH GUARD
- PENDANT ON DROP
- PENDANT ON DROP WITH GUARD

**FIRE EXTINGUISHERS**

- BRACKET MOUNTED FIRE EXTINGUISHER
- RECESSED MOUNTED FIRE EXTINGUISHER CAB
- SURFACE MOUNTED FIRE EXTINGUISHER CAB

**FIRE DEPARTMENT CONNECTIONS**

- DOUBLE SIAMESE CONNECTION
- TRIPLE SIAMESE CONNECTION
- DOUBLE STANDPIPE CONNECTION
- QUAD STANDPIPE CONNECTION


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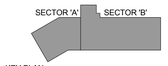
University Village

1301 Fulton
St. Newberg,
OR 97132

SHEET TITLE:
OVERALL FLOOR PLANS




KEY PLAN

KEY SECTION

True North

DRAWN BY: CJH
DATE ISSUED: 12/23/2015

SHEET:
A201
CMP/DR SET

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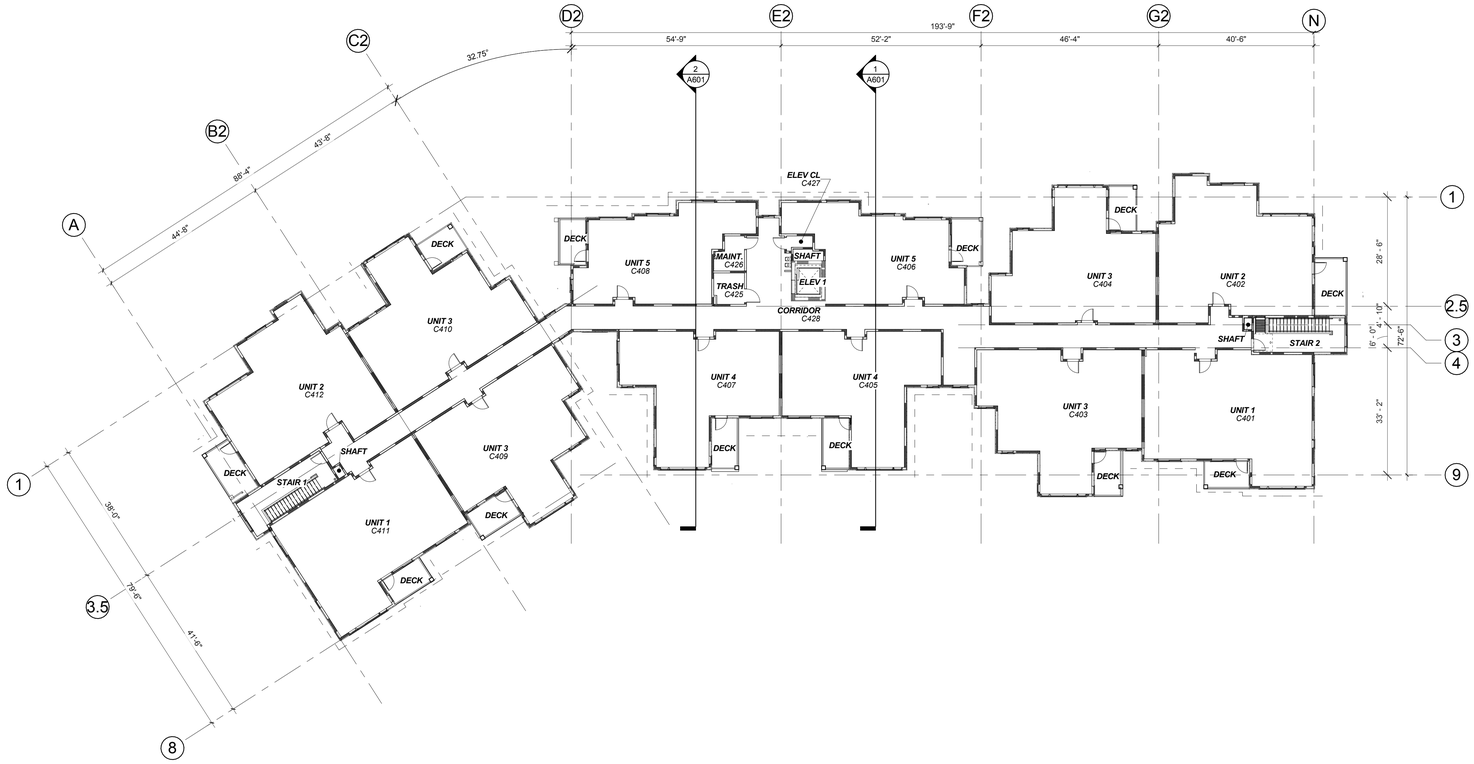
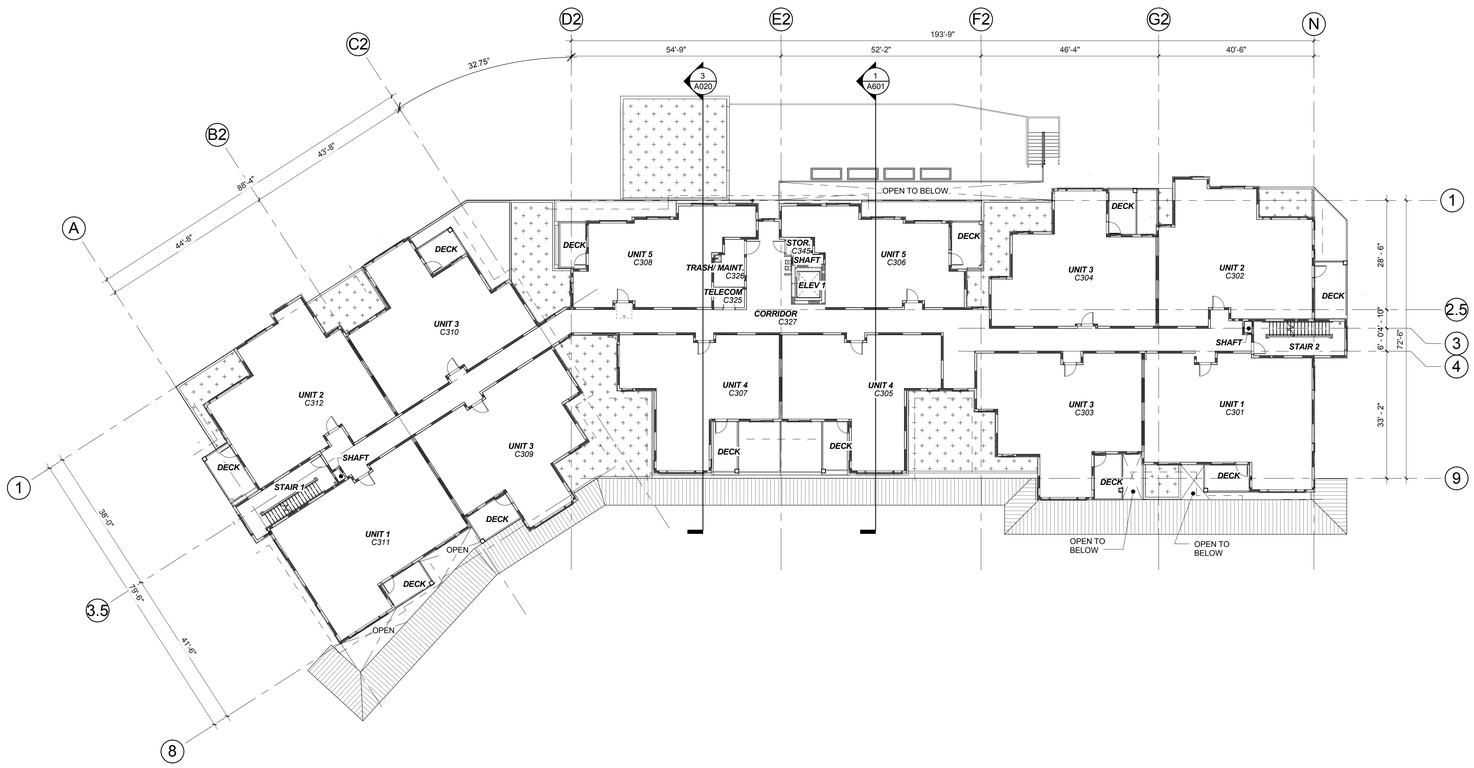



## 1. OVERALL FOURTH FLOOR PLAN

SCALE: 1/16" = 1'-0"




## 2. OVERALL THIRD FLOOR PLAN

SCALE: 1/16" = 1'-0"

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12/23/2015 1:43:42 PM

## GENERAL NOTES:

A. ALL DIMENSIONS ARE TO FACE OF FRAMING OR CENTER OF WINDOW OPENING, COLUMN OR GRID. EXTERIOR DIMENSIONS ARE TO FACE OF FOUNDATION/ FACE OF FRAMING. DIMENSIONS INDICATED AS "CLEAR MINIMUM" ARE TO FACE OF FINISH.

B. ALL DOOR OPENINGS PERPENDICULAR TO WALL ARE 5" TO THE WALL UON.

C. SEE SHEET A00i FOR STANDARD FIXTURE MOUNTING HEIGHTS AND REQUIREMENTS.

D. SEE A005 FOR WALL TYPES AND ASSEMBLIES

E. SEE A006 FOR PENETRATION REQUIREMENTS

F. SEE A007 FOR RECESSED WALL FIXTURE WRAP DETAILS AND OTHER FIRE RATED ASSEMBLY DETAILS.

G. SEE 1/8" PLANS AND WINDOW SCHEDULE FOR SIZE AND TYPE OF WINDOWS.

I. SEE 1/8" PLANS FOR LOCATIONS OF WALLS WITH WOOD SHEATHING FOR STRUCTURAL SHEAR.

J. SEE 1/8" PLANS FOR ACTUAL ROOM ORIENTATION AND OVERALL DIMENSIONS.

K. FURNITURE NIC SHOWN FOR REFERENCE ONLY

L. DASHED BOXES AND CIRCLES DESIGNATE ACCESSIBLE CLEAR FLOOR AREA SPACES FOR REFERENCE.

M. SEE INTERIOR ELEVATIONS FOR LOCATION OF LOW VOLTAGE AND THERMOSTAT CONTROLS.

N. ELECTRICAL OUTLETS SHOWN FOR COORDINATION. CONTRACTOR SHALL PROVIDE ADDITIONAL OUTLETS TO MEET CODE. SEPARATE OUTLETS ON SHARED UNITS WALLS BY AT LEAST ONE STUD BAY, SEE DETAIL

O. LOCATE CABLE AND ASSOCIATED ELECTRICAL OUTLET WITHIN THE SAME STUD BAY

P. SEE UNIT TYPE 1 ON THIS SHEET FOR TYPICAL CBC ACCESSIBILITY REQUIREMENTS

R. PLACE CLOSET DOORS TO ALLOW EVEN ACCESS TO BOTH SIDES OF CLOSET SPACE, UNO.

## WALL TYPES LEGEND

2-HOUR FIRE BARRIER WOOD WALL OR COMBINATION WITH A FIRE PARTITION WALL. SEE CODE ANALYSIS PLANS FOR SPECIFIC NAMES OF IBC WALL DESIGNATIONS

2-HOUR FIRE BARRIER CONCRETE WALL OR COMBINATION WITH A FIRE PARTITION WALL. SEE CODE ANALYSIS PLANS FOR SPECIFIC NAMES OF IBC WALL DESIGNATIONS

1-HOUR FIRE BARRIER WOOD WALL, FIRE PARTITION, OR SMOKE BARRIER WALL. SEE CODE ANALYSIS PLANS FOR SPECIFIC NAMES OF IBC WALL DESIGNATIONS

1-HOUR FIRE BARRIER CONCRETE WALL, FIRE PARTITION, OR SMOKE BARRIER WALL. SEE CODE ANALYSIS PLANS FOR SPECIFIC NAMES OF IBC WALL DESIGNATIONS

NON RATED WALL. SEE WALL TYPES & STRUCTURAL


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Friendsview RETIREMENT COMMUNITY

**University Village**

1301 Fulton
St. Newberg,
OR 97132

SHEET TITLE:

**OVERALL FLOOR PLANS**

SECTOR 'A' SECTOR 'B'

KEY PLAN

4
3
2
1

KEY SECTION

N
True North

DRAWN BY: CJH
DATE ISSUED: 12/23/2015

SHEET:

**A202**

CMP/DR SET

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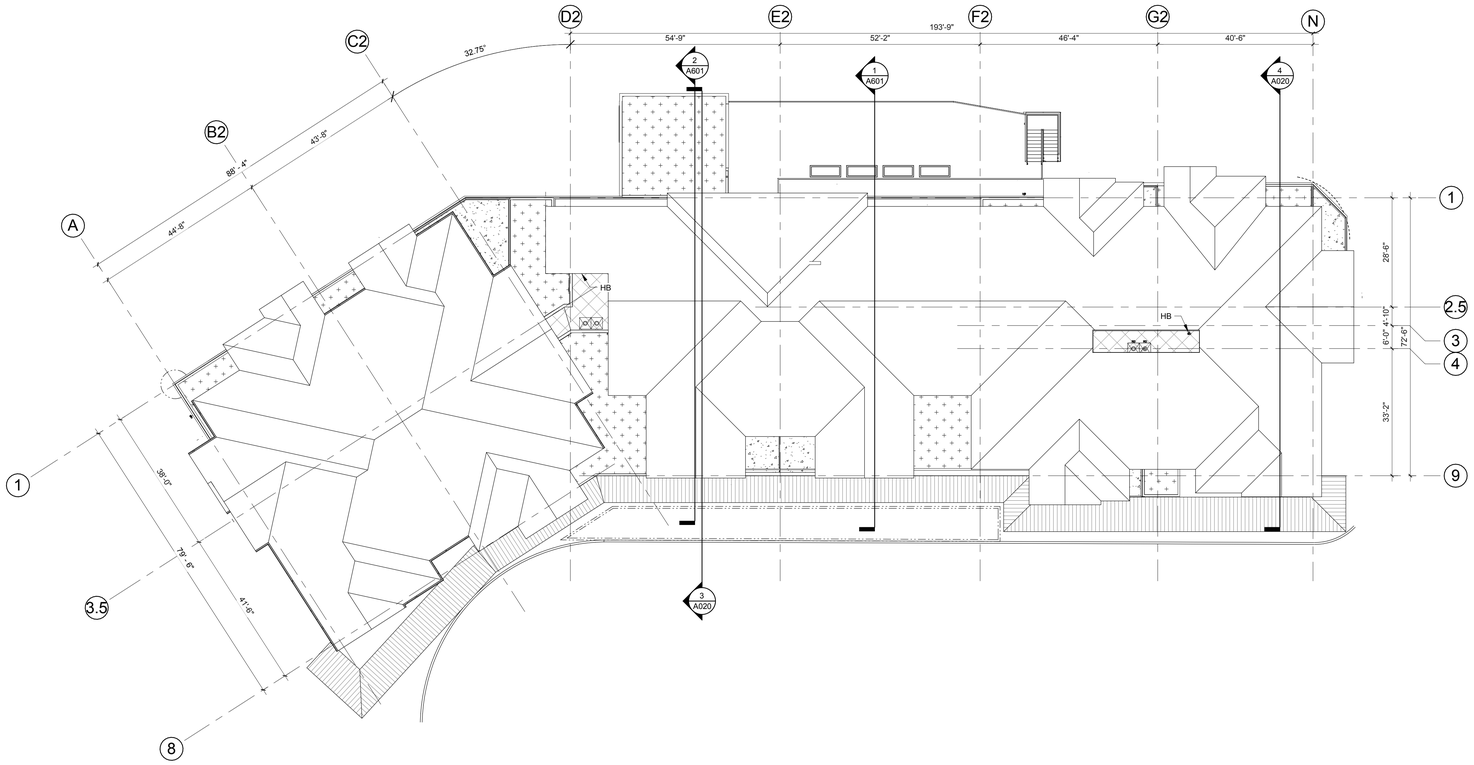
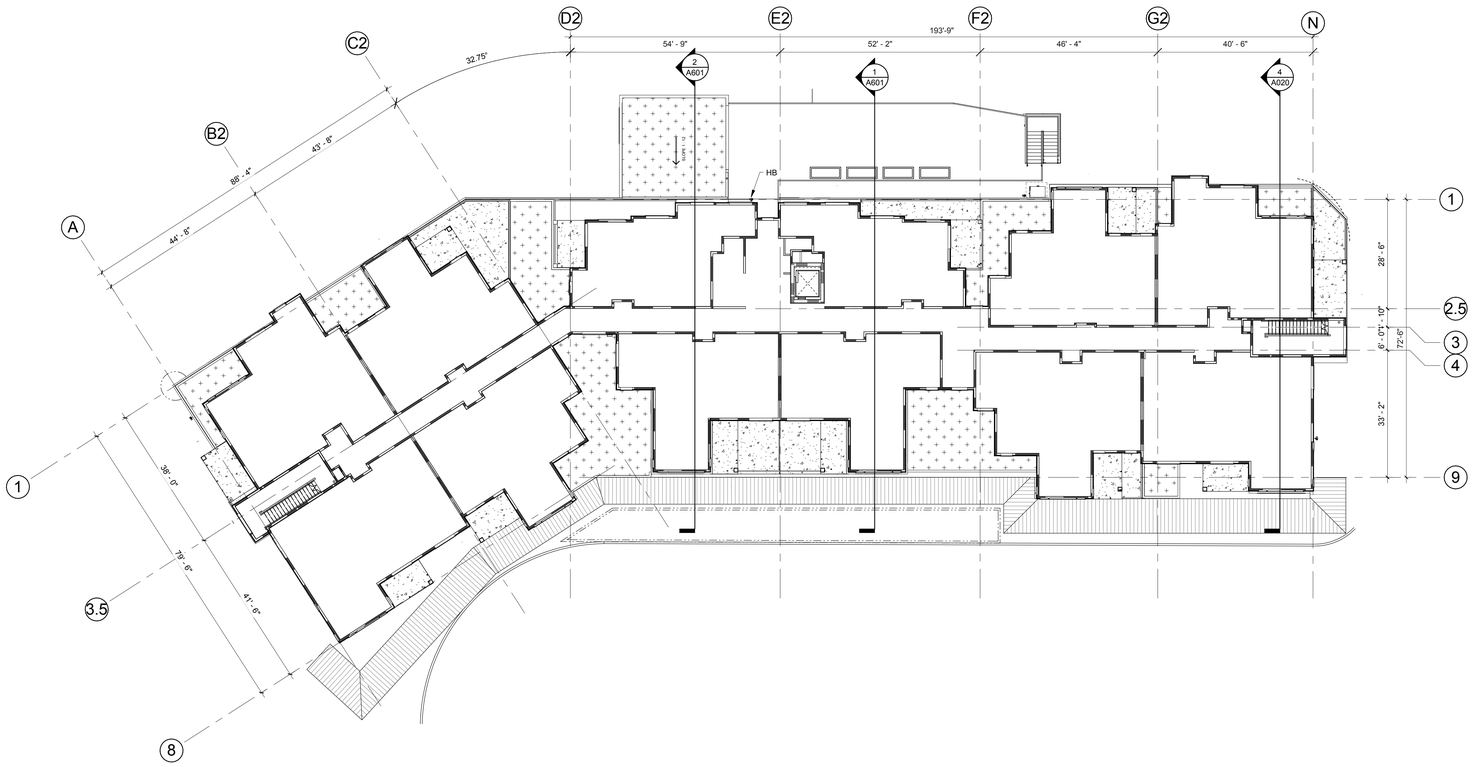



## 1. OVERALL UPPER ROOF PLAN

SCALE: 1/16" = 1'-0"




## 2. OVERALL LOWER ROOF PLAN

SCALE: 1/16" = 1'-0"

## GENERAL NOTES:

1. FOR SPECIFIC SECTOR ROOF PLANS SEE PAGES Axxx, Axxx, Axxx AND Axxx.
2. VERIFY ROOF DRAINS WITH STRUCTURAL AND MECHANICAL.
3. TYPICAL PIPE PENETRATION xx/Axxx
4. ALL SPOT ELEVATIONS ARE TO TOP OF TRUSS U.O.N.
5. HIGH-SLOPE ROOF SLOPES ARE 5:12 U.O.N.
6. LOW-SLOPE ROOF SLOPES ARE 1/4" / 12" U.O.N.
7. OVERHANGS ARE 2'-0" UON
8. SEE Axxx FOR ATTIC VENTILATION REQUIREMENTS
9. PROVIDE NO ROOF SLOPE LESS THAN 1/2" PER FOOT INCLUDING CRICKETS AND VALLEYS.
10. BLOCK ALL ROOF PENETRATIONS LARGER THAN 6" IN ANY DIRECTION. SEE DETAIL xx/Axxx.
11. SEE OVERALL ROOF PLAN SHEET Axxx FOR "SOLAR READY" AREAS

## ROOF PLAN LEGEND

- ASPHALT COMPOSITION SHINGLES
- TPO
- GREEN ROOF ASSEMBLY
- METAL ROOF
- BUILT UP CRICKET
- WALK PAD
- SKYLIGHT
- SINGLE ROOF DRAIN
- ROOF DRAIN AND OVERFLOW
- SCUPPER
- SCUPPER AND DOWNSPOUT
- ROOF ACCES HATCH AND CURB
- ROOF CURB
- PACKAGED MECHANICAL UNIT REFER TO MECHANICAL
- UPBLAST CENTRIFUGAL FAN REFER TO MECHANICAL
- CENTRIFUGAL BLOWER FAN REFER TO MECHANICAL
- SPLIT SYSTEM ROOF TOP UNIT REFER TO FLOOR PLANS FOR INTERIOR WALL MOUNTED UNIT
- SPLIT SYSTEM "MULTI" UNIT REFER TO FLOOR PLANS FOR INTERIOR WALL MOUNTED UNIT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**University Village**

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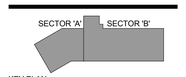
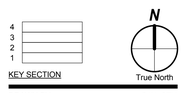
SHEET TITLE:

**OVERALL ROOF PLAN**




KEY PLAN




KEY SECTION

DRAWN BY: CJH, CTH

DATE ISSUED: 12/23/2015

SHEET:

**A301**

CMP/DR SET

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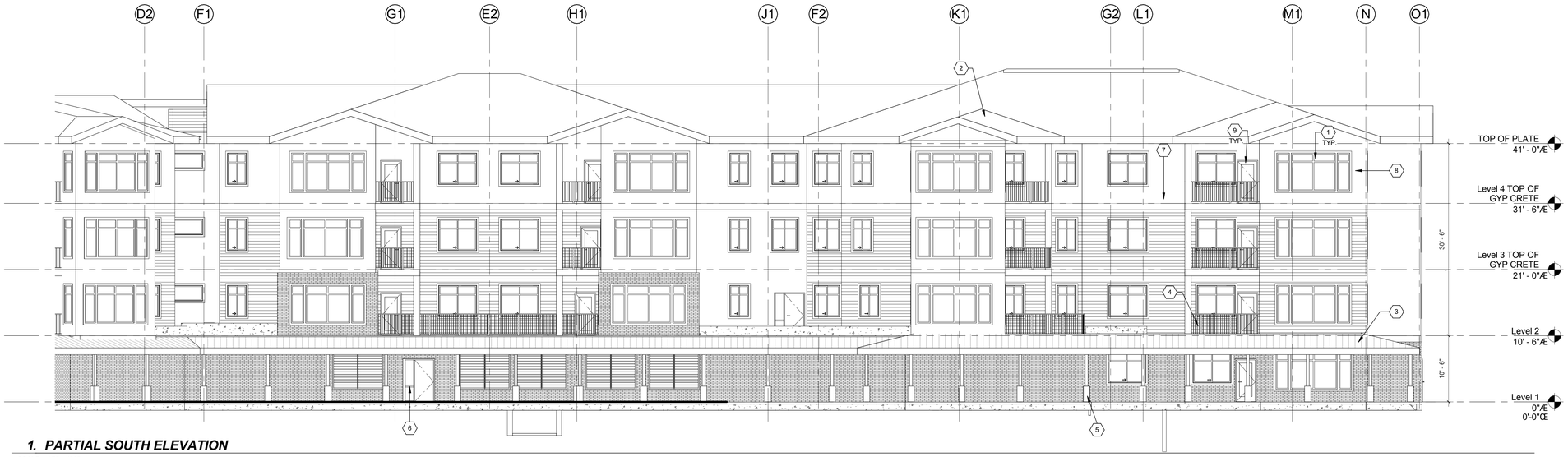
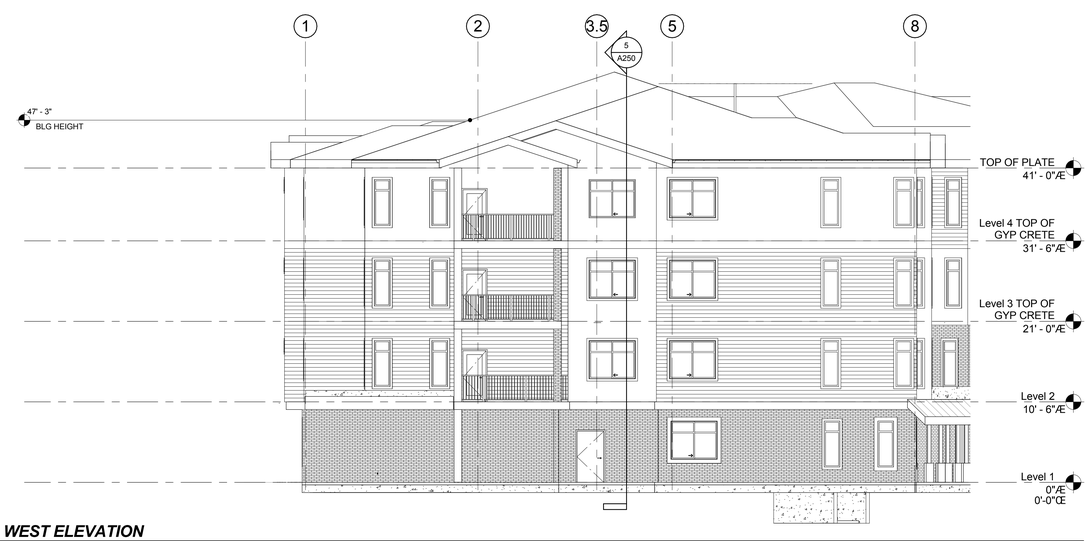



## 1. PARTIAL SOUTH ELEVATION

SCALE: 1/8" = 1'-0"

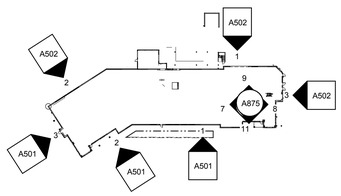
## 2. PARTIAL SOUTH ELEVATION

SCALE: 1/8" = 1'-0"




## 3. WEST ELEVATION

SCALE: 1/8" = 1'-0"




## 4. ELEVATION KEYPLAN

SCALE: Not To Scale

## GENERAL NOTES:

1. PAINT ALL NON-NOTED MISCELLANEOUS ITEMS TO MATCH ADJACENT REFERENCED FINISH COLOR UON
2. SEE WALL SECTIONS FOR PARTIAL ELEVATIONS NOT SHOWN.
3. SEE DOOR & WINDOW SCHEDULES & ELEVATIONS FOR ADDITIONAL INFORMATION.
4. WINDOWS TO ALIGN VERTICALLY, TYPICALLY U.O.N.
5. SEE CIVIL DRAWINGS FOR FOR FINISH FLOOR ELEVATIONS IN RELATION TO SEA LEVEL
6. ALIGN REVEALS WITH WINDOWS, WINDOW MULIONS, U.O.N.
7. COLOR ELEVATIONS AVAILABLE UPON REQUEST
8. EXTERIOR FIXTURE MOUNTING SEE DETAIL x/A9xxx

## KEYNOTE LEGEND:

KEYNOTES SHOWN AS: #

| Key Value | Keynote Text |
|---|---|
| 1 | VINYL CASEMENT WINDOWS, TYP |
| 2 | COMPOSITE SINGLE ROOF |
| 3 | METAL ROOFING AT COVERED WALKWAY |
| 4 | METAL RAILING, COLOR BLACK |
| 5 | BRICK BASE W/ PRECAST STONE CAP, WOOD WRAPPED COLUMN FOR COVERED WALKWAY |
| 6 | ALUMINUM ENTRY DOOR, POWER ASSIST |
| 7 | CEMENTITIOUS BOARD AND BATTEN |
| 8 | CEMENTITIOUS BOARD AND BATTEN |
| 9 | FIBERGLASS DOOR |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Suite 300 503.221.2077
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Friendsview RETIREMENT COMMUNITY

**University Village**

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SHEET TITLE:

**EXTERIOR ELEVATIONS**

DRAWN BY: CJH
DATE ISSUED: 12/23/2015

SHEET:

**A501**

CMP/DR SET

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12/23/2015 1:51:09 PM

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## 1. PARTIAL NORTH ELEVATION

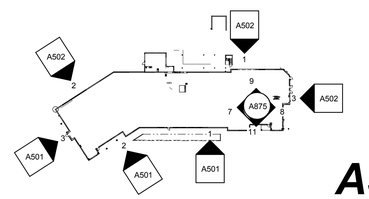
SCALE: 1/8" = 1'-0"

## 2. PARTIAL NORTH ELEVATION

SCALE: 1/8" = 1'-0"

## 3. EAST ELEVATION

SCALE: 1/8" = 1'-0"




## 4. ELEVATION KEYPLAN

SCALE: Not To Scale

## GENERAL NOTES:

1. PAINT ALL NON-NOTED MISCELLANEOUS ITEMS TO MATCH ADJACENT REFERENCED FINISH COLOR UON
2. SEE WALL SECTIONS FOR PARTIAL ELEVATIONS NOT SHOWN.
3. SEE DOOR & WINDOW SCHEDULES & ELEVATIONS FOR ADDITIONAL INFORMATION.
4. WINDOWS TO ALIGN VERTICALLY, TYPICALLY U.O.N.
5. SEE CIVIL DRAWINGS FOR FOR FINISH FLOOR ELEVATIONS IN RELATION TO SEA LEVEL
6. ALIGN REVEALS WITH WINDOWS, WINDOW MULIONS, U.O.N.
7. COLOR ELEVATIONS AVAILABLE UPON REQUEST
8. EXTERIOR FIXTURE MOUNTING SEE DETAIL x/A9xxx

## KEYNOTE LEGEND:

KEYNOTES SHOWN AS: #

| Key Value | Keynote Text |
|---|---|
| 1 | VINYL CASEMENT WINDOWS, TYP |
| 2 | METAL ROOFING AT COVERED WALKWAY |
| 3 | METAL RAILING, COLOR BLACK |
| 4 | |
| 5 | CEMENTITIOUS BOARD AND BATTEN |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Suite 300 503.221.2077
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SHEET TITLE:

**EXTERIOR ELEVATIONS**

DRAWN BY: CJH
DATE ISSUED: 12/23/2015

SHEET:

**A502**

CMP/DR SET

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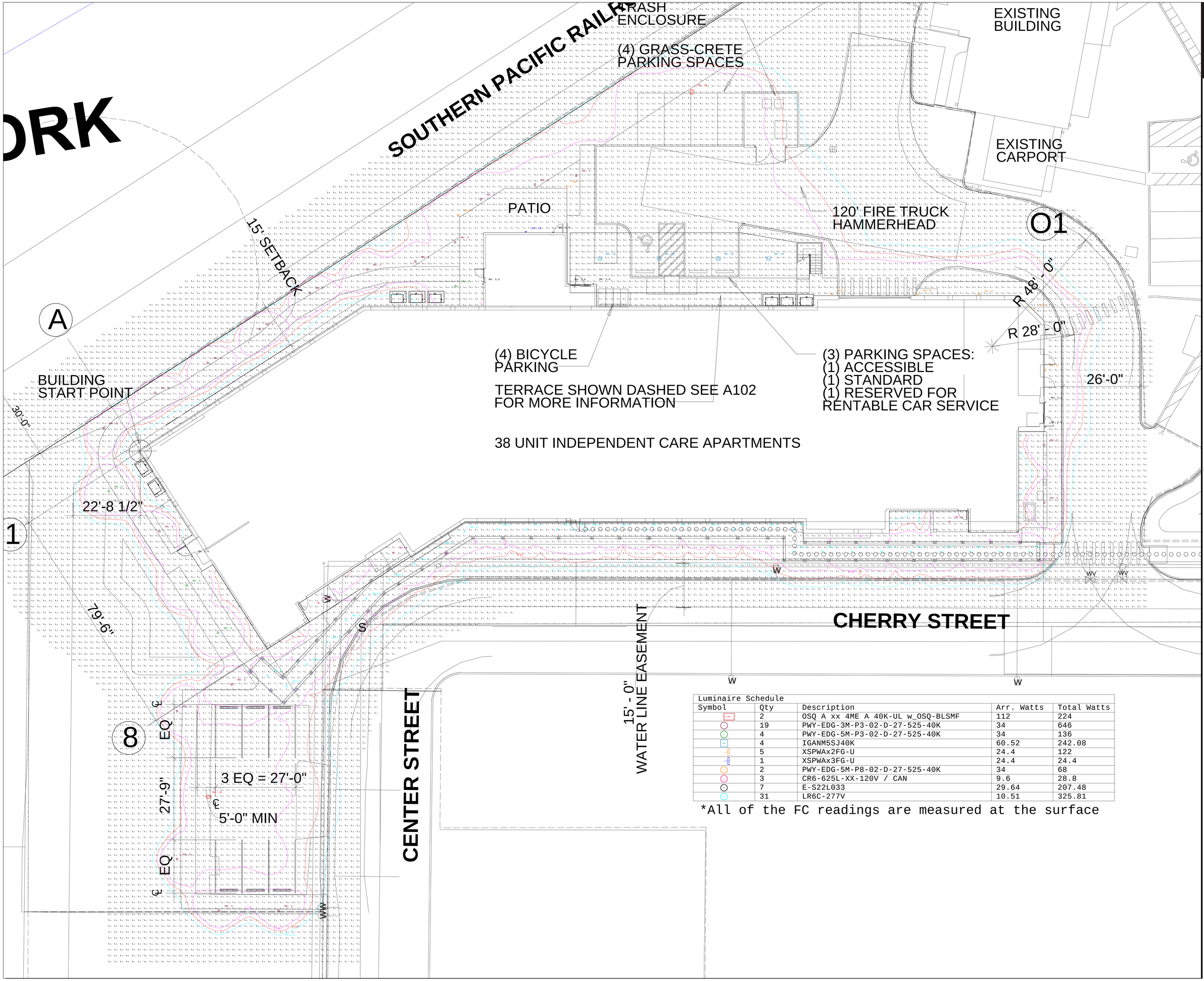



| Luminaire Schedule | | | | |
|---|---|---|---|---|
| Symbol | Qty | Description | Arr. Watts | Total Watts |
| | 2 | OSQ A xx 4ME A 40K-UL w_OSQ-BLSMF | 112 | 224 |
| | 19 | PWY-EDG-3M-P3-02-D-27-525-40K | 34 | 646 |
| | 4 | PWY-EDG-5M-P3-02-D-27-525-40K | 34 | 136 |
| | 4 | IGANM5SJ40K | 60.52 | 242.08 |
| | 5 | XSPWAx2FG-U | 24.4 | 122 |
| | 1 | XSPWAx3FG-U | 24.4 | 24.4 |
| | 2 | PWY-EDG-5M-P8-02-D-27-525-40K | 34 | 68 |
| | 3 | CR6-625L-XX-120V / CAN | 9.6 | 28.8 |
| | 7 | E-S22L033 | 29.64 | 207.48 |
| | 31 | LR6C-277V | 10.51 | 325.81 |

*All of the FC readings are measured at the surface

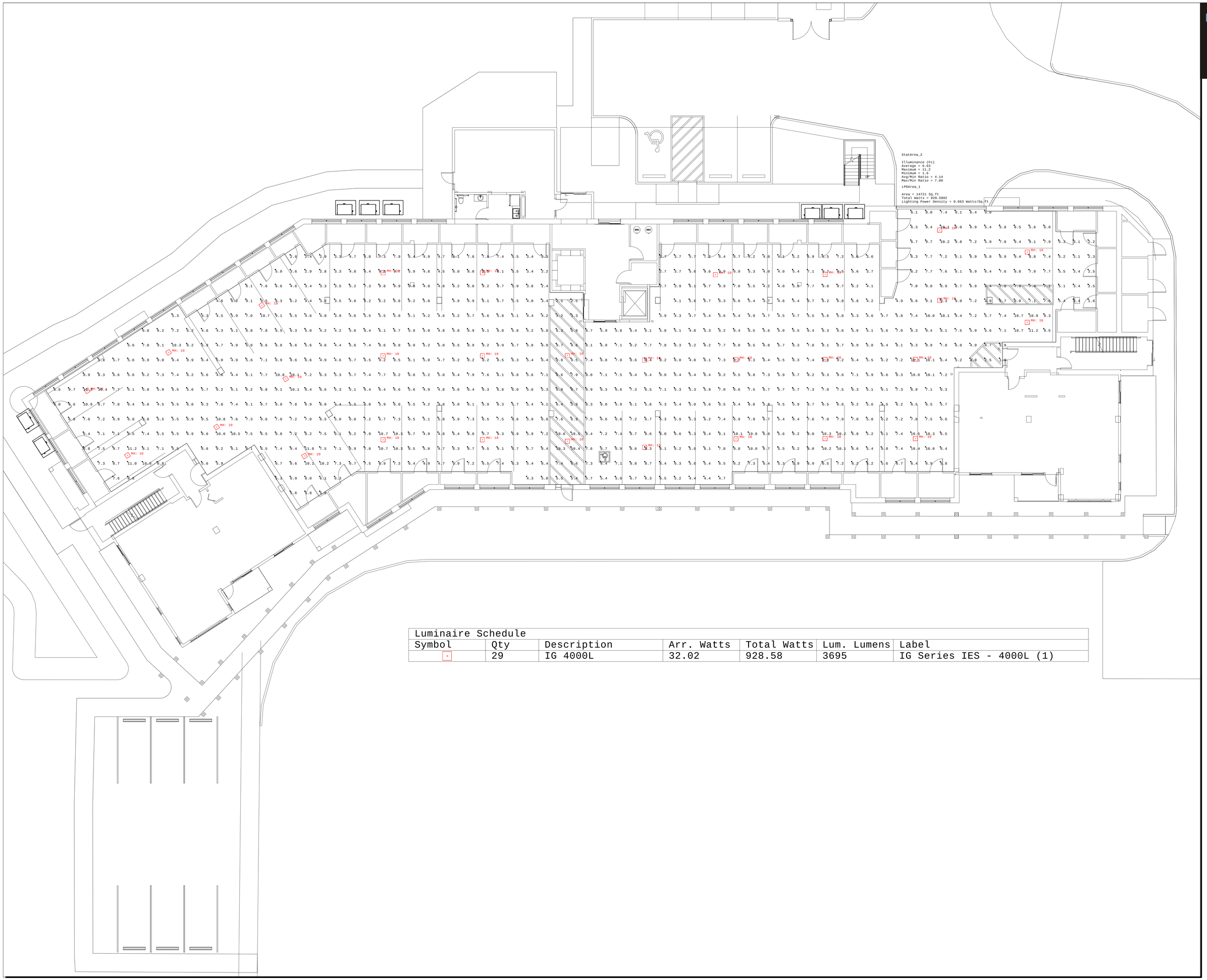
TLP

PHASE I PHOTOMETRIC SITE PLAN

Drawn By:Andrew Kidd
WWW.TLPNW.COM
Date:10/23/2015
Scale:NTS

FRIENDSVIEW PHASE 1

PH 1




| Luminaire Schedule | | | | | | |
|---|---|---|---|---|---|---|
| Symbol | Qty | Description | Arr. Watts | Total Watts | Lum. Lumens | Label |
| | 29 | IG 4000L | 32.02 | 928.58 | 3695 | IG Series IES - 4000L (1) |

TLP

PHASE I PHOTOMETRIC
GARAGE PLAN

Drawn By:Andrew Kidd
WWW.TLPNW.COM
Date:10/22/2015
Scale:NTS

FRIENDSVIEW PHASE 1 P.G.

PH 2

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825 NE Evans Street
McMinnville, OR 97128
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Fax - (866)800-7294

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Title Officer: **Clayton Carter**
(503)376-7363
ctcarter@firstam.com

# LOT BOOK SERVICE

Friendsview Manor
1301 E. Fulton Street
Newberg, OR 97132

Order No.: 1039-2462904
June 08, 2015

Attn: Todd Engle
Phone No.: (503)538-3144
Email: tengle@friendsview.org

Fee: $500.00

We have searched our Tract Indices as to the following described property:

The land referred to in this report is described in Exhibit A attached hereto.

and as of June 1, 2015 at 8:00 a.m.

We find that the last deed of record runs to

Friendsview Manor, as to Parcels 1, 2, 10 & 14

Friendsview Manor Inc. dba Friendsview Retirement Community, as to Parcels 3, 12 & 13

Friendsview Manor dba Friendsview Retirement Community, an Oregon non-profit corporation, as to Parcels 4 & 6

Friendsview Manor Inc. dba Friendsview Retirement Community, an Oregon non-profit 501c3 Charitable Organization, as to Parcel 5

Friendsview Manor, an Oregon Corporation, as to Parcels 7 & 9

Friendsview Manor, an Oregon non-profit corporation, as to Parcels 8 & 11

We find the following apparent encumbrances within ten (10) years prior to the effective date hereof:

1. Easement, including terms and provisions contained therein:
   Recording Information: May 14, 1962 in Volume 22, Page 603
   In Favor of: City of Newberg
   For: Sanitary sewer lines and storm sewer lines
   (Affects Parcel 10)

2. Reservation of utilities in vacated Center Street and the right to maintain the same as set forth in Ordinance No. 2062, a copy of which was recorded August 27, 1981 in Film Volume 163, Page 1407.
   (Affects Parcel 3)

3. Easement, including terms and provisions contained therein:
   Recording Information: January 5, 1999 as Instrument No. 199900136
   In Favor of: City of Newberg
   For: Storm sewer and sanitary sewer lines
   (Affects Parcel 10)

4. Easement, including terms and provisions contained therein:
   Recording Information: January 5, 1999 as Instrument No. 199900137
   In Favor of: City of Newberg
   For: Public sidewalk and underground utilities
   (Affects Parcels 9 and 10)

5. Line of Credit Trust Deed, Assignment, Security Agreement and Fixture Filing, including the terms and provisions thereof, given to secure an indebtedness of up to $23,840,022.00
   Grantor: Friendsview Manor dba Friendsview Retirement Community, an Oregon nonprofit corporate corporation
   Beneficiary: U.S. Bank National Association, a national banking association
   Trustee: First American Title Insurance Company of Oregon
   Dated: October 01, 2007
   Recorded: October 23, 2007
   Recording Information: Instrument No. 200723075, Deed and Mortgage Records
   (Affects Parcels 1, 9, 10, 11, 14 and Additional Property)

   A Notice of Continuation of said Financing Statement was recorded August 9, 2012 as Instrument No. 2012-11174.

6. Mortgage and the terms and conditions thereof.
   Mortgagor: Friendsview Manor dba Friendsview Retirement Community
   Mortgagee: Friends Church Extension Fund
   Amount: $500,000.00
   Recorded: November 25, 2009
   Recording Information: Instrument No. 200918439, Deed and Mortgage Records
   (Affects Parcels 2, 5 & 8)

7. Mortgage and the terms and conditions thereof.

| | |
|---|---|
| Mortgagor: | Friendsview Manor dba Friendsview Retirement Communtiy |
| Mortgagee: | Friends Church Extension Fund |
| Amount: | $1,000,000.00 |
| Recorded: | July 23, 2010 |
| Recording Information: | Instrument No. 2010009935, Deed and Mortgage Records |

(Affects Parcels 2, 4, 5, 7, 8, 13 and Additional Property)

| | |
|---|---|
| And Re-Recorded: | July 30, 2010 |
| Recording Information: | Instrument No. 201010340, Deed and Mortgage Records |

8. Mortgage and the terms and conditions thereof.

| | |
|---|---|
| Mortgagor: | Friendsview Manor dba Friendsview Retirement Communtiy |
| Mortgagee: | Friends Church Extension Fund |
| Amount: | $1,000,000.00 |
| Recorded: | February 15, 2011 |
| Recording Information: | Instrument No. 201102258, Deed and Mortgage Records |

(Affects Parcel 6)

We have also searched our General Index for Judgments and State and Federal Liens against the Grantee(s) named above and find: NONE

We find the following unpaid taxes and city liens: NONE

NOTE: Taxes for the year 2014-2015 PAID IN FULL

| | |
|---|---|
| Tax Amount: | $10,167.27 |
| Map No.: | R3217CB 00500 |
| Property ID: | 35232 |
| Tax Code No.: | 29.0 |

(Affects Parcel 1)

Situs Address as disclosed on Yamhill County Tax Roll:

1013 Cherry Street, Newberg, OR, 97132 (Parcel 1)

NOTE: Taxes for the year 2014-2015 PAID IN FULL

| | |
|---|---|
| Tax Amount: | $2,294.53 |
| Map No.: | R3217CB 00600 |
| Property ID: | 35250 |
| Tax Code No.: | 29.0 |

(Affects Parcel 2)

Situs Address as disclosed on Yamhill County Tax Roll:

1007 Cherry Street, Newberg, OR, 97132 (Parcel 2)

NOTE: Taxes for the year 2014-2015 PAID IN FULL
Tax Amount: $2,386.21
Map No.: R3217CB 00700
Property ID: 35269
Tax Code No.: 29.0
(Affects Parcel 3)

Situs Address as disclosed on Yamhill County Tax Roll:

1003 Cherry Street, Newberg, OR, 97132 (Parcel 3)

NOTE: Taxes for the year 2014-2015 PAID IN FULL
Tax Amount: $1,646.54
Map No.: R3217CB 00800
Property ID: 35287
Tax Code No.: 29.0
(Affects Parcel 4)

Situs Address as disclosed on Yamhill County Tax Roll:

815 N Center Street, Newberg, OR, 97132 (Parcel 4)

NOTE: Taxes for the year 2014-2015 PAID IN FULL
Tax Amount: $5,045.21
Map No.: R3217CB 00900
Property ID: 35296
Tax Code No.: 29.0
(Affects Parcel 5)

Situs Address as disclosed on Yamhill County Tax Roll:

805 N Center Street, Newberg, OR, 97132 (Parcel 5)

NOTE: Taxes for the year 2014-2015 PAID IN FULL
Tax Amount: $2,053.11
Map No.: R3217CB 01001
Property ID: 35321
Tax Code No.: 29.0
(Affects Parcel 6)

Situs Address as disclosed on Yamhill County Tax Roll:

803 N Center Street, Newberg, OR, 97132 (Parcel 6)

NOTE: Taxes for the year 2014-2015 PAID IN FULL
Tax Amount: $2,721.76
Map No.: R3217CB 01700
Property ID: 35429
Tax Code No.: 29.0
(Affects Parcel 7)

Situs Address as disclosed on Yamhill County Tax Roll:

1006 Cherry Street, Newberg, OR, 97132 (Parcel 7)

NOTE: Taxes for the year 2014-2015 PAID IN FULL
Tax Amount: $2,706.82
Map No.: R3217CB 01800
Property ID: 35438
Tax Code No.: 29.0
(Affects Parcel 8)

Situs Address as disclosed on Yamhill County Tax Roll:

1012 Cherry Street, Newberg, OR, 97132 (Parcel 8)

NOTE: Taxes for the year 2014-2015 PAID IN FULL
Tax Amount: $1,841.87
Map No.: R3217CB 01900
Property ID: 35456
Tax Code No.: 29.0
(Affects Parcel 9)

Situs Address as disclosed on Yamhill County Tax Roll:

1014 Cherry Street, Newberg, OR, 97132 (Parcel 9)

NOTE: Taxes for the year 2014-2015 PAID IN FULL
Tax Amount: $4,176.85
Map No.: R3217CB 02000
Property ID: 35474
Tax Code No.: 29.0
(Affects Parcel 10)

Situs Address as disclosed on Yamhill County Tax Roll:

1100 Cherry Street, Newberg, OR, 97132 (Parcel 10)

NOTE: Taxes for the year 2014-2015 PAID IN FULL
Tax Amount: $1,165.91
Map No.: R3217CB 02200
Property ID: 35553
Tax Code No.: 29.0
(Affects Parcel 11)

Situs Address as disclosed on Yamhill County Tax Roll:

1105 Fulton Street, Newberg, OR, 97132 (Parcel 11)

NOTE: Taxes for the year 2014-2015 PAID IN FULL
Tax Amount: $2,515.85
Map No.: R3217CB 02300
Property ID: 35571
Tax Code No.: 29.0
(Affects Parcel 12)

Situs Address as disclosed on Yamhill County Tax Roll:

1101 Fulton Street, Newberg, OR, 97132 (Parcel 12)

NOTE: Taxes for the year 2014-2015 PAID IN FULL
Tax Amount: $2,740.26
Map No.: R3217CB 02400
Property ID: 35599
Tax Code No.: 29.0
(Affects Parcel 13)

Situs Address as disclosed on Yamhill County Tax Roll:

1011 Fulton Street, Newberg, OR, 97132 (Parcel 13)

NOTE: Taxes for the year 2014-2015 PAID IN FULL
Tax Amount: $1,674.68
Map No.: R3217CB 02500
Property ID: 35606
Tax Code No.: 29.0
(Affects Parcel 14)

Situs Address as disclosed on Yamhill County Tax Roll:

1007 Fulton Street, Newberg, OR, 97132 (Parcel 14)

THIS IS NOT a title report since no examination has been made of the title to the above described property. Our search for apparent encumbrances was limited to our Tract Indices, and therefore above listings do not include additional matters which might have been disclosed by an examination of the

record title. We assume no liability in connection with this Lot Book Service and will not be responsible for errors or omissions therein. The charge for this service will not include supplemental reports, rechecks or other services.

## Exhibit "A"

Real property in the County of Yamhill, State of Oregon, described as follows:

PARCEL 1:

A part of the Daniel D. Deskins Donation Land Claim No. 54 in Section 17, Township 3 South, Range 2 West of the Willamette Meridian in Yamhill County, Oregon, described as follows:

Beginning at a point 245 feet North and 140 feet East of the intersection of the East line of East Street with the North line of Fulton Street in the City of Newberg; thence East 100 feet; thence North parallel to the West line of Hazel Dell to the Southerly boundary of the Southern Pacific Railroad Right of Way; thence South 57º08' West along the Southerly line of said right of way to the most Northerly corner of a tract conveyed by John Illig to Edward H. Benford by deed recorded September 27, 1884 in Book 90, Page 625, Deed Records; thence South 205.34 feet to the place of beginning.

Tax Lot No.: 3217CB-500

PARCEL 2:

Tract A

Being a part of the Donation Land Claim of Daniel D. Deskins, Claim No. 54, Notification No. 1475 in Section 17, Township 3 South, Range 2 West of the Willamette Meridian in Yamhill County, Oregon, and more particularly described as follows:

Commencing at a point on the East line of Center Street, 245 feet North of the North line of Fulton Street as platted and dedicated by Christine Clemenson and J.C. Clemenson, her husband, in the City of Newberg, Yamhill County, Oregon, and running thence East 90 feet to a point which marked the beginning point of the tract herein conveyed; thence North to the Southern Pacific Railroad right of way along a line parallel with and 90 feet East of the East line of Center Street; thence in a Northeasterly direction along said right of way to a point in the East line of a tract of land conveyed by John Illig to Emily Binford and Edward M. Binford, by deed dated June 30, 1924, recorded September 27, 1924, in Book 90, Page 625, Deed Records of Yamhill County, Oregon; thence South about 210 feet to the Southeast corner of the latter described tract; thence West 50 feet to the place of beginning.

Tract B

Being a part of the Donation Land Claim of Daniel D. Deskins, Claim No. 54, Notification No. 1475 in Section 17, Township 3 South, Range 2 West of the Willamette Meridian in Yamhill County, Oregon, and more particularly described as follows:

Commencing at a point on the East line of North Center Street (formerly East Street) 245 feet North of the North line of Fulton Street as platted and dedicated by Christine Clemenson and J.C. Clemenson, her husband, in the City of Newberg, Yamhill County, Oregon, and running thence East 82 feet to the true place of beginning; thence East 8 feet; thence North parallel with the East line of said North Center Street to the South line of the Southern Pacific Railroad right of way; thence Southwesterly along the South line of said right of way to a point directly North of the true point of beginning; thence South parallel with the East line of said North Center Street to the true place of beginning.

Tax Lot No.: 3217CB-600

PARCEL 3:

Tract A

Being a part of the Donation Land Claim of Daniel D. Deekins, Claim No. 54, Notification No. 1475, in Township 3 South, Range 2 West of the Willamette Meridian, in Yamhill County, Oregon, and more particularly described as follows:

Commencing at a Point on the East line of North Center Street (formerly East Street) 245 feet North of the North line of Fulton Street as platted and dedicated by Christine Clemenson and J.C. Clemenson, her husband, in the City of Newberg, Yamhill County, Oregon; and running thence East 82 feet; thence North parallel with the East line of North Center Street (formerly East Street) to the South line of the Southern Pacific Railroad right of way; thence Southwesterly along the South line of said right of way to the East line of North Center Street (formerly East Street); thence South along the East line of North Center Street (formerly East Street); 120 feet, more or less, to the place of beginning.

Together with that portion of the vacated Center Street inuring thereto by Vacation Ordinance No. 2062 recorded on August 27, 1981 in Film Volume 163, Page 1407, Yamhill County Records.

Tract B

The West 1/2 of that certain vacated street as per Vacation Ordinance No. 2062 dated August 3, 1981, City of Newberg, Yamhill County, Oregon, and as recorded August 27, 1981 in Film Volume 163, Page 1407-1408, Deed Records of Yamhill County, Oregon.

Tax Lot No.: 3217CB-700

PARCEL 4:

Being a part of the Daniel D. Deskins Donation Land Claim and particularly described as follows:

Beginning on the West line of East Street and 100 feet North of the North line of Fulton Street in the City of Newberg, Yamhill County, Oregon; and running thence West 100 feet; thence North to the South line of Southern Pacific Railroad right of way; thence Easterly along said railroad right of way to the West line of said East Street; thence South along the West line of said East Street to the place of beginning.

EXCEPTING THEREFROM the South 103 feet as conveyed to Leander A. Crockett et ux by deed recorded February 24, 1951, in Book 160, Page 678, Deed Records.

Tax Lot No.: 3217CB-800

PARCEL 5:

Being a part of the Daniel D. Deskins Donation Land Claim and more particularly described as follows:

The North 75 feet of the following described tract of land, to wit:

Beginning at a point on the West line of East Street, now North Center Street, and 100 feet North of the North line of Fulton Street, in the City of Newberg, Yamhill County, Oregon; and running thence West

100 feet; thence North 103 feet; thence East 100 feet to the West line of said East Street; thence South along the West line of said East Street to the place of beginning.

Tax Lot No.: 3217CB-900

PARCEL 6:

Beginning at a point on the West line of East Street (now North Center Street) in Section 17, Township 3 South, Range 2 West in the City of Newberg, Yamhill County, Oregon, said point being 128 feet North of the North line of Fulton Street, said point also being the Southeast corner of that certain tract of land conveyed to Ivan L Adams, et ux, by deed recorded July 2, 1976 in Film Volume 113, Page 419, Deed and Mortgage Records; thence West along the South line of said Adams tract 100 feet; thence South 50 feet; thence East 100 feet to the West line of said North Center Street; thence North 50 feet to the place of beginning.

Tax Lot No.: 3217CB-1001

PARCEL 7:

Beginning at a point on the South line of Cherry Street in the City of Newberg, in Yamhill County, Oregon, said point being South 00°34′ West 20 feet and North 89°59 East 175 feet from the intersection of the centerlines of Cherry and Center Streets in said City of Newberg; thence South 00°34′ West 105 feet; thence South 89°59 West 65 feet; thence North 00°34′ East 105 feet; thence North 89°59′ East 65 feet to the place of beginning.

Tax Lot No.: 3217CB-1700

PARCEL 8:

Beginning at a point on the South line of Cherry Street in the City of Newberg in Yamhill County, Oregon, said point being South 00°34' West 20 feet and North 89°59' East 175 feet from the intersection of the center line of Cherry and Center Streets in said City of Newberg; thence North 89°59' East along the South line of Cherry Street, 65 feet; thence South 00°34' West 105 feet; thence South 89°59' West 65 feet; thence North 00°34' East 105 feet to the place of beginning.

Tax Lot No.: 3217CB-1800

PARCEL 9:

Beginning at a point on the South line of Cherry Street in the City of Newberg, in Yamhill County, Oregon, said point being South 00º34' West 20 feet and North 89º59' East 240 feet from the intersection of the center lines of Cherry and Center Streets in said City of Newberg; thence South 00º34' West 105 feet; thence North 89º59' East 70 feet; thence North 00º34' East 105 feet; thence South 89º59' West 70 feet to the place of beginning.

EXCEPTING THEREFROM the East 5 feet.

Tax Lot No.: 3217CB-1900

PARCEL 10:

Tract A

Beginning at point 290 feet East of the intersection of the South line of Cherry Street with the East line of East Street (now North Center Street) in the City of Newberg, Yamhill County, Oregon; thence East along the South line of Cherry Street and the same extended a distance of 73 feet, more or less, to the Northeast corner of that certain tract conveyed to Frank L. Hill and Belva E. Hill by deed recorded in Book 143, Page 246, Deed Records; thence South along the East line of the Hill tract, 105 feet to the Southeast corner thereof; thence West 72 feet, more or less, to the Southwest corner of that certain tract conveyed to Frank and Belva E. Hill by deed recorded in Book 108, Page 232, Deed Records; thence North along the West line of the Hill tract, 105 feet to the place of beginning.

Tract B

Beginning at a point on the South line of Cherry Street in the City of Newberg, in Yamhill County, Oregon, said point being South 0º34' West 20 feet and North 89º59' East 310 feet from the intersection of the center lines of Cherry Street and Center Street in said City of Newberg; thence South 00º34' West 105 feet; thence South 89º59' West 5 feet; thence North 00º34' East 105 feet; thence North 89º59' East 5 feet to the place of beginning.

Tax Lot No.: 3217CB-2000

PARCEL 11:

A part of the Daniel D. Deskins Donation Land Claim No. 54 in Township 3 South, Range 2 West of the Willamette Meridian in Yamhill County, Oregon, described as follows:

Beginning at a point on the North line of Fulton Street, 282 feet East of the East line of East Street in Newberg, Yamhill County, Oregon; thence East 66 feet along the North line of Fulton Street; thence North 100 feet; thence West 66 feet; thence South 100 feet to the place of beginning.

Tax Lot No.: 3217CB-2200

PARCEL 12:

Part of the Daniel D. Deskins Donation Land Claim No. 54 in Township 3 South, Range 2 West of the Willamette Meridian in Yamhill County, Oregon, described as follows:

Beginning at a point on the North line of Fulton Street 200 feet East of the East line of East Street in Newberg; thence East 82 feet; thence North 100 feet; thence West 82 feet; thence South 100 feet to the place of beginning.

Tax Lot No.: 3217CB-2300

PARCEL 13:

A tract of land located in Section 17, Township 3 South, Range 2 West of the Willamette Meridian in Yamhill County, Oregon, described as follows:

Beginning at a point on the North line of Fulton Street and 136 feet East of the East line of Center Street; thence North 100 feet; thence East 64 feet; thence South 100 feet; thence West 64 feet to the point of beginning.

Tax Lot No.: 3217CB-2400

PARCEL 14:

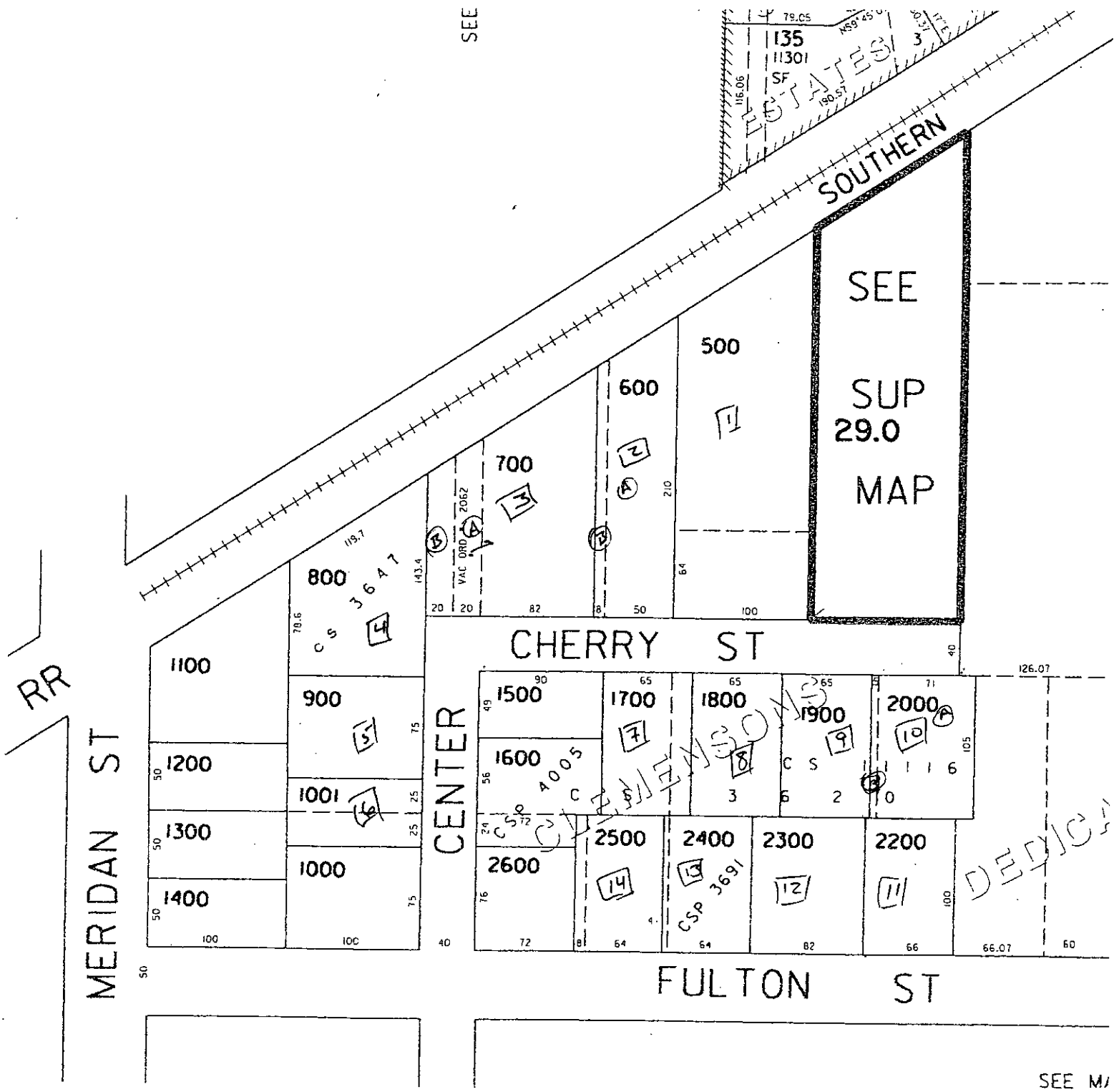
A tract of land located in Section 17, Township 3 South, Range 2 West of the Willamette Meridian in Yamhill County, Oregon, described as follows:

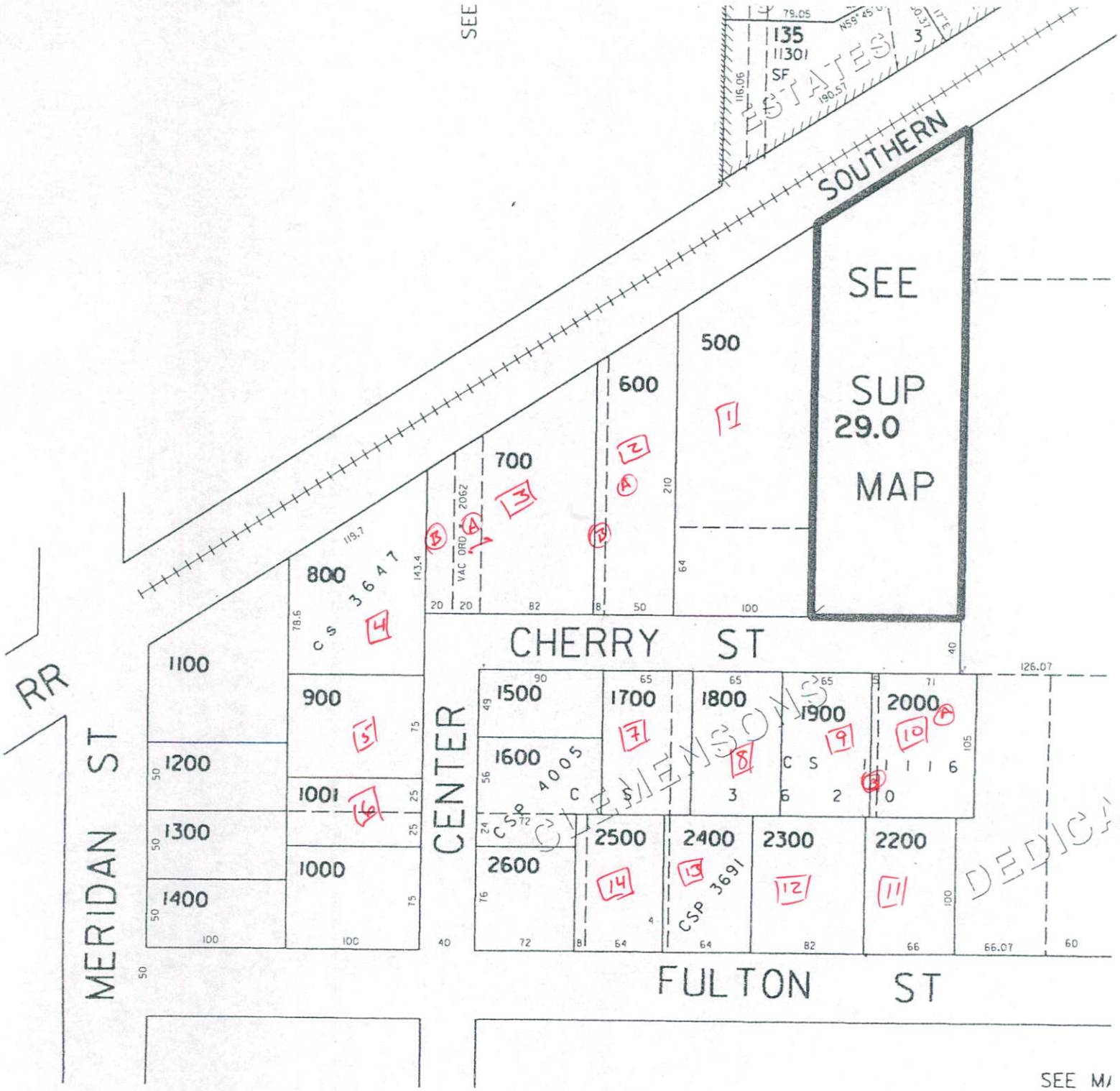
Beginning at a point on the North line of Fulton Street and 72 feet East of the East line of Center Street; thence North 100 feet; thence East 64 feet; thence South 100 feet; thence West 64 feet to the point of beginning.

Tax Lot No.: 3217CB-2500

First American

This map is furnished for illustration and to assist in property location. The company assumes no liability for any variation in dimensions by location ascertainable by actual survey

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First American

***First American Title Company of Oregon***
825 NE Evans Street
McMinnville, OR 97128
Phn - (503)376-7363
Fax - (866)800-7294

Order No.: 1032-2480698
July 17, 2015

**FOR QUESTIONS REGARDING YOUR CLOSING, PLEASE CONTACT:**
**CAROL BECHTOLD,** Escrow Officer/Closer
Phone: (503)538-7361 - Fax: (866)800-7290 - Email:cbechtold@firstam.com
First American Title Company of Oregon
515 E Hancock, Newberg, OR 97132

**FOR ALL QUESTIONS REGARDING THIS PRELIMINARY REPORT, PLEASE CONTACT:**
**Clayton Carter**, Title Officer
Phone: (503)376-7363 - Fax: (866)800-7294 - Email: ctcarter@firstam.com

# Preliminary Title Report

**County Tax Roll Situs Address:** 814 N. Center Street, Newberg, OR 97132

**Proposed Insured Lender:**

| | | | | | |
|---|---|---|---|---|---|
| 2006 ALTA Owners Standard Coverage | Liability $ | 430,000.00 | Premium $ | 1,216.00 | |
| 2006 ALTA Owners Extended Coverage | Liability $ | | Premium $ | | |
| 2006 ALTA Lenders Standard Coverage | Liability $ | | Premium $ | | |
| 2006 ALTA Lenders Extended Coverage | Liability $ | | Premium $ | | |
| Endorsement | | | Premium $ | | |
| Govt Service Charge | | | Cost $ | 20.00 | |
| Other | | | Cost $ | | |

We are prepared to issue Title Insurance Policy or Policies of First American Title Insurance Company, a Nebraska Corporation in the form and amount shown above, insuring title to the following described land:

The land referred to in this report is described in Exhibit A attached hereto.

and as of June 17, 2015 at 8:00 a.m., title to the fee simple estate is vested in:

Friendsview Manor, an Oregon religious corporation

Subject to the exceptions, exclusions, and stipulations which are ordinarily part of such Policy form and the following:

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.

This report is for the exclusive use of the parties herein shown and is preliminary to the issuance of a title insurance policy and shall become void unless a policy is issued, and the full premium paid.

2. 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, 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 subject 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.

**The exceptions to coverage 1-5 inclusive as set forth above will remain on any subsequently issued Standard Coverage Title Insurance Policy.**

**In order to remove these exceptions to coverage in the issuance of an Extended Coverage Policy the following items are required to be furnished to the Company; additional exceptions to coverage may be added upon review of such information:**

A. Survey or alternative acceptable to the company
B. Affidavit regarding possession
C. Proof that there is no new construction or remodeling of any improvement located on the premises. In the event of new construction or remodeling the following is required:
   i. Satisfactory evidence that no construction liens will be filed; or
   ii. Adequate security to protect against actual or potential construction liens;
   iii. Payment of additional premiums as required by the Industry Rate Filing approved by the Insurance Division of the State of Oregon

6. Water rights, claims to water or title to water, whether or not such rights are a matter of public record.

7. Taxes for the fiscal year 2015-2016 a lien due, but not yet payable.

8. The rights of the public in and to that portion of the premises herein described lying within the limits of streets, roads and highways.

9. Deed of Trust and the terms and conditions thereof.

| | |
|---|---|
| Grantor/Trustor: | Jeffrey Lee Northcutt and Joann Northcutt, as tenants by entirety |
| Grantee/Beneficiary: | Rivermark Community Credit Union |
| Trustee: | Ticor Title Company |
| Amount: | $147,200.00 |
| Recorded: | December 22, 2010 |
| Recording Information: | Instrument No. 201017831, Deed and Mortgage Records |

10. Deed of Trust and the terms and conditions thereof.

| | |
|---|---|
| Grantor/Trustor: | Joann Northcutt, as to an undivided one-half interest and Jeffrey Lee Northcutt, as to an undivided one-half interest , wife and husband |
| Grantee/Beneficiary: | Discover Bank |
| Trustee: | David A. Kubat, BAR# OSBA84265 |
| Amount: | $20,000.00 |
| Recorded: | February 4, 2015 |
| Recording Information: | Instrument No. 201501444, Deed and Mortgage Records |

- END OF EXCEPTIONS -

NOTE: According to the public record, the following deed(s) affecting the property herein described have been recorded within 24 months of the effective date of this report: Quit Claim Deed recorded February 4, 2015 as Instrument No. 201501443, Deed and Mortgage Records, Jeffrey Lee Northcutt and Joann Northcutt, also known of record as Jo Ann Northcutt to Jeffrey Lee Northcutt and Joann Northcutt.

NOTE: We find no matters of public record against Friendsview Manor that will take priority over any trust deed, mortgage or other security instrument given to purchase the subject real property as established by ORS 18.165.

NOTE: Taxes for the year 2014-2015 PAID IN FULL

| | |
|---|---|
| Tax Amount: | $2,118.83 |
| Map No.: | R3217CB-01500 |
| Property ID: | 35394 |
| Tax Code No.: | 29.0 |

Situs Address as disclosed on Yamhill County Tax Roll:

814 N. Center Street, Newberg, OR 97132

**THANK YOU FOR CHOOSING FIRST AMERICAN TITLE!**
**WE KNOW YOU HAVE A CHOICE!**

**RECORDING INFORMATION**

Filing Address: **Yamhill County**
535 NE Fifth Street
McMinnville, OR 97128

Recording Fees: $ **41.00** for the first page
$ **5.00** for each additional page

cc: Friendsview Manor, an Oregon religious corporation
cc: Jeffrey L. Northcutt and Joann Northcutt
cc: Rick Talbott, More Realty, Inc.
14945 SW Sequoia Parkway, Suite 150, Portland, OR 97224

***First American Title Insurance Company***

## SCHEDULE OF EXCLUSIONS FROM COVERAGE

### ALTA LOAN POLICY (06/17/06)

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:

1. (a) Any law, ordinance, permit, or governmental regulation (including those relating to building and zoning) restricting, regulating, prohibiting, or relating to
   (i) the occupancy, use, or enjoyment of the Land;
   (ii) the character, dimensions, or location of any improvement erected on the Land;
   (iii) the subdivision of land; or
   (iv) 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.
2. Rights of eminent domain. This Exclusion does not modify or limit the coverage provided under Covered Risk 7 or 8.
3. Defects, liens, encumbrances, adverse claims, or other matters
   (a) created, suffered, assumed, or agreed to by the Insured Claimant;
   (b) 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;
   (c) resulting in no loss or damage to the Insured Claimant;
   (d) 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
   (e) resulting in loss or damage that would not have been sustained if the Insured Claimant had paid value for the Insured Mortgage.
4. Unenforceability of the lien of the Insured Mortgage because of the inability or failure of an Insured to comply with applicable doing-business laws of the state where the Land is situated.
5. 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.
6. 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) a fraudulent conveyance or fraudulent transfer, or
   (b) a preferential transfer for any reason not stated in Covered Risk 13(b) of this policy.
7. 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).

### ALTA OWNER'S POLICY (06/17/06)

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:

1. (a) Any law, ordinance, permit, or governmental regulation (including those relating to building and zoning) restricting, regulating, prohibiting, or relating to
   (i) the occupancy, use, or enjoyment of the Land;
   (ii) the character, dimensions, or location of any improvement erected on the Land;
   (iii) the subdivision of land; or
   (iv) 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.
2. Rights of eminent domain. This Exclusion does not modify or limit the coverage provided under Covered Risk 7 or 8.
3. Defects, liens, encumbrances, adverse claims, or other matters
   (a) created, suffered, assumed, or agreed to by the Insured Claimant;
   (b) 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;
   (c) resulting in no loss or damage to the Insured Claimant;
   (d) attaching or created subsequent to Date of Policy (however, this does not modify or limit the coverage provided under Covered Risks 9 and 10); or
   (e) resulting in loss or damage that would not have been sustained if the Insured Claimant had paid value for the Title.
4. Any claim, by reason of the operation of federal bankruptcy, state insolvency, or similar creditors' rights laws, that the transaction vesting the Title as shown in Schedule A, is
   (a) a fraudulent conveyance or fraudulent transfer; or
   (b) a preferential transfer for any reason not stated in Covered Risk 9 of this policy.
5. 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.

## SCHEDULE OF STANDARD 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. 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, 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 subject 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.

NOTE: A SPECIMEN COPY OF THE POLICY FORM (OR FORMS) WILL BE FURNISHED UPON REQUEST

TI 149 Rev. 7-22-08

*First American Title*

**Privacy Information**

**We Are Committed to Safeguarding Customer Information**

In order to better serve your needs now and in the future, we may ask you to provide us with certain information. We understand that you may be concerned about what we will do with such information - particularly any personal or financial information. We agree that you have a right to know how we will utilize the personal information you provide to us. Therefore, together with our subsidiaries we have adopted this Privacy Policy to govern the use and handling of your personal information.

**Applicability**

This Privacy Policy governs our use of the information that you provide to us. It does not govern the manner in which we may use information we have obtained from any other source, such as information obtained from a public record or from another person or entity. First American has also adopted broader guidelines that govern our use of personal information regardless of its source. First American calls these guidelines its Fair Information Values.

**Types of Information**

Depending upon which of our services you are utilizing, the types of nonpublic personal information that we may collect include:

- Information we receive from you on applications, forms and in other communications to us, whether in writing, in person, by telephone or any other means;
- Information about your transactions with us, our affiliated companies, or others; and
- Information we receive from a consumer reporting agency.

**Use of Information**

We request information from you for our own legitimate business purposes and not for the benefit of any nonaffiliated party. Therefore, we will not release your information to nonaffiliated parties except: (1) as necessary for us to provide the product or service you have requested of us; or (2) as permitted by law. We may, however, store such information indefinitely, including the period after which any customer relationship has ceased. Such information may be used for any internal purpose, such as quality control efforts or customer analysis. We may also provide all of the types of nonpublic personal information listed above to one or more of our affiliated companies. Such affiliated companies include financial service providers, such as title insurers, property and casualty insurers, and trust and investment advisory companies, or companies involved in real estate services, such as appraisal companies, home warranty companies and escrow companies. Furthermore, we may also provide all the information we collect, as described above, to companies that perform marketing services on our behalf, on behalf of our affiliated companies or to other financial institutions with whom we or our affiliated companies have joint marketing agreements.

**Former Customers**

Even if you are no longer our customer, our Privacy Policy will continue to apply to you.

**Confidentiality and Security**

We will use our best efforts to ensure that no unauthorized parties have access to any of your information. We restrict access to nonpublic personal information about you to those individuals and entities who need to know that information to provide products or services to you. We will use our best efforts to train and oversee our employees and agents to ensure that your information will be handled responsibly and in accordance with this Privacy Policy and First American's Fair Information Values. We currently maintain physical, electronic, and procedural safeguards that comply with federal regulations to guard your nonpublic personal information.

**Information Obtained Through Our Web Site**

First American Financial Corporation is sensitive to privacy issues on the Internet. We believe it is important you know how we treat the information about you we receive on the Internet.

In general, you can visit First American or its affiliates' Web sites on the World Wide Web without telling us who you are or revealing any information about yourself. Our Web servers collect the domain names, not the e-mail addresses, of visitors. This information is aggregated to measure the number of visits, average time spent on the site, pages viewed and similar information. First American uses this information to measure the use of our site and to develop ideas to improve the content of our site.

There are times, however, when we may need information from you, such as your name and email address. When information is needed, we will use our best efforts to let you know at the time of collection how we will use the personal information. Usually, the personal information we collect is used only by us to respond to your inquiry, process an order or allow you to access specific account/profile information. If you choose to share any personal information with us, we will only use it in accordance with the policies outlined above.

**Business Relationships**

First American Financial Corporation's site and its affiliates' sites may contain links to other Web sites. While we try to link only to sites that share our high standards and respect for privacy, we are not responsible for the content or the privacy practices employed by other sites.

**Cookies**

Some of First American's Web sites may make use of "cookie" technology to measure site activity and to customize information to your personal tastes. A cookie is an element of data that a Web site can send to your browser, which may then store the cookie on your hard drive.

FirstAm.com uses stored cookies. The goal of this technology is to better serve you when visiting our site, save you time when you are here and to provide you with a more meaningful and productive Web site experience.

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**Fair Information Values**

**Fairness** We consider consumer expectations about their privacy in all our businesses. We only offer products and services that assure a favorable balance between consumer benefits and consumer privacy.

**Public Record** We believe that an open public record creates significant value for society, enhances consumer choice and creates consumer opportunity. We actively support an open public record and emphasize its importance and contribution to our economy.

**Use** We believe we should behave responsibly when we use information about a consumer in our business. We will obey the laws governing the collection, use and dissemination of data.

**Accuracy** We will take reasonable steps to help assure the accuracy of the data we collect, use and disseminate. Where possible, we will take reasonable steps to correct inaccurate information. When, as with the public record, we cannot correct inaccurate information, we will take all reasonable steps to assist consumers in identifying the source of the erroneous data so that the consumer can secure the required corrections.

**Education** We endeavor to educate the users of our products and services, our employees and others in our industry about the importance of consumer privacy. We will instruct our employees on our fair information values and on the responsible collection and use of data. We will encourage others in our industry to collect and use information in a responsible manner.

**Security** We will maintain appropriate facilities and systems to protect against unauthorized access to and corruption of the data we maintain.

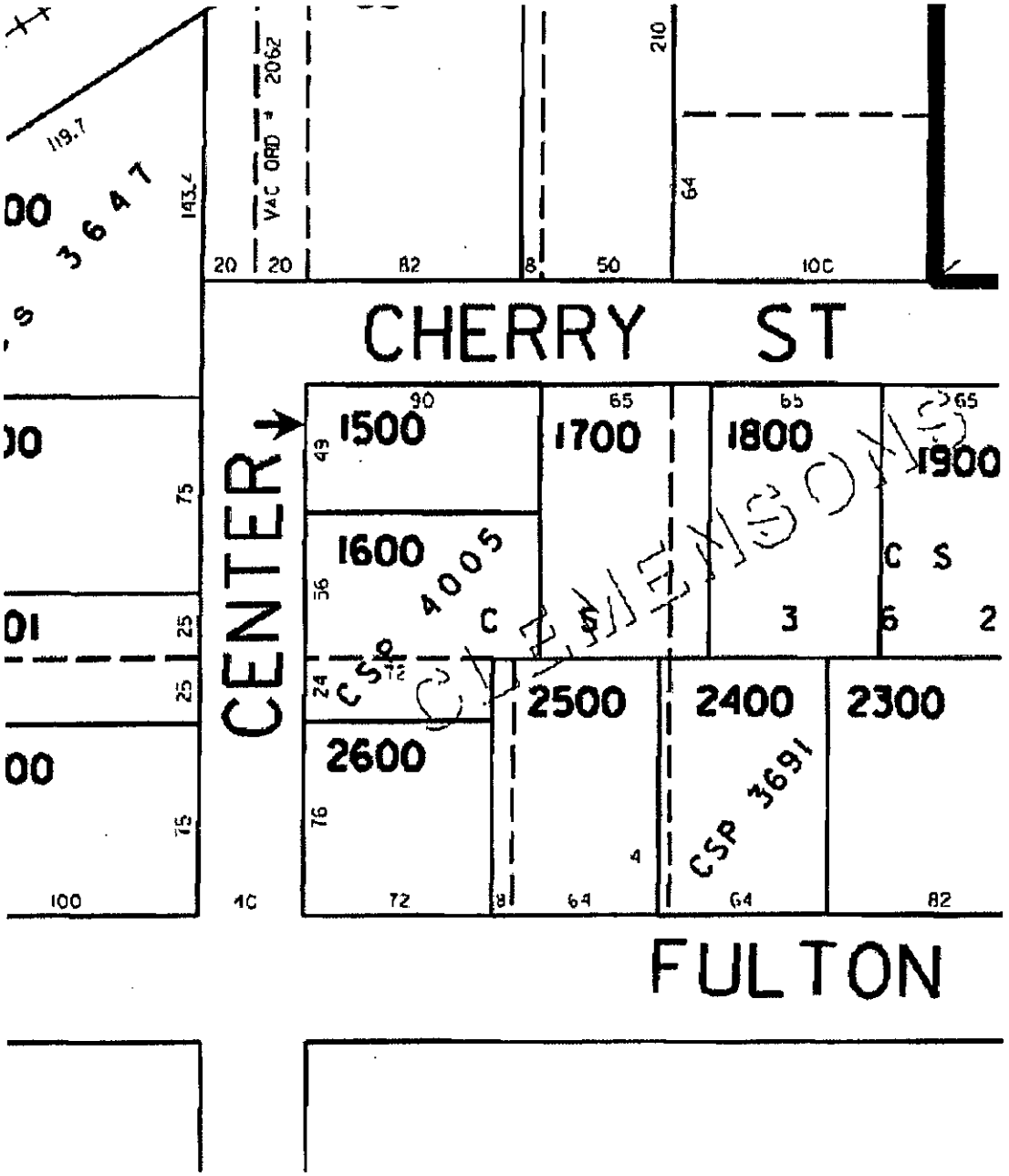
## Exhibit "A"

Real property in the County of Yamhill, State of Oregon, described as follows:

Beginning at a point 1069.45 feet South and 1769.57 feet West from the Northeast corner of the Daniel D. Deskins Donation Land Claim No. 54 in Township 3 South, Range 2 West of the Willamette Meridian in Yamhill County, Oregon, said beginning point also being North 00°34' East 181.0 feet from the center of Fulton Street in the City of Newberg; thence North 00°34' East 49.0 feet to an iron pipe; thence North 89°59' East 90 feet to an iron pipe; thence South 00°34' West 49.0 feet to an iron pipe; thence South 89°59' West 90.0 feet to an iron pipe at the point of beginning.

First American

This map is furnished for illustration and to assist in property location. The company assumes no liability for any variation in dimensions by location ascertainable by actual survey



City of Newberg

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 DECISION
# PROPERTY LINE CONSOLIDATION PLC-15-002

September 11, 2015

Dean Masukawa
LRS Architects
720 NW Davis, Suite 300
Portland, OR 97214

The Newberg Community Development Director has approved the proposed property consolidation PLC-15-002 of lots along the north side of Cherry Street (as described in North Lot Exhibit A and shown in North Lot Exhibit B) and along the south side of Cherry Street (as described in South Lot Exhibit A and shown in South Lot Exhibit B), subject to the following conditions:

1. Modify the deed restriction document so that there are two documents:
   a. A deed restriction document for the North Lot consolidation (as described in North Lot Exhibit A and shown in North Lot Exhibit B, attached).
   b. A deed restriction document for the South Lot consolidation (as described in South Lot Exhibit A and shown in South Lot Exhibit B, attached).

2. Record the two deed restriction documents with the Yamhill County Recorder, incorporating the legal description and map exhibits.

3. Submit copies of the recorded deed restrictions to the Newberg Community Development Department, attn.: Steve Olson.

This approval is valid for one year from the date of this decision. If the property consolidation is not recorded by that time, this approval will be void.

If you have any questions; please contact me at 503-537-1215 or steve.olson@newbergoregon.gov.

Sincerely,

Steve Olson, Associate Planner

AKS ENGINEERING & FORESTRY, LLC
12965 SW Herman Road, Suite 100, Tualatin, OR 97062
P: (503) 563-6151 F: (503) 563-6152
AKS Job No. 3199
ENGINEERING & FORESTRY
OFFICES IN: TUALATIN, OR - VANCOUVER, WA - SALEM, OR

# EXHIBIT A

## North Lot Consolidation Tract

A tract of land located in the Southwest One-Quarter of Section 17, Township 3 South, Range 2 West, Willamette Meridian, City of Newberg, Yamhill County, Oregon as shown on the attached Exhibit "B" and being described as follows:

COMMENCING at the northwest intersection of Fulton Street, a 50-foot right of way street, and Center Street, a 40-foot right-of-Way street; thence along the west Right-of-Way line of said Center Street North 02°24'50" East 128.14 feet to the southeast corner of tract conveyed to Friendsview Manor by deed recorded October 15, 2010 under Instrument No. 2010-14412 and the **Point of Beginning of the Herein-Described North Consolidation Tract;**

Thence along the south line of said October 15, 2010 Friendsview Manor Tract North 88°10'50" West 100.04 feet to the southwest corner thereof; Thence along the west line of said October 15, 2010 Friendsview Manor Tract, the tract conveyed to Friendsview Manor by deed recorded August 16th, 2006 under Instrument No. 2006-18846 and the tract conveyed to Friendsview Manor by deed recorded September 7, 2006 under Instrument No. 2006-20668, each in part, North 02°23'59" East 202.60 feet to the south margin of the Southern Pacific Railroad, said point being 30.00 feet southeasterly of, when measured perpendicular to the centerline thereof; Thence along said southeasterly margin North 59°02'57" East 574.72 feet to the northeast corner of Friendsview Village Condominium, a duly recorded plat in Yamhill County; thence along the east line of said Friendsview Village Condominium South 02°00'16" West 346.90 feet to the southeast corner thereof, said point being on the north line of the 40-foot Right-of-Way line of Cherry Street; thence along said north line of Cherry Street North 88°09'31" West 382.41 feet to said West Right-of-Way of Center Street; Thence along said West Line South 02°24'50" West 166.93 to said southeast corner of said October 15, 2010 Friendsview Manor tract and the **Point of Beginning of the Herein-Described North Consolidation Tract.**

Said North Consolidation Tract containing 2.501 acres, more or less.

08/22/15

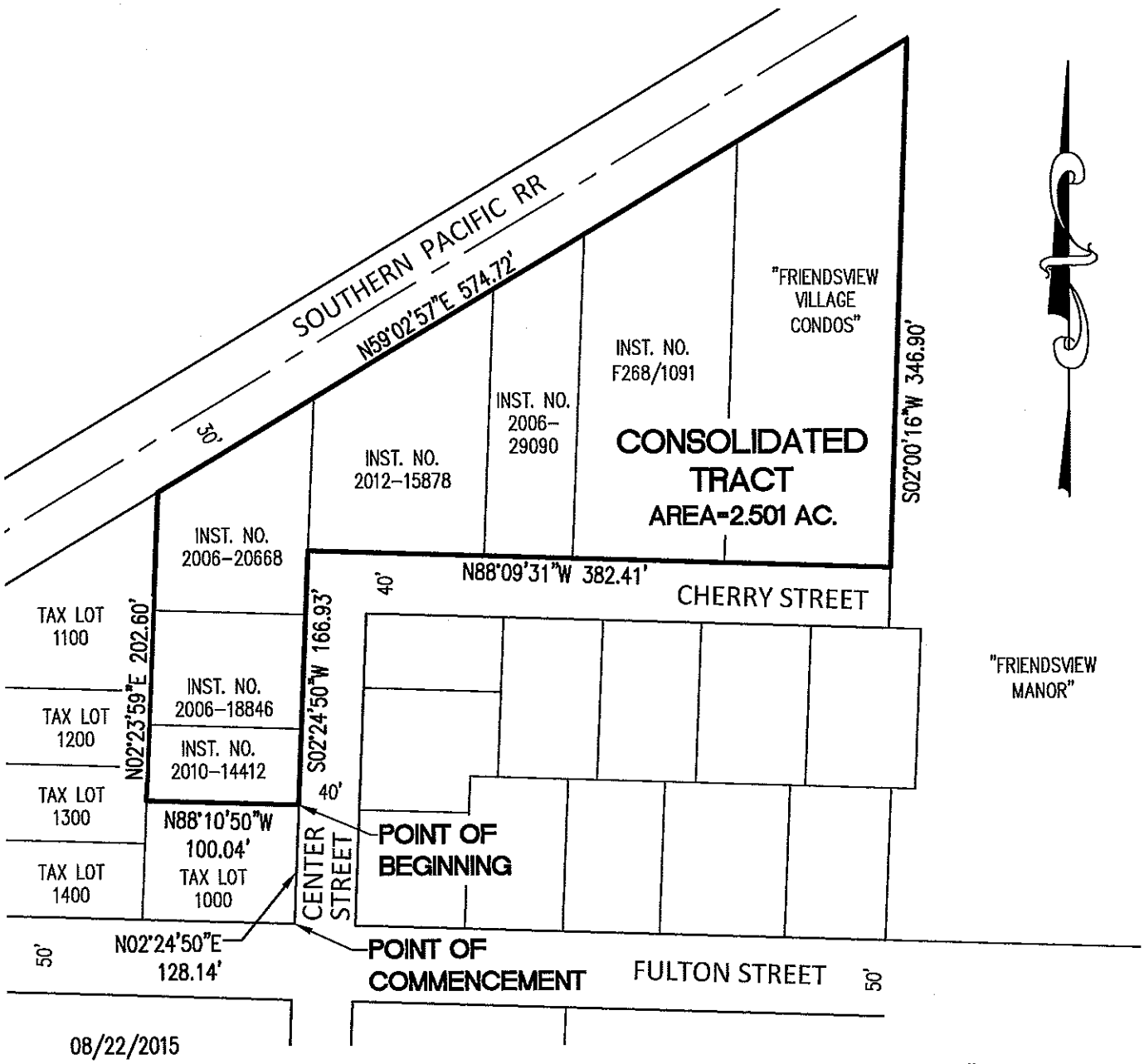
REGISTERED
PROFESSIONAL
LAND SURVEYOR

Theodore G. Lambert

OREGON
JULY 16, 1987
THEODORE G. LAMBERT
2294
RENEWS: 12/31/16

# EXHIBIT B

## MAP OF NORTH LOT CONSOLIDATION
## LAND LOCATED IN THE SW 1/4 OF SEC. 17, T3S, R2W, W.M., CITY OF NEWBERG, YAMHILL COUNTY, OREGON




08/22/2015
FOR CITY REVIEW

REGISTERED PROFESSIONAL LAND SURVEYOR

OREGON
JULY 16, 1987
THEODORE G. LAMBERT
2294
RENEWS: 12/31/16

PREPARED FOR
FRIENDSVIEW MANOR
1301 FULTON STREET
NEWBERG, OR 97132

SCALE 1" = 100 FEET

100 0 40 60 80 100

| FRIENDSVIEW - NORTH CONSOLIDATION EXHIBIT | EXHIBIT B |
|---|---|
| AKS ENGINEERING & FORESTRY, LLC<br>12965 SW HERMAN RD SUITE 100<br>TUALATIN, OR 97062 www.aks-eng.com<br>PHONE: 503.563.6151 FAX: 503.563.6152 | DRWN: TGL<br>CHKD: TGL<br>AKS JOB: 3199 |

DWG: 3199EXH B-CONSOLIDATE NORTH | EXH B-NORTH

AKS ENGINEERING & FORESTRY, LLC
12965 SW Herman Road, Suite 100, Tualatin, OR 97062
P: (503) 563-6151 F: (503) 563-6152
AKS Job No. 3199
ENGINEERING & FORESTRY
OFFICES IN: TUALATIN, OR - VANCOUVER, WA - SALEM, OR

# EXHIBIT A
## South Lot Consolidation Tract

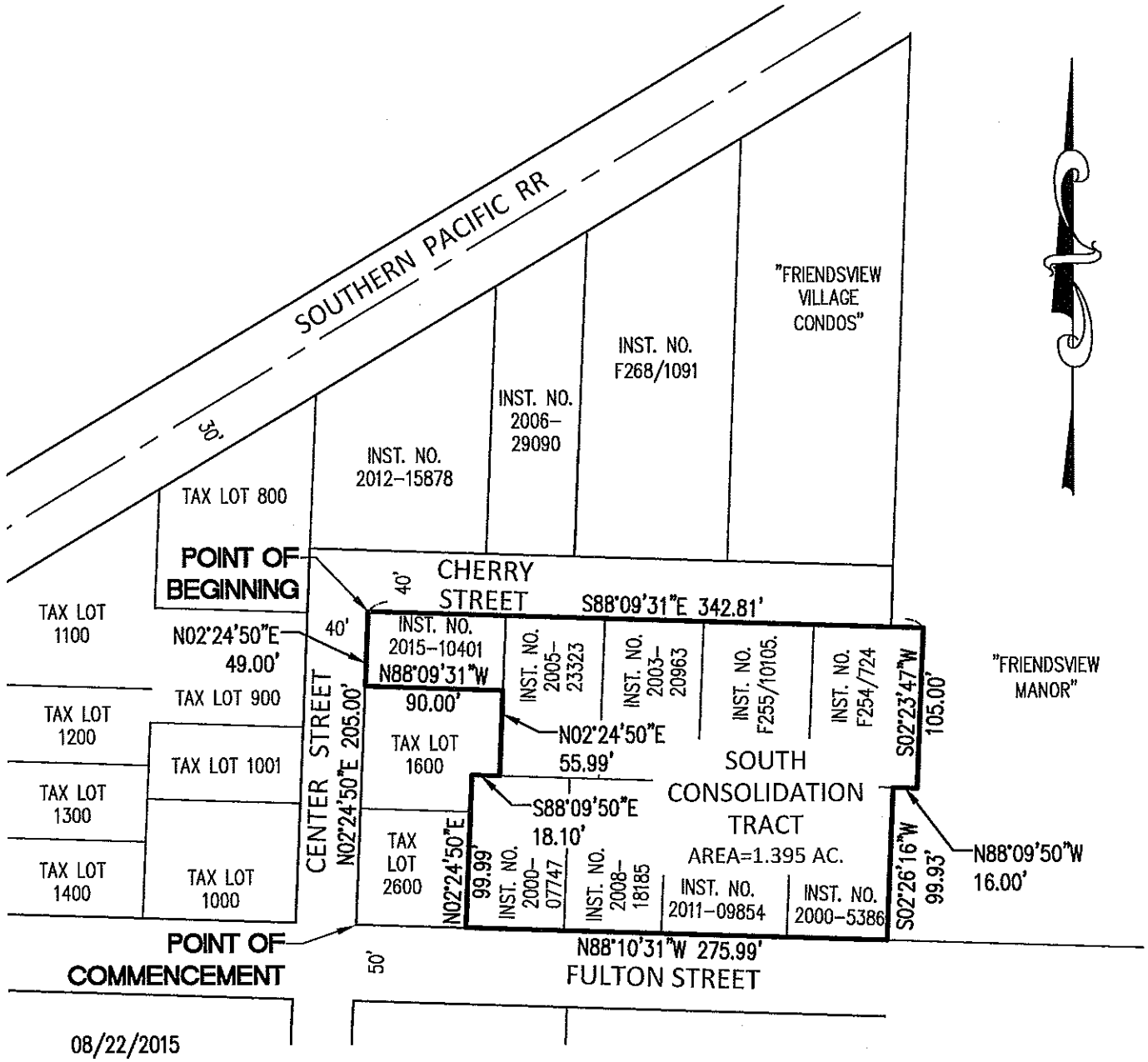
A tract of land located in the Southwest One-Quarter of Section 17, Township 3 South, Range 2 West, Willamette Meridian, City of Newberg, Yamhill County, Oregon as shown on the attached Exhibit "B" and being described as follows:

COMMENCING at the northeast intersection of Fulton Street, a 50-foot Right-of-Way street, and Center Street, a 40-foot Right-of-Way street; thence along the east Right-of-Way line of said Center Street North 02°24'50" East 205.00 feet to the intersection with the south line of Cherry Street, a 40.00-foot Right-of-Way street, being the northwest corner of a tract of land deeded to Friendsview Manor by deed recorded July 14, 2015 under Document No. 2015-10401 and being the **Point of Beginning of the Herein-Described South Consolidation Tract;**

Thence along said south line of Cherry Street South 88°09'31" East 342.81 feet to the northeast corner of the tract conveyed to Friendsview Manor by deed recorded May 2, 1991 in Book 254, Page 724; Thence along the east line of said May 2, 1991 Friendsview Tract South 02°23'47" West 105.00 feet to the southeast corner thereof; thence along the south line thereof North 88°09'50" West 16.00 feet to the northeast corner of the tract conveyed to Friendsview Manor by deed recorded April 20, 2000 under Instrument No. 2000-5386; Thence along the east line of said April 20, 2000 Friendsview Manor Tract South 02°26'16" West 99.93 feet to the southeast corner thereof, said corner being on the north line of the 50-foot Right-of-Way of Fulton Street; Thence along said north line of Fulton Street North 88°10'31" West 275.99 feet to the southwest corner of the tract conveyed to Friendsview Manor by deed recorded June 7, 2000 as Instrument No. 2000-07747; Thence along the west line of said June 7, 2000 Friendsview Manor Tract North 02°24'50" East 99.99 feet to the northwest corner thereof; Thence along the north line of said June 7, 2000 Friendsview Manor Tract North 88°09'50" East 18.10 feet to the southwest corner of the tract conveyed to Friendsview Manor by deed recorded October 21, 2005 under Instrument No. 2005-23323; Thence along west line of said October 21, 2005 Friendsview Manor Tract North 02°24'50" East 55.99 feet to the southeast corner of the tract conveyed to Friendsview Manor by deed recorded July 14, 2015 under Deed Document No. 2015-10401; thence along the south line of said July 14, 2015 tract North 88°09'31" West 90.00 feet to the southwest corner thereof, said point being on the east line of said Center Street; thence along said east

# EXHIBIT B

## MAP OF SOUTH LOT CONSOLIDATION
## LAND LOCATED IN THE SW 1/4 OF SEC. 17, T3S, R2W, W.M., CITY OF NEWBERG, YAMHILL COUNTY, OREGON




08/22/2015
FOR CITY REVIEW

REGISTERED PROFESSIONAL LAND SURVEYOR

OREGON
JULY 16, 1987
THEODORE G. LAMBERT
2294
RENEWS: 12/31/16

PREPARED FOR
FRIENDSVIEW MANOR
1301 FULTON STREET
NEWBERG, OR 97132

SCALE 1" = 200 FEET

200 0 80 120 160 200

| FRIENDSVIEW - SOUTH CONSOLIDATION EXHIBIT | EXHIBIT B |
|---|---|
| AKS ENGINEERING & FORESTRY, LLC<br>12965 SW HERMAN RD SUITE 100<br>TUALATIN, OR 97062 www.aks-eng.com<br>PHONE: 503.563.6151 FAX: 503.563.6152 | DRWN: TGL<br>CHKD: TGL<br>AKS JOB: 3199 |

DWG: 3199EXH B-CONSOLIDATE SOUTH | EXH B

# Traffic Impact Analysis
# University Village

Newberg, Oregon

October 8, 2015

completed for
Friendsview Retirement Community
with
LRS Architects

Prepared by:
Associated Transportation Engineering & Planning, Inc.
Salem, Oregon
October 6, 2015 - 15303

ASSOCIATED
TRANSPORTATION
ENGINEERING &
PLANNING Inc.

A.T.E.P., Inc.
P.O. Box 3047
Salem, OR. 97302

Tel.: 503.364.5066
FAX: 503.364.1260
e-mail: kbirky@atepinc.com

# Traffic Impact Analysis
# University Village

Newberg, Oregon

October 8, 2015

completed for
Friendsview Retirement Community
with
LRS Architects

REGISTERED PROFESSIONAL ENGINEER
OREGON
JULY 22, 1997
KARL BIRKY
12/31/2015
10/8/15

Prepared by:
Associated Transportation Engineering & Planning, Inc.
Salem, Oregon
October 6, 2015 - 15303

ASSOCIATED
TRANSPORTATION
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PLANNING Inc.

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Computer Modeling Printouts

# Traffic Impact Analysis
# University Village
# Newberg, Oregon

ASSOCIATED TRANSPORTATION ENGINEERING & PLANNING Inc.
A.T.E.P., Inc.
P.O. Box 3047
Salem, OR. 97302
Tel.: 503.364.5066
FAX: 503.364.1260
e-mail: kbirky@atepinc.com

## Introduction:

University Village is in preliminary planning stages for construction in Newberg, Oregon. North of Fulton St between Meridian St and Friendsview Retirement Community, the site will be developed in 4 phases and provide 175 apartments for persons living at Friendsview. The site will be accessed from Fulton Street via Center St and the existing Friendsview access at Cherry St. The intent of this analysis is to estimate the traffic residents of the Village will generate, its impact on the City of Newberg transportation system and recommend improvements to the system if the City's performance metrics will not be met.

**Figure 1 - Vicinity Map**

## Summary of Findings:

University Village will add 175 senior retirement apartment units in the City of Newberg. This analysis finds the studied intersections can convey the expected additional traffic without major changes. The performance metrics for the studied intersections will remain within the City's performance standards. The transportation system development charges (TSDCs) that developments like University Village pay continues to fund improvements to the transportation infrastructure away from the development site and serve all the residents of the City.

## Existing Conditions:

The project site includes tax lots 500, 600, 700, 800, 900, 1000, 1001, 1500, 1600, 1700, 1800, 1900, 2000, 2200, 2300, 2400, 2500, 2600 of tax map 3S 2W Sec17CB. Located west of Friendsview Retirement Community, south of the railroad tracks and north of Fulton St, the parcel is zoned R-2 with an institutional overlay.

This traffic impact analysis will examine performance metrics at the intersections of Fulton St at Meridian St, Fulton St at Center St, Fulton St at Cherry St and Fulton St at Villa Rd. Traffic counts were obtained by Quality Counts in July and September 2015 at the intersections to be studied. Reported crash data for the past 5 years at Villa at Fulton and Meridian at Fulton was provided by the ODOT Crash Data Unit. The posted speed is 25 mph on all approaches at the studied intersections.

When the site is developed and living units built and occupied, traffic will be generated. Traffic engineers have found that the average Senior Adult Housing - Attached (ITE 252) unit generates 0.13 AM Peak hour trips, 0.16 PM Peak hour trips and 3.48 trips per day. These averages, from the 8th Edition of the Trip Generation Manual published by the Institute of Transportation Engineers, will be used in this analysis to estimate the impact of this new traffic on the roadway system. It is observed that seniors living in attached units in retirement communities make fewer trips than residents in single family homes and tend to avoid peak hour periods because they have discretion in when to travel. A number of existing living units will be removed from the site and the trips those homes generate will be deducted in this study.

Traffic counts were conducted at the studied intersections on July 10 & September 31, 2015 for this study. A computer model was constructed to evaluate the performance metrics of the studied intersections with the existing traffic volumes. Results of the computer modeling are incorporated into this report and can also be found in the Appendix. Existing performance metrics of the studied intersections are shown in Figure 2.

**Intersection Analysis Summary**

| ID | Intersection Name | Control Type | Method | Worst Mvmt | V/C | Delay (s/veh) | LOS |
|---|---|---|---|---|---|---|---|
| 1 | Meridian St at Fulton St | Two-way stop | HCM2010 | WBT | 0.000 | 10.8 | B |
| 2 | Fulton St at Center St | Two-way stop | HCM2010 | NBT | 0.000 | 11.4 | B |
| 3 | Fulton St at Friendsview Entrance | Two-way stop | HCM2010 | SBL | 0.011 | 11.4 | B |
| 4 | Fulton at Villa Rd (South) | Two-way stop | HCM2010 | EBL | 0.094 | 12.0 | B |

Existing AM Peak Hour Summary

| ID | Intersection Name | Control Type | Method | Worst Mvmt | V/C | Delay (s/veh) | LOS |
|---|---|---|---|---|---|---|---|
| 1 | Meridian St at Fulton St | Two-way stop | HCM2010 | WBT | 0.000 | 12.6 | B |
| 2 | Fulton St at Center St | Two-way stop | HCM2010 | NBT | 0.000 | 12.3 | B |
| 3 | Fulton St at Friendsview Entrance | Two-way stop | HCM2010 | SBL | 0.034 | 11.7 | B |
| 4 | Fulton at Villa Rd (South) | Two-way stop | HCM2010 | EBL | 0.207 | 15.0 | B |

Existing PM Peak Hour Summary

**Figure 2 - Existing Traffic Conditions**

Figure 1 is a vicinity map locating the project in the City of Newberg, Figure 2 is the analysis summary at the existing intersections for AM & PM peak hours. Figure 3 is the developed intersection performance metrics. Figure 4 is the future (2025) intersection performance metrics. Figure 5 is a summary of crash data from ODOT Crash Data Unit and Figure 6 is the study area. Figure 7 shows the existing lane configuration and traffic control measures. Figure 8 is the existing AM Peak hour counts and metrics and Figure 9 is the existing PM Peak hour counts and metrics. Figure 10 is the background traffic (from the planned ReStore), Figure 11 is the site generated trips in the study. Figure 12 is the developed AM Peak

hour counts and metrics and Figure 13 is the developed PM Peak hour counts and metrics. Figure 14 is the Future (2025) AM Peak hour counts and metrics and Figure 15 is the Future (2025) PM Peak hour counts and metrics.

## Developed Traffic Conditions:

The site will generate 23 AM Peak hour trips and 28 trips in the PM Peak hour and 609 Daily trips (ADT). It is the assumption of this analysis that 10% of the traffic will travel to and from the north on Meridian St at Fulton St., that 40% will travel to and from the south on Meridian St at Fulton St and 25% of the traffic will travel north and 25% south on Villa Rd at Fulton St.

Plans have been submitted to the City for construction of a 10,500 sq. ft. Habitat for Humanity ReStore at the east bound approach to Fulton St. at Meridian St. Traffic from the ReStore (ITE 814 Specialty Retail) has been estimated and is added to this analysis as background traffic. The ReStore is estimated to generate no AM Peak hour trips (the store will be closed during the peak traffic period) and will generate 28 trips during the PM Peak hour. There are a number of housing units that have been or will be demolished to make room for the University Village. Current estimates are to remove 2 homes and 6 apartments in Phase 1, 8 homes and 4 apartments in Phase 2, 16 Senior Adult Housing units in Phase 3 and 4 single family homes in Phase 4. This is a total of 14 single family homes (133 ADT) and 26 apartments (90 ADT using the lower trip generation rate for Senior Adult Housing - Attached). These trips will be credited against the new trips generated by residents of University Village <223 ADT>. University Village will generate a **net increase of 386 average daily trips** (ADT) when all 175 units are occupied and the trips that were generated by demolished homes are subtracted.

The preliminary site plan shows the primary access for University Village will be Fulton St at Center St and Fulton St at Cherry St. There is adequate stopping sight distance and intersection sight distance at the intersections in all directions. Traffic performance metrics at full build out are shown in Figure 3.

| ID | Intersection Name | Control Type | Method | Worst Mvmt | V/C | Delay (s/veh) | LOS |
|---|---|---|---|---|---|---|---|
| 1 | Meridian St at Fulton St | Two-way stop | HCM2010 | WBT | 0.000 | 10.9 | B |
| 2 | Fulton St at Center St | Two-way stop | HCM2010 | NBT | 0.000 | 11.5 | B |
| 3 | Fulton St at Friendsview Entrance | Two-way stop | HCM2010 | SBL | 0.020 | 11.6 | B |
| 4 | Fulton at Villa Rd (South) | Two-way stop | HCM2010 | EBL | 0.103 | 12.2 | B |

Developed AM Peak Hour Summary

| ID | Intersection Name | Control Type | Method | Worst Mvmt | V/C | Delay (s/veh) | LOS |
|---|---|---|---|---|---|---|---|
| 1 | Meridian St at Fulton St | Two-way stop | HCM2010 | WBT | 0.010 | 13.2 | B |
| 2 | Fulton St at Center St | Two-way stop | HCM2010 | SBL | 0.011 | 12.9 | B |
| 3 | Fulton St at Friendsview Entrance | Two-way stop | HCM2010 | SBL | 0.019 | 11.8 | B |
| 4 | Fulton at Villa Rd (South) | Two-way stop | HCM2010 | EBL | 0.111 | 12.4 | B |

Developed PM Peak Hour Summary

**Figure 3 - Developed Traffic Conditions**

## Future Traffic Conditions:

It is the assumption of this analysis that traffic will increase linearly 1% per year from other areas of the City. The future traffic metrics are found by increasing the traffic 10% over the counted volumes in this study and adding the traffic from University Village and the ReStore.

| ID | Intersection Name | Control Type | Method | Worst Mvmt | V/C | Delay (s/veh) | LOS |
|---|---|---|---|---|---|---|---|
| 1 | Meridian St at Fulton St | Two-way stop | HCM2010 | WBT | 0.000 | 11.1 | B |
| 2 | Fulton St at Center St | Two-way stop | HCM2010 | NBT | 0.000 | 11.8 | B |
| 3 | Fulton St at Friendsview Entrance | Two-way stop | HCM2010 | SBL | 0.023 | 12.0 | B |
| 4 | Fulton at Villa Rd (South) | Two-way stop | HCM2010 | EBL | 0.121 | 12.8 | B |

Future (2025) AM Peak Hour Summary

| ID | Intersection Name | Control Type | Method | Worst Mvmt | V/C | Delay (s/veh) | LOS |
|---|---|---|---|---|---|---|---|
| 1 | Meridian St at Fulton St | Two-way stop | HCM2010 | WBT | 0.010 | 14.1 | B |
| 2 | Fulton St at Center St | Two-way stop | HCM2010 | SBL | 0.012 | 13.5 | B |
| 3 | Fulton St at Friendsview Entrance | Two-way stop | HCM2010 | SBL | 0.022 | 12.3 | B |
| 4 | Fulton at Villa Rd (South) | Two-way stop | HCM2010 | EBL | 0.130 | 13.1 | B |

Future (2025) PM Peak Hour Summary

**Figure 4 - Future (2025) Traffic Conditions**

## Crash Data:

The Oregon Department of Transportation Crash Data Unit provided information about reported crashes at the intersections in this study for the past 5 years.

| Intersection | Fatal Crashes | Injury Crashes | Property Damage Crashes | Total |
|---|---|---|---|---|
| Fulton St at Meridian St | 0 | 0 | 1 | 1 |
| Fulton St at Villa Rd | 0 | 0 | 0 | 0 |

**Figure 5 - Summary of Reported Crash Data in 2009 to 2013**

There do not appear to be significant traffic safety issues at the studied intersections, though continued monitoring of the roadways for unsafe conditions and unsafe drivers is important in the City.

## Findings and Summary:

Residents of the planned University Village housing will use the City of Newberg street system and will add traffic to the system. It is the finding of this analysis that all the intersections will function within the performance metrics of the City of Newberg. Additional traffic will not cause the studied intersections to

perform at levels below standards the City of Newberg has adopted for its intersections. There are no apparent significant safety problems at the studied intersections indicated by the crash data from ODOT. The City of Newberg has established a Transportation System Development Charge (TSDC) paid by developers to the City to improve the transportation system at intersections and streets not fronting developments like the University Village. The developer should and will be required to pay these charges to make improvements to the larger transportation system. The design and construction of University Village should be completed consistent with current City of Newberg design and construction standards.

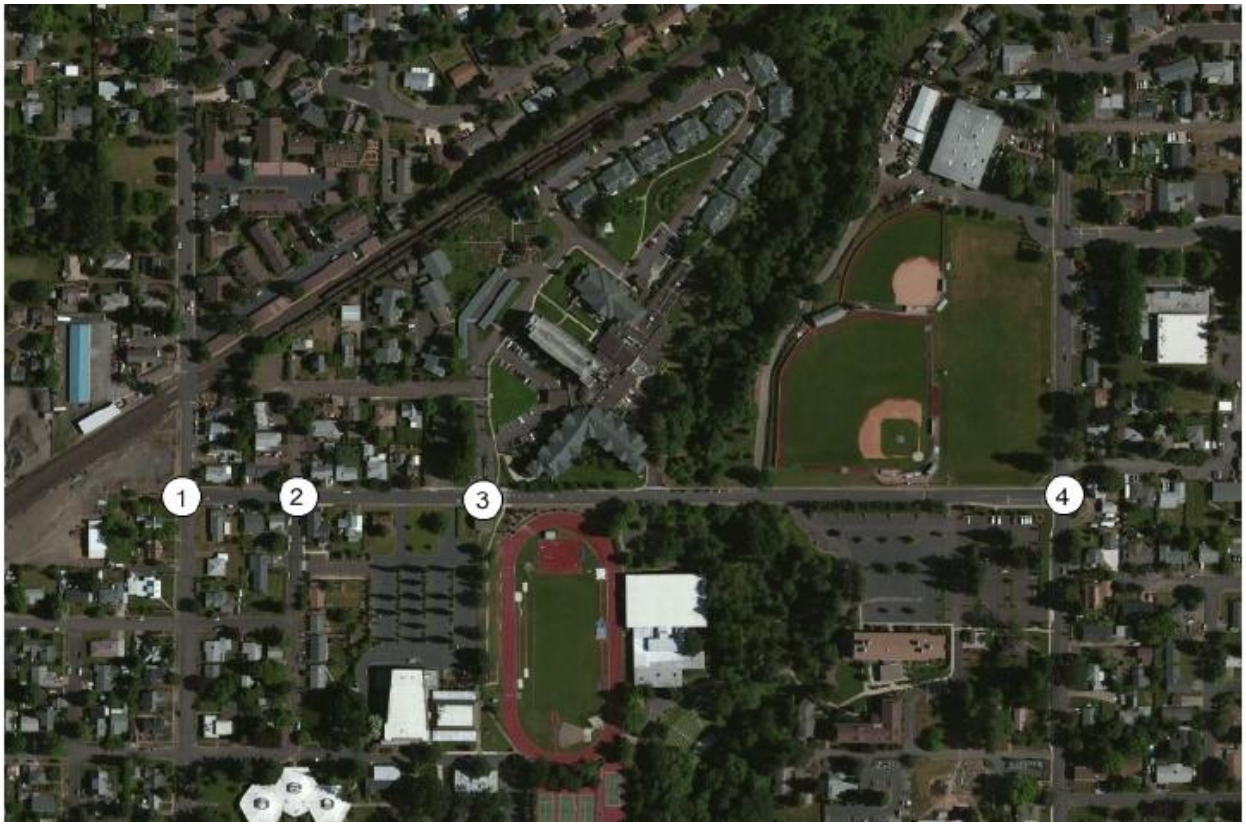



**Figure 6 - Study Area**

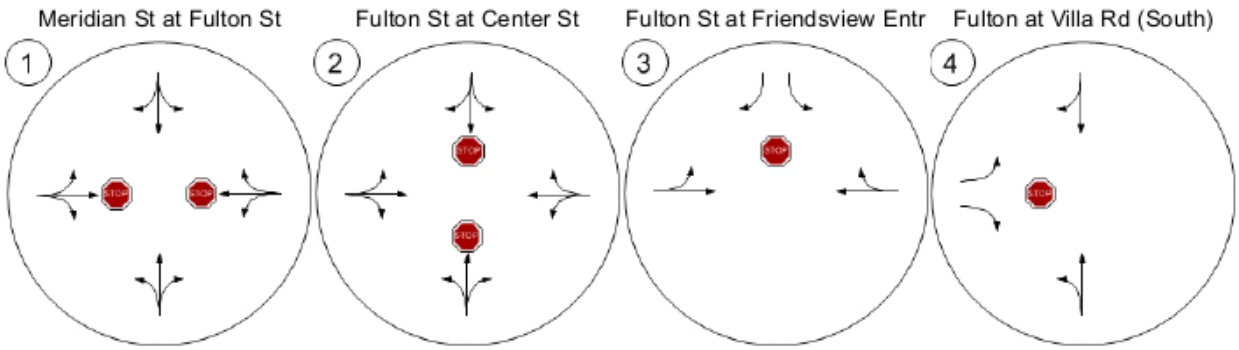



**Figure 7 - Lane Configuration and Traffic Controls**

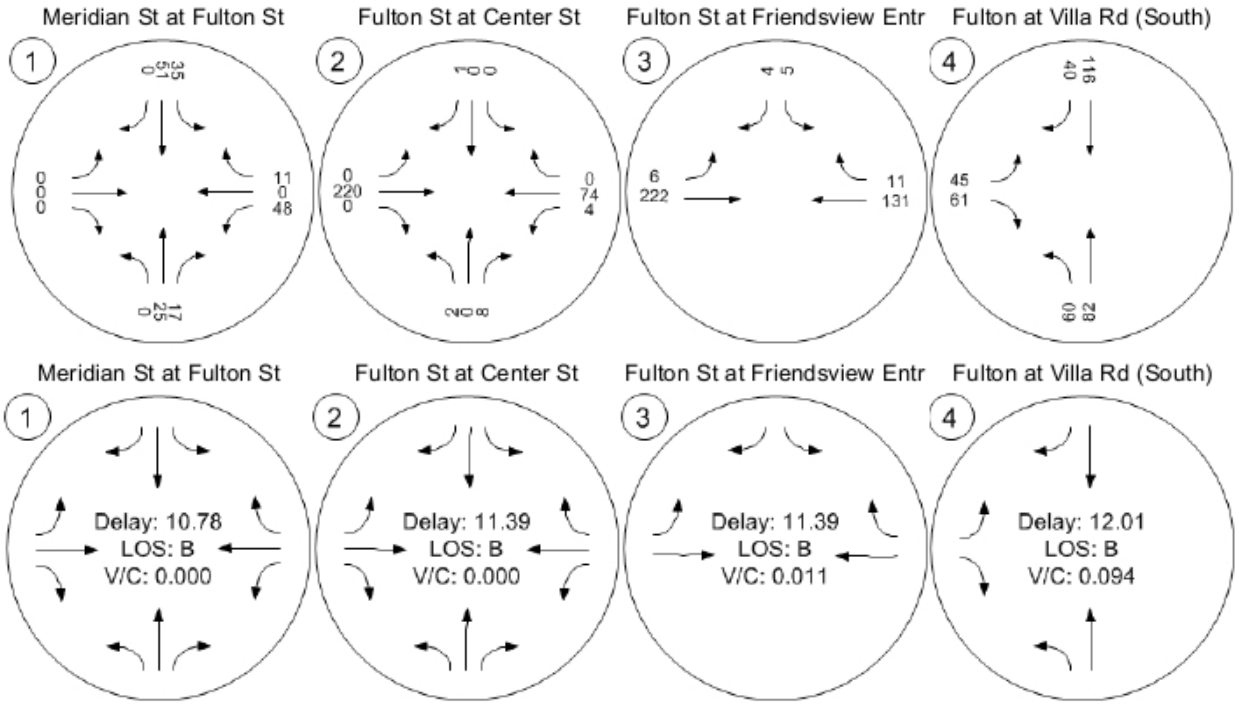



**Figure 8 - Existing AM Peak hour Counts and Metrics**

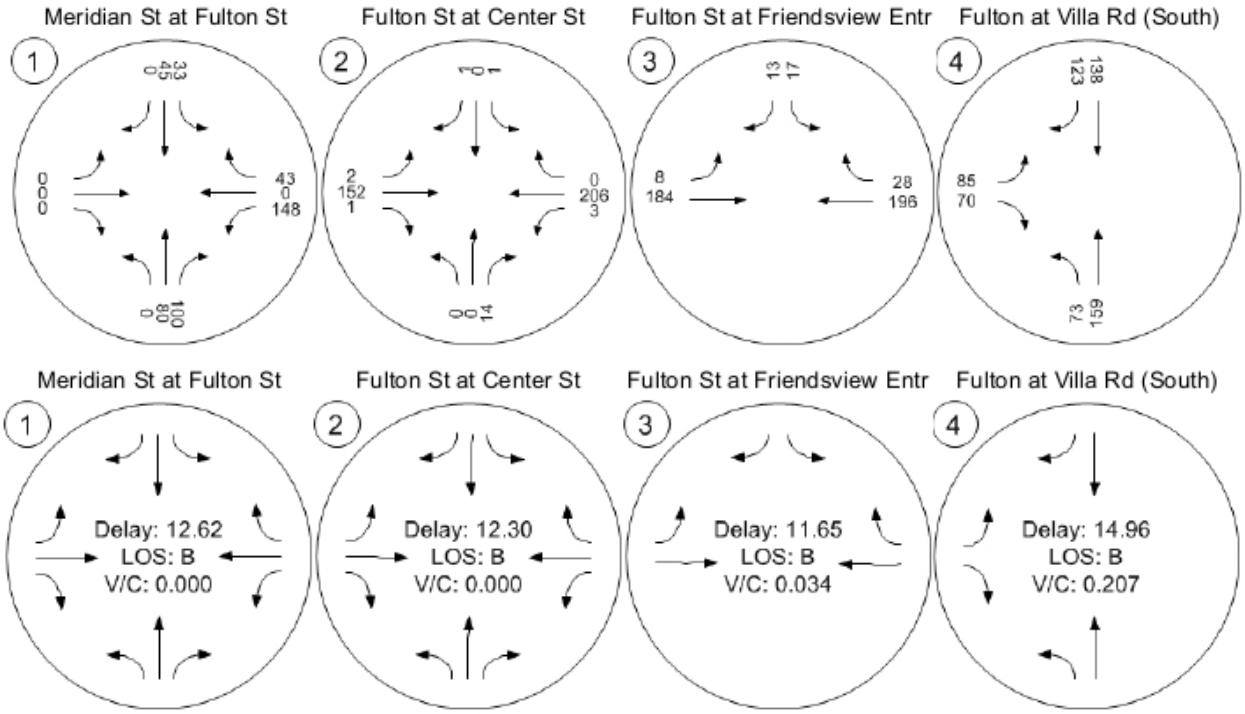



**Figure 9 - Existing PM Peak hour Counts and Metrics**

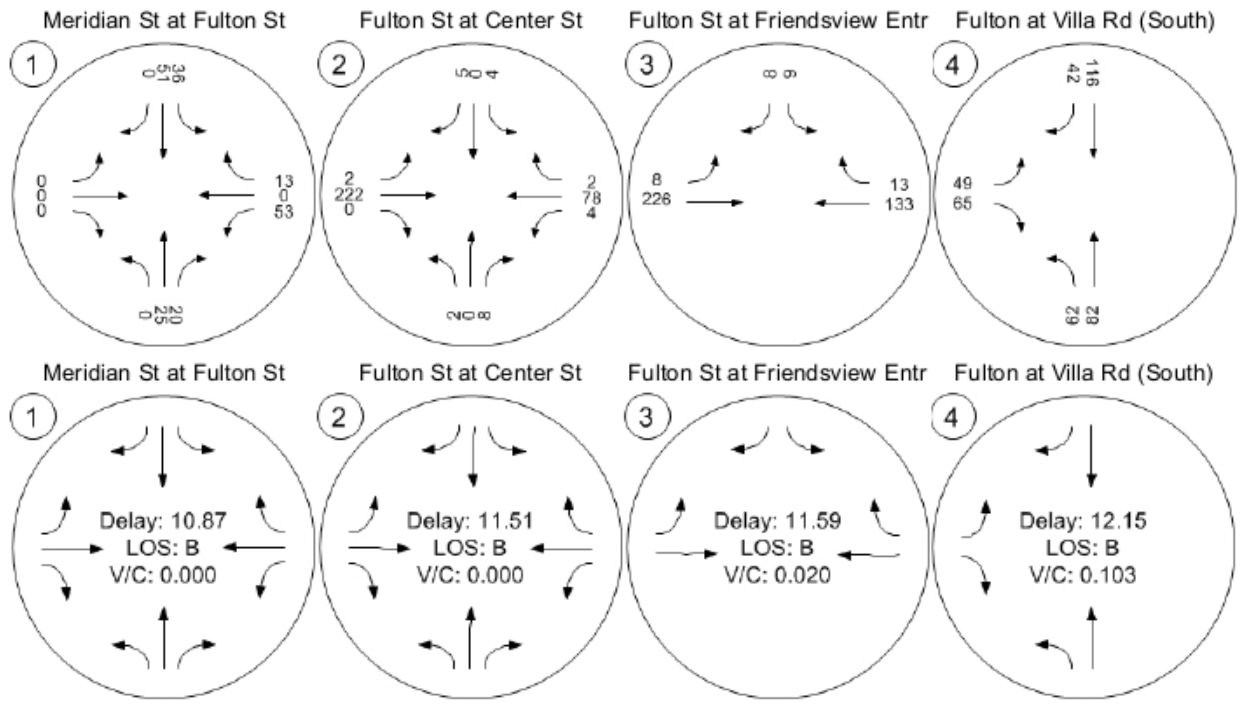



**Figure 10 - Developed AM Peak hour Counts and Metrics**

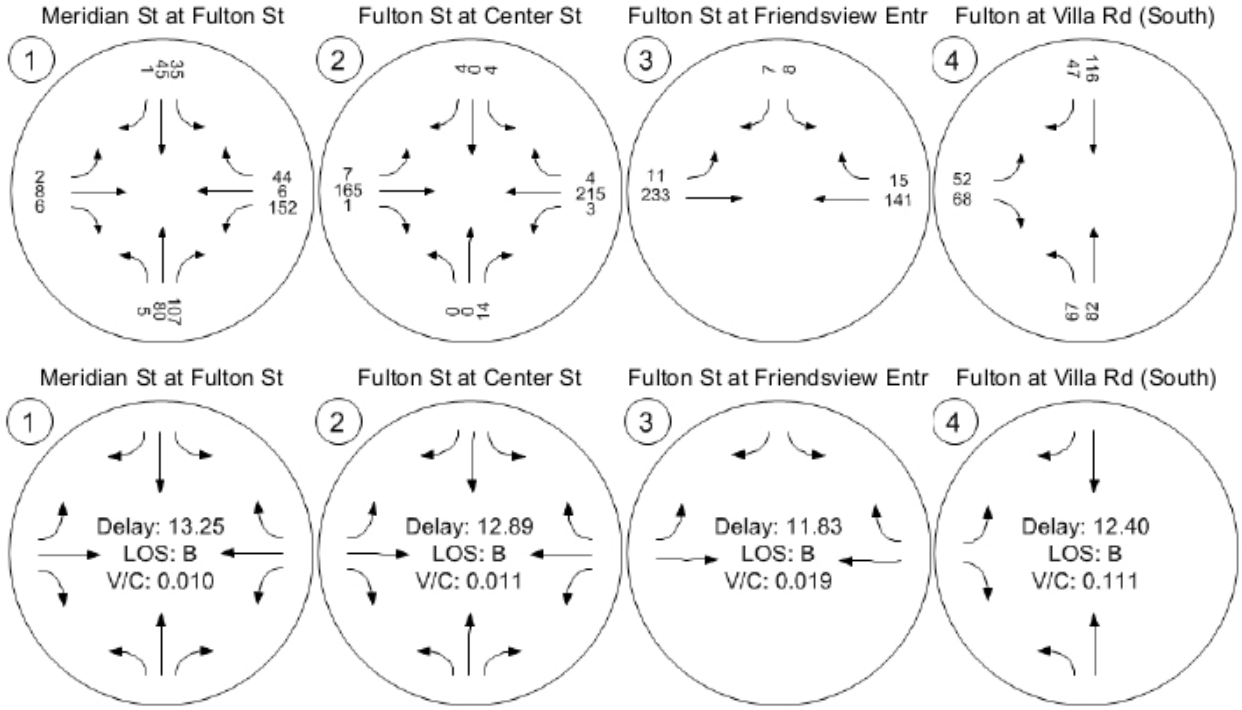



**Figure 11 - Developed PM Peak hour Counts and Metrics**

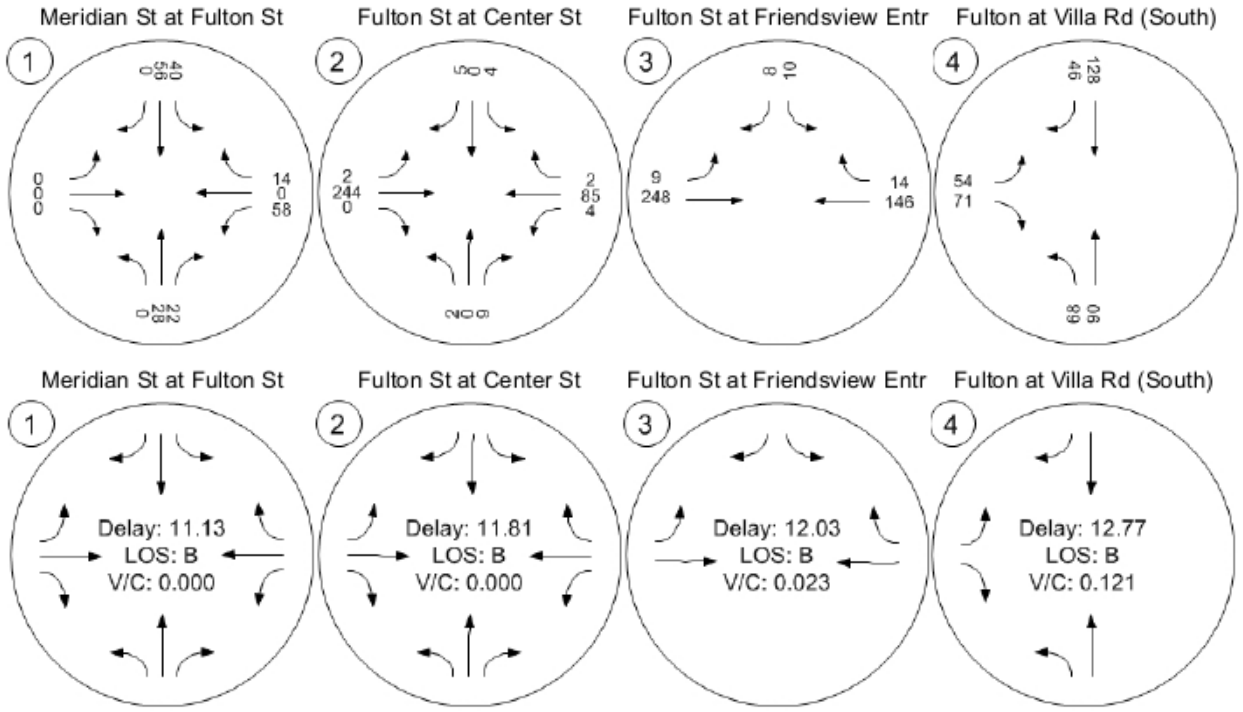



**Figure 12 - Future (2025) AM Peak hour Counts and Metrics**

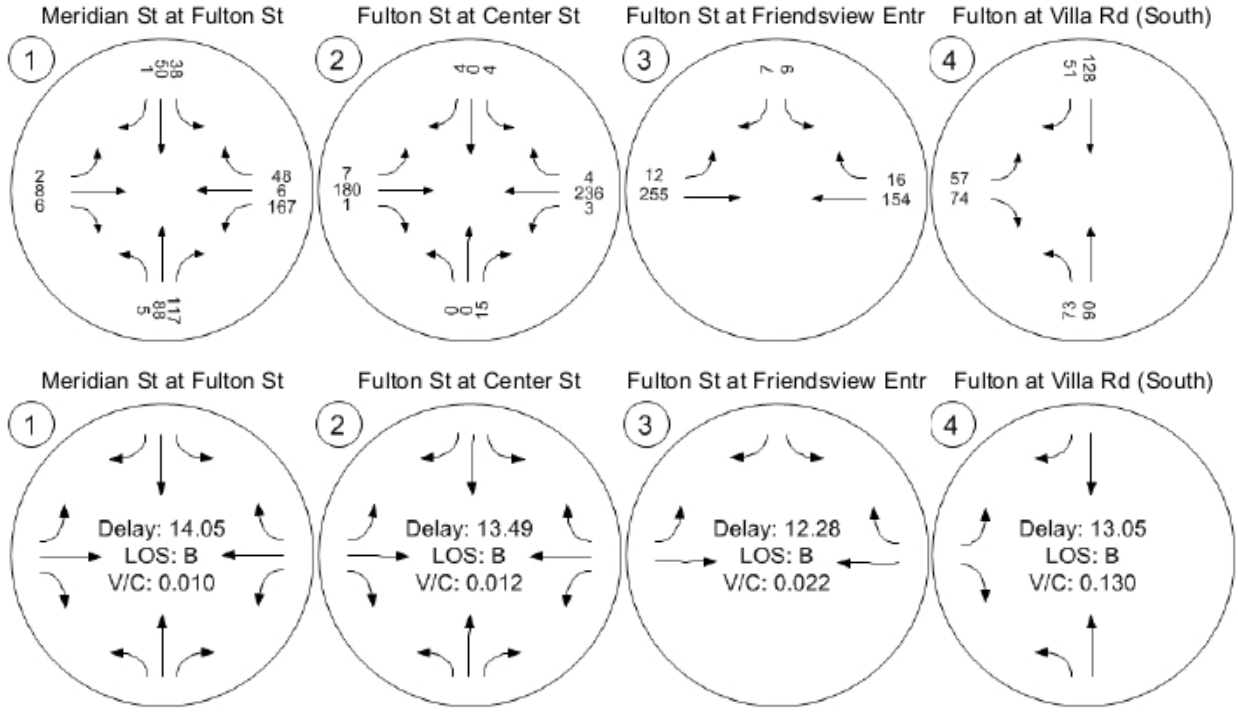



**Figure 13 - Future (2025) PM Peak hour Counts and Metrics**

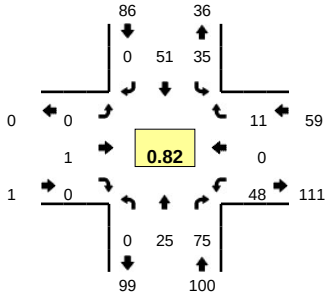
Type of peak hour being reported: Intersection Peak

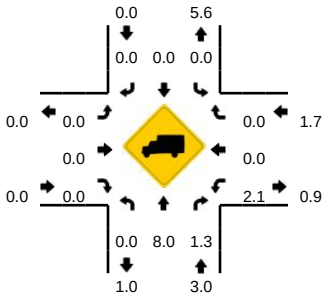
Method for determining peak hour: Total Entering Volume

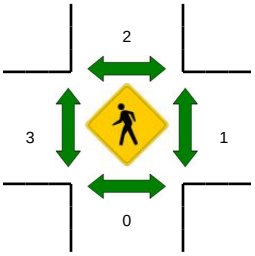
**LOCATION:** N Meridian St -- Fulton St
**CITY/STATE:** Newberg, OR

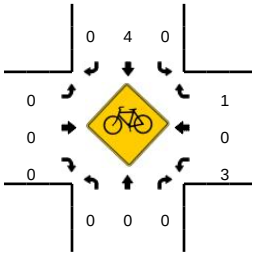
**QC JOB #:** 13545601
**DATE:** Tue, Jul 21 2015

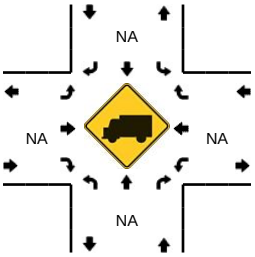
**Peak-Hour: 7:45 AM -- 8:45 AM**
**Peak 15-Min: 8:05 AM -- 8:20 AM**

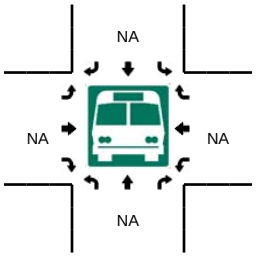







| 5-Min Count Period Beginning At | N Meridian St (Northbound) | | | | N Meridian St (Southbound) | | | | Fulton St (Eastbound) | | | | Fulton St (Westbound) | | | | Total | Hourly Totals |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Left | Thru | Right | U | Left | Thru | Right | U | Left | Thru | Right | U | Left | Thru | Right | U | | |
| 7:00 AM | 0 | 1 | 8 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 3 | 0 | 0 | 0 | 14 | |
| 7:05 AM | 0 | 3 | 3 | 0 | 3 | 4 | 0 | 0 | 0 | 0 | 0 | 0 | 4 | 0 | 0 | 0 | 17 | |
| 7:10 AM | 0 | 1 | 5 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 9 | |
| 7:15 AM | 0 | 2 | 1 | 0 | 4 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 11 | |
| 7:20 AM | 0 | 0 | 5 | 0 | 1 | 5 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 12 | |
| 7:25 AM | 0 | 1 | 7 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 12 | |
| 7:30 AM | 0 | 4 | 2 | 0 | 6 | 4 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 4 | 0 | 21 | |
| 7:35 AM | 0 | 0 | 3 | 0 | 3 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 3 | 0 | 1 | 0 | 13 | |
| 7:40 AM | 0 | 1 | 3 | 0 | 3 | 4 | 0 | 0 | 0 | 0 | 0 | 0 | 3 | 0 | 1 | 0 | 15 | |
| 7:45 AM | 0 | 1 | 7 | 0 | 2 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 13 | |
| 7:50 AM | 0 | 3 | 8 | 0 | 3 | 12 | 0 | 0 | 0 | 0 | 0 | 0 | 5 | 0 | 1 | 0 | 32 | |
| 7:55 AM | 0 | 5 | 8 | 0 | 4 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 21 | 190 |
| 8:00 AM | 0 | 2 | 5 | 0 | 0 | 4 | 0 | 0 | 0 | 0 | 0 | 0 | 5 | 0 | 2 | 0 | 18 | 194 |
| 8:05 AM | 0 | 3 | 8 | 0 | 3 | 5 | 0 | 0 | 0 | 0 | 0 | 0 | 4 | 0 | 2 | 0 | 25 | 202 |
| 8:10 AM | 0 | 1 | 6 | 0 | 6 | 5 | 0 | 0 | 0 | 0 | 0 | 0 | 7 | 0 | 1 | 0 | 26 | 219 |
| 8:15 AM | 0 | 2 | 6 | 0 | 5 | 6 | 0 | 0 | 0 | 0 | 0 | 0 | 4 | 0 | 1 | 0 | 24 | 232 |
| 8:20 AM | 0 | 2 | 8 | 0 | 0 | 1 | 0 | 0 | 0 | 1 | 0 | 0 | 4 | 0 | 0 | 0 | 16 | 236 |
| 8:25 AM | 0 | 1 | 5 | 0 | 2 | 5 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 15 | 239 |
| 8:30 AM | 0 | 2 | 4 | 0 | 5 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 5 | 0 | 2 | 0 | 19 | 237 |
| 8:35 AM | 0 | 2 | 3 | 0 | 3 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 7 | 0 | 1 | 0 | 19 | 243 |
| 8:40 AM | 0 | 1 | 7 | 0 | 2 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 5 | 0 | 0 | 0 | 18 | 246 |
| 8:45 AM | 0 | 0 | 5 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 3 | 0 | 1 | 0 | 10 | 243 |
| 8:50 AM | 0 | 4 | 6 | 0 | 0 | 8 | 0 | 0 | 0 | 0 | 0 | 0 | 5 | 0 | 1 | 0 | 24 | 235 |
| 8:55 AM | 0 | 3 | 6 | 0 | 3 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 3 | 0 | 0 | 0 | 18 | 232 |

| Peak 15-Min Flowrates | Northbound | | | | Southbound | | | | Eastbound | | | | Westbound | | | | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Left | Thru | Right | U | Left | Thru | Right | U | Left | Thru | Right | U | Left | Thru | Right | U | |
| All Vehicles | 0 | 24 | 80 | 0 | 56 | 64 | 0 | 0 | 0 | 0 | 0 | 0 | 60 | 0 | 16 | 0 | 300 |
| Heavy Trucks | 0 | 0 | 4 | | 0 | 0 | 0 | | 0 | 0 | 0 | | 0 | 0 | 0 | | 4 |
| Pedestrians | | 0 | | | | 4 | | | | 8 | | | | 0 | | | 12 |
| Bicycles | 0 | 0 | 0 | | 0 | 1 | 0 | | 0 | 0 | 0 | | 2 | 0 | 0 | | 3 |
| Railroad | | | | | | | | | | | | | | | | | |
| Stopped Buses | | | | | | | | | | | | | | | | | |

*Comments:*

Report generated on 7/23/2015 3:22 PM

SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

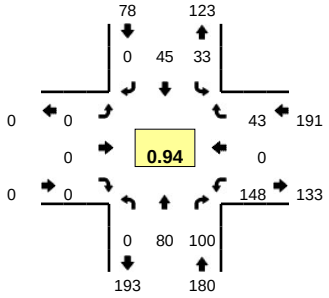
Type of peak hour being reported: Intersection Peak

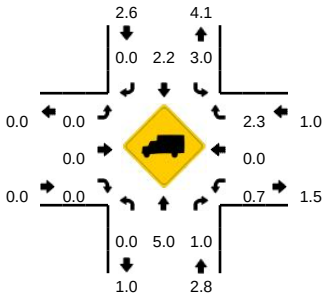
Method for determining peak hour: Total Entering Volume

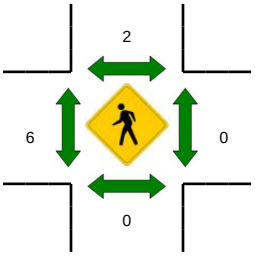
**LOCATION:** N Meridian St -- Fulton St
**CITY/STATE:** Newberg, OR

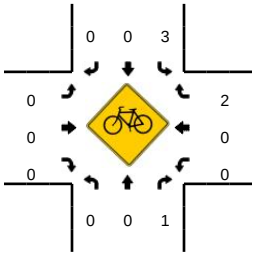
**QC JOB #:** 13545602
**DATE:** Tue, Jul 21 2015

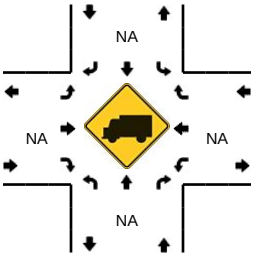
**Peak-Hour: 4:35 PM -- 5:35 PM**
**Peak 15-Min: 5:05 PM -- 5:20 PM**

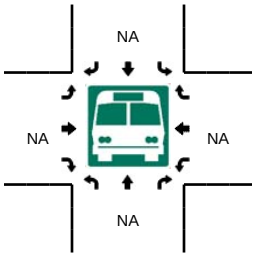







| 5-Min Count Period Beginning At | N Meridian St (Northbound) | | | | N Meridian St (Southbound) | | | | Fulton St (Eastbound) | | | | Fulton St (Westbound) | | | | Total | Hourly Totals |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Left | Thru | Right | U | Left | Thru | Right | U | Left | Thru | Right | U | Left | Thru | Right | U | | |
| 4:00 PM | 0 | 7 | 8 | 0 | 1 | 7 | 0 | 0 | 0 | 0 | 0 | 0 | 6 | 0 | 4 | 0 | 33 | |
| 4:05 PM | 0 | 5 | 7 | 0 | 3 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 7 | 0 | 5 | 0 | 30 | |
| 4:10 PM | 0 | 7 | 3 | 0 | 1 | 4 | 0 | 0 | 0 | 0 | 0 | 0 | 6 | 0 | 1 | 0 | 22 | |
| 4:15 PM | 0 | 4 | 7 | 1 | 1 | 5 | 0 | 0 | 0 | 0 | 0 | 0 | 6 | 0 | 4 | 0 | 28 | |
| 4:20 PM | 0 | 3 | 10 | 0 | 5 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 9 | 0 | 2 | 0 | 30 | |
| 4:25 PM | 0 | 7 | 8 | 0 | 0 | 5 | 0 | 0 | 0 | 0 | 0 | 0 | 9 | 0 | 2 | 0 | 31 | |
| 4:30 PM | 0 | 5 | 10 | 0 | 1 | 4 | 0 | 0 | 0 | 0 | 0 | 0 | 15 | 0 | 6 | 0 | 41 | |
| 4:35 PM | 0 | 8 | 3 | 0 | 0 | 6 | 0 | 0 | 0 | 0 | 0 | 0 | 12 | 0 | 4 | 0 | 33 | |
| 4:40 PM | 0 | 9 | 8 | 0 | 4 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 13 | 0 | 1 | 0 | 36 | |
| 4:45 PM | 0 | 3 | 9 | 0 | 5 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 15 | 0 | 4 | 0 | 37 | |
| 4:50 PM | 0 | 10 | 7 | 0 | 4 | 5 | 0 | 0 | 0 | 0 | 0 | 0 | 8 | 0 | 2 | 0 | 36 | |
| 4:55 PM | 0 | 5 | 13 | 0 | 3 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 11 | 0 | 4 | 0 | 39 | 396 |
| 5:00 PM | 0 | 8 | 6 | 0 | 3 | 4 | 0 | 0 | 0 | 0 | 0 | 0 | 9 | 0 | 3 | 0 | 33 | 396 |
| 5:05 PM | 0 | 9 | 10 | 0 | 3 | 4 | 0 | 0 | 0 | 0 | 0 | 0 | 10 | 0 | 3 | 0 | 39 | 405 |
| 5:10 PM | 0 | 6 | 6 | 0 | 2 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 17 | 0 | 4 | 0 | 37 | 420 |
| 5:15 PM | 0 | 5 | 10 | 0 | 3 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 16 | 0 | 7 | 0 | 43 | 435 |
| 5:20 PM | 0 | 5 | 10 | 0 | 2 | 5 | 0 | 0 | 0 | 0 | 0 | 0 | 10 | 0 | 2 | 0 | 34 | 439 |
| 5:25 PM | 0 | 4 | 9 | 0 | 2 | 6 | 0 | 0 | 0 | 0 | 0 | 0 | 12 | 0 | 5 | 0 | 38 | 446 |
| 5:30 PM | 0 | 8 | 9 | 0 | 2 | 6 | 0 | 0 | 0 | 0 | 0 | 0 | 15 | 0 | 4 | 0 | 44 | 449 |
| 5:35 PM | 0 | 3 | 4 | 0 | 5 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 5 | 0 | 2 | 0 | 21 | 437 |
| 5:40 PM | 0 | 4 | 10 | 0 | 1 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 8 | 0 | 1 | 0 | 26 | 427 |
| 5:45 PM | 0 | 12 | 12 | 0 | 2 | 4 | 0 | 0 | 0 | 0 | 0 | 0 | 8 | 0 | 2 | 0 | 40 | 430 |
| 5:50 PM | 0 | 4 | 4 | 0 | 3 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 7 | 0 | 0 | 0 | 21 | 415 |
| 5:55 PM | 0 | 5 | 7 | 0 | 3 | 7 | 0 | 0 | 0 | 0 | 0 | 0 | 9 | 1 | 4 | 0 | 36 | 412 |

| Peak 15-Min Flowrates | Northbound | | | | Southbound | | | | Eastbound | | | | Westbound | | | | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Left | Thru | Right | U | Left | Thru | Right | U | Left | Thru | Right | U | Left | Thru | Right | U | |
| All Vehicles | 0 | 80 | 104 | 0 | 32 | 32 | 0 | 0 | 0 | 0 | 0 | 0 | 172 | 0 | 56 | 0 | 476 |
| Heavy Trucks | 0 | 0 | 0 | | 4 | 4 | 0 | | 0 | 0 | 0 | | 0 | 0 | 0 | | 8 |
| Pedestrians | | 0 | | | | 8 | | | | 12 | | | | 0 | | | 20 |
| Bicycles | 0 | 0 | 1 | | 0 | 0 | 0 | | 0 | 0 | 0 | | 0 | 0 | 0 | | 1 |
| Railroad | | | | | | | | | | | | | | | | | |
| Stopped Buses | | | | | | | | | | | | | | | | | |

*Comments:*

Report generated on 7/23/2015 3:22 PM

SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

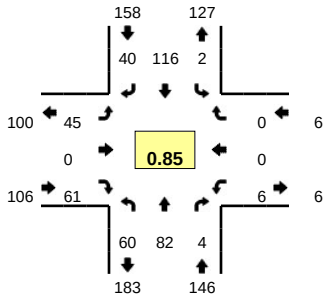
Type of peak hour being reported: Intersection Peak

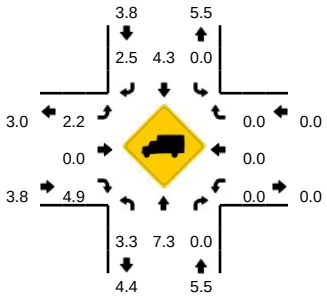
Method for determining peak hour: Total Entering Volume

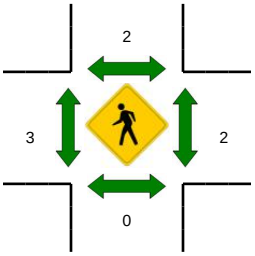
**LOCATION:** Villa Rd -- Fulton St
**CITY/STATE:** Newberg, OR

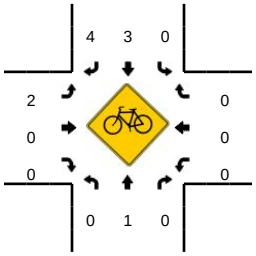
**QC JOB #:** 13545603
**DATE:** Tue, Jul 21 2015

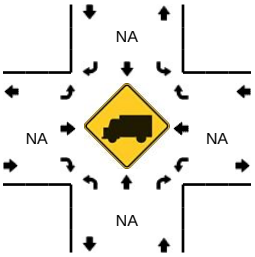
**Peak-Hour: 8:00 AM -- 9:00 AM**
**Peak 15-Min: 8:40 AM -- 8:55 AM**

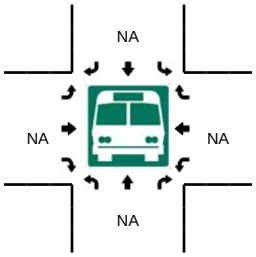







| 5-Min Count Period Beginning At | Villa Rd (Northbound) | | | | Villa Rd (Southbound) | | | | Fulton St (Eastbound) | | | | Fulton St (Westbound) | | | | Total | Hourly Totals |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Left | Thru | Right | U | Left | Thru | Right | U | Left | Thru | Right | U | Left | Thru | Right | U | | |
| 7:00 AM | 1 | 5 | 0 | 0 | 0 | 6 | 3 | 0 | 3 | 0 | 6 | 0 | 0 | 0 | 0 | 0 | 24 | |
| 7:05 AM | 2 | 5 | 0 | 0 | 0 | 10 | 1 | 0 | 1 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 21 | |
| 7:10 AM | 1 | 3 | 0 | 0 | 0 | 10 | 2 | 0 | 2 | 0 | 7 | 0 | 0 | 0 | 0 | 0 | 25 | |
| 7:15 AM | 2 | 3 | 0 | 0 | 0 | 4 | 1 | 0 | 2 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 15 | |
| 7:20 AM | 0 | 6 | 0 | 0 | 1 | 6 | 0 | 0 | 2 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 18 | |
| 7:25 AM | 4 | 6 | 0 | 0 | 1 | 9 | 0 | 0 | 1 | 0 | 6 | 0 | 0 | 0 | 0 | 0 | 27 | |
| 7:30 AM | 2 | 1 | 0 | 0 | 0 | 6 | 4 | 0 | 2 | 0 | 6 | 0 | 0 | 0 | 0 | 0 | 21 | |
| 7:35 AM | 4 | 3 | 2 | 0 | 0 | 10 | 4 | 0 | 2 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 27 | |
| 7:40 AM | 2 | 3 | 0 | 0 | 1 | 11 | 2 | 0 | 5 | 0 | 5 | 0 | 0 | 0 | 0 | 0 | 29 | |
| 7:45 AM | 2 | 6 | 0 | 0 | 0 | 11 | 2 | 0 | 2 | 0 | 5 | 0 | 0 | 0 | 0 | 0 | 28 | |
| 7:50 AM | 6 | 5 | 0 | 0 | 0 | 11 | 4 | 0 | 3 | 0 | 6 | 0 | 0 | 0 | 0 | 0 | 35 | |
| 7:55 AM | 7 | 7 | 1 | 0 | 0 | 11 | 3 | 0 | 4 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 36 | 306 |
| 8:00 AM | 6 | 7 | 1 | 0 | 0 | 14 | 6 | 0 | 4 | 0 | 4 | 0 | 1 | 0 | 0 | 0 | 43 | 325 |
| 8:05 AM | 6 | 4 | 0 | 0 | 0 | 9 | 4 | 0 | 4 | 0 | 4 | 0 | 0 | 0 | 0 | 0 | 31 | 335 |
| 8:10 AM | 5 | 6 | 0 | 0 | 0 | 3 | 6 | 0 | 5 | 0 | 9 | 0 | 0 | 0 | 0 | 0 | 34 | 344 |
| 8:15 AM | 5 | 0 | 0 | 0 | 0 | 10 | 4 | 0 | 2 | 0 | 7 | 0 | 0 | 0 | 0 | 0 | 28 | 357 |
| 8:20 AM | 7 | 6 | 1 | 0 | 0 | 9 | 1 | 0 | 2 | 0 | 6 | 0 | 0 | 0 | 0 | 0 | 32 | 371 |
| 8:25 AM | 8 | 7 | 0 | 0 | 0 | 9 | 1 | 0 | 4 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 31 | 375 |
| 8:30 AM | 2 | 2 | 0 | 0 | 0 | 14 | 2 | 0 | 2 | 0 | 9 | 0 | 0 | 0 | 0 | 0 | 31 | 385 |
| 8:35 AM | 3 | 5 | 0 | 0 | 0 | 5 | 3 | 0 | 2 | 0 | 4 | 0 | 0 | 0 | 0 | 0 | 22 | 380 |
| 8:40 AM | 2 | 9 | 1 | 0 | 1 | 15 | 2 | 0 | 6 | 0 | 3 | 0 | 2 | 0 | 0 | 0 | 41 | 392 |
| 8:45 AM | 1 | 11 | 0 | 0 | 0 | 11 | 5 | 0 | 2 | 0 | 6 | 0 | 1 | 0 | 0 | 0 | 37 | 401 |
| 8:50 AM | 12 | 14 | 1 | 0 | 1 | 9 | 0 | 0 | 2 | 0 | 5 | 0 | 1 | 0 | 0 | 0 | 45 | 411 |
| 8:55 AM | 3 | 11 | 0 | 0 | 0 | 8 | 6 | 0 | 10 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 41 | 416 |

| Peak 15-Min Flowrates | Northbound | | | | Southbound | | | | Eastbound | | | | Westbound | | | | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Left | Thru | Right | U | Left | Thru | Right | U | Left | Thru | Right | U | Left | Thru | Right | U | |
| All Vehicles | 60 | 136 | 8 | 0 | 8 | 140 | 28 | 0 | 40 | 0 | 56 | 0 | 16 | 0 | 0 | 0 | 492 |
| Heavy Trucks | 4 | 8 | 0 | | 0 | 12 | 4 | | 4 | 0 | 0 | | 0 | 0 | 0 | | 32 |
| Pedestrians | | 0 | | | | 0 | | | | 0 | | | | 4 | | | 4 |
| Bicycles | 0 | 0 | 0 | | 0 | 1 | 0 | | 0 | 0 | 0 | | 0 | 0 | 0 | | 1 |
| Railroad | | | | | | | | | | | | | | | | | |
| Stopped Buses | | | | | | | | | | | | | | | | | |

*Comments:*

Report generated on 7/23/2015 3:22 PM

SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

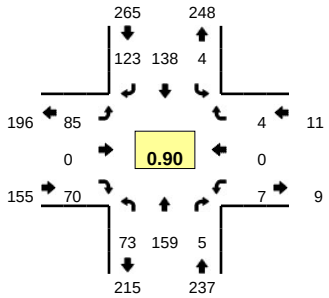
Type of peak hour being reported: Intersection Peak

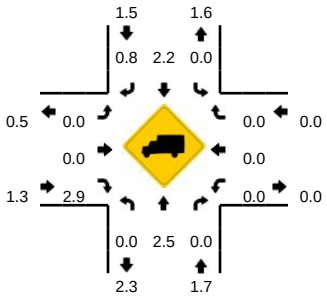
Method for determining peak hour: Total Entering Volume

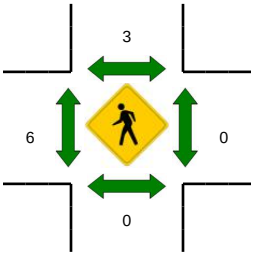
**LOCATION:** Villa Rd -- Fulton St
**CITY/STATE:** Newberg, OR

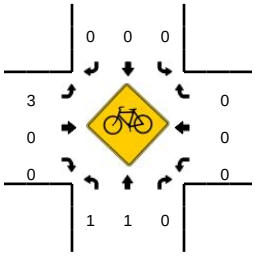
**QC JOB #:** 13545604
**DATE:** Tue, Jul 21 2015

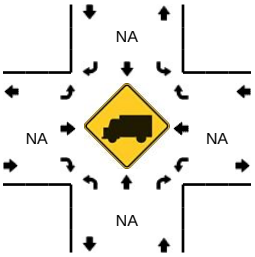
**Peak-Hour: 4:25 PM -- 5:25 PM**
**Peak 15-Min: 4:25 PM -- 4:40 PM**

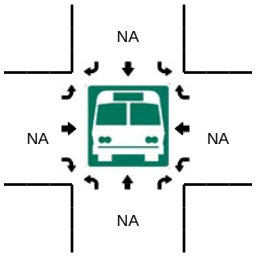







| 5-Min Count Period Beginning At | Villa Rd (Northbound) | | | | Villa Rd (Southbound) | | | | Fulton St (Eastbound) | | | | Fulton St (Westbound) | | | | Total | Hourly Totals |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Left | Thru | Right | U | Left | Thru | Right | U | Left | Thru | Right | U | Left | Thru | Right | U | | |
| 4:00 PM | 3 | 10 | 0 | 0 | 1 | 8 | 5 | 0 | 5 | 0 | 3 | 0 | 0 | 0 | 1 | 0 | 36 | |
| 4:05 PM | 8 | 17 | 2 | 0 | 0 | 9 | 9 | 0 | 5 | 0 | 7 | 0 | 0 | 0 | 0 | 0 | 57 | |
| 4:10 PM | 7 | 16 | 1 | 0 | 0 | 10 | 6 | 0 | 4 | 0 | 2 | 0 | 3 | 0 | 0 | 0 | 49 | |
| 4:15 PM | 5 | 7 | 0 | 0 | 0 | 11 | 12 | 0 | 2 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 38 | |
| 4:20 PM | 5 | 14 | 0 | 0 | 0 | 10 | 5 | 0 | 6 | 0 | 7 | 0 | 1 | 0 | 1 | 0 | 49 | |
| 4:25 PM | 5 | 12 | 1 | 0 | 0 | 16 | 14 | 0 | 4 | 0 | 5 | 0 | 1 | 0 | 0 | 0 | 58 | |
| 4:30 PM | 8 | 18 | 1 | 0 | 0 | 13 | 14 | 0 | 8 | 0 | 8 | 0 | 2 | 0 | 0 | 0 | 72 | |
| 4:35 PM | 9 | 10 | 0 | 0 | 0 | 17 | 9 | 0 | 4 | 0 | 5 | 0 | 0 | 0 | 1 | 0 | 55 | |
| 4:40 PM | 4 | 11 | 0 | 0 | 0 | 15 | 8 | 0 | 5 | 0 | 6 | 0 | 0 | 0 | 0 | 0 | 49 | |
| 4:45 PM | 5 | 15 | 0 | 0 | 0 | 16 | 7 | 0 | 4 | 0 | 8 | 0 | 1 | 0 | 0 | 0 | 56 | |
| 4:50 PM | 4 | 13 | 1 | 0 | 0 | 15 | 10 | 0 | 8 | 0 | 5 | 0 | 0 | 0 | 0 | 0 | 56 | |
| 4:55 PM | 8 | 11 | 0 | 0 | 0 | 8 | 9 | 0 | 8 | 0 | 3 | 0 | 1 | 0 | 0 | 0 | 48 | 623 |
| 5:00 PM | 9 | 19 | 2 | 0 | 1 | 5 | 5 | 0 | 8 | 0 | 5 | 0 | 0 | 0 | 2 | 0 | 56 | 643 |
| 5:05 PM | 6 | 13 | 0 | 0 | 0 | 7 | 8 | 0 | 11 | 0 | 9 | 0 | 0 | 0 | 0 | 0 | 54 | 640 |
| 5:10 PM | 7 | 11 | 0 | 0 | 1 | 8 | 14 | 0 | 8 | 0 | 4 | 0 | 0 | 0 | 1 | 0 | 54 | 645 |
| 5:15 PM | 4 | 11 | 0 | 0 | 0 | 10 | 15 | 0 | 10 | 0 | 3 | 0 | 2 | 0 | 0 | 0 | 55 | 662 |
| 5:20 PM | 4 | 15 | 0 | 0 | 2 | 8 | 10 | 0 | 7 | 0 | 9 | 0 | 0 | 0 | 0 | 0 | 55 | 668 |
| 5:25 PM | 3 | 12 | 0 | 0 | 0 | 6 | 8 | 0 | 6 | 0 | 7 | 0 | 0 | 0 | 0 | 0 | 42 | 652 |
| 5:30 PM | 2 | 13 | 1 | 0 | 0 | 13 | 11 | 0 | 12 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 55 | 635 |
| 5:35 PM | 6 | 8 | 0 | 0 | 0 | 14 | 6 | 0 | 5 | 0 | 5 | 0 | 0 | 0 | 0 | 0 | 44 | 624 |
| 5:40 PM | 4 | 14 | 0 | 0 | 0 | 12 | 5 | 0 | 5 | 0 | 4 | 0 | 0 | 0 | 0 | 0 | 44 | 619 |
| 5:45 PM | 2 | 5 | 0 | 0 | 0 | 8 | 10 | 0 | 6 | 0 | 10 | 0 | 0 | 0 | 0 | 0 | 41 | 604 |
| 5:50 PM | 4 | 8 | 0 | 0 | 1 | 15 | 6 | 0 | 7 | 0 | 5 | 0 | 0 | 0 | 0 | 0 | 46 | 594 |
| 5:55 PM | 4 | 14 | 1 | 0 | 0 | 10 | 11 | 0 | 4 | 0 | 5 | 0 | 0 | 0 | 0 | 0 | 49 | 595 |

| Peak 15-Min Flowrates | Northbound | | | | Southbound | | | | Eastbound | | | | Westbound | | | | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Left | Thru | Right | U | Left | Thru | Right | U | Left | Thru | Right | U | Left | Thru | Right | U | |
| All Vehicles | 88 | 160 | 8 | 0 | 0 | 184 | 148 | 0 | 64 | 0 | 72 | 0 | 12 | 0 | 4 | 0 | 740 |
| Heavy Trucks | 0 | 0 | 0 | | 0 | 8 | 4 | | 0 | 0 | 0 | | 0 | 0 | 0 | | 12 |
| Pedestrians | | 0 | | | | 8 | | | | 12 | | | | 0 | | | 20 |
| Bicycles | 0 | 0 | 0 | | 0 | 0 | 0 | | 1 | 0 | 0 | | 0 | 0 | 0 | | 1 |
| Railroad | | | | | | | | | | | | | | | | | |
| Stopped Buses | | | | | | | | | | | | | | | | | |

*Comments:*

Report generated on 7/23/2015 3:22 PM

SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

Type of peak hour being reported: Intersection Peak

Method for determining peak hour: Total Entering Volume

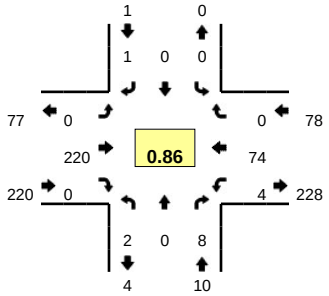
**LOCATION:** N Center St -- Fulton St

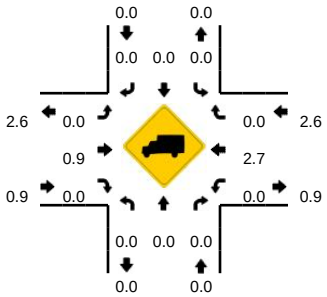
**CITY/STATE:** Newberg, OR

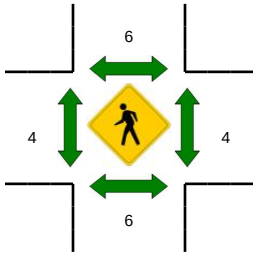
**QC JOB #:** 13604101

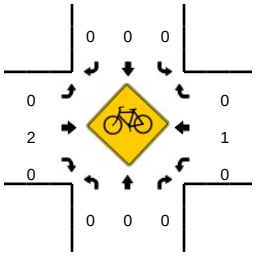
**DATE:** Tue, Sep 29 2015

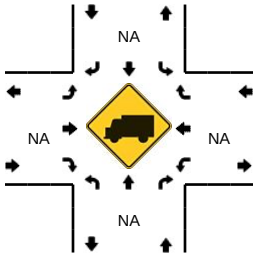
**Peak-Hour: 7:15 AM -- 8:15 AM**
**Peak 15-Min: 7:25 AM -- 7:40 AM**

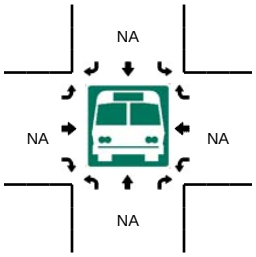







| 5-Min Count Period Beginning At | N Center St (Northbound) | | | | N Center St (Southbound) | | | | Fulton St (Eastbound) | | | | Fulton St (Westbound) | | | | Total | Hourly Totals |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Left | Thru | Right | U | Left | Thru | Right | U | Left | Thru | Right | U | Left | Thru | Right | U | | |
| 7:00 AM | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 0 | 0 | 15 | 0 | 0 | 0 | 2 | 0 | 0 | 19 | |
| 7:05 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 13 | 0 | 0 | 0 | 3 | 0 | 0 | 16 | |
| 7:10 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 15 | 0 | 0 | 0 | 1 | 0 | 0 | 16 | |
| 7:15 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 21 | 0 | 0 | 0 | 0 | 0 | 0 | 21 | |
| 7:20 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 26 | 0 | 0 | 0 | 3 | 0 | 0 | 29 | |
| 7:25 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 23 | 0 | 0 | 1 | 8 | 0 | 0 | 32 | |
| 7:30 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 21 | 0 | 0 | 1 | 4 | 0 | 0 | 26 | |
| 7:35 AM | 0 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 18 | 0 | 0 | 0 | 11 | 0 | 0 | 32 | |
| 7:40 AM | 1 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 8 | 0 | 0 | 0 | 15 | 0 | 0 | 25 | |
| 7:45 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 15 | 0 | 0 | 1 | 6 | 0 | 0 | 22 | |
| 7:50 AM | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 30 | 0 | 0 | 0 | 5 | 0 | 0 | 36 | |
| 7:55 AM | 0 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 17 | 0 | 0 | 0 | 7 | 0 | 0 | 27 | 301 |
| 8:00 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 14 | 0 | 0 | 0 | 8 | 0 | 0 | 22 | 304 |
| 8:05 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 13 | 0 | 0 | 0 | 3 | 0 | 0 | 16 | 304 |
| 8:10 AM | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 14 | 0 | 0 | 1 | 4 | 0 | 0 | 21 | 309 |
| 8:15 AM | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 10 | 0 | 0 | 0 | 4 | 1 | 0 | 16 | 304 |
| 8:20 AM | 0 | 0 | 2 | 0 | 0 | 0 | 1 | 0 | 0 | 8 | 0 | 0 | 1 | 3 | 0 | 0 | 15 | 290 |
| 8:25 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 10 | 0 | 0 | 0 | 1 | 0 | 0 | 11 | 269 |
| 8:30 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 10 | 0 | 0 | 0 | 5 | 0 | 0 | 15 | 258 |
| 8:35 AM | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 12 | 0 | 0 | 0 | 6 | 0 | 0 | 20 | 246 |
| 8:40 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 9 | 0 | 0 | 1 | 8 | 0 | 0 | 19 | 240 |
| 8:45 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 9 | 0 | 0 | 0 | 4 | 0 | 0 | 13 | 231 |
| 8:50 AM | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 16 | 1 | 0 | 1 | 9 | 0 | 0 | 28 | 223 |
| 8:55 AM | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 1 | 13 | 0 | 0 | 2 | 5 | 0 | 0 | 23 | 219 |

| Peak 15-Min Flowrates | Northbound | | | | Southbound | | | | Eastbound | | | | Westbound | | | | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Left | Thru | Right | U | Left | Thru | Right | U | Left | Thru | Right | U | Left | Thru | Right | U | |
| All Vehicles | 0 | 0 | 12 | 0 | 0 | 0 | 0 | 0 | 0 | 248 | 0 | 0 | 8 | 92 | 0 | 0 | 360 |
| Heavy Trucks | 0 | 0 | 0 | | 0 | 0 | 0 | | 0 | 4 | 0 | | 0 | 4 | 0 | | 8 |
| Pedestrians | | 8 | | | | 0 | | | | 4 | | | | 0 | | | 12 |
| Bicycles | 0 | 0 | 0 | | 0 | 0 | 0 | | 0 | 0 | 0 | | 0 | 0 | 0 | | 0 |
| Railroad | | | | | | | | | | | | | | | | | |
| Stopped Buses | | | | | | | | | | | | | | | | | |

*Comments:*

Report generated on 10/5/2015 1:13 AM

SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

Type of peak hour being reported: Intersection Peak

Method for determining peak hour: Total Entering Volume

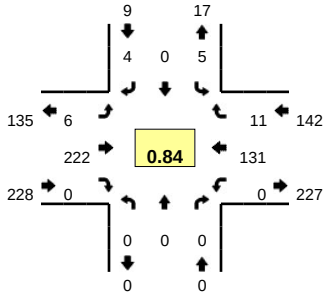
**LOCATION:** E Cherry St -- Fulton St

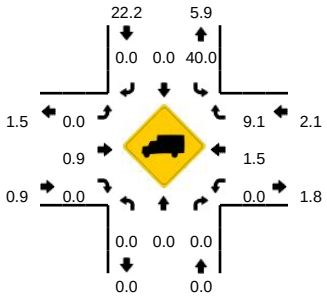
**CITY/STATE:** Newberg, OR

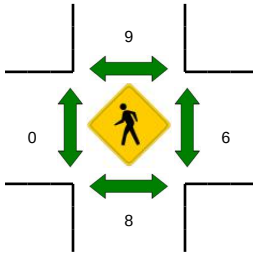
**QC JOB #:** 13604103

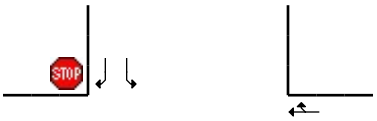
**DATE:** Tue, Sep 29 2015

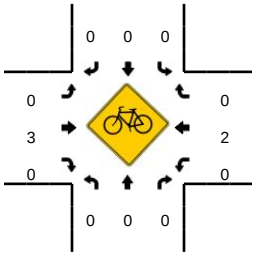
**Peak-Hour: 7:15 AM -- 8:15 AM**
**Peak 15-Min: 7:45 AM -- 8:00 AM**

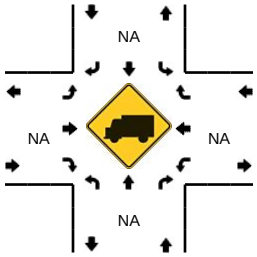


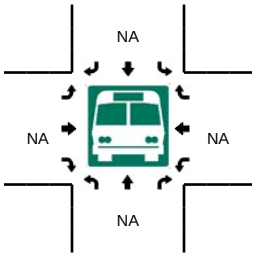






| 5-Min Count Period Beginning At | E Cherry St (Northbound) | | | | E Cherry St (Southbound) | | | | Fulton St (Eastbound) | | | | Fulton St (Westbound) | | | | Total | Hourly Totals |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Left | Thru | Right | U | Left | Thru | Right | U | Left | Thru | Right | U | Left | Thru | Right | U | | |
| 7:00 AM | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 15 | 0 | 0 | 0 | 2 | 2 | 0 | 20 | |
| 7:05 AM | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 11 | 0 | 0 | 0 | 4 | 0 | 0 | 17 | |
| 7:10 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 15 | 0 | 0 | 0 | 1 | 2 | 0 | 18 | |
| 7:15 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 20 | 0 | 0 | 0 | 2 | 0 | 0 | 22 | |
| 7:20 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 24 | 0 | 0 | 0 | 5 | 0 | 0 | 29 | |
| 7:25 AM | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 25 | 0 | 0 | 0 | 8 | 0 | 0 | 35 | |
| 7:30 AM | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 20 | 0 | 0 | 0 | 5 | 1 | 0 | 27 | |
| 7:35 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 24 | 0 | 0 | 0 | 15 | 1 | 0 | 40 | |
| 7:40 AM | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 8 | 0 | 0 | 0 | 19 | 0 | 0 | 28 | |
| 7:45 AM | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 1 | 17 | 0 | 0 | 0 | 16 | 1 | 0 | 36 | |
| 7:50 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 25 | 0 | 0 | 0 | 17 | 1 | 0 | 44 | |
| 7:55 AM | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 2 | 17 | 0 | 0 | 0 | 11 | 1 | 0 | 33 | 349 |
| 8:00 AM | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 2 | 15 | 0 | 0 | 0 | 15 | 3 | 0 | 36 | 365 |
| 8:05 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 15 | 0 | 0 | 0 | 8 | 2 | 0 | 25 | 373 |
| 8:10 AM | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 12 | 0 | 0 | 0 | 10 | 1 | 0 | 24 | 379 |
| 8:15 AM | 0 | 0 | 0 | 0 | 3 | 0 | 0 | 0 | 0 | 6 | 0 | 0 | 0 | 8 | 0 | 0 | 17 | 374 |
| 8:20 AM | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 10 | 0 | 0 | 0 | 6 | 1 | 0 | 18 | 363 |
| 8:25 AM | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 1 | 9 | 0 | 0 | 0 | 4 | 0 | 0 | 16 | 344 |
| 8:30 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 8 | 0 | 0 | 0 | 7 | 0 | 0 | 16 | 333 |
| 8:35 AM | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 13 | 0 | 0 | 0 | 8 | 1 | 0 | 24 | 317 |
| 8:40 AM | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 2 | 9 | 0 | 0 | 0 | 9 | 0 | 0 | 22 | 311 |
| 8:45 AM | 0 | 0 | 0 | 0 | 3 | 0 | 1 | 0 | 2 | 8 | 0 | 0 | 0 | 8 | 0 | 0 | 22 | 297 |
| 8:50 AM | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 15 | 0 | 0 | 0 | 15 | 2 | 0 | 34 | 287 |
| 8:55 AM | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 1 | 16 | 0 | 0 | 0 | 12 | 0 | 0 | 31 | 285 |

| Peak 15-Min Flowrates | Northbound | | | | Southbound | | | | Eastbound | | | | Westbound | | | | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Left | Thru | Right | U | Left | Thru | Right | U | Left | Thru | Right | U | Left | Thru | Right | U | |
| All Vehicles | 0 | 0 | 0 | 0 | 4 | 0 | 8 | 0 | 16 | 236 | 0 | 0 | 0 | 176 | 12 | 0 | 452 |
| Heavy Trucks | 0 | 0 | 0 | | 4 | 0 | 0 | | 0 | 4 | 0 | | 0 | 4 | 0 | | 12 |
| Pedestrians | | 8 | | | | 8 | | | | 0 | | | | 4 | | | 20 |
| Bicycles | 0 | 0 | 0 | | 0 | 0 | 0 | | 0 | 0 | 0 | | 0 | 2 | 0 | | 2 |
| Railroad | | | | | | | | | | | | | | | | | |
| Stopped Buses | | | | | | | | | | | | | | | | | |

*Comments:*

Report generated on 10/5/2015 1:13 AM

SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

Type of peak hour being reported: Intersection Peak

Method for determining peak hour: Total Entering Volume

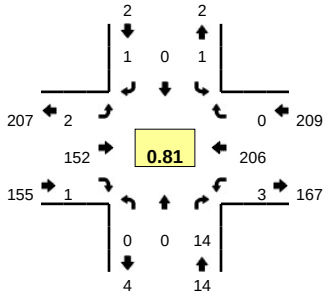
**LOCATION:** N Center St -- Fulton St

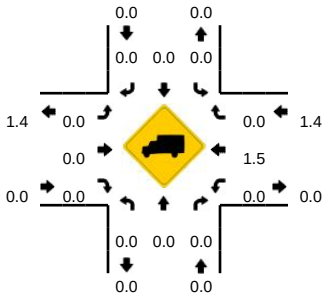
**CITY/STATE:** Newberg, OR

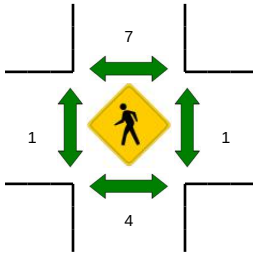
**QC JOB #:** 13604102

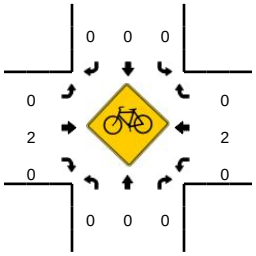
**DATE:** Tue, Sep 29 2015

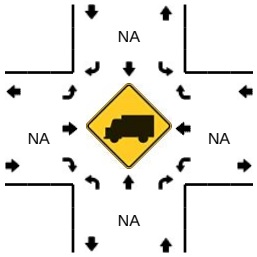
**Peak-Hour: 4:45 PM -- 5:45 PM**
**Peak 15-Min: 5:30 PM -- 5:45 PM**

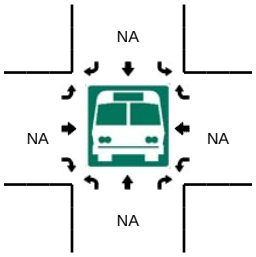







| 5-Min Count Period Beginning At | N Center St (Northbound) | | | | N Center St (Southbound) | | | | Fulton St (Eastbound) | | | | Fulton St (Westbound) | | | | Total | Hourly Totals |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Left | Thru | Right | U | Left | Thru | Right | U | Left | Thru | Right | U | Left | Thru | Right | U | | |
| 4:00 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 9 | 0 | 0 | 0 | 18 | 0 | 0 | 27 | |
| 4:05 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 12 | 0 | 0 | 1 | 31 | 0 | 0 | 44 | |
| 4:10 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 13 | 0 | 0 | 0 | 19 | 0 | 0 | 32 | |
| 4:15 PM | 0 | 0 | 1 | 0 | 0 | 0 | 1 | 0 | 0 | 9 | 0 | 0 | 2 | 12 | 1 | 0 | 26 | |
| 4:20 PM | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 20 | 0 | 0 | 0 | 17 | 0 | 0 | 38 | |
| 4:25 PM | 1 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 19 | 0 | 0 | 0 | 12 | 0 | 0 | 34 | |
| 4:30 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 7 | 0 | 0 | 0 | 10 | 0 | 0 | 17 | |
| 4:35 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 9 | 0 | 0 | 0 | 22 | 0 | 0 | 31 | |
| 4:40 PM | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 14 | 0 | 0 | 1 | 7 | 0 | 0 | 24 | |
| 4:45 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 14 | 0 | 0 | 1 | 17 | 0 | 0 | 32 | |
| 4:50 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 16 | 1 | 0 | 0 | 19 | 0 | 0 | 36 | |
| 4:55 PM | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 4 | 0 | 0 | 0 | 16 | 0 | 0 | 21 | 362 |
| 5:00 PM | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 12 | 0 | 0 | 1 | 14 | 0 | 0 | 28 | 363 |
| 5:05 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 15 | 0 | 0 | 0 | 17 | 0 | 0 | 32 | 351 |
| 5:10 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 10 | 0 | 0 | 0 | 21 | 0 | 0 | 31 | 350 |
| 5:15 PM | 0 | 0 | 2 | 0 | 0 | 0 | 1 | 0 | 1 | 15 | 0 | 0 | 0 | 16 | 0 | 0 | 35 | 359 |
| 5:20 PM | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 9 | 0 | 0 | 0 | 11 | 0 | 0 | 22 | 343 |
| 5:25 PM | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 8 | 0 | 0 | 0 | 17 | 0 | 0 | 26 | 335 |
| 5:30 PM | 0 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 12 | 0 | 0 | 1 | 20 | 0 | 0 | 36 | 354 |
| 5:35 PM | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 1 | 19 | 0 | 0 | 0 | 18 | 0 | 0 | 40 | 363 |
| 5:40 PM | 0 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 18 | 0 | 0 | 0 | 20 | 0 | 0 | 41 | 380 |
| 5:45 PM | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 10 | 0 | 0 | 0 | 9 | 0 | 0 | 20 | 368 |
| 5:50 PM | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 14 | 0 | 0 | 0 | 17 | 0 | 0 | 32 | 364 |
| 5:55 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 5 | 0 | 0 | 0 | 19 | 0 | 0 | 24 | 367 |

| Peak 15-Min Flowrates | Northbound | | | | Southbound | | | | Eastbound | | | | Westbound | | | | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Left | Thru | Right | U | Left | Thru | Right | U | Left | Thru | Right | U | Left | Thru | Right | U | |
| All Vehicles | 0 | 0 | 28 | 0 | 4 | 0 | 0 | 0 | 4 | 196 | 0 | 0 | 4 | 232 | 0 | 0 | 468 |
| Heavy Trucks | 0 | 0 | 0 | | 0 | 0 | 0 | | 0 | 0 | 0 | | 0 | 0 | 0 | | 0 |
| Pedestrians | | 8 | | | | 8 | | | | 4 | | | | 4 | | | 24 |
| Bicycles | 0 | 0 | 0 | | 0 | 0 | 0 | | 0 | 0 | 0 | | 0 | 0 | 0 | | 0 |
| Railroad | | | | | | | | | | | | | | | | | |
| Stopped Buses | | | | | | | | | | | | | | | | | |

*Comments:*

Report generated on 10/5/2015 1:13 AM

SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

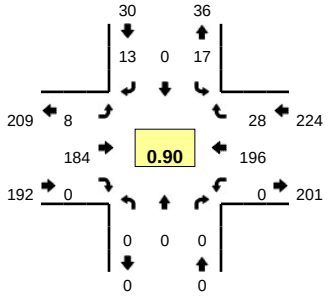
Type of peak hour being reported: Intersection Peak

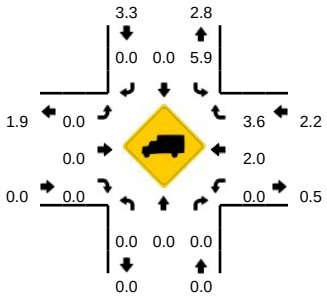
Method for determining peak hour: Total Entering Volume

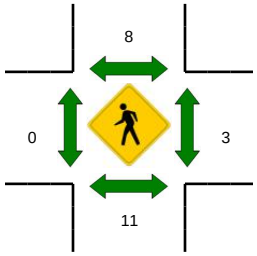
**LOCATION:** E Cherry St -- Fulton St
**CITY/STATE:** Newberg, OR

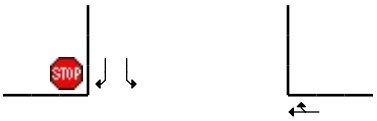
**QC JOB #:** 13604104
**DATE:** Tue, Sep 29 2015

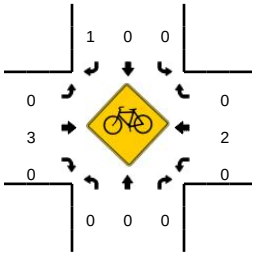
**Peak-Hour: 4:05 PM -- 5:05 PM**
**Peak 15-Min: 4:05 PM -- 4:20 PM**

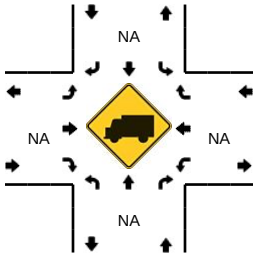


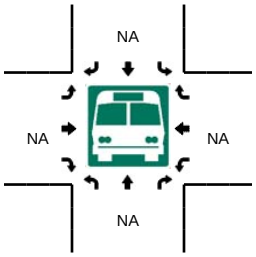






| 5-Min Count Period Beginning At | E Cherry St (Northbound) | | | | E Cherry St (Southbound) | | | | Fulton St (Eastbound) | | | | Fulton St (Westbound) | | | | Total | Hourly Totals |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Left | Thru | Right | U | Left | Thru | Right | U | Left | Thru | Right | U | Left | Thru | Right | U | | |
| 4:00 PM | 0 | 0 | 0 | 0 | 1 | 0 | 2 | 0 | 0 | 12 | 0 | 0 | 0 | 17 | 2 | 0 | 34 | |
| 4:05 PM | 0 | 0 | 0 | 0 | 0 | 0 | 3 | 0 | 2 | 16 | 0 | 0 | 0 | 28 | 1 | 0 | 50 | |
| 4:10 PM | 0 | 0 | 0 | 0 | 2 | 0 | 1 | 0 | 0 | 24 | 0 | 0 | 0 | 13 | 2 | 0 | 42 | |
| 4:15 PM | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 13 | 0 | 0 | 0 | 15 | 3 | 0 | 32 | |
| 4:20 PM | 0 | 0 | 0 | 0 | 2 | 0 | 2 | 0 | 1 | 26 | 0 | 0 | 0 | 19 | 0 | 0 | 50 | |
| 4:25 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 22 | 0 | 0 | 0 | 11 | 4 | 0 | 38 | |
| 4:30 PM | 0 | 0 | 0 | 0 | 3 | 0 | 0 | 0 | 1 | 8 | 0 | 0 | 0 | 15 | 2 | 0 | 29 | |
| 4:35 PM | 0 | 0 | 0 | 0 | 2 | 0 | 1 | 0 | 1 | 10 | 0 | 0 | 0 | 18 | 0 | 0 | 32 | |
| 4:40 PM | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 17 | 0 | 0 | 0 | 11 | 2 | 0 | 32 | |
| 4:45 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 14 | 0 | 0 | 0 | 18 | 1 | 0 | 33 | |
| 4:50 PM | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 1 | 14 | 0 | 0 | 0 | 17 | 7 | 0 | 41 | |
| 4:55 PM | 0 | 0 | 0 | 0 | 4 | 0 | 0 | 0 | 1 | 5 | 0 | 0 | 0 | 18 | 2 | 0 | 30 | 443 |
| 5:00 PM | 0 | 0 | 0 | 0 | 1 | 0 | 4 | 0 | 0 | 15 | 0 | 0 | 0 | 13 | 4 | 0 | 37 | 446 |
| 5:05 PM | 0 | 0 | 0 | 0 | 2 | 0 | 1 | 0 | 0 | 16 | 0 | 0 | 0 | 17 | 1 | 0 | 37 | 433 |
| 5:10 PM | 0 | 0 | 0 | 0 | 4 | 0 | 2 | 0 | 0 | 11 | 0 | 0 | 0 | 20 | 3 | 0 | 40 | 431 |
| 5:15 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 18 | 0 | 0 | 0 | 16 | 1 | 0 | 37 | 436 |
| 5:20 PM | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 15 | 0 | 0 | 0 | 14 | 0 | 0 | 30 | 416 |
| 5:25 PM | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 7 | 0 | 0 | 0 | 14 | 1 | 0 | 23 | 401 |
| 5:30 PM | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 18 | 0 | 0 | 0 | 20 | 1 | 0 | 41 | 413 |
| 5:35 PM | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 20 | 0 | 0 | 0 | 18 | 0 | 0 | 39 | 420 |
| 5:40 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 21 | 0 | 0 | 0 | 24 | 2 | 0 | 47 | 435 |
| 5:45 PM | 0 | 0 | 0 | 0 | 2 | 0 | 1 | 0 | 0 | 9 | 0 | 0 | 0 | 8 | 0 | 0 | 20 | 422 |
| 5:50 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 20 | 0 | 0 | 0 | 20 | 1 | 0 | 41 | 422 |
| 5:55 PM | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 12 | 0 | 0 | 0 | 16 | 0 | 0 | 30 | 422 |

| Peak 15-Min Flowrates | Northbound | | | | Southbound | | | | Eastbound | | | | Westbound | | | | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Left | Thru | Right | U | Left | Thru | Right | U | Left | Thru | Right | U | Left | Thru | Right | U | |
| All Vehicles | 0 | 0 | 0 | 0 | 12 | 0 | 16 | 0 | 8 | 212 | 0 | 0 | 0 | 224 | 24 | 0 | 496 |
| Heavy Trucks | 0 | 0 | 0 | | 0 | 0 | 0 | | 0 | 0 | 0 | | 0 | 4 | 0 | | 4 |
| Pedestrians | | 12 | | | | 0 | | | | 0 | | | | 0 | | | 12 |
| Bicycles | 0 | 0 | 0 | | 0 | 0 | 0 | | 0 | 1 | 0 | | 0 | 0 | 0 | | 1 |
| Railroad | | | | | | | | | | | | | | | | | |
| Stopped Buses | | | | | | | | | | | | | | | | | |

*Comments:*

Report generated on 10/5/2015 1:13 AM

SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

OREGON DEPARTMENT OF TRANSPORTATION - TRANSPORTATION DEVELOPMENT DIVISION
TRANSPORTATION DATA SECTION - CRASH ANALYSIS AND REPORTING UNIT
CRASH SUMMARIES BY YEAR BY COLLISION TYPE



Fulton Street & Meridian Street
January 1, 2009 through December 31, 2013

| COLLISION TYPE | FATAL CRASHES | NON-FATAL CRASHES | PROPERTY DAMAGE ONLY | TOTAL CRASHES | PEOPLE KILLED | PEOPLE INJURED | TRUCKS | DRY SURF | WET SURF | DAY | DARK | INTER-SECTION | INTER-SECTION RELATED | OFF-ROAD |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| YEAR: 2011 | | | | | | | | | | | | | | |
| TURNING MOVEMENTS | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 0 |
| 2011 TOTAL | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 0 |
| FINAL TOTAL | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 0 |

*Disclaimer: A higher number of crashes may be reported as of 2011 compared to prior years. This does not reflect an increase in annual crashes. The higher numbers result from a change to an internal departmental process that allows the Crash Analysis and Reporting Unit to add previously unavailable, non-fatal crash reports to the annual data file. Please be aware of this change when comparing pre-2011 crash statistics.*

OREGON DEPARTMENT OF TRANSPORTATION - TRANSPORTATION DEVELOPMENT DIVISION
TRANSPORTATION DATA SECTION - CRASH ANALYSIS AND REPORTING UNIT
CRASH SUMMARIES BY YEAR BY COLLISION TYPE



Fulton Street & Villa Road
January 1, 2009 through December 31, 2013

| COLLISION TYPE | FATAL CRASHES | NON-FATAL CRASHES | PROPERTY DAMAGE ONLY | TOTAL CRASHES | PEOPLE KILLED | PEOPLE INJURED | TRUCKS | DRY SURF | WET SURF | DAY | DARK | INTER-SECTION | INTER-SECTION RELATED | OFF-ROAD |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| YEAR: | | | | | | | | | | | | | | |
| TOTAL | | | | | | | | | | | | | | |
| FINAL TOTAL | | | | | | | | | | | | | | |

*Disclaimer: A higher number of crashes may be reported as of 2011 compared to prior years. This does not reflect an increase in annual crashes. The higher numbers result from a change to an internal departmental process that allows the Crash Analysis and Reporting Unit to add previously unavailable, non-fatal crash reports to the annual data file. Please be aware of this change when comparing pre-2011 crash statistics.*

University Village TIA

Vistro File: J:\...\Newberg University Village.vistro
Report File: J:\...\AM Existing.pdf

Scenario 1: AM Existing Traffic
10/6/2015

**Intersection Analysis Summary**

| ID | Intersection Name | Control Type | Method | Worst Mvmt | V/C | Delay (s/veh) | LOS |
|---|---|---|---|---|---|---|---|
| 1 | Meridian St at Fulton St | Two-way stop | HCM2010 | WBT | 0.000 | 10.8 | B |
| 2 | Fulton St at Center St | Two-way stop | HCM2010 | NBT | 0.000 | 11.4 | B |
| 3 | Fulton St at Friendsview Entrance | Two-way stop | HCM2010 | SBL | 0.011 | 11.4 | B |
| 4 | Fulton at Villa Rd (South) | Two-way stop | HCM2010 | EBL | 0.094 | 12.0 | B |

V/C, Delay, LOS: For two-way stop, these values are taken from the movement with the worst (highest) delay value; for all other control types, they are taken for the whole intersection.

**Intersection Level Of Service Report**
**#1: Meridian St at Fulton St**

| | | | |
|---|---|---|---|
| Control Type: | Two-way stop | Delay (sec / veh): | 10.8 |
| Analysis Method: | HCM2010 | Level Of Service: | B |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.000 |

**Intersection Setup**

| Name | Meridian St | | | | | | Fulton St | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration | | | | | | | | | | | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| Speed [mph] | 25.00 | | | 25.00 | | | 25.00 | | | 25.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Crosswalk | yes | | | yes | | | yes | | | yes | | |

**Volumes**

| Name | Meridian St | | | | | | Fulton St | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 0 | 25 | 17 | 35 | 51 | 0 | 0 | 0 | 0 | 48 | 0 | 11 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 6.50 | 6.50 | 6.50 | 6.50 | 6.50 | 6.50 | 6.50 | 6.50 | 6.50 | 6.50 | 6.50 | 6.50 |
| Growth Rate | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 0 | 25 | 17 | 35 | 51 | 0 | 0 | 0 | 0 | 48 | 0 | 11 |
| Peak Hour Factor | 0.8200 | 0.8200 | 0.8200 | 0.8200 | 0.8200 | 0.8200 | 0.8200 | 0.8200 | 0.8200 | 0.8200 | 0.8200 | 0.8200 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 0 | 8 | 5 | 11 | 16 | 0 | 0 | 0 | 0 | 15 | 0 | 3 |
| Total Analysis Volume [veh/h] | 0 | 30 | 21 | 43 | 62 | 0 | 0 | 0 | 0 | 59 | 0 | 13 |
| Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| Priority Scheme | Free | Free | Stop | Stop |
|---|---|---|---|---|
| Flared Lane | | | no | no |
| Storage Area [veh] | 0 | 0 | 0 | 0 |
| Two-Stage Gap Acceptance | | | no | no |
| Number of Storage Spaces in Median | 0 | 0 | 0 | 0 |

**Movement, Approach, & Intersection Results**

| V/C, Movement V/C Ratio | 0.00 | 0.00 | 0.00 | 0.03 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.08 | 0.00 | 0.01 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| d_M, Delay for Movement [s/veh] | 7.38 | 0.00 | 0.00 | 7.43 | 0.00 | 0.00 | 9.94 | 10.38 | 8.64 | 10.30 | 10.78 | 9.00 |
| Movement LOS | A | A | A | A | A | A | A | B | A | B | B | A |
| 95th-Percentile Queue Length [veh] | 0.00 | 0.00 | 0.00 | 0.22 | 0.22 | 0.22 | 0.00 | 0.00 | 0.00 | 0.30 | 0.30 | 0.30 |
| 95th-Percentile Queue Length [ft] | 0.00 | 0.00 | 0.00 | 5.53 | 5.53 | 5.53 | 0.00 | 0.00 | 0.00 | 7.57 | 7.57 | 7.57 |
| d_A, Approach Delay [s/veh] | 0.00 | | | 3.04 | | | 9.65 | | | 10.06 | | |
| Approach LOS | A | | | A | | | A | | | B | | |
| d_I, Intersection Delay [s/veh] | 4.58 | | | | | | | | | | | |
| Intersection LOS | B | | | | | | | | | | | |

**Intersection Level Of Service Report**
**#2: Fulton St at Center St**

| | | | |
|---|---|---|---|
| Control Type: | Two-way stop | Delay (sec / veh): | 11.4 |
| Analysis Method: | HCM2010 | Level Of Service: | B |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.000 |

**Intersection Setup**

| Name | Center St | | | | | | | | | Fulton St | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration | | | | | | | | | | | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| Speed [mph] | 25.00 | | | 25.00 | | | 25.00 | | | 25.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Crosswalk | yes | | | yes | | | yes | | | yes | | |

**Volumes**

| Name | Center St | | | | | | | | | Fulton St | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 2 | 0 | 8 | 0 | 0 | 1 | 0 | 220 | 0 | 4 | 74 | 0 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.20 | 2.20 | 2.20 | 2.20 | 2.20 | 2.20 | 2.20 | 2.20 | 2.20 | 2.20 | 2.20 | 2.20 |
| Growth Rate | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 2 | 0 | 8 | 0 | 0 | 1 | 0 | 220 | 0 | 4 | 74 | 0 |
| Peak Hour Factor | 0.8600 | 0.8600 | 0.8600 | 0.8600 | 0.8600 | 0.8600 | 0.8600 | 0.8600 | 0.8600 | 0.8600 | 0.8600 | 0.8600 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 1 | 0 | 2 | 0 | 0 | 0 | 0 | 64 | 0 | 1 | 22 | 0 |
| Total Analysis Volume [veh/h] | 2 | 0 | 9 | 0 | 0 | 1 | 0 | 256 | 0 | 5 | 86 | 0 |
| Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| Priority Scheme | Stop | Stop | Free | Free |
|---|---|---|---|---|
| Flared Lane | no | no | | |
| Storage Area [veh] | 0 | 0 | 0 | 0 |
| Two-Stage Gap Acceptance | no | no | | |
| Number of Storage Spaces in Median | 0 | 0 | 0 | 0 |

**Movement, Approach, & Intersection Results**

| V/C, Movement V/C Ratio | 0.00 | 0.00 | 0.01 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| d_M, Delay for Movement [s/veh] | 11.08 | 11.39 | 9.68 | 11.11 | 11.32 | 8.71 | 7.39 | 0.00 | 0.00 | 7.76 | 0.00 | 0.00 |
| Movement LOS | B | B | A | B | B | A | A | A | A | A | A | A |
| 95th-Percentile Queue Length [veh] | 0.05 | 0.05 | 0.05 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.22 | 0.22 | 0.22 |
| 95th-Percentile Queue Length [ft] | 1.13 | 1.13 | 1.13 | 0.08 | 0.08 | 0.08 | 0.00 | 0.00 | 0.00 | 5.60 | 5.60 | 5.60 |
| d_A, Approach Delay [s/veh] | 9.93 | | | 8.71 | | | 0.00 | | | 0.43 | | |
| Approach LOS | A | | | A | | | A | | | A | | |
| d_I, Intersection Delay [s/veh] | 0.44 | | | | | | | | | | | |
| Intersection LOS | B | | | | | | | | | | | |

**Intersection Level Of Service Report**
**#3: Fulton St at Friendsview Entrance**

| | | | |
|---|---|---|---|
| Control Type: | Two-way stop | Delay (sec / veh): | 11.4 |
| Analysis Method: | HCM2010 | Level Of Service: | B |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.011 |

**Intersection Setup**

| Name | Cherry St | | Fulton St | | Fulton St | |
|---|---|---|---|---|---|---|
| Approach | Southbound | | Eastbound | | Westbound | |
| Lane Configuration | | | | | | |
| Turning Movement | Left | Right | Left | Thru | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Pocket | 0 | 0 | 0 | 0 | 0 | 0 |
| Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| Speed [mph] | 25.00 | | 25.00 | | 25.00 | |
| Grade [%] | 0.00 | | 0.00 | | 0.00 | |
| Crosswalk | yes | | yes | | yes | |

**Volumes**

| Name | Cherry St | | Fulton St | | Fulton St | |
|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 5 | 4 | 6 | 222 | 131 | 11 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.70 | 2.70 | 2.70 | 2.70 | 2.70 | 2.70 |
| Growth Rate | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 5 | 4 | 6 | 222 | 131 | 11 |
| Peak Hour Factor | 0.8400 | 0.8400 | 0.8400 | 0.8400 | 0.8400 | 0.8400 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 1 | 1 | 2 | 66 | 39 | 3 |
| Total Analysis Volume [veh/h] | 6 | 5 | 7 | 264 | 156 | 13 |
| Pedestrian Volume [ped/h] | 0 | | 0 | | 0 | |

**Intersection Settings**

| Priority Scheme | Stop | Free | Free |
|---|---|---|---|
| Flared Lane | | | |
| Storage Area [veh] | 0 | 0 | 0 |
| Two-Stage Gap Acceptance | no | | |
| Number of Storage Spaces in Median | 0 | 0 | 0 |

**Movement, Approach, & Intersection Results**

| V/C, Movement V/C Ratio | 0.01 | 0.01 | 0.00 | 0.00 | 0.00 | 0.00 |
|---|---|---|---|---|---|---|
| d_M, Delay for Movement [s/veh] | 11.39 | 9.11 | 7.58 | 0.00 | 0.00 | 0.00 |
| Movement LOS | B | A | A | A | A | A |
| 95th-Percentile Queue Length [veh] | 0.03 | 0.02 | 0.71 | 0.71 | 0.00 | 0.00 |
| 95th-Percentile Queue Length [ft] | 0.80 | 0.43 | 17.85 | 17.85 | 0.00 | 0.00 |
| d_A, Approach Delay [s/veh] | 10.35 | | 0.20 | | 0.00 | |
| Approach LOS | B | | A | | A | |
| d_I, Intersection Delay [s/veh] | 0.37 | | | | | |
| Intersection LOS | B | | | | | |

**Intersection Level Of Service Report**
**#4: Fulton at Villa Rd (South)**

| | | | |
|---|---|---|---|
| Control Type: | Two-way stop | Delay (sec / veh): | 12.0 |
| Analysis Method: | HCM2010 | Level Of Service: | B |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.094 |

**Intersection Setup**

| Name | Villa Road | | Villa Road | | Fulton St | |
|---|---|---|---|---|---|---|
| Approach | Northbound | | Southbound | | Eastbound | |
| Lane Configuration | | | | | | |
| Turning Movement | Left | Thru | Thru | Right | Left | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Pocket | 0 | 0 | 0 | 0 | 0 | 0 |
| Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| Speed [mph] | 30.00 | | 30.00 | | 30.00 | |
| Grade [%] | 0.00 | | 0.00 | | 0.00 | |
| Crosswalk | yes | | yes | | yes | |

**Volumes**

| Name | Villa Road | | Villa Road | | Fulton St | |
|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 60 | 82 | 116 | 40 | 45 | 61 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 6.50 | 6.50 | 6.50 | 6.50 | 6.50 | 6.50 |
| Growth Rate | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 60 | 82 | 116 | 40 | 45 | 61 |
| Peak Hour Factor | 0.8500 | 0.8500 | 0.8500 | 0.8500 | 0.8500 | 0.8500 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 18 | 24 | 34 | 12 | 13 | 18 |
| Total Analysis Volume [veh/h] | 71 | 96 | 136 | 47 | 53 | 72 |
| Pedestrian Volume [ped/h] | 0 | | 0 | | 0 | |

**Intersection Settings**

| Priority Scheme | Free | Free | Stop |
|---|---|---|---|
| Flared Lane | | | |
| Storage Area [veh] | 0 | 0 | 0 |
| Two-Stage Gap Acceptance | | | no |
| Number of Storage Spaces in Median | 0 | 0 | 0 |

**Movement, Approach, & Intersection Results**

| V/C, Movement V/C Ratio | 0.05 | 0.00 | 0.00 | 0.00 | 0.09 | 0.08 |
|---|---|---|---|---|---|---|
| d_M, Delay for Movement [s/veh] | 7.78 | 0.00 | 0.00 | 0.00 | 12.01 | 9.49 |
| Movement LOS | A | A | A | A | B | A |
| 95th-Percentile Queue Length [veh] | 0.42 | 0.42 | 0.00 | 0.00 | 0.31 | 0.27 |
| 95th-Percentile Queue Length [ft] | 10.42 | 10.42 | 0.00 | 0.00 | 7.71 | 6.72 |
| d_A, Approach Delay [s/veh] | 3.31 | | 0.00 | | 10.56 | |
| Approach LOS | A | | A | | B | |
| d_I, Intersection Delay [s/veh] | 3.94 | | | | | |
| Intersection LOS | B | | | | | |

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Report File: J:\...\AM Existing.pdf

Scenario 1: AM Existing Traffic
10/6/2015

## Turning Movement Volume: Summary

| ID | Intersection Name | Northbound | | | Southbound | | | Eastbound | | | Westbound | | | Total Volume |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | |
| 1 | Meridian St at Fulton St | 0 | 25 | 17 | 35 | 51 | 0 | 0 | 0 | 0 | 48 | 0 | 11 | 187 |

| ID | Intersection Name | Northbound | | | Southbound | | | Eastbound | | | Westbound | | | Total Volume |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | |
| 2 | Fulton St at Center St | 2 | 0 | 8 | 0 | 0 | 1 | 0 | 220 | 0 | 4 | 74 | 0 | 309 |

| ID | Intersection Name | Southbound | | Eastbound | | Westbound | | Total Volume |
|---|---|---|---|---|---|---|---|---|
| | | Left | Right | Left | Thru | Thru | Right | |
| 3 | Fulton St at Friendsview Entrance | 5 | 4 | 6 | 222 | 131 | 11 | 379 |

| ID | Intersection Name | Northbound | | Southbound | | Eastbound | | Total Volume |
|---|---|---|---|---|---|---|---|---|
| | | Left | Thru | Thru | Right | Left | Right | |
| 4 | Fulton at Villa Rd (South) | 60 | 82 | 116 | 40 | 45 | 61 | 404 |

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Report File: J:\...\AM Existing.pdf

Scenario 1: AM Existing Traffic
10/6/2015

## Turning Movement Volume: Detail

| ID | Intersection Name | Volume Type | Northbound | | | Southbound | | | Eastbound | | | Westbound | | | Total Volume |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | |
| 1 | Meridian St at Fulton St | Final Base | 0 | 25 | 17 | 35 | 51 | 0 | 0 | 0 | 0 | 48 | 0 | 11 | 187 |
| | | Growth Rate | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | - |
| | | In Process | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | Net New Trips | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | Other | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | **Future Total** | **0** | **25** | **17** | **35** | **51** | **0** | **0** | **0** | **0** | **48** | **0** | **11** | **187** |

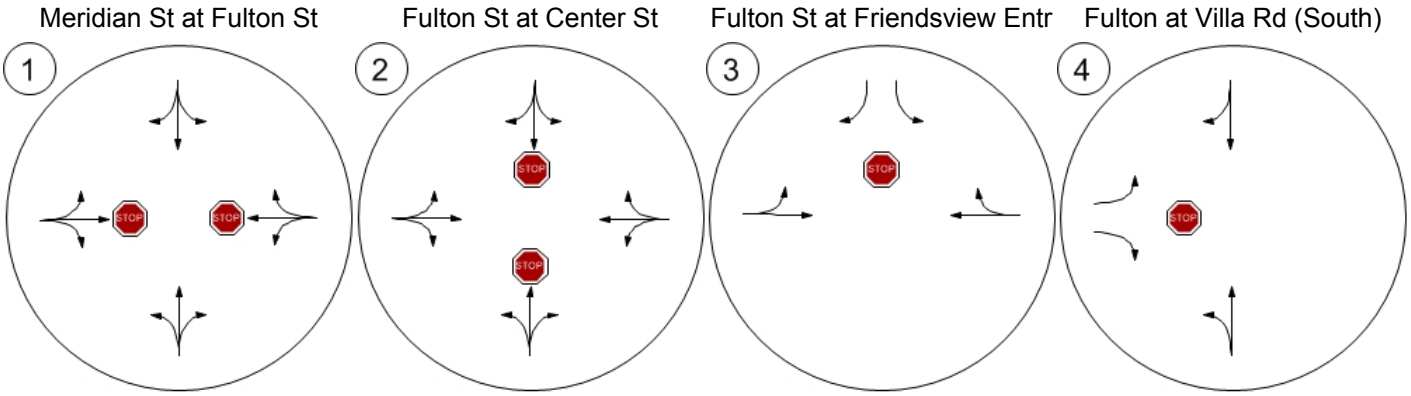
| ID | Intersection Name | Volume Type | Northbound | | | Southbound | | | Eastbound | | | Westbound | | | Total Volume |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | |
| 2 | Fulton St at Center St | Final Base | 2 | 0 | 8 | 0 | 0 | 1 | 0 | 220 | 0 | 4 | 74 | 0 | 309 |
| | | Growth Rate | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | - |
| | | In Process | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | Net New Trips | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | Other | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | **Future Total** | **2** | **0** | **8** | **0** | **0** | **1** | **0** | **220** | **0** | **4** | **74** | **0** | **309** |

| ID | Intersection Name | Volume Type | Southbound | | Eastbound | | Westbound | | Total Volume |
|---|---|---|---|---|---|---|---|---|---|
| | | | Left | Right | Left | Thru | Thru | Right | |
| 3 | Fulton St at Friendsview Entrance | Final Base | 5 | 4 | 6 | 222 | 131 | 11 | 379 |
| | | Growth Rate | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | - |
| | | In Process | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | Net New Trips | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | Other | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | **Future Total** | **5** | **4** | **6** | **222** | **131** | **11** | **379** |

| ID | Intersection Name | Volume Type | Northbound | | Southbound | | Eastbound | | Total Volume |
|---|---|---|---|---|---|---|---|---|---|
| | | | Left | Thru | Thru | Right | Left | Right | |
| 4 | Fulton at Villa Rd (South) | Final Base | 60 | 82 | 116 | 40 | 45 | 61 | 404 |
| | | Growth Rate | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | - |
| | | In Process | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | Net New Trips | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | Other | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | **Future Total** | **60** | **82** | **116** | **40** | **45** | **61** | **404** |

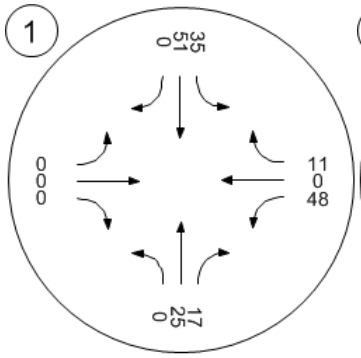
Report Figure 1: Study Intersections

Report Figure 2: Lane Configuration and Traffic Control

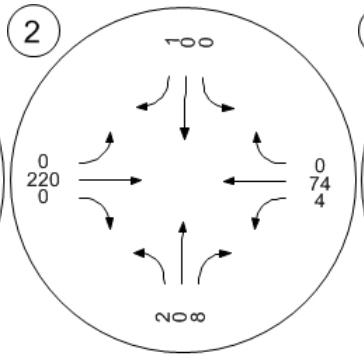


Report Figure 3a: Traffic Volume - Base Volume

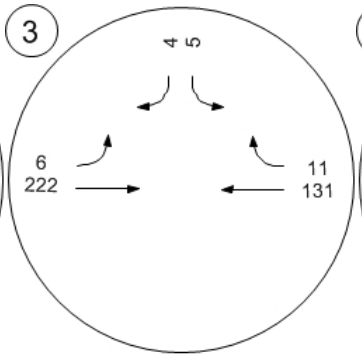
Meridian St at Fulton St



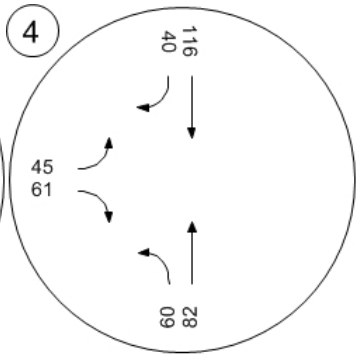

Fulton St at Center St



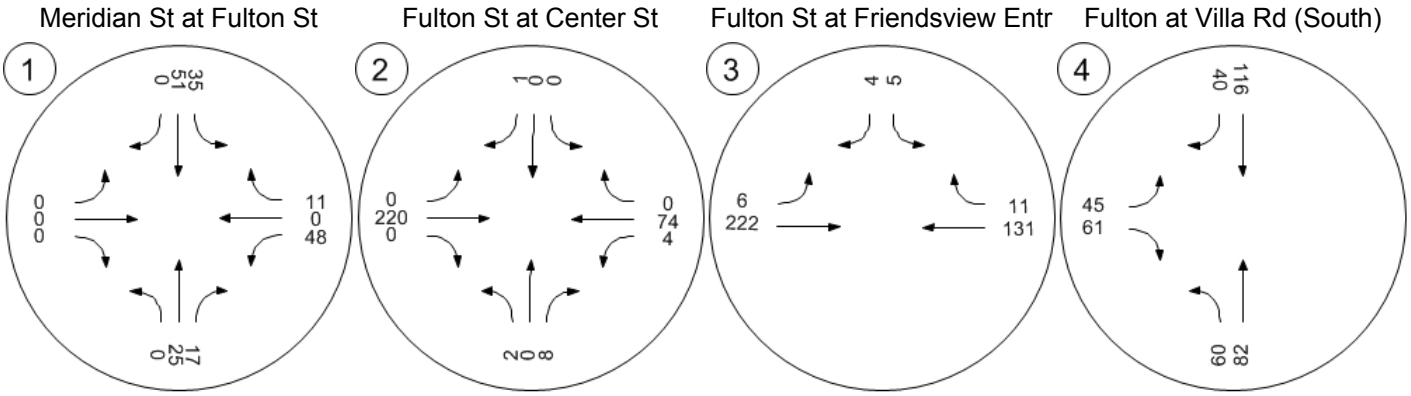

Fulton St at Friendsview Entr



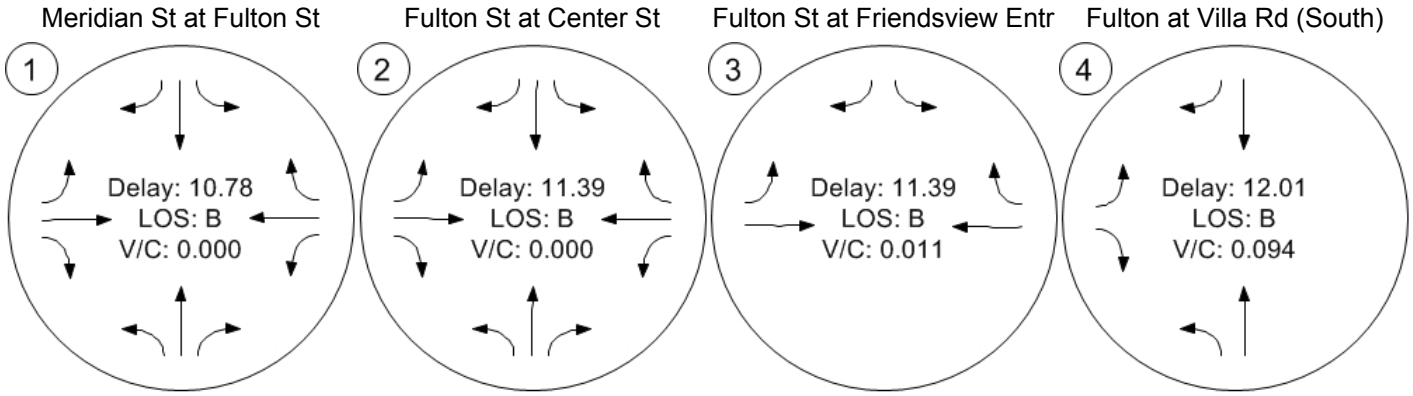

Fulton at Villa Rd (South)



Report Figure 3e: Traffic Volume - Future Total Volume



Report Figure 4: Traffic Conditions



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Report File: J:\...\PM Existing.pdf

Scenario 2: PM Existing Traffic
10/6/2015

**Intersection Analysis Summary**

| ID | Intersection Name | Control Type | Method | Worst Mvmt | V/C | Delay (s/veh) | LOS |
|---|---|---|---|---|---|---|---|
| 1 | Meridian St at Fulton St | Two-way stop | HCM2010 | WBT | 0.000 | 12.6 | B |
| 2 | Fulton St at Center St | Two-way stop | HCM2010 | NBT | 0.000 | 12.3 | B |
| 3 | Fulton St at Friendsview Entrance | Two-way stop | HCM2010 | SBL | 0.034 | 11.7 | B |
| 4 | Fulton at Villa Rd (South) | Two-way stop | HCM2010 | EBL | 0.207 | 15.0 | B |

V/C, Delay, LOS: For two-way stop, these values are taken from the movement with the worst (highest) delay value; for all other control types, they are taken for the whole intersection.

**Intersection Level Of Service Report**
**#1: Meridian St at Fulton St**

| | | | |
|---|---|---|---|
| Control Type: | Two-way stop | Delay (sec / veh): | 12.6 |
| Analysis Method: | HCM2010 | Level Of Service: | B |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.000 |

**Intersection Setup**

| Name | Meridian St | | | | | | Fulton St | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration | | | | | | | | | | | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| Speed [mph] | 25.00 | | | 25.00 | | | 25.00 | | | 25.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Crosswalk | yes | | | yes | | | yes | | | yes | | |

**Volumes**

| Name | Meridian St | | | | | | Fulton St | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 0 | 80 | 100 | 33 | 45 | 0 | 0 | 0 | 0 | 148 | 0 | 43 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 1.60 | 1.60 | 1.60 | 1.60 | 1.60 | 1.60 | 1.60 | 1.60 | 1.60 | 1.60 | 1.60 | 1.60 |
| Growth Rate | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 0 | 80 | 100 | 33 | 45 | 0 | 0 | 0 | 0 | 148 | 0 | 43 |
| Peak Hour Factor | 0.9400 | 0.9400 | 0.9400 | 0.9400 | 0.9400 | 0.9400 | 0.9400 | 0.9400 | 0.9400 | 0.9400 | 0.9400 | 0.9400 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 0 | 21 | 27 | 9 | 12 | 0 | 0 | 0 | 0 | 39 | 0 | 11 |
| Total Analysis Volume [veh/h] | 0 | 85 | 106 | 35 | 48 | 0 | 0 | 0 | 0 | 157 | 0 | 46 |
| Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| Priority Scheme | Free | Free | Stop | Stop |
|---|---|---|---|---|
| Flared Lane | | | no | no |
| Storage Area [veh] | 0 | 0 | 0 | 0 |
| Two-Stage Gap Acceptance | | | no | no |
| Number of Storage Spaces in Median | 0 | 0 | 0 | 0 |

**Movement, Approach, & Intersection Results**

| V/C, Movement V/C Ratio | 0.00 | 0.00 | 0.00 | 0.03 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.23 | 0.00 | 0.05 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| d_M, Delay for Movement [s/veh] | 7.31 | 0.00 | 0.00 | 7.67 | 0.00 | 0.00 | 10.74 | 11.10 | 8.52 | 12.18 | 12.62 | 10.87 |
| Movement LOS | A | A | A | A | A | A | B | B | A | B | B | B |
| 95th-Percentile Queue Length [veh] | 0.00 | 0.00 | 0.00 | 0.19 | 0.19 | 0.19 | 0.00 | 0.00 | 0.00 | 1.15 | 1.15 | 1.15 |
| 95th-Percentile Queue Length [ft] | 0.00 | 0.00 | 0.00 | 4.78 | 4.78 | 4.78 | 0.00 | 0.00 | 0.00 | 28.66 | 28.66 | 28.66 |
| d_A, Approach Delay [s/veh] | 0.00 | | | 3.23 | | | 10.12 | | | 11.88 | | |
| Approach LOS | A | | | A | | | B | | | B | | |
| d_I, Intersection Delay [s/veh] | 5.62 | | | | | | | | | | | |
| Intersection LOS | B | | | | | | | | | | | |

**Intersection Level Of Service Report**
**#2: Fulton St at Center St**

| | | | |
|---|---|---|---|
| Control Type: | Two-way stop | Delay (sec / veh): | 12.3 |
| Analysis Method: | HCM2010 | Level Of Service: | B |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.000 |

**Intersection Setup**

| Name | Center St | | | | | | | | | Fulton St | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration | | | | | | | | | | | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| Speed [mph] | 25.00 | | | 25.00 | | | 25.00 | | | 25.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Crosswalk | yes | | | yes | | | yes | | | yes | | |

**Volumes**

| Name | Center St | | | | | | | | | Fulton St | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 0 | 0 | 14 | 1 | 0 | 1 | 2 | 152 | 1 | 3 | 206 | 0 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.20 | 2.20 | 2.20 | 2.20 | 2.20 | 2.20 | 2.20 | 2.20 | 2.20 | 2.20 | 2.20 | 2.20 |
| Growth Rate | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 0 | 0 | 14 | 1 | 0 | 1 | 2 | 152 | 1 | 3 | 206 | 0 |
| Peak Hour Factor | 0.8100 | 0.8100 | 0.8100 | 0.8100 | 0.8100 | 0.8100 | 0.8100 | 0.8100 | 0.8100 | 0.8100 | 0.8100 | 0.8100 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 0 | 0 | 4 | 0 | 0 | 0 | 1 | 47 | 0 | 1 | 64 | 0 |
| Total Analysis Volume [veh/h] | 0 | 0 | 17 | 1 | 0 | 1 | 2 | 188 | 1 | 4 | 254 | 0 |
| Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| Priority Scheme | Stop | Stop | Free | Free |
|---|---|---|---|---|
| Flared Lane | no | no | | |
| Storage Area [veh] | 0 | 0 | 0 | 0 |
| Two-Stage Gap Acceptance | no | no | | |
| Number of Storage Spaces in Median | 0 | 0 | 0 | 0 |

**Movement, Approach, & Intersection Results**

| V/C, Movement V/C Ratio | 0.00 | 0.00 | 0.02 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| d_M, Delay for Movement [s/veh] | 12.11 | 12.30 | 9.31 | 12.27 | 12.24 | 9.61 | 7.75 | 0.00 | 0.00 | 7.61 | 0.00 | 0.00 |
| Movement LOS | B | B | A | B | B | A | A | A | A | A | A | A |
| 95th-Percentile Queue Length [veh] | 0.06 | 0.06 | 0.06 | 0.01 | 0.01 | 0.01 | 0.51 | 0.51 | 0.51 | 0.68 | 0.68 | 0.68 |
| 95th-Percentile Queue Length [ft] | 1.52 | 1.52 | 1.52 | 0.25 | 0.25 | 0.25 | 12.76 | 12.76 | 12.76 | 17.10 | 17.10 | 17.10 |
| d_A, Approach Delay [s/veh] | 9.31 | | | 10.94 | | | 0.08 | | | 0.12 | | |
| Approach LOS | A | | | B | | | A | | | A | | |
| d_I, Intersection Delay [s/veh] | 0.48 | | | | | | | | | | | |
| Intersection LOS | B | | | | | | | | | | | |

**Intersection Level Of Service Report**
**#3: Fulton St at Friendsview Entrance**

| | | | |
|---|---|---|---|
| Control Type: | Two-way stop | Delay (sec / veh): | 11.7 |
| Analysis Method: | HCM2010 | Level Of Service: | B |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.034 |

**Intersection Setup**

| Name | Cherry St | | Fulton St | | Fulton St | |
|---|---|---|---|---|---|---|
| Approach | Southbound | | Eastbound | | Westbound | |
| Lane Configuration | | | | | | |
| Turning Movement | Left | Right | Left | Thru | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Pocket | 0 | 0 | 0 | 0 | 0 | 0 |
| Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| Speed [mph] | 25.00 | | 25.00 | | 25.00 | |
| Grade [%] | 0.00 | | 0.00 | | 0.00 | |
| Crosswalk | yes | | yes | | yes | |

**Volumes**

| Name | Cherry St | | Fulton St | | Fulton St | |
|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 17 | 13 | 8 | 184 | 196 | 28 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Growth Rate | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 17 | 13 | 8 | 184 | 196 | 28 |
| Peak Hour Factor | 0.9000 | 0.9000 | 0.9000 | 0.9000 | 0.9000 | 0.9000 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 5 | 4 | 2 | 51 | 54 | 8 |
| Total Analysis Volume [veh/h] | 19 | 14 | 9 | 204 | 218 | 31 |
| Pedestrian Volume [ped/h] | 0 | | 0 | | 0 | |

**Intersection Settings**

| Priority Scheme | Stop | Free | Free |
|---|---|---|---|
| Flared Lane | | | |
| Storage Area [veh] | 0 | 0 | 0 |
| Two-Stage Gap Acceptance | no | | |
| Number of Storage Spaces in Median | 0 | 0 | 0 |

**Movement, Approach, & Intersection Results**

| | | | | | | |
|---|---|---|---|---|---|---|
| V/C, Movement V/C Ratio | 0.03 | 0.02 | 0.01 | 0.00 | 0.00 | 0.00 |
| d_M, Delay for Movement [s/veh] | 11.65 | 9.53 | 7.74 | 0.00 | 0.00 | 0.00 |
| Movement LOS | B | A | A | A | A | A |
| 95th-Percentile Queue Length [veh] | 0.11 | 0.05 | 0.57 | 0.57 | 0.00 | 0.00 |
| 95th-Percentile Queue Length [ft] | 2.63 | 1.32 | 14.34 | 14.34 | 0.00 | 0.00 |
| d_A, Approach Delay [s/veh] | 10.75 | | 0.33 | | 0.00 | |
| Approach LOS | B | | A | | A | |
| d_I, Intersection Delay [s/veh] | 0.86 | | | | | |
| Intersection LOS | B | | | | | |

**Intersection Level Of Service Report**
**#4: Fulton at Villa Rd (South)**

| | | | |
|---|---|---|---|
| Control Type: | Two-way stop | Delay (sec / veh): | 15.0 |
| Analysis Method: | HCM2010 | Level Of Service: | B |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.207 |

**Intersection Setup**

| Name | Villa Road | | Villa Road | | Fulton St | |
|---|---|---|---|---|---|---|
| Approach | Northbound | | Southbound | | Eastbound | |
| Lane Configuration | | | | | | |
| Turning Movement | Left | Thru | Thru | Right | Left | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Pocket | 0 | 0 | 0 | 0 | 0 | 0 |
| Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| Speed [mph] | 25.00 | | 25.00 | | 25.00 | |
| Grade [%] | 0.00 | | 0.00 | | 0.00 | |
| Crosswalk | yes | | yes | | yes | |

**Volumes**

| Name | Villa Road | | Villa Road | | Fulton St | |
|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 73 | 159 | 138 | 123 | 85 | 70 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 1.60 | 1.60 | 1.60 | 1.60 | 1.60 | 1.60 |
| Growth Rate | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 73 | 159 | 138 | 123 | 85 | 70 |
| Peak Hour Factor | 0.9000 | 0.9000 | 0.9000 | 0.9000 | 0.9000 | 0.9000 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 20 | 44 | 38 | 34 | 24 | 19 |
| Total Analysis Volume [veh/h] | 81 | 177 | 153 | 137 | 94 | 78 |
| Pedestrian Volume [ped/h] | 0 | | 0 | | 0 | |

**Intersection Settings**

| Priority Scheme | Free | Free | Stop |
|---|---|---|---|
| Flared Lane | | | |
| Storage Area [veh] | 0 | 0 | 0 |
| Two-Stage Gap Acceptance | | | no |
| Number of Storage Spaces in Median | 0 | 0 | 0 |

**Movement, Approach, & Intersection Results**

| V/C, Movement V/C Ratio | 0.06 | 0.00 | 0.00 | 0.00 | 0.21 | 0.10 |
|---|---|---|---|---|---|---|
| d_M, Delay for Movement [s/veh] | 8.02 | 0.00 | 0.00 | 0.00 | 14.96 | 9.86 |
| Movement LOS | A | A | A | A | B | A |
| 95th-Percentile Queue Length [veh] | 0.76 | 0.76 | 0.00 | 0.00 | 0.77 | 0.31 |
| 95th-Percentile Queue Length [ft] | 18.93 | 18.93 | 0.00 | 0.00 | 19.20 | 7.87 |
| d_A, Approach Delay [s/veh] | 2.52 | | 0.00 | | 12.65 | |
| Approach LOS | A | | A | | B | |
| d_I, Intersection Delay [s/veh] | 3.92 | | | | | |
| Intersection LOS | B | | | | | |

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Report File: J:\...\PM Existing.pdf

Scenario 2: PM Existing Traffic
10/6/2015

## Turning Movement Volume: Summary

| ID | Intersection Name | Northbound | | | Southbound | | | Eastbound | | | Westbound | | | Total Volume |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | |
| 1 | Meridian St at Fulton St | 0 | 80 | 100 | 33 | 45 | 0 | 0 | 0 | 0 | 148 | 0 | 43 | 449 |

| ID | Intersection Name | Northbound | | | Southbound | | | Eastbound | | | Westbound | | | Total Volume |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | |
| 2 | Fulton St at Center St | 0 | 0 | 14 | 1 | 0 | 1 | 2 | 152 | 1 | 3 | 206 | 0 | 380 |

| ID | Intersection Name | Southbound | | Eastbound | | Westbound | | Total Volume |
|---|---|---|---|---|---|---|---|---|
| | | Left | Right | Left | Thru | Thru | Right | |
| 3 | Fulton St at Friendsview Entrance | 17 | 13 | 8 | 184 | 196 | 28 | 446 |

| ID | Intersection Name | Northbound | | Southbound | | Eastbound | | Total Volume |
|---|---|---|---|---|---|---|---|---|
| | | Left | Thru | Thru | Right | Left | Right | |
| 4 | Fulton at Villa Rd (South) | 73 | 159 | 138 | 123 | 85 | 70 | 648 |

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Scenario 2: PM Existing Traffic
10/6/2015

## Turning Movement Volume: Detail

| ID | Intersection Name | Volume Type | Northbound | | | Southbound | | | Eastbound | | | Westbound | | | Total Volume |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | |
| 1 | Meridian St at Fulton St | Final Base | 0 | 80 | 100 | 33 | 45 | 0 | 0 | 0 | 0 | 148 | 0 | 43 | 449 |
| | | Growth Rate | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | - |
| | | In Process | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | Net New Trips | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | Other | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | **Future Total** | **0** | **80** | **100** | **33** | **45** | **0** | **0** | **0** | **0** | **148** | **0** | **43** | **449** |

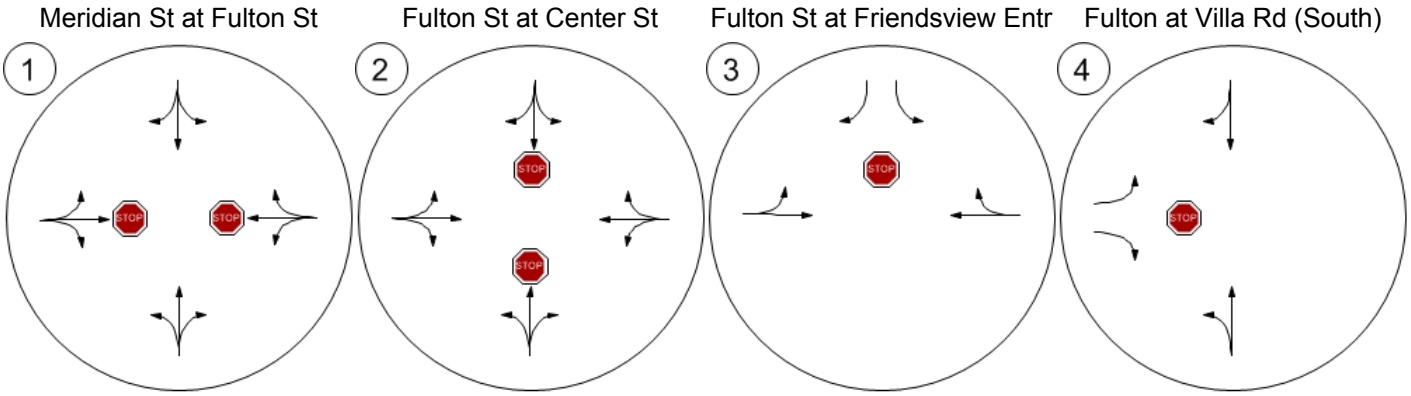
| ID | Intersection Name | Volume Type | Northbound | | | Southbound | | | Eastbound | | | Westbound | | | Total Volume |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | |
| 2 | Fulton St at Center St | Final Base | 0 | 0 | 14 | 1 | 0 | 1 | 2 | 152 | 1 | 3 | 206 | 0 | 380 |
| | | Growth Rate | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | - |
| | | In Process | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | Net New Trips | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | Other | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | **Future Total** | **0** | **0** | **14** | **1** | **0** | **1** | **2** | **152** | **1** | **3** | **206** | **0** | **380** |

| ID | Intersection Name | Volume Type | Southbound | | Eastbound | | Westbound | | Total Volume |
|---|---|---|---|---|---|---|---|---|---|
| | | | Left | Right | Left | Thru | Thru | Right | |
| 3 | Fulton St at Friendsview Entrance | Final Base | 17 | 13 | 8 | 184 | 196 | 28 | 446 |
| | | Growth Rate | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | - |
| | | In Process | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | Net New Trips | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | Other | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | **Future Total** | **17** | **13** | **8** | **184** | **196** | **28** | **446** |

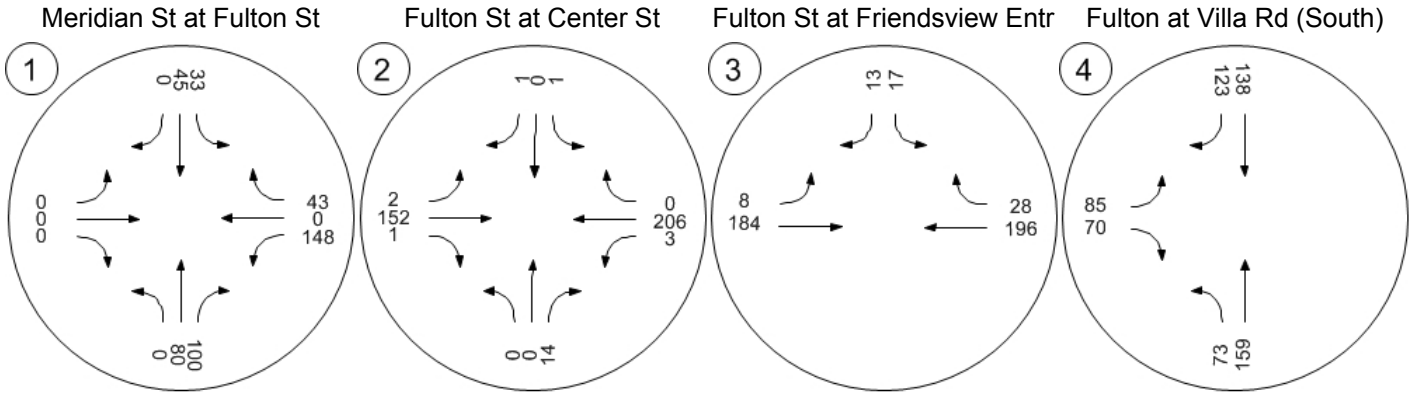
| ID | Intersection Name | Volume Type | Northbound | | Southbound | | Eastbound | | Total Volume |
|---|---|---|---|---|---|---|---|---|---|
| | | | Left | Thru | Thru | Right | Left | Right | |
| 4 | Fulton at Villa Rd (South) | Final Base | 73 | 159 | 138 | 123 | 85 | 70 | 648 |
| | | Growth Rate | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | - |
| | | In Process | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | Net New Trips | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | Other | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | **Future Total** | **73** | **159** | **138** | **123** | **85** | **70** | **648** |

Report Figure 1: Study Intersections

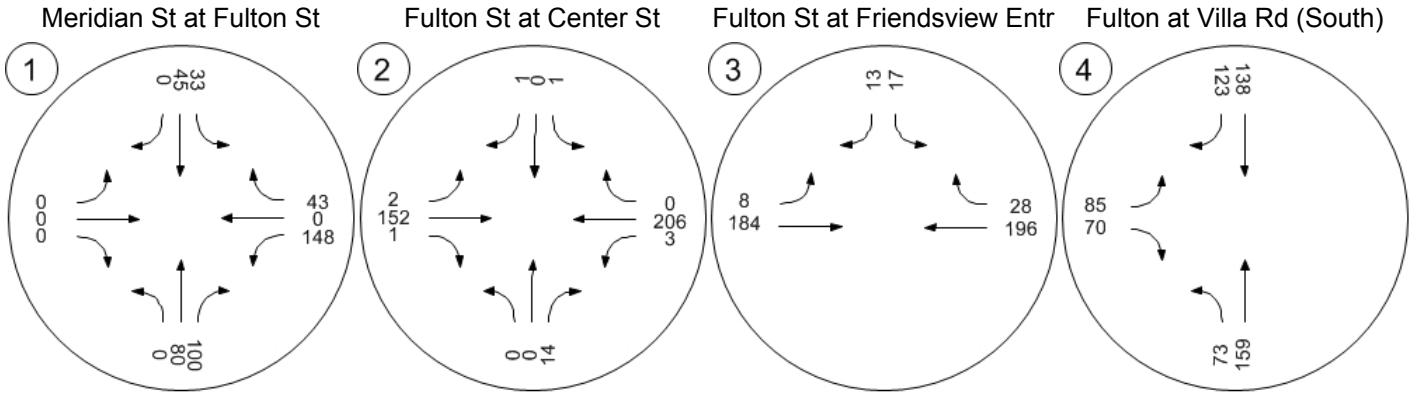
Report Figure 2: Lane Configuration and Traffic Control



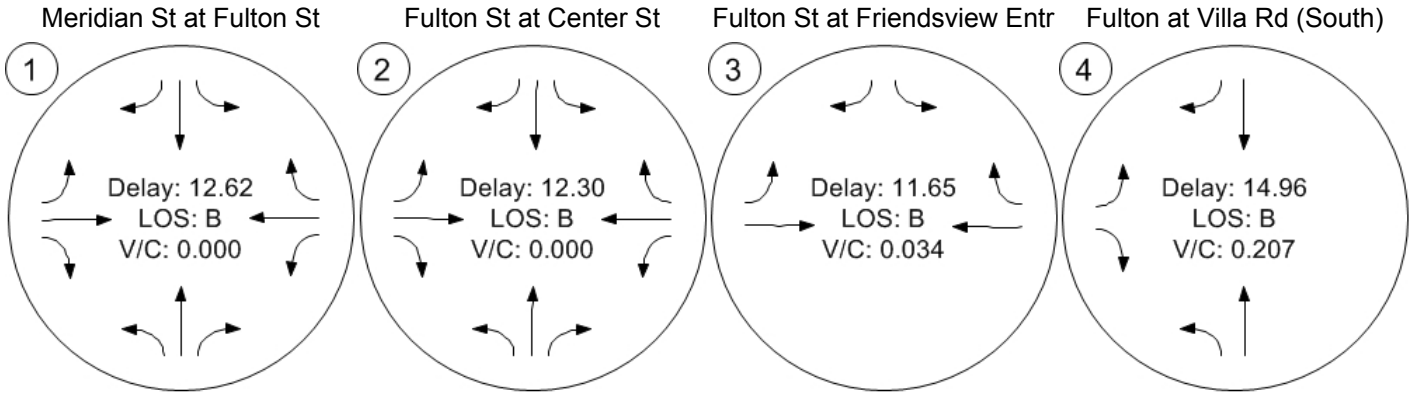
Report Figure 3a: Traffic Volume - Base Volume



Report Figure 3e: Traffic Volume - Future Total Volume



Report Figure 4: Traffic Conditions



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Report File: J:\...\AM Developed.pdf

Scenario 3: AM Developed Traffic
10/6/2015

**Intersection Analysis Summary**

| ID | Intersection Name | Control Type | Method | Worst Mvmt | V/C | Delay (s/veh) | LOS |
|---|---|---|---|---|---|---|---|
| 1 | Meridian St at Fulton St | Two-way stop | HCM2010 | WBT | 0.000 | 10.9 | B |
| 2 | Fulton St at Center St | Two-way stop | HCM2010 | NBT | 0.000 | 11.5 | B |
| 3 | Fulton St at Friendsview Entrance | Two-way stop | HCM2010 | SBL | 0.020 | 11.6 | B |
| 4 | Fulton at Villa Rd (South) | Two-way stop | HCM2010 | EBL | 0.103 | 12.2 | B |

V/C, Delay, LOS: For two-way stop, these values are taken from the movement with the worst (highest) delay value; for all other control types, they are taken for the whole intersection.

**Intersection Level Of Service Report**
**#1: Meridian St at Fulton St**

| | | | |
|---|---|---|---|
| Control Type: | Two-way stop | Delay (sec / veh): | 10.9 |
| Analysis Method: | HCM2010 | Level Of Service: | B |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.000 |

**Intersection Setup**

| Name | Meridian St | | | | | | Fulton St | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration | | | | | | | | | | | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| Speed [mph] | 25.00 | | | 25.00 | | | 25.00 | | | 25.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Crosswalk | yes | | | yes | | | yes | | | yes | | |

**Volumes**

| Name | Meridian St | | | | | | Fulton St | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 0 | 25 | 17 | 35 | 51 | 0 | 0 | 0 | 0 | 48 | 0 | 11 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 6.50 | 6.50 | 6.50 | 6.50 | 6.50 | 6.50 | 6.50 | 6.50 | 6.50 | 6.50 | 6.50 | 6.50 |
| Growth Rate | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 3 | 1 | 0 | 0 | 0 | 0 | 0 | 5 | 0 | 2 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 0 | 25 | 20 | 36 | 51 | 0 | 0 | 0 | 0 | 53 | 0 | 13 |
| Peak Hour Factor | 0.8200 | 0.8200 | 0.8200 | 0.8200 | 0.8200 | 0.8200 | 0.8200 | 0.8200 | 0.8200 | 0.8200 | 0.8200 | 0.8200 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 0 | 8 | 6 | 11 | 16 | 0 | 0 | 0 | 0 | 16 | 0 | 4 |
| Total Analysis Volume [veh/h] | 0 | 30 | 24 | 44 | 62 | 0 | 0 | 0 | 0 | 65 | 0 | 16 |
| Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| Priority Scheme | Free | Free | Stop | Stop |
|---|---|---|---|---|
| Flared Lane | | | no | no |
| Storage Area [veh] | 0 | 0 | 0 | 0 |
| Two-Stage Gap Acceptance | | | no | no |
| Number of Storage Spaces in Median | 0 | 0 | 0 | 0 |

**Movement, Approach, & Intersection Results**

| V/C, Movement V/C Ratio | 0.00 | 0.00 | 0.00 | 0.03 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.09 | 0.00 | 0.02 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| d_M, Delay for Movement [s/veh] | 7.38 | 0.00 | 0.00 | 7.43 | 0.00 | 0.00 | 10.00 | 10.42 | 8.64 | 10.39 | 10.87 | 9.07 |
| Movement LOS | A | A | A | A | A | A | A | B | A | B | B | A |
| 95th-Percentile Queue Length [veh] | 0.00 | 0.00 | 0.00 | 0.22 | 0.22 | 0.22 | 0.00 | 0.00 | 0.00 | 0.35 | 0.35 | 0.35 |
| 95th-Percentile Queue Length [ft] | 0.00 | 0.00 | 0.00 | 5.60 | 5.60 | 5.60 | 0.00 | 0.00 | 0.00 | 8.63 | 8.63 | 8.63 |
| d_A, Approach Delay [s/veh] | 0.00 | | | 3.09 | | | 9.69 | | | 10.13 | | |
| Approach LOS | A | | | A | | | A | | | B | | |
| d_I, Intersection Delay [s/veh] | 4.76 | | | | | | | | | | | |
| Intersection LOS | B | | | | | | | | | | | |

**Intersection Level Of Service Report**
**#2: Fulton St at Center St**

| | | | |
|---|---|---|---|
| Control Type: | Two-way stop | Delay (sec / veh): | 11.5 |
| Analysis Method: | HCM2010 | Level Of Service: | B |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.000 |

**Intersection Setup**

| Name | Center St | | | | | | | | | Fulton St | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration | | | | | | | | | | | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| Speed [mph] | 25.00 | | | 25.00 | | | 25.00 | | | 25.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Crosswalk | yes | | | yes | | | yes | | | yes | | |

**Volumes**

| Name | Center St | | | | | | | | | Fulton St | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 2 | 0 | 8 | 0 | 0 | 1 | 0 | 220 | 0 | 4 | 74 | 0 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.20 | 2.20 | 2.20 | 2.20 | 2.20 | 2.20 | 2.20 | 2.20 | 2.20 | 2.20 | 2.20 | 2.20 |
| Growth Rate | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 4 | 0 | 4 | 2 | 2 | 0 | 0 | 4 | 2 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 2 | 0 | 8 | 4 | 0 | 5 | 2 | 222 | 0 | 4 | 78 | 2 |
| Peak Hour Factor | 0.8600 | 0.8600 | 0.8600 | 0.8600 | 0.8600 | 0.8600 | 0.8600 | 0.8600 | 0.8600 | 0.8600 | 0.8600 | 0.8600 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 1 | 0 | 2 | 1 | 0 | 1 | 1 | 65 | 0 | 1 | 23 | 1 |
| Total Analysis Volume [veh/h] | 2 | 0 | 9 | 5 | 0 | 6 | 2 | 258 | 0 | 5 | 91 | 2 |
| Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| Priority Scheme | Stop | Stop | Free | Free |
|---|---|---|---|---|
| Flared Lane | no | no | | |
| Storage Area [veh] | 0 | 0 | 0 | 0 |
| Two-Stage Gap Acceptance | no | no | | |
| Number of Storage Spaces in Median | 0 | 0 | 0 | 0 |

**Movement, Approach, & Intersection Results**

| V/C, Movement V/C Ratio | 0.00 | 0.00 | 0.01 | 0.01 | 0.00 | 0.01 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| d_M, Delay for Movement [s/veh] | 11.25 | 11.51 | 9.69 | 11.30 | 11.50 | 8.80 | 7.40 | 0.00 | 0.00 | 7.77 | 0.00 | 0.00 |
| Movement LOS | B | B | A | B | B | A | A | A | A | A | A | A |
| 95th-Percentile Queue Length [veh] | 0.05 | 0.05 | 0.05 | 0.05 | 0.05 | 0.05 | 0.63 | 0.63 | 0.63 | 0.24 | 0.24 | 0.24 |
| 95th-Percentile Queue Length [ft] | 1.14 | 1.14 | 1.14 | 1.13 | 1.13 | 1.13 | 15.66 | 15.66 | 15.66 | 6.08 | 6.08 | 6.08 |
| d_A, Approach Delay [s/veh] | 9.97 | | | 9.94 | | | 0.06 | | | 0.40 | | |
| Approach LOS | A | | | A | | | A | | | A | | |
| d_I, Intersection Delay [s/veh] | 0.72 | | | | | | | | | | | |
| Intersection LOS | B | | | | | | | | | | | |

**Intersection Level Of Service Report**
**#3: Fulton St at Friendsview Entrance**

| | | | |
|---|---|---|---|
| Control Type: | Two-way stop | Delay (sec / veh): | 11.6 |
| Analysis Method: | HCM2010 | Level Of Service: | B |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.020 |

**Intersection Setup**

| Name | Cherry St | | Fulton St | | Fulton St | |
|---|---|---|---|---|---|---|
| Approach | Southbound | | Eastbound | | Westbound | |
| Lane Configuration | | | | | | |
| Turning Movement | Left | Right | Left | Thru | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Pocket | 0 | 0 | 0 | 0 | 0 | 0 |
| Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| Speed [mph] | 25.00 | | 25.00 | | 25.00 | |
| Grade [%] | 0.00 | | 0.00 | | 0.00 | |
| Crosswalk | yes | | yes | | yes | |

**Volumes**

| Name | Cherry St | | Fulton St | | Fulton St | |
|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 5 | 4 | 6 | 222 | 131 | 11 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.70 | 2.70 | 2.70 | 2.70 | 2.70 | 2.70 |
| Growth Rate | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 4 | 4 | 2 | 4 | 2 | 2 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 9 | 8 | 8 | 226 | 133 | 13 |
| Peak Hour Factor | 0.8400 | 0.8400 | 0.8400 | 0.8400 | 0.8400 | 0.8400 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 3 | 2 | 2 | 67 | 40 | 4 |
| Total Analysis Volume [veh/h] | 11 | 10 | 10 | 269 | 158 | 15 |
| Pedestrian Volume [ped/h] | 0 | | 0 | | 0 | |

**Intersection Settings**

| Priority Scheme | Stop | Free | Free |
|---|---|---|---|
| Flared Lane | | | |
| Storage Area [veh] | 0 | 0 | 0 |
| Two-Stage Gap Acceptance | no | | |
| Number of Storage Spaces in Median | 0 | 0 | 0 |

**Movement, Approach, & Intersection Results**

| V/C, Movement V/C Ratio | 0.02 | 0.01 | 0.01 | 0.00 | 0.00 | 0.00 |
|---|---|---|---|---|---|---|
| d_M, Delay for Movement [s/veh] | 11.59 | 9.15 | 7.59 | 0.00 | 0.00 | 0.00 |
| Movement LOS | B | A | A | A | A | A |
| 95th-Percentile Queue Length [veh] | 0.06 | 0.03 | 0.74 | 0.74 | 0.00 | 0.00 |
| 95th-Percentile Queue Length [ft] | 1.51 | 0.86 | 18.58 | 18.58 | 0.00 | 0.00 |
| d_A, Approach Delay [s/veh] | 10.43 | | 0.27 | | 0.00 | |
| Approach LOS | B | | A | | A | |
| d_I, Intersection Delay [s/veh] | 0.62 | | | | | |
| Intersection LOS | B | | | | | |

**Intersection Level Of Service Report**
**#4: Fulton at Villa Rd (South)**

| | | | |
|---|---|---|---|
| Control Type: | Two-way stop | Delay (sec / veh): | 12.2 |
| Analysis Method: | HCM2010 | Level Of Service: | B |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.103 |

**Intersection Setup**

| Name | Villa Road | | Villa Road | | Fulton St | |
|---|---|---|---|---|---|---|
| Approach | Northbound | | Southbound | | Eastbound | |
| Lane Configuration | | | | | | |
| Turning Movement | Left | Thru | Thru | Right | Left | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Pocket | 0 | 0 | 0 | 0 | 0 | 0 |
| Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| Speed [mph] | 25.00 | | 25.00 | | 25.00 | |
| Grade [%] | 0.00 | | 0.00 | | 0.00 | |
| Crosswalk | yes | | yes | | yes | |

**Volumes**

| Name | Villa Road | | Villa Road | | Fulton St | |
|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 60 | 82 | 116 | 40 | 45 | 61 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 6.50 | 6.50 | 6.50 | 6.50 | 6.50 | 6.50 |
| Growth Rate | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 2 | 0 | 0 | 2 | 4 | 4 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 62 | 82 | 116 | 42 | 49 | 65 |
| Peak Hour Factor | 0.8500 | 0.8500 | 0.8500 | 0.8500 | 0.8500 | 0.8500 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 18 | 24 | 34 | 12 | 14 | 19 |
| Total Analysis Volume [veh/h] | 73 | 96 | 136 | 49 | 58 | 76 |
| Pedestrian Volume [ped/h] | 0 | | 0 | | 0 | |

**Intersection Settings**

| Priority Scheme | Free | Free | Stop |
|---|---|---|---|
| Flared Lane | | | |
| Storage Area [veh] | 0 | 0 | 0 |
| Two-Stage Gap Acceptance | | | no |
| Number of Storage Spaces in Median | 0 | 0 | 0 |

**Movement, Approach, & Intersection Results**

| V/C, Movement V/C Ratio | 0.05 | 0.00 | 0.00 | 0.00 | 0.10 | 0.09 |
|---|---|---|---|---|---|---|
| d_M, Delay for Movement [s/veh] | 7.79 | 0.00 | 0.00 | 0.00 | 12.15 | 9.52 |
| Movement LOS | A | A | A | A | B | A |
| 95th-Percentile Queue Length [veh] | 0.42 | 0.42 | 0.00 | 0.00 | 0.34 | 0.29 |
| 95th-Percentile Queue Length [ft] | 10.59 | 10.59 | 0.00 | 0.00 | 8.59 | 7.13 |
| d_A, Approach Delay [s/veh] | 3.37 | | 0.00 | | 10.66 | |
| Approach LOS | A | | A | | B | |
| d_I, Intersection Delay [s/veh] | 4.09 | | | | | |
| Intersection LOS | B | | | | | |

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Report File: J:\...\AM Developed.pdf

Scenario 3: AM Developed Traffic
10/6/2015

## Turning Movement Volume: Summary

| ID | Intersection Name | Northbound | | | Southbound | | | Eastbound | | | Westbound | | | Total Volume |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | |
| 1 | Meridian St at Fulton St | 0 | 25 | 20 | 36 | 51 | 0 | 0 | 0 | 0 | 53 | 0 | 13 | 198 |

| ID | Intersection Name | Northbound | | | Southbound | | | Eastbound | | | Westbound | | | Total Volume |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | |
| 2 | Fulton St at Center St | 2 | 0 | 8 | 4 | 0 | 5 | 2 | 222 | 0 | 4 | 78 | 2 | 327 |

| ID | Intersection Name | Southbound | | Eastbound | | Westbound | | Total Volume |
|---|---|---|---|---|---|---|---|---|
| | | Left | Right | Left | Thru | Thru | Right | |
| 3 | Fulton St at Friendsview Entrance | 9 | 8 | 8 | 226 | 133 | 13 | 397 |

| ID | Intersection Name | Northbound | | Southbound | | Eastbound | | Total Volume |
|---|---|---|---|---|---|---|---|---|
| | | Left | Thru | Thru | Right | Left | Right | |
| 4 | Fulton at Villa Rd (South) | 62 | 82 | 116 | 42 | 49 | 65 | 416 |

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Report File: J:\...\AM Developed.pdf

Scenario 3: AM Developed Traffic
10/6/2015

## Turning Movement Volume: Detail

| ID | Intersection Name | Volume Type | Northbound | | | Southbound | | | Eastbound | | | Westbound | | | Total Volume |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | |
| 1 | Meridian St at Fulton St | Final Base | 0 | 25 | 17 | 35 | 51 | 0 | 0 | 0 | 0 | 48 | 0 | 11 | 187 |
| | | Growth Rate | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | - |
| | | In Process | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | Net New Trips | 0 | 0 | 3 | 1 | 0 | 0 | 0 | 0 | 0 | 5 | 0 | 2 | 11 |
| | | Other | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | **Future Total** | **0** | **25** | **20** | **36** | **51** | **0** | **0** | **0** | **0** | **53** | **0** | **13** | **198** |

| ID | Intersection Name | Volume Type | Northbound | | | Southbound | | | Eastbound | | | Westbound | | | Total Volume |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | |
| 2 | Fulton St at Center St | Final Base | 2 | 0 | 8 | 0 | 0 | 1 | 0 | 220 | 0 | 4 | 74 | 0 | 309 |
| | | Growth Rate | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | - |
| | | In Process | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | Net New Trips | 0 | 0 | 0 | 4 | 0 | 4 | 2 | 2 | 0 | 0 | 4 | 2 | 18 |
| | | Other | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | **Future Total** | **2** | **0** | **8** | **4** | **0** | **5** | **2** | **222** | **0** | **4** | **78** | **2** | **327** |

| ID | Intersection Name | Volume Type | Southbound | | Eastbound | | Westbound | | Total Volume |
|---|---|---|---|---|---|---|---|---|---|
| | | | Left | Right | Left | Thru | Thru | Right | |
| 3 | Fulton St at Friendsview Entrance | Final Base | 5 | 4 | 6 | 222 | 131 | 11 | 379 |
| | | Growth Rate | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | - |
| | | In Process | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | Net New Trips | 4 | 4 | 2 | 4 | 2 | 2 | 18 |
| | | Other | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | **Future Total** | **9** | **8** | **8** | **226** | **133** | **13** | **397** |

| ID | Intersection Name | Volume Type | Northbound | | Southbound | | Eastbound | | Total Volume |
|---|---|---|---|---|---|---|---|---|---|
| | | | Left | Thru | Thru | Right | Left | Right | |
| 4 | Fulton at Villa Rd (South) | Final Base | 60 | 82 | 116 | 40 | 45 | 61 | 404 |
| | | Growth Rate | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | - |
| | | In Process | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | Net New Trips | 2 | 0 | 0 | 2 | 4 | 4 | 12 |
| | | Other | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | **Future Total** | **62** | **82** | **116** | **42** | **49** | **65** | **416** |

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Report File: J:\...\AM Developed.pdf

Scenario 3: AM Developed Traffic
10/6/2015

## Trip generation summary

### Added Trips

| Zone ID: Name | Land Use variables | Code | Ind. Var. | Rate | Quantity | % In | % Out | Trips In | Trips Out | Total trips | % of Total Trips |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 8: Newberg ReStore | Specialty Retail | 814 | ksf | 0.000 | 10.500 | 52.00 | 48.00 | 0 | 0 | 0 | 0.00 |
| 15: University Village | Senior Adult Housing - Attached | ITE 252 | Dwelling Unit | 0.130 | 175.000 | 36.00 | 64.00 | 8 | 15 | 23 | 100.00 |
| | | | | | **Added Trips Total** | | | **8** | **15** | **23** | **100.00** |

University Village TIA

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Report File: J:\...\AM Developed.pdf

Scenario 3: AM Developed Traffic
10/6/2015

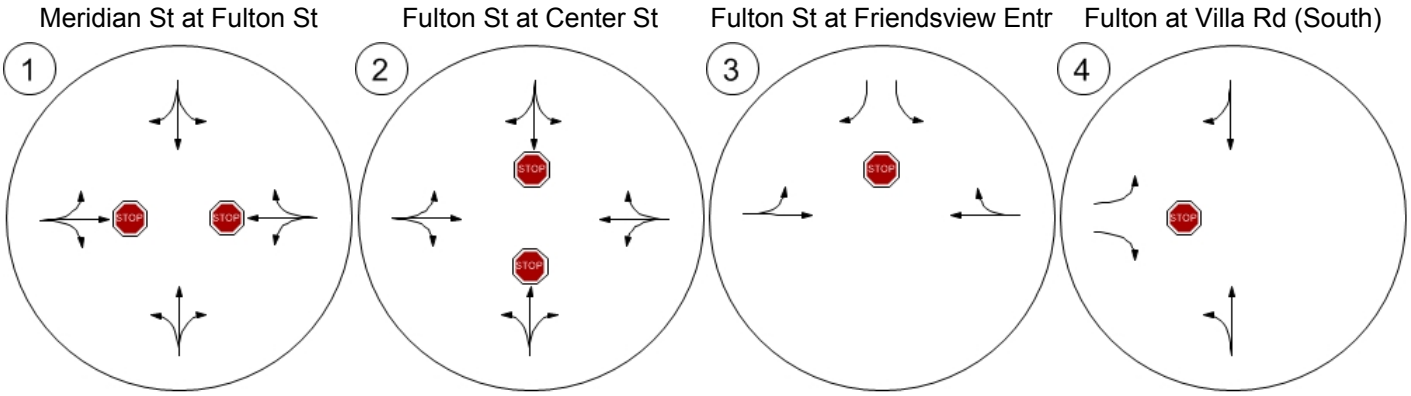
## Trip distribution summary

| Zone / Gate | Zone 8: Newberg ReStore | | | |
|---|---|---|---|---|
| | To Newberg ReStore: | | From Newberg ReStore: | |
| | Share % | Trips | Share % | Trips |
| 15: University Village | 0.00 | 0 | 0.00 | 0 |
| 1: Gate | 10.00 | 0 | 10.00 | 0 |
| 2: Gate | 40.00 | 0 | 40.00 | 0 |
| 3: Gate | 25.00 | 0 | 25.00 | 0 |
| 4: Gate | 25.00 | 0 | 25.00 | 0 |
| 7: Gate | 0.00 | 0 | 0.00 | 0 |
| 10: Gate | 0.00 | 0 | 0.00 | 0 |
| 16: Gate | 0.00 | 0 | 0.00 | 0 |
| **Total** | **100.00** | **0** | **100.00** | **0** |

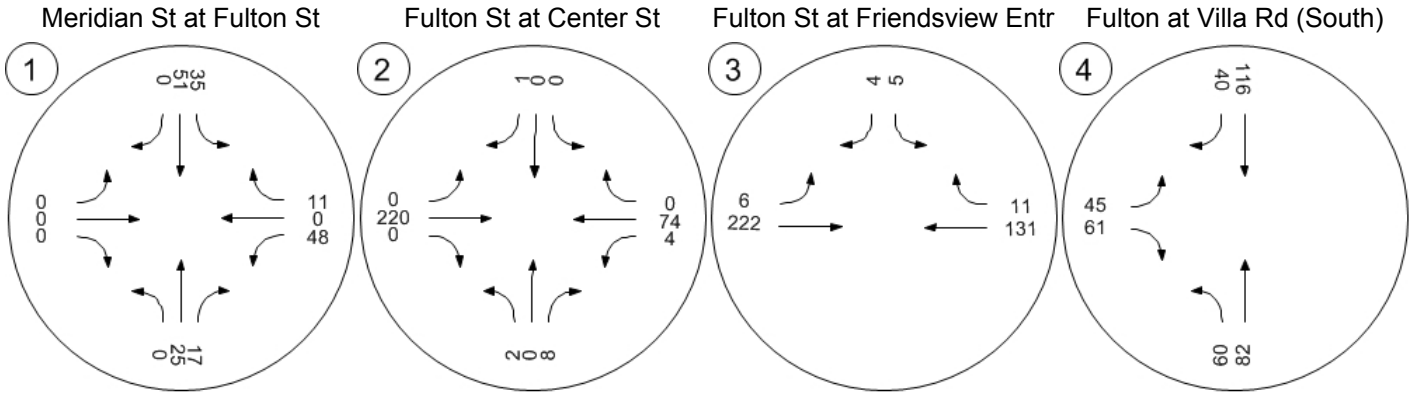
| Zone / Gate | Zone 15: University Village | | | |
|---|---|---|---|---|
| | To University Village: | | From University Village: | |
| | Share % | Trips | Share % | Trips |
| 8: Newberg ReStore | 0.00 | 0 | 0.00 | 0 |
| 1: Gate | 10.00 | 1 | 10.00 | 2 |
| 2: Gate | 40.00 | 3 | 40.00 | 5 |
| 3: Gate | 25.00 | 2 | 25.00 | 4 |
| 4: Gate | 25.00 | 2 | 25.00 | 4 |
| 7: Gate | 0.00 | 0 | 0.00 | 0 |
| 10: Gate | 0.00 | 0 | 0.00 | 0 |
| 16: Gate | 0.00 | 0 | 0.00 | 0 |
| **Total** | **100.00** | **8** | **100.00** | **15** |

Report Figure 1: Study Intersections

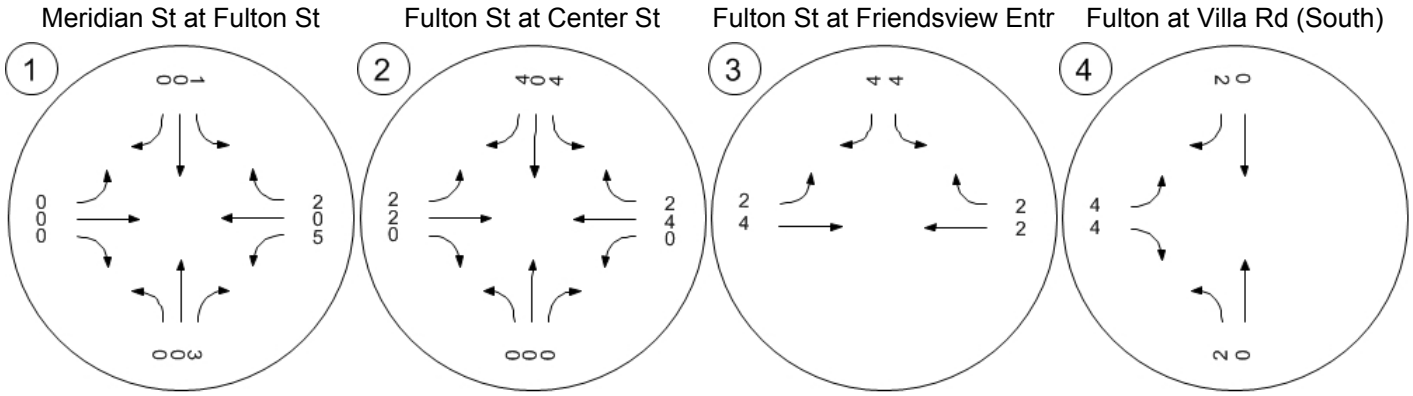
Report Figure 2: Lane Configuration and Traffic Control



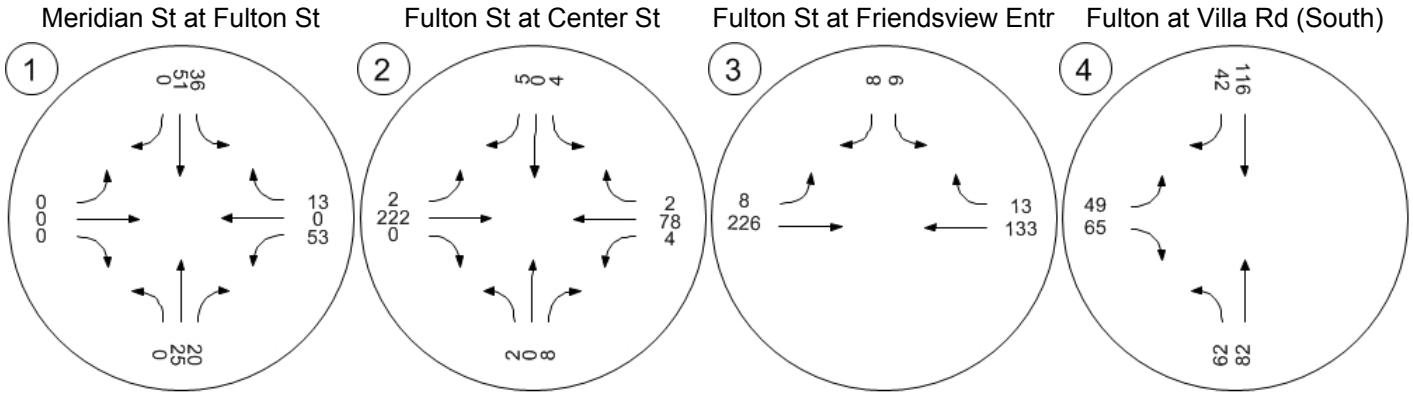
Report Figure 3a: Traffic Volume - Base Volume



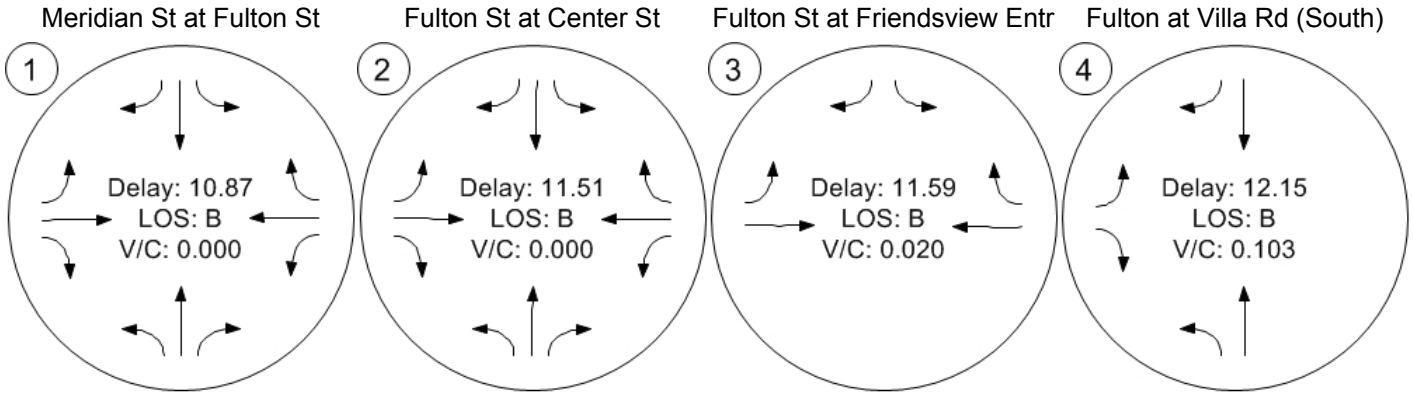
Report Figure 3c: Traffic Volume - Net New Site Trips



Report Figure 3e: Traffic Volume - Future Total Volume



Report Figure 4: Traffic Conditions



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Report File: J:\...\PM Developed.pdf

Scenario 4: PM Developed Traffic
10/6/2015

**Intersection Analysis Summary**

| ID | Intersection Name | Control Type | Method | Worst Mvmt | V/C | Delay (s/veh) | LOS |
|---|---|---|---|---|---|---|---|
| 1 | Meridian St at Fulton St | Two-way stop | HCM2010 | WBT | 0.010 | 13.2 | B |
| 2 | Fulton St at Center St | Two-way stop | HCM2010 | SBL | 0.011 | 12.9 | B |
| 3 | Fulton St at Friendsview Entrance | Two-way stop | HCM2010 | SBL | 0.019 | 11.8 | B |
| 4 | Fulton at Villa Rd (South) | Two-way stop | HCM2010 | EBL | 0.111 | 12.4 | B |

V/C, Delay, LOS: For two-way stop, these values are taken from the movement with the worst (highest) delay value; for all other control types, they are taken for the whole intersection.

**Intersection Level Of Service Report**
**#1: Meridian St at Fulton St**

| | | | |
|---|---|---|---|
| Control Type: | Two-way stop | Delay (sec / veh): | 13.2 |
| Analysis Method: | HCM2010 | Level Of Service: | B |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.010 |

**Intersection Setup**

| Name | Meridian St | | | | | | Fulton St | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration | | | | | | | | | | | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| Speed [mph] | 25.00 | | | 25.00 | | | 25.00 | | | 25.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Crosswalk | yes | | | yes | | | yes | | | yes | | |

**Volumes**

| Name | Meridian St | | | | | | Fulton St | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 0 | 80 | 100 | 33 | 45 | 0 | 0 | 0 | 0 | 148 | 0 | 43 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 1.60 | 1.60 | 1.60 | 1.60 | 1.60 | 1.60 | 1.60 | 1.60 | 1.60 | 1.60 | 1.60 | 1.60 |
| Growth Rate | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 5 | 0 | 7 | 2 | 0 | 1 | 2 | 8 | 6 | 4 | 6 | 1 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 5 | 80 | 107 | 35 | 45 | 1 | 2 | 8 | 6 | 152 | 6 | 44 |
| Peak Hour Factor | 0.9400 | 0.9400 | 0.9400 | 0.9400 | 0.9400 | 0.9400 | 0.9400 | 0.9400 | 0.9400 | 0.9400 | 0.9400 | 0.9400 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 1 | 21 | 28 | 9 | 12 | 0 | 1 | 2 | 2 | 40 | 2 | 12 |
| Total Analysis Volume [veh/h] | 5 | 85 | 114 | 37 | 48 | 1 | 2 | 9 | 6 | 162 | 6 | 47 |
| Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| Priority Scheme | Free | Free | Stop | Stop |
|---|---|---|---|---|
| Flared Lane | | | no | no |
| Storage Area [veh] | 0 | 0 | 0 | 0 |
| Two-Stage Gap Acceptance | | | no | no |
| Number of Storage Spaces in Median | 0 | 0 | 0 | 0 |

**Movement, Approach, & Intersection Results**

| V/C, Movement V/C Ratio | 0.00 | 0.00 | 0.00 | 0.03 | 0.00 | 0.00 | 0.00 | 0.02 | 0.01 | 0.25 | 0.01 | 0.05 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| d_M, Delay for Movement [s/veh] | 7.31 | 0.00 | 0.00 | 7.69 | 0.00 | 0.00 | 11.14 | 11.45 | 8.66 | 12.97 | 13.25 | 11.35 |
| Movement LOS | A | A | A | A | A | A | B | B | A | B | B | B |
| 95th-Percentile Queue Length [veh] | 0.45 | 0.45 | 0.45 | 0.20 | 0.20 | 0.20 | 0.08 | 0.08 | 0.08 | 1.34 | 1.34 | 1.34 |
| 95th-Percentile Queue Length [ft] | 11.25 | 11.25 | 11.25 | 4.99 | 4.99 | 4.99 | 1.92 | 1.92 | 1.92 | 33.47 | 33.47 | 33.47 |
| d_A, Approach Delay [s/veh] | 0.18 | | | 3.31 | | | 10.43 | | | 12.62 | | |
| Approach LOS | A | | | A | | | B | | | B | | |
| d_I, Intersection Delay [s/veh] | 6.15 | | | | | | | | | | | |
| Intersection LOS | B | | | | | | | | | | | |

**Intersection Level Of Service Report**
**#2: Fulton St at Center St**

| | | | |
|---|---|---|---|
| Control Type: | Two-way stop | Delay (sec / veh): | 12.9 |
| Analysis Method: | HCM2010 | Level Of Service: | B |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.011 |

**Intersection Setup**

| Name | Center St | | | | | | | | | Fulton St | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration | | | | | | | | | | | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| Speed [mph] | 25.00 | | | 25.00 | | | 25.00 | | | 25.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Crosswalk | yes | | | yes | | | yes | | | yes | | |

**Volumes**

| Name | Center St | | | | | | | | | Fulton St | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 0 | 0 | 14 | 1 | 0 | 1 | 2 | 152 | 1 | 3 | 206 | 0 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Rate | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 3 | 0 | 3 | 5 | 13 | 0 | 0 | 9 | 4 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 0 | 0 | 14 | 4 | 0 | 4 | 7 | 165 | 1 | 3 | 215 | 4 |
| Peak Hour Factor | 0.8100 | 0.8100 | 0.8100 | 0.8100 | 0.8100 | 0.8100 | 0.8100 | 0.8100 | 0.8100 | 0.8100 | 0.8100 | 0.8100 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 0 | 0 | 4 | 1 | 0 | 1 | 2 | 51 | 0 | 1 | 66 | 1 |
| Total Analysis Volume [veh/h] | 0 | 0 | 17 | 5 | 0 | 5 | 9 | 204 | 1 | 4 | 265 | 5 |
| Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| Priority Scheme | Stop | Stop | Free | Free |
|---|---|---|---|---|
| Flared Lane | no | no | | |
| Storage Area [veh] | 0 | 0 | 0 | 0 |
| Two-Stage Gap Acceptance | no | no | | |
| Number of Storage Spaces in Median | 0 | 0 | 0 | 0 |

**Movement, Approach, & Intersection Results**

| V/C, Movement V/C Ratio | 0.00 | 0.00 | 0.02 | 0.01 | 0.00 | 0.01 | 0.01 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| d_M, Delay for Movement [s/veh] | 12.69 | 12.80 | 9.40 | 12.89 | 12.80 | 9.78 | 7.80 | 0.00 | 0.00 | 7.64 | 0.00 | 0.00 |
| Movement LOS | B | B | A | B | B | A | A | A | A | A | A | A |
| 95th-Percentile Queue Length [veh] | 0.06 | 0.06 | 0.06 | 0.05 | 0.05 | 0.05 | 0.59 | 0.59 | 0.59 | 0.75 | 0.75 | 0.75 |
| 95th-Percentile Queue Length [ft] | 1.56 | 1.56 | 1.56 | 1.32 | 1.32 | 1.32 | 14.80 | 14.80 | 14.80 | 18.71 | 18.71 | 18.71 |
| d_A, Approach Delay [s/veh] | 9.40 | | | 11.33 | | | 0.33 | | | 0.11 | | |
| Approach LOS | A | | | B | | | A | | | A | | |
| d_I, Intersection Delay [s/veh] | 0.73 | | | | | | | | | | | |
| Intersection LOS | B | | | | | | | | | | | |

**Intersection Level Of Service Report**
**#3: Fulton St at Friendsview Entrance**

| | | | |
|---|---|---|---|
| Control Type: | Two-way stop | Delay (sec / veh): | 11.8 |
| Analysis Method: | HCM2010 | Level Of Service: | B |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.019 |

**Intersection Setup**

| Name | Cherry St | | Fulton St | | Fulton St | |
|---|---|---|---|---|---|---|
| Approach | Southbound | | Eastbound | | Westbound | |
| Lane Configuration | | | | | | |
| Turning Movement | Left | Right | Left | Thru | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Pocket | 0 | 0 | 0 | 0 | 0 | 0 |
| Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| Speed [mph] | 25.00 | | 25.00 | | 25.00 | |
| Grade [%] | 0.00 | | 0.00 | | 0.00 | |
| Crosswalk | yes | | yes | | yes | |

**Volumes**

| Name | Cherry St | | Fulton St | | Fulton St | |
|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 5 | 4 | 6 | 222 | 131 | 11 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.70 | 2.70 | 2.70 | 2.70 | 2.70 | 2.70 |
| Growth Rate | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 3 | 3 | 5 | 11 | 10 | 4 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 8 | 7 | 11 | 233 | 141 | 15 |
| Peak Hour Factor | 0.8400 | 0.8400 | 0.8400 | 0.8400 | 0.8400 | 0.8400 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 2 | 2 | 3 | 69 | 42 | 4 |
| Total Analysis Volume [veh/h] | 10 | 8 | 13 | 277 | 168 | 18 |
| Pedestrian Volume [ped/h] | 0 | | 0 | | 0 | |

**Intersection Settings**

| Priority Scheme | Stop | Free | Free |
|---|---|---|---|
| Flared Lane | | | |
| Storage Area [veh] | 0 | 0 | 0 |
| Two-Stage Gap Acceptance | no | | |
| Number of Storage Spaces in Median | 0 | 0 | 0 |

**Movement, Approach, & Intersection Results**

| | | | | | | |
|---|---|---|---|---|---|---|
| V/C, Movement V/C Ratio | 0.02 | 0.01 | 0.01 | 0.00 | 0.00 | 0.00 |
| d_M, Delay for Movement [s/veh] | 11.83 | 9.20 | 7.63 | 0.00 | 0.00 | 0.00 |
| Movement LOS | B | A | A | A | A | A |
| 95th-Percentile Queue Length [veh] | 0.06 | 0.03 | 0.79 | 0.79 | 0.00 | 0.00 |
| 95th-Percentile Queue Length [ft] | 1.42 | 0.70 | 19.76 | 19.76 | 0.00 | 0.00 |
| d_A, Approach Delay [s/veh] | 10.66 | | 0.34 | | 0.00 | |
| Approach LOS | B | | A | | A | |
| d_I, Intersection Delay [s/veh] | 0.59 | | | | | |
| Intersection LOS | B | | | | | |

**Intersection Level Of Service Report**
**#4: Fulton at Villa Rd (South)**

| | | | |
|---|---|---|---|
| Control Type: | Two-way stop | Delay (sec / veh): | 12.4 |
| Analysis Method: | HCM2010 | Level Of Service: | B |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.111 |

**Intersection Setup**

| Name | Villa Road | | Villa Road | | Fulton St | |
|---|---|---|---|---|---|---|
| Approach | Northbound | | Southbound | | Eastbound | |
| Lane Configuration | | | | | | |
| Turning Movement | Left | Thru | Thru | Right | Left | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Pocket | 0 | 0 | 0 | 0 | 0 | 0 |
| Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| Speed [mph] | 25.00 | | 25.00 | | 25.00 | |
| Grade [%] | 0.00 | | 0.00 | | 0.00 | |
| Crosswalk | yes | | yes | | yes | |

**Volumes**

| Name | Villa Road | | Villa Road | | Fulton St | |
|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 60 | 82 | 116 | 40 | 45 | 61 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 6.50 | 6.50 | 6.50 | 6.50 | 6.50 | 6.50 |
| Growth Rate | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 7 | 0 | 0 | 7 | 7 | 7 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 67 | 82 | 116 | 47 | 52 | 68 |
| Peak Hour Factor | 0.8500 | 0.8500 | 0.8500 | 0.8500 | 0.8500 | 0.8500 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 20 | 24 | 34 | 14 | 15 | 20 |
| Total Analysis Volume [veh/h] | 79 | 96 | 136 | 55 | 61 | 80 |
| Pedestrian Volume [ped/h] | 0 | | 0 | | 0 | |

**Intersection Settings**

| Priority Scheme | Free | Free | Stop |
|---|---|---|---|
| Flared Lane | | | |
| Storage Area [veh] | 0 | 0 | 0 |
| Two-Stage Gap Acceptance | | | no |
| Number of Storage Spaces in Median | 0 | 0 | 0 |

**Movement, Approach, & Intersection Results**

| V/C, Movement V/C Ratio | 0.06 | 0.00 | 0.00 | 0.00 | 0.11 | 0.09 |
|---|---|---|---|---|---|---|
| d_M, Delay for Movement [s/veh] | 7.82 | 0.00 | 0.00 | 0.00 | 12.40 | 9.56 |
| Movement LOS | A | A | A | A | B | A |
| 95th-Percentile Queue Length [veh] | 0.44 | 0.44 | 0.00 | 0.00 | 0.37 | 0.30 |
| 95th-Percentile Queue Length [ft] | 11.08 | 11.08 | 0.00 | 0.00 | 9.35 | 7.58 |
| d_A, Approach Delay [s/veh] | 3.53 | | 0.00 | | 10.79 | |
| Approach LOS | A | | A | | B | |
| d_I, Intersection Delay [s/veh] | 4.22 | | | | | |
| Intersection LOS | B | | | | | |

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Report File: J:\...\PM Developed.pdf

Scenario 4: PM Developed Traffic
10/6/2015

## Turning Movement Volume: Summary

| ID | Intersection Name | Northbound | | | Southbound | | | Eastbound | | | Westbound | | | Total Volume |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | |
| 1 | Meridian St at Fulton St | 5 | 80 | 107 | 35 | 45 | 1 | 2 | 8 | 6 | 152 | 6 | 44 | 491 |

| ID | Intersection Name | Northbound | | | Southbound | | | Eastbound | | | Westbound | | | Total Volume |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | |
| 2 | Fulton St at Center St | 0 | 0 | 14 | 4 | 0 | 4 | 7 | 165 | 1 | 3 | 215 | 4 | 417 |

| ID | Intersection Name | Southbound | | Eastbound | | Westbound | | Total Volume |
|---|---|---|---|---|---|---|---|---|
| | | Left | Right | Left | Thru | Thru | Right | |
| 3 | Fulton St at Friendsview Entrance | 8 | 7 | 11 | 233 | 141 | 15 | 415 |

| ID | Intersection Name | Northbound | | Southbound | | Eastbound | | Total Volume |
|---|---|---|---|---|---|---|---|---|
| | | Left | Thru | Thru | Right | Left | Right | |
| 4 | Fulton at Villa Rd (South) | 67 | 82 | 116 | 47 | 52 | 68 | 432 |

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Report File: J:\...\PM Developed.pdf

Scenario 4: PM Developed Traffic
10/6/2015

## Turning Movement Volume: Detail

| ID | Intersection Name | Volume Type | Northbound | | | Southbound | | | Eastbound | | | Westbound | | | Total Volume |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | |
| 1 | Meridian St at Fulton St | Final Base | 0 | 80 | 100 | 33 | 45 | 0 | 0 | 0 | 0 | 148 | 0 | 43 | 449 |
| | | Growth Rate | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | - |
| | | In Process | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | Net New Trips | 5 | 0 | 7 | 2 | 0 | 1 | 2 | 8 | 6 | 4 | 6 | 1 | 42 |
| | | Other | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | **Future Total** | **5** | **80** | **107** | **35** | **45** | **1** | **2** | **8** | **6** | **152** | **6** | **44** | **491** |

| ID | Intersection Name | Volume Type | Northbound | | | Southbound | | | Eastbound | | | Westbound | | | Total Volume |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | |
| 2 | Fulton St at Center St | Final Base | 0 | 0 | 14 | 1 | 0 | 1 | 2 | 152 | 1 | 3 | 206 | 0 | 380 |
| | | Growth Rate | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | - |
| | | In Process | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | Net New Trips | 0 | 0 | 0 | 3 | 0 | 3 | 5 | 13 | 0 | 0 | 9 | 4 | 37 |
| | | Other | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | **Future Total** | **0** | **0** | **14** | **4** | **0** | **4** | **7** | **165** | **1** | **3** | **215** | **4** | **417** |

| ID | Intersection Name | Volume Type | Southbound | | Eastbound | | Westbound | | Total Volume |
|---|---|---|---|---|---|---|---|---|---|
| | | | Left | Right | Left | Thru | Thru | Right | |
| 3 | Fulton St at Friendsview Entrance | Final Base | 5 | 4 | 6 | 222 | 131 | 11 | 379 |
| | | Growth Rate | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | - |
| | | In Process | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | Net New Trips | 3 | 3 | 5 | 11 | 10 | 4 | 36 |
| | | Other | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | **Future Total** | **8** | **7** | **11** | **233** | **141** | **15** | **415** |

| ID | Intersection Name | Volume Type | Northbound | | Southbound | | Eastbound | | Total Volume |
|---|---|---|---|---|---|---|---|---|---|
| | | | Left | Thru | Thru | Right | Left | Right | |
| 4 | Fulton at Villa Rd (South) | Final Base | 60 | 82 | 116 | 40 | 45 | 61 | 404 |
| | | Growth Rate | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | - |
| | | In Process | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | Net New Trips | 7 | 0 | 0 | 7 | 7 | 7 | 28 |
| | | Other | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | **Future Total** | **67** | **82** | **116** | **47** | **52** | **68** | **432** |

University Village TIA

Vistro File: J:\...\Newberg University Village.vistro
Report File: J:\...\PM Developed.pdf

Scenario 4: PM Developed Traffic
10/6/2015

## Trip generation summary

### Added Trips

| Zone ID: Name | Land Use variables | Code | Ind. Var. | Rate | Quantity | % In | % Out | Trips In | Trips Out | Total trips | % of Total Trips |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 8: Newberg ReStore | Specialty Retail | 814 | ksf | 2.710 | 10.500 | 44.00 | 56.00 | 12 | 16 | 28 | 50.00 |
| 15: University Village | Senior Adult Housing - Attached | ITE 252 | Dwelling Unit | 0.160 | 175.000 | 60.00 | 40.00 | 17 | 11 | 28 | 50.00 |
| | | | | | **Added Trips Total** | | | **29** | **27** | **56** | **100.00** |

University Village TIA

Vistro File: J:\...\Newberg University Village.vistro
Report File: J:\...\PM Developed.pdf

Scenario 4: PM Developed Traffic
10/6/2015

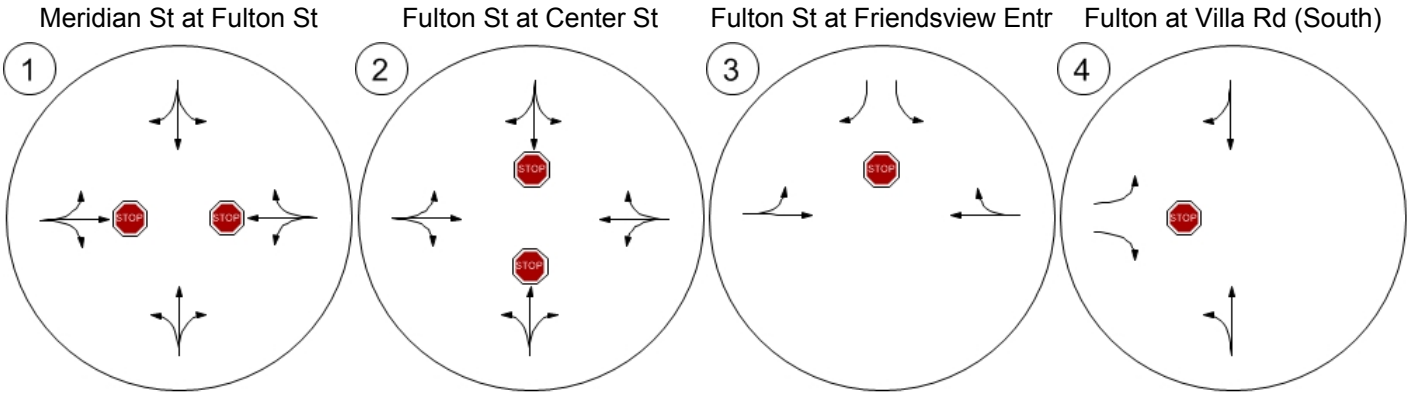
## Trip distribution summary

| Zone / Gate | Zone 8: Newberg ReStore | | | |
|---|---|---|---|---|
| | To Newberg ReStore: | | From Newberg ReStore: | |
| | Share % | Trips | Share % | Trips |
| 15: University Village | 0.00 | 0 | 0.00 | 0 |
| 1: Gate | 10.00 | 1 | 10.00 | 2 |
| 2: Gate | 40.00 | 5 | 40.00 | 6 |
| 3: Gate | 25.00 | 3 | 25.00 | 4 |
| 4: Gate | 25.00 | 3 | 25.00 | 4 |
| 7: Gate | 0.00 | 0 | 0.00 | 0 |
| 10: Gate | 0.00 | 0 | 0.00 | 0 |
| 16: Gate | 0.00 | 0 | 0.00 | 0 |
| **Total** | **100.00** | **12** | **100.00** | **16** |

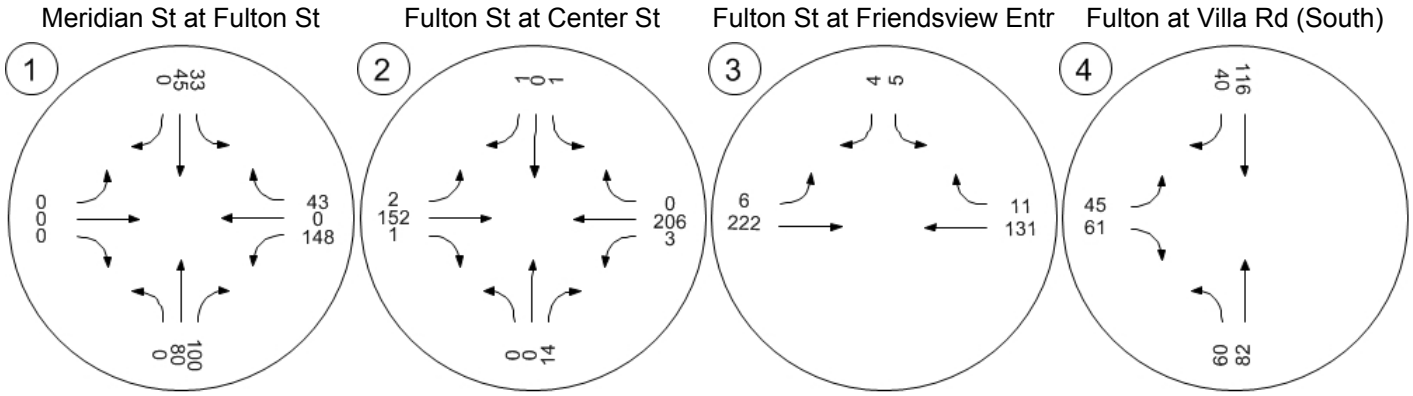
| Zone / Gate | Zone 15: University Village | | | |
|---|---|---|---|---|
| | To University Village: | | From University Village: | |
| | Share % | Trips | Share % | Trips |
| 8: Newberg ReStore | 0.00 | 0 | 0.00 | 0 |
| 1: Gate | 10.00 | 2 | 10.00 | 1 |
| 2: Gate | 40.00 | 7 | 40.00 | 4 |
| 3: Gate | 25.00 | 4 | 25.00 | 3 |
| 4: Gate | 25.00 | 4 | 25.00 | 3 |
| 7: Gate | 0.00 | 0 | 0.00 | 0 |
| 10: Gate | 0.00 | 0 | 0.00 | 0 |
| 16: Gate | 0.00 | 0 | 0.00 | 0 |
| **Total** | **100.00** | **17** | **100.00** | **11** |

Report Figure 1: Study Intersections

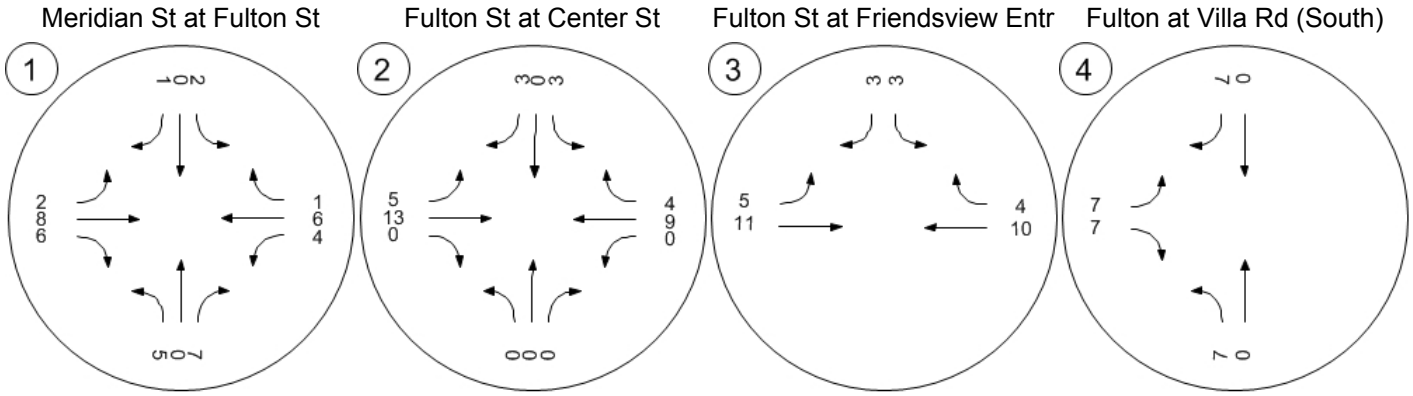
Report Figure 2: Lane Configuration and Traffic Control



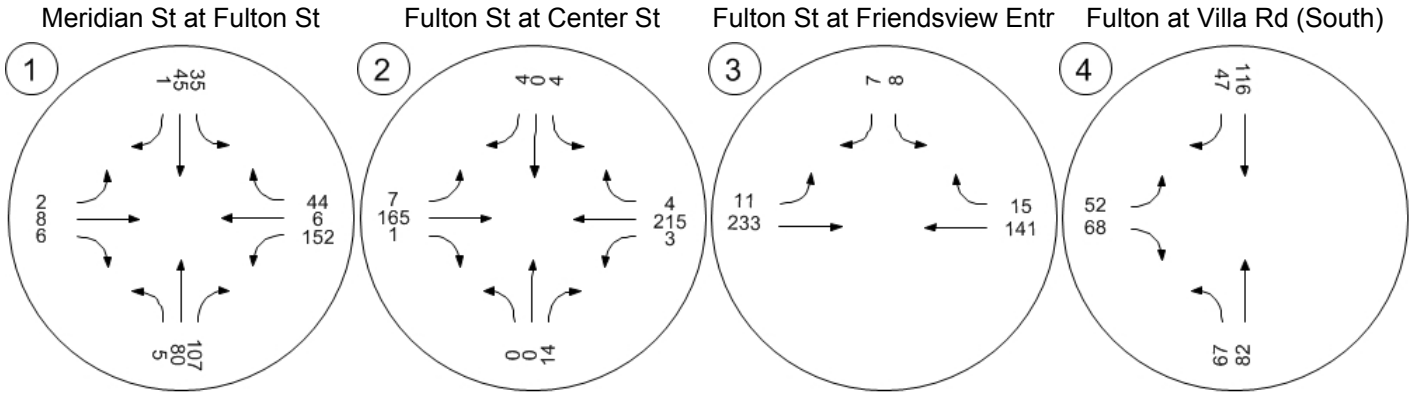
Report Figure 3a: Traffic Volume - Base Volume



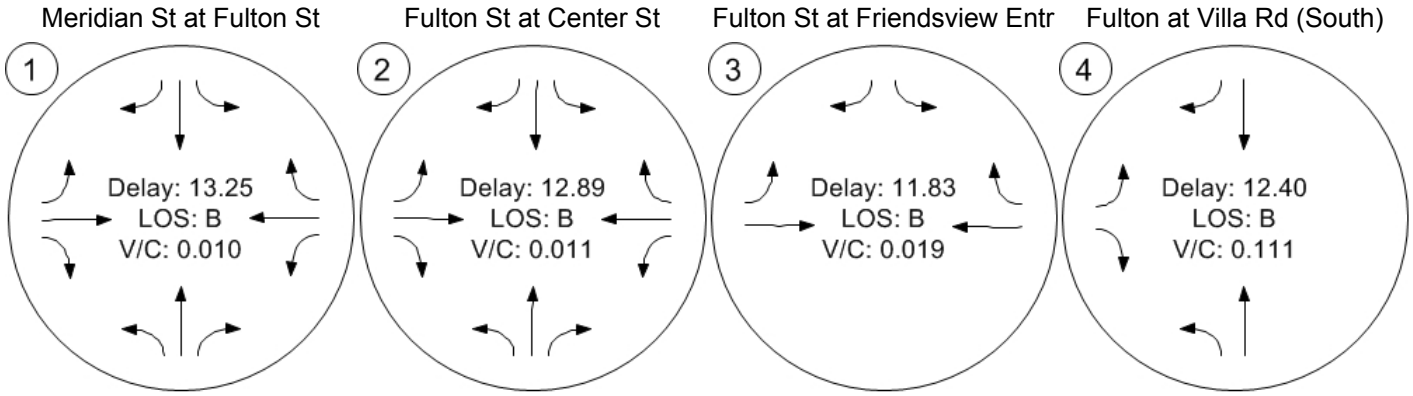
Report Figure 3c: Traffic Volume - Net New Site Trips



Report Figure 3e: Traffic Volume - Future Total Volume



Report Figure 4: Traffic Conditions



University Village TIA

Vistro File: J:\...\Newberg University Village.vistro
Report File: J:\...\AM Future (2025).pdf

Scenario 5: AM Future (2025) Traffic
10/6/2015

**Intersection Analysis Summary**

| ID | Intersection Name | Control Type | Method | Worst Mvmt | V/C | Delay (s/veh) | LOS |
|---|---|---|---|---|---|---|---|
| 1 | Meridian St at Fulton St | Two-way stop | HCM2010 | WBT | 0.000 | 11.1 | B |
| 2 | Fulton St at Center St | Two-way stop | HCM2010 | NBT | 0.000 | 11.8 | B |
| 3 | Fulton St at Friendsview Entrance | Two-way stop | HCM2010 | SBL | 0.023 | 12.0 | B |
| 4 | Fulton at Villa Rd (South) | Two-way stop | HCM2010 | EBL | 0.121 | 12.8 | B |

V/C, Delay, LOS: For two-way stop, these values are taken from the movement with the worst (highest) delay value; for all other control types, they are taken for the whole intersection.

**Intersection Level Of Service Report**
**#1: Meridian St at Fulton St**

| | | | |
|---|---|---|---|
| Control Type: | Two-way stop | Delay (sec / veh): | 11.1 |
| Analysis Method: | HCM2010 | Level Of Service: | B |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.000 |

**Intersection Setup**

| Name | Meridian St | | | | | | Fulton St | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration | | | | | | | | | | | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| Speed [mph] | 25.00 | | | 25.00 | | | 25.00 | | | 25.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Crosswalk | yes | | | yes | | | yes | | | yes | | |

**Volumes**

| Name | Meridian St | | | | | | Fulton St | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 0 | 25 | 17 | 35 | 51 | 0 | 0 | 0 | 0 | 48 | 0 | 11 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 6.50 | 6.50 | 6.50 | 6.50 | 6.50 | 6.50 | 6.50 | 6.50 | 6.50 | 6.50 | 6.50 | 6.50 |
| Growth Rate | 1.10 | 1.10 | 1.10 | 1.10 | 1.10 | 1.10 | 1.10 | 1.10 | 1.10 | 1.10 | 1.10 | 1.10 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 3 | 1 | 0 | 0 | 0 | 0 | 0 | 5 | 0 | 2 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 0 | 28 | 22 | 40 | 56 | 0 | 0 | 0 | 0 | 58 | 0 | 14 |
| Peak Hour Factor | 0.8200 | 0.8200 | 0.8200 | 0.8200 | 0.8200 | 0.8200 | 0.8200 | 0.8200 | 0.8200 | 0.8200 | 0.8200 | 0.8200 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 0 | 9 | 7 | 12 | 17 | 0 | 0 | 0 | 0 | 18 | 0 | 4 |
| Total Analysis Volume [veh/h] | 0 | 34 | 27 | 49 | 68 | 0 | 0 | 0 | 0 | 71 | 0 | 17 |
| Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| Priority Scheme | Free | Free | Stop | Stop |
|---|---|---|---|---|
| Flared Lane | | | no | no |
| Storage Area [veh] | 0 | 0 | 0 | 0 |
| Two-Stage Gap Acceptance | | | no | no |
| Number of Storage Spaces in Median | 0 | 0 | 0 | 0 |

**Movement, Approach, & Intersection Results**

| V/C, Movement V/C Ratio | 0.00 | 0.00 | 0.00 | 0.03 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.10 | 0.00 | 0.02 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| d_M, Delay for Movement [s/veh] | 7.39 | 0.00 | 0.00 | 7.46 | 0.00 | 0.00 | 10.19 | 10.61 | 8.66 | 10.66 | 11.13 | 9.19 |
| Movement LOS | A | A | A | A | A | A | B | B | A | B | B | A |
| 95th-Percentile Queue Length [veh] | 0.00 | 0.00 | 0.00 | 0.25 | 0.25 | 0.25 | 0.00 | 0.00 | 0.00 | 0.39 | 0.39 | 0.39 |
| 95th-Percentile Queue Length [ft] | 0.00 | 0.00 | 0.00 | 6.27 | 6.27 | 6.27 | 0.00 | 0.00 | 0.00 | 9.81 | 9.81 | 9.81 |
| d_A, Approach Delay [s/veh] | 0.00 | | | 3.12 | | | 9.82 | | | 10.38 | | |
| Approach LOS | A | | | A | | | A | | | B | | |
| d_I, Intersection Delay [s/veh] | 4.81 | | | | | | | | | | | |
| Intersection LOS | B | | | | | | | | | | | |

**Intersection Level Of Service Report**
**#2: Fulton St at Center St**

| | | | |
|---|---|---|---|
| Control Type: | Two-way stop | Delay (sec / veh): | 11.8 |
| Analysis Method: | HCM2010 | Level Of Service: | B |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.000 |

**Intersection Setup**

| Name | Center St | | | | | | | | | Fulton St | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration | | | | | | | | | | | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| Speed [mph] | 25.00 | | | 25.00 | | | 25.00 | | | 25.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Crosswalk | yes | | | yes | | | yes | | | yes | | |

**Volumes**

| Name | Center St | | | | | | | | | Fulton St | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 2 | 0 | 8 | 0 | 0 | 1 | 0 | 220 | 0 | 4 | 74 | 0 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.20 | 2.20 | 2.20 | 2.20 | 2.20 | 2.20 | 2.20 | 2.20 | 2.20 | 2.20 | 2.20 | 2.20 |
| Growth Rate | 1.10 | 1.10 | 1.10 | 1.10 | 1.10 | 1.10 | 1.10 | 1.10 | 1.10 | 1.10 | 1.10 | 1.10 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 4 | 0 | 4 | 2 | 2 | 0 | 0 | 4 | 2 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 2 | 0 | 9 | 4 | 0 | 5 | 2 | 244 | 0 | 4 | 85 | 2 |
| Peak Hour Factor | 0.8600 | 0.8600 | 0.8600 | 0.8600 | 0.8600 | 0.8600 | 0.8600 | 0.8600 | 0.8600 | 0.8600 | 0.8600 | 0.8600 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 1 | 0 | 3 | 1 | 0 | 1 | 1 | 71 | 0 | 1 | 25 | 1 |
| Total Analysis Volume [veh/h] | 2 | 0 | 10 | 5 | 0 | 6 | 2 | 284 | 0 | 5 | 99 | 2 |
| Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| Priority Scheme | Stop | Stop | Free | Free |
|---|---|---|---|---|
| Flared Lane | no | no | | |
| Storage Area [veh] | 0 | 0 | 0 | 0 |
| Two-Stage Gap Acceptance | no | no | | |
| Number of Storage Spaces in Median | 0 | 0 | 0 | 0 |

**Movement, Approach, & Intersection Results**

| V/C, Movement V/C Ratio | 0.00 | 0.00 | 0.01 | 0.01 | 0.00 | 0.01 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| d_M, Delay for Movement [s/veh] | 11.59 | 11.81 | 9.86 | 11.65 | 11.79 | 8.85 | 7.42 | 0.00 | 0.00 | 7.83 | 0.00 | 0.00 |
| Movement LOS | B | B | A | B | B | A | A | A | A | A | A | A |
| 95th-Percentile Queue Length [veh] | 0.05 | 0.05 | 0.05 | 0.05 | 0.05 | 0.05 | 0.71 | 0.71 | 0.71 | 0.27 | 0.27 | 0.27 |
| 95th-Percentile Queue Length [ft] | 1.29 | 1.29 | 1.29 | 1.17 | 1.17 | 1.17 | 17.73 | 17.73 | 17.73 | 6.78 | 6.78 | 6.78 |
| d_A, Approach Delay [s/veh] | 10.15 | | | 10.12 | | | 0.05 | | | 0.37 | | |
| Approach LOS | B | | | B | | | A | | | A | | |
| d_I, Intersection Delay [s/veh] | 0.69 | | | | | | | | | | | |
| Intersection LOS | B | | | | | | | | | | | |

**Intersection Level Of Service Report**
**#3: Fulton St at Friendsview Entrance**

| | | | |
|---|---|---|---|
| Control Type: | Two-way stop | Delay (sec / veh): | 12.0 |
| Analysis Method: | HCM2010 | Level Of Service: | B |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.023 |

**Intersection Setup**

| Name | Cherry St | | Fulton St | | Fulton St | |
|---|---|---|---|---|---|---|
| Approach | Southbound | | Eastbound | | Westbound | |
| Lane Configuration | | | | | | |
| Turning Movement | Left | Right | Left | Thru | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Pocket | 0 | 0 | 0 | 0 | 0 | 0 |
| Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| Speed [mph] | 25.00 | | 25.00 | | 25.00 | |
| Grade [%] | 0.00 | | 0.00 | | 0.00 | |
| Crosswalk | yes | | yes | | yes | |

**Volumes**

| Name | Cherry St | | Fulton St | | Fulton St | |
|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 5 | 4 | 6 | 222 | 131 | 11 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.70 | 2.70 | 2.70 | 2.70 | 2.70 | 2.70 |
| Growth Rate | 1.10 | 1.10 | 1.10 | 1.10 | 1.10 | 1.10 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 4 | 4 | 2 | 4 | 2 | 2 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 10 | 8 | 9 | 248 | 146 | 14 |
| Peak Hour Factor | 0.8400 | 0.8400 | 0.8400 | 0.8400 | 0.8400 | 0.8400 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 3 | 2 | 3 | 74 | 43 | 4 |
| Total Analysis Volume [veh/h] | 12 | 10 | 11 | 295 | 174 | 17 |
| Pedestrian Volume [ped/h] | 0 | | 0 | | 0 | |

**Intersection Settings**

| Priority Scheme | Stop | Free | Free |
|---|---|---|---|
| Flared Lane | | | |
| Storage Area [veh] | 0 | 0 | 0 |
| Two-Stage Gap Acceptance | no | | |
| Number of Storage Spaces in Median | 0 | 0 | 0 |

**Movement, Approach, & Intersection Results**

| | | | | | | |
|---|---|---|---|---|---|---|
| V/C, Movement V/C Ratio | 0.02 | 0.01 | 0.01 | 0.00 | 0.00 | 0.00 |
| d_M, Delay for Movement [s/veh] | 12.03 | 9.24 | 7.63 | 0.00 | 0.00 | 0.00 |
| Movement LOS | B | A | A | A | A | A |
| 95th-Percentile Queue Length [veh] | 0.07 | 0.04 | 0.85 | 0.85 | 0.00 | 0.00 |
| 95th-Percentile Queue Length [ft] | 1.75 | 0.88 | 21.26 | 21.26 | 0.00 | 0.00 |
| d_A, Approach Delay [s/veh] | 10.76 | | 0.27 | | 0.00 | |
| Approach LOS | B | | A | | A | |
| d_I, Intersection Delay [s/veh] | 0.62 | | | | | |
| Intersection LOS | B | | | | | |

**Intersection Level Of Service Report**
**#4: Fulton at Villa Rd (South)**

| | | | |
|---|---|---|---|
| Control Type: | Two-way stop | Delay (sec / veh): | 12.8 |
| Analysis Method: | HCM2010 | Level Of Service: | B |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.121 |

**Intersection Setup**

| Name | Villa Road | | Villa Road | | Fulton St | |
|---|---|---|---|---|---|---|
| Approach | Northbound | | Southbound | | Eastbound | |
| Lane Configuration | | | | | | |
| Turning Movement | Left | Thru | Thru | Right | Left | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Pocket | 0 | 0 | 0 | 0 | 0 | 0 |
| Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| Speed [mph] | 25.00 | | 25.00 | | 25.00 | |
| Grade [%] | 0.00 | | 0.00 | | 0.00 | |
| Crosswalk | yes | | yes | | yes | |

**Volumes**

| Name | Villa Road | | Villa Road | | Fulton St | |
|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 60 | 82 | 116 | 40 | 45 | 61 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 6.50 | 6.50 | 6.50 | 6.50 | 6.50 | 6.50 |
| Growth Rate | 1.10 | 1.10 | 1.10 | 1.10 | 1.10 | 1.10 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 2 | 0 | 0 | 2 | 4 | 4 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 68 | 90 | 128 | 46 | 54 | 71 |
| Peak Hour Factor | 0.8500 | 0.8500 | 0.8500 | 0.8500 | 0.8500 | 0.8500 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 20 | 26 | 38 | 14 | 16 | 21 |
| Total Analysis Volume [veh/h] | 80 | 106 | 151 | 54 | 64 | 84 |
| Pedestrian Volume [ped/h] | 0 | | 0 | | 0 | |

**Intersection Settings**

| Priority Scheme | Free | Free | Stop |
|---|---|---|---|
| Flared Lane | | | |
| Storage Area [veh] | 0 | 0 | 0 |
| Two-Stage Gap Acceptance | | | no |
| Number of Storage Spaces in Median | 0 | 0 | 0 |

**Movement, Approach, & Intersection Results**

| V/C, Movement V/C Ratio | 0.06 | 0.00 | 0.00 | 0.00 | 0.12 | 0.10 |
|---|---|---|---|---|---|---|
| d_M, Delay for Movement [s/veh] | 7.86 | 0.00 | 0.00 | 0.00 | 12.77 | 9.68 |
| Movement LOS | A | A | A | A | B | A |
| 95th-Percentile Queue Length [veh] | 0.48 | 0.48 | 0.00 | 0.00 | 0.41 | 0.33 |
| 95th-Percentile Queue Length [ft] | 12.05 | 12.05 | 0.00 | 0.00 | 10.29 | 8.16 |
| d_A, Approach Delay [s/veh] | 3.38 | | 0.00 | | 11.01 | |
| Approach LOS | A | | A | | B | |
| d_I, Intersection Delay [s/veh] | 4.19 | | | | | |
| Intersection LOS | B | | | | | |

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Scenario 5: AM Future (2025) Traffic
10/6/2015

## Turning Movement Volume: Summary

| ID | Intersection Name | Northbound | | | Southbound | | | Eastbound | | | Westbound | | | Total Volume |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | |
| 1 | Meridian St at Fulton St | 0 | 28 | 22 | 40 | 56 | 0 | 0 | 0 | 0 | 58 | 0 | 14 | 218 |

| ID | Intersection Name | Northbound | | | Southbound | | | Eastbound | | | Westbound | | | Total Volume |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | |
| 2 | Fulton St at Center St | 2 | 0 | 9 | 4 | 0 | 5 | 2 | 244 | 0 | 4 | 85 | 2 | 357 |

| ID | Intersection Name | Southbound | | Eastbound | | Westbound | | Total Volume |
|---|---|---|---|---|---|---|---|---|
| | | Left | Right | Left | Thru | Thru | Right | |
| 3 | Fulton St at Friendsview Entrance | 10 | 8 | 9 | 248 | 146 | 14 | 435 |

| ID | Intersection Name | Northbound | | Southbound | | Eastbound | | Total Volume |
|---|---|---|---|---|---|---|---|---|
| | | Left | Thru | Thru | Right | Left | Right | |
| 4 | Fulton at Villa Rd (South) | 68 | 90 | 128 | 46 | 54 | 71 | 457 |

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Report File: J:\...\AM Future (2025).pdf

Scenario 5: AM Future (2025) Traffic
10/6/2015

## Turning Movement Volume: Detail

| ID | Intersection Name | Volume Type | Northbound | | | Southbound | | | Eastbound | | | Westbound | | | Total Volume |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | |
| 1 | Meridian St at Fulton St | Final Base | 0 | 25 | 17 | 35 | 51 | 0 | 0 | 0 | 0 | 48 | 0 | 11 | 187 |
| | | Growth Rate | 1.10 | 1.10 | 1.10 | 1.10 | 1.10 | 1.10 | 1.10 | 1.10 | 1.10 | 1.10 | 1.10 | 1.10 | - |
| | | In Process | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | Net New Trips | 0 | 0 | 3 | 1 | 0 | 0 | 0 | 0 | 0 | 5 | 0 | 2 | 11 |
| | | Other | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | **Future Total** | **0** | **28** | **22** | **40** | **56** | **0** | **0** | **0** | **0** | **58** | **0** | **14** | **218** |

| ID | Intersection Name | Volume Type | Northbound | | | Southbound | | | Eastbound | | | Westbound | | | Total Volume |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | |
| 2 | Fulton St at Center St | Final Base | 2 | 0 | 8 | 0 | 0 | 1 | 0 | 220 | 0 | 4 | 74 | 0 | 309 |
| | | Growth Rate | 1.10 | 1.10 | 1.10 | 1.10 | 1.10 | 1.10 | 1.10 | 1.10 | 1.10 | 1.10 | 1.10 | 1.10 | - |
| | | In Process | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | Net New Trips | 0 | 0 | 0 | 4 | 0 | 4 | 2 | 2 | 0 | 0 | 4 | 2 | 18 |
| | | Other | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | **Future Total** | **2** | **0** | **9** | **4** | **0** | **5** | **2** | **244** | **0** | **4** | **85** | **2** | **357** |

| ID | Intersection Name | Volume Type | Southbound | | Eastbound | | Westbound | | Total Volume |
|---|---|---|---|---|---|---|---|---|---|
| | | | Left | Right | Left | Thru | Thru | Right | |
| 3 | Fulton St at Friendsview Entrance | Final Base | 5 | 4 | 6 | 222 | 131 | 11 | 379 |
| | | Growth Rate | 1.10 | 1.10 | 1.10 | 1.10 | 1.10 | 1.10 | - |
| | | In Process | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | Net New Trips | 4 | 4 | 2 | 4 | 2 | 2 | 18 |
| | | Other | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | **Future Total** | **10** | **8** | **9** | **248** | **146** | **14** | **435** |

| ID | Intersection Name | Volume Type | Northbound | | Southbound | | Eastbound | | Total Volume |
|---|---|---|---|---|---|---|---|---|---|
| | | | Left | Thru | Thru | Right | Left | Right | |
| 4 | Fulton at Villa Rd (South) | Final Base | 60 | 82 | 116 | 40 | 45 | 61 | 404 |
| | | Growth Rate | 1.10 | 1.10 | 1.10 | 1.10 | 1.10 | 1.10 | - |
| | | In Process | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | Net New Trips | 2 | 0 | 0 | 2 | 4 | 4 | 12 |
| | | Other | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | **Future Total** | **68** | **90** | **128** | **46** | **54** | **71** | **457** |

University Village TIA

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Scenario 5: AM Future (2025) Traffic
10/6/2015

## Trip generation summary

### Added Trips

| Zone ID: Name | Land Use variables | Code | Ind. Var. | Rate | Quantity | % In | % Out | Trips In | Trips Out | Total trips | % of Total Trips |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 8: Newberg ReStore | Specialty Retail | 814 | ksf | 0.000 | 10.500 | 52.00 | 48.00 | 0 | 0 | 0 | 0.00 |
| 15: University Village | Senior Adult Housing - Attached | ITE 252 | Dwelling Unit | 0.130 | 175.000 | 36.00 | 64.00 | 8 | 15 | 23 | 100.00 |
| | | | | | **Added Trips Total** | | | **8** | **15** | **23** | **100.00** |

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Scenario 5: AM Future (2025) Traffic
10/6/2015

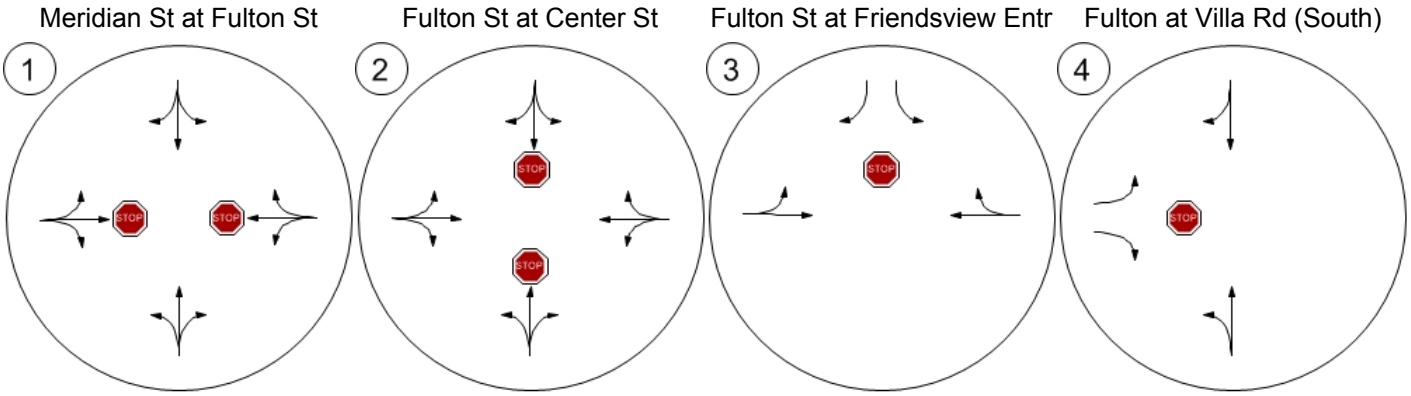
## Trip distribution summary

| Zone / Gate | Zone 8: Newberg ReStore | | | |
|---|---|---|---|---|
| | To Newberg ReStore: | | From Newberg ReStore: | |
| | Share % | Trips | Share % | Trips |
| 15: University Village | 0.00 | 0 | 0.00 | 0 |
| 1: Gate | 10.00 | 0 | 10.00 | 0 |
| 2: Gate | 40.00 | 0 | 40.00 | 0 |
| 3: Gate | 25.00 | 0 | 25.00 | 0 |
| 4: Gate | 25.00 | 0 | 25.00 | 0 |
| 7: Gate | 0.00 | 0 | 0.00 | 0 |
| 10: Gate | 0.00 | 0 | 0.00 | 0 |
| 16: Gate | 0.00 | 0 | 0.00 | 0 |
| **Total** | **100.00** | **0** | **100.00** | **0** |

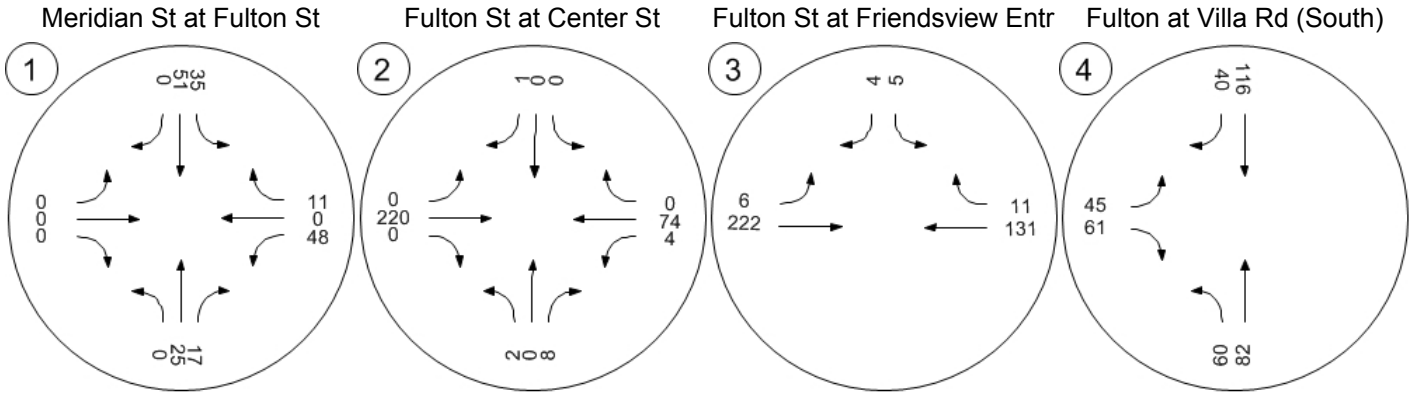
| Zone / Gate | Zone 15: University Village | | | |
|---|---|---|---|---|
| | To University Village: | | From University Village: | |
| | Share % | Trips | Share % | Trips |
| 8: Newberg ReStore | 0.00 | 0 | 0.00 | 0 |
| 1: Gate | 10.00 | 1 | 10.00 | 2 |
| 2: Gate | 40.00 | 3 | 40.00 | 5 |
| 3: Gate | 25.00 | 2 | 25.00 | 4 |
| 4: Gate | 25.00 | 2 | 25.00 | 4 |
| 7: Gate | 0.00 | 0 | 0.00 | 0 |
| 10: Gate | 0.00 | 0 | 0.00 | 0 |
| 16: Gate | 0.00 | 0 | 0.00 | 0 |
| **Total** | **100.00** | **8** | **100.00** | **15** |

Report Figure 1: Study Intersections

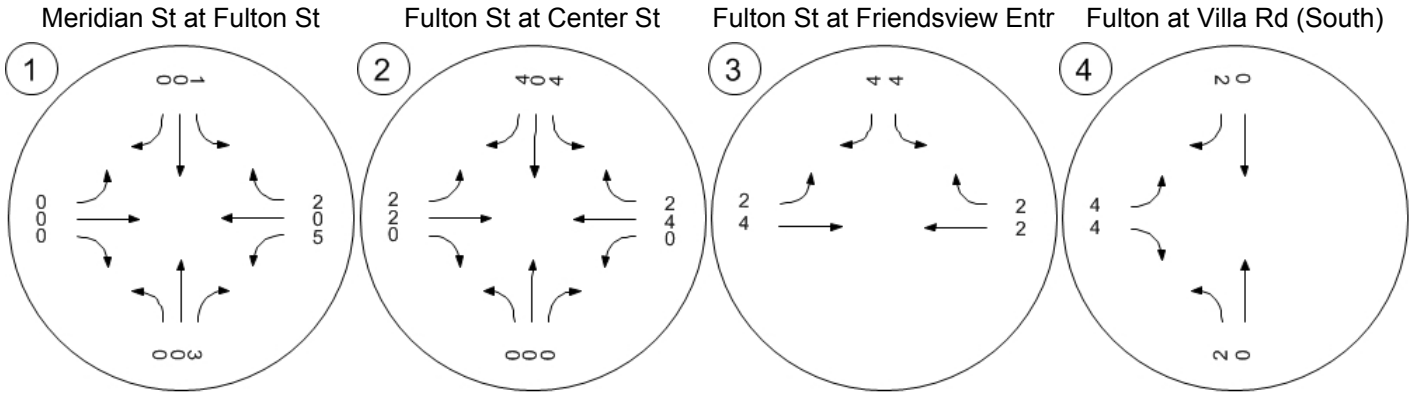
Report Figure 2: Lane Configuration and Traffic Control



Report Figure 3a: Traffic Volume - Base Volume

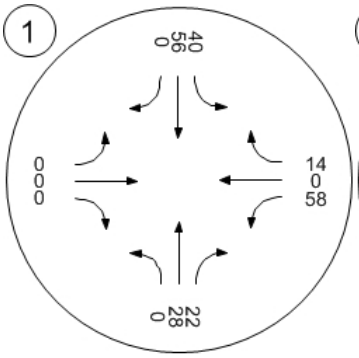


Report Figure 3c: Traffic Volume - Net New Site Trips

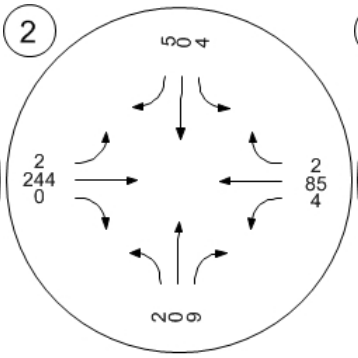


Report Figure 3e: Traffic Volume - Future Total Volume

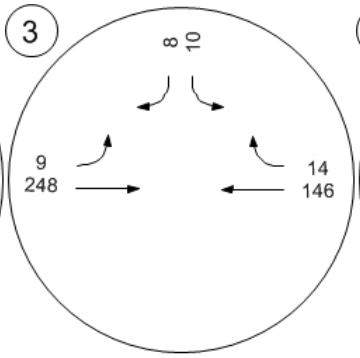
Meridian St at Fulton St



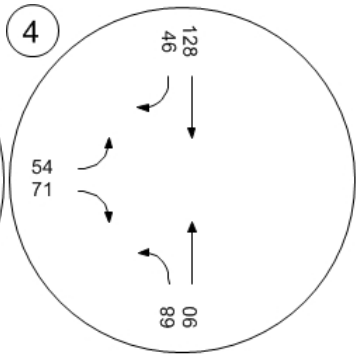

Fulton St at Center St



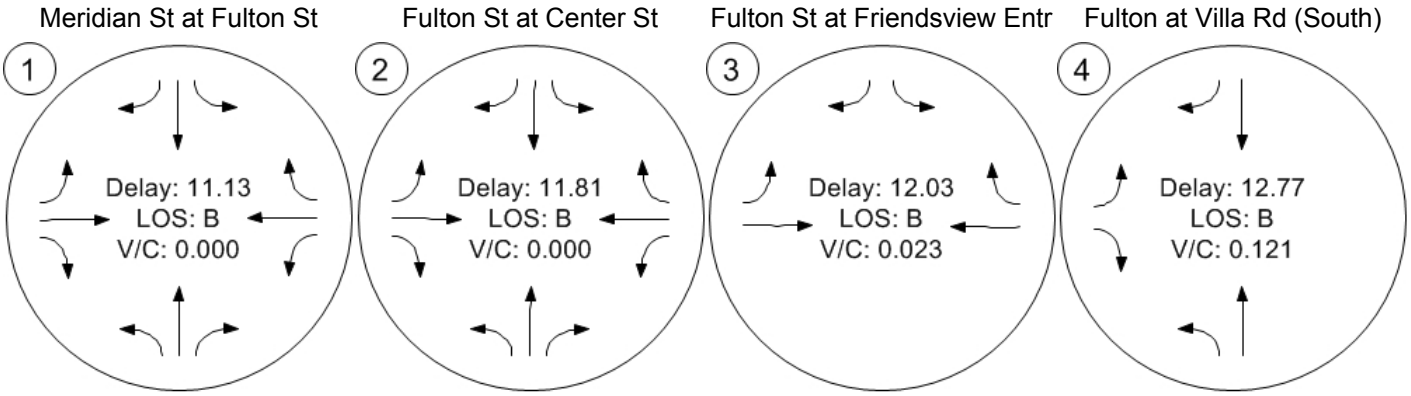

Fulton St at Friendsview Entr




Fulton at Villa Rd (South)



Report Figure 4: Traffic Conditions



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Report File: J:\...\PM Future (2025).pdf

Scenario 6: PM Future (2025) Traffic
10/6/2015

**Intersection Analysis Summary**

| ID | Intersection Name | Control Type | Method | Worst Mvmt | V/C | Delay (s/veh) | LOS |
|---|---|---|---|---|---|---|---|
| 1 | Meridian St at Fulton St | Two-way stop | HCM2010 | WBT | 0.010 | 14.1 | B |
| 2 | Fulton St at Center St | Two-way stop | HCM2010 | SBL | 0.012 | 13.5 | B |
| 3 | Fulton St at Friendsview Entrance | Two-way stop | HCM2010 | SBL | 0.022 | 12.3 | B |
| 4 | Fulton at Villa Rd (South) | Two-way stop | HCM2010 | EBL | 0.130 | 13.1 | B |

V/C, Delay, LOS: For two-way stop, these values are taken from the movement with the worst (highest) delay value; for all other control types, they are taken for the whole intersection.

**Intersection Level Of Service Report**
**#1: Meridian St at Fulton St**

| | | | |
|---|---|---|---|
| Control Type: | Two-way stop | Delay (sec / veh): | 14.1 |
| Analysis Method: | HCM2010 | Level Of Service: | B |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.010 |

**Intersection Setup**

| Name | Meridian St | | | | | | Fulton St | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration | | | | | | | | | | | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| Speed [mph] | 25.00 | | | 25.00 | | | 25.00 | | | 25.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Crosswalk | yes | | | yes | | | yes | | | yes | | |

**Volumes**

| Name | Meridian St | | | | | | Fulton St | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 0 | 80 | 100 | 33 | 45 | 0 | 0 | 0 | 0 | 148 | 0 | 43 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 1.60 | 1.60 | 1.60 | 1.60 | 1.60 | 1.60 | 1.60 | 1.60 | 1.60 | 1.60 | 1.60 | 1.60 |
| Growth Rate | 1.10 | 1.10 | 1.10 | 1.10 | 1.10 | 1.10 | 1.10 | 1.10 | 1.10 | 1.10 | 1.10 | 1.10 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 5 | 0 | 7 | 2 | 0 | 1 | 2 | 8 | 6 | 4 | 6 | 1 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 5 | 88 | 117 | 38 | 50 | 1 | 2 | 8 | 6 | 167 | 6 | 48 |
| Peak Hour Factor | 0.9400 | 0.9400 | 0.9400 | 0.9400 | 0.9400 | 0.9400 | 0.9400 | 0.9400 | 0.9400 | 0.9400 | 0.9400 | 0.9400 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 1 | 23 | 31 | 10 | 13 | 0 | 1 | 2 | 2 | 44 | 2 | 13 |
| Total Analysis Volume [veh/h] | 5 | 94 | 124 | 40 | 53 | 1 | 2 | 9 | 6 | 178 | 6 | 51 |
| Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| Priority Scheme | Free | Free | Stop | Stop |
|---|---|---|---|---|
| Flared Lane | | | no | no |
| Storage Area [veh] | 0 | 0 | 0 | 0 |
| Two-Stage Gap Acceptance | | | no | no |
| Number of Storage Spaces in Median | 0 | 0 | 0 | 0 |

**Movement, Approach, & Intersection Results**

| V/C, Movement V/C Ratio | 0.00 | 0.00 | 0.00 | 0.03 | 0.00 | 0.00 | 0.00 | 0.02 | 0.01 | 0.29 | 0.01 | 0.06 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| d_M, Delay for Movement [s/veh] | 7.32 | 0.00 | 0.00 | 7.74 | 0.00 | 0.00 | 11.46 | 11.73 | 8.69 | 13.80 | 14.05 | 12.02 |
| Movement LOS | A | A | A | A | A | A | B | B | A | B | B | B |
| 95th-Percentile Queue Length [veh] | 0.50 | 0.50 | 0.50 | 0.22 | 0.22 | 0.22 | 0.08 | 0.08 | 0.08 | 1.61 | 1.61 | 1.61 |
| 95th-Percentile Queue Length [ft] | 12.53 | 12.53 | 12.53 | 5.59 | 5.59 | 5.59 | 1.99 | 1.99 | 1.99 | 40.16 | 40.16 | 40.16 |
| d_A, Approach Delay [s/veh] | 0.16 | | | 3.29 | | | 10.62 | | | 13.42 | | |
| Approach LOS | A | | | A | | | B | | | B | | |
| d_I, Intersection Delay [s/veh] | 6.47 | | | | | | | | | | | |
| Intersection LOS | B | | | | | | | | | | | |

**Intersection Level Of Service Report**
**#2: Fulton St at Center St**

| | | | |
|---|---|---|---|
| Control Type: | Two-way stop | Delay (sec / veh): | 13.5 |
| Analysis Method: | HCM2010 | Level Of Service: | B |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.012 |

**Intersection Setup**

| Name | Center St | | | | | | | | | Fulton St | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration | | | | | | | | | | | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Pocket | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| Speed [mph] | 25.00 | | | 25.00 | | | 25.00 | | | 25.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Crosswalk | yes | | | yes | | | yes | | | yes | | |

**Volumes**

| Name | Center St | | | | | | | | | Fulton St | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 0 | 0 | 14 | 1 | 0 | 1 | 2 | 152 | 1 | 3 | 206 | 0 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Rate | 1.10 | 1.10 | 1.10 | 1.10 | 1.10 | 1.10 | 1.10 | 1.10 | 1.10 | 1.10 | 1.10 | 1.10 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 3 | 0 | 3 | 5 | 13 | 0 | 0 | 9 | 4 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 0 | 0 | 15 | 4 | 0 | 4 | 7 | 180 | 1 | 3 | 236 | 4 |
| Peak Hour Factor | 0.8100 | 0.8100 | 0.8100 | 0.8100 | 0.8100 | 0.8100 | 0.8100 | 0.8100 | 0.8100 | 0.8100 | 0.8100 | 0.8100 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 0 | 0 | 5 | 1 | 0 | 1 | 2 | 56 | 0 | 1 | 73 | 1 |
| Total Analysis Volume [veh/h] | 0 | 0 | 19 | 5 | 0 | 5 | 9 | 222 | 1 | 4 | 291 | 5 |
| Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |

**Intersection Settings**

| Priority Scheme | Stop | Stop | Free | Free |
|---|---|---|---|---|
| Flared Lane | no | no | | |
| Storage Area [veh] | 0 | 0 | 0 | 0 |
| Two-Stage Gap Acceptance | no | no | | |
| Number of Storage Spaces in Median | 0 | 0 | 0 | 0 |

**Movement, Approach, & Intersection Results**

| V/C, Movement V/C Ratio | 0.00 | 0.00 | 0.02 | 0.01 | 0.00 | 0.01 | 0.01 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| d_M, Delay for Movement [s/veh] | 13.24 | 13.27 | 9.51 | 13.49 | 13.27 | 9.95 | 7.87 | 0.00 | 0.00 | 7.68 | 0.00 | 0.00 |
| Movement LOS | B | B | A | B | B | A | A | A | A | A | A | A |
| 95th-Percentile Queue Length [veh] | 0.07 | 0.07 | 0.07 | 0.06 | 0.06 | 0.06 | 0.67 | 0.67 | 0.67 | 0.85 | 0.85 | 0.85 |
| 95th-Percentile Queue Length [ft] | 1.78 | 1.78 | 1.78 | 1.40 | 1.40 | 1.40 | 16.75 | 16.75 | 16.75 | 21.37 | 21.37 | 21.37 |
| d_A, Approach Delay [s/veh] | 9.51 | | | 11.72 | | | 0.31 | | | 0.10 | | |
| Approach LOS | A | | | B | | | A | | | A | | |
| d_I, Intersection Delay [s/veh] | 0.71 | | | | | | | | | | | |
| Intersection LOS | B | | | | | | | | | | | |

**Intersection Level Of Service Report**
**#3: Fulton St at Friendsview Entrance**

| | | | |
|---|---|---|---|
| Control Type: | Two-way stop | Delay (sec / veh): | 12.3 |
| Analysis Method: | HCM2010 | Level Of Service: | B |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.022 |

**Intersection Setup**

| Name | Cherry St | | Fulton St | | Fulton St | |
|---|---|---|---|---|---|---|
| Approach | Southbound | | Eastbound | | Westbound | |
| Lane Configuration | | | | | | |
| Turning Movement | Left | Right | Left | Thru | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Pocket | 0 | 0 | 0 | 0 | 0 | 0 |
| Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| Speed [mph] | 25.00 | | 25.00 | | 25.00 | |
| Grade [%] | 0.00 | | 0.00 | | 0.00 | |
| Crosswalk | yes | | yes | | yes | |

**Volumes**

| Name | Cherry St | | Fulton St | | Fulton St | |
|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 5 | 4 | 6 | 222 | 131 | 11 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.70 | 2.70 | 2.70 | 2.70 | 2.70 | 2.70 |
| Growth Rate | 1.10 | 1.10 | 1.10 | 1.10 | 1.10 | 1.10 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 3 | 3 | 5 | 11 | 10 | 4 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 9 | 7 | 12 | 255 | 154 | 16 |
| Peak Hour Factor | 0.8400 | 0.8400 | 0.8400 | 0.8400 | 0.8400 | 0.8400 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 3 | 2 | 4 | 76 | 46 | 5 |
| Total Analysis Volume [veh/h] | 11 | 8 | 14 | 304 | 183 | 19 |
| Pedestrian Volume [ped/h] | 0 | | 0 | | 0 | |

**Intersection Settings**

| Priority Scheme | Stop | Free | Free |
|---|---|---|---|
| Flared Lane | | | |
| Storage Area [veh] | 0 | 0 | 0 |
| Two-Stage Gap Acceptance | no | | |
| Number of Storage Spaces in Median | 0 | 0 | 0 |

**Movement, Approach, & Intersection Results**

| | | | | | | |
|---|---|---|---|---|---|---|
| V/C, Movement V/C Ratio | 0.02 | 0.01 | 0.01 | 0.00 | 0.00 | 0.00 |
| d_M, Delay for Movement [s/veh] | 12.28 | 9.29 | 7.66 | 0.00 | 0.00 | 0.00 |
| Movement LOS | B | A | A | A | A | A |
| 95th-Percentile Queue Length [veh] | 0.07 | 0.03 | 0.90 | 0.90 | 0.00 | 0.00 |
| 95th-Percentile Queue Length [ft] | 1.67 | 0.71 | 22.61 | 22.61 | 0.00 | 0.00 |
| d_A, Approach Delay [s/veh] | 11.02 | | 0.34 | | 0.00 | |
| Approach LOS | B | | A | | A | |
| d_I, Intersection Delay [s/veh] | 0.59 | | | | | |
| Intersection LOS | B | | | | | |

**Intersection Level Of Service Report**
**#4: Fulton at Villa Rd (South)**

| | | | |
|---|---|---|---|
| Control Type: | Two-way stop | Delay (sec / veh): | 13.1 |
| Analysis Method: | HCM2010 | Level Of Service: | B |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.130 |

**Intersection Setup**

| Name | Villa Road | | Villa Road | | Fulton St | |
|---|---|---|---|---|---|---|
| Approach | Northbound | | Southbound | | Eastbound | |
| Lane Configuration | | | | | | |
| Turning Movement | Left | Thru | Thru | Right | Left | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Pocket | 0 | 0 | 0 | 0 | 0 | 0 |
| Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| Speed [mph] | 25.00 | | 25.00 | | 25.00 | |
| Grade [%] | 0.00 | | 0.00 | | 0.00 | |
| Crosswalk | yes | | yes | | yes | |

**Volumes**

| Name | Villa Road | | Villa Road | | Fulton St | |
|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 60 | 82 | 116 | 40 | 45 | 61 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 6.50 | 6.50 | 6.50 | 6.50 | 6.50 | 6.50 |
| Growth Rate | 1.10 | 1.10 | 1.10 | 1.10 | 1.10 | 1.10 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 7 | 0 | 0 | 7 | 7 | 7 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 73 | 90 | 128 | 51 | 57 | 74 |
| Peak Hour Factor | 0.8500 | 0.8500 | 0.8500 | 0.8500 | 0.8500 | 0.8500 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 21 | 26 | 38 | 15 | 17 | 22 |
| Total Analysis Volume [veh/h] | 86 | 106 | 151 | 60 | 67 | 87 |
| Pedestrian Volume [ped/h] | 0 | | 0 | | 0 | |

**Intersection Settings**

| Priority Scheme | Free | Free | Stop |
|---|---|---|---|
| Flared Lane | | | |
| Storage Area [veh] | 0 | 0 | 0 |
| Two-Stage Gap Acceptance | | | no |
| Number of Storage Spaces in Median | 0 | 0 | 0 |

**Movement, Approach, & Intersection Results**

| V/C, Movement V/C Ratio | 0.06 | 0.00 | 0.00 | 0.00 | 0.13 | 0.10 |
|---|---|---|---|---|---|---|
| d_M, Delay for Movement [s/veh] | 7.89 | 0.00 | 0.00 | 0.00 | 13.05 | 9.72 |
| Movement LOS | A | A | A | A | B | A |
| 95th-Percentile Queue Length [veh] | 0.50 | 0.50 | 0.00 | 0.00 | 0.45 | 0.34 |
| 95th-Percentile Queue Length [ft] | 12.57 | 12.57 | 0.00 | 0.00 | 11.15 | 8.52 |
| d_A, Approach Delay [s/veh] | 3.53 | | 0.00 | | 11.17 | |
| Approach LOS | A | | A | | B | |
| d_I, Intersection Delay [s/veh] | 4.31 | | | | | |
| Intersection LOS | B | | | | | |

University Village TIA

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Report File: J:\...\PM Future (2025).pdf

Scenario 6: PM Future (2025) Traffic
10/6/2015

## Turning Movement Volume: Summary

| ID | Intersection Name | Northbound | | | Southbound | | | Eastbound | | | Westbound | | | Total Volume |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | |
| 1 | Meridian St at Fulton St | 5 | 88 | 117 | 38 | 50 | 1 | 2 | 8 | 6 | 167 | 6 | 48 | 536 |

| ID | Intersection Name | Northbound | | | Southbound | | | Eastbound | | | Westbound | | | Total Volume |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | |
| 2 | Fulton St at Center St | 0 | 0 | 15 | 4 | 0 | 4 | 7 | 180 | 1 | 3 | 236 | 4 | 454 |

| ID | Intersection Name | Southbound | | Eastbound | | Westbound | | Total Volume |
|---|---|---|---|---|---|---|---|---|
| | | Left | Right | Left | Thru | Thru | Right | |
| 3 | Fulton St at Friendsview Entrance | 9 | 7 | 12 | 255 | 154 | 16 | 453 |

| ID | Intersection Name | Northbound | | Southbound | | Eastbound | | Total Volume |
|---|---|---|---|---|---|---|---|---|
| | | Left | Thru | Thru | Right | Left | Right | |
| 4 | Fulton at Villa Rd (South) | 73 | 90 | 128 | 51 | 57 | 74 | 473 |

University Village TIA

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Report File: J:\...\PM Future (2025).pdf

Scenario 6: PM Future (2025) Traffic
10/6/2015

## Turning Movement Volume: Detail

| ID | Intersection Name | Volume Type | Northbound | | | Southbound | | | Eastbound | | | Westbound | | | Total Volume |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | |
| 1 | Meridian St at Fulton St | Final Base | 0 | 80 | 100 | 33 | 45 | 0 | 0 | 0 | 0 | 148 | 0 | 43 | 449 |
| | | Growth Rate | 1.10 | 1.10 | 1.10 | 1.10 | 1.10 | 1.10 | 1.10 | 1.10 | 1.10 | 1.10 | 1.10 | 1.10 | - |
| | | In Process | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | Net New Trips | 5 | 0 | 7 | 2 | 0 | 1 | 2 | 8 | 6 | 4 | 6 | 1 | 42 |
| | | Other | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | **Future Total** | **5** | **88** | **117** | **38** | **50** | **1** | **2** | **8** | **6** | **167** | **6** | **48** | **536** |

| ID | Intersection Name | Volume Type | Northbound | | | Southbound | | | Eastbound | | | Westbound | | | Total Volume |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | |
| 2 | Fulton St at Center St | Final Base | 0 | 0 | 14 | 1 | 0 | 1 | 2 | 152 | 1 | 3 | 206 | 0 | 380 |
| | | Growth Rate | 1.10 | 1.10 | 1.10 | 1.10 | 1.10 | 1.10 | 1.10 | 1.10 | 1.10 | 1.10 | 1.10 | 1.10 | - |
| | | In Process | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | Net New Trips | 0 | 0 | 0 | 3 | 0 | 3 | 5 | 13 | 0 | 0 | 9 | 4 | 37 |
| | | Other | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | **Future Total** | **0** | **0** | **15** | **4** | **0** | **4** | **7** | **180** | **1** | **3** | **236** | **4** | **454** |

| ID | Intersection Name | Volume Type | Southbound | | Eastbound | | Westbound | | Total Volume |
|---|---|---|---|---|---|---|---|---|---|
| | | | Left | Right | Left | Thru | Thru | Right | |
| 3 | Fulton St at Friendsview Entrance | Final Base | 5 | 4 | 6 | 222 | 131 | 11 | 379 |
| | | Growth Rate | 1.10 | 1.10 | 1.10 | 1.10 | 1.10 | 1.10 | - |
| | | In Process | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | Net New Trips | 3 | 3 | 5 | 11 | 10 | 4 | 36 |
| | | Other | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | **Future Total** | **9** | **7** | **12** | **255** | **154** | **16** | **453** |

| ID | Intersection Name | Volume Type | Northbound | | Southbound | | Eastbound | | Total Volume |
|---|---|---|---|---|---|---|---|---|---|
| | | | Left | Thru | Thru | Right | Left | Right | |
| 4 | Fulton at Villa Rd (South) | Final Base | 60 | 82 | 116 | 40 | 45 | 61 | 404 |
| | | Growth Rate | 1.10 | 1.10 | 1.10 | 1.10 | 1.10 | 1.10 | - |
| | | In Process | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | Net New Trips | 7 | 0 | 0 | 7 | 7 | 7 | 28 |
| | | Other | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | **Future Total** | **73** | **90** | **128** | **51** | **57** | **74** | **473** |

University Village TIA

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Scenario 6: PM Future (2025) Traffic
10/6/2015

## Trip generation summary

### Added Trips

| Zone ID: Name | Land Use variables | Code | Ind. Var. | Rate | Quantity | % In | % Out | Trips In | Trips Out | Total trips | % of Total Trips |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 8: Newberg ReStore | Specialty Retail | 814 | ksf | 2.710 | 10.500 | 44.00 | 56.00 | 12 | 16 | 28 | 50.00 |
| 15: University Village | Senior Adult Housing - Attached | ITE 252 | Dwelling Unit | 0.160 | 175.000 | 60.00 | 40.00 | 17 | 11 | 28 | 50.00 |
| | | | | | **Added Trips Total** | | | **29** | **27** | **56** | **100.00** |

University Village TIA

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Report File: J:\...\PM Future (2025).pdf

Scenario 6: PM Future (2025) Traffic
10/6/2015

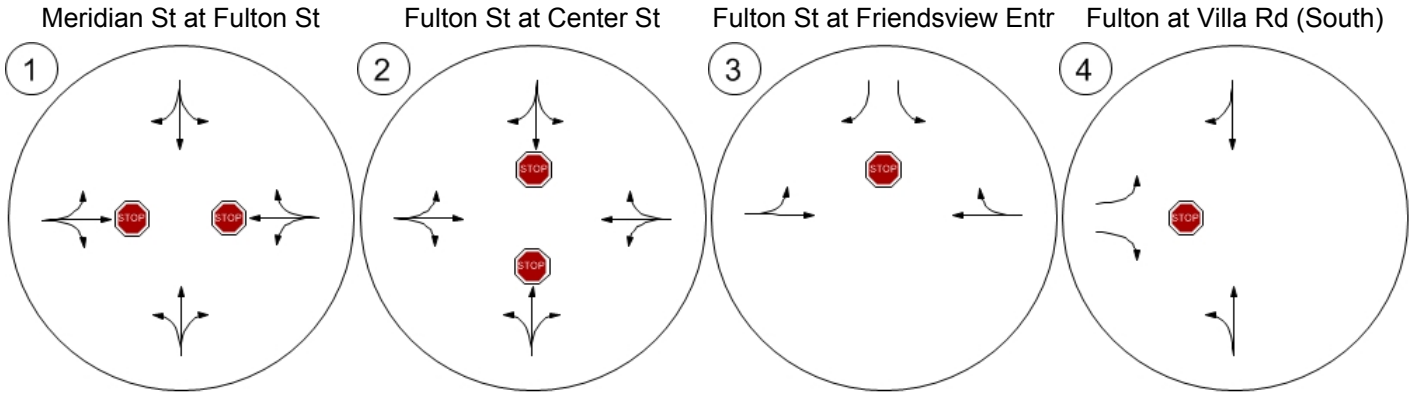
## Trip distribution summary

| Zone / Gate | Zone 8: Newberg ReStore | | | |
|---|---|---|---|---|
| | To Newberg ReStore: | | From Newberg ReStore: | |
| | Share % | Trips | Share % | Trips |
| 15: University Village | 0.00 | 0 | 0.00 | 0 |
| 1: Gate | 10.00 | 1 | 10.00 | 2 |
| 2: Gate | 40.00 | 5 | 40.00 | 6 |
| 3: Gate | 25.00 | 3 | 25.00 | 4 |
| 4: Gate | 25.00 | 3 | 25.00 | 4 |
| 7: Gate | 0.00 | 0 | 0.00 | 0 |
| 10: Gate | 0.00 | 0 | 0.00 | 0 |
| 16: Gate | 0.00 | 0 | 0.00 | 0 |
| **Total** | **100.00** | **12** | **100.00** | **16** |

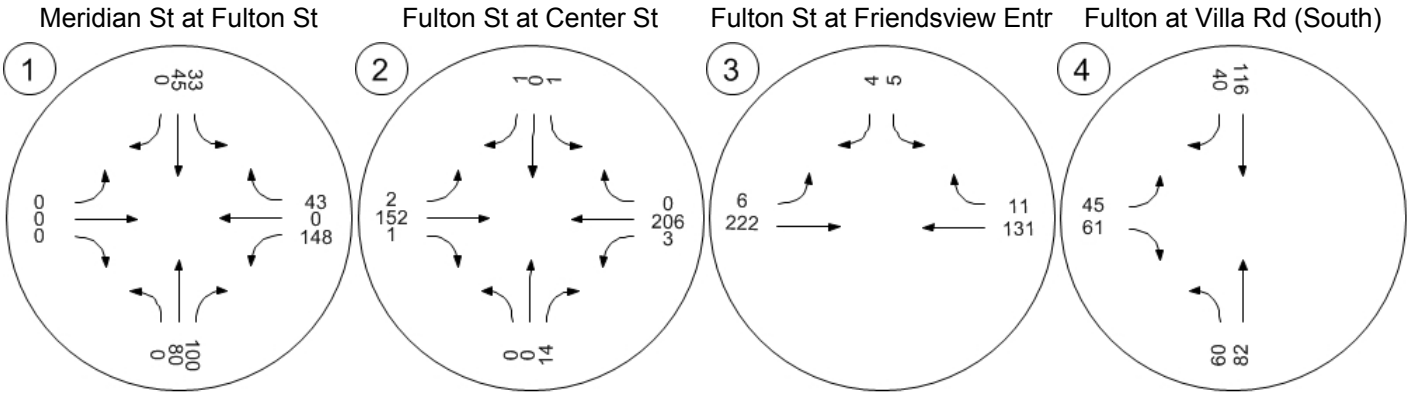
| Zone / Gate | Zone 15: University Village | | | |
|---|---|---|---|---|
| | To University Village: | | From University Village: | |
| | Share % | Trips | Share % | Trips |
| 8: Newberg ReStore | 0.00 | 0 | 0.00 | 0 |
| 1: Gate | 10.00 | 2 | 10.00 | 1 |
| 2: Gate | 40.00 | 7 | 40.00 | 4 |
| 3: Gate | 25.00 | 4 | 25.00 | 3 |
| 4: Gate | 25.00 | 4 | 25.00 | 3 |
| 7: Gate | 0.00 | 0 | 0.00 | 0 |
| 10: Gate | 0.00 | 0 | 0.00 | 0 |
| 16: Gate | 0.00 | 0 | 0.00 | 0 |
| **Total** | **100.00** | **17** | **100.00** | **11** |

Report Figure 1: Study Intersections

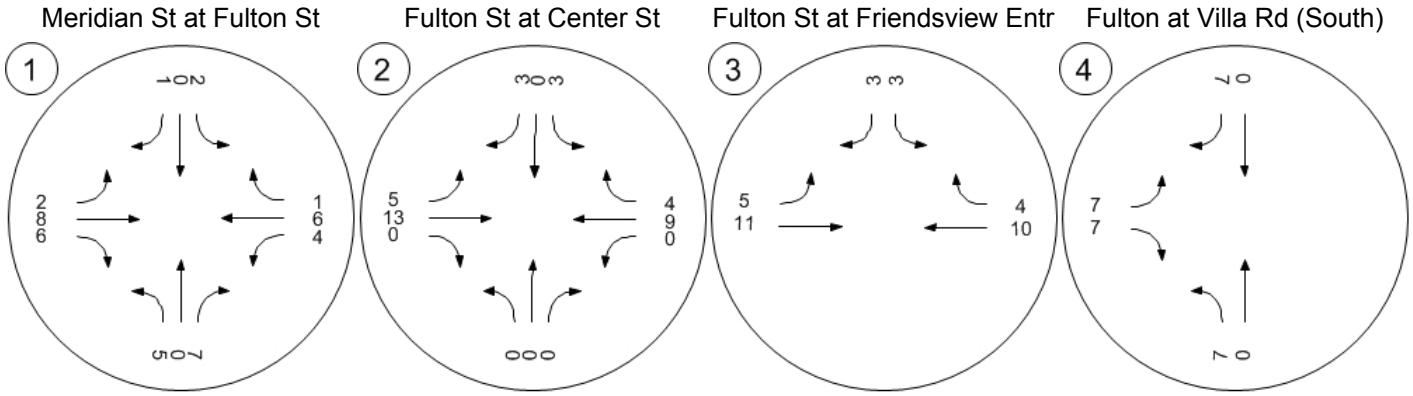
Report Figure 2: Lane Configuration and Traffic Control



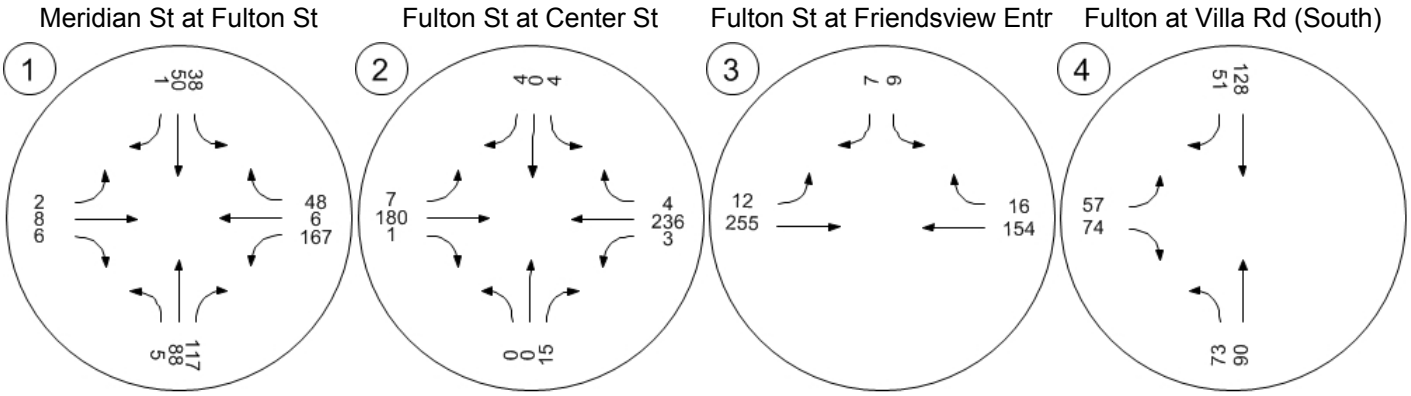
Report Figure 3a: Traffic Volume - Base Volume



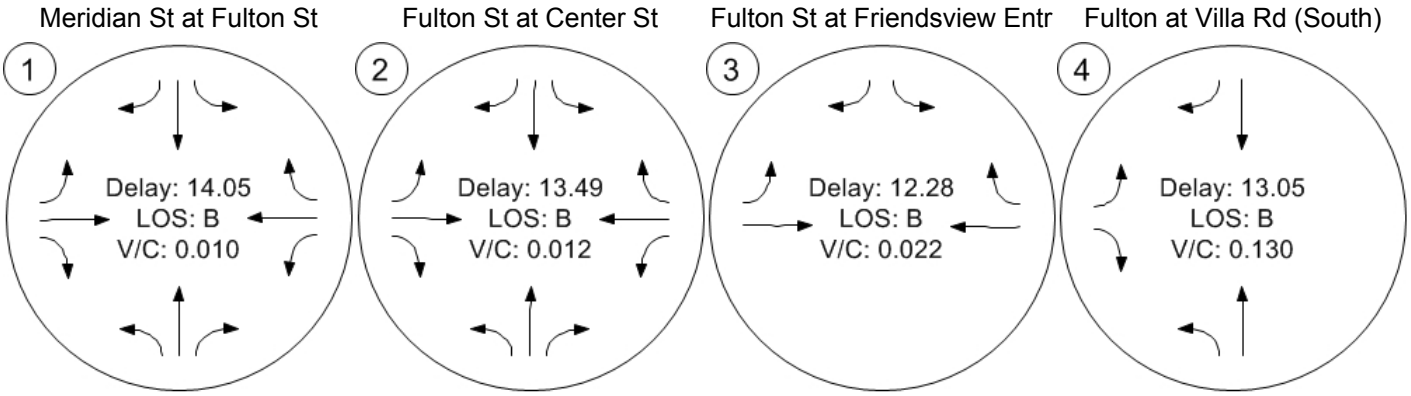
Report Figure 3c: Traffic Volume - Net New Site Trips



Report Figure 3e: Traffic Volume - Future Total Volume



Report Figure 4: Traffic Conditions



# Friendsview

# PRELIMINARY STORMWATER REPORT

| | |
|---|---|
| **Date:** | October 30, 2015 |
| **Client:** | LRS Architects<br>720 NW Davis Street Suite 300<br>Portland, OR 97209 |
| **Engineering Contact:** | Chuck Gregory, PE |
| **Engineering Firm:** | AKS Engineering & Forestry, LLC. |
| **AKS Job Number:** | 3199 |


AKS Engineering & Forestry

12965 SW Herman Road, Suite 100
Tualatin, OR 97062
P: (503) 563-6151
www.aks-eng.com

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# PRELIMINARY STORMWATER REPORT

## *PROJECT: FRIENDSVIEW*

### 1.0 PURPOSE OF REPORT

The purpose of this report is to analyze the effects that the proposed development will have on the existing site, document the criteria, methodology, and informational sources by which the proposed stormwater system was designed, and the results of the analysis.

### 2.0 PROJECT LOCATION/DESCRIPTION

The proposed total (phases I – IV) development involves 22 properties and two existing streets (Tax Lots 500, 600, 700, 800, 900, 1000, 1001, 1200, 1300, 1400, 1500, 1600, 1700, 1800, 1900, 2000, 2200, 2300, 2400, 2500, 2600, and Friendsview Village Condominiums, Yamhill County Assessor's Map 3S 2W 17CB), at the intersection of N Center St. and E Cherry, St. Section 17CB, Township 3 South, Range 2 West, Willamette Meridian, City of Newberg, Yamhill County, Oregon.

The site was previously developed with 27 homes, sidewalks, driveways and assorted landscaping and trees.

The project proposes to consolidate lots, existing ROW (to be vacated) and develop 4 apartment buildings in phases. Underground utilities will be constructed to serve the site including stormwater conveyance. In general, the total impervious area will be reduced as part of the proposed redevelopment. The following table summarizes the development actions of each phase. Also a phase plan is located in Appendix 1.2.

| Phases | Description |
|---|---|
| Phase 1 | • Consolidate tax lots 800, 804, 900, 1001, 1300 and 1400.<br>• Vacate Cherry Street<br>• Construct Building C<br>• To offset the net new impervious area four planters will be constructed |
| Phase 2 | • Consolidate tax lots 1500, 1600, 1700, 1800, 1900, 2000, 2200, 2300, 2400, 2500, and 2600<br>• Vacate Center Street<br>• Construct Building A |
| Phase 3 | • Construct Building B |
| Phase 4 | • Consolidate tax lot 1000 and 1200<br>• Construct Building D |

Note: this report generally addresses phase 1 of the proposed development

## 3.0 REGULATORY DESIGN CRITERIA

### 3.1 STORMWATER QUANTITY MANAGEMENT CRITERIA

The design will provide stormwater quantity management per *City of Newberg Public Works Design and Construction Standards*, dated February 2015,

Stormwater Quantity management is required when more than 2,722 $ft^2$ of net new imperious area is created.

- When required water quantity facilities shall: Detain the peak flow from the post-developed site for the one half of the 2-year, the 2-year, the 10-year, and 25-year storm events to their respective pre-developed storm event flows.
- Size the storm sewer pipes to convey stormwater flows for the 25-year storm.

Stormwater facilities are to be designed to meet the above criteria for detention, conveyance, and overflow. Slopes in surface facilities shall be no steeper than 3:1.

### 3.2 STORMWATER QUALITY MANAGEMENT CRITERIA

The stormwater facilities will provide stormwater quality management per City of Newberg requirements. The water quality event storm for the City of Newberg when designed using the SBUH method, is one (1) inch in 24 hours and the volume generated by the storm is to be released over 48 hours. Stormwater quality only facilities shall be designed for a dry weather storm event (water quality event described above) with an average storm return period of 96 hours.

Stormwater quantity facilities are required when: Net new impervious area created is greater than 2,722 $ft^2$ or any site which disturbs more than one acre.

## 4.0 DESIGN METHODOLOGY

For stormwater quality the Santa Barbara Urban Hydrograph (SBUH) Method was used to analyze stormwater runoff generated on-site. This method utilizes an SCS Type 1A 24-hour design storm. HydroCAD 8.50 computer software was utilized in the analysis. Representative CN numbers obtained from *Technical Release –55 Urban Hydrology for Small Watersheds* is included in the appendix.

- Rainfall depth as shown in Table 4.2 (City of Newberg standards)

Table 2 – 24-hr Rainfall Depths

| Year | Rainfall (Inch) |
|---|---|
| ½ 2-yr | 1.25 |
| 2-yr | 2.5 |
| 10-yr | 3.5 |
| 25-yr | 4.0 |

- A minimum time of concentration ($T_c$) of 5 min. was used for catchment areas within the development. The TR 55 method utilizing sheet flow and shallow concentrated flow was used to calculate a $T_c$ greater than 5 minutes.
- Estimates of storm water runoff were determined using the Santa Barbara Unit Hydrograph (SBUH) method as provided by the HydroCAD software (See Appendix 2.1 – 2.10)

## 5.0 DESIGN PARAMETERS

### 5.1 DESIGN STORM – ON-SITE CONVEYANCE SIZING

Stormwater pipes and inlets for the site are placed at locations that adequately control the surface water runoff for the site. The stormwater pipes were sized using Manning's Equation based on peak flows for a 25-year storm event.

### 5.2 PRE-DEVELOPED SITE TOPOGRAPHY AND LAND USE

#### 5.2.1 SITE TOPOGRAPHY

Existing on-site grades are generally less than 2% and slope northwest to southeast.

#### 5.2.2 LAND USE

The existing site is zoned as Medium Density Residential (R-2) and Institutional (I). The site is currently developed with single family homes and condominiums.

### 5.3 SOIL TYPE

On-site soils are classified as Aloha Silt Loam (2300A) 0% to 3% slopes (hydrologic soil group D) according to the USDA Soil Survey for Yamhill County. The USDA NRCS soil report for the site is included in the Appendix.

### 5.3.1 INFILTRATION TESTING RESULTS

GRI, the Project Geotechnical Engineer, performed infiltration testing at 3 locations across the site measured at a depth of about 5 feet below existing site grades. The result is an average infiltration rate of 0.13 in/hr (50% of the measured in situ rate or a safety factor of 2 per Geotechnical Engineer). See preliminary results located in appendix 7.1.

## 5.4 POST DEVELOPED SITE TOPOGRAPHY AND LAND USE

### 5.4.1 SITE TOPOGRAPHY

Development of the site requires tree and vegetation removal and demolition of existing structures and other impervious area. Site grading is required to facilitate the construction of the residential building, interior site access, and a parking lot. Post-developed grades on-site will be generally level at building locations, no greater than 5% at longitudinal runs of walkways and no greater than 5% in the parking lot.

### 5.4.2 LAND USE

The site will remain zoned as Medium Density Residential (R-2) and Institutional (I). The project will result in the construction of 4 residential buildings, interior concrete walkways, new street frontage sidewalk, and pavement parking lot.

### 5.4.3 POST-DEVELOPED INPUT PARAMETERS

- Curve Numbers were taken from the USDA/NRCS TR-55 Urban Hydrology for small Watersheds manual:
  - Pervious surfaces (landscaping) – CN = 80
  - Impervious Surfaces (roofs, sidewalks, asphalt, etc.) – CN = 98

Detailed HydroCAD analysis pertaining to stormwater conveyance and infiltration design can be found in the Appendix.

## 5.5 DESCRIPTION OF OFF-SITE CONTRIBUTORY BASINS

There are no off-site contributory basins that affect this site.

# 6.0 CALCULATION METHODOLOGY

## 6.1 PROPOSED STORMWATER CONDUIT SIZING AND INLET SPACING

Stormwater pipes and inlets for the site are adequately sized to convey flows generated by a 25-year storm event. Detailed HydroCAD calculations are included in the Appendix.

## 6.2 PROPOSED STORMWATER QUANTITY CONTROL FACILITY DESIGN

The stormwater facilities are designed to accommodate flows generated by developed areas of the subject property in order to meet the City of Newberg's water quantity requirements (described in section 3.1)

Though the net impervious area proposed in the overall master plan buildout will be less than the existing impervious area, Phase 1 will create more impervious area than it will remove (see area summary table below). Because of this net new impervious area Phase 1 will require detention and treatment in order to meet the City of Newberg's Standards.

| Impervious Area Summary Table | | |
|---|---|---|
| | Existing | Proposed |
| Phase 1 | ±46,580 $ft^2$ | ±51,300 $ft^2$ |
| Master Plan | ±139,000 $ft^2$ | ±123,000 $ft^2$ |

Impervious area created on-site will be captured and treated with the construction of 4 planters. As previously mentioned the sizing and performance of the planters for water quality is based on the city of Portland P.A.C. calculator and water quantity is based on the SBUH method. Printouts of each result are included in the appendix.

## 6.3 PROPOSED STORMWATER QUALITY CONTROL FACILITY DESIGN

As discussed with city staff, this development will utilize the City of Portland's Presumptive Approach Calculator (P.A.C.) to determine stormwater quality facility sizing. The stormwater facilities are designed to accommodate flows generated by developed areas of the subject property meeting the City of Newberg's water quality requirements (described in section 3.2).

In order to meet the City of Newberg's Stormwater Facility Selection Hierarchy, green roofs are proposed for impervious are reduction and LIDA facilities (flow through planters) are placed to treat and detain stormwater runoff. LIDA facilities are designed in accordance with the City of Newberg standard details included in the Appendix sized per the City of Portland P.A.C.

Planters are proposed to treat portions of the new roof and portions of Cherry Street.

## 6.4 DOWNSTREAM ANALYSIS

Per *City of Newberg Public Works Design and Construction Standards* 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.

All stormwater runoff is conveyed to the City of Newberg's public stormwater sewer system.

The existing public stomwater system (to be converted to private) located in E Cherry Street is 8" in diameter and sloping to the south at approximately 1.30% providing for 1.38 cfs of gravity non-pressure flow capacity. The E Cherry storm line is conveyed to an 8" storm sewer located in Fulton Street where the stomwater flows to Hess Creek, a total length of approximately 800 ft. It has not come to our attention, nor have there been reports from the property owner, neighbors or City staff concerning the capacity of the stormwater system in Fulton Street.

The above mentioned storm drain discharges to Hess Creek which has full open channel flow. A dual, oversized corrugated metal pipe culvert crossing is located downstream on George Fox University's campus beneath a gravel path/access road. Another single, oversized corrugated metal pipe culvert crossing is located further downstream on campus beneath an asphalt access road. The ¼ mile visual inspection was terminated at a concrete box culvert where Hess Creek passes under HWY 99W. There was no evidence of overtopping at the culvert locations at the time of observation. Water levels at the time of observation were well below the top of the stream bank and with freeboard in excess of +/- 3 feet in most areas. There was no evidence of significant flow restrictions as the stream was free of debris and obstructions. No buildings or outbuildings were present in the apparent floodplain. Buildings located outside the apparent floodplain were +/-20 feet above the water level at the time of inspection.

Though phase 1 will create ±4,720 net new impervious area (~10%), the stormwater will be retained though the new flow through planters such that there will be a net decrease in flow exiting the site. This decrease will reduce the demand on the existing storm system. The capacity of this pipe under pressure flow circumstances will be evaluated during final design.

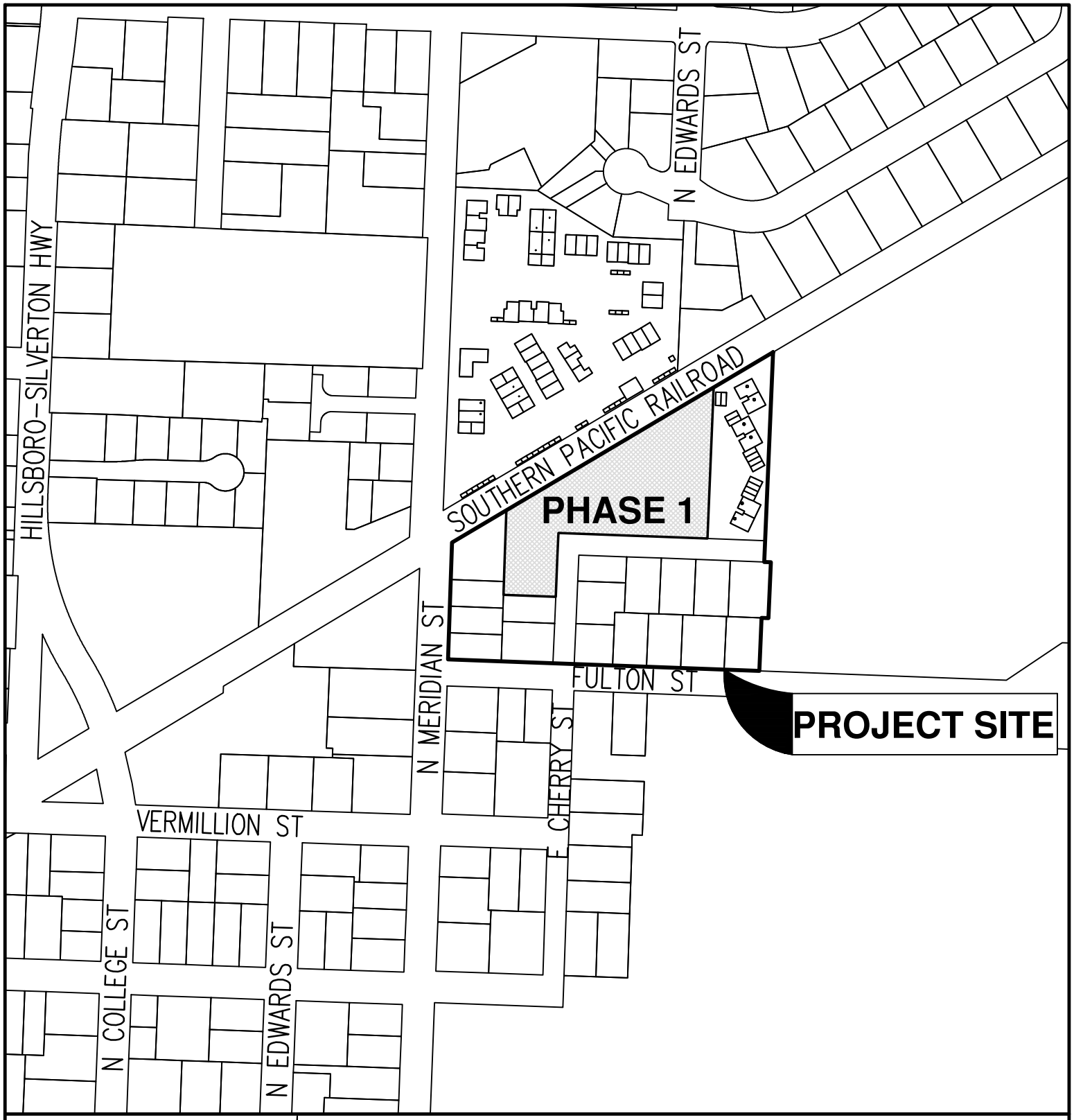
All of the proposed storm structures convey runoff to the existing storm sewer in E Cherry Street. Flow from the phase 1 site to this storm sewer during a 25 year storm has been modeled and values are listed in the table in section 7.0

## 6.0 STORMWATER SUMMARY

This table below shows a summary of the peak flows for each storm event, where post developed runoff rates reflect flows through the detention facilities:

| | Storm Event (cfs) | | | |
|---|---|---|---|---|
| | ½ of 2-yr | 2-yr | 10-yr | 25-yr |
| Phase 1 Pre-Development | 0.28 | 0.76 | 1.17 | 1.39 |
| Phase 1 Post-Development | 0.22 | 0.59 | 0.97 | 1.07 |
| Phase 1Difference (Reduction) | **0.06** | **0.17** | **0.20** | **0.32** |

# APPENDIX 1.1
## VICINITY MAP




# VICINITY MAP

NTS

DATE: 10/28/2015

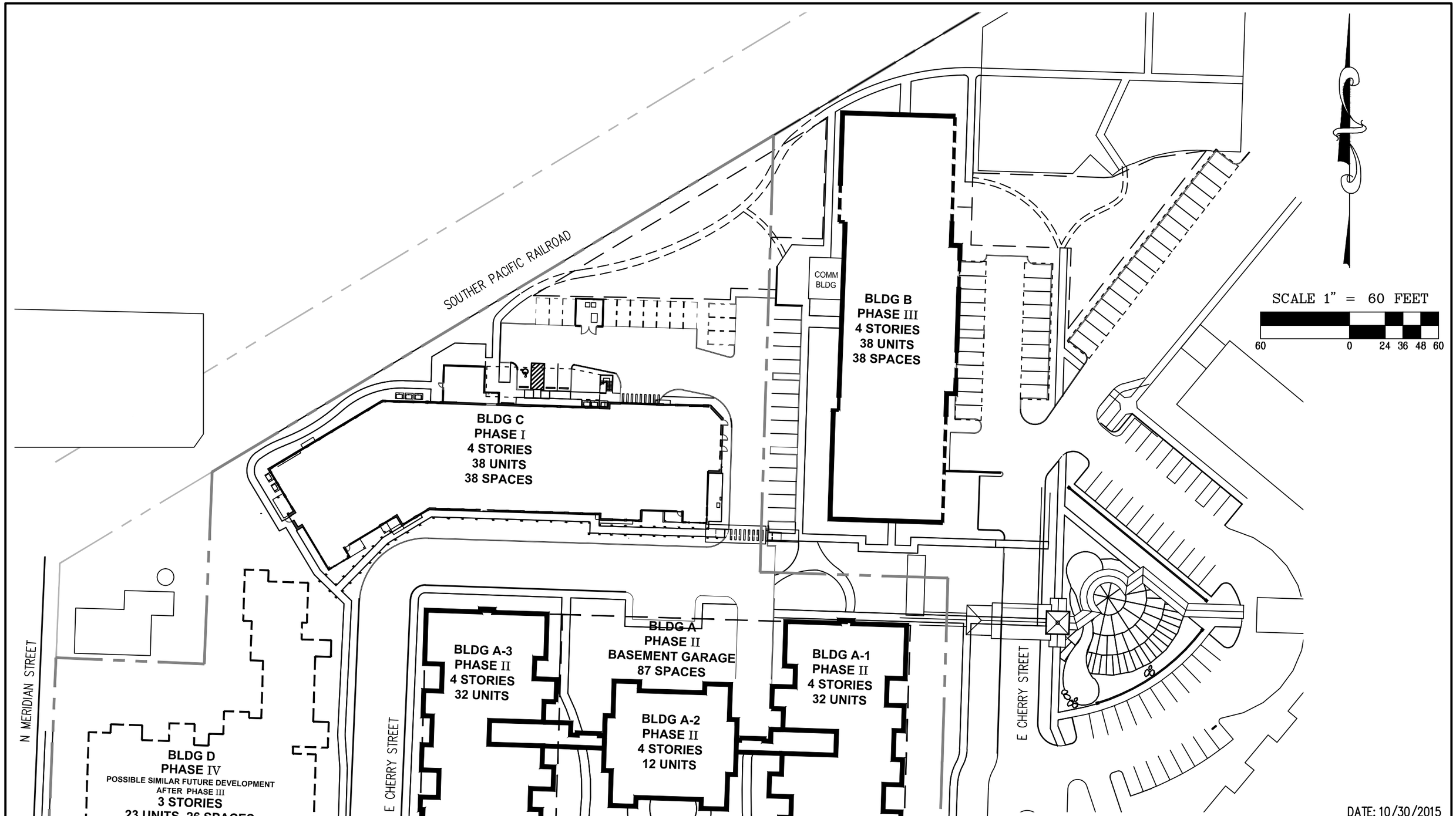
**FREINDSVIEW**

| DRAWN BY: CAK | CHECKED BY: CEG | DWG: 3199 VICINITY MAP | JOB: 3199 |
|---|---|---|---|

AKS ENGINEERING & FORESTRY, LLC
12965 SW HERMAN RD SUITE 100
TUALATIN, OR 97062 www.aks-eng.com
PHONE: 503.563.6151 FAX: 503.563.6152

# APPENDIX 1.2

## PHASE PLAN




DATE: 10/30/2015

| PHASE PLAN | EXHIBIT A |
|---|---|
| AKS ENGINEERING & FORESTRY, LLC<br>12965 SW HERMAN RD, STE 100<br>TUALATIN, OR 97062<br>P: 503.563.6151 F: 503.563.6152 aks-eng.com | DRWN: CAK<br>CHKD: CEG<br>AKS JOB: 3199 |

DWG: 3199 PHASING PLAN | GRADING PLAN

# APPENDIX 1.3
## CATCHMENT MAPS

## LEGEND

- # BASIN NUMBER
  PHASE 1 IS CONTAINED BY BASIN 1
- BASIN BOUNDARY
- IMPERVIOUS AREA (EXISTING FULL BUILDOUT)
- PERVIOUS AREA

SCALE 1" = 60 FEET

60 0 24 36 48 60

DATE: 10/30/2015

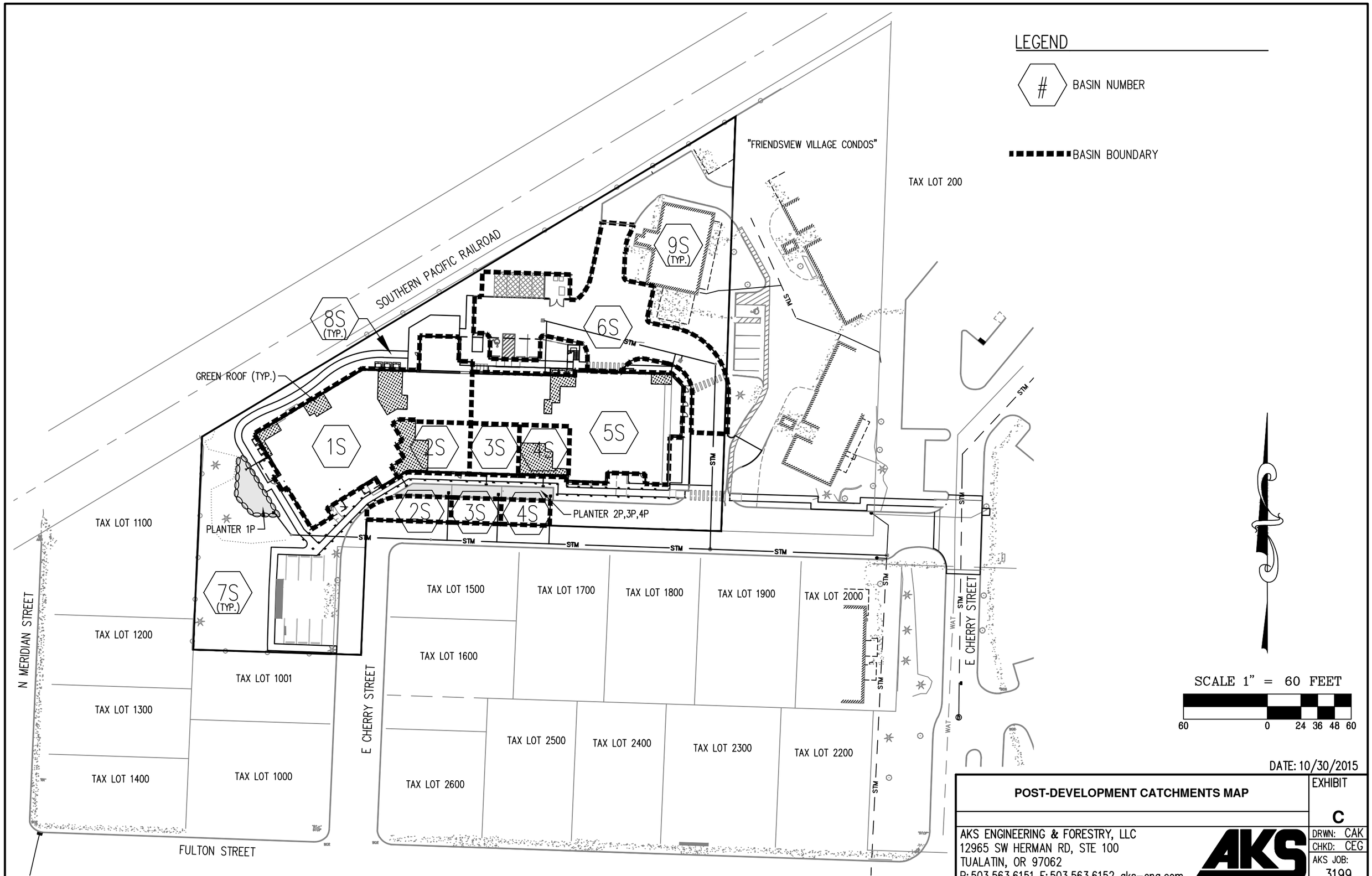
**PRE-DEVELOPMENT CATCHMENTS MAP**

EXHIBIT **B**

AKS ENGINEERING & FORESTRY, LLC
12965 SW HERMAN RD, STE 100
TUALATIN, OR 97062
P: 503.563.6151 F: 503.563.6152 aks-eng.com

DRWN: CAK
CHKD: CEG
AKS JOB: 3199

DWG: 3199 PRE-DEV | PRE-DEV




DATE: 10/30/2015

**POST-DEVELOPMENT CATCHMENTS MAP**

EXHIBIT C

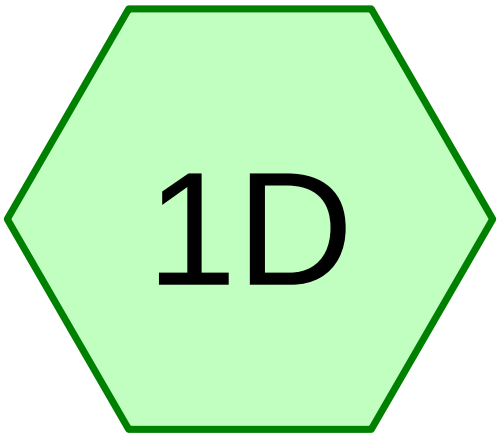
AKS ENGINEERING & FORESTRY, LLC
12965 SW HERMAN RD, STE 100
TUALATIN, OR 97062
P: 503.563.6151 F: 503.563.6152 aks-eng.com

DRWN: CAK
CHKD: CEG
AKS JOB: 3199

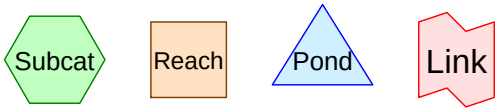
DWG: 3199 POST-DEV | POST DEV.

# APPENDIX 2.1

## PRE-DEVELOPED ROUTING DIAGRAM AND AREA LISTING




# PHASE 1 EXISTING




**Drainage Diagram for 3199 PRE DEV**
Prepared by AKS Engineering & Forestry, LLC, Printed 10/28/2015
HydroCAD® 8.50 s/n 005096 © 2007 HydroCAD Software Solutions LLC

## Area Listing (selected nodes)

| Area (acres) | CN | Description (subcatchment-numbers) |
|---|---|---|
| 0.708 | 84 | 50-75% Grass cover, Fair, HSG D (1D) |
| 0.151 | 91 | Gravel roads, HSG D (1D) |
| 0.919 | 98 | Paved parking & roofs (1D) |
| **1.778** | | **TOTAL AREA** |

# APPENDIX 2.2

## PRE-DEVELOPED ½ THE 2-YEAR STORMEVENT (1.25”) –HYDROGRAPH AND FLOW INFORMATION

## Summary for Subcatchment 1D: PHASE 1 EXISTING

[49] Hint: Tc<2dt may require smaller dt

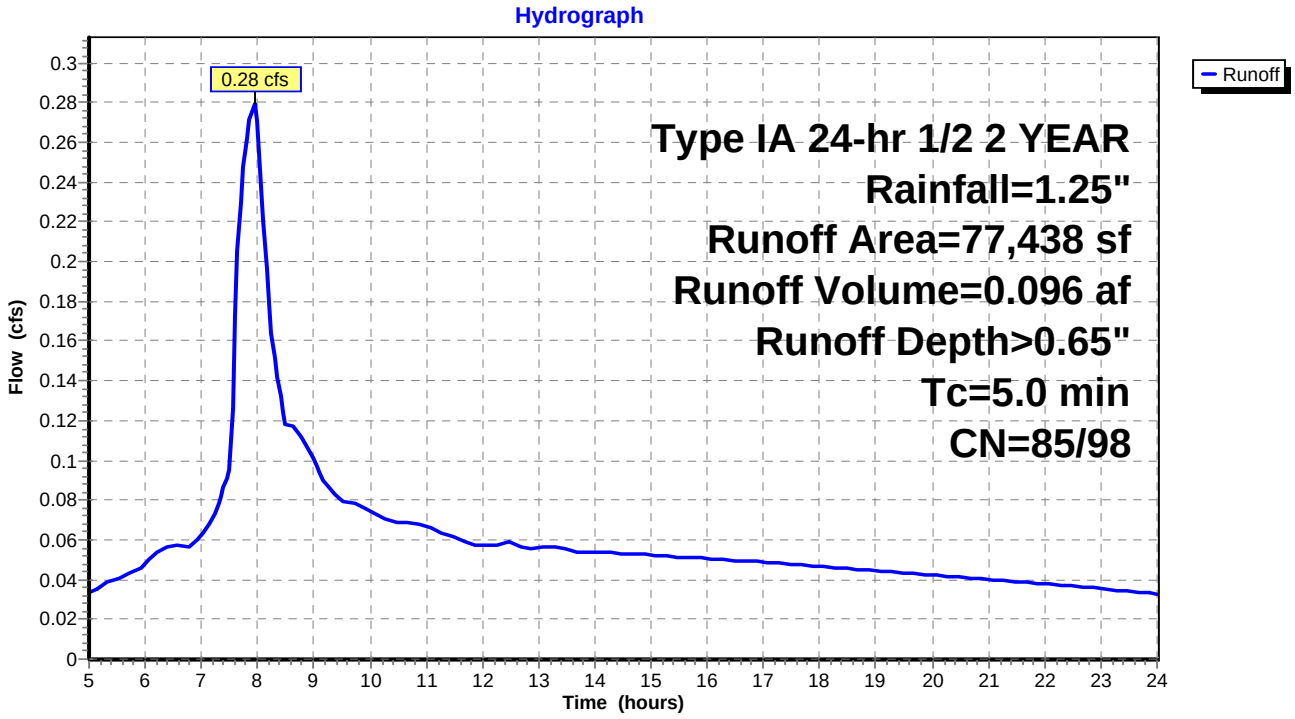
Runoff = 0.28 cfs @ 7.96 hrs, Volume= 0.096 af, Depth> 0.65"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 5.00-24.00 hrs, dt= 0.05 hrs
Type IA 24-hr 1/2 2 YEAR Rainfall=1.25"

| Area (sf) | CN | Description |
|---|---|---|
| 40,025 | 98 | Paved parking & roofs |
| 30,856 | 84 | 50-75% Grass cover, Fair, HSG D |
| 6,557 | 91 | Gravel roads, HSG D |
| 77,438 | 92 | Weighted Average |
| 37,413 | 85 | Pervious Area |
| 40,025 | 98 | Impervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|---|---|---|---|---|---|
| 5.0 | | | | | **Direct Entry,** |

## Subcatchment 1D: PHASE 1 EXISTING



# APPENDIX 2.3
# PRE-DEVELOPED 2-YEAR STORMEVENT (2.5”) –HYDROGRAPH AND FLOW INFORMATION

## Summary for Subcatchment 1D: PHASE 1 EXISTING

[49] Hint: Tc<2dt may require smaller dt

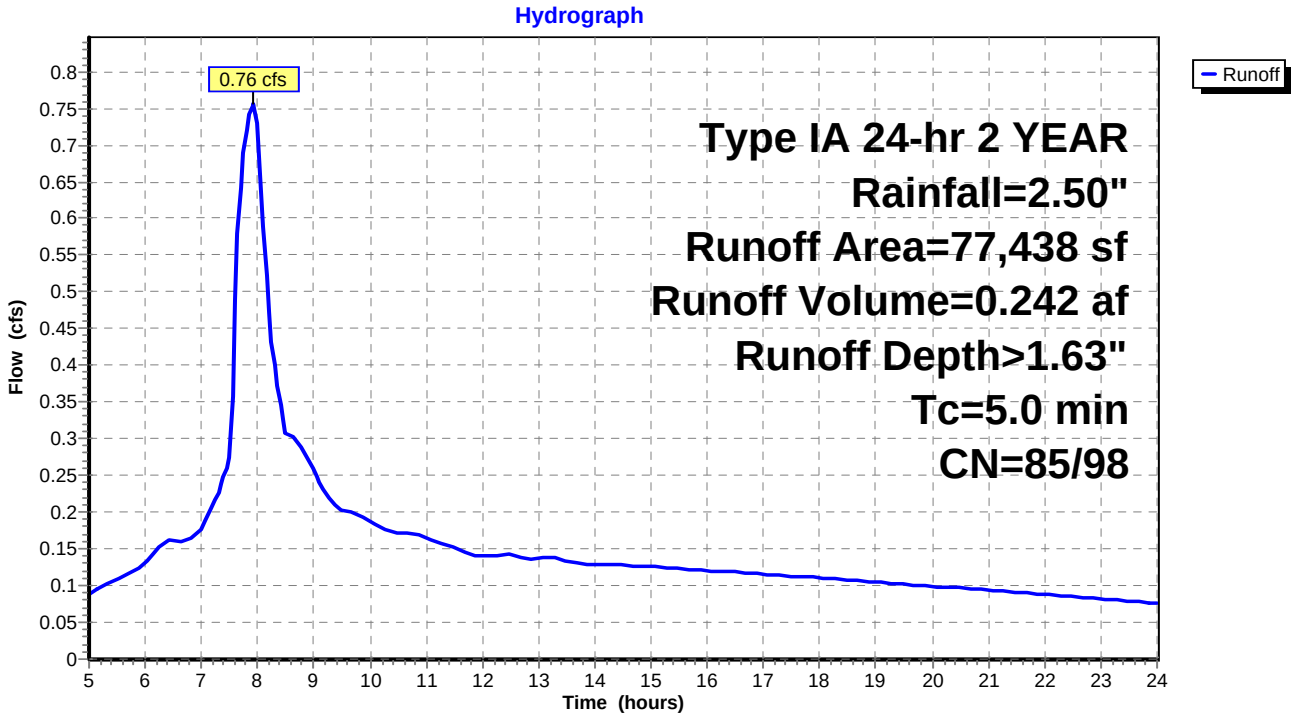
Runoff = 0.76 cfs @ 7.93 hrs, Volume= 0.242 af, Depth> 1.63"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 5.00-24.00 hrs, dt= 0.05 hrs
Type IA 24-hr 2 YEAR Rainfall=2.50"

| Area (sf) | CN | Description |
|---|---|---|
| 40,025 | 98 | Paved parking & roofs |
| 30,856 | 84 | 50-75% Grass cover, Fair, HSG D |
| 6,557 | 91 | Gravel roads, HSG D |
| 77,438 | 92 | Weighted Average |
| 37,413 | 85 | Pervious Area |
| 40,025 | 98 | Impervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|---|---|---|---|---|---|
| 5.0 | | | | | **Direct Entry,** |

## Subcatchment 1D: PHASE 1 EXISTING



# APPENDIX 2.4

## PRE-DEVELOPED 10-YEAR STORMEVENT (3.5”) –HYDROGRAPH AND FLOW INFORMATION

## Summary for Subcatchment 1D: PHASE 1 EXISTING

[49] Hint: Tc<2dt may require smaller dt

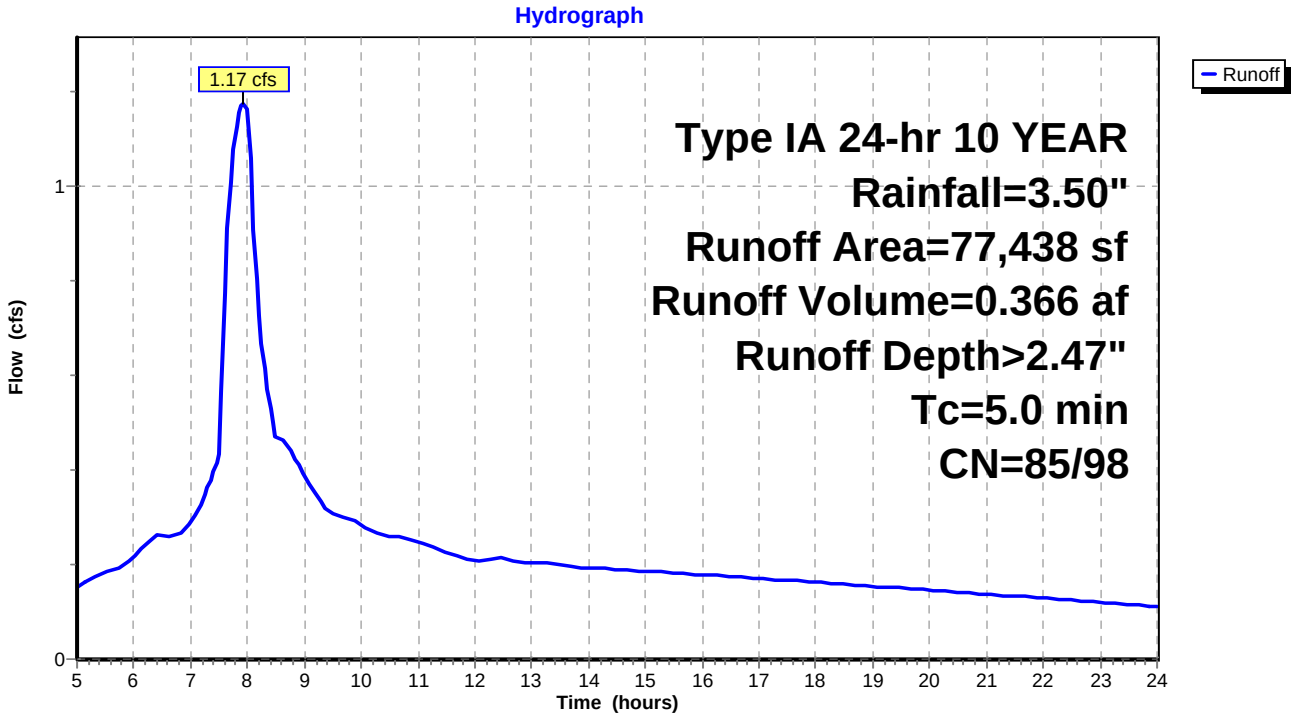
Runoff = 1.17 cfs @ 7.92 hrs, Volume= 0.366 af, Depth> 2.47"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 5.00-24.00 hrs, dt= 0.05 hrs
Type IA 24-hr 10 YEAR Rainfall=3.50"

| Area (sf) | CN | Description |
|---|---|---|
| 40,025 | 98 | Paved parking & roofs |
| 30,856 | 84 | 50-75% Grass cover, Fair, HSG D |
| 6,557 | 91 | Gravel roads, HSG D |
| 77,438 | 92 | Weighted Average |
| 37,413 | 85 | Pervious Area |
| 40,025 | 98 | Impervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|---|---|---|---|---|---|
| 5.0 | | | | | **Direct Entry,** |

## Subcatchment 1D: PHASE 1 EXISTING



# APPENDIX 2.5

## PRE-DEVELOPED 25-YEAR STORMEVENT (4.0”) –HYDROGRAPH AND FLOW INFORMATION

## Summary for Subcatchment 1D: PHASE 1 EXISTING

[49] Hint: Tc<2dt may require smaller dt

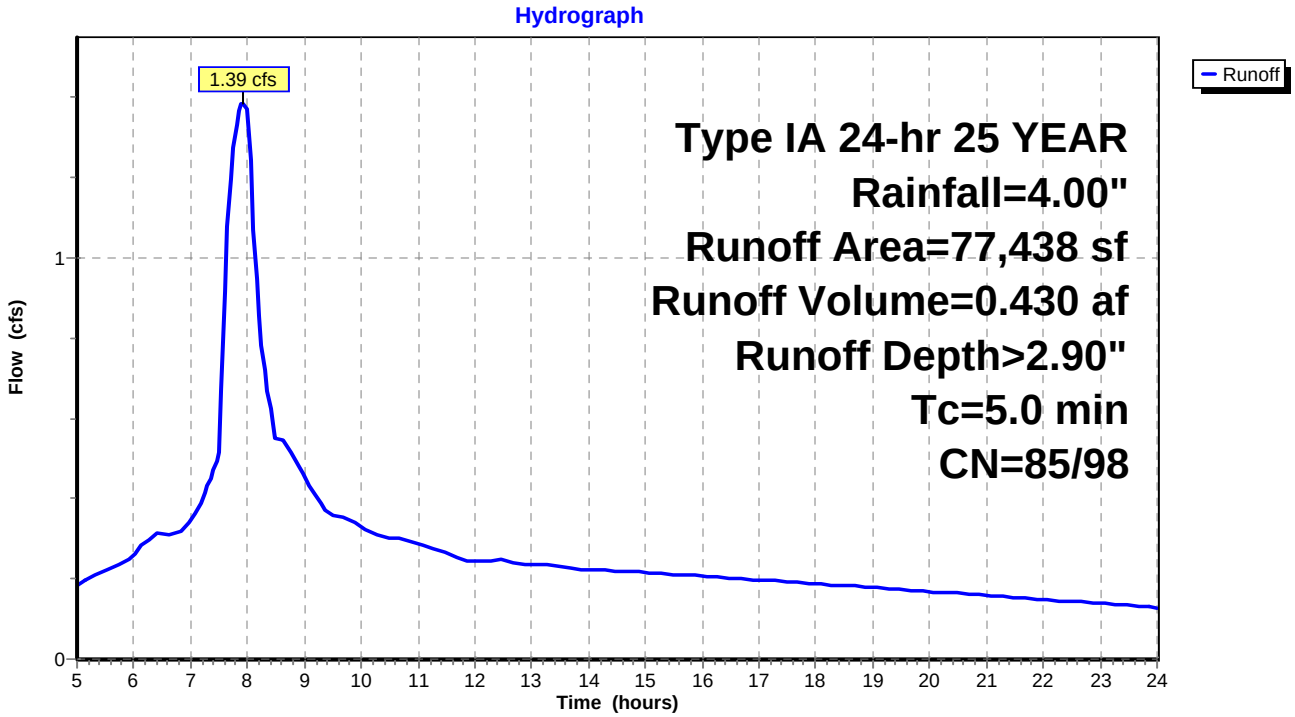
Runoff = 1.39 cfs @ 7.92 hrs, Volume= 0.430 af, Depth> 2.90"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 5.00-24.00 hrs, dt= 0.05 hrs
Type IA 24-hr 25 YEAR Rainfall=4.00"

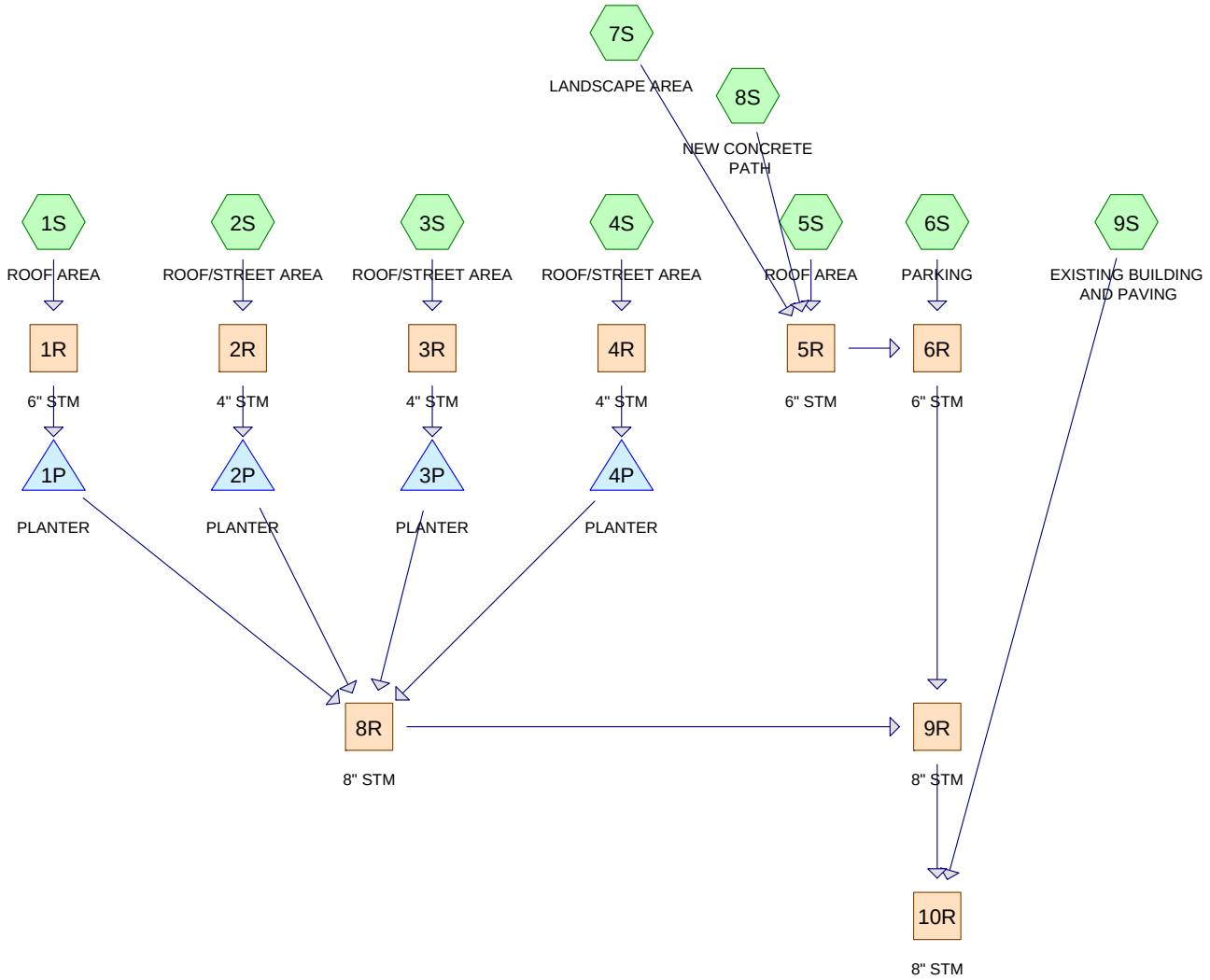
| Area (sf) | CN | Description |
|---|---|---|
| 40,025 | 98 | Paved parking & roofs |
| 30,856 | 84 | 50-75% Grass cover, Fair, HSG D |
| 6,557 | 91 | Gravel roads, HSG D |
| 77,438 | 92 | Weighted Average |
| 37,413 | 85 | Pervious Area |
| 40,025 | 98 | Impervious Area |

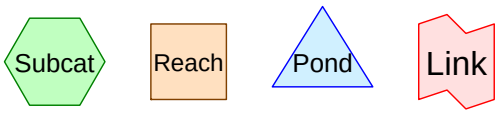
| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|---|---|---|---|---|---|
| 5.0 | | | | | **Direct Entry,** |

## Subcatchment 1D: PHASE 1 EXISTING



# APPENDIX 2.6
# POST-DEVELOPED ROUTING DIAGRAM AND AREA LISTING




**Drainage Diagram for 3199 POST DEV**
Prepared by ASK Engineering & Forestry LLC, Printed 10/30/2015
HydroCAD® 8.50 s/n 005096 © 2007 HydroCAD Software Solutions LLC

## Area Listing (all nodes)

| Area (acres) | CN | Description (subcatchment-numbers) |
|---|---|---|
| 0.600 | 80 | >75% Grass cover, Good, HSG D (7S) |
| 0.136 | 98 | Concrete path (8S) |
| 0.306 | 98 | Existing Building and Paving (9S) |
| 0.212 | 98 | Parking Area (6S) |
| 0.472 | 98 | Roof Area (1S,2S,3S,4S,5S) |
| 0.051 | 98 | Street Area (2S,3S,4S) |

# APPENDIX 2.7

# POST-DEVELOPED ½ OF THE 2-YEAR STORM EVENT (1.25”)—HYDROGRAPH AND FLOW INFORMATION

Time span=5.00-24.00 hrs, dt=0.01 hrs, 1901 points
Runoff by SBUH method, Split Pervious/Imperv.
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

**Subcatchment 1S: ROOF AREA** Runoff Area=9,028 sf 100.00% Impervious Runoff Depth>0.97"
Tc=5.0 min CN=0/98 Runoff=0.06 cfs 0.017 af

**Subcatchment 2S: ROOF/STREET AREA** Runoff Area=2,233 sf 100.00% Impervious Runoff Depth>0.97"
Tc=0.0 min CN=0/98 Runoff=0.01 cfs 0.004 af

**Subcatchment 3S: ROOF/STREET AREA** Runoff Area=1,910 sf 100.00% Impervious Runoff Depth>0.97"
Tc=0.0 min CN=0/98 Runoff=0.01 cfs 0.004 af

**Subcatchment 4S: ROOF/STREET AREA** Runoff Area=1,412 sf 100.00% Impervious Runoff Depth>0.97"
Tc=0.0 min CN=0/98 Runoff=0.01 cfs 0.003 af

**Subcatchment 5S: ROOF AREA** Runoff Area=8,214 sf 100.00% Impervious Runoff Depth>0.97"
Tc=5.0 min CN=0/98 Runoff=0.05 cfs 0.015 af

**Subcatchment 6S: PARKING** Runoff Area=9,254 sf 100.00% Impervious Runoff Depth>0.97"
Tc=5.0 min CN=0/98 Runoff=0.06 cfs 0.017 af

**Subcatchment 7S: LANDSCAPE AREA** Runoff Area=26,140 sf 0.00% Impervious Runoff Depth>0.17"
Tc=5.0 min CN=80/0 Runoff=0.01 cfs 0.009 af

**Subcatchment 8S: NEW CONCRETE PATH** Runoff Area=5,916 sf 100.00% Impervious Runoff Depth>0.97"
Tc=5.0 min CN=0/98 Runoff=0.04 cfs 0.011 af

**Subcatchment 9S: EXISTING BUILDING** Runoff Area=13,332 sf 100.00% Impervious Runoff Depth>0.97"
Tc=5.0 min CN=0/98 Runoff=0.08 cfs 0.025 af

**Reach 1R: 6" STM** Avg. Depth=0.08' Max Vel=2.61 fps Inflow=0.06 cfs 0.017 af
D=6.0" n=0.013 L=18.0' S=0.0278 '/' Capacity=0.94 cfs Outflow=0.06 cfs 0.017 af

**Reach 2R: 4" STM** Avg. Depth=0.04' Max Vel=2.24 fps Inflow=0.01 cfs 0.004 af
D=4.0" n=0.013 L=10.0' S=0.0500 '/' Capacity=0.43 cfs Outflow=0.01 cfs 0.004 af

**Reach 3R: 4" STM** Avg. Depth=0.04' Max Vel=2.14 fps Inflow=0.01 cfs 0.004 af
D=4.0" n=0.013 L=10.0' S=0.0500 '/' Capacity=0.43 cfs Outflow=0.01 cfs 0.004 af

**Reach 4R: 4" STM** Avg. Depth=0.03' Max Vel=1.95 fps Inflow=0.01 cfs 0.003 af
D=4.0" n=0.013 L=10.0' S=0.0500 '/' Capacity=0.43 cfs Outflow=0.01 cfs 0.003 af

**Reach 5R: 6" STM** Avg. Depth=0.10' Max Vel=3.18 fps Inflow=0.09 cfs 0.035 af
D=6.0" n=0.013 L=30.0' S=0.0333 '/' Capacity=1.02 cfs Outflow=0.09 cfs 0.035 af

**Reach 6R: 6" STM** Avg. Depth=0.17' Max Vel=2.52 fps Inflow=0.14 cfs 0.052 af
D=6.0" n=0.013 L=260.0' S=0.0115 '/' Capacity=0.60 cfs Outflow=0.14 cfs 0.052 af

**Reach 8R: 8" STM** Avg. Depth=0.06' Max Vel=0.55 fps Inflow=0.01 cfs 0.005 af
D=8.0" n=0.013 L=320.0' S=0.0019 '/' Capacity=0.52 cfs Outflow=0.01 cfs 0.005 af

**Reach 9R: 8" STM** Avg. Depth=0.18' Max Vel=1.83 fps Inflow=0.14 cfs 0.057 af
D=8.0" n=0.013 L=126.5' S=0.0051 '/' Capacity=0.86 cfs Outflow=0.14 cfs 0.057 af

**Reach 10R: 8" STM** Avg. Depth=0.19' Max Vel=2.78 fps Inflow=0.23 cfs 0.081 af
D=8.0" n=0.013 L=292.1' S=0.0115 '/' Capacity=1.29 cfs Outflow=0.22 cfs 0.081 af

**Pond 1P: PLANTER** Peak Elev=198.51' Storage=520 cf Inflow=0.06 cfs 0.017 af
Outflow=0.01 cfs 0.005 af

**Pond 2P: PLANTER** Peak Elev=197.27' Storage=180 cf Inflow=0.01 cfs 0.004 af
Outflow=0.00 cfs 0.000 af

**Pond 3P: PLANTER** Peak Elev=197.14' Storage=154 cf Inflow=0.01 cfs 0.004 af
Outflow=0.00 cfs 0.000 af

**Pond 4P: PLANTER** Peak Elev=196.57' Storage=114 cf Inflow=0.01 cfs 0.003 af
Outflow=0.00 cfs 0.000 af

## Summary for Subcatchment 1S: ROOF AREA

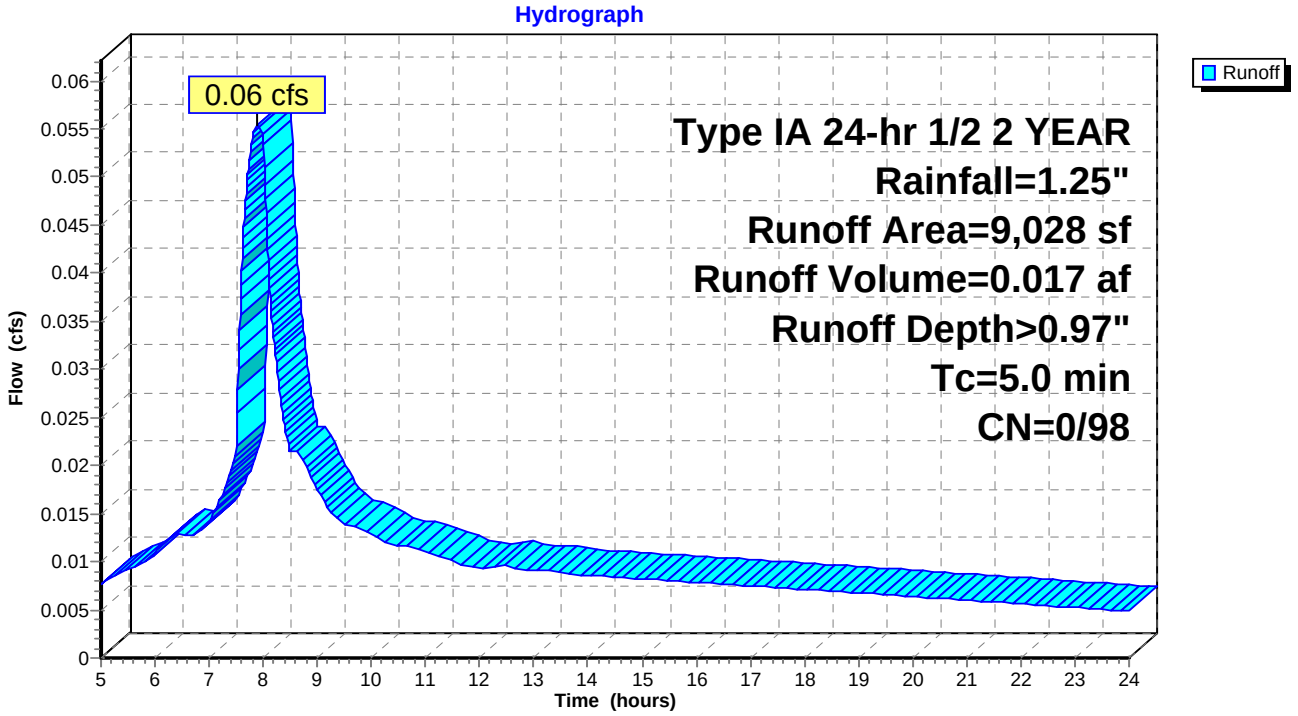
Runoff = 0.06 cfs @ 7.89 hrs, Volume= 0.017 af, Depth> 0.97"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 5.00-24.00 hrs, dt= 0.01 hrs
Type IA 24-hr 1/2 2 YEAR Rainfall=1.25"

| | Area (sf) | CN | Description |
|---|---|---|---|
| * | 9,028 | 98 | Roof Area |
| | 9,028 | 98 | Impervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|---|---|---|---|---|---|
| 5.0 | | | | | **Direct Entry,** |

## Subcatchment 1S: ROOF AREA



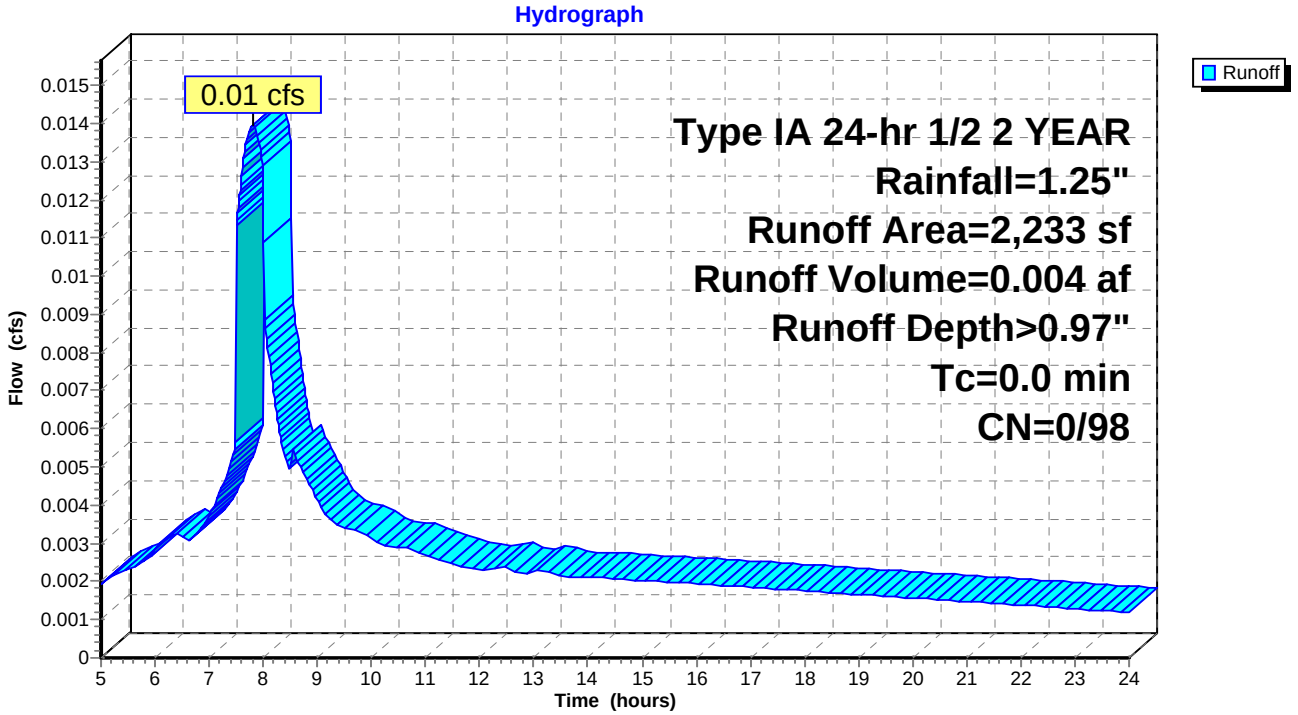
## Summary for Subcatchment 2S: ROOF/STREET AREA

Runoff = 0.01 cfs @ 7.80 hrs, Volume= 0.004 af, Depth> 0.97"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 5.00-24.00 hrs, dt= 0.01 hrs
Type IA 24-hr 1/2 2 YEAR Rainfall=1.25"

| | Area (sf) | CN | Description |
|---|---|---|---|
| * | 981 | 98 | Street Area |
| * | 1,252 | 98 | Roof Area |
| | 2,233 | 98 | Weighted Average |
| | 2,233 | 98 | Impervious Area |

## Subcatchment 2S: ROOF/STREET AREA



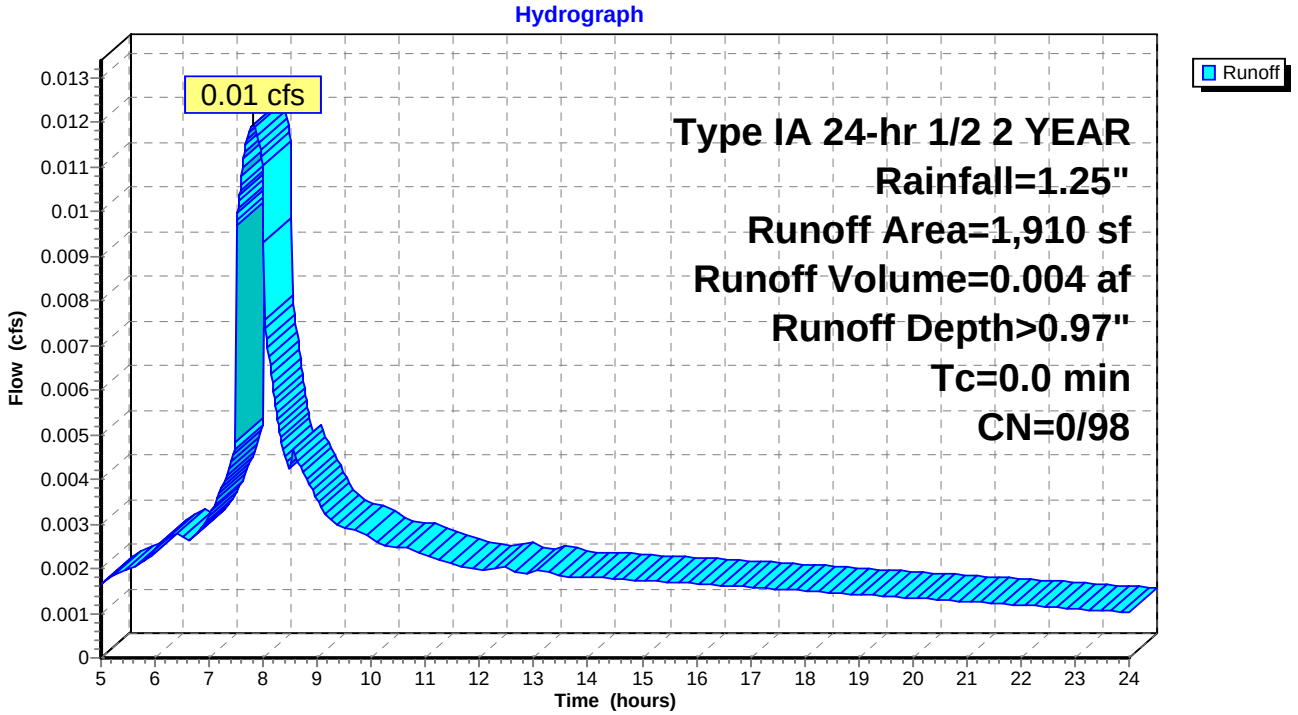
## Summary for Subcatchment 3S: ROOF/STREET AREA

Runoff = 0.01 cfs @ 7.80 hrs, Volume= 0.004 af, Depth> 0.97"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 5.00-24.00 hrs, dt= 0.01 hrs
Type IA 24-hr 1/2 2 YEAR Rainfall=1.25"

| | Area (sf) | CN | Description |
|---|---|---|---|
| * | 637 | 98 | Street Area |
| * | 1,273 | 98 | Roof Area |
| | 1,910 | 98 | Weighted Average |
| | 1,910 | 98 | Impervious Area |

## Subcatchment 3S: ROOF/STREET AREA



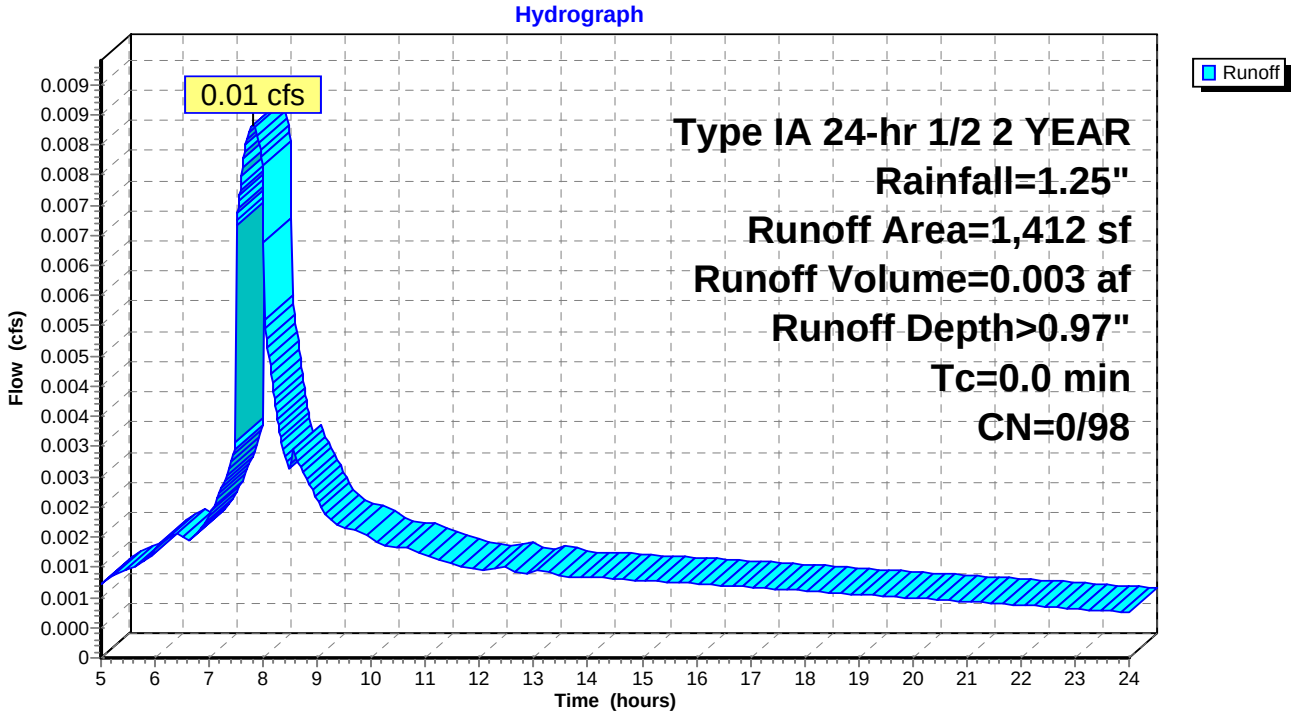
## Summary for Subcatchment 4S: ROOF/STREET AREA

Runoff = 0.01 cfs @ 7.80 hrs, Volume= 0.003 af, Depth> 0.97"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 5.00-24.00 hrs, dt= 0.01 hrs
Type IA 24-hr 1/2 2 YEAR Rainfall=1.25"

| | Area (sf) | CN | Description |
|---|---|---|---|
| * | 625 | 98 | Street Area |
| * | 787 | 98 | Roof Area |
| | 1,412 | 98 | Weighted Average |
| | 1,412 | 98 | Impervious Area |

## Subcatchment 4S: ROOF/STREET AREA



## Summary for Subcatchment 5S: ROOF AREA

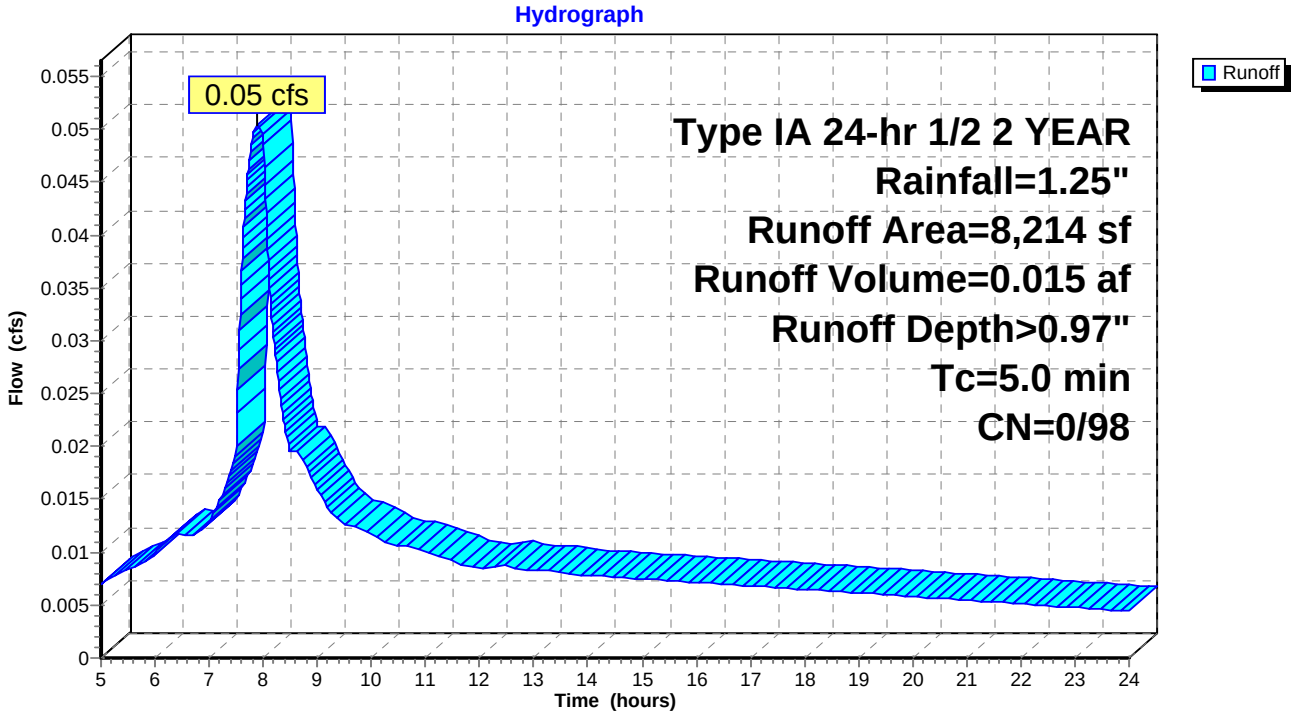
Runoff = 0.05 cfs @ 7.89 hrs, Volume= 0.015 af, Depth> 0.97"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 5.00-24.00 hrs, dt= 0.01 hrs
Type IA 24-hr 1/2 2 YEAR Rainfall=1.25"

| | Area (sf) | CN | Description |
|---|---|---|---|
| * | 8,214 | 98 | Roof Area |
| | 8,214 | 98 | Impervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|---|---|---|---|---|---|
| 5.0 | | | | | **Direct Entry,** |

## Subcatchment 5S: ROOF AREA



## Summary for Subcatchment 6S: PARKING

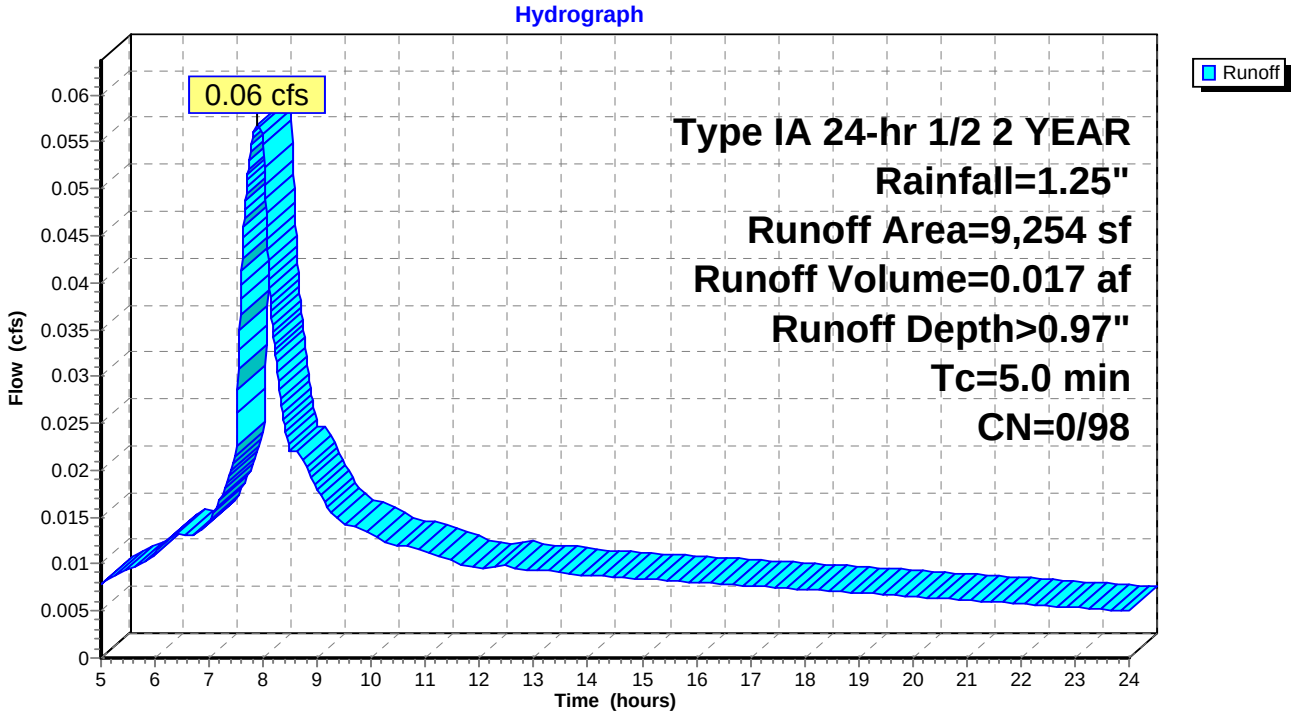
Runoff = 0.06 cfs @ 7.89 hrs, Volume= 0.017 af, Depth> 0.97"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 5.00-24.00 hrs, dt= 0.01 hrs
Type IA 24-hr 1/2 2 YEAR Rainfall=1.25"

| | Area (sf) | CN | Description |
|---|---|---|---|
| * | 9,254 | 98 | Parking Area |
| | 9,254 | 98 | Impervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|---|---|---|---|---|---|
| 5.0 | | | | | **Direct Entry,** |

## Subcatchment 6S: PARKING



## Summary for Subcatchment 7S: LANDSCAPE AREA

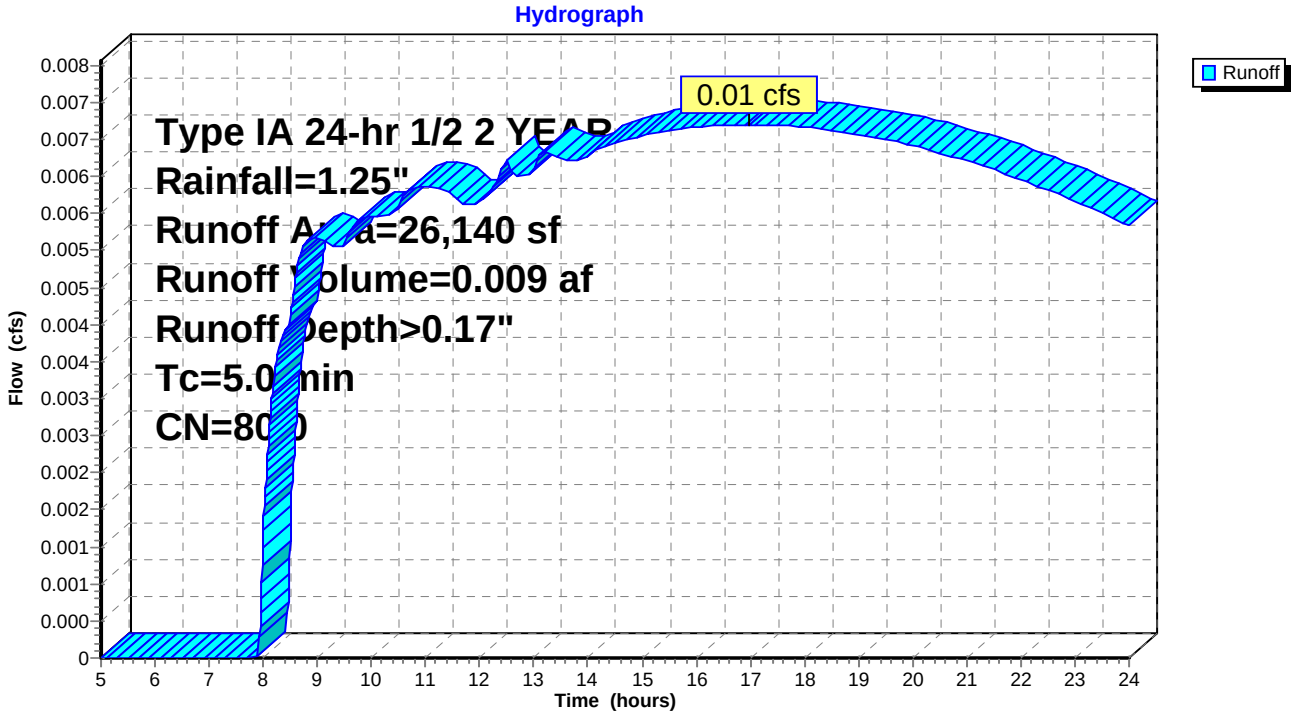
Runoff = 0.01 cfs @ 16.99 hrs, Volume= 0.009 af, Depth> 0.17"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 5.00-24.00 hrs, dt= 0.01 hrs
Type IA 24-hr 1/2 2 YEAR Rainfall=1.25"

| Area (sf) | CN | Description |
|---|---|---|
| 26,140 | 80 | >75% Grass cover, Good, HSG D |
| 26,140 | 80 | Pervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|---|---|---|---|---|---|
| 5.0 | | | | | **Direct Entry,** |

## Subcatchment 7S: LANDSCAPE AREA



## Summary for Subcatchment 8S: NEW CONCRETE PATH

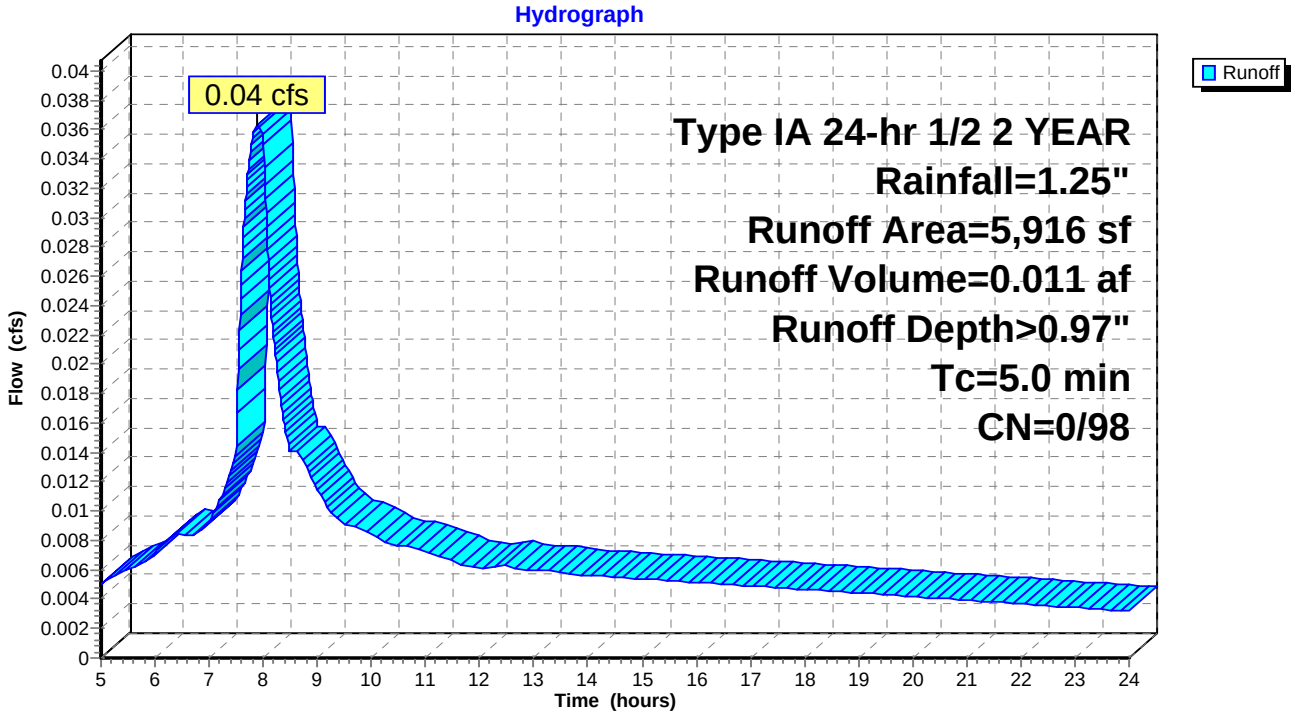
Runoff = 0.04 cfs @ 7.89 hrs, Volume= 0.011 af, Depth> 0.97"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 5.00-24.00 hrs, dt= 0.01 hrs
Type IA 24-hr 1/2 2 YEAR Rainfall=1.25"

| | Area (sf) | CN | Description |
|---|---|---|---|
| * | 5,916 | 98 | Concrete path |
| | 5,916 | 98 | Impervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|---|---|---|---|---|---|
| 5.0 | | | | | **Direct Entry,** |

## Subcatchment 8S: NEW CONCRETE PATH



## Summary for Subcatchment 9S: EXISTING BUILDING AND PAVING

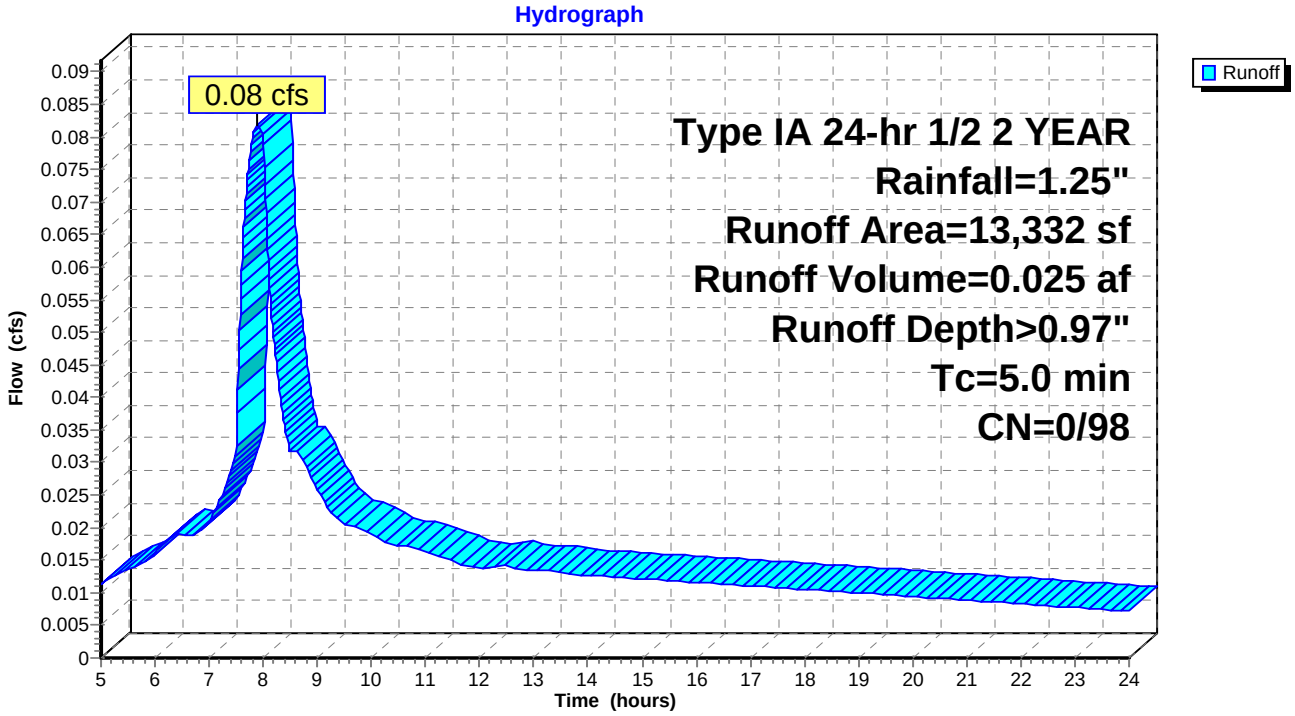
Runoff = 0.08 cfs @ 7.89 hrs, Volume= 0.025 af, Depth> 0.97"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 5.00-24.00 hrs, dt= 0.01 hrs
Type IA 24-hr 1/2 2 YEAR Rainfall=1.25"

| | Area (sf) | CN | Description |
|---|---|---|---|
| * | 13,332 | 98 | Existing Building and Paving |
| | 13,332 | 98 | Impervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|---|---|---|---|---|---|
| 5.0 | | | | | **Direct Entry,** |

## Subcatchment 9S: EXISTING BUILDING AND PAVING



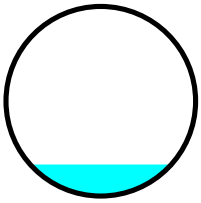
## Summary for Reach 1R: 6" STM

Inflow Area = 0.207 ac,100.00% Impervious, Inflow Depth > 0.97" for 1/2 2 YEAR event
Inflow = 0.06 cfs @ 7.89 hrs, Volume= 0.017 af
Outflow = 0.06 cfs @ 7.89 hrs, Volume= 0.017 af, Atten= 0%, Lag= 0.1 min

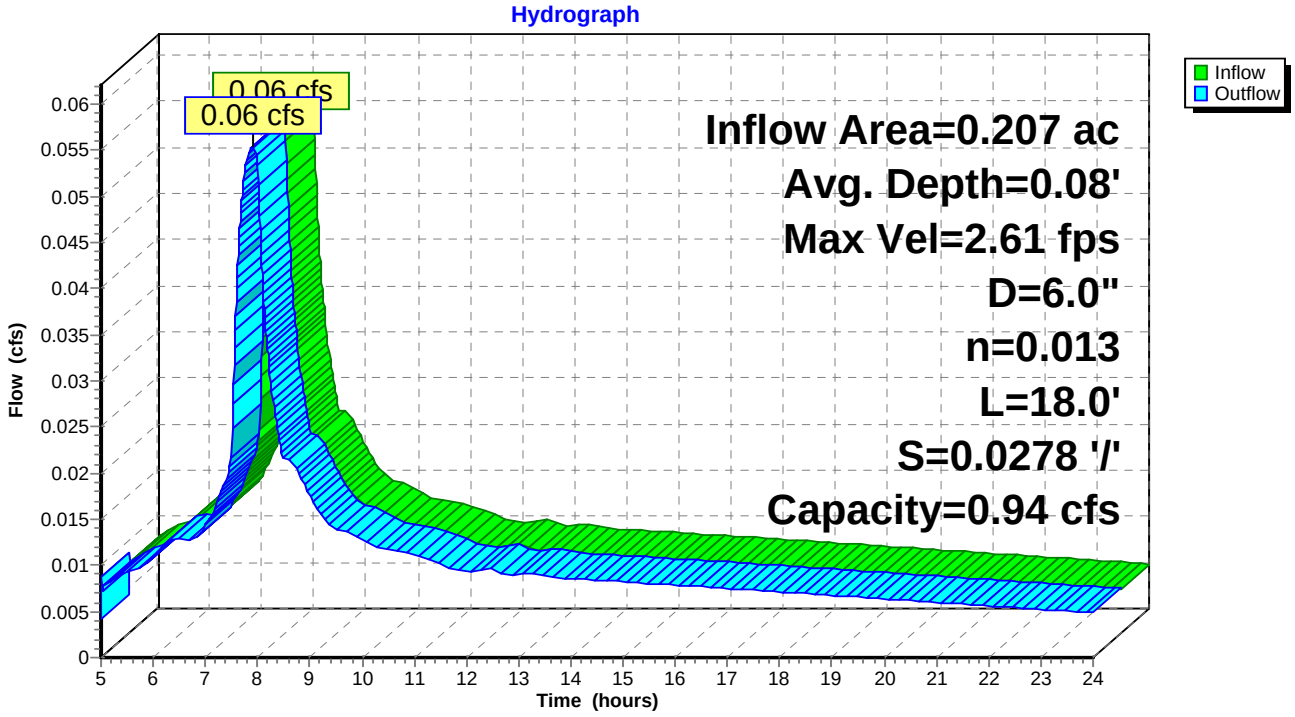
Routing by Dyn-Stor-Ind method, Time Span= 5.00-24.00 hrs, dt= 0.01 hrs
Max. Velocity= 2.61 fps, Min. Travel Time= 0.1 min
Avg. Velocity = 1.54 fps, Avg. Travel Time= 0.2 min

Peak Storage= 0 cf @ 7.89 hrs, Average Depth at Peak Storage= 0.08'
Bank-Full Depth= 0.50', Capacity at Bank-Full= 0.94 cfs

6.0" Diameter Pipe, n= 0.013 Corrugated PE, smooth interior
Length= 18.0' Slope= 0.0278 '/'
Inlet Invert= 199.00', Outlet Invert= 198.50'



### Reach 1R: 6" STM



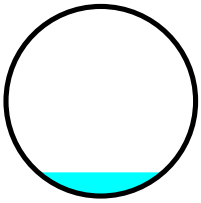
## Summary for Reach 2R: 4" STM

Inflow Area = 0.051 ac,100.00% Impervious, Inflow Depth > 0.97" for 1/2 2 YEAR event
Inflow = 0.01 cfs @ 7.80 hrs, Volume= 0.004 af
Outflow = 0.01 cfs @ 7.80 hrs, Volume= 0.004 af, Atten= 0%, Lag= 0.0 min

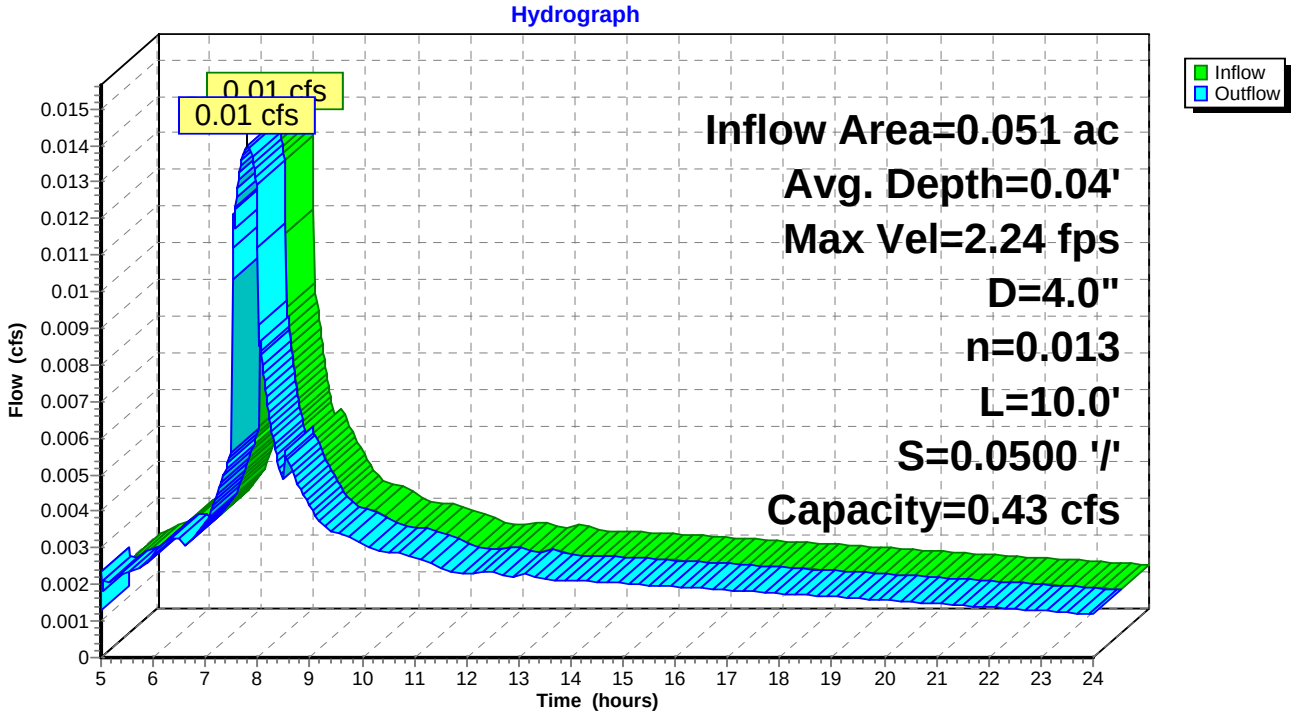
Routing by Dyn-Stor-Ind method, Time Span= 5.00-24.00 hrs, dt= 0.01 hrs
Max. Velocity= 2.24 fps, Min. Travel Time= 0.1 min
Avg. Velocity = 1.31 fps, Avg. Travel Time= 0.1 min

Peak Storage= 0 cf @ 7.80 hrs, Average Depth at Peak Storage= 0.04'
Bank-Full Depth= 0.33', Capacity at Bank-Full= 0.43 cfs

4.0" Diameter Pipe, n= 0.013 Corrugated PE, smooth interior
Length= 10.0' Slope= 0.0500 '/'
Inlet Invert= 198.00', Outlet Invert= 197.50'



### Reach 2R: 4" STM



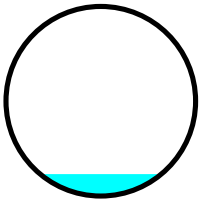
## Summary for Reach 3R: 4" STM

Inflow Area = 0.044 ac,100.00% Impervious, Inflow Depth > 0.97" for 1/2 2 YEAR event
Inflow = 0.01 cfs @ 7.80 hrs, Volume= 0.004 af
Outflow = 0.01 cfs @ 7.80 hrs, Volume= 0.004 af, Atten= 0%, Lag= 0.1 min

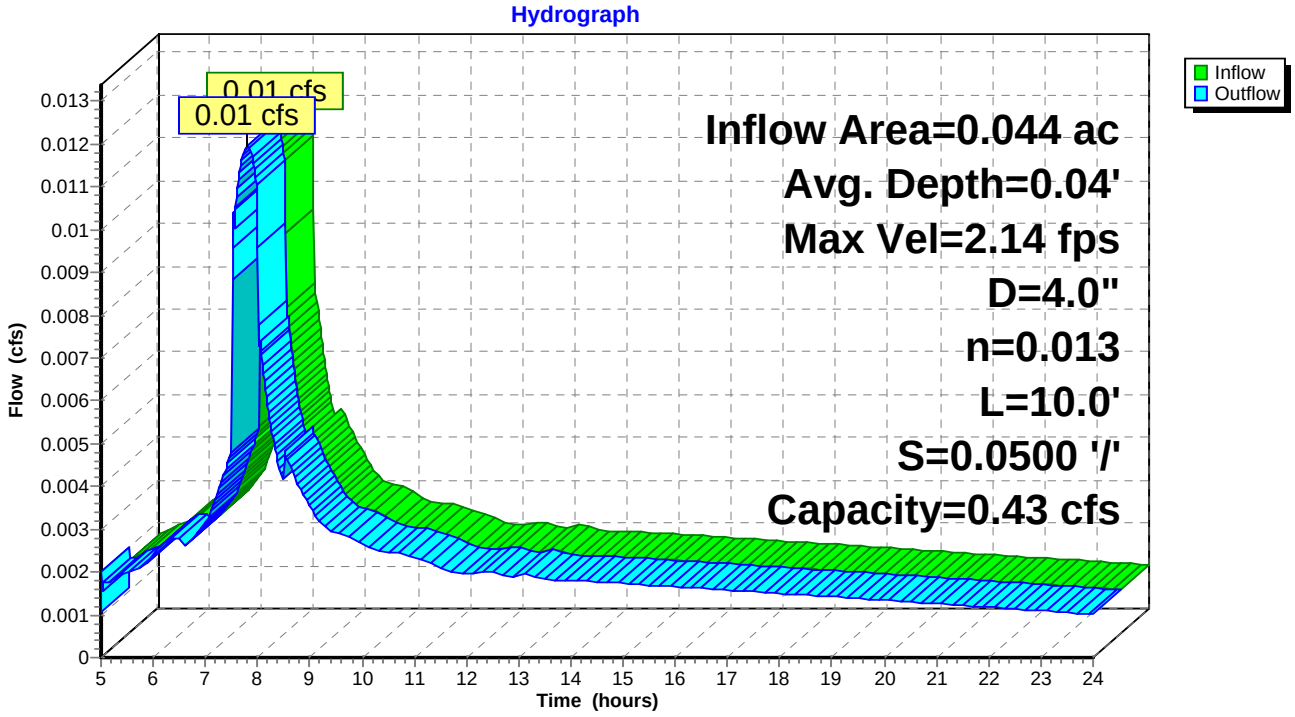
Routing by Dyn-Stor-Ind method, Time Span= 5.00-24.00 hrs, dt= 0.01 hrs
Max. Velocity= 2.14 fps, Min. Travel Time= 0.1 min
Avg. Velocity = 1.25 fps, Avg. Travel Time= 0.1 min

Peak Storage= 0 cf @ 7.80 hrs, Average Depth at Peak Storage= 0.04'
Bank-Full Depth= 0.33', Capacity at Bank-Full= 0.43 cfs

4.0" Diameter Pipe, n= 0.013 Corrugated PE, smooth interior
Length= 10.0' Slope= 0.0500 '/'
Inlet Invert= 198.00', Outlet Invert= 197.50'



### Reach 3R: 4" STM



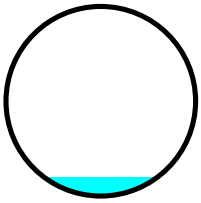
## Summary for Reach 4R: 4" STM

Inflow Area = 0.032 ac,100.00% Impervious, Inflow Depth > 0.97" for 1/2 2 YEAR event
Inflow = 0.01 cfs @ 7.80 hrs, Volume= 0.003 af
Outflow = 0.01 cfs @ 7.81 hrs, Volume= 0.003 af, Atten= 0%, Lag= 0.1 min

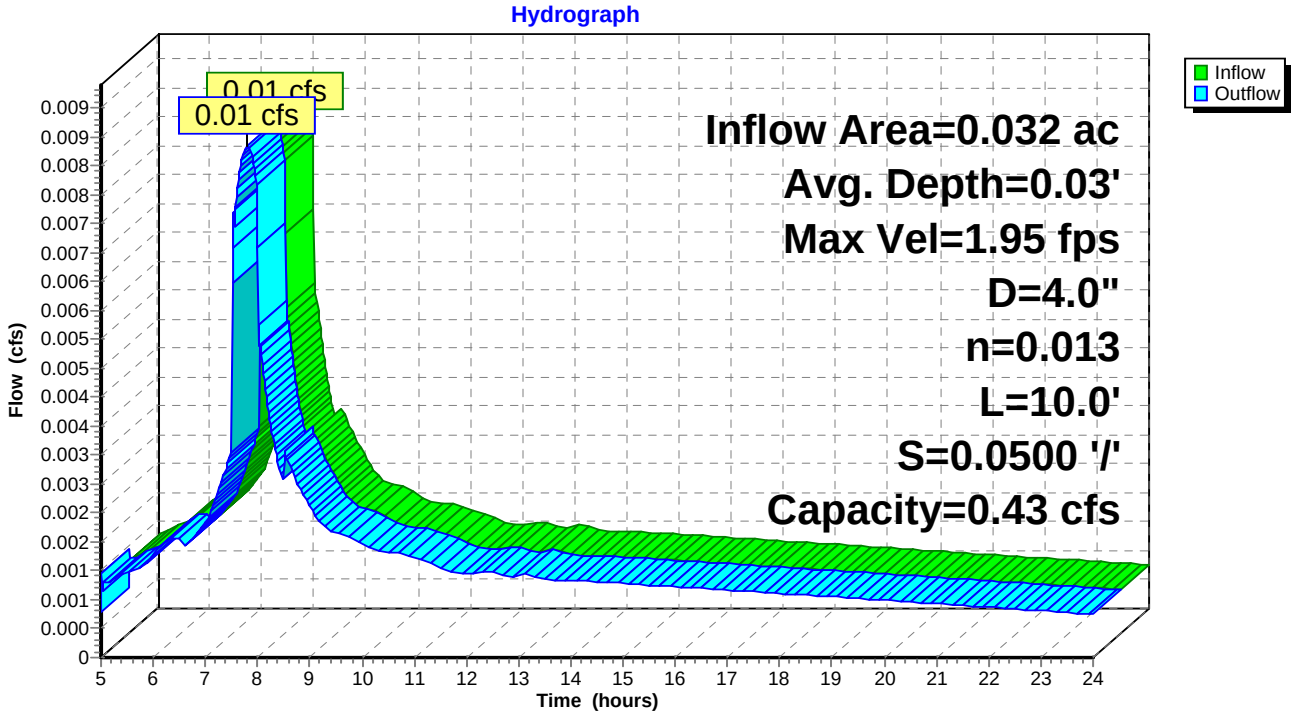
Routing by Dyn-Stor-Ind method, Time Span= 5.00-24.00 hrs, dt= 0.01 hrs
Max. Velocity= 1.95 fps, Min. Travel Time= 0.1 min
Avg. Velocity = 1.14 fps, Avg. Travel Time= 0.1 min

Peak Storage= 0 cf @ 7.81 hrs, Average Depth at Peak Storage= 0.03'
Bank-Full Depth= 0.33', Capacity at Bank-Full= 0.43 cfs

4.0" Diameter Pipe, n= 0.013 Corrugated PE, smooth interior
Length= 10.0' Slope= 0.0500 '/'
Inlet Invert= 198.00', Outlet Invert= 197.50'



### Reach 4R: 4" STM



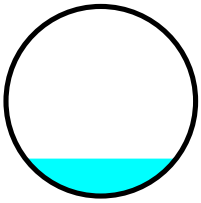
## Summary for Reach 5R: 6" STM

Inflow Area = 0.924 ac, 35.09% Impervious, Inflow Depth > 0.45" for 1/2 2 YEAR event
Inflow = 0.09 cfs @ 7.90 hrs, Volume= 0.035 af
Outflow = 0.09 cfs @ 7.90 hrs, Volume= 0.035 af, Atten= 0%, Lag= 0.1 min

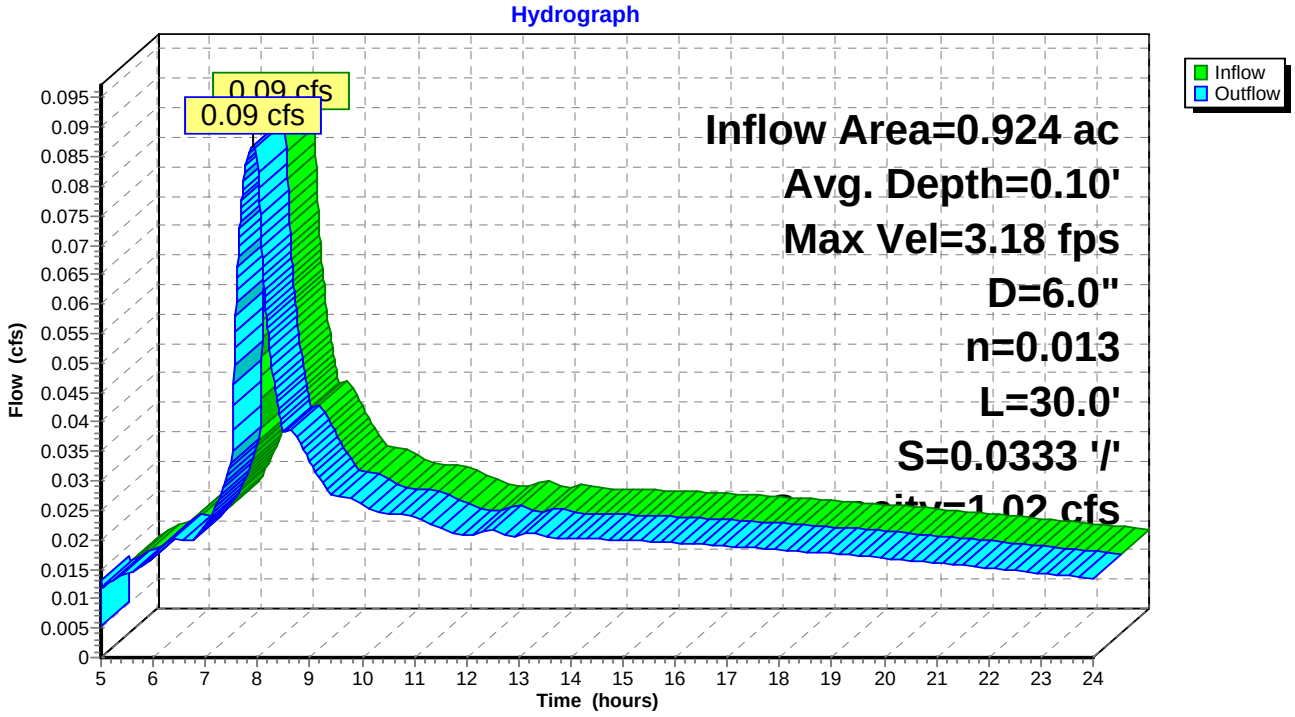
Routing by Dyn-Stor-Ind method, Time Span= 5.00-24.00 hrs, dt= 0.01 hrs
Max. Velocity= 3.18 fps, Min. Travel Time= 0.2 min
Avg. Velocity = 2.08 fps, Avg. Travel Time= 0.2 min

Peak Storage= 1 cf @ 7.90 hrs, Average Depth at Peak Storage= 0.10'
Bank-Full Depth= 0.50', Capacity at Bank-Full= 1.02 cfs

6.0" Diameter Pipe, n= 0.013 Corrugated PE, smooth interior
Length= 30.0' Slope= 0.0333 '/'
Inlet Invert= 197.00', Outlet Invert= 196.00'



### Reach 5R: 6" STM



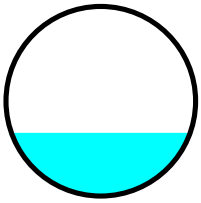
## Summary for Reach 6R: 6" STM

Inflow Area = 1.137 ac, 47.22% Impervious, Inflow Depth > 0.55" for 1/2 2 YEAR event
Inflow = 0.14 cfs @ 7.90 hrs, Volume= 0.052 af
Outflow = 0.14 cfs @ 7.92 hrs, Volume= 0.052 af, Atten= 0%, Lag= 1.5 min

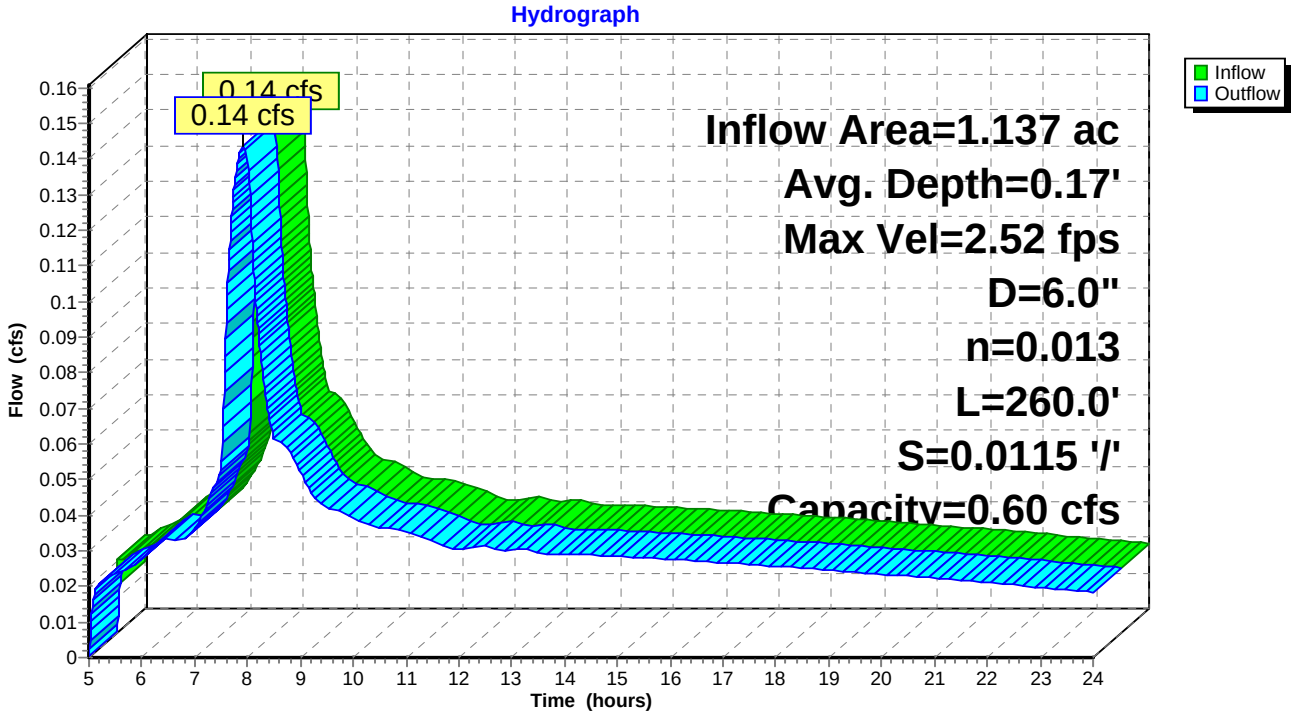
Routing by Dyn-Stor-Ind method, Time Span= 5.00-24.00 hrs, dt= 0.01 hrs
Max. Velocity= 2.52 fps, Min. Travel Time= 1.7 min
Avg. Velocity = 1.61 fps, Avg. Travel Time= 2.7 min

Peak Storage= 15 cf @ 7.92 hrs, Average Depth at Peak Storage= 0.17'
Bank-Full Depth= 0.50', Capacity at Bank-Full= 0.60 cfs

6.0" Diameter Pipe, n= 0.013 Corrugated PE, smooth interior
Length= 260.0' Slope= 0.0115 '/'
Inlet Invert= 199.00', Outlet Invert= 196.00'



### Reach 6R: 6" STM



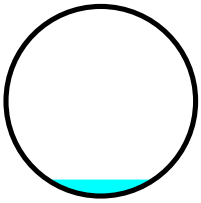
## Summary for Reach 8R: 8" STM

Inflow Area = 0.335 ac,100.00% Impervious, Inflow Depth > 0.17" for 1/2 2 YEAR event
Inflow = 0.01 cfs @ 15.74 hrs, Volume= 0.005 af
Outflow = 0.01 cfs @ 15.94 hrs, Volume= 0.005 af, Atten= 0%, Lag= 12.3 min

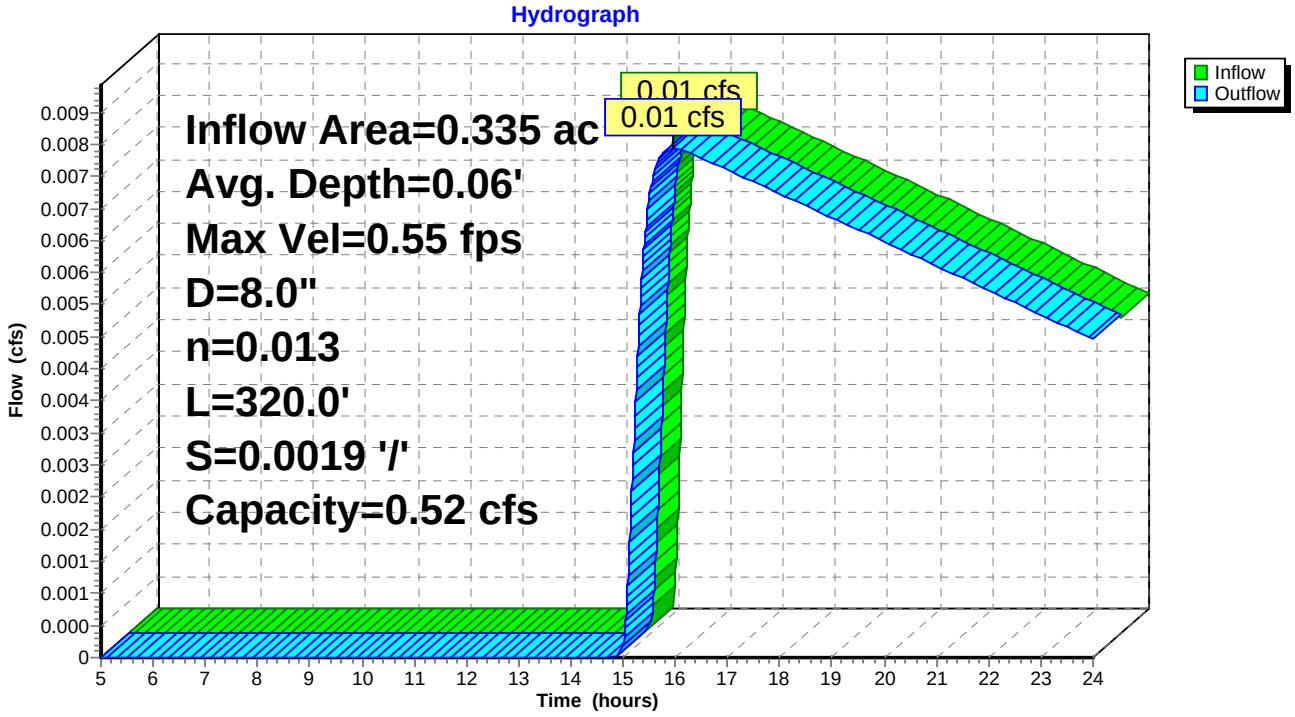
Routing by Dyn-Stor-Ind method, Time Span= 5.00-24.00 hrs, dt= 0.01 hrs
Max. Velocity= 0.55 fps, Min. Travel Time= 9.8 min
Avg. Velocity = 0.51 fps, Avg. Travel Time= 10.5 min

Peak Storage= 5 cf @ 15.94 hrs, Average Depth at Peak Storage= 0.06'
Bank-Full Depth= 0.67', Capacity at Bank-Full= 0.52 cfs

8.0" Diameter Pipe, n= 0.013 Corrugated PE, smooth interior
Length= 320.0' Slope= 0.0019 '/'
Inlet Invert= 194.74', Outlet Invert= 194.14'



### Reach 8R: 8" STM



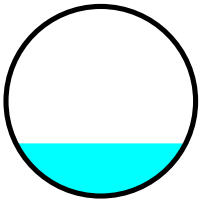
## Summary for Reach 9R: 8" STM

Inflow Area = 1.472 ac, 59.22% Impervious, Inflow Depth > 0.46" for 1/2 2 YEAR event
Inflow = 0.14 cfs @ 7.92 hrs, Volume= 0.057 af
Outflow = 0.14 cfs @ 7.94 hrs, Volume= 0.057 af, Atten= 0%, Lag= 0.9 min

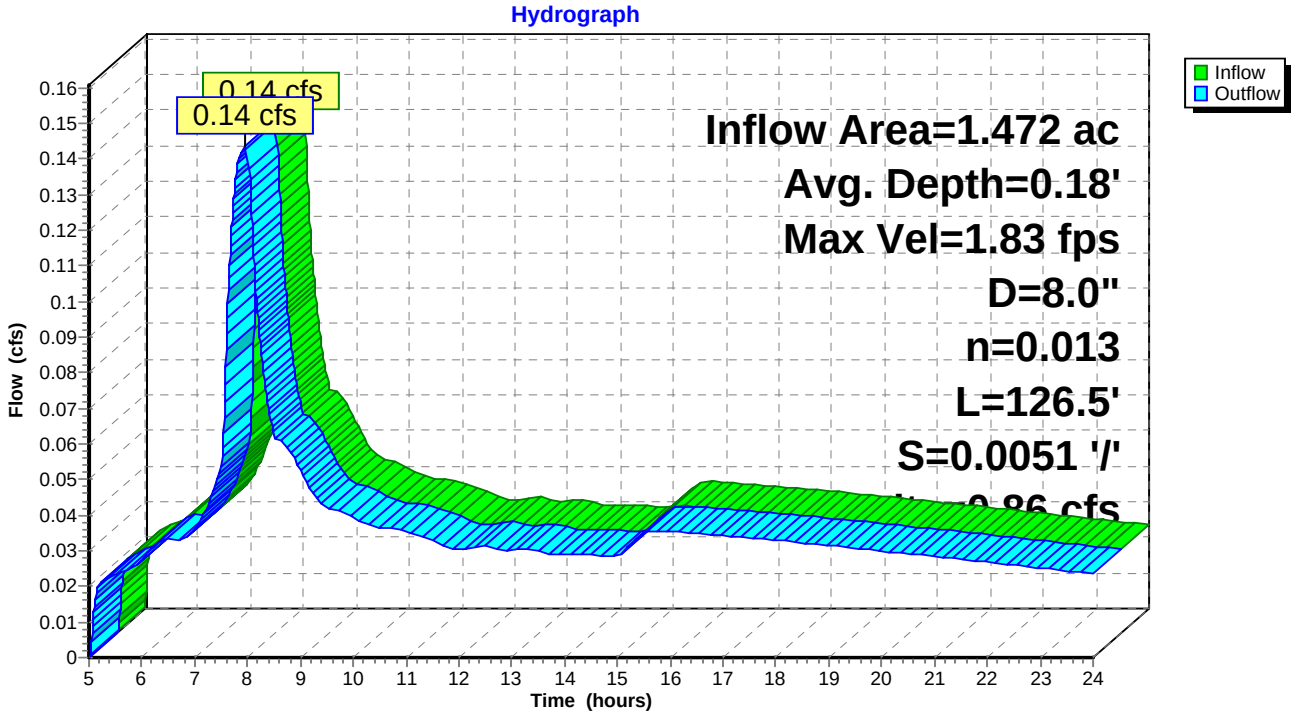
Routing by Dyn-Stor-Ind method, Time Span= 5.00-24.00 hrs, dt= 0.01 hrs
Max. Velocity= 1.83 fps, Min. Travel Time= 1.2 min
Avg. Velocity = 1.20 fps, Avg. Travel Time= 1.8 min

Peak Storage= 10 cf @ 7.94 hrs, Average Depth at Peak Storage= 0.18'
Bank-Full Depth= 0.67', Capacity at Bank-Full= 0.86 cfs

8.0" Diameter Pipe, n= 0.013 Corrugated PE, smooth interior
Length= 126.5' Slope= 0.0051 '/'
Inlet Invert= 194.14', Outlet Invert= 193.50'



### Reach 9R: 8" STM



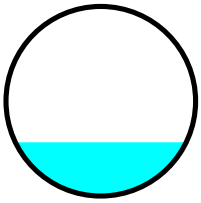
## Summary for Reach 10R: 8" STM

Inflow Area = 1.778 ac, 66.24% Impervious, Inflow Depth > 0.55" for 1/2 2 YEAR event
Inflow = 0.23 cfs @ 7.92 hrs, Volume= 0.081 af
Outflow = 0.22 cfs @ 7.94 hrs, Volume= 0.081 af, Atten= 0%, Lag= 1.3 min

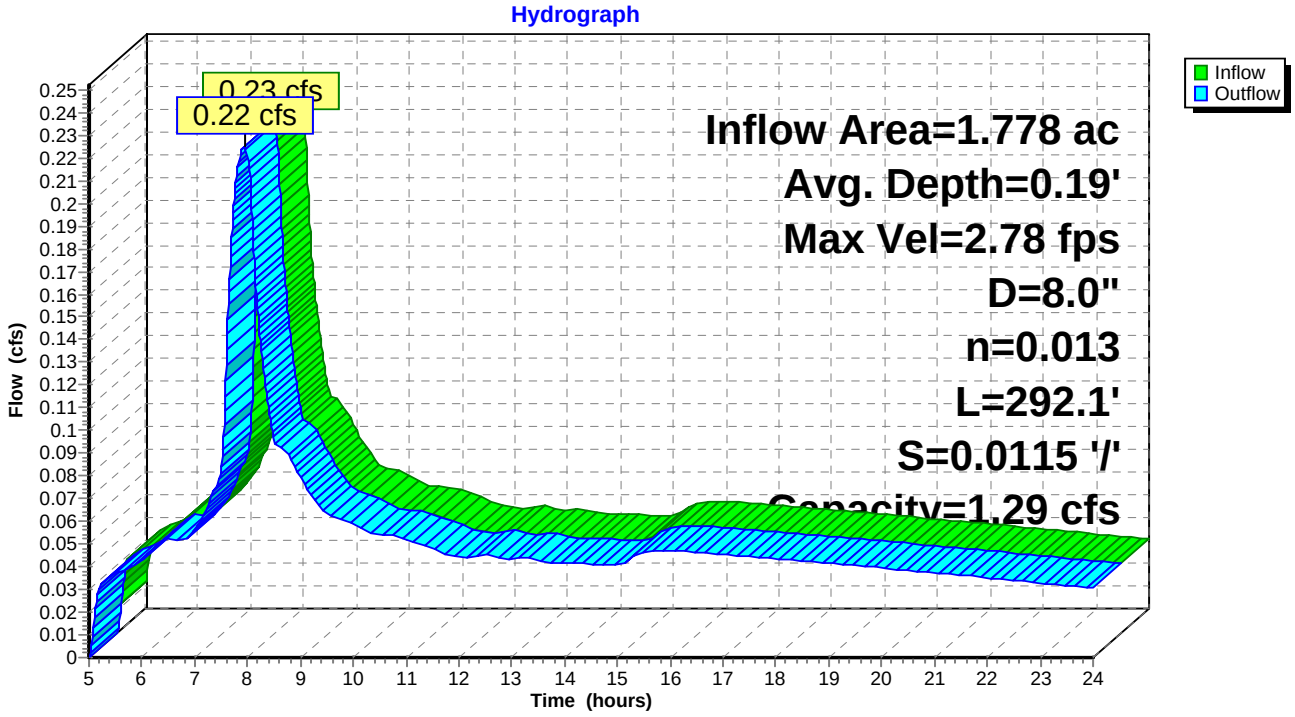
Routing by Dyn-Stor-Ind method, Time Span= 5.00-24.00 hrs, dt= 0.01 hrs
Max. Velocity= 2.78 fps, Min. Travel Time= 1.8 min
Avg. Velocity = 1.77 fps, Avg. Travel Time= 2.8 min

Peak Storage= 24 cf @ 7.94 hrs, Average Depth at Peak Storage= 0.19'
Bank-Full Depth= 0.67', Capacity at Bank-Full= 1.29 cfs

8.0" Diameter Pipe, n= 0.013 Corrugated PE, smooth interior
Length= 292.1' Slope= 0.0115 '/'
Inlet Invert= 193.25', Outlet Invert= 189.90'



### Reach 10R: 8" STM



## Summary for Pond 1P: PLANTER

Inflow Area = 0.207 ac,100.00% Impervious, Inflow Depth > 0.97" for 1/2 2 YEAR event
Inflow = 0.06 cfs @ 7.89 hrs, Volume= 0.017 af
Outflow = 0.01 cfs @ 15.74 hrs, Volume= 0.005 af, Atten= 86%, Lag= 470.7 min
Primary = 0.01 cfs @ 15.74 hrs, Volume= 0.005 af

Routing by Dyn-Stor-Ind method, Time Span= 5.00-24.00 hrs, dt= 0.01 hrs
Peak Elev= 198.51' @ 15.74 hrs Surf.Area= 1,704 sf Storage= 520 cf

Plug-Flow detention time= 725.4 min calculated for 0.005 af (29% of inflow)
Center-of-Mass det. time= 420.9 min ( 1,151.1 - 730.2 )

| Volume | Invert | Avail.Storage | Storage Description |
|---|---|---|---|
| #1 | 195.50' | 187 cf | **1' Drain Rock (Prismatic)**Listed below (Recalc)<br>568 cf Overall x 33.0% Voids |
| #2 | 196.50' | 43 cf | **1.5' Growing Medium (Prismatic)**Listed below (Recalc)<br>852 cf Overall x 5.0% Voids |
| #3 | 198.00' | 471 cf | **Ponding Depth (Prismatic)**Listed below (Recalc) |
| | | 701 cf | Total Available Storage |

| Elevation (feet) | Surf.Area (sq-ft) | Inc.Store (cubic-feet) | Cum.Store (cubic-feet) |
|---|---|---|---|
| 195.50 | 568 | 0 | 0 |
| 196.50 | 568 | 568 | 568 |

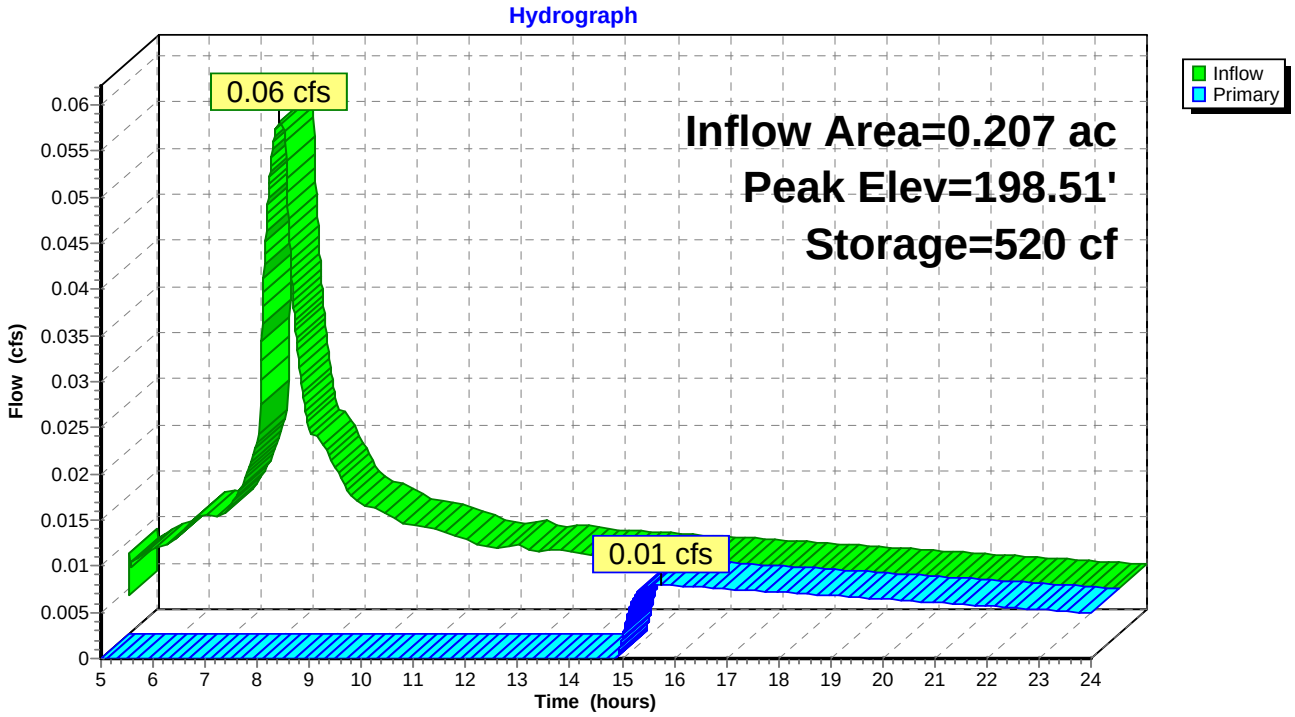
| Elevation (feet) | Surf.Area (sq-ft) | Inc.Store (cubic-feet) | Cum.Store (cubic-feet) |
|---|---|---|---|
| 196.50 | 568 | 0 | 0 |
| 198.00 | 568 | 852 | 852 |

| Elevation (feet) | Surf.Area (sq-ft) | Inc.Store (cubic-feet) | Cum.Store (cubic-feet) |
|---|---|---|---|
| 198.00 | 568 | 0 | 0 |
| 198.83 | 568 | 471 | 471 |

| Device | Routing | Invert | Outlet Devices |
|---|---|---|---|
| #1 | Primary | 195.50' | **8.0" x 205.0' long Culvert** Ke= 0.500<br>Outlet Invert= 194.46' S= 0.0051 '/' Cc= 0.900 n= 0.013 |
| #2 | Device 1 | 198.50' | **8.0" Horiz. Orifice/Grate** Limited to weir flow C= 0.610 |

**Primary OutFlow** Max=0.01 cfs @ 15.74 hrs HW=198.51' TW=194.80' (Dynamic Tailwater)
└─**1=Culvert** (Passes 0.01 cfs of 1.45 cfs potential flow)
  └─**2=Orifice/Grate** (Weir Controls 0.01 cfs @ 0.34 fps)

## Pond 1P: PLANTER



## Summary for Pond 2P: PLANTER

Inflow Area = 0.051 ac,100.00% Impervious, Inflow Depth > 0.97" for 1/2 2 YEAR event
Inflow = 0.01 cfs @ 7.80 hrs, Volume= 0.004 af
Outflow = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af, Atten= 100%, Lag= 0.0 min
Primary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 5.00-24.00 hrs, dt= 0.01 hrs
Peak Elev= 197.27' @ 24.00 hrs Surf.Area= 798 sf Storage= 180 cf

Plug-Flow detention time= (not calculated: initial storage excedes outflow)
Center-of-Mass det. time= (not calculated: no outflow)

| Volume | Invert | Avail.Storage | Storage Description |
|---|---|---|---|
| #1 | 194.50' | 88 cf | **1' Drain Rock (Prismatic)**Listed below (Recalc)<br>266 cf Overall x 33.0% Voids |
| #2 | 195.50' | 20 cf | **1.5' Growing Medium (Prismatic)**Listed below (Recalc)<br>399 cf Overall x 5.0% Voids |
| #3 | 197.00' | 221 cf | **Ponding Depth (Prismatic)**Listed below (Recalc) |
| | | 329 cf | Total Available Storage |

| Elevation (feet) | Surf.Area (sq-ft) | Inc.Store (cubic-feet) | Cum.Store (cubic-feet) |
|---|---|---|---|
| 194.50 | 266 | 0 | 0 |
| 195.50 | 266 | 266 | 266 |

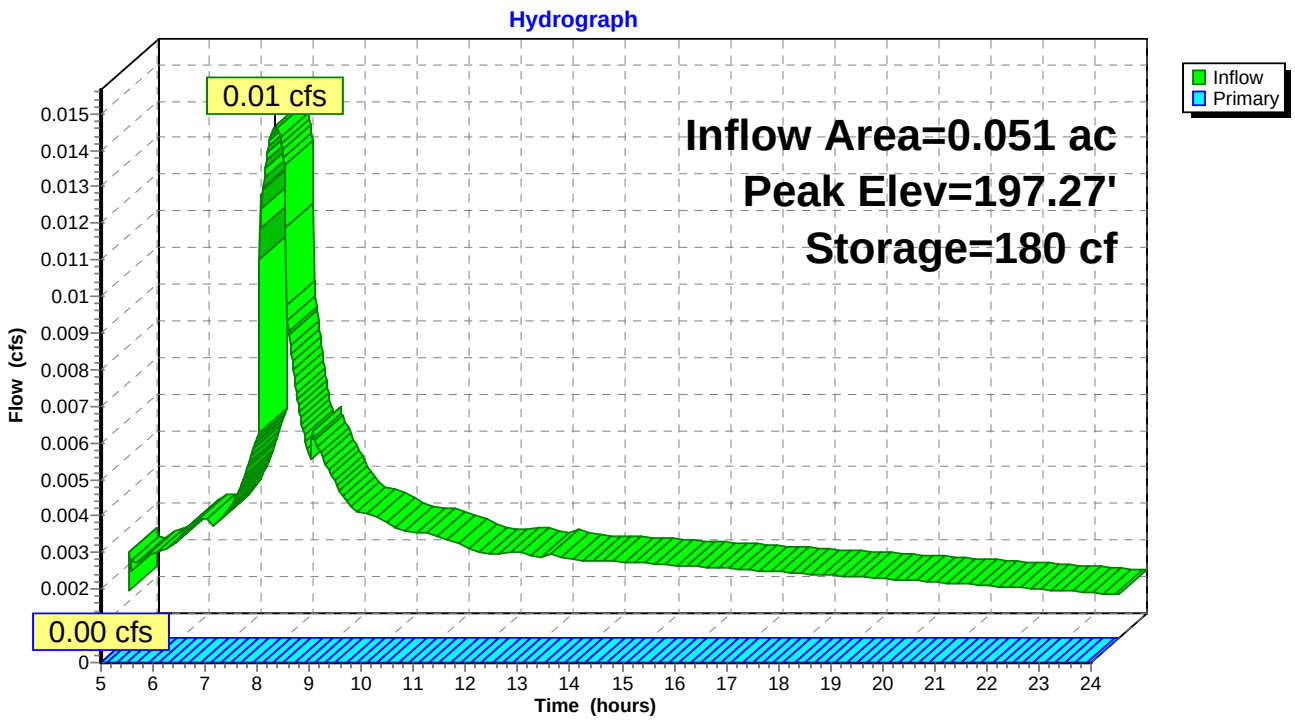
| Elevation (feet) | Surf.Area (sq-ft) | Inc.Store (cubic-feet) | Cum.Store (cubic-feet) |
|---|---|---|---|
| 195.50 | 266 | 0 | 0 |
| 197.00 | 266 | 399 | 399 |

| Elevation (feet) | Surf.Area (sq-ft) | Inc.Store (cubic-feet) | Cum.Store (cubic-feet) |
|---|---|---|---|
| 197.00 | 266 | 0 | 0 |
| 197.83 | 266 | 221 | 221 |

| Device | Routing | Invert | Outlet Devices |
|---|---|---|---|
| #1 | Device 2 | 197.50' | **4.0" Horiz. Orifice/Grate** Limited to weir flow C= 0.610 |
| #2 | Primary | 194.63' | **4.0" x 33.4' long Culvert** Ke= 0.500<br>Outlet Invert= 194.46' S= 0.0051 '/' Cc= 0.900 n= 0.013 |

**Primary OutFlow** Max=0.00 cfs @ 5.00 hrs HW=194.50' TW=194.74' (Dynamic Tailwater)
└─**2=Culvert** ( Controls 0.00 cfs)
  └─**1=Orifice/Grate** ( Controls 0.00 cfs)

## Pond 2P: PLANTER



## Summary for Pond 3P: PLANTER

Inflow Area = 0.044 ac,100.00% Impervious, Inflow Depth > 0.97" for 1/2 2 YEAR event
Inflow = 0.01 cfs @ 7.80 hrs, Volume= 0.004 af
Outflow = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af, Atten= 100%, Lag= 0.0 min
Primary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 5.00-24.00 hrs, dt= 0.01 hrs
Peak Elev= 197.14' @ 24.00 hrs Surf.Area= 849 sf Storage= 154 cf

Plug-Flow detention time= (not calculated: initial storage excedes outflow)
Center-of-Mass det. time= (not calculated: no outflow)

| Volume | Invert | Avail.Storage | Storage Description |
|---|---|---|---|
| #1 | 194.50' | 93 cf | **1' Drain Rock (Prismatic)**Listed below (Recalc)<br>283 cf Overall x 33.0% Voids |
| #2 | 195.50' | 21 cf | **1.5' Growing Medium (Prismatic)**Listed below (Recalc)<br>425 cf Overall x 5.0% Voids |
| #3 | 197.00' | 235 cf | **Ponding Depth (Prismatic)**Listed below (Recalc) |
| | | 350 cf | Total Available Storage |

| Elevation (feet) | Surf.Area (sq-ft) | Inc.Store (cubic-feet) | Cum.Store (cubic-feet) |
|---|---|---|---|
| 194.50 | 283 | 0 | 0 |
| 195.50 | 283 | 283 | 283 |

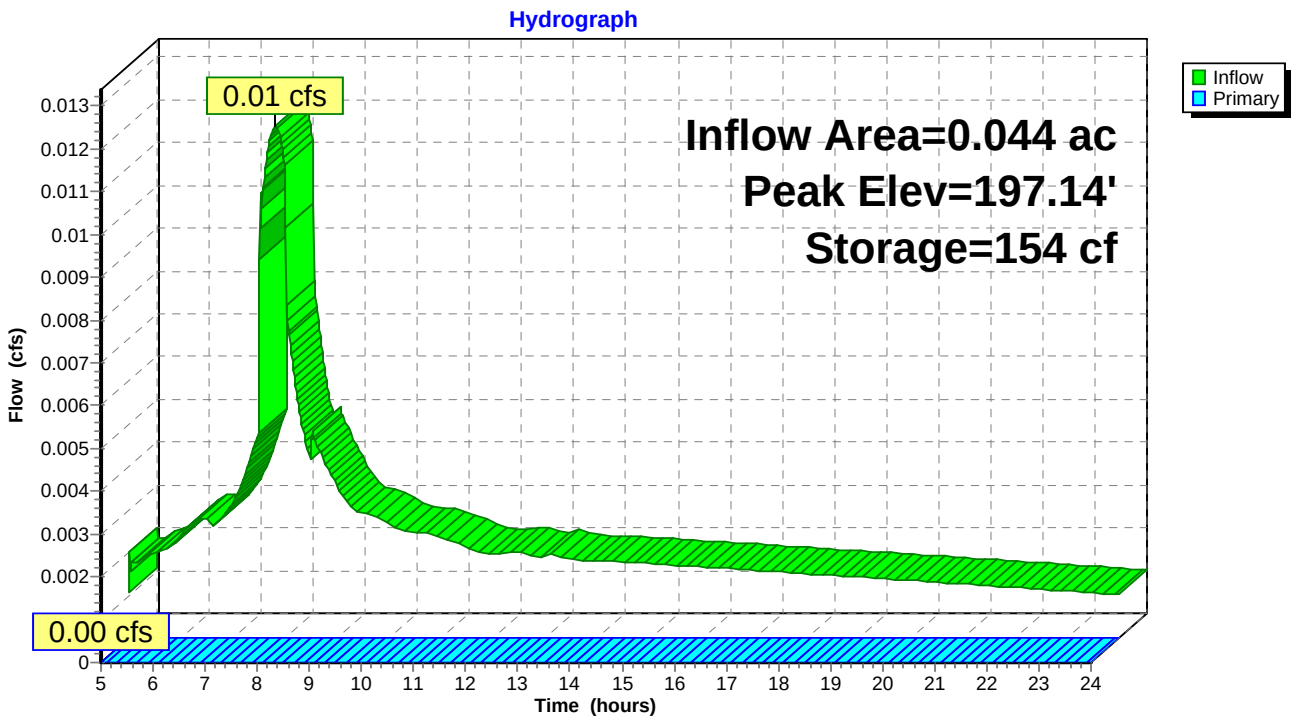
| Elevation (feet) | Surf.Area (sq-ft) | Inc.Store (cubic-feet) | Cum.Store (cubic-feet) |
|---|---|---|---|
| 195.50 | 283 | 0 | 0 |
| 197.00 | 283 | 425 | 425 |

| Elevation (feet) | Surf.Area (sq-ft) | Inc.Store (cubic-feet) | Cum.Store (cubic-feet) |
|---|---|---|---|
| 197.00 | 283 | 0 | 0 |
| 197.83 | 283 | 235 | 235 |

| Device | Routing | Invert | Outlet Devices |
|---|---|---|---|
| #1 | Device 2 | 197.50' | **4.0" Horiz. Orifice/Grate** Limited to weir flow C= 0.610 |
| #2 | Primary | 194.82' | **4.0" x 33.3' long Culvert** Ke= 0.500<br>Outlet Invert= 194.65' S= 0.0051 '/' Cc= 0.900 n= 0.013 |

**Primary OutFlow** Max=0.00 cfs @ 5.00 hrs HW=194.50' TW=194.74' (Dynamic Tailwater)
└─**2=Culvert** ( Controls 0.00 cfs)
  └─**1=Orifice/Grate** ( Controls 0.00 cfs)

## Pond 3P: PLANTER



## Summary for Pond 4P: PLANTER

Inflow Area = 0.032 ac,100.00% Impervious, Inflow Depth > 0.97" for 1/2 2 YEAR event
Inflow = 0.01 cfs @ 7.81 hrs, Volume= 0.003 af
Outflow = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af, Atten= 100%, Lag= 0.0 min
Primary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 5.00-24.00 hrs, dt= 0.01 hrs
Peak Elev= 196.57' @ 24.00 hrs Surf.Area= 594 sf Storage= 114 cf

Plug-Flow detention time= (not calculated: initial storage excedes outflow)
Center-of-Mass det. time= (not calculated: no outflow)

| Volume | Invert | Avail.Storage | Storage Description |
|---|---|---|---|
| #1 | 194.50' | 98 cf | **1' Drain Rock (Prismatic)**Listed below (Recalc)<br>297 cf Overall x 33.0% Voids |
| #2 | 195.50' | 22 cf | **1.5' Growing Medium (Prismatic)**Listed below (Recalc)<br>446 cf Overall x 5.0% Voids |
| #3 | 197.00' | 247 cf | **Ponding Depth (Prismatic)**Listed below (Recalc) |
| | | 367 cf | Total Available Storage |

| Elevation (feet) | Surf.Area (sq-ft) | Inc.Store (cubic-feet) | Cum.Store (cubic-feet) |
|---|---|---|---|
| 194.50 | 297 | 0 | 0 |
| 195.50 | 297 | 297 | 297 |

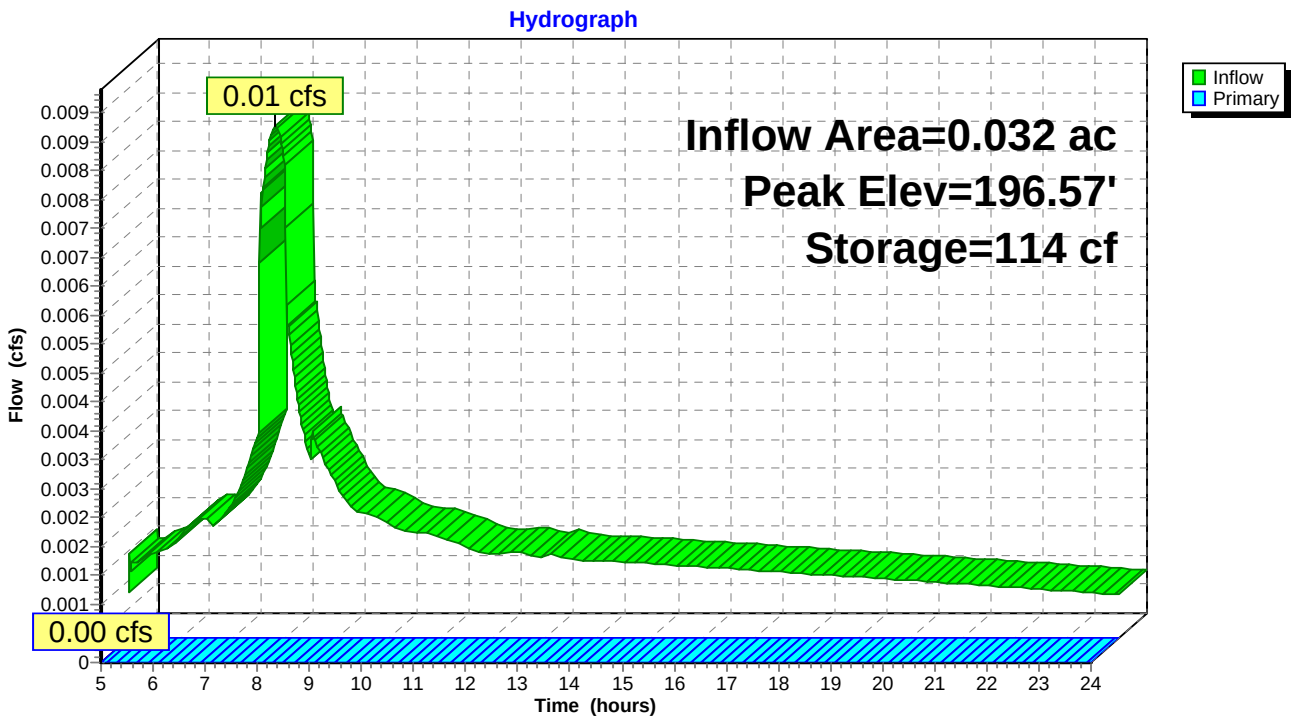
| Elevation (feet) | Surf.Area (sq-ft) | Inc.Store (cubic-feet) | Cum.Store (cubic-feet) |
|---|---|---|---|
| 195.50 | 297 | 0 | 0 |
| 197.00 | 297 | 446 | 446 |

| Elevation (feet) | Surf.Area (sq-ft) | Inc.Store (cubic-feet) | Cum.Store (cubic-feet) |
|---|---|---|---|
| 197.00 | 297 | 0 | 0 |
| 197.83 | 297 | 247 | 247 |

| Device | Routing | Invert | Outlet Devices |
|---|---|---|---|
| #1 | Device 2 | 197.50' | **4.0" Horiz. Orifice/Grate** Limited to weir flow C= 0.610 |
| #2 | Primary | 194.99' | **4.0" x 33.2' long Culvert** Ke= 0.500<br>Outlet Invert= 194.82' S= 0.0051 '/' Cc= 0.900 n= 0.013 |

**Primary OutFlow** Max=0.00 cfs @ 5.00 hrs HW=194.50' TW=194.74' (Dynamic Tailwater)
└─**2=Culvert** ( Controls 0.00 cfs)
  └─**1=Orifice/Grate** ( Controls 0.00 cfs)

## Pond 4P: PLANTER



# APPENDIX 2.8
# POST-DEVELOPED 2-YEAR STORM EVENT (2.5”)—HYDROGRAPH AND FLOW INFORMATION

Time span=5.00-24.00 hrs, dt=0.01 hrs, 1901 points
Runoff by SBUH method, Split Pervious/Imperv.
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

**Subcatchment 1S: ROOF AREA** Runoff Area=9,028 sf 100.00% Impervious Runoff Depth>2.06"
Tc=5.0 min CN=0/98 Runoff=0.12 cfs 0.035 af

**Subcatchment 2S: ROOF/STREET AREA** Runoff Area=2,233 sf 100.00% Impervious Runoff Depth>2.05"
Tc=0.0 min CN=0/98 Runoff=0.03 cfs 0.009 af

**Subcatchment 3S: ROOF/STREET AREA** Runoff Area=1,910 sf 100.00% Impervious Runoff Depth>2.05"
Tc=0.0 min CN=0/98 Runoff=0.03 cfs 0.007 af

**Subcatchment 4S: ROOF/STREET AREA** Runoff Area=1,412 sf 100.00% Impervious Runoff Depth>2.05"
Tc=0.0 min CN=0/98 Runoff=0.02 cfs 0.006 af

**Subcatchment 5S: ROOF AREA** Runoff Area=8,214 sf 100.00% Impervious Runoff Depth>2.06"
Tc=5.0 min CN=0/98 Runoff=0.11 cfs 0.032 af

**Subcatchment 6S: PARKING** Runoff Area=9,254 sf 100.00% Impervious Runoff Depth>2.06"
Tc=5.0 min CN=0/98 Runoff=0.12 cfs 0.036 af

**Subcatchment 7S: LANDSCAPE AREA** Runoff Area=26,140 sf 0.00% Impervious Runoff Depth>0.89"
Tc=5.0 min CN=80/0 Runoff=0.11 cfs 0.044 af

**Subcatchment 8S: NEW CONCRETE PATH** Runoff Area=5,916 sf 100.00% Impervious Runoff Depth>2.06"
Tc=5.0 min CN=0/98 Runoff=0.08 cfs 0.023 af

**Subcatchment 9S: EXISTING BUILDING** Runoff Area=13,332 sf 100.00% Impervious Runoff Depth>2.06"
Tc=5.0 min CN=0/98 Runoff=0.18 cfs 0.052 af

**Reach 1R: 6" STM** Avg. Depth=0.12' Max Vel=3.27 fps Inflow=0.12 cfs 0.035 af
D=6.0" n=0.013 L=18.0' S=0.0278 '/' Capacity=0.94 cfs Outflow=0.12 cfs 0.035 af

**Reach 2R: 4" STM** Avg. Depth=0.06' Max Vel=2.82 fps Inflow=0.03 cfs 0.009 af
D=4.0" n=0.013 L=10.0' S=0.0500 '/' Capacity=0.43 cfs Outflow=0.03 cfs 0.009 af

**Reach 3R: 4" STM** Avg. Depth=0.06' Max Vel=2.69 fps Inflow=0.03 cfs 0.007 af
D=4.0" n=0.013 L=10.0' S=0.0500 '/' Capacity=0.43 cfs Outflow=0.03 cfs 0.007 af

**Reach 4R: 4" STM** Avg. Depth=0.05' Max Vel=2.46 fps Inflow=0.02 cfs 0.006 af
D=4.0" n=0.013 L=10.0' S=0.0500 '/' Capacity=0.43 cfs Outflow=0.02 cfs 0.006 af

**Reach 5R: 6" STM** Avg. Depth=0.18' Max Vel=4.49 fps Inflow=0.29 cfs 0.100 af
D=6.0" n=0.013 L=30.0' S=0.0333 '/' Capacity=1.02 cfs Outflow=0.29 cfs 0.100 af

**Reach 6R: 6" STM** Avg. Depth=0.30' Max Vel=3.30 fps Inflow=0.41 cfs 0.136 af
D=6.0" n=0.013 L=260.0' S=0.0115 '/' Capacity=0.60 cfs Outflow=0.41 cfs 0.136 af

**Reach 8R: 8" STM** Avg. Depth=0.13' Max Vel=0.92 fps Inflow=0.05 cfs 0.028 af
D=8.0" n=0.013 L=320.0' S=0.0019 '/' Capacity=0.52 cfs Outflow=0.05 cfs 0.028 af

**Reach 9R: 8" STM** Avg. Depth=0.32' Max Vel=2.43 fps Inflow=0.41 cfs 0.164 af
D=8.0" n=0.013 L=126.5' S=0.0051 '/' Capacity=0.86 cfs Outflow=0.41 cfs 0.164 af

**Reach 10R: 8" STM** Avg. Depth=0.31' Max Vel=3.61 fps Inflow=0.59 cfs 0.217 af
D=8.0" n=0.013 L=292.1' S=0.0115 '/' Capacity=1.29 cfs Outflow=0.59 cfs 0.216 af

**Pond 1P: PLANTER** Peak Elev=198.54' Storage=534 cf Inflow=0.12 cfs 0.035 af
Outflow=0.05 cfs 0.024 af

**Pond 2P: PLANTER** Peak Elev=197.51' Storage=244 cf Inflow=0.03 cfs 0.009 af
Outflow=0.00 cfs 0.003 af

**Pond 3P: PLANTER** Peak Elev=197.51' Storage=259 cf Inflow=0.03 cfs 0.007 af
Outflow=0.00 cfs 0.002 af

**Pond 4P: PLANTER** Peak Elev=197.41' Storage=241 cf Inflow=0.02 cfs 0.006 af
Outflow=0.00 cfs 0.000 af

## Summary for Subcatchment 1S: ROOF AREA

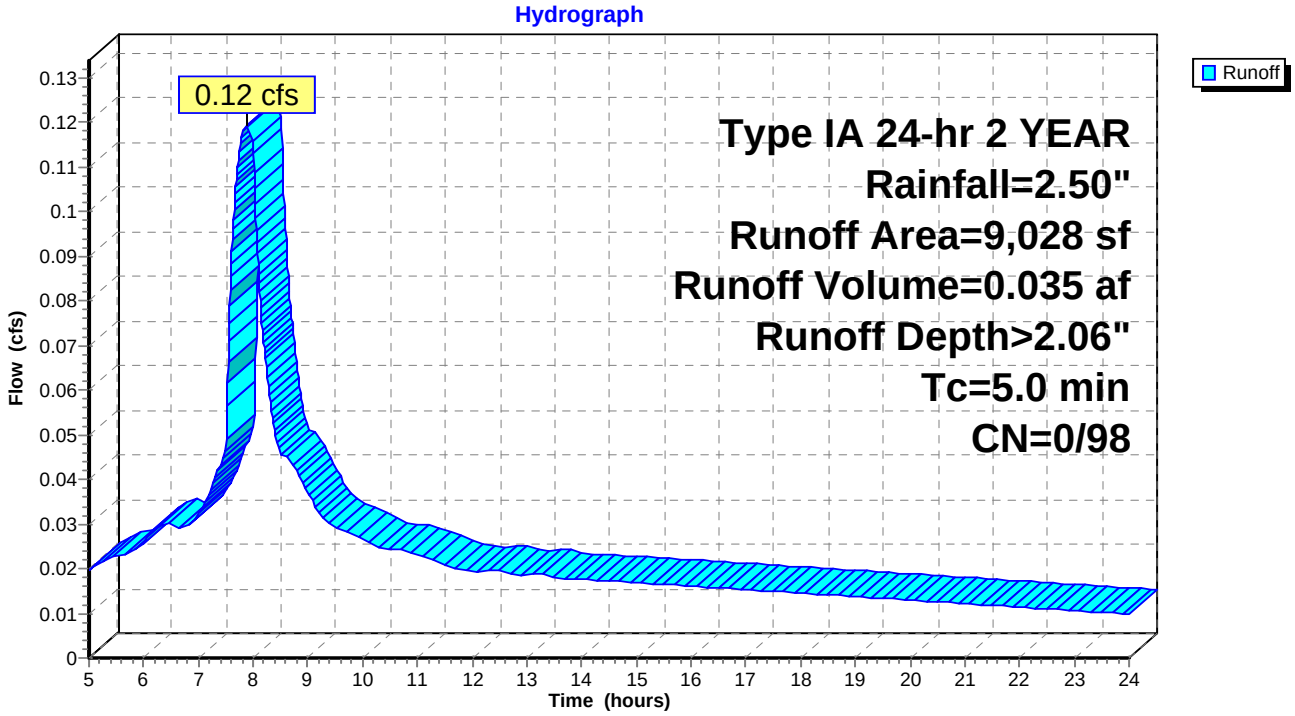
Runoff = 0.12 cfs @ 7.88 hrs, Volume= 0.035 af, Depth> 2.06"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 5.00-24.00 hrs, dt= 0.01 hrs
Type IA 24-hr 2 YEAR Rainfall=2.50"

| | Area (sf) | CN | Description |
|---|---|---|---|
| * | 9,028 | 98 | Roof Area |
| | 9,028 | 98 | Impervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|---|---|---|---|---|---|
| 5.0 | | | | | **Direct Entry,** |

## Subcatchment 1S: ROOF AREA



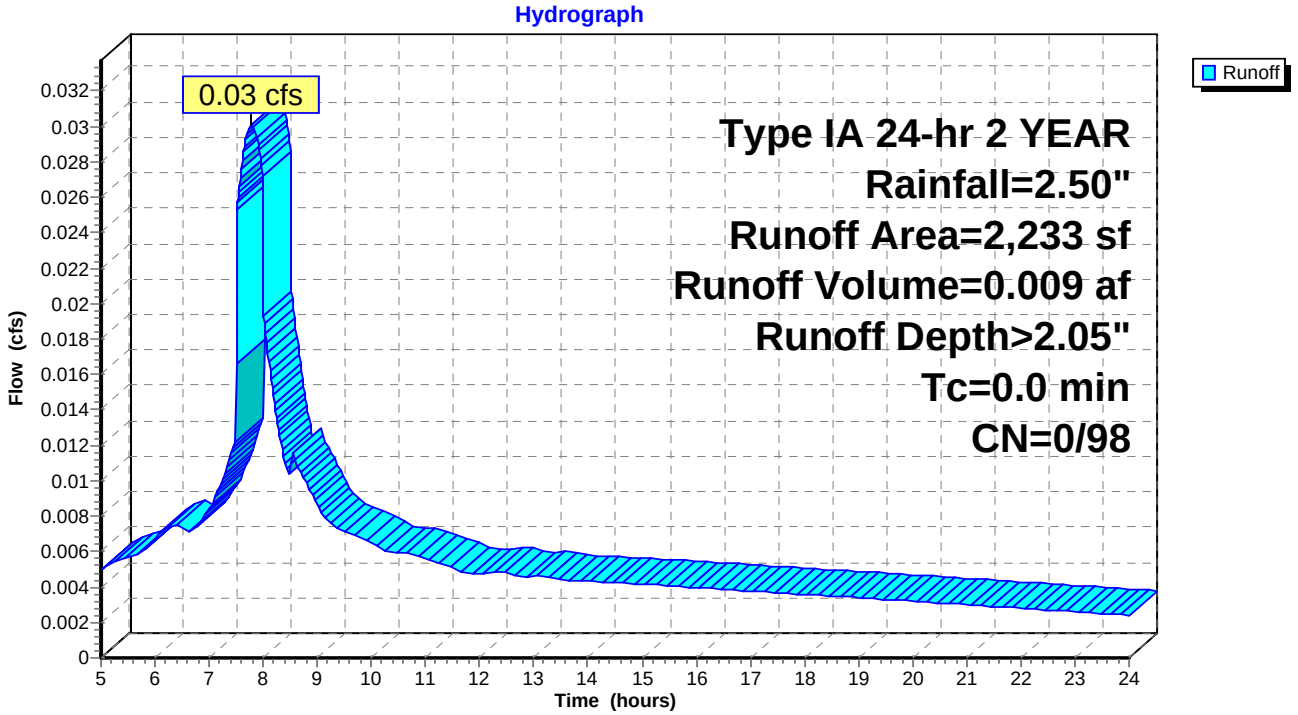
## Summary for Subcatchment 2S: ROOF/STREET AREA

Runoff = 0.03 cfs @ 7.79 hrs, Volume= 0.009 af, Depth> 2.05"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 5.00-24.00 hrs, dt= 0.01 hrs
Type IA 24-hr 2 YEAR Rainfall=2.50"

| | Area (sf) | CN | Description |
|---|---|---|---|
| * | 981 | 98 | Street Area |
| * | 1,252 | 98 | Roof Area |
| | 2,233 | 98 | Weighted Average |
| | 2,233 | 98 | Impervious Area |

## Subcatchment 2S: ROOF/STREET AREA



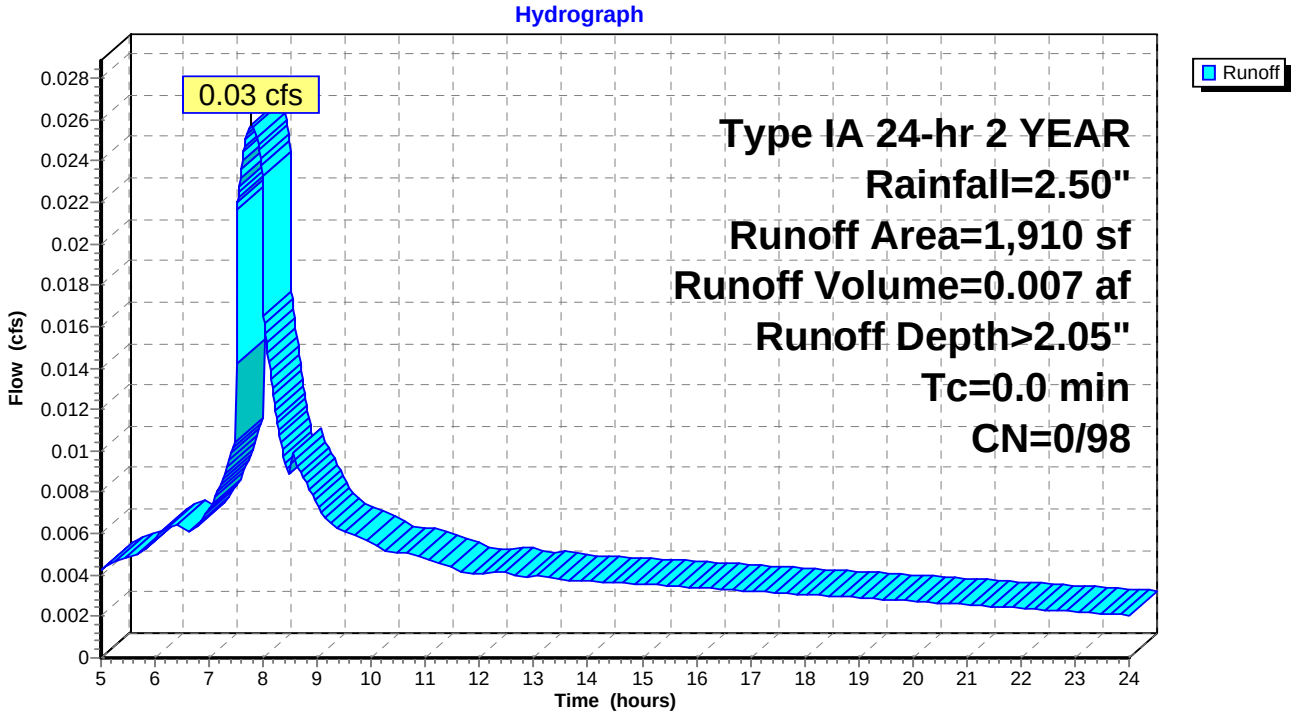
## Summary for Subcatchment 3S: ROOF/STREET AREA

Runoff = 0.03 cfs @ 7.79 hrs, Volume= 0.007 af, Depth> 2.05"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 5.00-24.00 hrs, dt= 0.01 hrs
Type IA 24-hr 2 YEAR Rainfall=2.50"

| | Area (sf) | CN | Description |
|---|---|---|---|
| * | 637 | 98 | Street Area |
| * | 1,273 | 98 | Roof Area |
| | 1,910 | 98 | Weighted Average |
| | 1,910 | 98 | Impervious Area |

## Subcatchment 3S: ROOF/STREET AREA



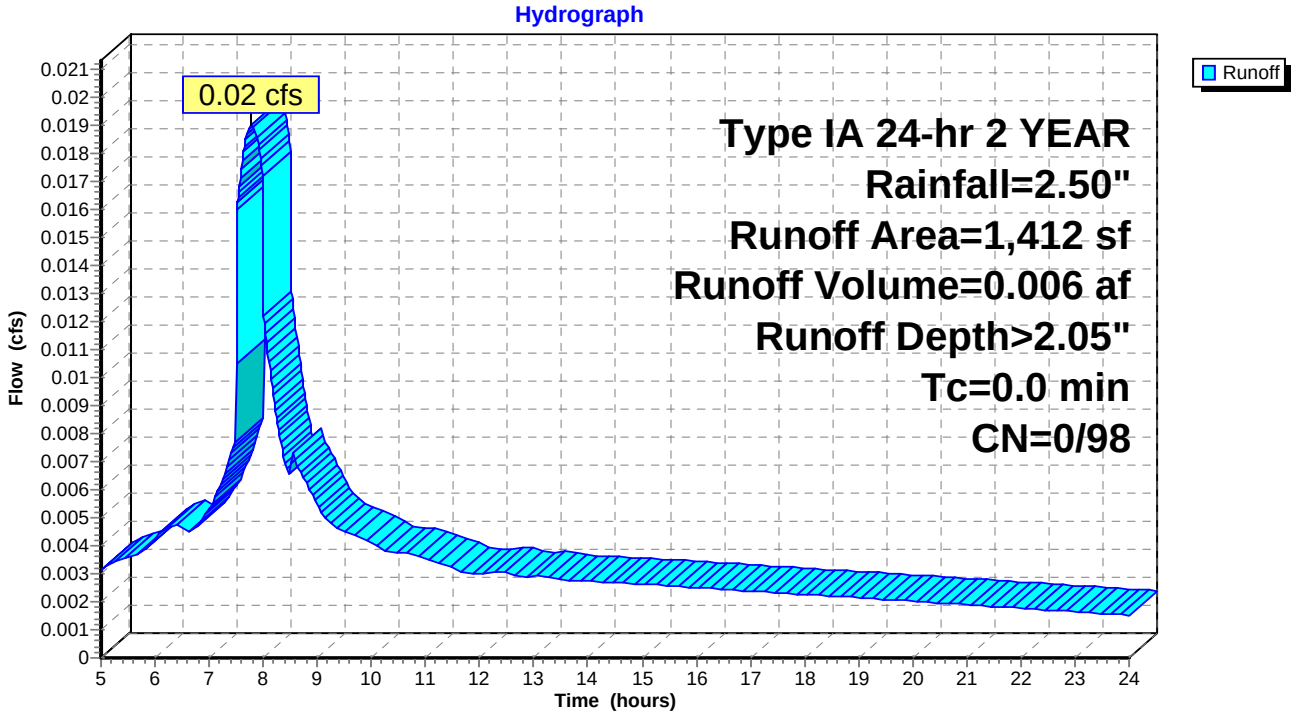
## Summary for Subcatchment 4S: ROOF/STREET AREA

Runoff = 0.02 cfs @ 7.79 hrs, Volume= 0.006 af, Depth> 2.05"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 5.00-24.00 hrs, dt= 0.01 hrs
Type IA 24-hr 2 YEAR Rainfall=2.50"

| | Area (sf) | CN | Description |
|---|---|---|---|
| * | 625 | 98 | Street Area |
| * | 787 | 98 | Roof Area |
| | 1,412 | 98 | Weighted Average |
| | 1,412 | 98 | Impervious Area |

## Subcatchment 4S: ROOF/STREET AREA



## Summary for Subcatchment 5S: ROOF AREA

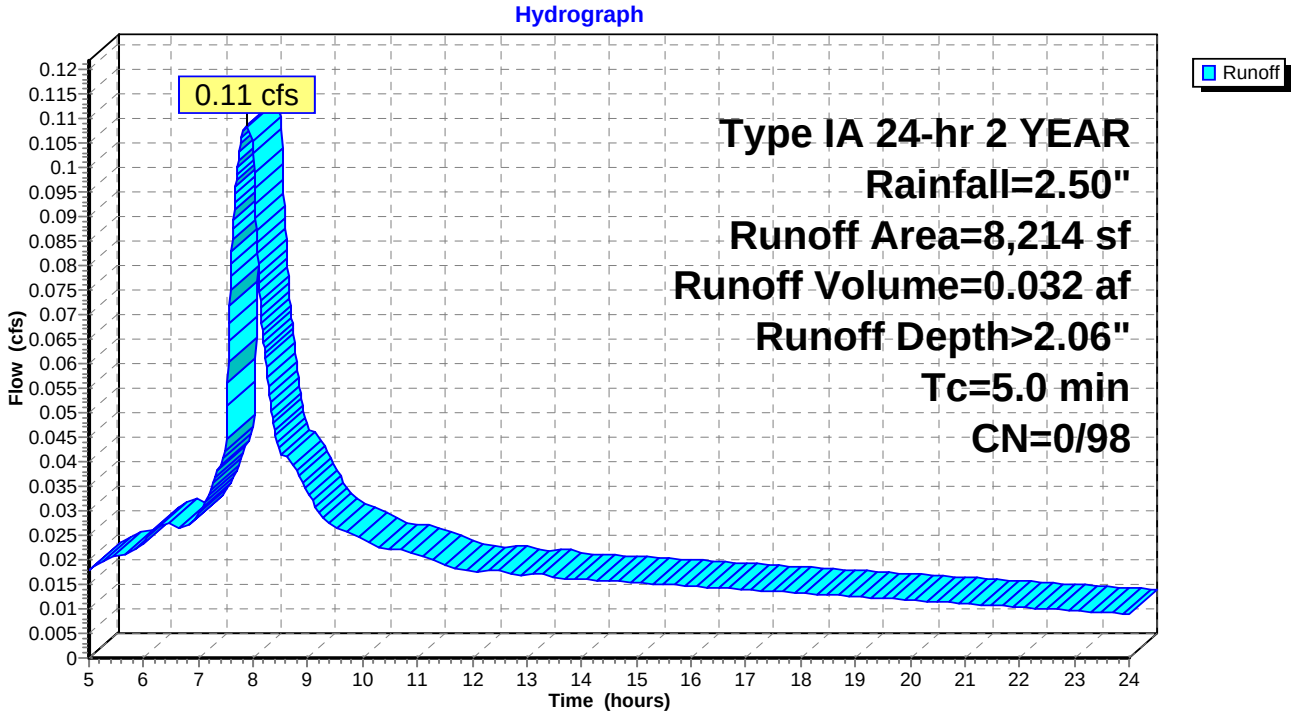
Runoff = 0.11 cfs @ 7.88 hrs, Volume= 0.032 af, Depth> 2.06"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 5.00-24.00 hrs, dt= 0.01 hrs
Type IA 24-hr 2 YEAR Rainfall=2.50"

| | Area (sf) | CN | Description |
|---|---|---|---|
| * | 8,214 | 98 | Roof Area |
| | 8,214 | 98 | Impervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|---|---|---|---|---|---|
| 5.0 | | | | | **Direct Entry,** |

## Subcatchment 5S: ROOF AREA



## Summary for Subcatchment 6S: PARKING

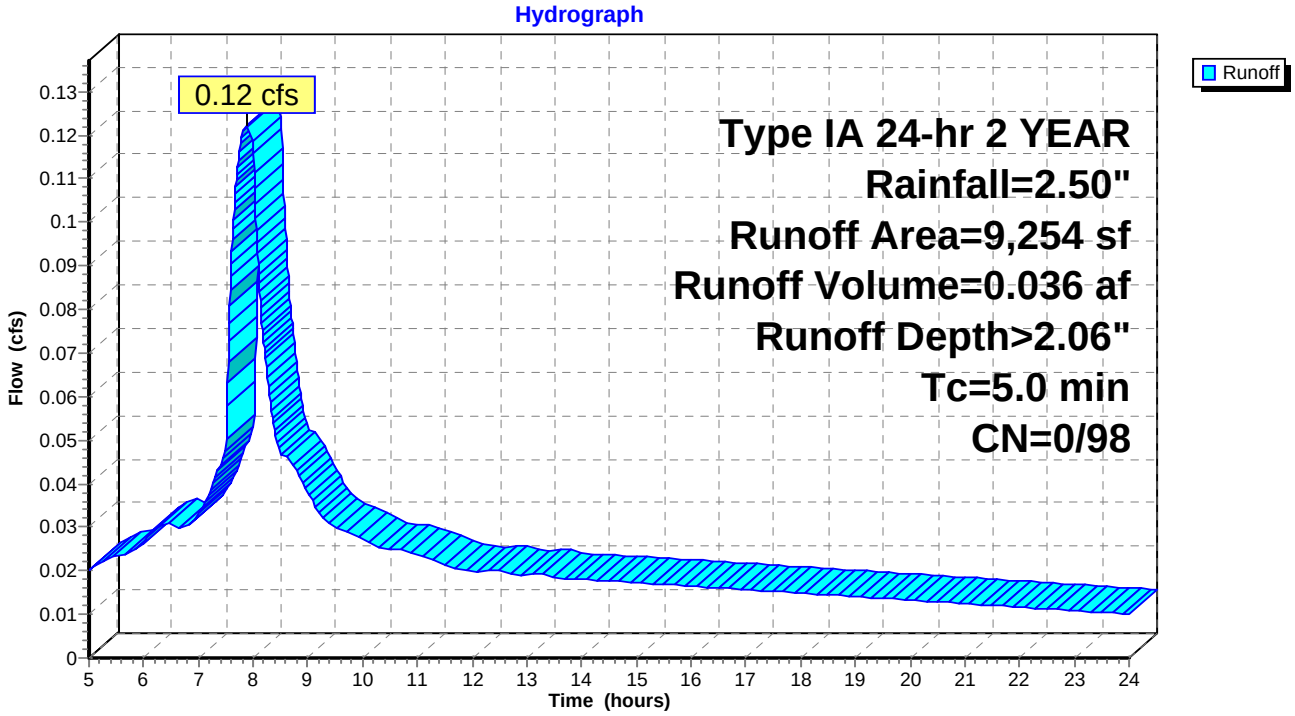
Runoff = 0.12 cfs @ 7.88 hrs, Volume= 0.036 af, Depth> 2.06"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 5.00-24.00 hrs, dt= 0.01 hrs
Type IA 24-hr 2 YEAR Rainfall=2.50"

| | Area (sf) | CN | Description |
|---|---|---|---|
| * | 9,254 | 98 | Parking Area |
| | 9,254 | 98 | Impervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|---|---|---|---|---|---|
| 5.0 | | | | | **Direct Entry,** |

## Subcatchment 6S: PARKING



## Summary for Subcatchment 7S: LANDSCAPE AREA

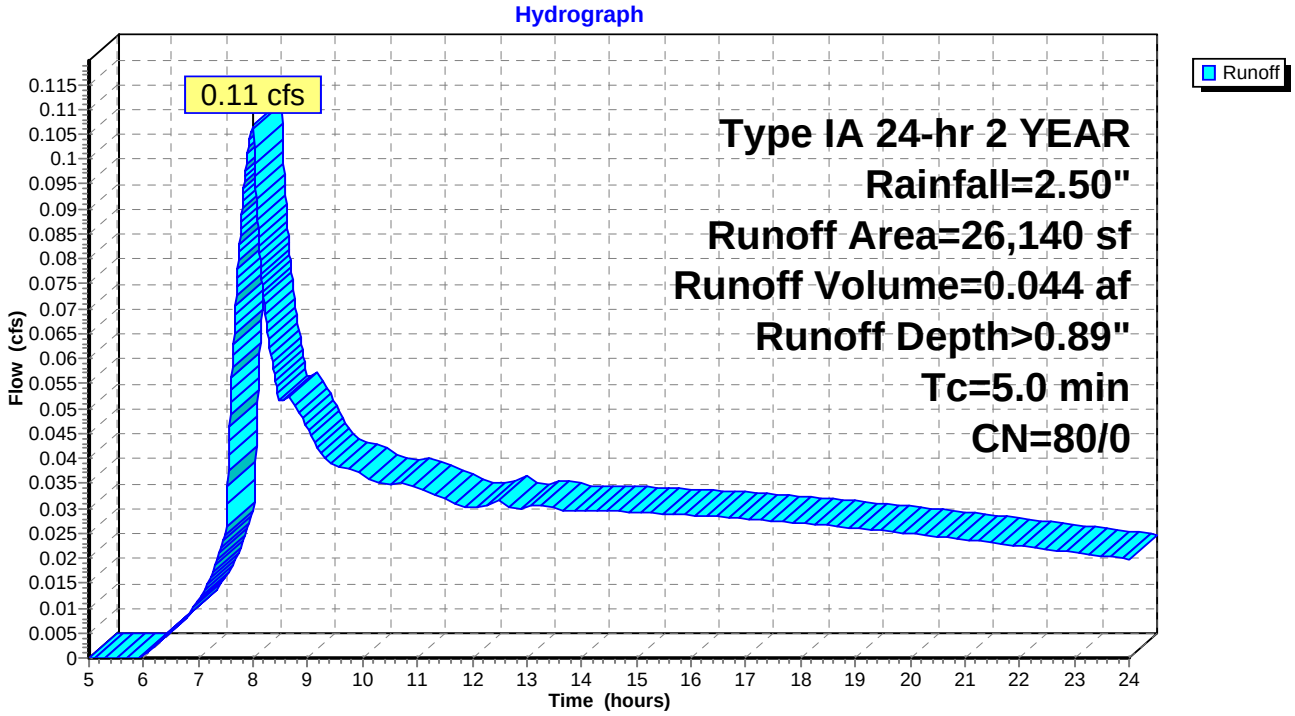
Runoff = 0.11 cfs @ 8.00 hrs, Volume= 0.044 af, Depth> 0.89"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 5.00-24.00 hrs, dt= 0.01 hrs
Type IA 24-hr 2 YEAR Rainfall=2.50"

| Area (sf) | CN | Description |
|---|---|---|
| 26,140 | 80 | >75% Grass cover, Good, HSG D |
| 26,140 | 80 | Pervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|---|---|---|---|---|---|
| 5.0 | | | | | **Direct Entry,** |

## Subcatchment 7S: LANDSCAPE AREA



## Summary for Subcatchment 8S: NEW CONCRETE PATH

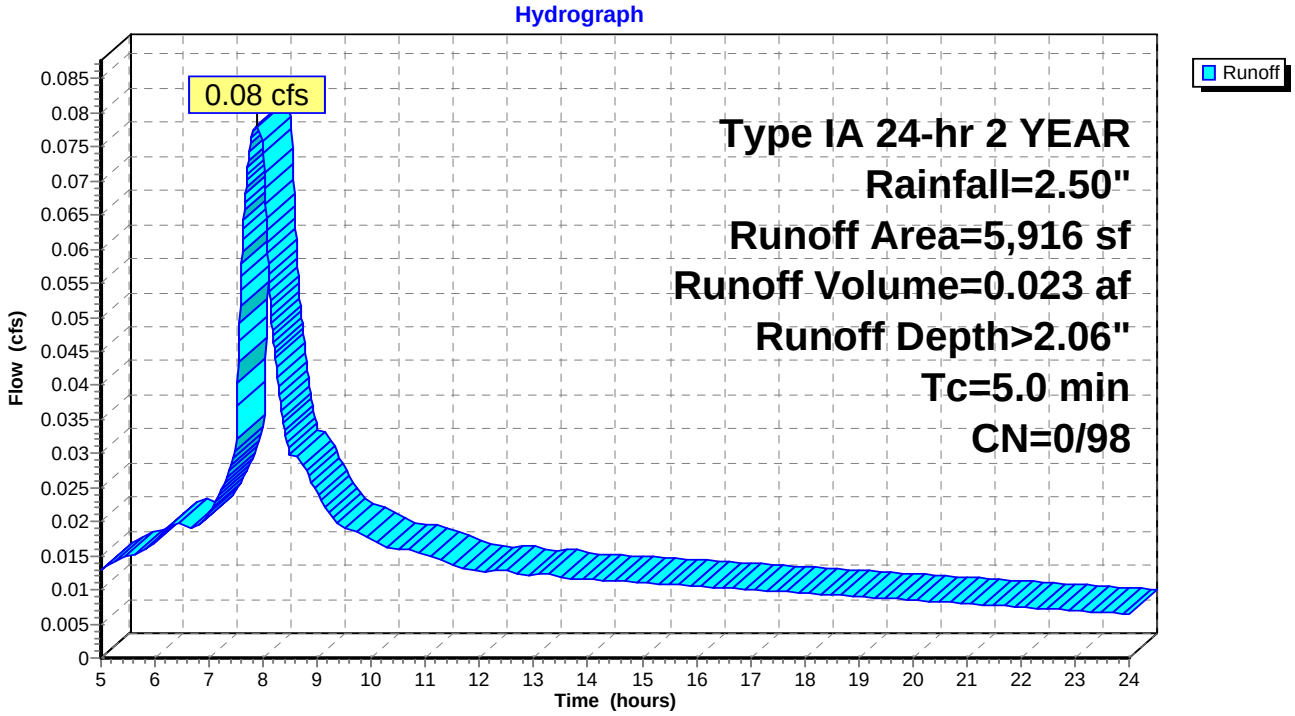
Runoff = 0.08 cfs @ 7.88 hrs, Volume= 0.023 af, Depth> 2.06"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 5.00-24.00 hrs, dt= 0.01 hrs
Type IA 24-hr 2 YEAR Rainfall=2.50"

| | Area (sf) | CN | Description |
|---|---|---|---|
| * | 5,916 | 98 | Concrete path |
| | 5,916 | 98 | Impervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|---|---|---|---|---|---|
| 5.0 | | | | | **Direct Entry,** |

## Subcatchment 8S: NEW CONCRETE PATH



## Summary for Subcatchment 9S: EXISTING BUILDING AND PAVING

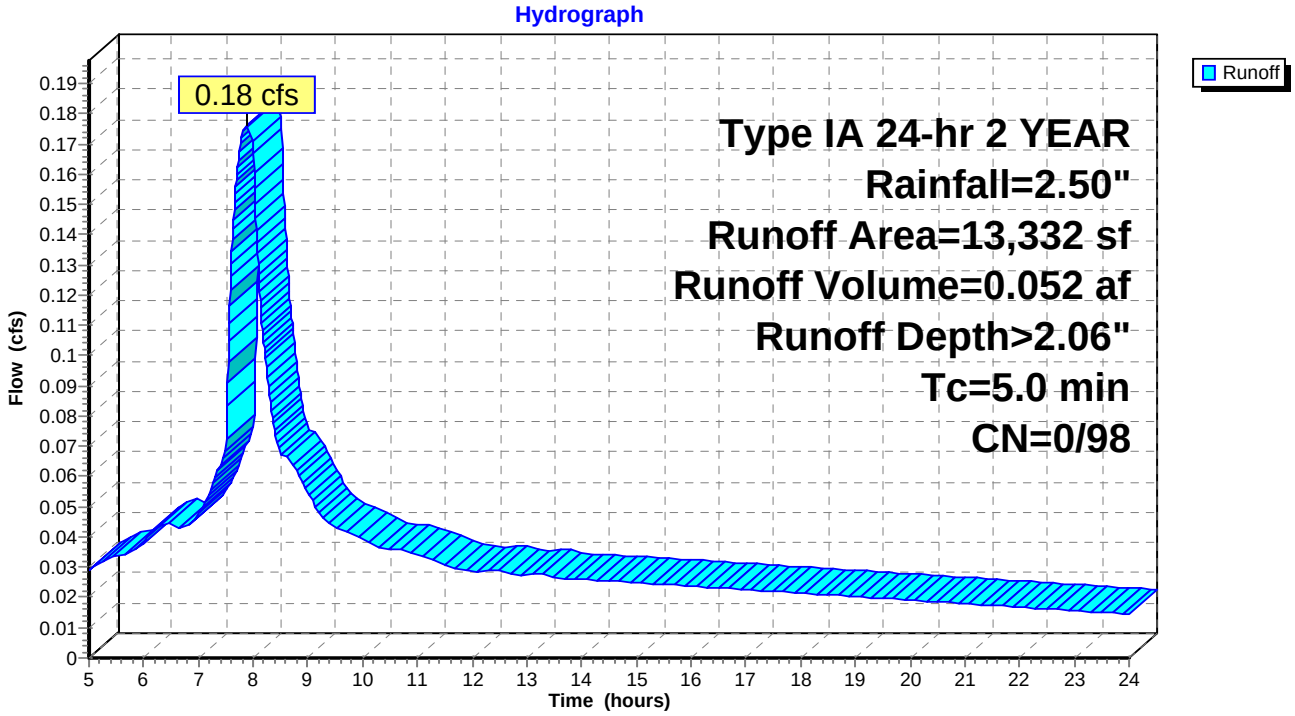
Runoff = 0.18 cfs @ 7.88 hrs, Volume= 0.052 af, Depth> 2.06"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 5.00-24.00 hrs, dt= 0.01 hrs
Type IA 24-hr 2 YEAR Rainfall=2.50"

| | Area (sf) | CN | Description |
|---|---|---|---|
| * | 13,332 | 98 | Existing Building and Paving |
| | 13,332 | 98 | Impervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|---|---|---|---|---|---|
| 5.0 | | | | | **Direct Entry,** |

## Subcatchment 9S: EXISTING BUILDING AND PAVING



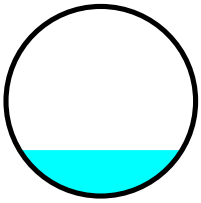
## Summary for Reach 1R: 6" STM

Inflow Area = 0.207 ac,100.00% Impervious, Inflow Depth > 2.06" for 2 YEAR event
Inflow = 0.12 cfs @ 7.88 hrs, Volume= 0.035 af
Outflow = 0.12 cfs @ 7.88 hrs, Volume= 0.035 af, Atten= 0%, Lag= 0.1 min

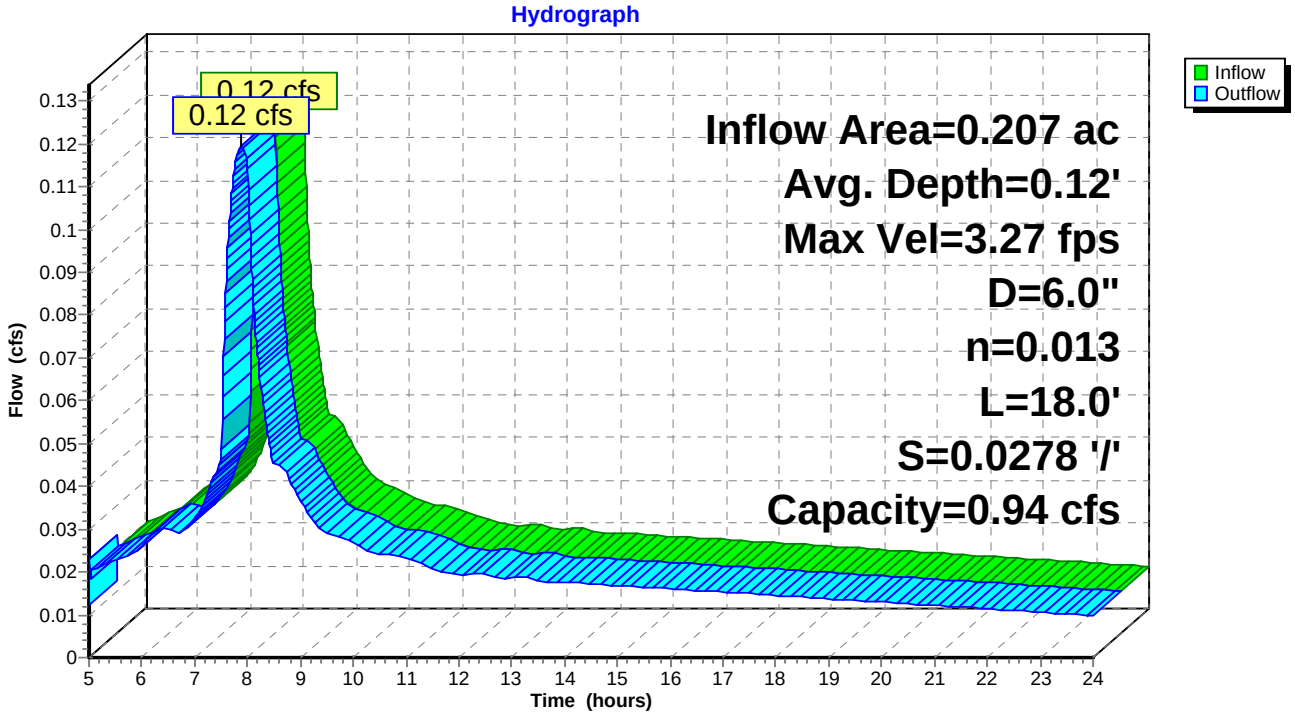
Routing by Dyn-Stor-Ind method, Time Span= 5.00-24.00 hrs, dt= 0.01 hrs
Max. Velocity= 3.27 fps, Min. Travel Time= 0.1 min
Avg. Velocity = 1.93 fps, Avg. Travel Time= 0.2 min

Peak Storage= 1 cf @ 7.88 hrs, Average Depth at Peak Storage= 0.12'
Bank-Full Depth= 0.50', Capacity at Bank-Full= 0.94 cfs

6.0" Diameter Pipe, n= 0.013 Corrugated PE, smooth interior
Length= 18.0' Slope= 0.0278 '/'
Inlet Invert= 199.00', Outlet Invert= 198.50'



### Reach 1R: 6" STM



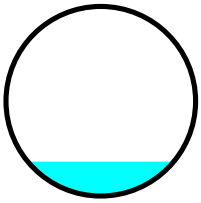
## Summary for Reach 2R: 4" STM

Inflow Area = 0.051 ac,100.00% Impervious, Inflow Depth > 2.05" for 2 YEAR event
Inflow = 0.03 cfs @ 7.79 hrs, Volume= 0.009 af
Outflow = 0.03 cfs @ 7.79 hrs, Volume= 0.009 af, Atten= 0%, Lag= 0.0 min

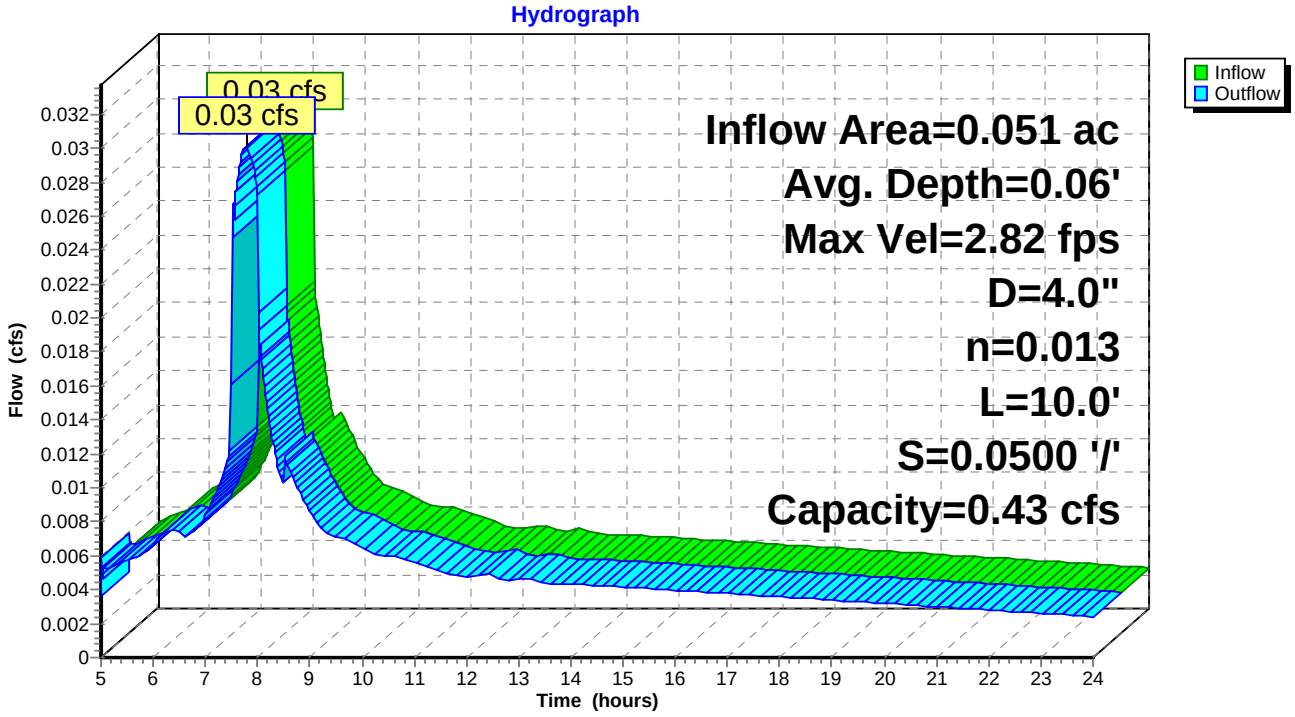
Routing by Dyn-Stor-Ind method, Time Span= 5.00-24.00 hrs, dt= 0.01 hrs
Max. Velocity= 2.82 fps, Min. Travel Time= 0.1 min
Avg. Velocity = 1.64 fps, Avg. Travel Time= 0.1 min

Peak Storage= 0 cf @ 7.79 hrs, Average Depth at Peak Storage= 0.06'
Bank-Full Depth= 0.33', Capacity at Bank-Full= 0.43 cfs

4.0" Diameter Pipe, n= 0.013 Corrugated PE, smooth interior
Length= 10.0' Slope= 0.0500 '/'
Inlet Invert= 198.00', Outlet Invert= 197.50'



### Reach 2R: 4" STM



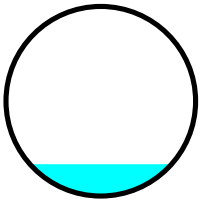
## Summary for Reach 3R: 4" STM

Inflow Area = 0.044 ac,100.00% Impervious, Inflow Depth > 2.05" for 2 YEAR event
Inflow = 0.03 cfs @ 7.79 hrs, Volume= 0.007 af
Outflow = 0.03 cfs @ 7.79 hrs, Volume= 0.007 af, Atten= 0%, Lag= 0.0 min

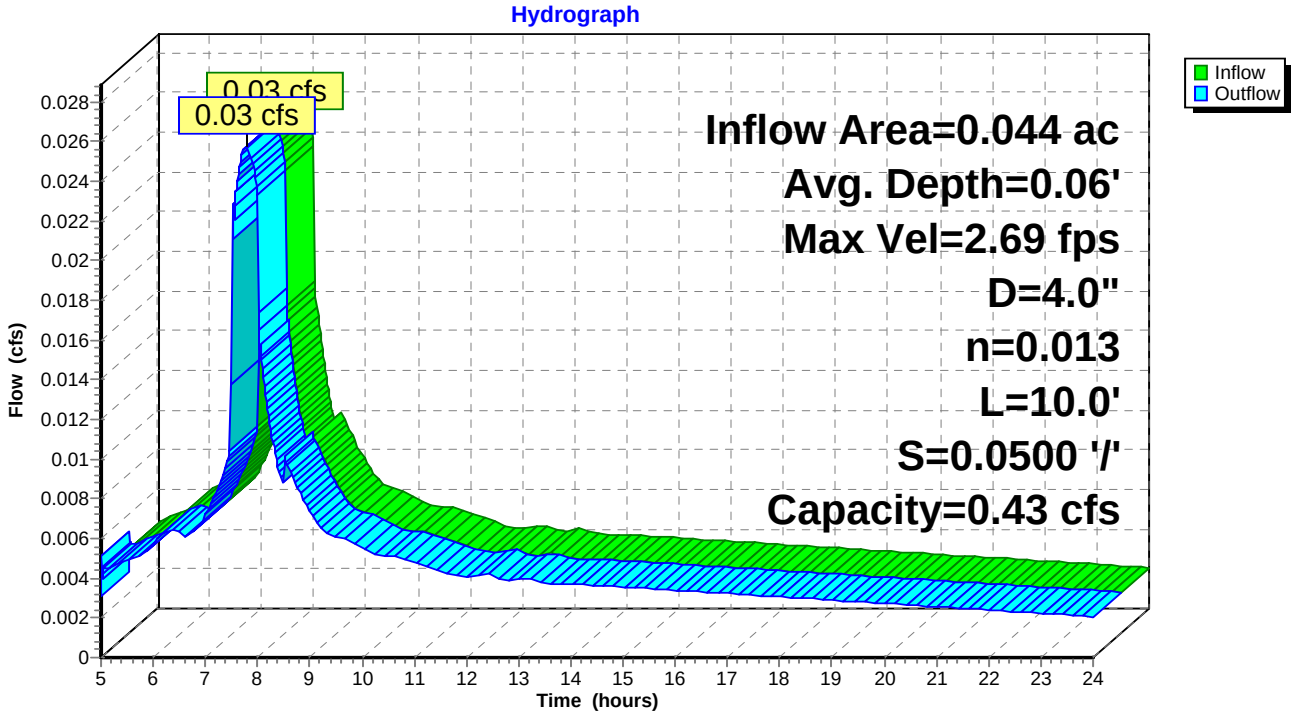
Routing by Dyn-Stor-Ind method, Time Span= 5.00-24.00 hrs, dt= 0.01 hrs
Max. Velocity= 2.69 fps, Min. Travel Time= 0.1 min
Avg. Velocity = 1.56 fps, Avg. Travel Time= 0.1 min

Peak Storage= 0 cf @ 7.79 hrs, Average Depth at Peak Storage= 0.06'
Bank-Full Depth= 0.33', Capacity at Bank-Full= 0.43 cfs

4.0" Diameter Pipe, n= 0.013 Corrugated PE, smooth interior
Length= 10.0' Slope= 0.0500 '/'
Inlet Invert= 198.00', Outlet Invert= 197.50'



### Reach 3R: 4" STM



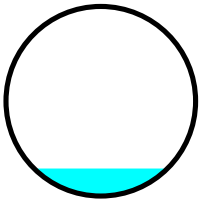
## Summary for Reach 4R: 4" STM

Inflow Area = 0.032 ac,100.00% Impervious, Inflow Depth > 2.05" for 2 YEAR event
Inflow = 0.02 cfs @ 7.79 hrs, Volume= 0.006 af
Outflow = 0.02 cfs @ 7.79 hrs, Volume= 0.006 af, Atten= 0%, Lag= 0.0 min

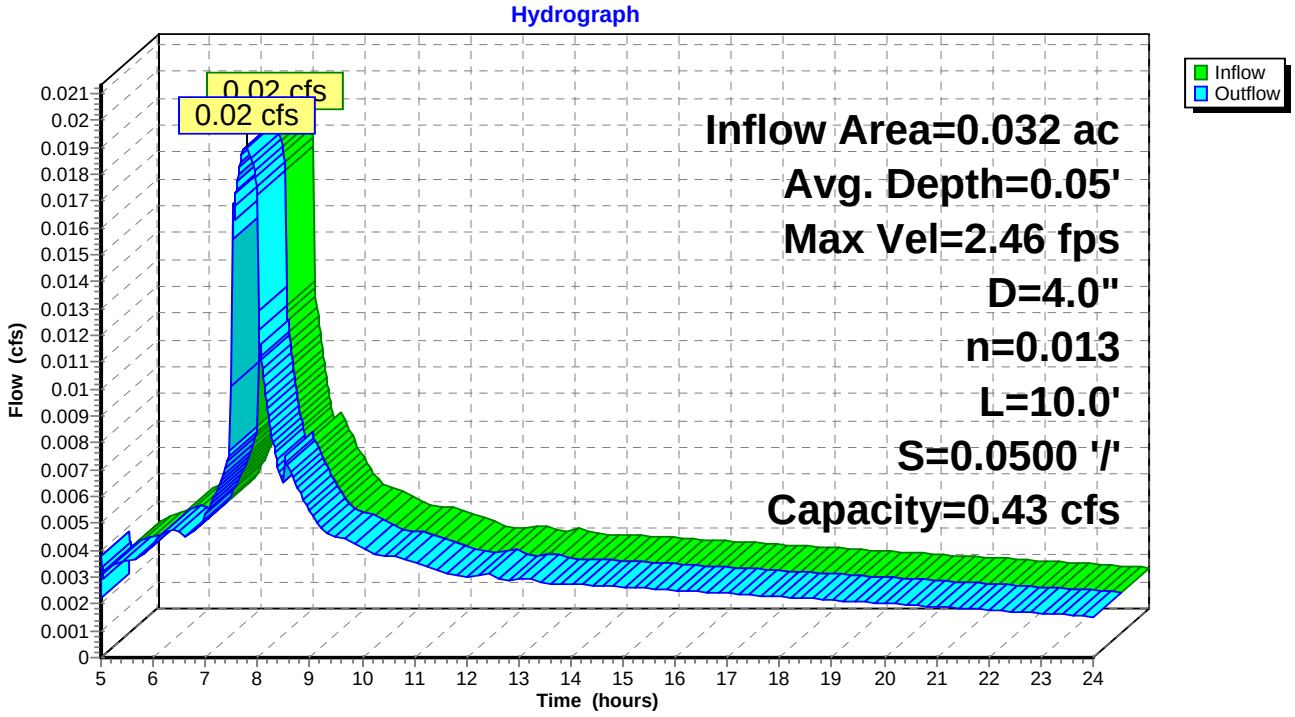
Routing by Dyn-Stor-Ind method, Time Span= 5.00-24.00 hrs, dt= 0.01 hrs
Max. Velocity= 2.46 fps, Min. Travel Time= 0.1 min
Avg. Velocity = 1.43 fps, Avg. Travel Time= 0.1 min

Peak Storage= 0 cf @ 7.79 hrs, Average Depth at Peak Storage= 0.05'
Bank-Full Depth= 0.33', Capacity at Bank-Full= 0.43 cfs

4.0" Diameter Pipe, n= 0.013 Corrugated PE, smooth interior
Length= 10.0' Slope= 0.0500 '/'
Inlet Invert= 198.00', Outlet Invert= 197.50'



### Reach 4R: 4" STM



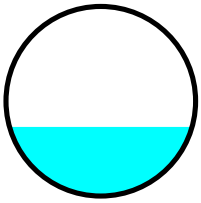
## Summary for Reach 5R: 6" STM

Inflow Area = 0.924 ac, 35.09% Impervious, Inflow Depth > 1.30" for 2 YEAR event
Inflow = 0.29 cfs @ 7.94 hrs, Volume= 0.100 af
Outflow = 0.29 cfs @ 7.94 hrs, Volume= 0.100 af, Atten= 0%, Lag= 0.1 min

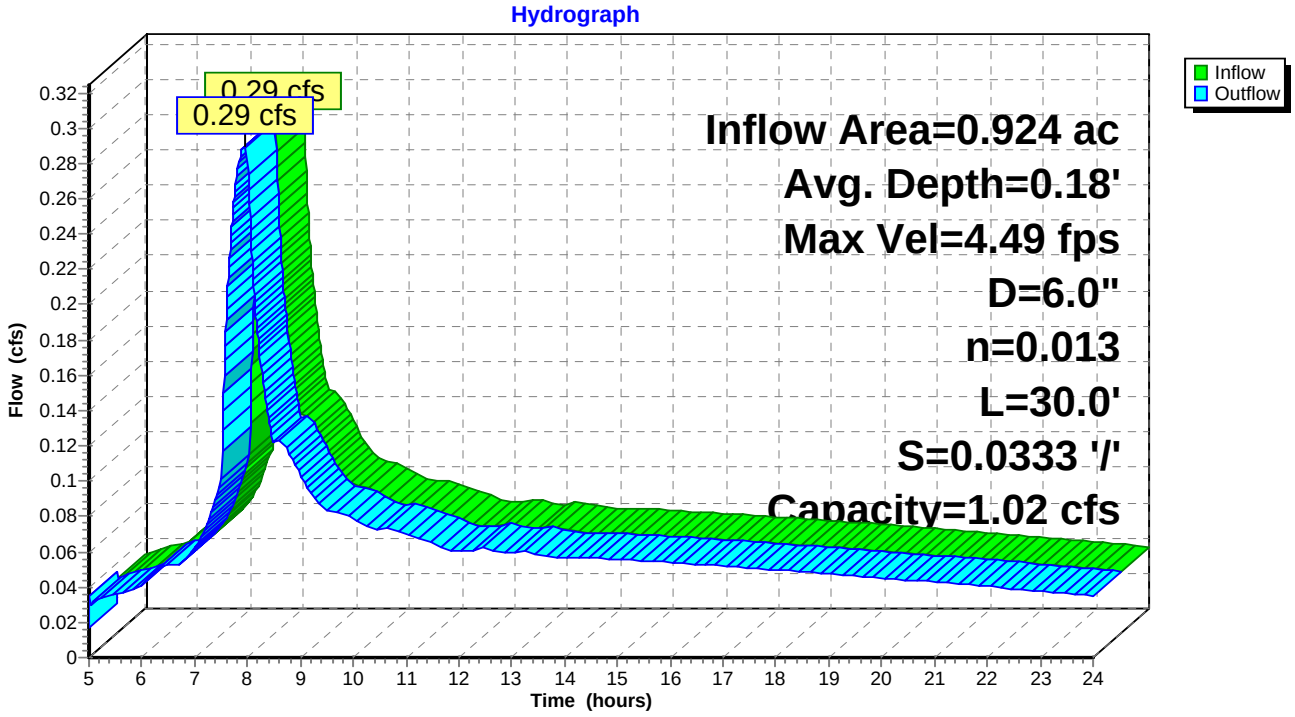
Routing by Dyn-Stor-Ind method, Time Span= 5.00-24.00 hrs, dt= 0.01 hrs
Max. Velocity= 4.49 fps, Min. Travel Time= 0.1 min
Avg. Velocity = 2.83 fps, Avg. Travel Time= 0.2 min

Peak Storage= 2 cf @ 7.94 hrs, Average Depth at Peak Storage= 0.18'
Bank-Full Depth= 0.50', Capacity at Bank-Full= 1.02 cfs

6.0" Diameter Pipe, n= 0.013 Corrugated PE, smooth interior
Length= 30.0' Slope= 0.0333 '/'
Inlet Invert= 197.00', Outlet Invert= 196.00'



### Reach 5R: 6" STM



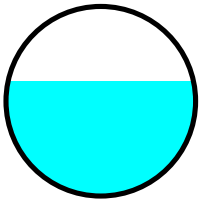
## Summary for Reach 6R: 6" STM

Inflow Area = 1.137 ac, 47.22% Impervious, Inflow Depth > 1.44" for 2 YEAR event
Inflow = 0.41 cfs @ 7.93 hrs, Volume= 0.136 af
Outflow = 0.41 cfs @ 7.94 hrs, Volume= 0.136 af, Atten= 0%, Lag= 1.0 min

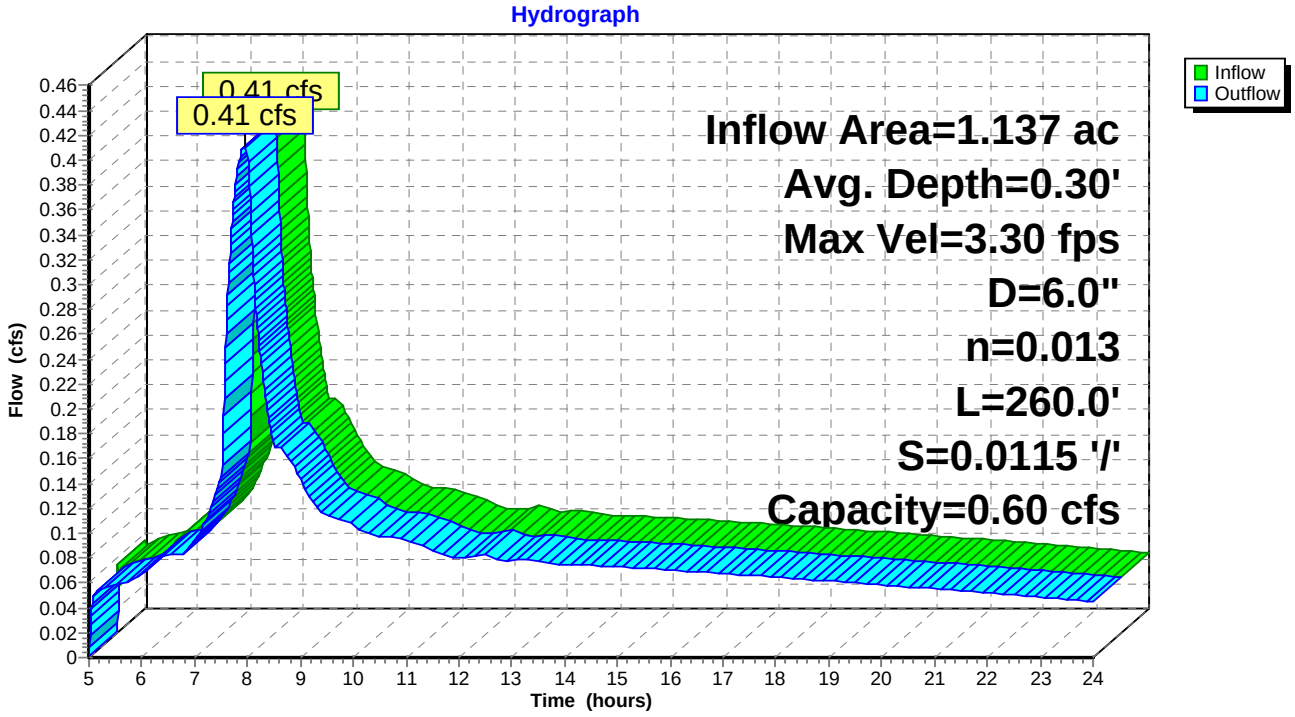
Routing by Dyn-Stor-Ind method, Time Span= 5.00-24.00 hrs, dt= 0.01 hrs
Max. Velocity= 3.30 fps, Min. Travel Time= 1.3 min
Avg. Velocity = 2.12 fps, Avg. Travel Time= 2.0 min

Peak Storage= 32 cf @ 7.94 hrs, Average Depth at Peak Storage= 0.30'
Bank-Full Depth= 0.50', Capacity at Bank-Full= 0.60 cfs

6.0" Diameter Pipe, n= 0.013 Corrugated PE, smooth interior
Length= 260.0' Slope= 0.0115 '/'
Inlet Invert= 199.00', Outlet Invert= 196.00'



### Reach 6R: 6" STM



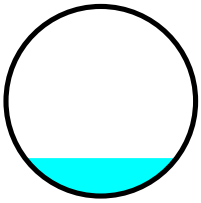
## Summary for Reach 8R: 8" STM

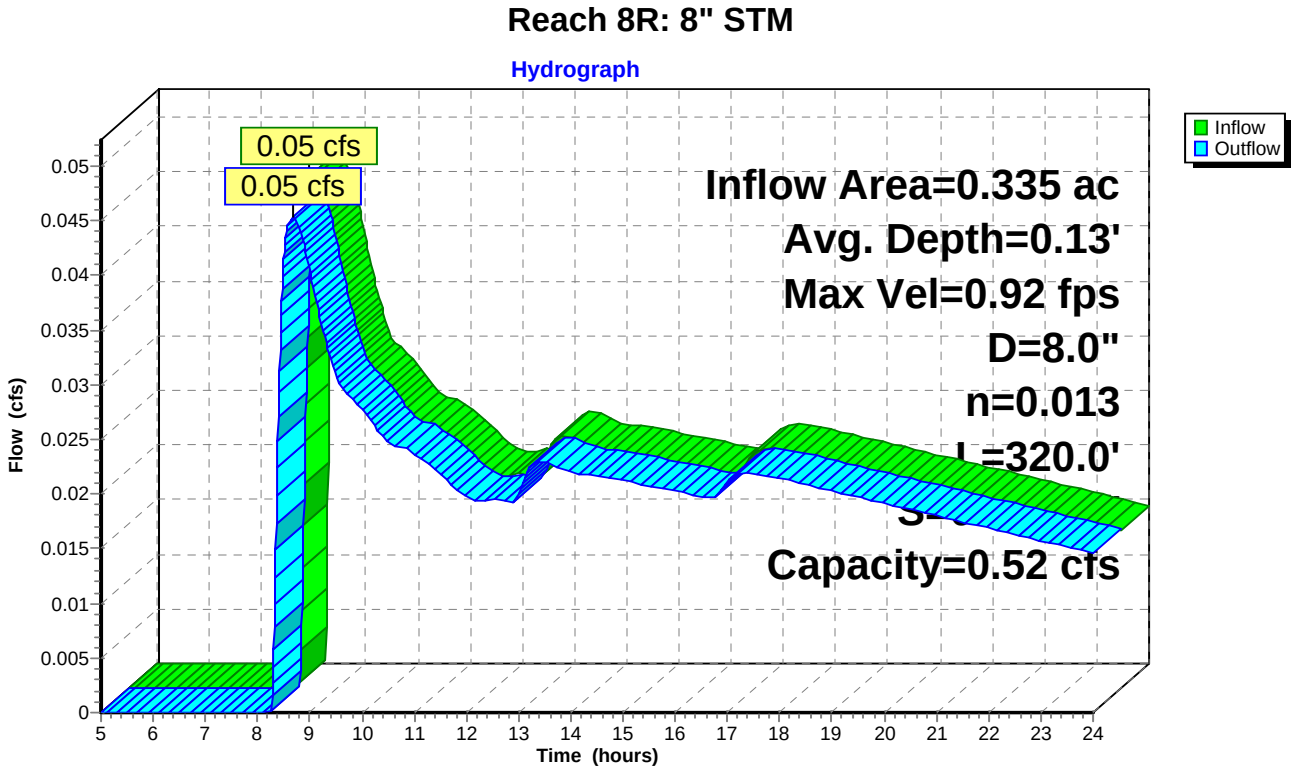
Inflow Area = 0.335 ac,100.00% Impervious, Inflow Depth > 1.01" for 2 YEAR event
Inflow = 0.05 cfs @ 8.47 hrs, Volume= 0.028 af
Outflow = 0.05 cfs @ 8.67 hrs, Volume= 0.028 af, Atten= 3%, Lag= 12.5 min

Routing by Dyn-Stor-Ind method, Time Span= 5.00-24.00 hrs, dt= 0.01 hrs
Max. Velocity= 0.92 fps, Min. Travel Time= 5.8 min
Avg. Velocity = 0.73 fps, Avg. Travel Time= 7.3 min

Peak Storage= 16 cf @ 8.67 hrs, Average Depth at Peak Storage= 0.13'
Bank-Full Depth= 0.67', Capacity at Bank-Full= 0.52 cfs

8.0" Diameter Pipe, n= 0.013 Corrugated PE, smooth interior
Length= 320.0' Slope= 0.0019 '/'
Inlet Invert= 194.74', Outlet Invert= 194.14'





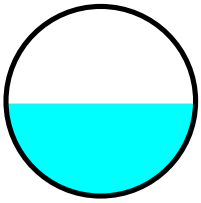
## Summary for Reach 9R: 8" STM

Inflow Area = 1.472 ac, 59.22% Impervious, Inflow Depth > 1.34" for 2 YEAR event
Inflow = 0.41 cfs @ 7.94 hrs, Volume= 0.164 af
Outflow = 0.41 cfs @ 7.95 hrs, Volume= 0.164 af, Atten= 0%, Lag= 0.6 min

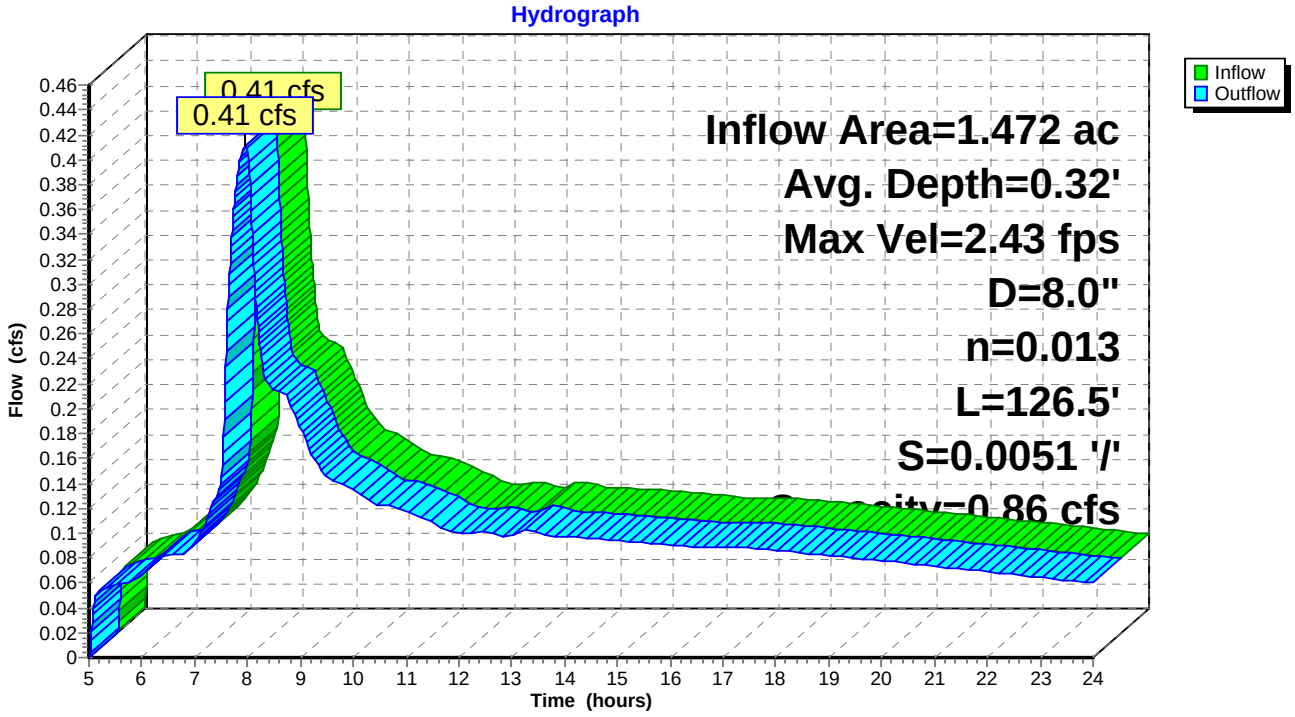
Routing by Dyn-Stor-Ind method, Time Span= 5.00-24.00 hrs, dt= 0.01 hrs
Max. Velocity= 2.43 fps, Min. Travel Time= 0.9 min
Avg. Velocity = 1.63 fps, Avg. Travel Time= 1.3 min

Peak Storage= 21 cf @ 7.95 hrs, Average Depth at Peak Storage= 0.32'
Bank-Full Depth= 0.67', Capacity at Bank-Full= 0.86 cfs

8.0" Diameter Pipe, n= 0.013 Corrugated PE, smooth interior
Length= 126.5' Slope= 0.0051 '/'
Inlet Invert= 194.14', Outlet Invert= 193.50'



### Reach 9R: 8" STM



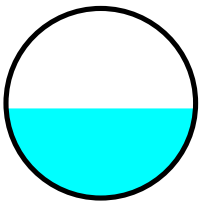
## Summary for Reach 10R: 8" STM

Inflow Area = 1.778 ac, 66.24% Impervious, Inflow Depth > 1.46" for 2 YEAR event
Inflow = 0.59 cfs @ 7.93 hrs, Volume= 0.217 af
Outflow = 0.59 cfs @ 7.95 hrs, Volume= 0.216 af, Atten= 0%, Lag= 1.0 min

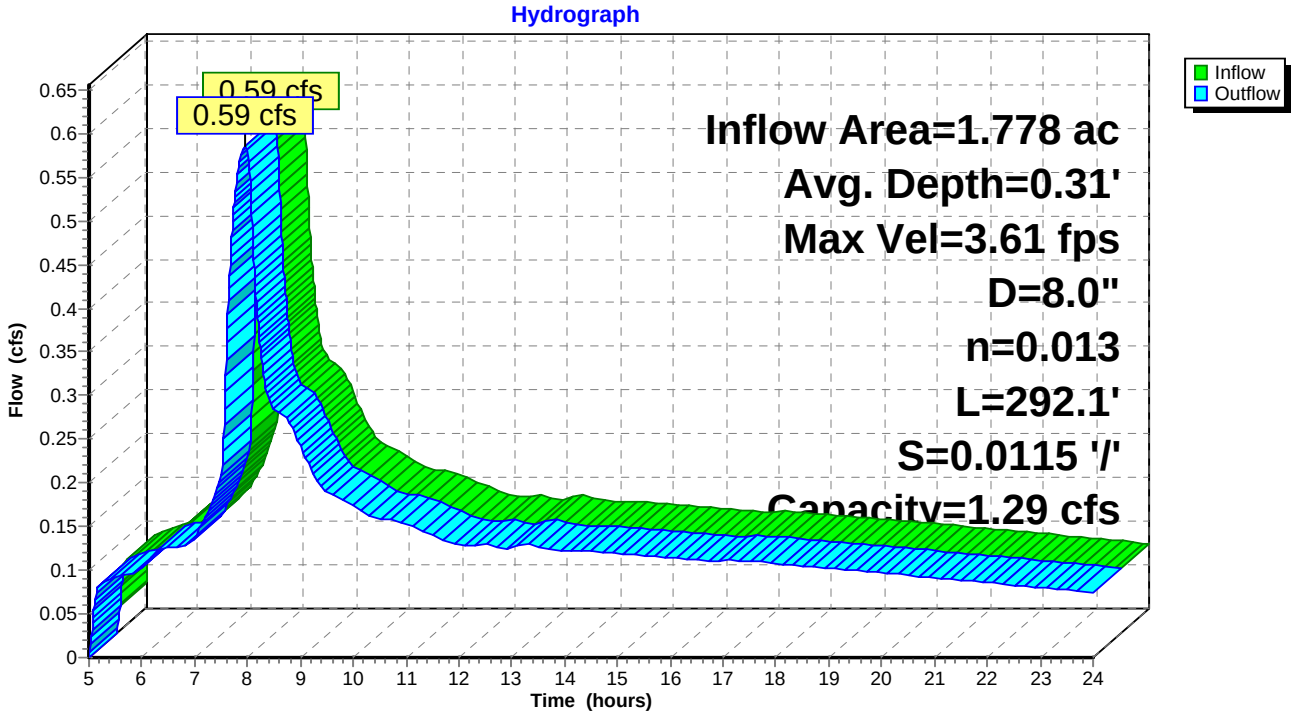
Routing by Dyn-Stor-Ind method, Time Span= 5.00-24.00 hrs, dt= 0.01 hrs
Max. Velocity= 3.61 fps, Min. Travel Time= 1.3 min
Avg. Velocity = 2.36 fps, Avg. Travel Time= 2.1 min

Peak Storage= 47 cf @ 7.95 hrs, Average Depth at Peak Storage= 0.31'
Bank-Full Depth= 0.67', Capacity at Bank-Full= 1.29 cfs

8.0" Diameter Pipe, n= 0.013 Corrugated PE, smooth interior
Length= 292.1' Slope= 0.0115 '/'
Inlet Invert= 193.25', Outlet Invert= 189.90'



### Reach 10R: 8" STM



## Summary for Pond 1P: PLANTER

Inflow Area = 0.207 ac,100.00% Impervious, Inflow Depth > 2.06" for 2 YEAR event
Inflow = 0.12 cfs @ 7.88 hrs, Volume= 0.035 af
Outflow = 0.05 cfs @ 8.47 hrs, Volume= 0.024 af, Atten= 61%, Lag= 35.0 min
Primary = 0.05 cfs @ 8.47 hrs, Volume= 0.024 af

Routing by Dyn-Stor-Ind method, Time Span= 5.00-24.00 hrs, dt= 0.01 hrs
Peak Elev= 198.54' @ 8.47 hrs Surf.Area= 1,704 sf Storage= 534 cf

Plug-Flow detention time= 343.5 min calculated for 0.024 af (66% of inflow)
Center-of-Mass det. time= 150.7 min ( 869.6 - 718.9 )

| Volume | Invert | Avail.Storage | Storage Description |
|---|---|---|---|
| #1 | 195.50' | 187 cf | **1' Drain Rock (Prismatic)**Listed below (Recalc)<br>568 cf Overall x 33.0% Voids |
| #2 | 196.50' | 43 cf | **1.5' Growing Medium (Prismatic)**Listed below (Recalc)<br>852 cf Overall x 5.0% Voids |
| #3 | 198.00' | 471 cf | **Ponding Depth (Prismatic)**Listed below (Recalc) |
| | | 701 cf | Total Available Storage |

| Elevation (feet) | Surf.Area (sq-ft) | Inc.Store (cubic-feet) | Cum.Store (cubic-feet) |
|---|---|---|---|
| 195.50 | 568 | 0 | 0 |
| 196.50 | 568 | 568 | 568 |

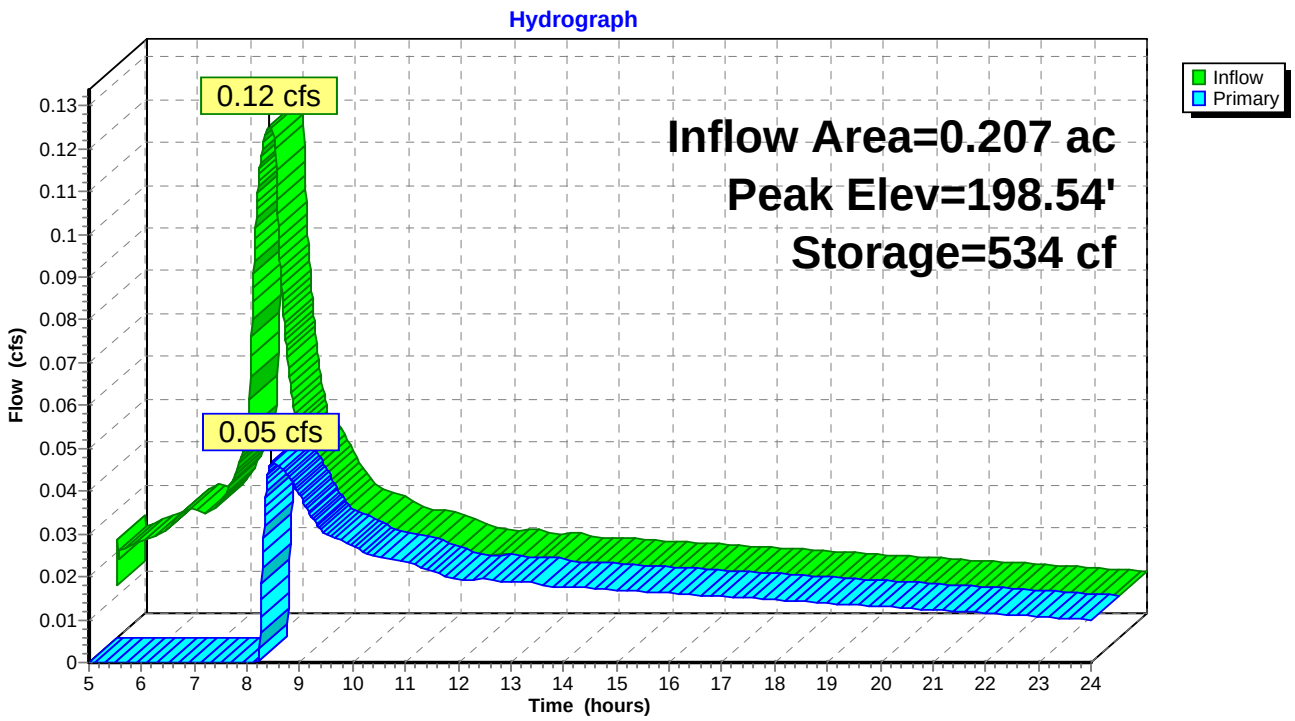
| Elevation (feet) | Surf.Area (sq-ft) | Inc.Store (cubic-feet) | Cum.Store (cubic-feet) |
|---|---|---|---|
| 196.50 | 568 | 0 | 0 |
| 198.00 | 568 | 852 | 852 |

| Elevation (feet) | Surf.Area (sq-ft) | Inc.Store (cubic-feet) | Cum.Store (cubic-feet) |
|---|---|---|---|
| 198.00 | 568 | 0 | 0 |
| 198.83 | 568 | 471 | 471 |

| Device | Routing | Invert | Outlet Devices |
|---|---|---|---|
| #1 | Primary | 195.50' | **8.0" x 205.0' long Culvert** Ke= 0.500<br>Outlet Invert= 194.46' S= 0.0051 '/' Cc= 0.900 n= 0.013 |
| #2 | Device 1 | 198.50' | **8.0" Horiz. Orifice/Grate** Limited to weir flow C= 0.610 |

**Primary OutFlow** Max=0.05 cfs @ 8.47 hrs HW=198.54' TW=194.86' (Dynamic Tailwater)
└─**1=Culvert** (Passes 0.05 cfs of 1.46 cfs potential flow)
└─**2=Orifice/Grate** (Weir Controls 0.05 cfs @ 0.62 fps)

## Pond 1P: PLANTER



## Summary for Pond 2P: PLANTER

Inflow Area = 0.051 ac,100.00% Impervious, Inflow Depth > 2.05" for 2 YEAR event
Inflow = 0.03 cfs @ 7.79 hrs, Volume= 0.009 af
Outflow = 0.00 cfs @ 13.45 hrs, Volume= 0.003 af, Atten= 85%, Lag= 339.6 min
Primary = 0.00 cfs @ 13.45 hrs, Volume= 0.003 af

Routing by Dyn-Stor-Ind method, Time Span= 5.00-24.00 hrs, dt= 0.01 hrs
Peak Elev= 197.51' @ 13.45 hrs Surf.Area= 798 sf Storage= 244 cf

Plug-Flow detention time= 646.4 min calculated for 0.003 af (36% of inflow)
Center-of-Mass det. time= 360.4 min ( 1,077.2 - 716.8 )

| Volume | Invert | Avail.Storage | Storage Description |
|---|---|---|---|
| #1 | 194.50' | 88 cf | **1' Drain Rock (Prismatic)**Listed below (Recalc)<br>266 cf Overall x 33.0% Voids |
| #2 | 195.50' | 20 cf | **1.5' Growing Medium (Prismatic)**Listed below (Recalc)<br>399 cf Overall x 5.0% Voids |
| #3 | 197.00' | 221 cf | **Ponding Depth (Prismatic)**Listed below (Recalc) |
| | | 329 cf | Total Available Storage |

| Elevation (feet) | Surf.Area (sq-ft) | Inc.Store (cubic-feet) | Cum.Store (cubic-feet) |
|---|---|---|---|
| 194.50 | 266 | 0 | 0 |
| 195.50 | 266 | 266 | 266 |

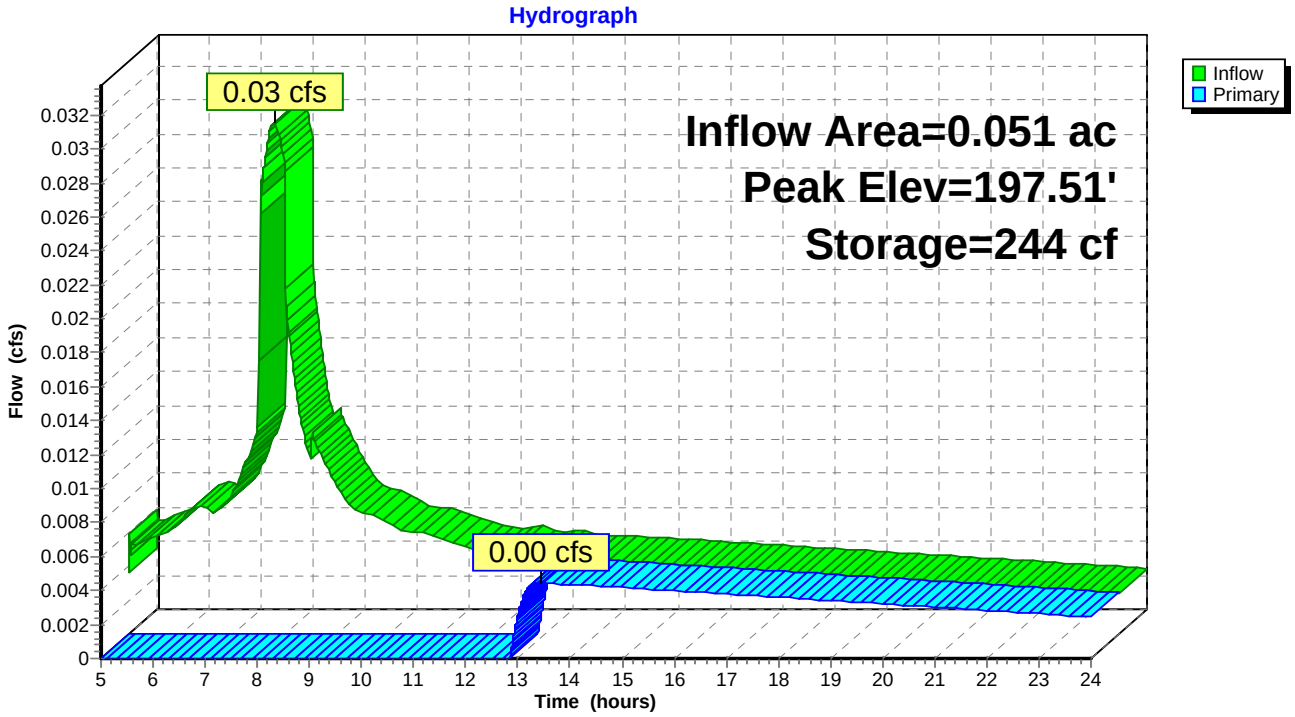
| Elevation (feet) | Surf.Area (sq-ft) | Inc.Store (cubic-feet) | Cum.Store (cubic-feet) |
|---|---|---|---|
| 195.50 | 266 | 0 | 0 |
| 197.00 | 266 | 399 | 399 |

| Elevation (feet) | Surf.Area (sq-ft) | Inc.Store (cubic-feet) | Cum.Store (cubic-feet) |
|---|---|---|---|
| 197.00 | 266 | 0 | 0 |
| 197.83 | 266 | 221 | 221 |

| Device | Routing | Invert | Outlet Devices |
|---|---|---|---|
| #1 | Device 2 | 197.50' | **4.0" Horiz. Orifice/Grate** Limited to weir flow C= 0.610 |
| #2 | Primary | 194.63' | **4.0" x 33.4' long Culvert** Ke= 0.500<br>Outlet Invert= 194.46' S= 0.0051 '/' Cc= 0.900 n= 0.013 |

**Primary OutFlow** Max=0.00 cfs @ 13.45 hrs HW=197.51' TW=194.84' (Dynamic Tailwater)
└─**2=Culvert** (Passes 0.00 cfs of 0.47 cfs potential flow)
└─**1=Orifice/Grate** (Weir Controls 0.00 cfs @ 0.36 fps)

## Pond 2P: PLANTER



## Summary for Pond 3P: PLANTER

Inflow Area = 0.044 ac,100.00% Impervious, Inflow Depth > 2.05" for 2 YEAR event
Inflow = 0.03 cfs @ 7.79 hrs, Volume= 0.007 af
Outflow = 0.00 cfs @ 17.56 hrs, Volume= 0.002 af, Atten= 88%, Lag= 586.5 min
Primary = 0.00 cfs @ 17.56 hrs, Volume= 0.002 af

Routing by Dyn-Stor-Ind method, Time Span= 5.00-24.00 hrs, dt= 0.01 hrs
Peak Elev= 197.51' @ 17.56 hrs Surf.Area= 849 sf Storage= 259 cf

Plug-Flow detention time= 815.6 min calculated for 0.002 af (21% of inflow)
Center-of-Mass det. time= 495.5 min ( 1,212.4 - 716.8 )

| Volume | Invert | Avail.Storage | Storage Description |
|---|---|---|---|
| #1 | 194.50' | 93 cf | **1' Drain Rock (Prismatic)**Listed below (Recalc)<br>283 cf Overall x 33.0% Voids |
| #2 | 195.50' | 21 cf | **1.5' Growing Medium (Prismatic)**Listed below (Recalc)<br>425 cf Overall x 5.0% Voids |
| #3 | 197.00' | 235 cf | **Ponding Depth (Prismatic)**Listed below (Recalc) |
| | | 350 cf | Total Available Storage |

| Elevation (feet) | Surf.Area (sq-ft) | Inc.Store (cubic-feet) | Cum.Store (cubic-feet) |
|---|---|---|---|
| 194.50 | 283 | 0 | 0 |
| 195.50 | 283 | 283 | 283 |

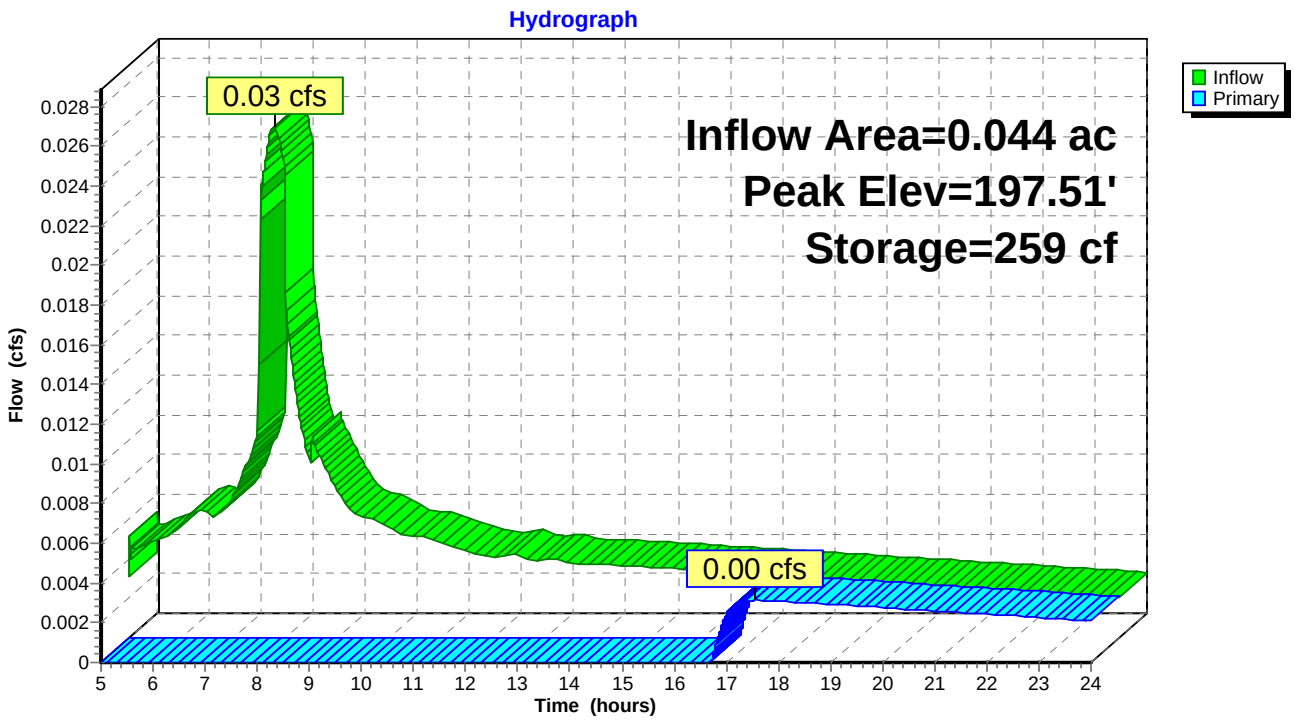
| Elevation (feet) | Surf.Area (sq-ft) | Inc.Store (cubic-feet) | Cum.Store (cubic-feet) |
|---|---|---|---|
| 195.50 | 283 | 0 | 0 |
| 197.00 | 283 | 425 | 425 |

| Elevation (feet) | Surf.Area (sq-ft) | Inc.Store (cubic-feet) | Cum.Store (cubic-feet) |
|---|---|---|---|
| 197.00 | 283 | 0 | 0 |
| 197.83 | 283 | 235 | 235 |

| Device | Routing | Invert | Outlet Devices |
|---|---|---|---|
| #1 | Device 2 | 197.50' | **4.0" Horiz. Orifice/Grate** Limited to weir flow C= 0.610 |
| #2 | Primary | 194.82' | **4.0" x 33.3' long Culvert** Ke= 0.500<br>Outlet Invert= 194.65' S= 0.0051 '/' Cc= 0.900 n= 0.013 |

**Primary OutFlow** Max=0.00 cfs @ 17.56 hrs HW=197.51' TW=194.83' (Dynamic Tailwater)
└─**2=Culvert** (Passes 0.00 cfs of 0.45 cfs potential flow)
  └─**1=Orifice/Grate** (Weir Controls 0.00 cfs @ 0.32 fps)

## Pond 3P: PLANTER



## Summary for Pond 4P: PLANTER

Inflow Area = 0.032 ac,100.00% Impervious, Inflow Depth > 2.05" for 2 YEAR event
Inflow = 0.02 cfs @ 7.79 hrs, Volume= 0.006 af
Outflow = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af, Atten= 100%, Lag= 0.0 min
Primary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 5.00-24.00 hrs, dt= 0.01 hrs
Peak Elev= 197.41' @ 24.00 hrs Surf.Area= 891 sf Storage= 241 cf

Plug-Flow detention time= (not calculated: initial storage excedes outflow)
Center-of-Mass det. time= (not calculated: no outflow)

| Volume | Invert | Avail.Storage | Storage Description |
|---|---|---|---|
| #1 | 194.50' | 98 cf | **1' Drain Rock (Prismatic)**Listed below (Recalc)<br>297 cf Overall x 33.0% Voids |
| #2 | 195.50' | 22 cf | **1.5' Growing Medium (Prismatic)**Listed below (Recalc)<br>446 cf Overall x 5.0% Voids |
| #3 | 197.00' | 247 cf | **Ponding Depth (Prismatic)**Listed below (Recalc) |
| | | 367 cf | Total Available Storage |

| Elevation (feet) | Surf.Area (sq-ft) | Inc.Store (cubic-feet) | Cum.Store (cubic-feet) |
|---|---|---|---|
| 194.50 | 297 | 0 | 0 |
| 195.50 | 297 | 297 | 297 |

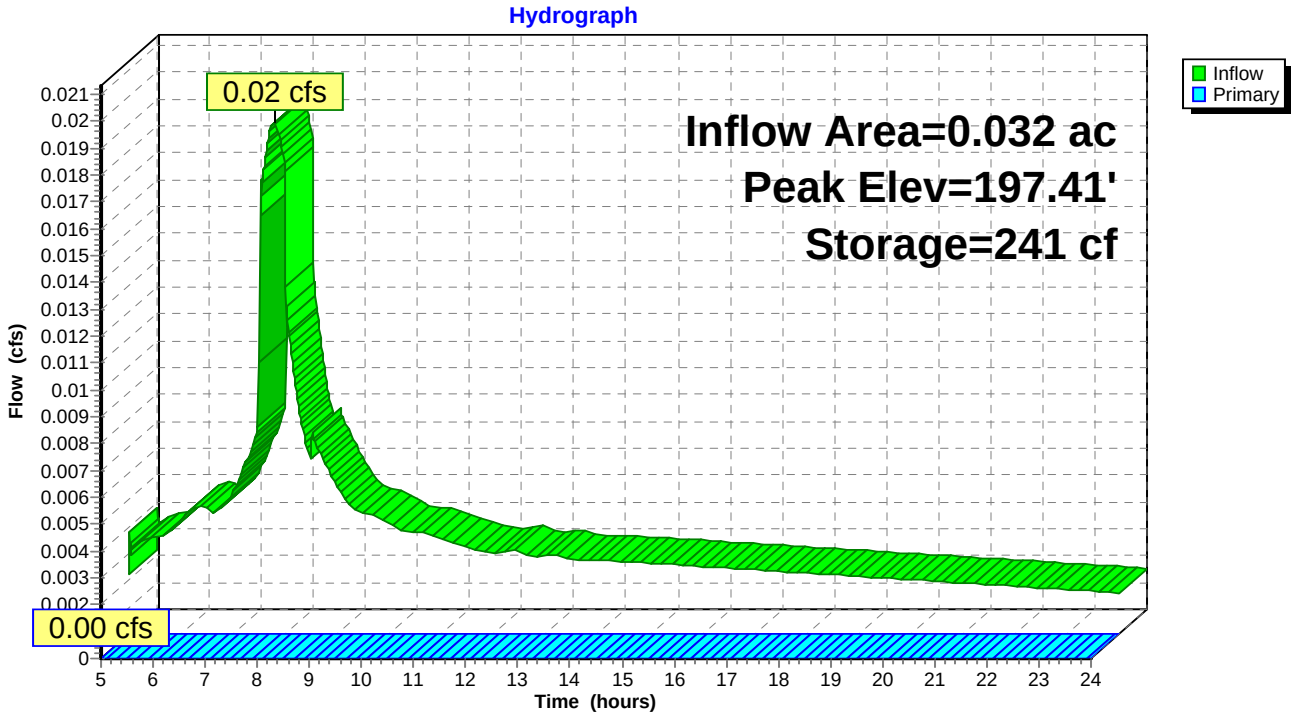
| Elevation (feet) | Surf.Area (sq-ft) | Inc.Store (cubic-feet) | Cum.Store (cubic-feet) |
|---|---|---|---|
| 195.50 | 297 | 0 | 0 |
| 197.00 | 297 | 446 | 446 |

| Elevation (feet) | Surf.Area (sq-ft) | Inc.Store (cubic-feet) | Cum.Store (cubic-feet) |
|---|---|---|---|
| 197.00 | 297 | 0 | 0 |
| 197.83 | 297 | 247 | 247 |

| Device | Routing | Invert | Outlet Devices |
|---|---|---|---|
| #1 | Device 2 | 197.50' | **4.0" Horiz. Orifice/Grate** Limited to weir flow C= 0.610 |
| #2 | Primary | 194.99' | **4.0" x 33.2' long Culvert** Ke= 0.500<br>Outlet Invert= 194.82' S= 0.0051 '/' Cc= 0.900 n= 0.013 |

**Primary OutFlow** Max=0.00 cfs @ 5.00 hrs HW=194.50' TW=194.74' (Dynamic Tailwater)
└─**2=Culvert** ( Controls 0.00 cfs)
  └─**1=Orifice/Grate** ( Controls 0.00 cfs)

## Pond 4P: PLANTER



# APPENDIX 2.9

# POST-DEVELOPED 10-YEAR STORM EVENT (3.5”)—HYDROGRAPH AND FLOW INFORMATION

Time span=5.00-24.00 hrs, dt=0.01 hrs, 1901 points
Runoff by SBUH method, Split Pervious/Imperv.
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

**Subcatchment 1S: ROOF AREA** Runoff Area=9,028 sf 100.00% Impervious Runoff Depth>2.91"
Tc=5.0 min CN=0/98 Runoff=0.17 cfs 0.050 af

**Subcatchment 2S: ROOF/STREET AREA** Runoff Area=2,233 sf 100.00% Impervious Runoff Depth>2.91"
Tc=0.0 min CN=0/98 Runoff=0.04 cfs 0.012 af

**Subcatchment 3S: ROOF/STREET AREA** Runoff Area=1,910 sf 100.00% Impervious Runoff Depth>2.91"
Tc=0.0 min CN=0/98 Runoff=0.04 cfs 0.011 af

**Subcatchment 4S: ROOF/STREET AREA** Runoff Area=1,412 sf 100.00% Impervious Runoff Depth>2.91"
Tc=0.0 min CN=0/98 Runoff=0.03 cfs 0.008 af

**Subcatchment 5S: ROOF AREA** Runoff Area=8,214 sf 100.00% Impervious Runoff Depth>2.91"
Tc=5.0 min CN=0/98 Runoff=0.15 cfs 0.046 af

**Subcatchment 6S: PARKING** Runoff Area=9,254 sf 100.00% Impervious Runoff Depth>2.91"
Tc=5.0 min CN=0/98 Runoff=0.17 cfs 0.052 af

**Subcatchment 7S: LANDSCAPE AREA** Runoff Area=26,140 sf 0.00% Impervious Runoff Depth>1.63"
Tc=5.0 min CN=80/0 Runoff=0.22 cfs 0.082 af

**Subcatchment 8S: NEW CONCRETE PATH** Runoff Area=5,916 sf 100.00% Impervious Runoff Depth>2.91"
Tc=5.0 min CN=0/98 Runoff=0.11 cfs 0.033 af

**Subcatchment 9S: EXISTING BUILDING** Runoff Area=13,332 sf 100.00% Impervious Runoff Depth>2.91"
Tc=5.0 min CN=0/98 Runoff=0.25 cfs 0.074 af

**Reach 1R: 6" STM** Avg. Depth=0.14' Max Vel=3.62 fps Inflow=0.17 cfs 0.050 af
D=6.0" n=0.013 L=18.0' S=0.0278 '/' Capacity=0.94 cfs Outflow=0.17 cfs 0.050 af

**Reach 2R: 4" STM** Avg. Depth=0.07' Max Vel=3.12 fps Inflow=0.04 cfs 0.012 af
D=4.0" n=0.013 L=10.0' S=0.0500 '/' Capacity=0.43 cfs Outflow=0.04 cfs 0.012 af

**Reach 3R: 4" STM** Avg. Depth=0.07' Max Vel=2.98 fps Inflow=0.04 cfs 0.011 af
D=4.0" n=0.013 L=10.0' S=0.0500 '/' Capacity=0.43 cfs Outflow=0.04 cfs 0.011 af

**Reach 4R: 4" STM** Avg. Depth=0.06' Max Vel=2.73 fps Inflow=0.03 cfs 0.008 af
D=4.0" n=0.013 L=10.0' S=0.0500 '/' Capacity=0.43 cfs Outflow=0.03 cfs 0.008 af

**Reach 5R: 6" STM** Avg. Depth=0.24' Max Vel=5.15 fps Inflow=0.49 cfs 0.160 af
D=6.0" n=0.013 L=30.0' S=0.0333 '/' Capacity=1.02 cfs Outflow=0.49 cfs 0.160 af

**Reach 6R: 6" STM** Avg. Depth=0.50' Max Vel=3.50 fps Inflow=0.66 cfs 0.212 af
D=6.0" n=0.013 L=260.0' S=0.0115 '/' Capacity=0.60 cfs Outflow=0.65 cfs 0.212 af

**Reach 8R: 8" STM** Avg. Depth=0.25' Max Vel=1.30 fps Inflow=0.16 cfs 0.051 af
D=8.0" n=0.013 L=320.0' S=0.0019 '/' Capacity=0.52 cfs Outflow=0.15 cfs 0.051 af

**Reach 9R: 8" STM** Avg. Depth=0.50' Max Vel=2.79 fps Inflow=0.80 cfs 0.263 af
D=8.0" n=0.013 L=126.5' S=0.0051 '/' Capacity=0.86 cfs Outflow=0.78 cfs 0.263 af

**Reach 10R: 8" STM** Avg. Depth=0.43' Max Vel=4.07 fps Inflow=0.98 cfs 0.337 af
D=8.0" n=0.013 L=292.1' S=0.0115 '/' Capacity=1.29 cfs Outflow=0.97 cfs 0.337 af

**Pond 1P: PLANTER** Peak Elev=198.58' Storage=561 cf Inflow=0.17 cfs 0.050 af
Outflow=0.16 cfs 0.038 af

**Pond 2P: PLANTER** Peak Elev=197.52' Storage=246 cf Inflow=0.04 cfs 0.012 af
Outflow=0.01 cfs 0.007 af

**Pond 3P: PLANTER** Peak Elev=197.51' Storage=260 cf Inflow=0.04 cfs 0.011 af
Outflow=0.01 cfs 0.005 af

**Pond 4P: PLANTER** Peak Elev=197.51' Storage=272 cf Inflow=0.03 cfs 0.008 af
Outflow=0.00 cfs 0.002 af

## Summary for Subcatchment 1S: ROOF AREA

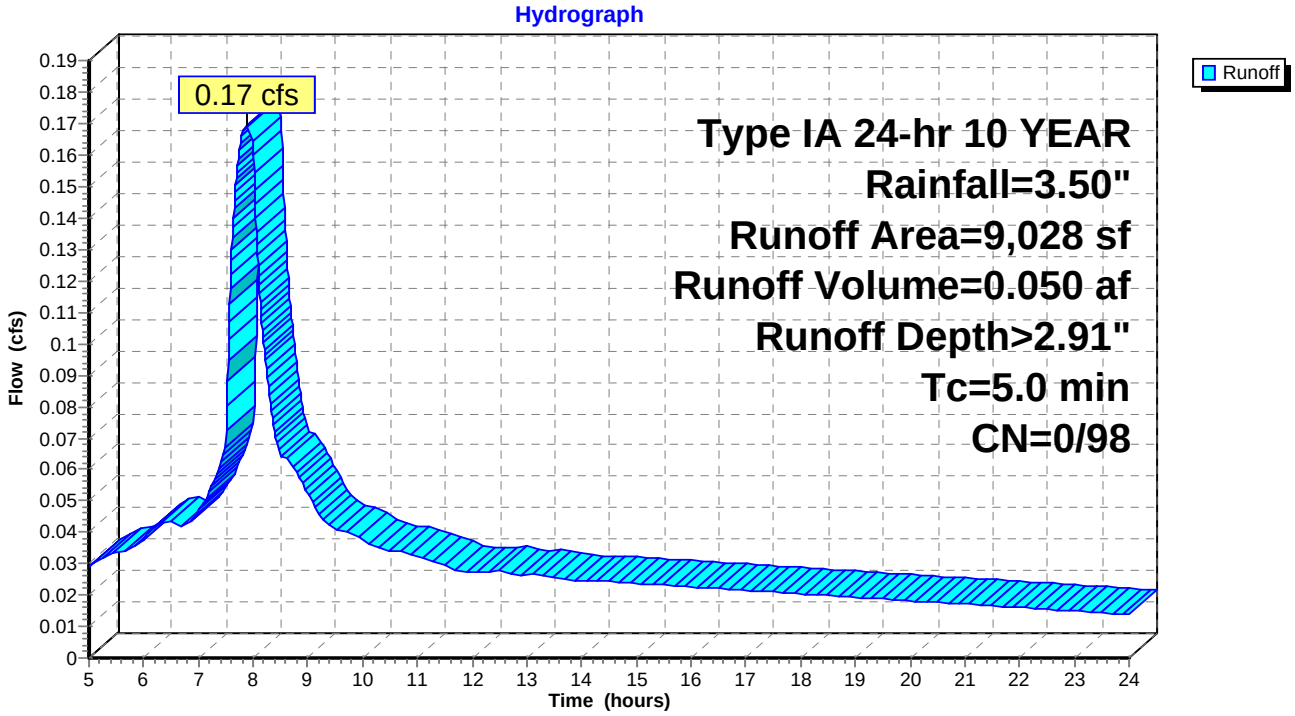
Runoff = 0.17 cfs @ 7.88 hrs, Volume= 0.050 af, Depth> 2.91"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 5.00-24.00 hrs, dt= 0.01 hrs
Type IA 24-hr 10 YEAR Rainfall=3.50"

| | Area (sf) | CN | Description |
|---|---|---|---|
| * | 9,028 | 98 | Roof Area |
| | 9,028 | 98 | Impervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|---|---|---|---|---|---|
| 5.0 | | | | | **Direct Entry,** |

## Subcatchment 1S: ROOF AREA



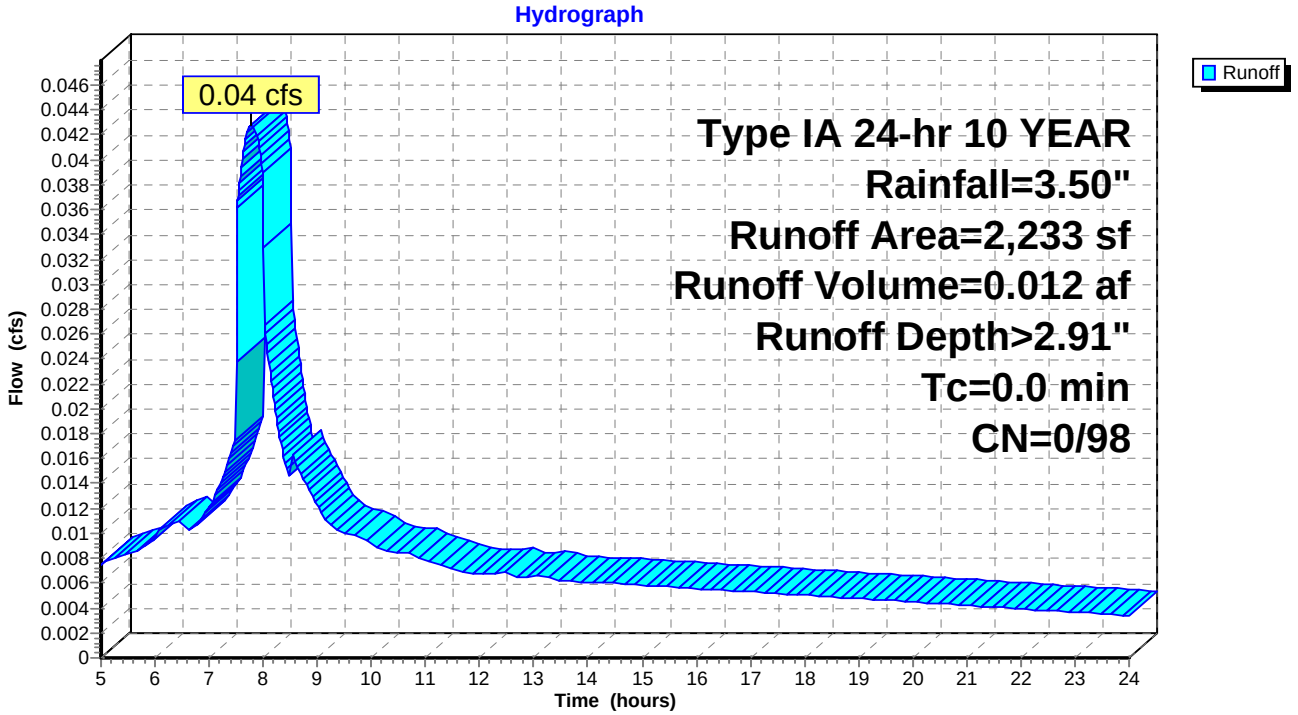
## Summary for Subcatchment 2S: ROOF/STREET AREA

Runoff = 0.04 cfs @ 7.78 hrs, Volume= 0.012 af, Depth> 2.91"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 5.00-24.00 hrs, dt= 0.01 hrs
Type IA 24-hr 10 YEAR Rainfall=3.50"

| | Area (sf) | CN | Description |
|---|---|---|---|
| * | 981 | 98 | Street Area |
| * | 1,252 | 98 | Roof Area |
| | 2,233 | 98 | Weighted Average |
| | 2,233 | 98 | Impervious Area |

## Subcatchment 2S: ROOF/STREET AREA



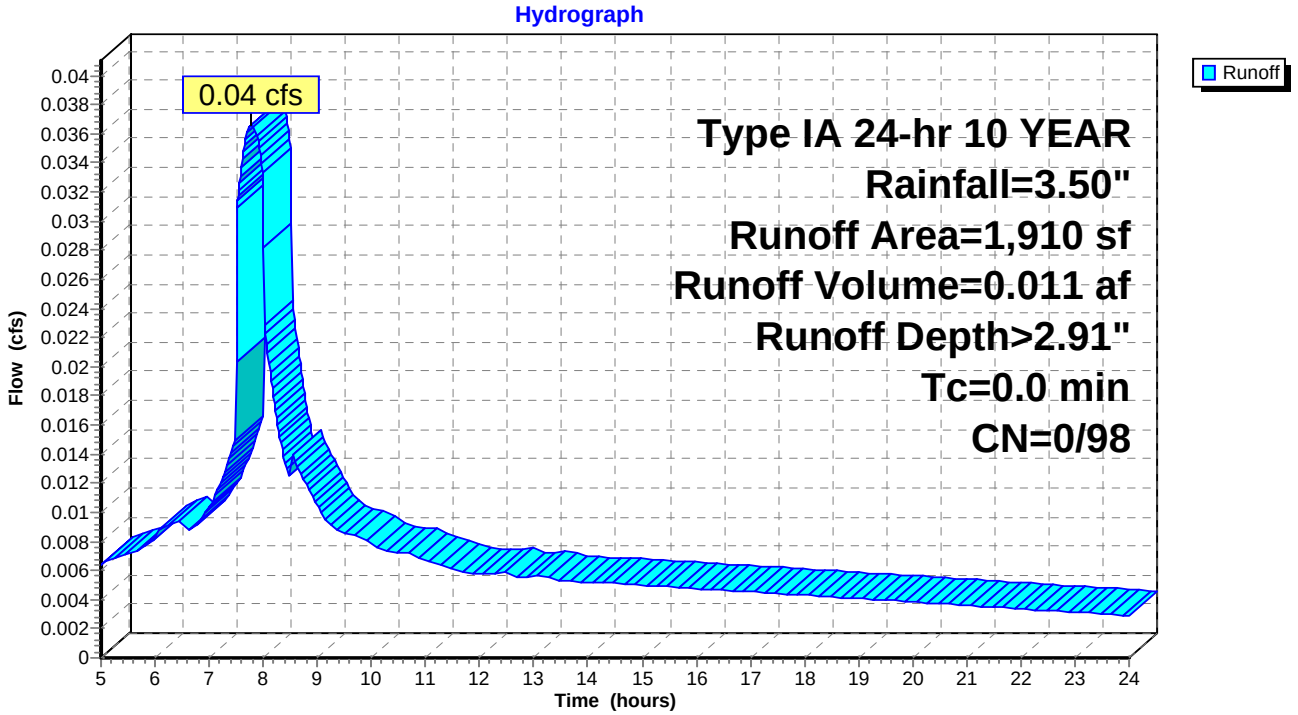
## Summary for Subcatchment 3S: ROOF/STREET AREA

Runoff = 0.04 cfs @ 7.78 hrs, Volume= 0.011 af, Depth> 2.91"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 5.00-24.00 hrs, dt= 0.01 hrs
Type IA 24-hr 10 YEAR Rainfall=3.50"

| | Area (sf) | CN | Description |
|---|---|---|---|
| * | 637 | 98 | Street Area |
| * | 1,273 | 98 | Roof Area |
| | 1,910 | 98 | Weighted Average |
| | 1,910 | 98 | Impervious Area |

## Subcatchment 3S: ROOF/STREET AREA



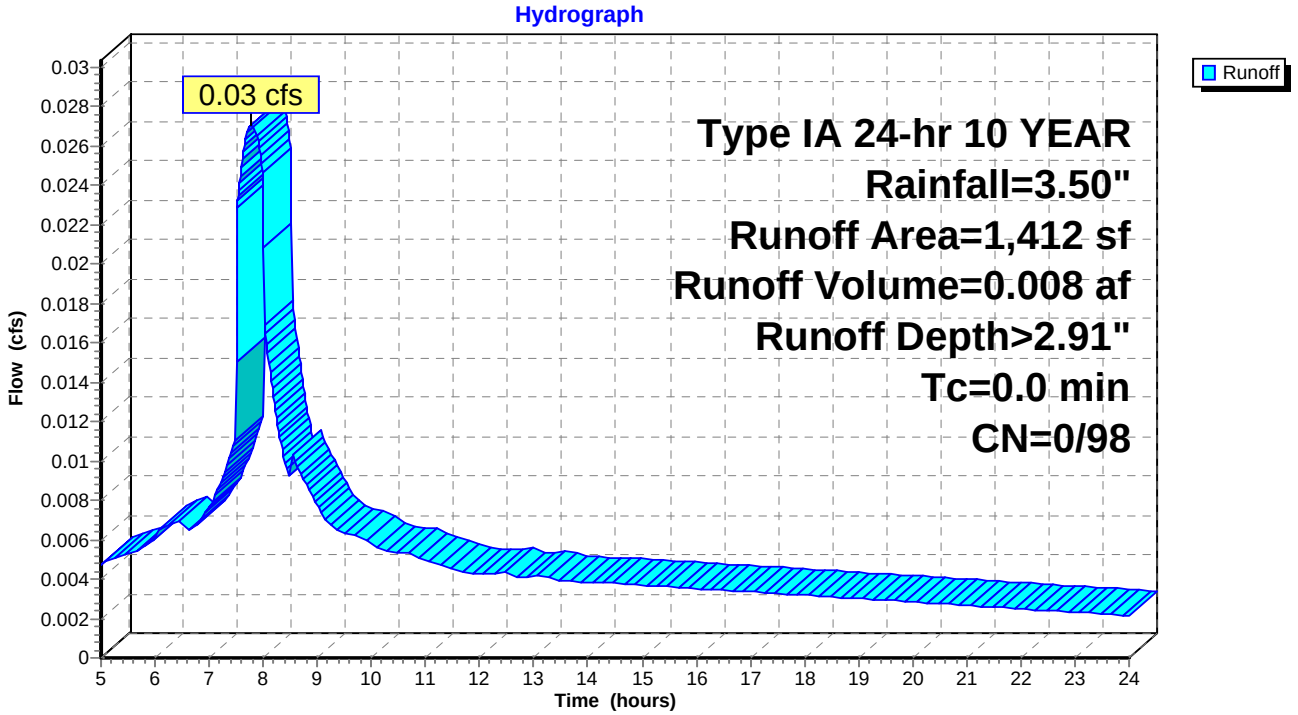
## Summary for Subcatchment 4S: ROOF/STREET AREA

Runoff = 0.03 cfs @ 7.78 hrs, Volume= 0.008 af, Depth> 2.91"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 5.00-24.00 hrs, dt= 0.01 hrs
Type IA 24-hr 10 YEAR Rainfall=3.50"

| | Area (sf) | CN | Description |
|---|---|---|---|
| * | 625 | 98 | Street Area |
| * | 787 | 98 | Roof Area |
| | 1,412 | 98 | Weighted Average |
| | 1,412 | 98 | Impervious Area |

## Subcatchment 4S: ROOF/STREET AREA



## Summary for Subcatchment 5S: ROOF AREA

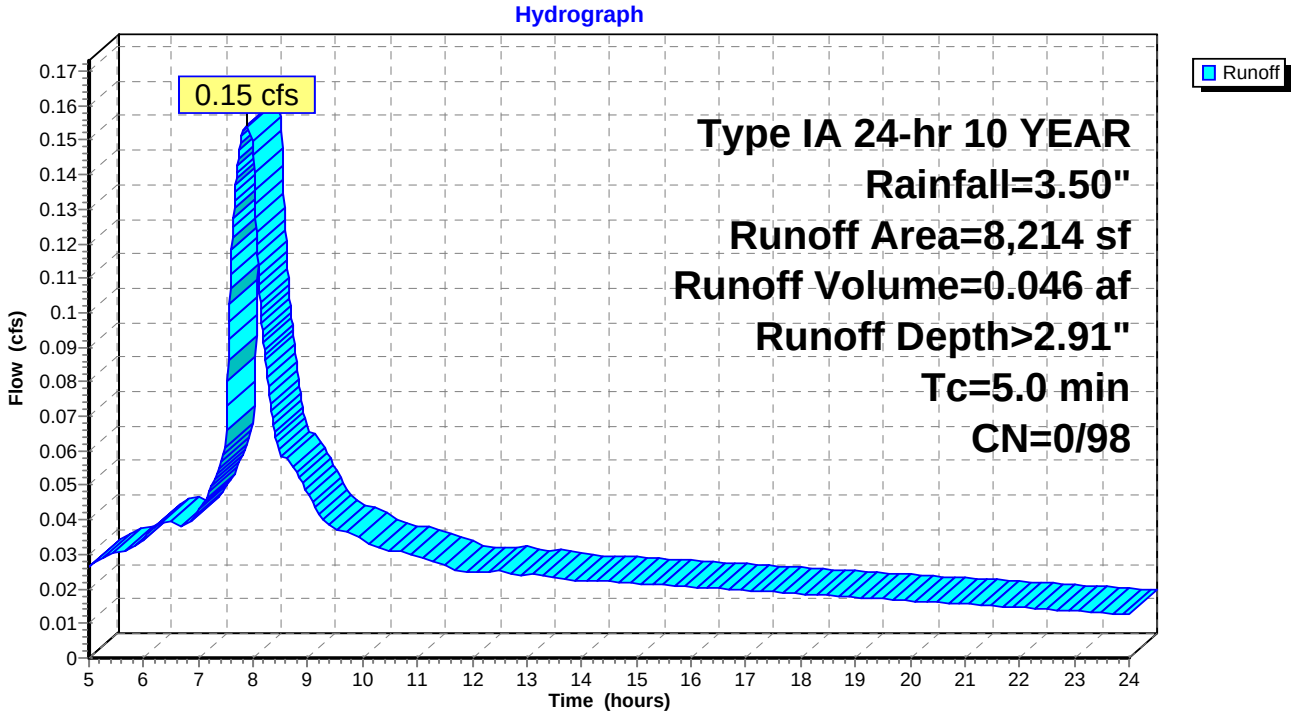
Runoff = 0.15 cfs @ 7.88 hrs, Volume= 0.046 af, Depth> 2.91"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 5.00-24.00 hrs, dt= 0.01 hrs
Type IA 24-hr 10 YEAR Rainfall=3.50"

| | Area (sf) | CN | Description |
|---|---|---|---|
| * | 8,214 | 98 | Roof Area |
| | 8,214 | 98 | Impervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|---|---|---|---|---|---|
| 5.0 | | | | | **Direct Entry,** |

## Subcatchment 5S: ROOF AREA



## Summary for Subcatchment 6S: PARKING

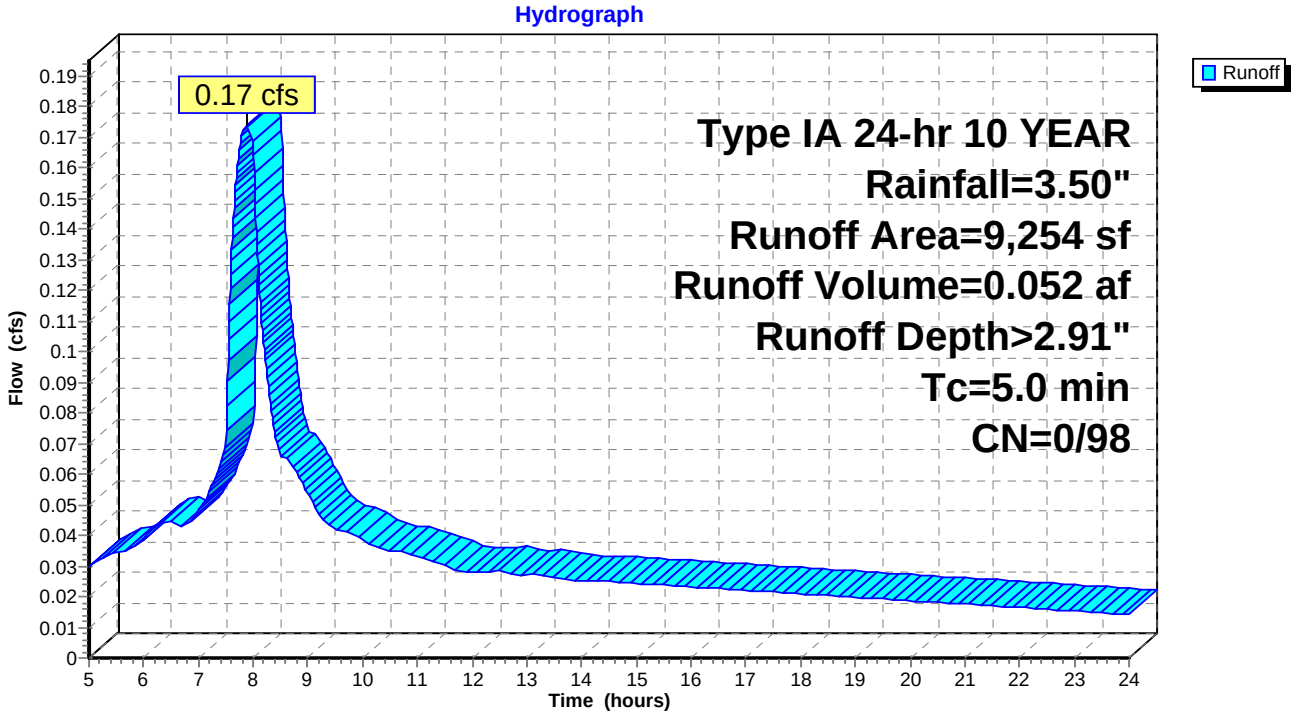
Runoff = 0.17 cfs @ 7.88 hrs, Volume= 0.052 af, Depth> 2.91"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 5.00-24.00 hrs, dt= 0.01 hrs
Type IA 24-hr 10 YEAR Rainfall=3.50"

| | Area (sf) | CN | Description |
|---|---|---|---|
| * | 9,254 | 98 | Parking Area |
| | 9,254 | 98 | Impervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|---|---|---|---|---|---|
| 5.0 | | | | | **Direct Entry,** |

## Subcatchment 6S: PARKING



## Summary for Subcatchment 7S: LANDSCAPE AREA

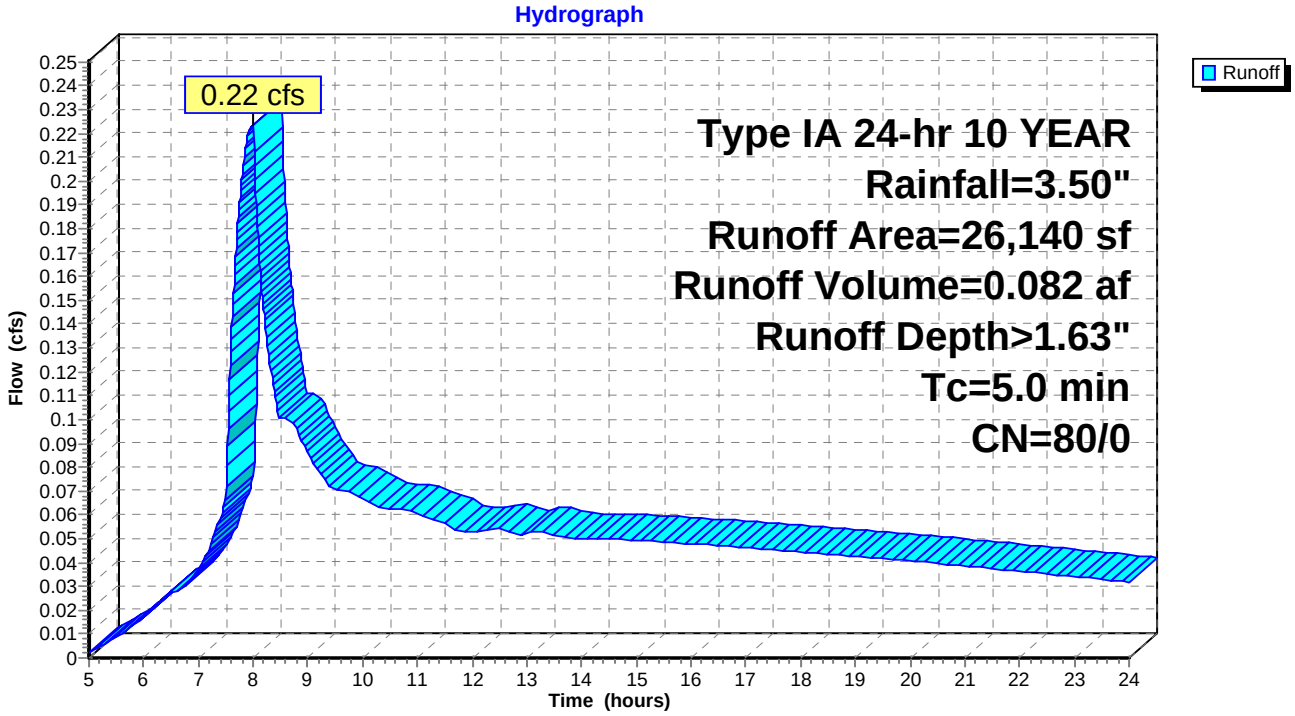
Runoff = 0.22 cfs @ 7.98 hrs, Volume= 0.082 af, Depth> 1.63"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 5.00-24.00 hrs, dt= 0.01 hrs
Type IA 24-hr 10 YEAR Rainfall=3.50"

| Area (sf) | CN | Description |
|---|---|---|
| 26,140 | 80 | >75% Grass cover, Good, HSG D |
| 26,140 | 80 | Pervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|---|---|---|---|---|---|
| 5.0 | | | | | **Direct Entry,** |

## Subcatchment 7S: LANDSCAPE AREA



## Summary for Subcatchment 8S: NEW CONCRETE PATH

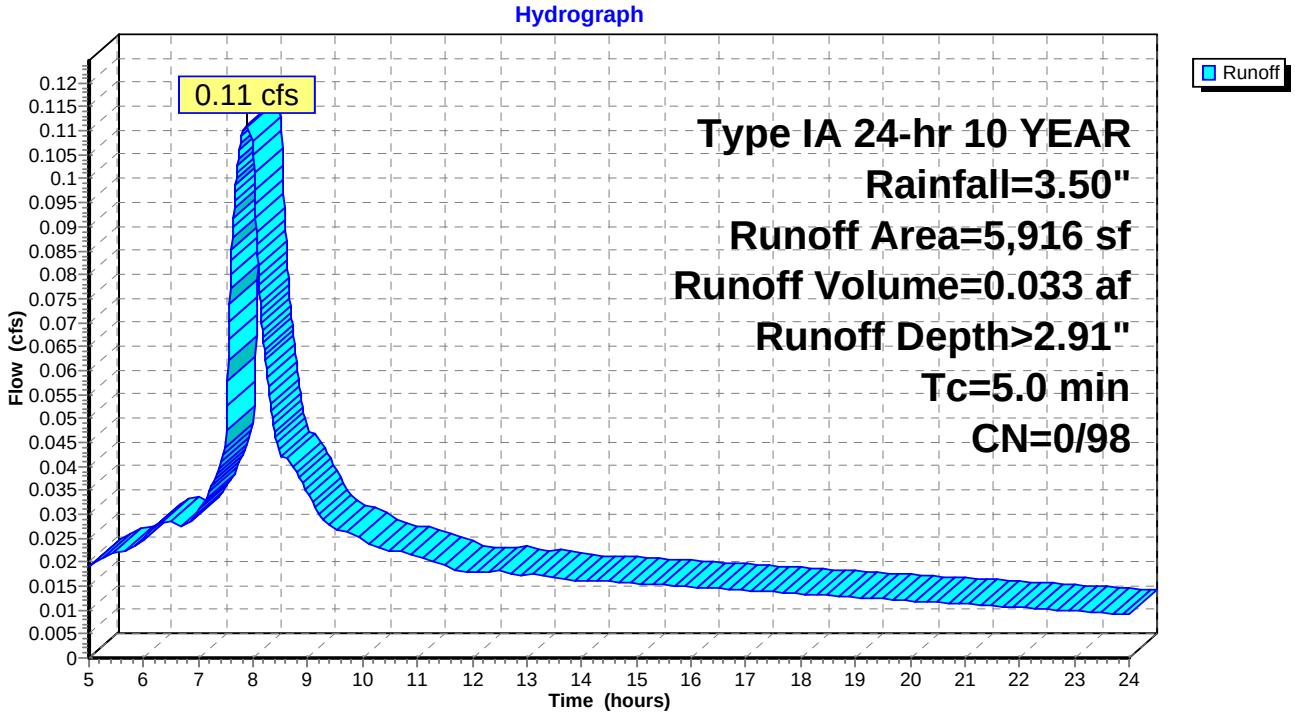
Runoff = 0.11 cfs @ 7.88 hrs, Volume= 0.033 af, Depth> 2.91"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 5.00-24.00 hrs, dt= 0.01 hrs
Type IA 24-hr 10 YEAR Rainfall=3.50"

| | Area (sf) | CN | Description |
|---|---|---|---|
| * | 5,916 | 98 | Concrete path |
| | 5,916 | 98 | Impervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|---|---|---|---|---|---|
| 5.0 | | | | | **Direct Entry,** |

## Subcatchment 8S: NEW CONCRETE PATH



## Summary for Subcatchment 9S: EXISTING BUILDING AND PAVING

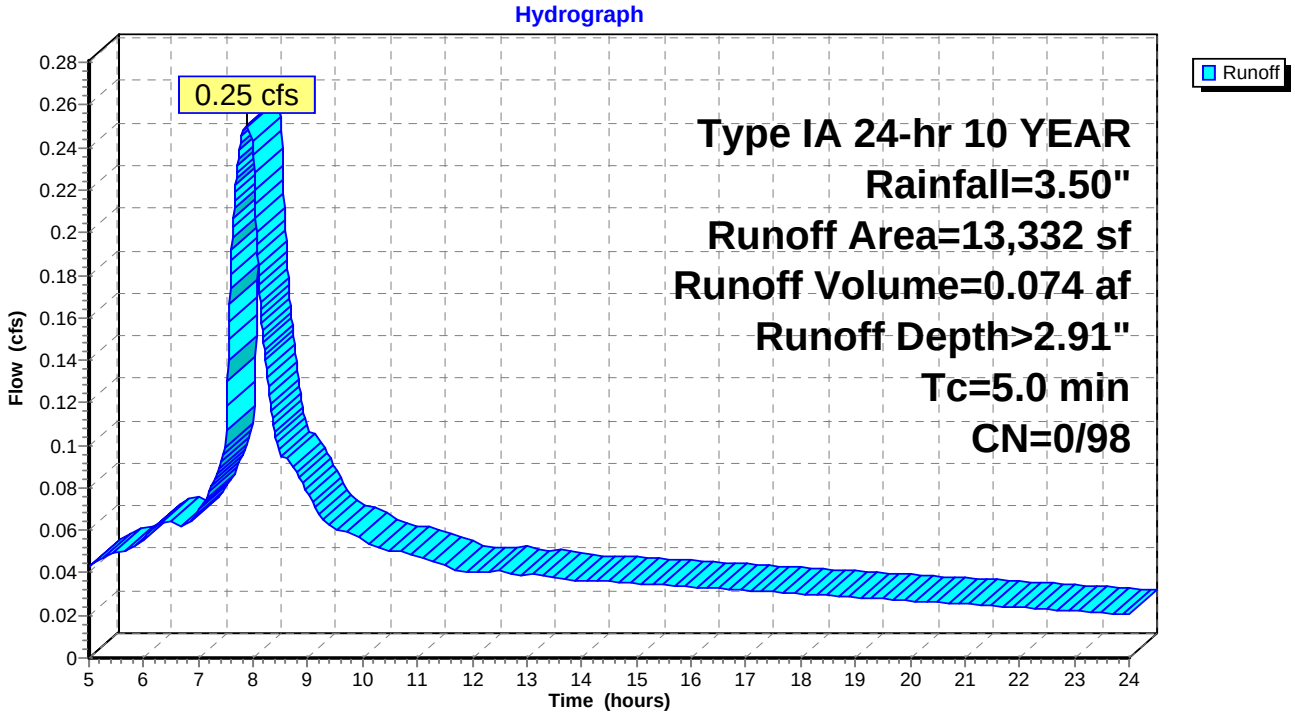
Runoff = 0.25 cfs @ 7.88 hrs, Volume= 0.074 af, Depth> 2.91"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 5.00-24.00 hrs, dt= 0.01 hrs
Type IA 24-hr 10 YEAR Rainfall=3.50"

| | Area (sf) | CN | Description |
|---|---|---|---|
| * | 13,332 | 98 | Existing Building and Paving |
| | 13,332 | 98 | Impervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|---|---|---|---|---|---|
| 5.0 | | | | | **Direct Entry,** |

## Subcatchment 9S: EXISTING BUILDING AND PAVING



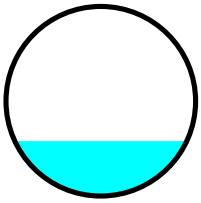
## Summary for Reach 1R: 6" STM

Inflow Area = 0.207 ac,100.00% Impervious, Inflow Depth > 2.91" for 10 YEAR event
Inflow = 0.17 cfs @ 7.88 hrs, Volume= 0.050 af
Outflow = 0.17 cfs @ 7.88 hrs, Volume= 0.050 af, Atten= 0%, Lag= 0.1 min

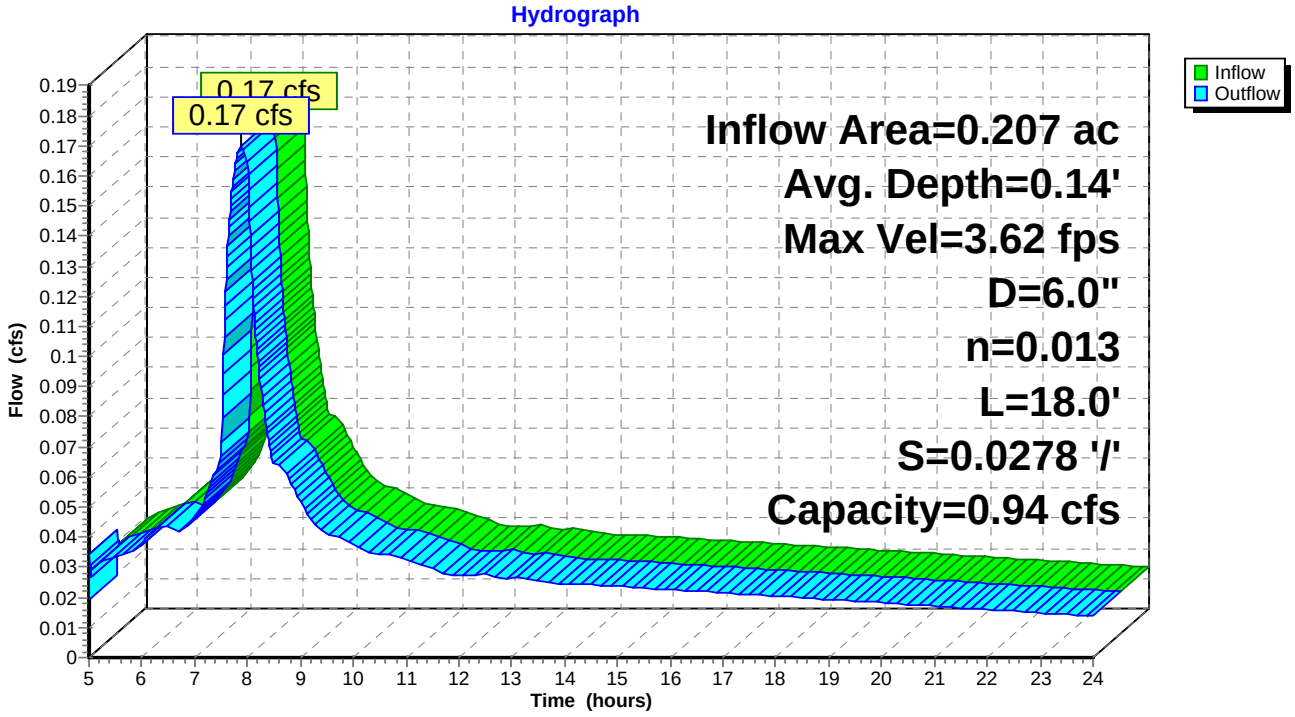
Routing by Dyn-Stor-Ind method, Time Span= 5.00-24.00 hrs, dt= 0.01 hrs
Max. Velocity= 3.62 fps, Min. Travel Time= 0.1 min
Avg. Velocity = 2.14 fps, Avg. Travel Time= 0.1 min

Peak Storage= 1 cf @ 7.88 hrs, Average Depth at Peak Storage= 0.14'
Bank-Full Depth= 0.50', Capacity at Bank-Full= 0.94 cfs

6.0" Diameter Pipe, n= 0.013 Corrugated PE, smooth interior
Length= 18.0' Slope= 0.0278 '/'
Inlet Invert= 199.00', Outlet Invert= 198.50'



### Reach 1R: 6" STM



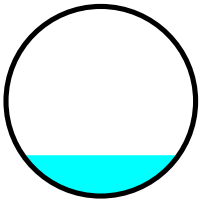
## Summary for Reach 2R: 4" STM

Inflow Area = 0.051 ac,100.00% Impervious, Inflow Depth > 2.91" for 10 YEAR event
Inflow = 0.04 cfs @ 7.78 hrs, Volume= 0.012 af
Outflow = 0.04 cfs @ 7.78 hrs, Volume= 0.012 af, Atten= 0%, Lag= 0.0 min

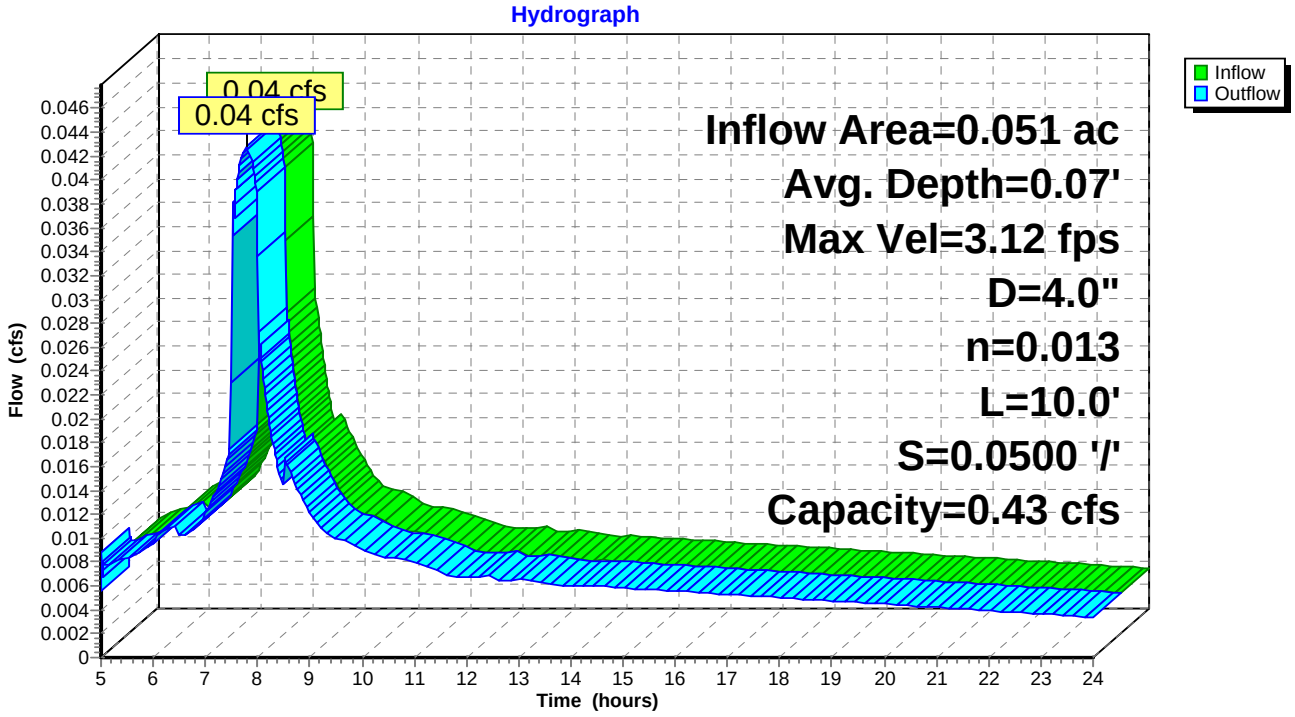
Routing by Dyn-Stor-Ind method, Time Span= 5.00-24.00 hrs, dt= 0.01 hrs
Max. Velocity= 3.12 fps, Min. Travel Time= 0.1 min
Avg. Velocity = 1.82 fps, Avg. Travel Time= 0.1 min

Peak Storage= 0 cf @ 7.78 hrs, Average Depth at Peak Storage= 0.07'
Bank-Full Depth= 0.33', Capacity at Bank-Full= 0.43 cfs

4.0" Diameter Pipe, n= 0.013 Corrugated PE, smooth interior
Length= 10.0' Slope= 0.0500 '/'
Inlet Invert= 198.00', Outlet Invert= 197.50'



### Reach 2R: 4" STM



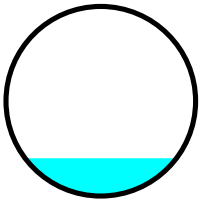
## Summary for Reach 3R: 4" STM

Inflow Area = 0.044 ac,100.00% Impervious, Inflow Depth > 2.91" for 10 YEAR event
Inflow = 0.04 cfs @ 7.78 hrs, Volume= 0.011 af
Outflow = 0.04 cfs @ 7.78 hrs, Volume= 0.011 af, Atten= 0%, Lag= 0.0 min

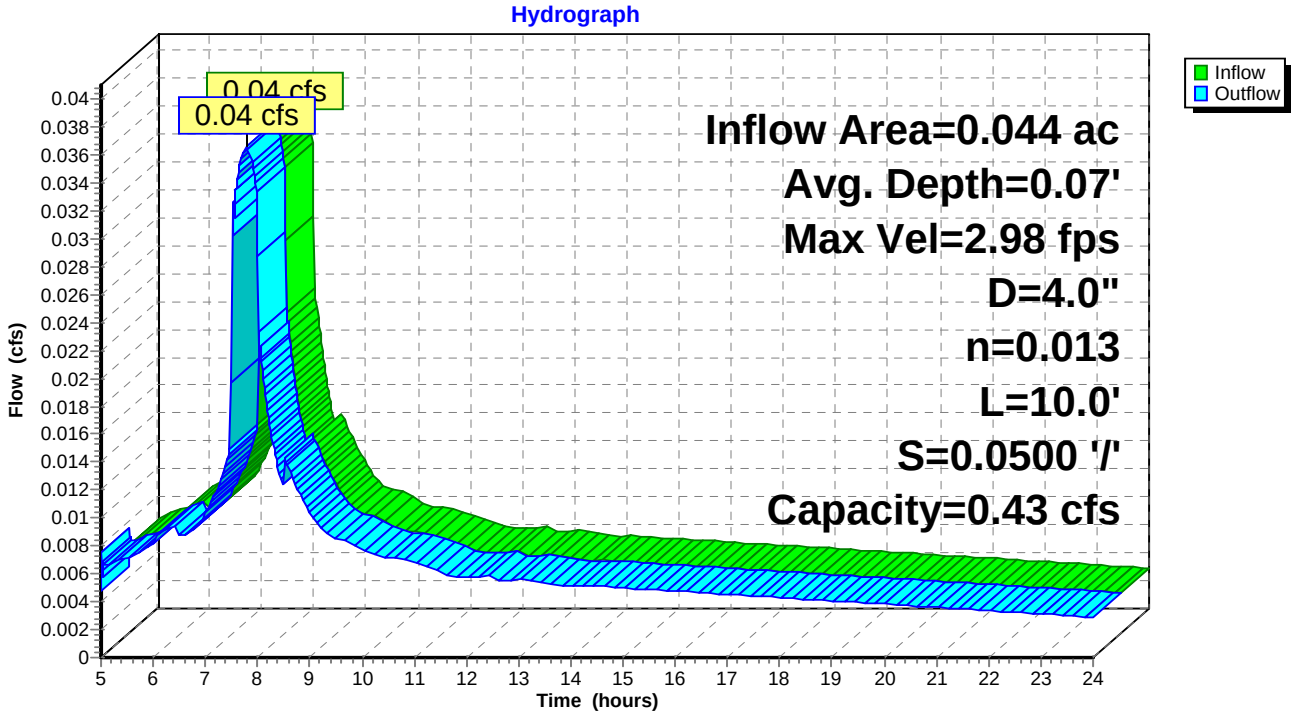
Routing by Dyn-Stor-Ind method, Time Span= 5.00-24.00 hrs, dt= 0.01 hrs
Max. Velocity= 2.98 fps, Min. Travel Time= 0.1 min
Avg. Velocity = 1.74 fps, Avg. Travel Time= 0.1 min

Peak Storage= 0 cf @ 7.78 hrs, Average Depth at Peak Storage= 0.07'
Bank-Full Depth= 0.33', Capacity at Bank-Full= 0.43 cfs

4.0" Diameter Pipe, n= 0.013 Corrugated PE, smooth interior
Length= 10.0' Slope= 0.0500 '/'
Inlet Invert= 198.00', Outlet Invert= 197.50'



### Reach 3R: 4" STM



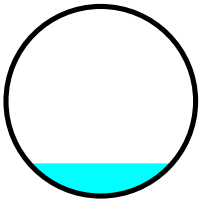
## Summary for Reach 4R: 4" STM

Inflow Area = 0.032 ac,100.00% Impervious, Inflow Depth > 2.91" for 10 YEAR event
Inflow = 0.03 cfs @ 7.78 hrs, Volume= 0.008 af
Outflow = 0.03 cfs @ 7.78 hrs, Volume= 0.008 af, Atten= 0%, Lag= 0.0 min

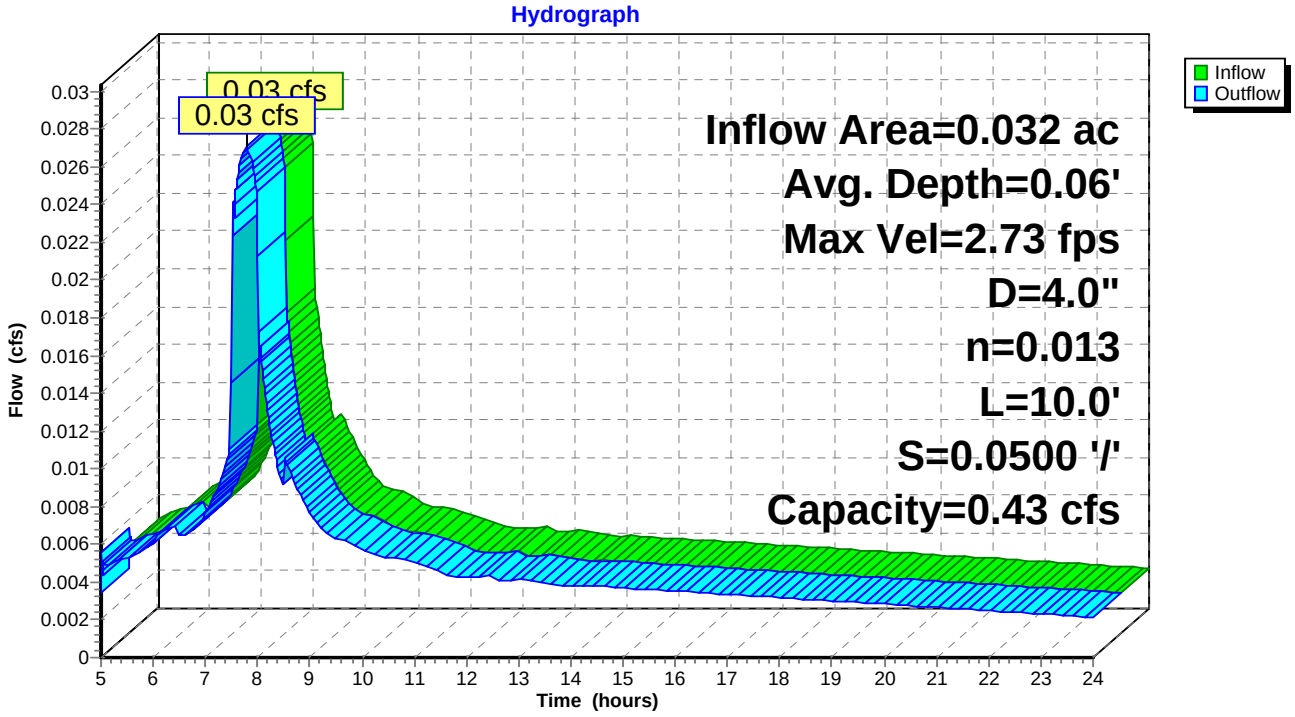
Routing by Dyn-Stor-Ind method, Time Span= 5.00-24.00 hrs, dt= 0.01 hrs
Max. Velocity= 2.73 fps, Min. Travel Time= 0.1 min
Avg. Velocity = 1.59 fps, Avg. Travel Time= 0.1 min

Peak Storage= 0 cf @ 7.78 hrs, Average Depth at Peak Storage= 0.06'
Bank-Full Depth= 0.33', Capacity at Bank-Full= 0.43 cfs

4.0" Diameter Pipe, n= 0.013 Corrugated PE, smooth interior
Length= 10.0' Slope= 0.0500 '/'
Inlet Invert= 198.00', Outlet Invert= 197.50'



### Reach 4R: 4" STM



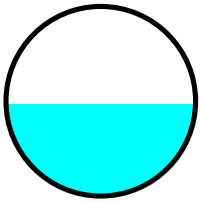
## Summary for Reach 5R: 6" STM

Inflow Area = 0.924 ac, 35.09% Impervious, Inflow Depth > 2.08" for 10 YEAR event
Inflow = 0.49 cfs @ 7.93 hrs, Volume= 0.160 af
Outflow = 0.49 cfs @ 7.93 hrs, Volume= 0.160 af, Atten= 0%, Lag= 0.1 min

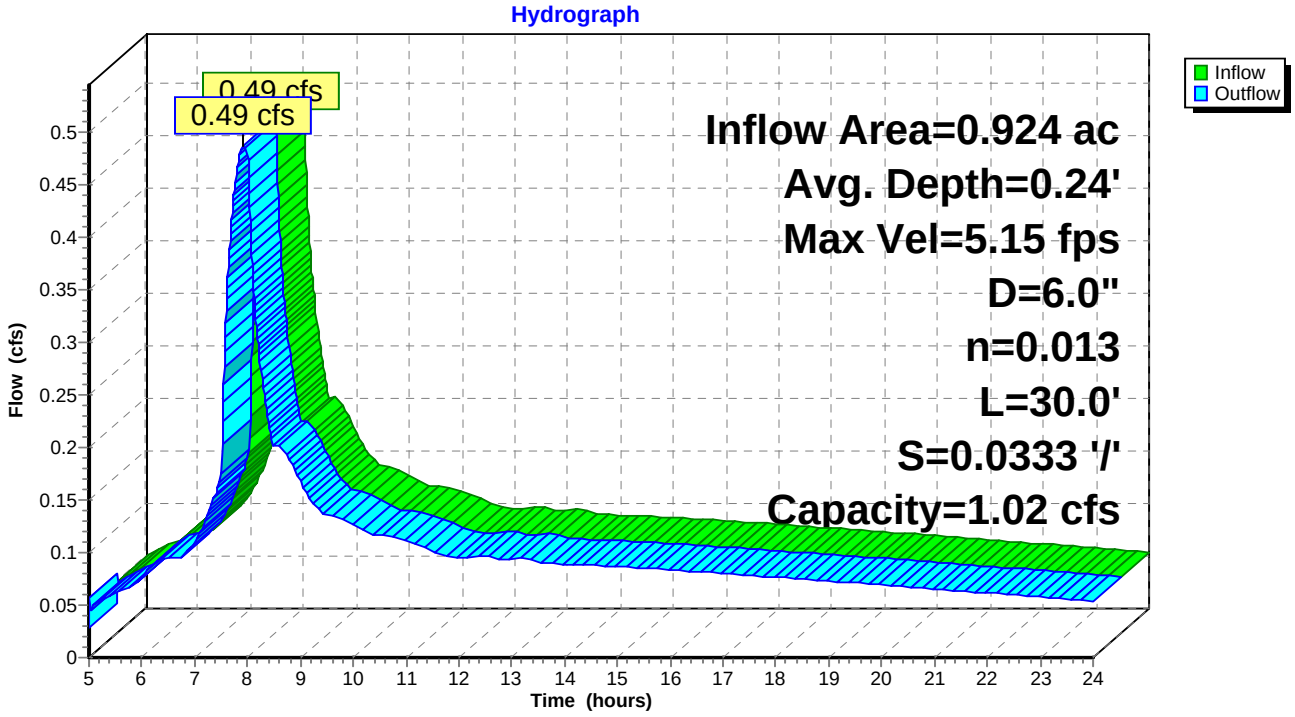
Routing by Dyn-Stor-Ind method, Time Span= 5.00-24.00 hrs, dt= 0.01 hrs
Max. Velocity= 5.15 fps, Min. Travel Time= 0.1 min
Avg. Velocity = 3.24 fps, Avg. Travel Time= 0.2 min

Peak Storage= 3 cf @ 7.93 hrs, Average Depth at Peak Storage= 0.24'
Bank-Full Depth= 0.50', Capacity at Bank-Full= 1.02 cfs

6.0" Diameter Pipe, n= 0.013 Corrugated PE, smooth interior
Length= 30.0' Slope= 0.0333 '/'
Inlet Invert= 197.00', Outlet Invert= 196.00'



### Reach 5R: 6" STM



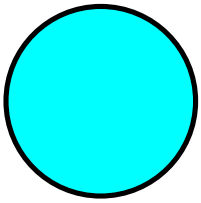
## Summary for Reach 6R: 6" STM

Inflow Area = 1.137 ac, 47.22% Impervious, Inflow Depth > 2.24" for 10 YEAR event
Inflow = 0.66 cfs @ 7.92 hrs, Volume= 0.212 af
Outflow = 0.65 cfs @ 7.89 hrs, Volume= 0.212 af, Atten= 2%, Lag= 0.0 min

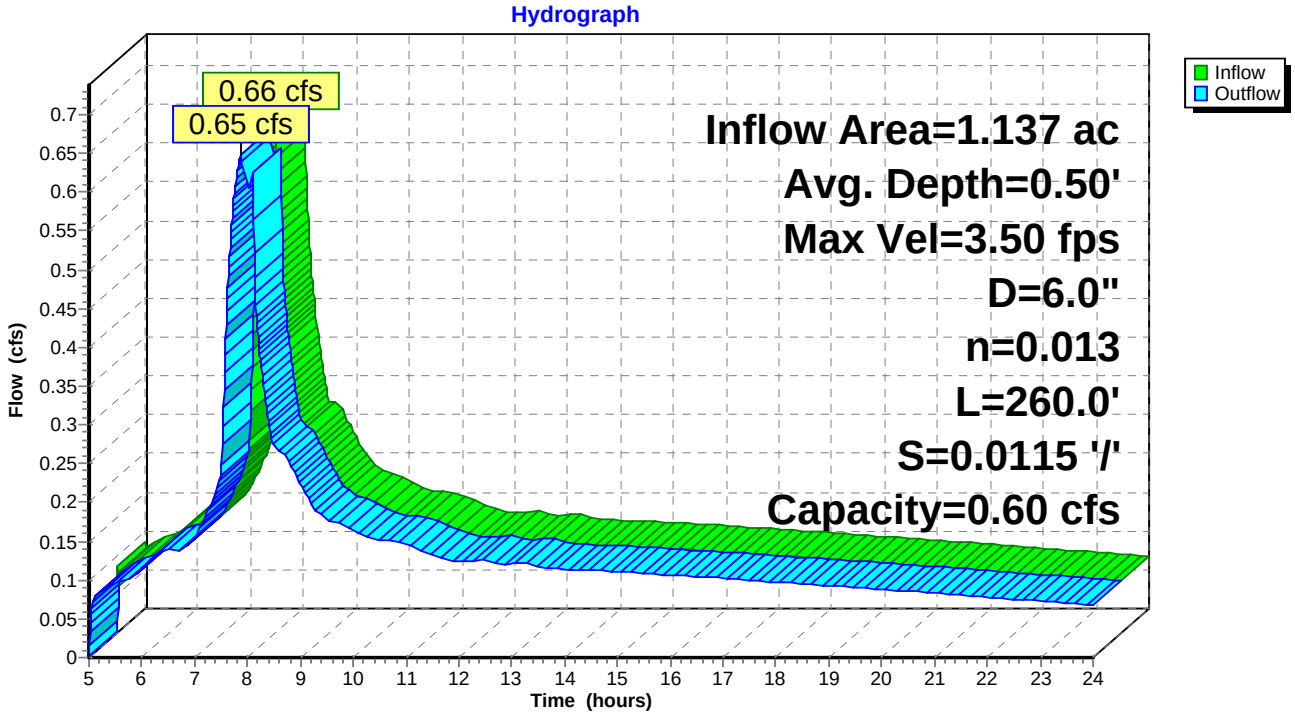
Routing by Dyn-Stor-Ind method, Time Span= 5.00-24.00 hrs, dt= 0.01 hrs
Max. Velocity= 3.50 fps, Min. Travel Time= 1.2 min
Avg. Velocity = 2.39 fps, Avg. Travel Time= 1.8 min

Peak Storage= 51 cf @ 7.92 hrs, Average Depth at Peak Storage= 0.50'
Bank-Full Depth= 0.50', Capacity at Bank-Full= 0.60 cfs

6.0" Diameter Pipe, n= 0.013 Corrugated PE, smooth interior
Length= 260.0' Slope= 0.0115 '/'
Inlet Invert= 199.00', Outlet Invert= 196.00'



### Reach 6R: 6" STM



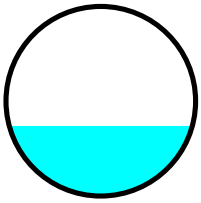
## Summary for Reach 8R: 8" STM

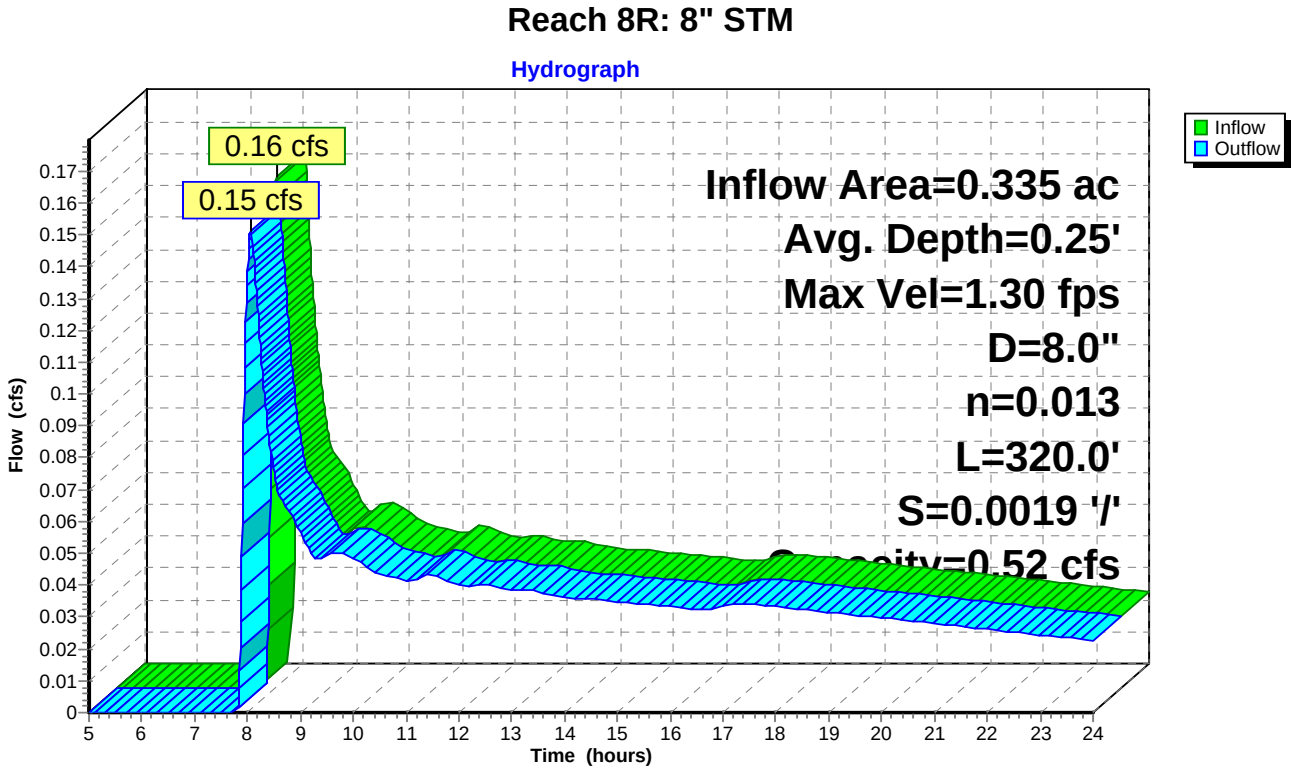
Inflow Area = 0.335 ac,100.00% Impervious, Inflow Depth > 1.85" for 10 YEAR event
Inflow = 0.16 cfs @ 8.01 hrs, Volume= 0.051 af
Outflow = 0.15 cfs @ 8.06 hrs, Volume= 0.051 af, Atten= 6%, Lag= 3.1 min

Routing by Dyn-Stor-Ind method, Time Span= 5.00-24.00 hrs, dt= 0.01 hrs
Max. Velocity= 1.30 fps, Min. Travel Time= 4.1 min
Avg. Velocity = 0.86 fps, Avg. Travel Time= 6.2 min

Peak Storage= 37 cf @ 8.06 hrs, Average Depth at Peak Storage= 0.25'
Bank-Full Depth= 0.67', Capacity at Bank-Full= 0.52 cfs

8.0" Diameter Pipe, n= 0.013 Corrugated PE, smooth interior
Length= 320.0' Slope= 0.0019 '/'
Inlet Invert= 194.74', Outlet Invert= 194.14'





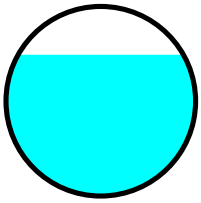
## Summary for Reach 9R: 8" STM

Inflow Area = 1.472 ac, 59.22% Impervious, Inflow Depth > 2.14" for 10 YEAR event
Inflow = 0.80 cfs @ 8.10 hrs, Volume= 0.263 af
Outflow = 0.78 cfs @ 8.11 hrs, Volume= 0.263 af, Atten= 2%, Lag= 0.4 min

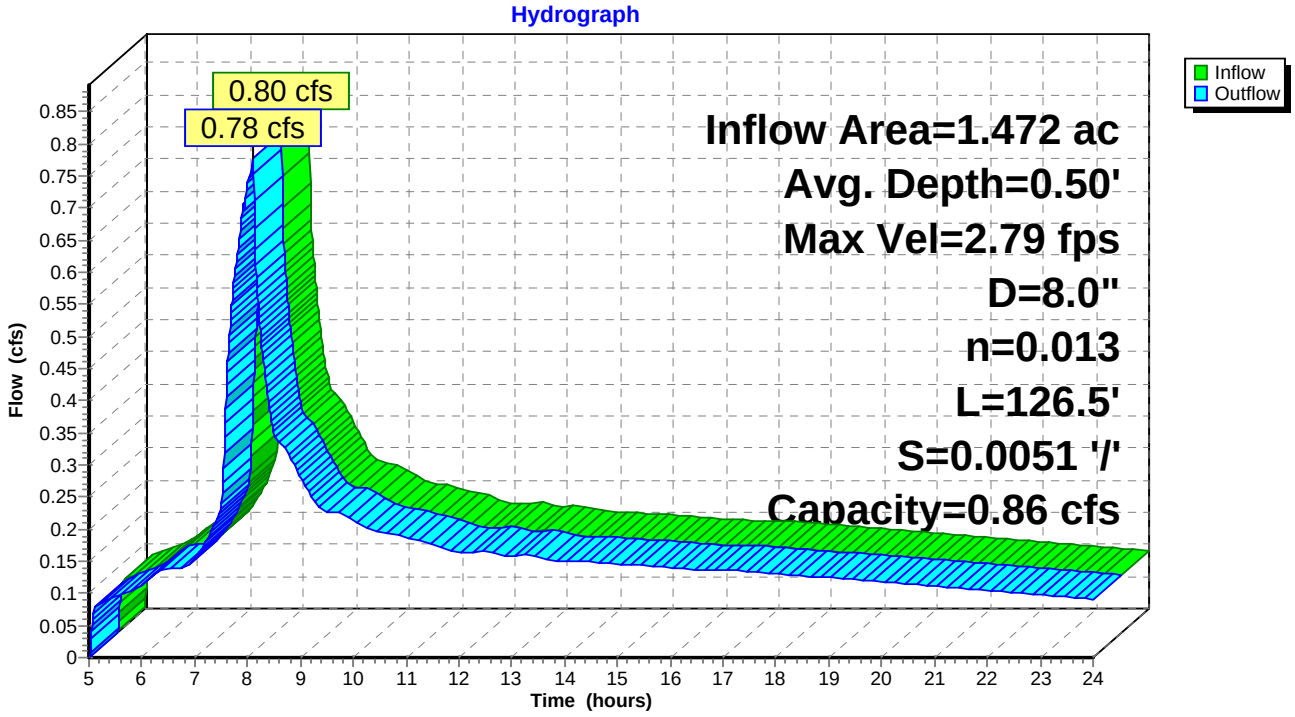
Routing by Dyn-Stor-Ind method, Time Span= 5.00-24.00 hrs, dt= 0.01 hrs
Max. Velocity= 2.79 fps, Min. Travel Time= 0.8 min
Avg. Velocity = 1.86 fps, Avg. Travel Time= 1.1 min

Peak Storage= 35 cf @ 8.11 hrs, Average Depth at Peak Storage= 0.50'
Bank-Full Depth= 0.67', Capacity at Bank-Full= 0.86 cfs

8.0" Diameter Pipe, n= 0.013 Corrugated PE, smooth interior
Length= 126.5' Slope= 0.0051 '/'
Inlet Invert= 194.14', Outlet Invert= 193.50'



### Reach 9R: 8" STM



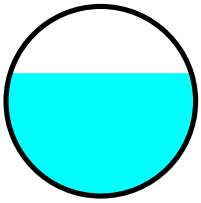
## Summary for Reach 10R: 8" STM

Inflow Area = 1.778 ac, 66.24% Impervious, Inflow Depth > 2.28" for 10 YEAR event
Inflow = 0.98 cfs @ 8.00 hrs, Volume= 0.337 af
Outflow = 0.97 cfs @ 8.02 hrs, Volume= 0.337 af, Atten= 0%, Lag= 0.8 min

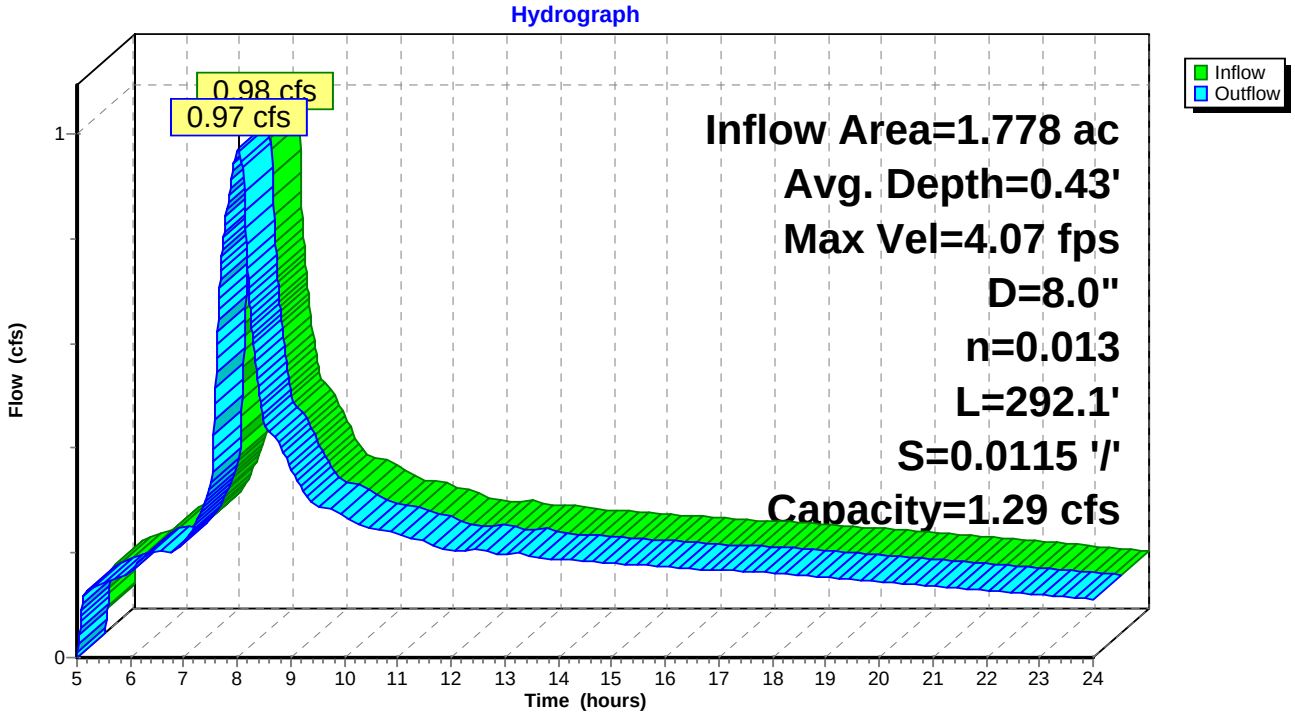
Routing by Dyn-Stor-Ind method, Time Span= 5.00-24.00 hrs, dt= 0.01 hrs
Max. Velocity= 4.07 fps, Min. Travel Time= 1.2 min
Avg. Velocity = 2.67 fps, Avg. Travel Time= 1.8 min

Peak Storage= 70 cf @ 8.02 hrs, Average Depth at Peak Storage= 0.43'
Bank-Full Depth= 0.67', Capacity at Bank-Full= 1.29 cfs

8.0" Diameter Pipe, n= 0.013 Corrugated PE, smooth interior
Length= 292.1' Slope= 0.0115 '/'
Inlet Invert= 193.25', Outlet Invert= 189.90'



### Reach 10R: 8" STM



## Summary for Pond 1P: PLANTER

Inflow Area = 0.207 ac,100.00% Impervious, Inflow Depth > 2.91" for 10 YEAR event
Inflow = 0.17 cfs @ 7.88 hrs, Volume= 0.050 af
Outflow = 0.16 cfs @ 8.01 hrs, Volume= 0.038 af, Atten= 5%, Lag= 7.9 min
Primary = 0.16 cfs @ 8.01 hrs, Volume= 0.038 af

Routing by Dyn-Stor-Ind method, Time Span= 5.00-24.00 hrs, dt= 0.01 hrs
Peak Elev= 198.58' @ 8.01 hrs Surf.Area= 1,704 sf Storage= 561 cf

Plug-Flow detention time= 246.3 min calculated for 0.038 af (76% of inflow)
Center-of-Mass det. time= 100.4 min ( 816.6 - 716.2 )

| Volume | Invert | Avail.Storage | Storage Description |
|---|---|---|---|
| #1 | 195.50' | 187 cf | **1' Drain Rock (Prismatic)**Listed below (Recalc)<br>568 cf Overall x 33.0% Voids |
| #2 | 196.50' | 43 cf | **1.5' Growing Medium (Prismatic)**Listed below (Recalc)<br>852 cf Overall x 5.0% Voids |
| #3 | 198.00' | 471 cf | **Ponding Depth (Prismatic)**Listed below (Recalc) |
| | | 701 cf | Total Available Storage |

| Elevation (feet) | Surf.Area (sq-ft) | Inc.Store (cubic-feet) | Cum.Store (cubic-feet) |
|---|---|---|---|
| 195.50 | 568 | 0 | 0 |
| 196.50 | 568 | 568 | 568 |

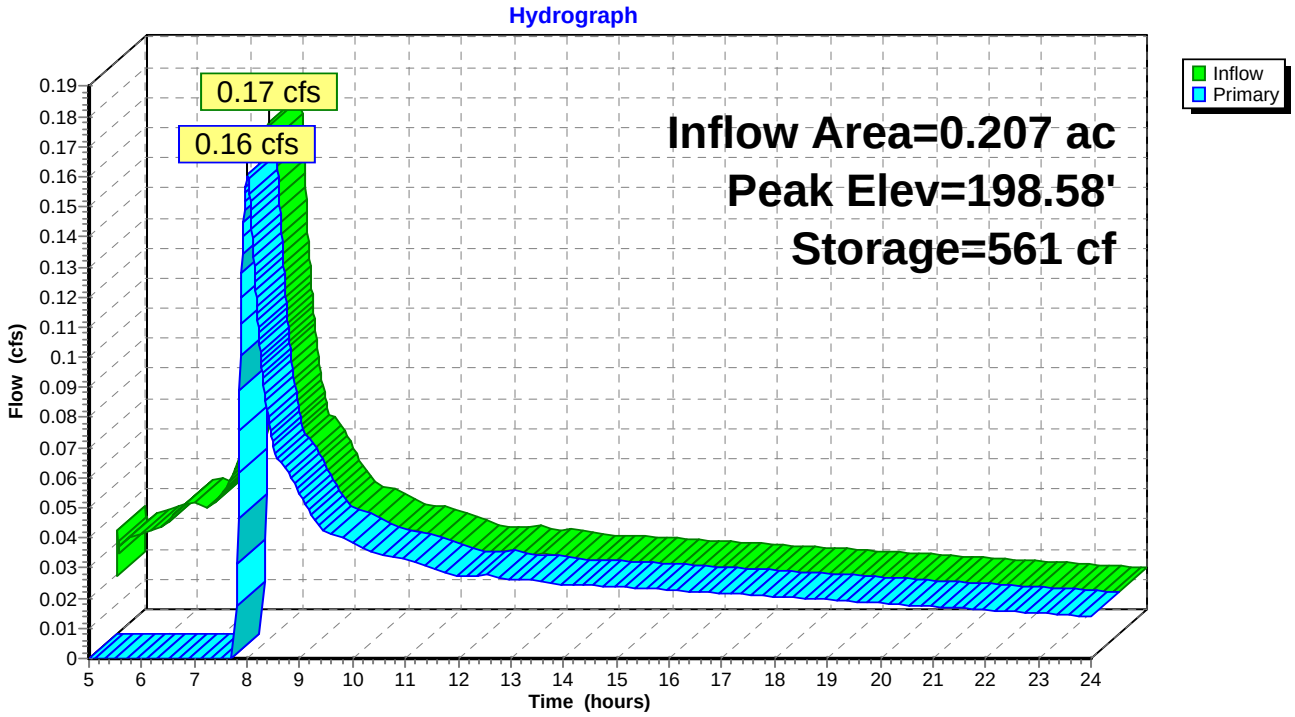
| Elevation (feet) | Surf.Area (sq-ft) | Inc.Store (cubic-feet) | Cum.Store (cubic-feet) |
|---|---|---|---|
| 196.50 | 568 | 0 | 0 |
| 198.00 | 568 | 852 | 852 |

| Elevation (feet) | Surf.Area (sq-ft) | Inc.Store (cubic-feet) | Cum.Store (cubic-feet) |
|---|---|---|---|
| 198.00 | 568 | 0 | 0 |
| 198.83 | 568 | 471 | 471 |

| Device | Routing | Invert | Outlet Devices |
|---|---|---|---|
| #1 | Primary | 195.50' | **8.0" x 205.0' long Culvert** Ke= 0.500<br>Outlet Invert= 194.46' S= 0.0051 '/' Cc= 0.900 n= 0.013 |
| #2 | Device 1 | 198.50' | **8.0" Horiz. Orifice/Grate** Limited to weir flow C= 0.610 |

**Primary OutFlow** Max=0.16 cfs @ 8.01 hrs HW=198.58' TW=194.98' (Dynamic Tailwater)
└─**1=Culvert** (Passes 0.16 cfs of 1.47 cfs potential flow)
└─**2=Orifice/Grate** (Weir Controls 0.16 cfs @ 0.94 fps)

## Pond 1P: PLANTER



## Summary for Pond 2P: PLANTER

Inflow Area = 0.051 ac,100.00% Impervious, Inflow Depth > 2.91" for 10 YEAR event
Inflow = 0.04 cfs @ 7.78 hrs, Volume= 0.012 af
Outflow = 0.01 cfs @ 9.74 hrs, Volume= 0.007 af, Atten= 77%, Lag= 117.5 min
Primary = 0.01 cfs @ 9.74 hrs, Volume= 0.007 af

Routing by Dyn-Stor-Ind method, Time Span= 5.00-24.00 hrs, dt= 0.01 hrs
Peak Elev= 197.52' @ 9.74 hrs Surf.Area= 798 sf Storage= 246 cf

Plug-Flow detention time= 456.9 min calculated for 0.007 af (55% of inflow)
Center-of-Mass det. time= 220.3 min ( 934.5 - 714.2 )

| Volume | Invert | Avail.Storage | Storage Description |
|---|---|---|---|
| #1 | 194.50' | 88 cf | **1' Drain Rock (Prismatic)**Listed below (Recalc)<br>266 cf Overall x 33.0% Voids |
| #2 | 195.50' | 20 cf | **1.5' Growing Medium (Prismatic)**Listed below (Recalc)<br>399 cf Overall x 5.0% Voids |
| #3 | 197.00' | 221 cf | **Ponding Depth (Prismatic)**Listed below (Recalc) |
| | | 329 cf | Total Available Storage |

| Elevation (feet) | Surf.Area (sq-ft) | Inc.Store (cubic-feet) | Cum.Store (cubic-feet) |
|---|---|---|---|
| 194.50 | 266 | 0 | 0 |
| 195.50 | 266 | 266 | 266 |

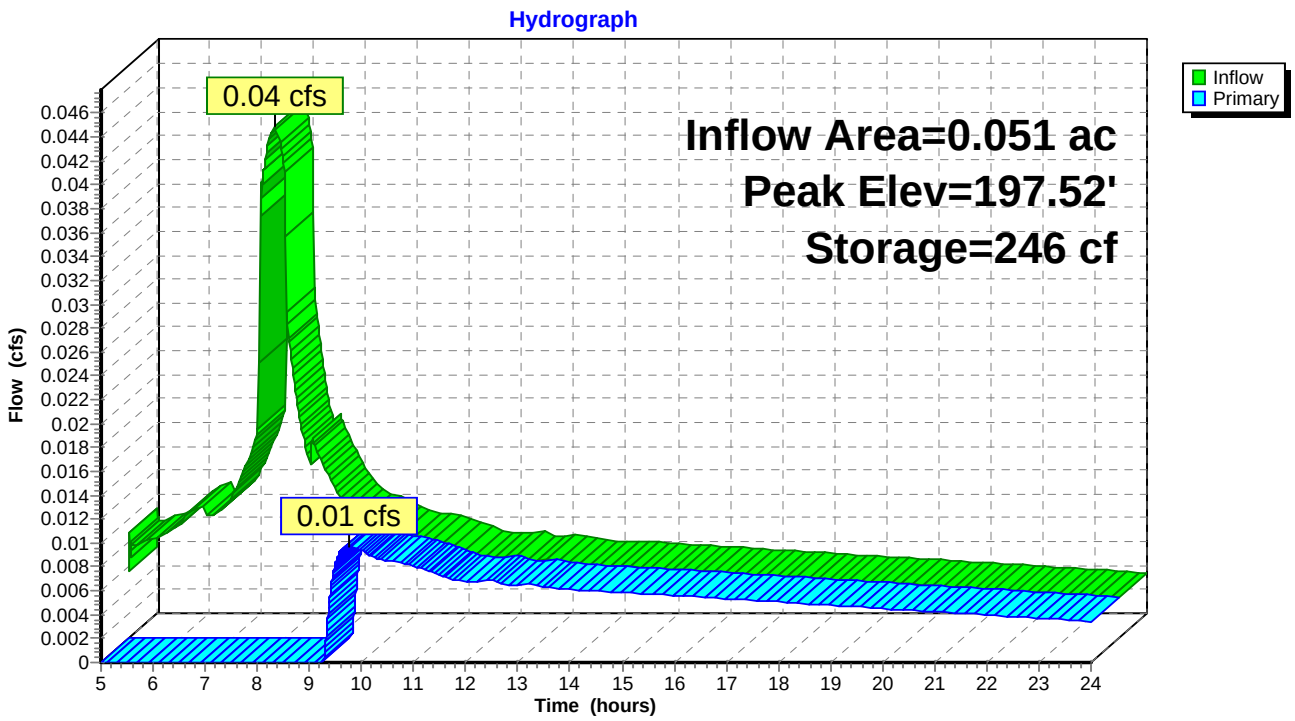
| Elevation (feet) | Surf.Area (sq-ft) | Inc.Store (cubic-feet) | Cum.Store (cubic-feet) |
|---|---|---|---|
| 195.50 | 266 | 0 | 0 |
| 197.00 | 266 | 399 | 399 |

| Elevation (feet) | Surf.Area (sq-ft) | Inc.Store (cubic-feet) | Cum.Store (cubic-feet) |
|---|---|---|---|
| 197.00 | 266 | 0 | 0 |
| 197.83 | 266 | 221 | 221 |

| Device | Routing | Invert | Outlet Devices |
|---|---|---|---|
| #1 | Device 2 | 197.50' | **4.0" Horiz. Orifice/Grate** Limited to weir flow C= 0.610 |
| #2 | Primary | 194.63' | **4.0" x 33.4' long Culvert** Ke= 0.500<br>Outlet Invert= 194.46' S= 0.0051 '/' Cc= 0.900 n= 0.013 |

**Primary OutFlow** Max=0.01 cfs @ 9.74 hrs HW=197.52' TW=194.88' (Dynamic Tailwater)
└─**2=Culvert** (Passes 0.01 cfs of 0.46 cfs potential flow)
  └─**1=Orifice/Grate** (Weir Controls 0.01 cfs @ 0.46 fps)

## Pond 2P: PLANTER



## Summary for Pond 3P: PLANTER

Inflow Area = 0.044 ac,100.00% Impervious, Inflow Depth > 2.91" for 10 YEAR event
Inflow = 0.04 cfs @ 7.78 hrs, Volume= 0.011 af
Outflow = 0.01 cfs @ 11.61 hrs, Volume= 0.005 af, Atten= 84%, Lag= 229.5 min
Primary = 0.01 cfs @ 11.61 hrs, Volume= 0.005 af

Routing by Dyn-Stor-Ind method, Time Span= 5.00-24.00 hrs, dt= 0.01 hrs
Peak Elev= 197.51' @ 11.61 hrs Surf.Area= 849 sf Storage= 260 cf

Plug-Flow detention time= 566.9 min calculated for 0.005 af (44% of inflow)
Center-of-Mass det. time= 299.0 min ( 1,013.2 - 714.2 )

| Volume | Invert | Avail.Storage | Storage Description |
|---|---|---|---|
| #1 | 194.50' | 93 cf | **1' Drain Rock (Prismatic)**Listed below (Recalc)<br>283 cf Overall x 33.0% Voids |
| #2 | 195.50' | 21 cf | **1.5' Growing Medium (Prismatic)**Listed below (Recalc)<br>425 cf Overall x 5.0% Voids |
| #3 | 197.00' | 235 cf | **Ponding Depth (Prismatic)**Listed below (Recalc) |
| | | 350 cf | Total Available Storage |

| Elevation (feet) | Surf.Area (sq-ft) | Inc.Store (cubic-feet) | Cum.Store (cubic-feet) |
|---|---|---|---|
| 194.50 | 283 | 0 | 0 |
| 195.50 | 283 | 283 | 283 |

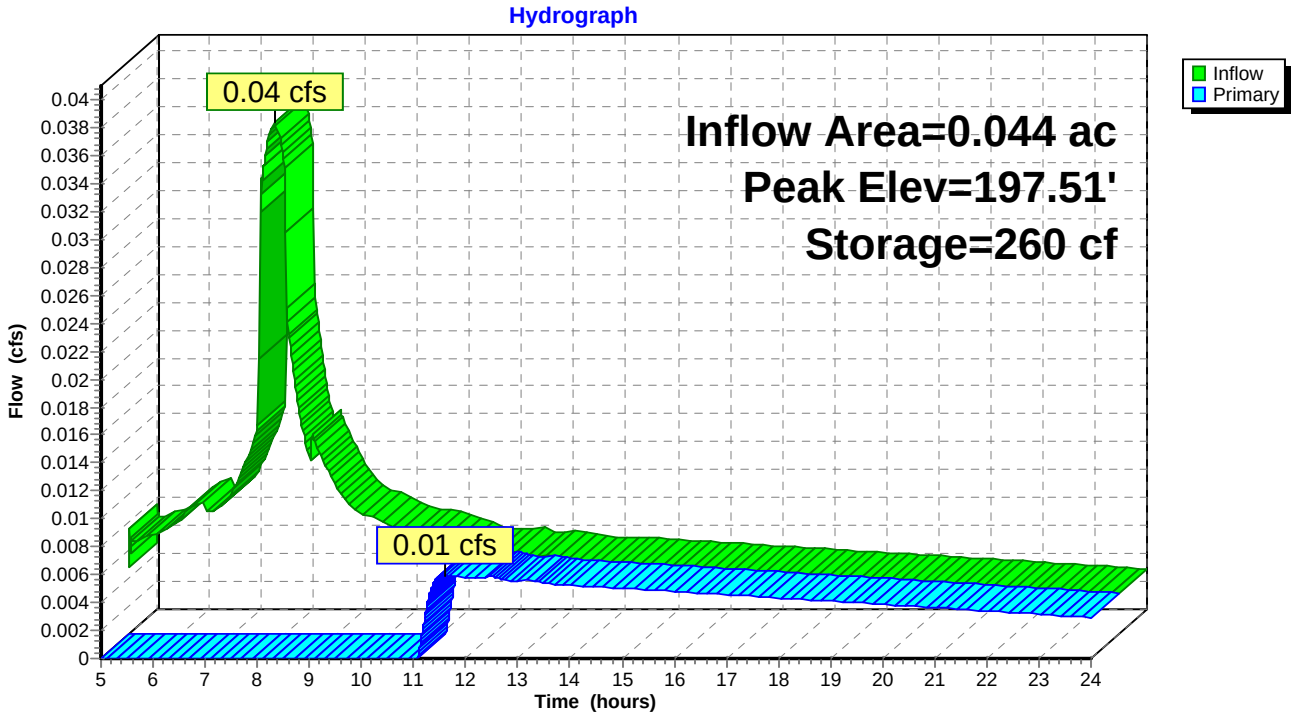
| Elevation (feet) | Surf.Area (sq-ft) | Inc.Store (cubic-feet) | Cum.Store (cubic-feet) |
|---|---|---|---|
| 195.50 | 283 | 0 | 0 |
| 197.00 | 283 | 425 | 425 |

| Elevation (feet) | Surf.Area (sq-ft) | Inc.Store (cubic-feet) | Cum.Store (cubic-feet) |
|---|---|---|---|
| 197.00 | 283 | 0 | 0 |
| 197.83 | 283 | 235 | 235 |

| Device | Routing | Invert | Outlet Devices |
|---|---|---|---|
| #1 | Device 2 | 197.50' | **4.0" Horiz. Orifice/Grate** Limited to weir flow C= 0.610 |
| #2 | Primary | 194.82' | **4.0" x 33.3' long Culvert** Ke= 0.500<br>Outlet Invert= 194.65' S= 0.0051 '/' Cc= 0.900 n= 0.013 |

**Primary OutFlow** Max=0.01 cfs @ 11.61 hrs HW=197.51' TW=194.87' (Dynamic Tailwater)
└─**2=Culvert** (Passes 0.01 cfs of 0.45 cfs potential flow)
  └─**1=Orifice/Grate** (Weir Controls 0.01 cfs @ 0.39 fps)

## Pond 3P: PLANTER



## Summary for Pond 4P: PLANTER

Inflow Area = 0.032 ac,100.00% Impervious, Inflow Depth > 2.91" for 10 YEAR event
Inflow = 0.03 cfs @ 7.78 hrs, Volume= 0.008 af
Outflow = 0.00 cfs @ 17.56 hrs, Volume= 0.002 af, Atten= 88%, Lag= 586.7 min
Primary = 0.00 cfs @ 17.56 hrs, Volume= 0.002 af

Routing by Dyn-Stor-Ind method, Time Span= 5.00-24.00 hrs, dt= 0.01 hrs
Peak Elev= 197.51' @ 17.56 hrs Surf.Area= 891 sf Storage= 272 cf

Plug-Flow detention time= 817.2 min calculated for 0.002 af (21% of inflow)
Center-of-Mass det. time= 497.5 min ( 1,211.7 - 714.2 )

| Volume | Invert | Avail.Storage | Storage Description |
|---|---|---|---|
| #1 | 194.50' | 98 cf | **1' Drain Rock (Prismatic)**Listed below (Recalc)<br>297 cf Overall x 33.0% Voids |
| #2 | 195.50' | 22 cf | **1.5' Growing Medium (Prismatic)**Listed below (Recalc)<br>446 cf Overall x 5.0% Voids |
| #3 | 197.00' | 247 cf | **Ponding Depth (Prismatic)**Listed below (Recalc) |
| | | 367 cf | Total Available Storage |

| Elevation (feet) | Surf.Area (sq-ft) | Inc.Store (cubic-feet) | Cum.Store (cubic-feet) |
|---|---|---|---|
| 194.50 | 297 | 0 | 0 |
| 195.50 | 297 | 297 | 297 |

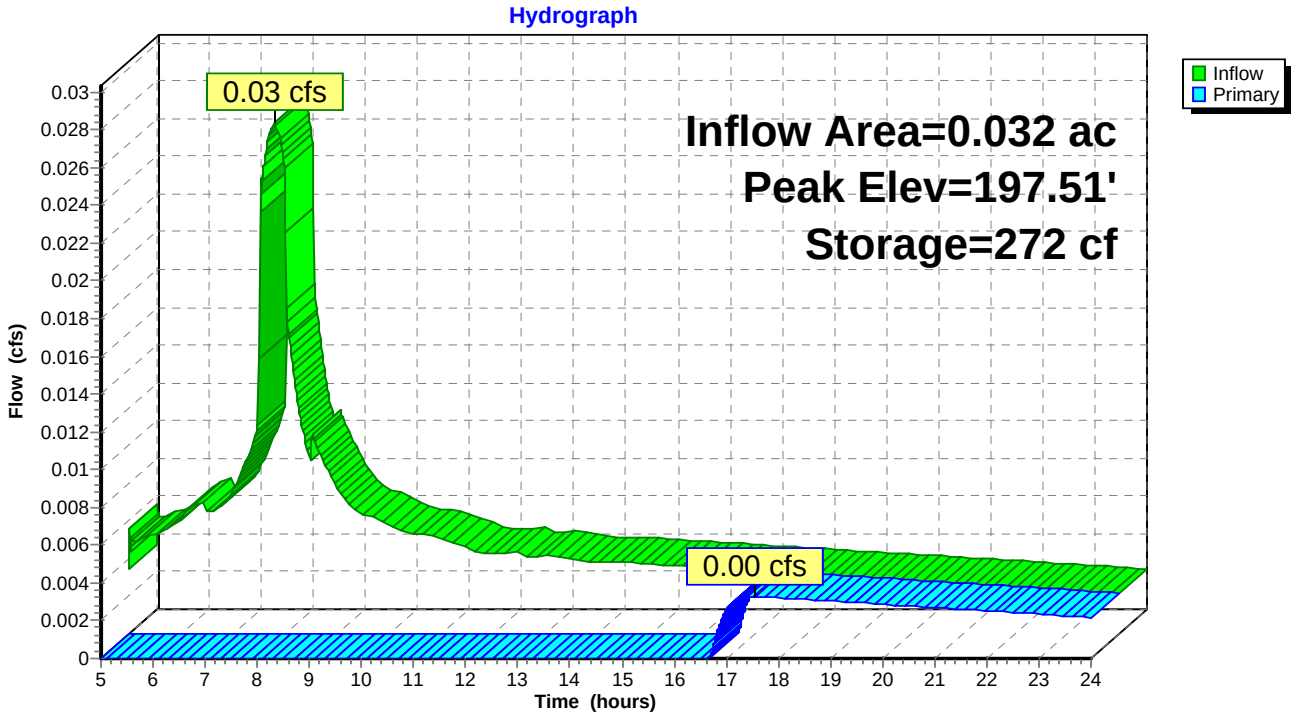
| Elevation (feet) | Surf.Area (sq-ft) | Inc.Store (cubic-feet) | Cum.Store (cubic-feet) |
|---|---|---|---|
| 195.50 | 297 | 0 | 0 |
| 197.00 | 297 | 446 | 446 |

| Elevation (feet) | Surf.Area (sq-ft) | Inc.Store (cubic-feet) | Cum.Store (cubic-feet) |
|---|---|---|---|
| 197.00 | 297 | 0 | 0 |
| 197.83 | 297 | 247 | 247 |

| Device | Routing | Invert | Outlet Devices |
|---|---|---|---|
| #1 | Device 2 | 197.50' | **4.0" Horiz. Orifice/Grate** Limited to weir flow C= 0.610 |
| #2 | Primary | 194.99' | **4.0" x 33.2' long Culvert** Ke= 0.500<br>Outlet Invert= 194.82' S= 0.0051 '/' Cc= 0.900 n= 0.013 |

**Primary OutFlow** Max=0.00 cfs @ 17.56 hrs HW=197.51' TW=194.86' (Dynamic Tailwater)
└─**2=Culvert** (Passes 0.00 cfs of 0.44 cfs potential flow)
└─**1=Orifice/Grate** (Weir Controls 0.00 cfs @ 0.32 fps)

## Pond 4P: PLANTER



# APPENDIX 2.10
# POST-DEVELOPED 25-YEAR STORM EVENT (4.0”)—HYDROGRAPH AND FLOW INFORMATION

Time span=5.00-24.00 hrs, dt=0.01 hrs, 1901 points
Runoff by SBUH method, Split Pervious/Imperv.
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

**Subcatchment 1S: ROOF AREA** Runoff Area=9,028 sf 100.00% Impervious Runoff Depth>3.34"
Tc=5.0 min CN=0/98 Runoff=0.19 cfs 0.058 af

**Subcatchment 2S: ROOF/STREET AREA** Runoff Area=2,233 sf 100.00% Impervious Runoff Depth>3.33"
Tc=0.0 min CN=0/98 Runoff=0.05 cfs 0.014 af

**Subcatchment 3S: ROOF/STREET AREA** Runoff Area=1,910 sf 100.00% Impervious Runoff Depth>3.33"
Tc=0.0 min CN=0/98 Runoff=0.04 cfs 0.012 af

**Subcatchment 4S: ROOF/STREET AREA** Runoff Area=1,412 sf 100.00% Impervious Runoff Depth>3.33"
Tc=0.0 min CN=0/98 Runoff=0.03 cfs 0.009 af

**Subcatchment 5S: ROOF AREA** Runoff Area=8,214 sf 100.00% Impervious Runoff Depth>3.34"
Tc=5.0 min CN=0/98 Runoff=0.18 cfs 0.053 af

**Subcatchment 6S: PARKING** Runoff Area=9,254 sf 100.00% Impervious Runoff Depth>3.34"
Tc=5.0 min CN=0/98 Runoff=0.20 cfs 0.059 af

**Subcatchment 7S: LANDSCAPE AREA** Runoff Area=26,140 sf 0.00% Impervious Runoff Depth>2.03"
Tc=5.0 min CN=80/0 Runoff=0.29 cfs 0.102 af

**Subcatchment 8S: NEW CONCRETE PATH** Runoff Area=5,916 sf 100.00% Impervious Runoff Depth>3.34"
Tc=5.0 min CN=0/98 Runoff=0.13 cfs 0.038 af

**Subcatchment 9S: EXISTING BUILDING** Runoff Area=13,332 sf 100.00% Impervious Runoff Depth>3.34"
Tc=5.0 min CN=0/98 Runoff=0.29 cfs 0.085 af

**Reach 1R: 6" STM** Avg. Depth=0.15' Max Vel=3.76 fps Inflow=0.19 cfs 0.058 af
D=6.0" n=0.013 L=18.0' S=0.0278 '/' Capacity=0.94 cfs Outflow=0.19 cfs 0.058 af

**Reach 2R: 4" STM** Avg. Depth=0.08' Max Vel=3.25 fps Inflow=0.05 cfs 0.014 af
D=4.0" n=0.013 L=10.0' S=0.0500 '/' Capacity=0.43 cfs Outflow=0.05 cfs 0.014 af

**Reach 3R: 4" STM** Avg. Depth=0.07' Max Vel=3.11 fps Inflow=0.04 cfs 0.012 af
D=4.0" n=0.013 L=10.0' S=0.0500 '/' Capacity=0.43 cfs Outflow=0.04 cfs 0.012 af

**Reach 4R: 4" STM** Avg. Depth=0.06' Max Vel=2.84 fps Inflow=0.03 cfs 0.009 af
D=4.0" n=0.013 L=10.0' S=0.0500 '/' Capacity=0.43 cfs Outflow=0.03 cfs 0.009 af

**Reach 5R: 6" STM** Avg. Depth=0.27' Max Vel=5.40 fps Inflow=0.59 cfs 0.192 af
D=6.0" n=0.013 L=30.0' S=0.0333 '/' Capacity=1.02 cfs Outflow=0.59 cfs 0.192 af

**Reach 6R: 6" STM** Avg. Depth=0.50' Max Vel=3.50 fps Inflow=0.79 cfs 0.251 af
D=6.0" n=0.013 L=260.0' S=0.0115 '/' Capacity=0.60 cfs Outflow=0.65 cfs 0.251 af

**Reach 8R: 8" STM** Avg. Depth=0.28' Max Vel=1.38 fps Inflow=0.19 cfs 0.063 af
D=8.0" n=0.013 L=320.0' S=0.0019 '/' Capacity=0.52 cfs Outflow=0.19 cfs 0.063 af

**Reach 9R: 8" STM** Avg. Depth=0.50' Max Vel=2.79 fps Inflow=0.79 cfs 0.314 af
D=8.0" n=0.013 L=126.5' S=0.0051 '/' Capacity=0.86 cfs Outflow=0.79 cfs 0.314 af

**Reach 10R: 8" STM** Avg. Depth=0.46' Max Vel=4.14 fps Inflow=1.07 cfs 0.399 af
D=8.0" n=0.013 L=292.1' S=0.0115 '/' Capacity=1.29 cfs Outflow=1.07 cfs 0.399 af

**Pond 1P: PLANTER** Peak Elev=198.59' Storage=566 cf Inflow=0.19 cfs 0.058 af
Outflow=0.19 cfs 0.046 af

**Pond 2P: PLANTER** Peak Elev=197.53' Storage=248 cf Inflow=0.05 cfs 0.014 af
Outflow=0.01 cfs 0.009 af

**Pond 3P: PLANTER** Peak Elev=197.52' Storage=261 cf Inflow=0.04 cfs 0.012 af
Outflow=0.01 cfs 0.006 af

**Pond 4P: PLANTER** Peak Elev=197.51' Storage=272 cf Inflow=0.03 cfs 0.009 af
Outflow=0.00 cfs 0.003 af

## Summary for Subcatchment 1S: ROOF AREA

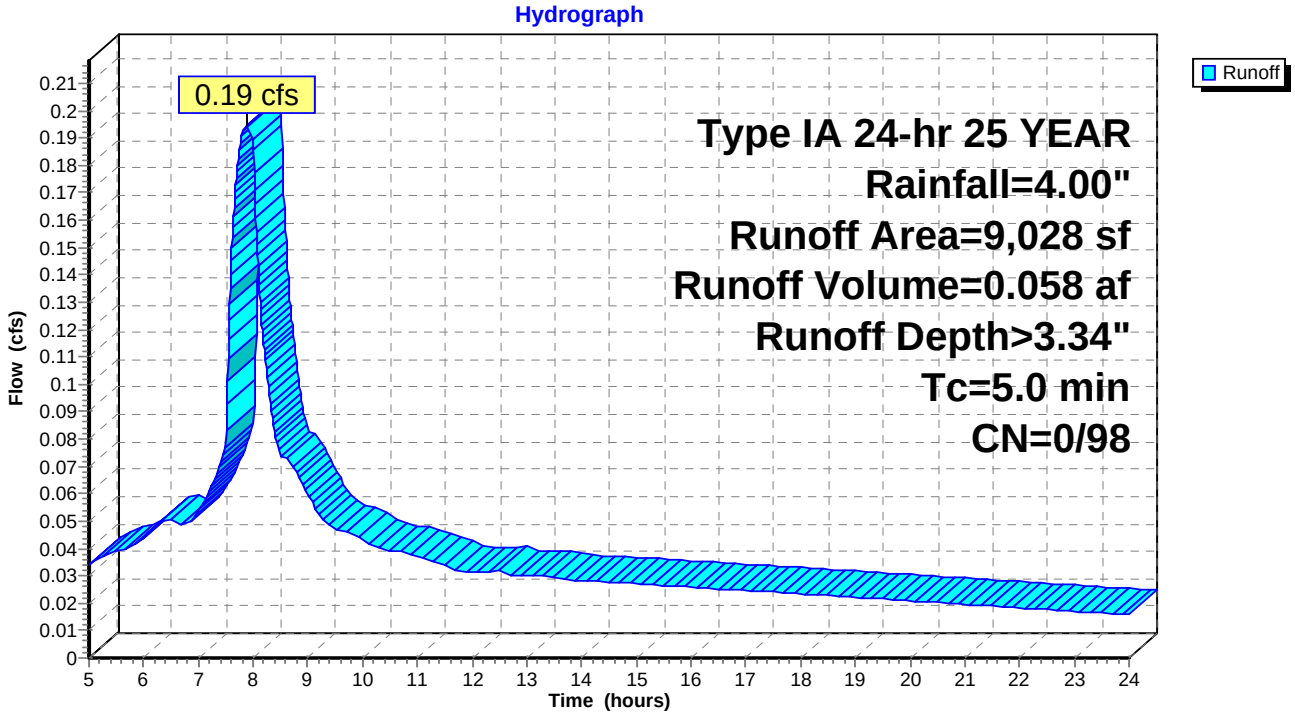
Runoff = 0.19 cfs @ 7.88 hrs, Volume= 0.058 af, Depth> 3.34"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 5.00-24.00 hrs, dt= 0.01 hrs
Type IA 24-hr 25 YEAR Rainfall=4.00"

| | Area (sf) | CN | Description |
|---|---|---|---|
| * | 9,028 | 98 | Roof Area |
| | 9,028 | 98 | Impervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|---|---|---|---|---|---|
| 5.0 | | | | | **Direct Entry,** |

## Subcatchment 1S: ROOF AREA



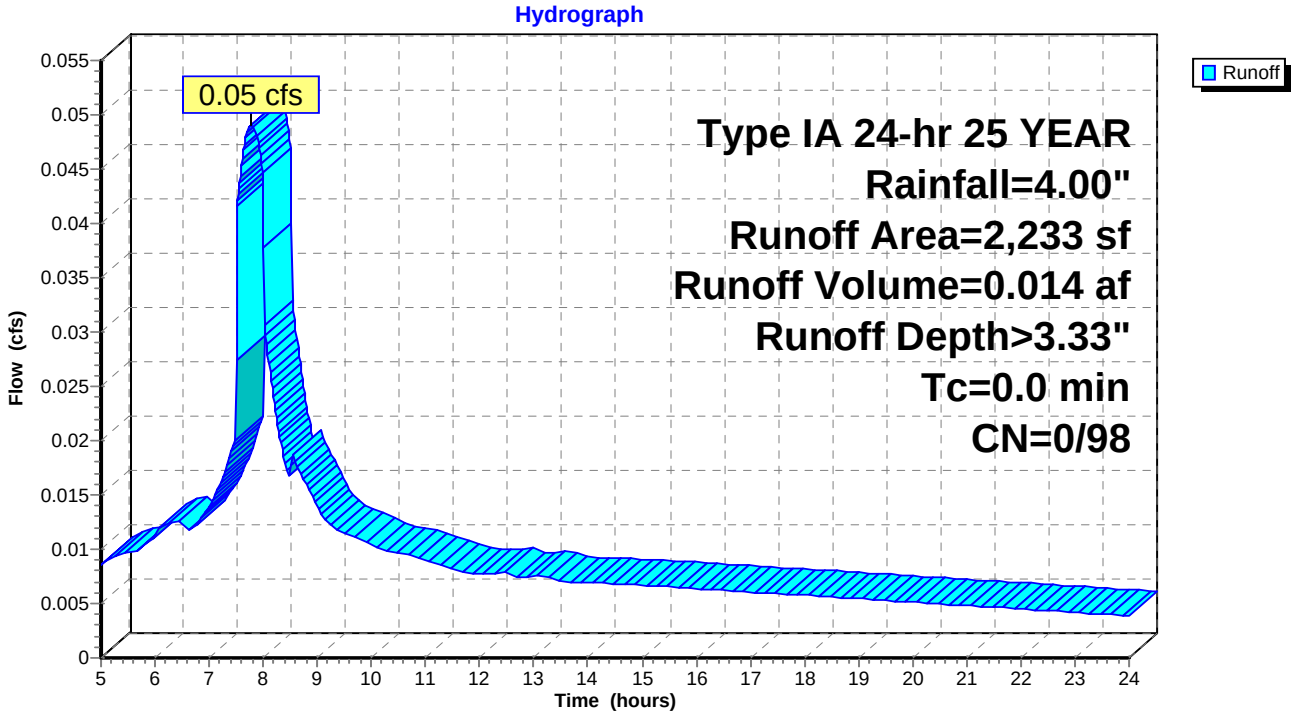
## Summary for Subcatchment 2S: ROOF/STREET AREA

Runoff = 0.05 cfs @ 7.78 hrs, Volume= 0.014 af, Depth> 3.33"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 5.00-24.00 hrs, dt= 0.01 hrs
Type IA 24-hr 25 YEAR Rainfall=4.00"

| | Area (sf) | CN | Description |
|---|---|---|---|
| * | 981 | 98 | Street Area |
| * | 1,252 | 98 | Roof Area |
| | 2,233 | 98 | Weighted Average |
| | 2,233 | 98 | Impervious Area |

## Subcatchment 2S: ROOF/STREET AREA



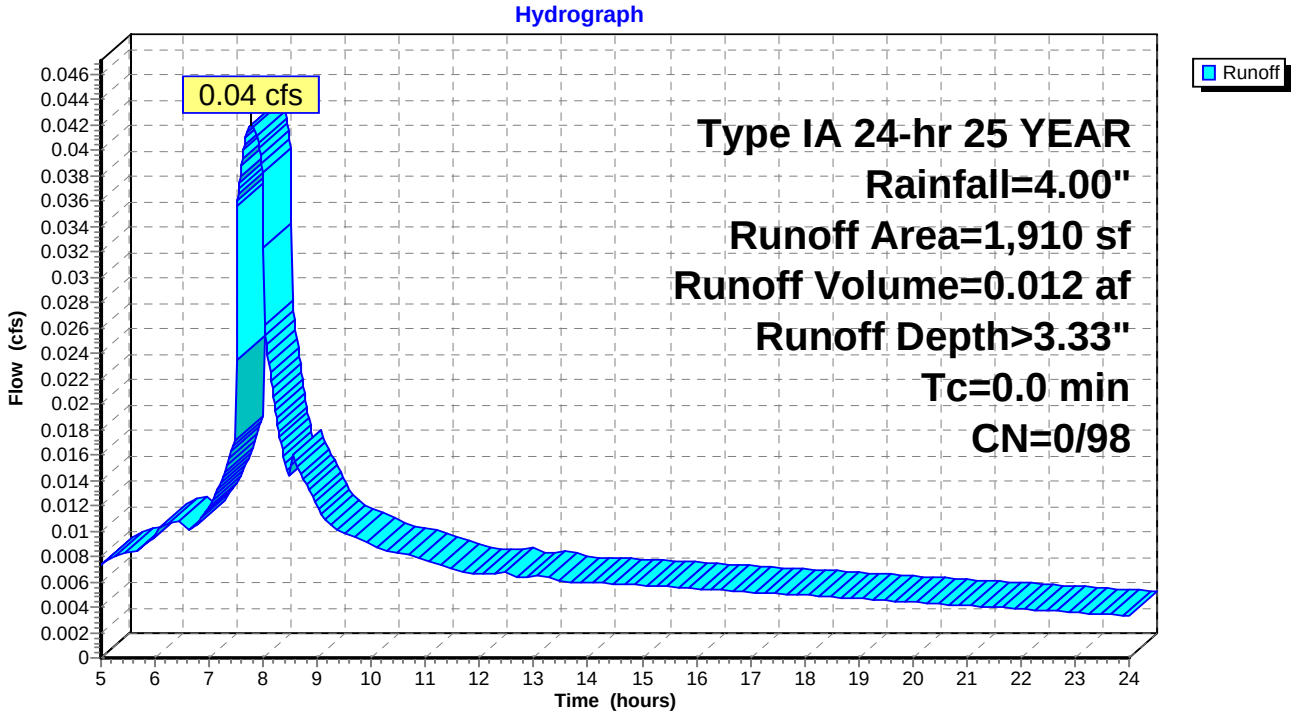
## Summary for Subcatchment 3S: ROOF/STREET AREA

Runoff = 0.04 cfs @ 7.78 hrs, Volume= 0.012 af, Depth> 3.33"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 5.00-24.00 hrs, dt= 0.01 hrs
Type IA 24-hr 25 YEAR Rainfall=4.00"

| | Area (sf) | CN | Description |
|---|---|---|---|
| * | 637 | 98 | Street Area |
| * | 1,273 | 98 | Roof Area |
| | 1,910 | 98 | Weighted Average |
| | 1,910 | 98 | Impervious Area |

## Subcatchment 3S: ROOF/STREET AREA



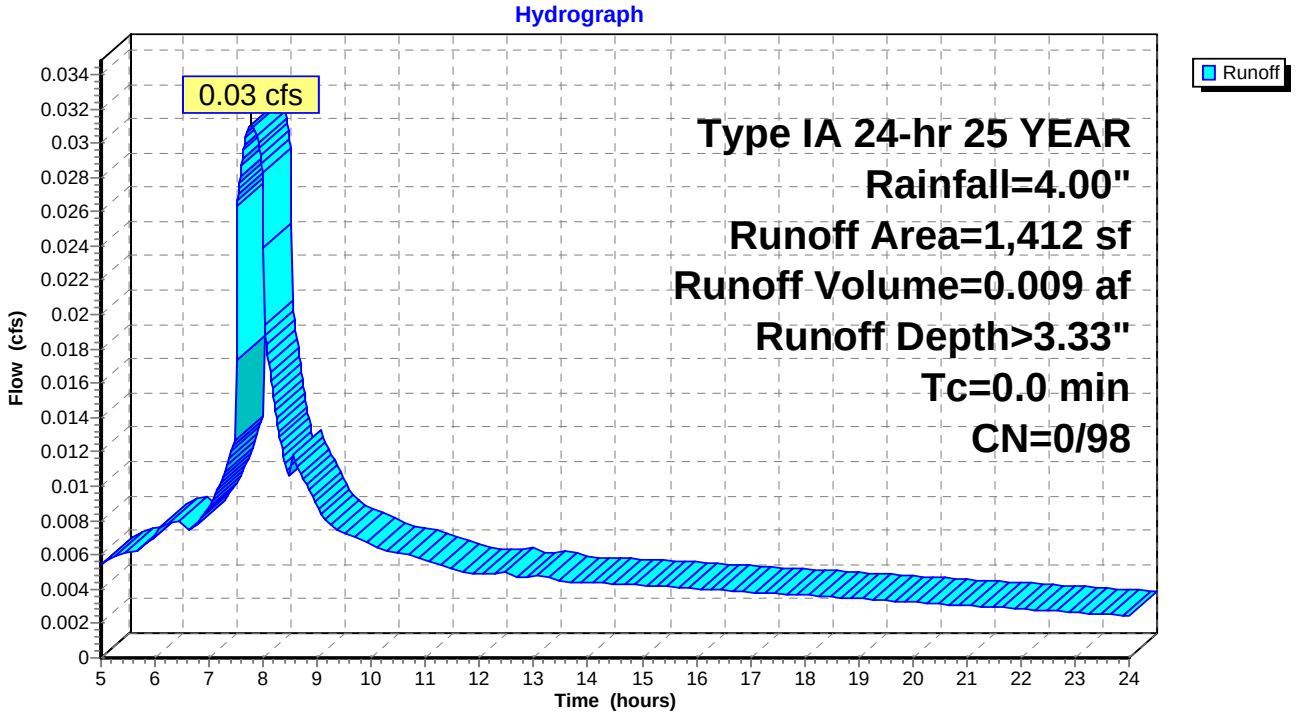
## Summary for Subcatchment 4S: ROOF/STREET AREA

Runoff = 0.03 cfs @ 7.78 hrs, Volume= 0.009 af, Depth> 3.33"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 5.00-24.00 hrs, dt= 0.01 hrs
Type IA 24-hr 25 YEAR Rainfall=4.00"

| | Area (sf) | CN | Description |
|---|---|---|---|
| * | 625 | 98 | Street Area |
| * | 787 | 98 | Roof Area |
| | 1,412 | 98 | Weighted Average |
| | 1,412 | 98 | Impervious Area |

## Subcatchment 4S: ROOF/STREET AREA



## Summary for Subcatchment 5S: ROOF AREA

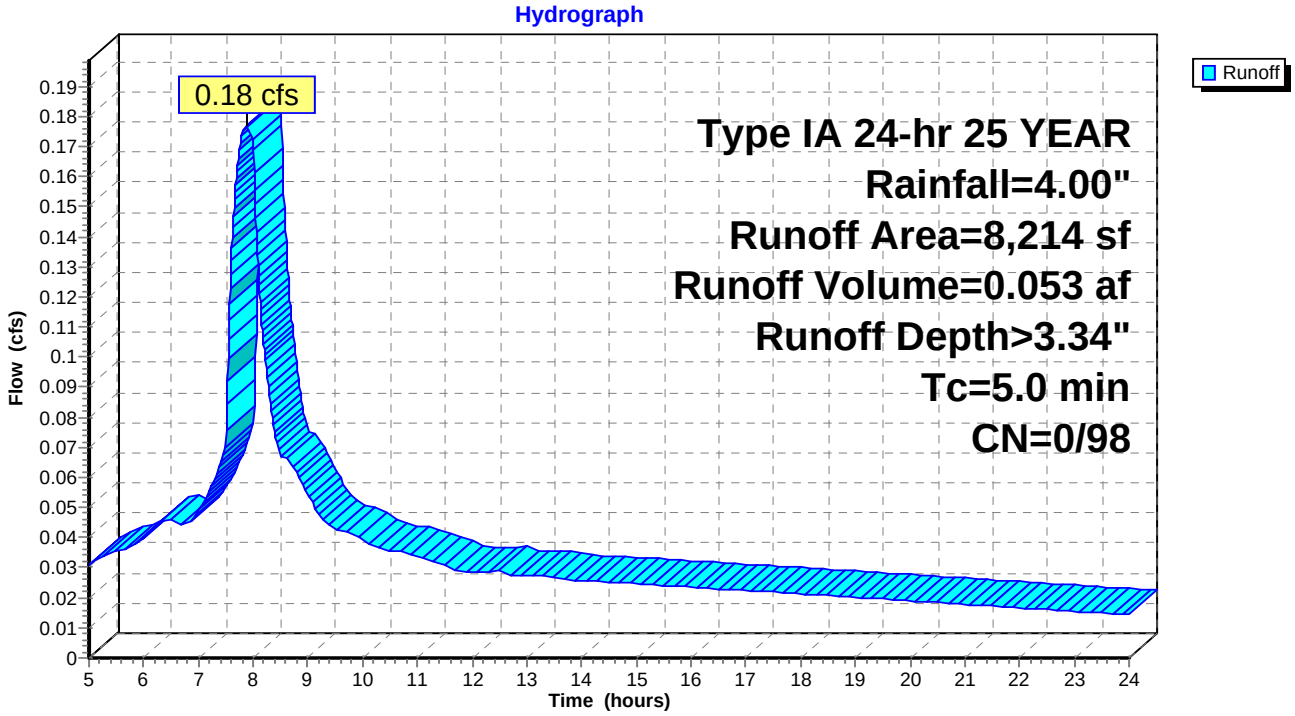
Runoff = 0.18 cfs @ 7.88 hrs, Volume= 0.053 af, Depth> 3.34"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 5.00-24.00 hrs, dt= 0.01 hrs
Type IA 24-hr 25 YEAR Rainfall=4.00"

| | Area (sf) | CN | Description |
|---|---|---|---|
| * | 8,214 | 98 | Roof Area |
| | 8,214 | 98 | Impervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|---|---|---|---|---|---|
| 5.0 | | | | | **Direct Entry,** |

## Subcatchment 5S: ROOF AREA



## Summary for Subcatchment 6S: PARKING

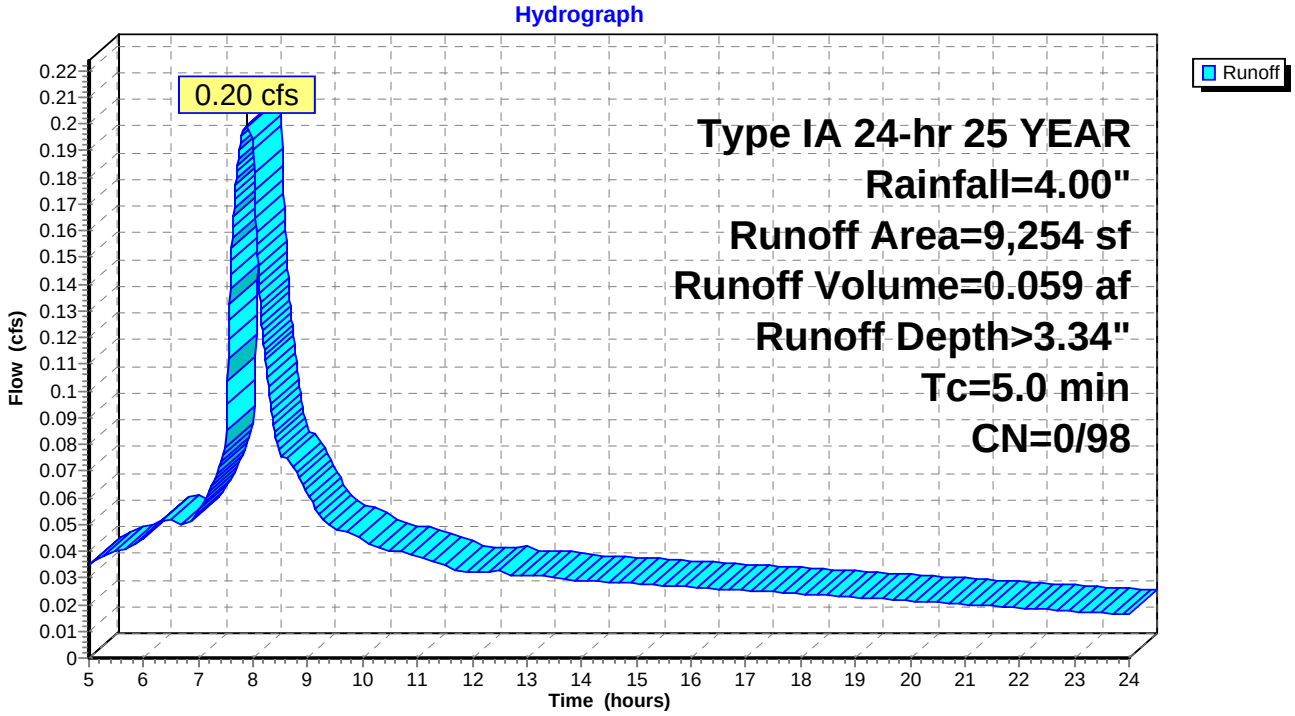
Runoff = 0.20 cfs @ 7.88 hrs, Volume= 0.059 af, Depth> 3.34"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 5.00-24.00 hrs, dt= 0.01 hrs
Type IA 24-hr 25 YEAR Rainfall=4.00"

| | Area (sf) | CN | Description |
|---|---|---|---|
| * | 9,254 | 98 | Parking Area |
| | 9,254 | 98 | Impervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|---|---|---|---|---|---|
| 5.0 | | | | | **Direct Entry,** |

## Subcatchment 6S: PARKING



## Summary for Subcatchment 7S: LANDSCAPE AREA

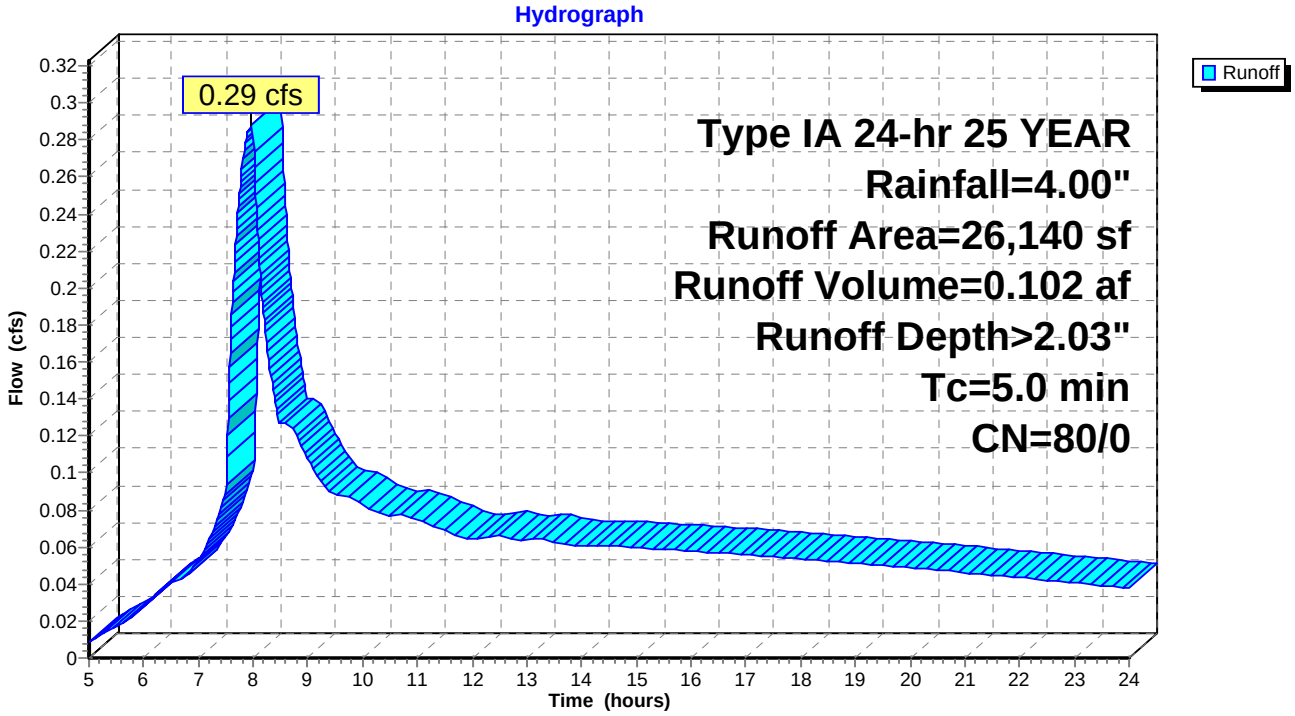
Runoff = 0.29 cfs @ 7.97 hrs, Volume= 0.102 af, Depth> 2.03"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 5.00-24.00 hrs, dt= 0.01 hrs
Type IA 24-hr 25 YEAR Rainfall=4.00"

| Area (sf) | CN | Description |
|---|---|---|
| 26,140 | 80 | >75% Grass cover, Good, HSG D |
| 26,140 | 80 | Pervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|---|---|---|---|---|---|
| 5.0 | | | | | **Direct Entry,** |

## Subcatchment 7S: LANDSCAPE AREA



## Summary for Subcatchment 8S: NEW CONCRETE PATH

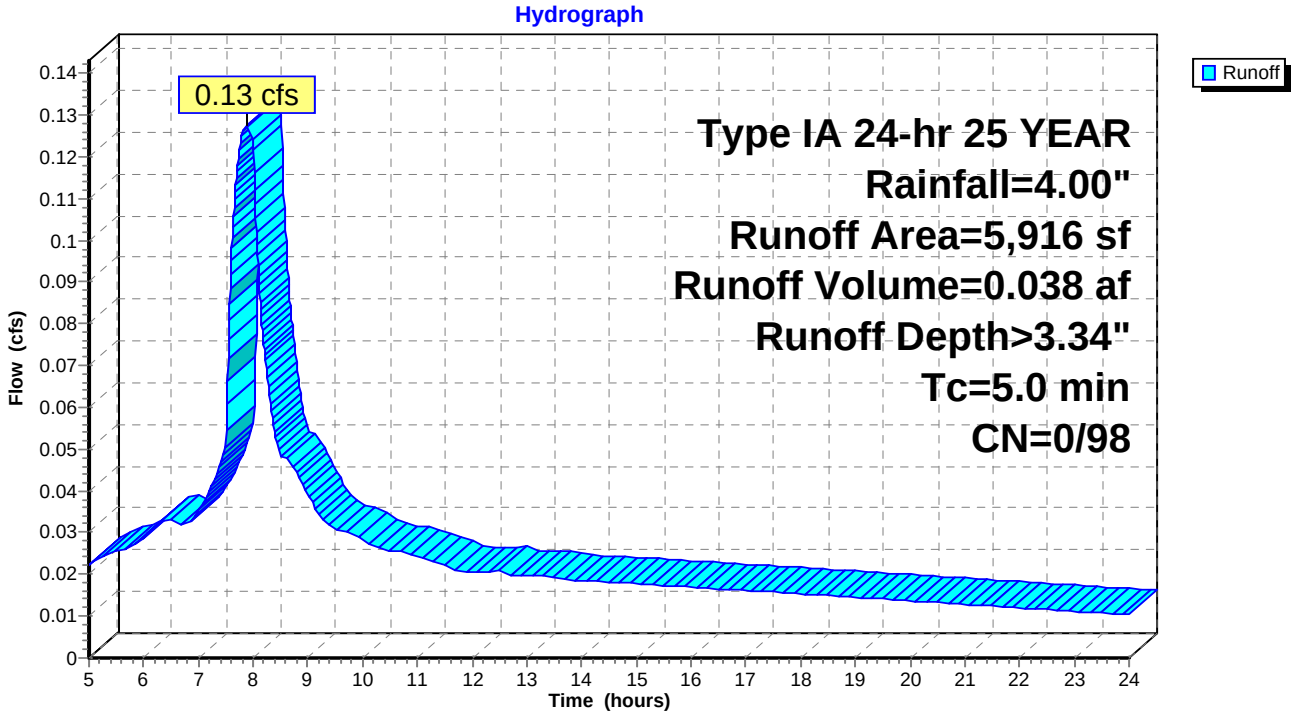
Runoff = 0.13 cfs @ 7.88 hrs, Volume= 0.038 af, Depth> 3.34"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 5.00-24.00 hrs, dt= 0.01 hrs
Type IA 24-hr 25 YEAR Rainfall=4.00"

| | Area (sf) | CN | Description |
|---|---|---|---|
| * | 5,916 | 98 | Concrete path |
| | 5,916 | 98 | Impervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|---|---|---|---|---|---|
| 5.0 | | | | | **Direct Entry,** |

## Subcatchment 8S: NEW CONCRETE PATH



## Summary for Subcatchment 9S: EXISTING BUILDING AND PAVING

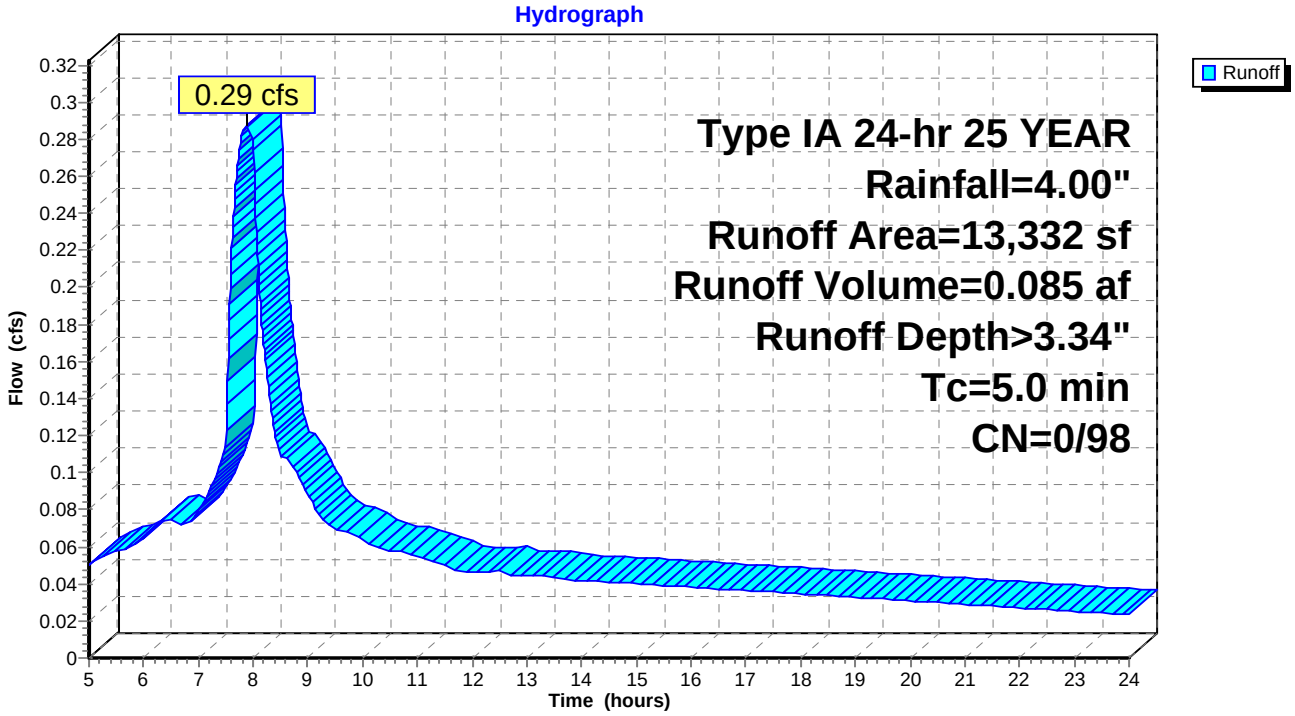
Runoff = 0.29 cfs @ 7.88 hrs, Volume= 0.085 af, Depth> 3.34"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 5.00-24.00 hrs, dt= 0.01 hrs
Type IA 24-hr 25 YEAR Rainfall=4.00"

| | Area (sf) | CN | Description |
|---|---|---|---|
| * | 13,332 | 98 | Existing Building and Paving |
| | 13,332 | 98 | Impervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|---|---|---|---|---|---|
| 5.0 | | | | | **Direct Entry,** |

## Subcatchment 9S: EXISTING BUILDING AND PAVING



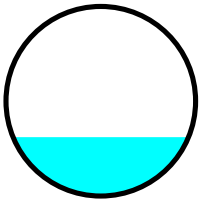
## Summary for Reach 1R: 6" STM

Inflow Area = 0.207 ac,100.00% Impervious, Inflow Depth > 3.34" for 25 YEAR event
Inflow = 0.19 cfs @ 7.88 hrs, Volume= 0.058 af
Outflow = 0.19 cfs @ 7.88 hrs, Volume= 0.058 af, Atten= 0%, Lag= 0.1 min

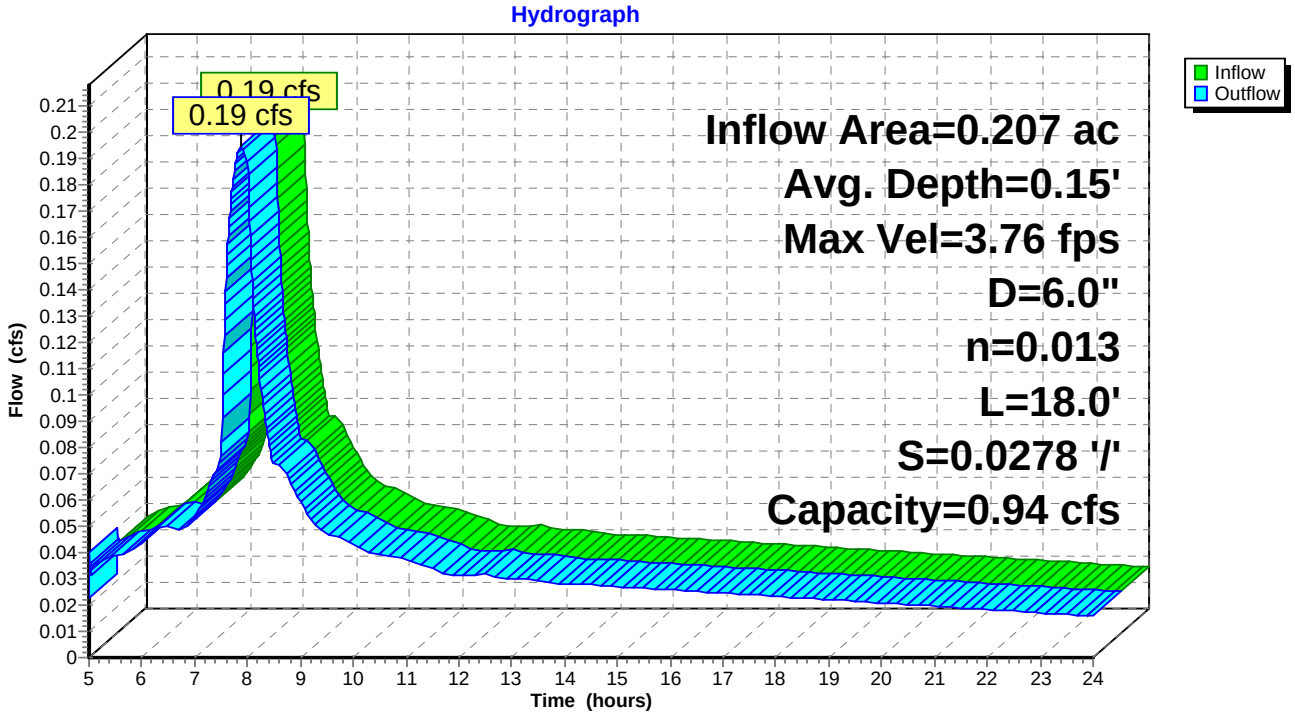
Routing by Dyn-Stor-Ind method, Time Span= 5.00-24.00 hrs, dt= 0.01 hrs
Max. Velocity= 3.76 fps, Min. Travel Time= 0.1 min
Avg. Velocity = 2.22 fps, Avg. Travel Time= 0.1 min

Peak Storage= 1 cf @ 7.88 hrs, Average Depth at Peak Storage= 0.15'
Bank-Full Depth= 0.50', Capacity at Bank-Full= 0.94 cfs

6.0" Diameter Pipe, n= 0.013 Corrugated PE, smooth interior
Length= 18.0' Slope= 0.0278 '/'
Inlet Invert= 199.00', Outlet Invert= 198.50'



### Reach 1R: 6" STM



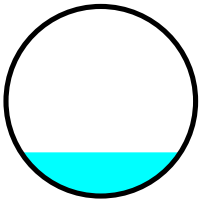
## Summary for Reach 2R: 4" STM

Inflow Area = 0.051 ac,100.00% Impervious, Inflow Depth > 3.33" for 25 YEAR event
Inflow = 0.05 cfs @ 7.78 hrs, Volume= 0.014 af
Outflow = 0.05 cfs @ 7.78 hrs, Volume= 0.014 af, Atten= 0%, Lag= 0.0 min

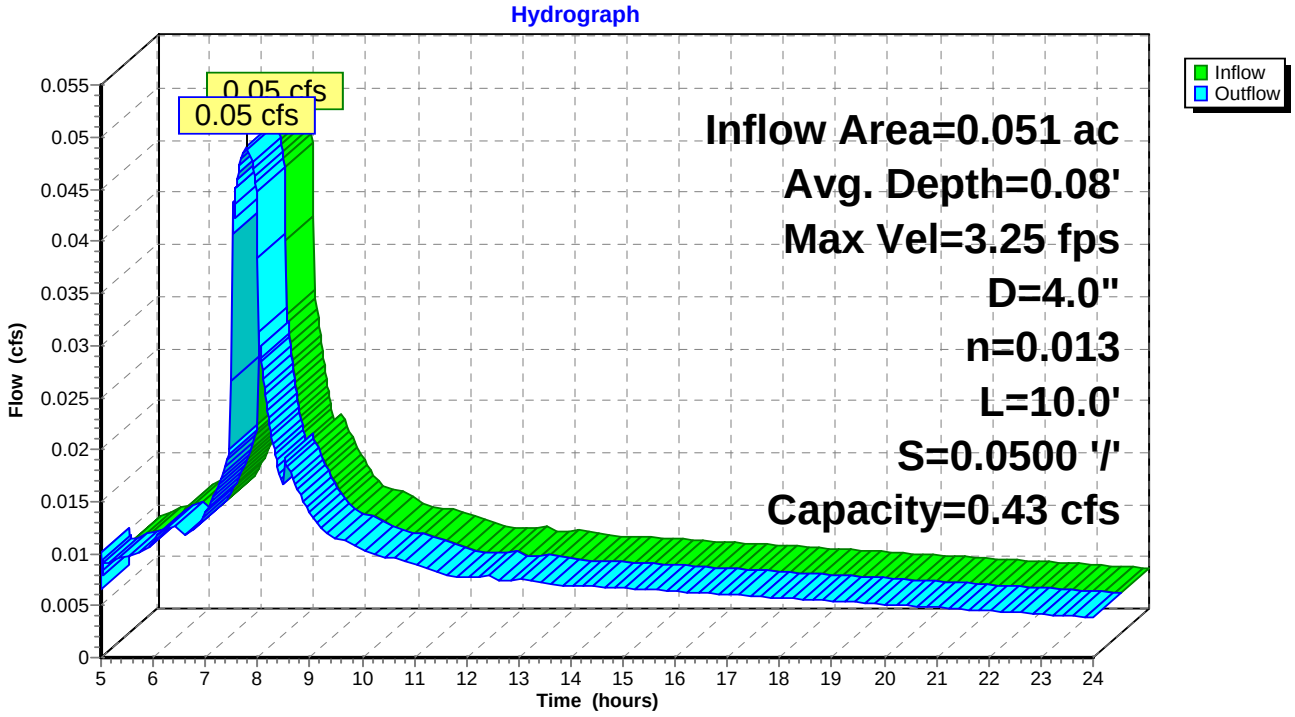
Routing by Dyn-Stor-Ind method, Time Span= 5.00-24.00 hrs, dt= 0.01 hrs
Max. Velocity= 3.25 fps, Min. Travel Time= 0.1 min
Avg. Velocity = 1.90 fps, Avg. Travel Time= 0.1 min

Peak Storage= 0 cf @ 7.78 hrs, Average Depth at Peak Storage= 0.08'
Bank-Full Depth= 0.33', Capacity at Bank-Full= 0.43 cfs

4.0" Diameter Pipe, n= 0.013 Corrugated PE, smooth interior
Length= 10.0' Slope= 0.0500 '/'
Inlet Invert= 198.00', Outlet Invert= 197.50'



### Reach 2R: 4" STM



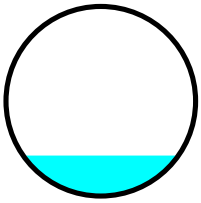
## Summary for Reach 3R: 4" STM

Inflow Area = 0.044 ac,100.00% Impervious, Inflow Depth > 3.33" for 25 YEAR event
Inflow = 0.04 cfs @ 7.78 hrs, Volume= 0.012 af
Outflow = 0.04 cfs @ 7.78 hrs, Volume= 0.012 af, Atten= 0%, Lag= 0.0 min

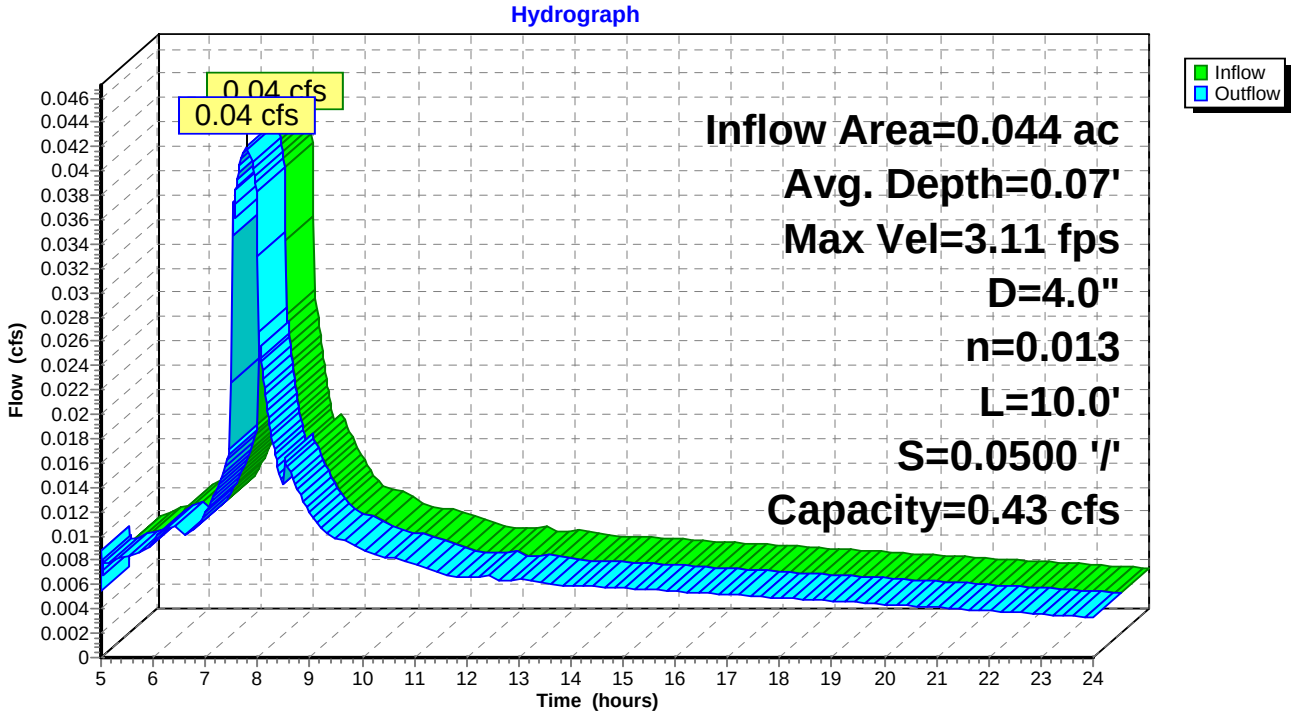
Routing by Dyn-Stor-Ind method, Time Span= 5.00-24.00 hrs, dt= 0.01 hrs
Max. Velocity= 3.11 fps, Min. Travel Time= 0.1 min
Avg. Velocity = 1.81 fps, Avg. Travel Time= 0.1 min

Peak Storage= 0 cf @ 7.78 hrs, Average Depth at Peak Storage= 0.07'
Bank-Full Depth= 0.33', Capacity at Bank-Full= 0.43 cfs

4.0" Diameter Pipe, n= 0.013 Corrugated PE, smooth interior
Length= 10.0' Slope= 0.0500 '/'
Inlet Invert= 198.00', Outlet Invert= 197.50'



### Reach 3R: 4" STM



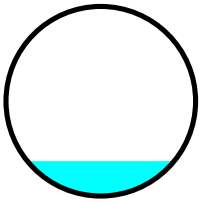
## Summary for Reach 4R: 4" STM

Inflow Area = 0.032 ac,100.00% Impervious, Inflow Depth > 3.33" for 25 YEAR event
Inflow = 0.03 cfs @ 7.78 hrs, Volume= 0.009 af
Outflow = 0.03 cfs @ 7.78 hrs, Volume= 0.009 af, Atten= 0%, Lag= 0.0 min

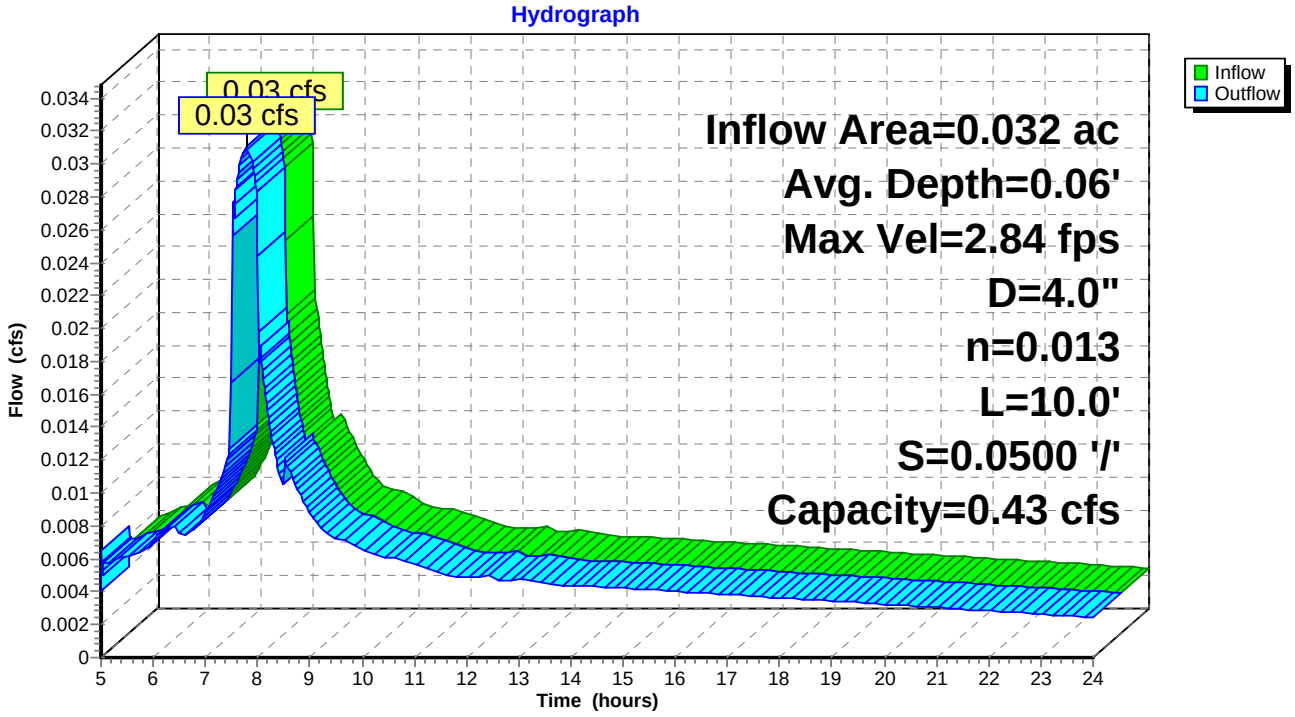
Routing by Dyn-Stor-Ind method, Time Span= 5.00-24.00 hrs, dt= 0.01 hrs
Max. Velocity= 2.84 fps, Min. Travel Time= 0.1 min
Avg. Velocity = 1.65 fps, Avg. Travel Time= 0.1 min

Peak Storage= 0 cf @ 7.78 hrs, Average Depth at Peak Storage= 0.06'
Bank-Full Depth= 0.33', Capacity at Bank-Full= 0.43 cfs

4.0" Diameter Pipe, n= 0.013 Corrugated PE, smooth interior
Length= 10.0' Slope= 0.0500 '/'
Inlet Invert= 198.00', Outlet Invert= 197.50'



### Reach 4R: 4" STM



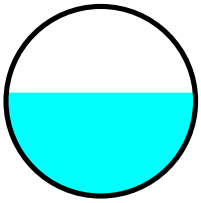
## Summary for Reach 5R: 6" STM

Inflow Area = 0.924 ac, 35.09% Impervious, Inflow Depth > 2.49" for 25 YEAR event
Inflow = 0.59 cfs @ 7.92 hrs, Volume= 0.192 af
Outflow = 0.59 cfs @ 7.93 hrs, Volume= 0.192 af, Atten= 0%, Lag= 0.1 min

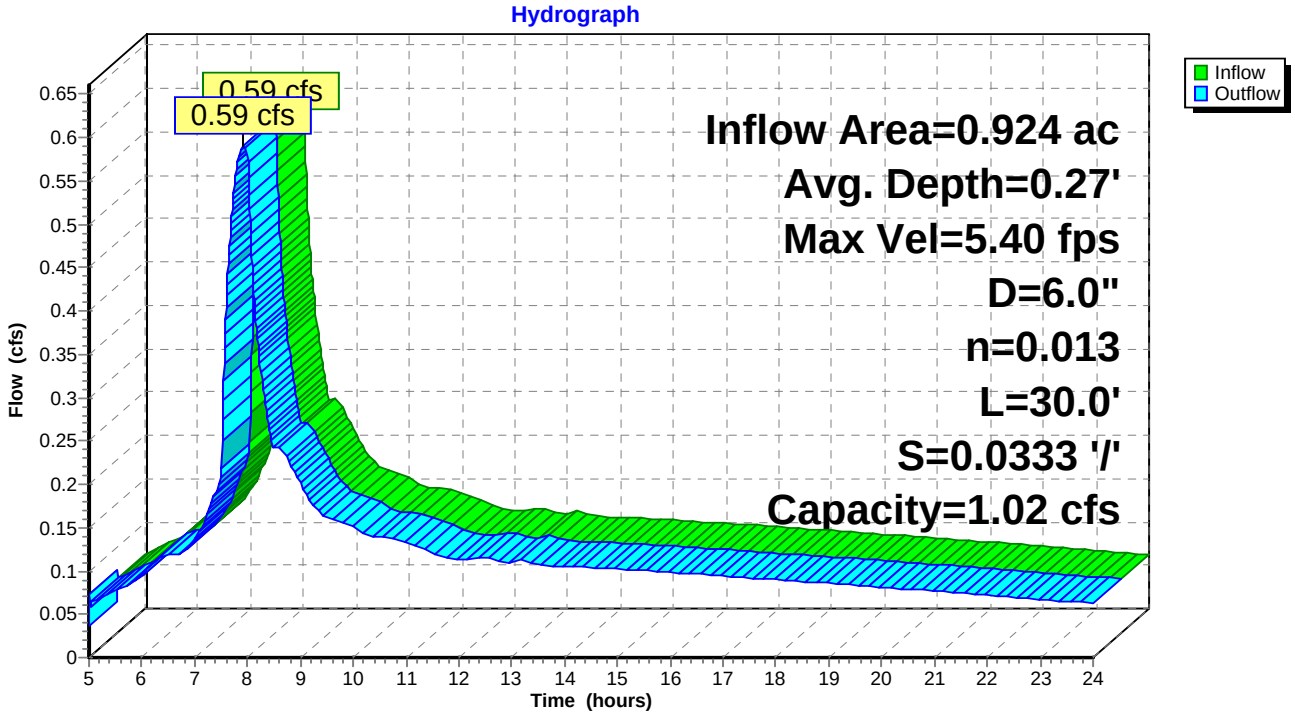
Routing by Dyn-Stor-Ind method, Time Span= 5.00-24.00 hrs, dt= 0.01 hrs
Max. Velocity= 5.40 fps, Min. Travel Time= 0.1 min
Avg. Velocity = 3.41 fps, Avg. Travel Time= 0.1 min

Peak Storage= 3 cf @ 7.93 hrs, Average Depth at Peak Storage= 0.27'
Bank-Full Depth= 0.50', Capacity at Bank-Full= 1.02 cfs

6.0" Diameter Pipe, n= 0.013 Corrugated PE, smooth interior
Length= 30.0' Slope= 0.0333 '/'
Inlet Invert= 197.00', Outlet Invert= 196.00'



### Reach 5R: 6" STM



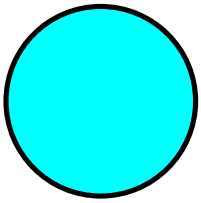
## Summary for Reach 6R: 6" STM

Inflow Area = 1.137 ac, 47.22% Impervious, Inflow Depth > 2.65" for 25 YEAR event
Inflow = 0.79 cfs @ 7.91 hrs, Volume= 0.251 af
Outflow = 0.65 cfs @ 7.69 hrs, Volume= 0.251 af, Atten= 18%, Lag= 0.0 min

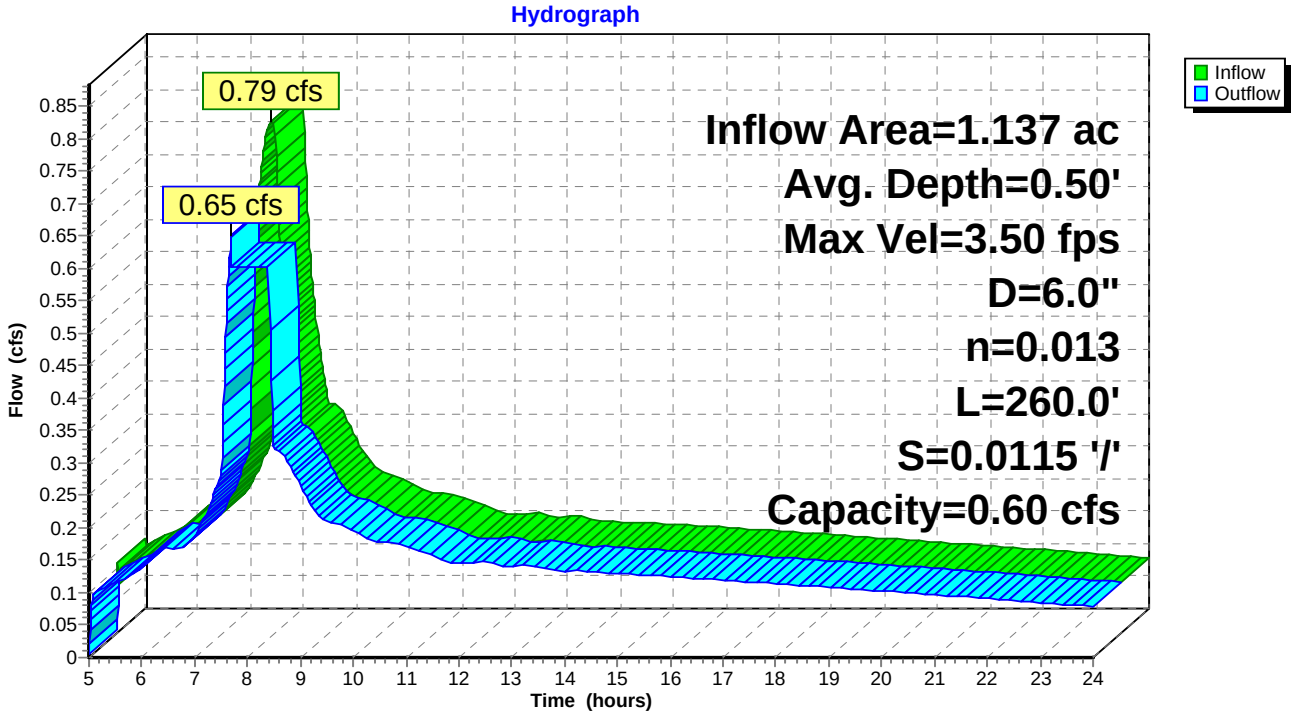
Routing by Dyn-Stor-Ind method, Time Span= 5.00-24.00 hrs, dt= 0.01 hrs
Max. Velocity= 3.50 fps, Min. Travel Time= 1.2 min
Avg. Velocity = 2.49 fps, Avg. Travel Time= 1.7 min

Peak Storage= 51 cf @ 7.70 hrs, Average Depth at Peak Storage= 0.50'
Bank-Full Depth= 0.50', Capacity at Bank-Full= 0.60 cfs

6.0" Diameter Pipe, n= 0.013 Corrugated PE, smooth interior
Length= 260.0' Slope= 0.0115 '/'
Inlet Invert= 199.00', Outlet Invert= 196.00'



### Reach 6R: 6" STM



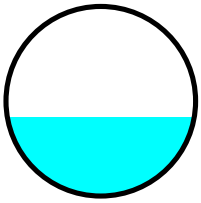
## Summary for Reach 8R: 8" STM

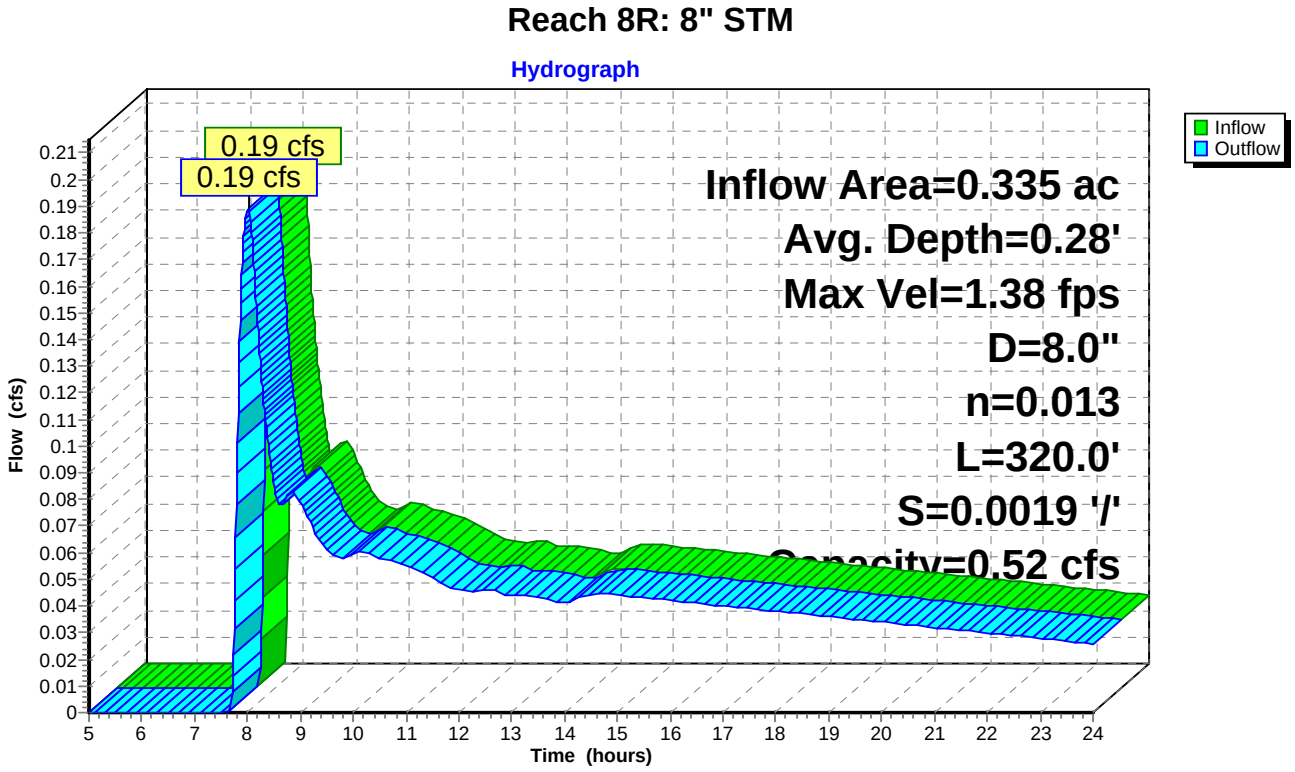
Inflow Area = 0.335 ac,100.00% Impervious, Inflow Depth > 2.27" for 25 YEAR event
Inflow = 0.19 cfs @ 7.96 hrs, Volume= 0.063 af
Outflow = 0.19 cfs @ 8.02 hrs, Volume= 0.063 af, Atten= 2%, Lag= 3.5 min

Routing by Dyn-Stor-Ind method, Time Span= 5.00-24.00 hrs, dt= 0.01 hrs
Max. Velocity= 1.38 fps, Min. Travel Time= 3.9 min
Avg. Velocity = 0.91 fps, Avg. Travel Time= 5.9 min

Peak Storage= 44 cf @ 8.02 hrs, Average Depth at Peak Storage= 0.28'
Bank-Full Depth= 0.67', Capacity at Bank-Full= 0.52 cfs

8.0" Diameter Pipe, n= 0.013 Corrugated PE, smooth interior
Length= 320.0' Slope= 0.0019 '/'
Inlet Invert= 194.74', Outlet Invert= 194.14'





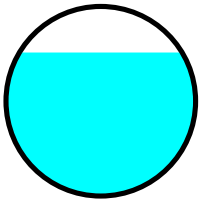
## Summary for Reach 9R: 8" STM

Inflow Area = 1.472 ac, 59.22% Impervious, Inflow Depth > 2.56" for 25 YEAR event
Inflow = 0.79 cfs @ 8.02 hrs, Volume= 0.314 af
Outflow = 0.79 cfs @ 8.03 hrs, Volume= 0.314 af, Atten= 0%, Lag= 0.6 min

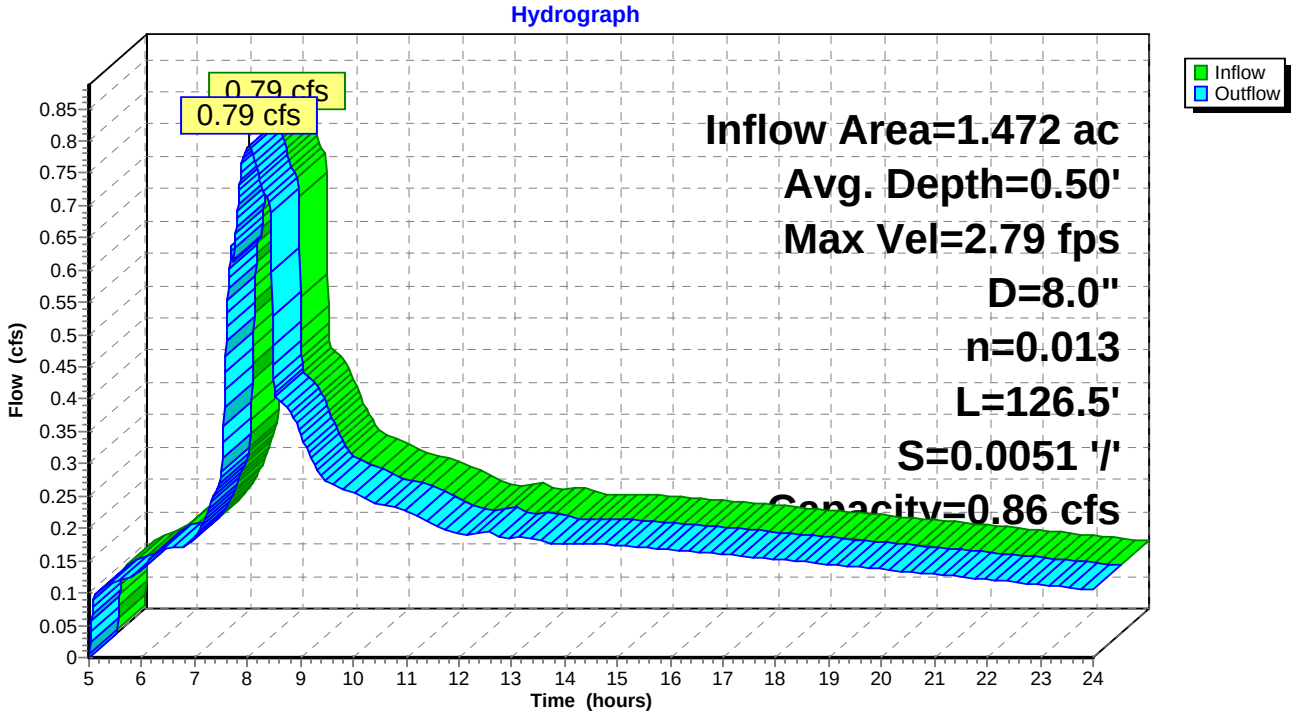
Routing by Dyn-Stor-Ind method, Time Span= 5.00-24.00 hrs, dt= 0.01 hrs
Max. Velocity= 2.79 fps, Min. Travel Time= 0.8 min
Avg. Velocity = 1.95 fps, Avg. Travel Time= 1.1 min

Peak Storage= 36 cf @ 8.03 hrs, Average Depth at Peak Storage= 0.50'
Bank-Full Depth= 0.67', Capacity at Bank-Full= 0.86 cfs

8.0" Diameter Pipe, n= 0.013 Corrugated PE, smooth interior
Length= 126.5' Slope= 0.0051 '/'
Inlet Invert= 194.14', Outlet Invert= 193.50'



### Reach 9R: 8" STM



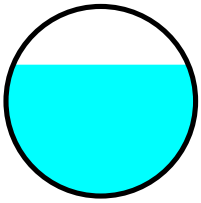
## Summary for Reach 10R: 8" STM

Inflow Area = 1.778 ac, 66.24% Impervious, Inflow Depth > 2.69" for 25 YEAR event
Inflow = 1.07 cfs @ 7.97 hrs, Volume= 0.399 af
Outflow = 1.07 cfs @ 7.99 hrs, Volume= 0.399 af, Atten= 0%, Lag= 1.0 min

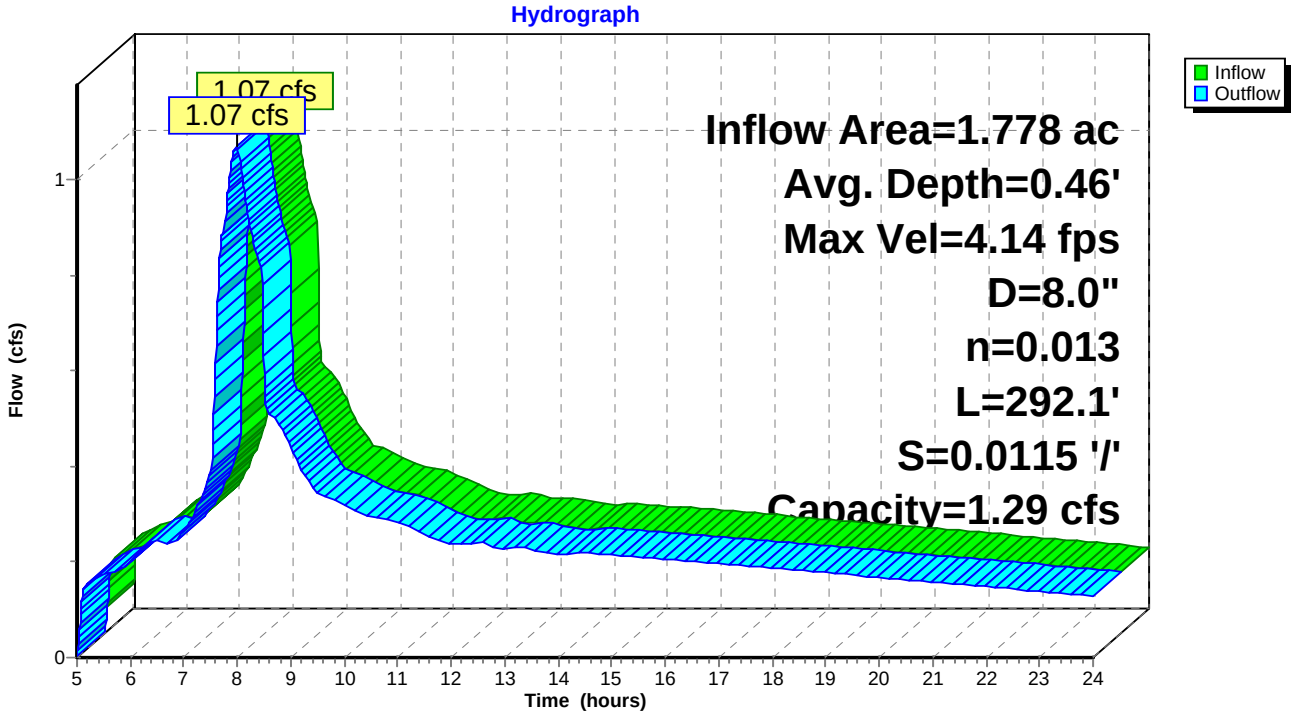
Routing by Dyn-Stor-Ind method, Time Span= 5.00-24.00 hrs, dt= 0.01 hrs
Max. Velocity= 4.14 fps, Min. Travel Time= 1.2 min
Avg. Velocity = 2.79 fps, Avg. Travel Time= 1.7 min

Peak Storage= 75 cf @ 7.99 hrs, Average Depth at Peak Storage= 0.46'
Bank-Full Depth= 0.67', Capacity at Bank-Full= 1.29 cfs

8.0" Diameter Pipe, n= 0.013 Corrugated PE, smooth interior
Length= 292.1' Slope= 0.0115 '/'
Inlet Invert= 193.25', Outlet Invert= 189.90'



### Reach 10R: 8" STM



## Summary for Pond 1P: PLANTER

Inflow Area = 0.207 ac,100.00% Impervious, Inflow Depth > 3.34" for 25 YEAR event
Inflow = 0.19 cfs @ 7.88 hrs, Volume= 0.058 af
Outflow = 0.19 cfs @ 7.96 hrs, Volume= 0.046 af, Atten= 2%, Lag= 4.8 min
Primary = 0.19 cfs @ 7.96 hrs, Volume= 0.046 af

Routing by Dyn-Stor-Ind method, Time Span= 5.00-24.00 hrs, dt= 0.01 hrs
Peak Elev= 198.59' @ 7.96 hrs Surf.Area= 1,704 sf Storage= 566 cf

Plug-Flow detention time= 217.2 min calculated for 0.046 af (79% of inflow)
Center-of-Mass det. time= 86.9 min ( 802.4 - 715.5 )

| Volume | Invert | Avail.Storage | Storage Description |
|---|---|---|---|
| #1 | 195.50' | 187 cf | **1' Drain Rock (Prismatic)**Listed below (Recalc)<br>568 cf Overall x 33.0% Voids |
| #2 | 196.50' | 43 cf | **1.5' Growing Medium (Prismatic)**Listed below (Recalc)<br>852 cf Overall x 5.0% Voids |
| #3 | 198.00' | 471 cf | **Ponding Depth (Prismatic)**Listed below (Recalc) |
| | | 701 cf | Total Available Storage |

| Elevation (feet) | Surf.Area (sq-ft) | Inc.Store (cubic-feet) | Cum.Store (cubic-feet) |
|---|---|---|---|
| 195.50 | 568 | 0 | 0 |
| 196.50 | 568 | 568 | 568 |

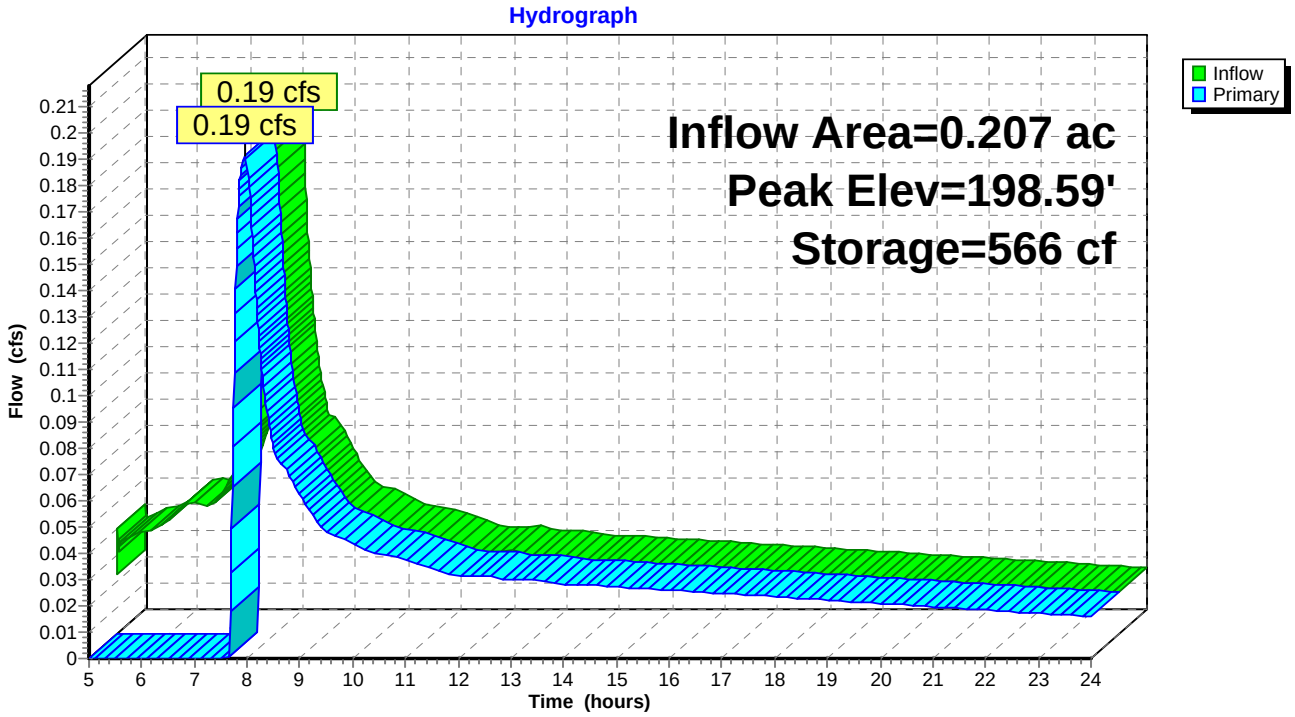
| Elevation (feet) | Surf.Area (sq-ft) | Inc.Store (cubic-feet) | Cum.Store (cubic-feet) |
|---|---|---|---|
| 196.50 | 568 | 0 | 0 |
| 198.00 | 568 | 852 | 852 |

| Elevation (feet) | Surf.Area (sq-ft) | Inc.Store (cubic-feet) | Cum.Store (cubic-feet) |
|---|---|---|---|
| 198.00 | 568 | 0 | 0 |
| 198.83 | 568 | 471 | 471 |

| Device | Routing | Invert | Outlet Devices |
|---|---|---|---|
| #1 | Primary | 195.50' | **8.0" x 205.0' long Culvert** Ke= 0.500<br>Outlet Invert= 194.46' S= 0.0051 '/' Cc= 0.900 n= 0.013 |
| #2 | Device 1 | 198.50' | **8.0" Horiz. Orifice/Grate** Limited to weir flow C= 0.610 |

**Primary OutFlow** Max=0.19 cfs @ 7.96 hrs HW=198.59' TW=195.01' (Dynamic Tailwater)
└─**1=Culvert** (Passes 0.19 cfs of 1.47 cfs potential flow)
  └─**2=Orifice/Grate** (Weir Controls 0.19 cfs @ 0.99 fps)

## Pond 1P: PLANTER



## Summary for Pond 2P: PLANTER

Inflow Area = 0.051 ac,100.00% Impervious, Inflow Depth > 3.33" for 25 YEAR event
Inflow = 0.05 cfs @ 7.78 hrs, Volume= 0.014 af
Outflow = 0.01 cfs @ 8.91 hrs, Volume= 0.009 af, Atten= 70%, Lag= 67.4 min
Primary = 0.01 cfs @ 8.91 hrs, Volume= 0.009 af

Routing by Dyn-Stor-Ind method, Time Span= 5.00-24.00 hrs, dt= 0.01 hrs
Peak Elev= 197.53' @ 8.91 hrs Surf.Area= 798 sf Storage= 248 cf

Plug-Flow detention time= 399.3 min calculated for 0.009 af (61% of inflow)
Center-of-Mass det. time= 183.1 min ( 896.6 - 713.5 )

| Volume | Invert | Avail.Storage | Storage Description |
|---|---|---|---|
| #1 | 194.50' | 88 cf | **1' Drain Rock (Prismatic)**Listed below (Recalc)<br>266 cf Overall x 33.0% Voids |
| #2 | 195.50' | 20 cf | **1.5' Growing Medium (Prismatic)**Listed below (Recalc)<br>399 cf Overall x 5.0% Voids |
| #3 | 197.00' | 221 cf | **Ponding Depth (Prismatic)**Listed below (Recalc) |
| | | 329 cf | Total Available Storage |

| Elevation (feet) | Surf.Area (sq-ft) | Inc.Store (cubic-feet) | Cum.Store (cubic-feet) |
|---|---|---|---|
| 194.50 | 266 | 0 | 0 |
| 195.50 | 266 | 266 | 266 |

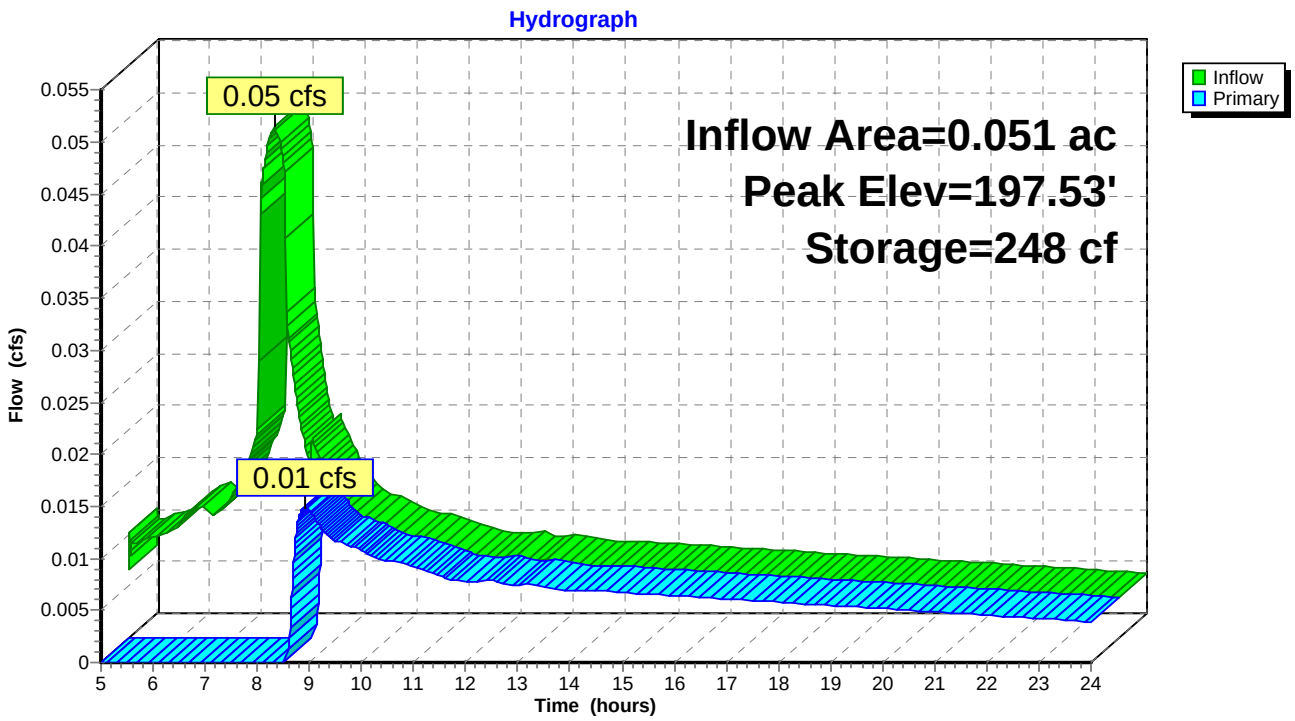
| Elevation (feet) | Surf.Area (sq-ft) | Inc.Store (cubic-feet) | Cum.Store (cubic-feet) |
|---|---|---|---|
| 195.50 | 266 | 0 | 0 |
| 197.00 | 266 | 399 | 399 |

| Elevation (feet) | Surf.Area (sq-ft) | Inc.Store (cubic-feet) | Cum.Store (cubic-feet) |
|---|---|---|---|
| 197.00 | 266 | 0 | 0 |
| 197.83 | 266 | 221 | 221 |

| Device | Routing | Invert | Outlet Devices |
|---|---|---|---|
| #1 | Device 2 | 197.50' | **4.0" Horiz. Orifice/Grate** Limited to weir flow C= 0.610 |
| #2 | Primary | 194.63' | **4.0" x 33.4' long Culvert** Ke= 0.500<br>Outlet Invert= 194.46' S= 0.0051 '/' Cc= 0.900 n= 0.013 |

**Primary OutFlow** Max=0.01 cfs @ 8.91 hrs HW=197.53' TW=194.92' (Dynamic Tailwater)
└─**2=Culvert** (Passes 0.01 cfs of 0.46 cfs potential flow)
  └─**1=Orifice/Grate** (Weir Controls 0.01 cfs @ 0.53 fps)

## Pond 2P: PLANTER



## Summary for Pond 3P: PLANTER

Inflow Area = 0.044 ac,100.00% Impervious, Inflow Depth > 3.33" for 25 YEAR event
Inflow = 0.04 cfs @ 7.78 hrs, Volume= 0.012 af
Outflow = 0.01 cfs @ 10.33 hrs, Volume= 0.006 af, Atten= 80%, Lag= 153.1 min
Primary = 0.01 cfs @ 10.33 hrs, Volume= 0.006 af

Routing by Dyn-Stor-Ind method, Time Span= 5.00-24.00 hrs, dt= 0.01 hrs
Peak Elev= 197.52' @ 10.33 hrs Surf.Area= 849 sf Storage= 261 cf

Plug-Flow detention time= 495.2 min calculated for 0.006 af (51% of inflow)
Center-of-Mass det. time= 246.5 min ( 960.0 - 713.5 )

| Volume | Invert | Avail.Storage | Storage Description |
|---|---|---|---|
| #1 | 194.50' | 93 cf | **1' Drain Rock (Prismatic)**Listed below (Recalc)<br>283 cf Overall x 33.0% Voids |
| #2 | 195.50' | 21 cf | **1.5' Growing Medium (Prismatic)**Listed below (Recalc)<br>425 cf Overall x 5.0% Voids |
| #3 | 197.00' | 235 cf | **Ponding Depth (Prismatic)**Listed below (Recalc) |
| | | 350 cf | Total Available Storage |

| Elevation (feet) | Surf.Area (sq-ft) | Inc.Store (cubic-feet) | Cum.Store (cubic-feet) |
|---|---|---|---|
| 194.50 | 283 | 0 | 0 |
| 195.50 | 283 | 283 | 283 |

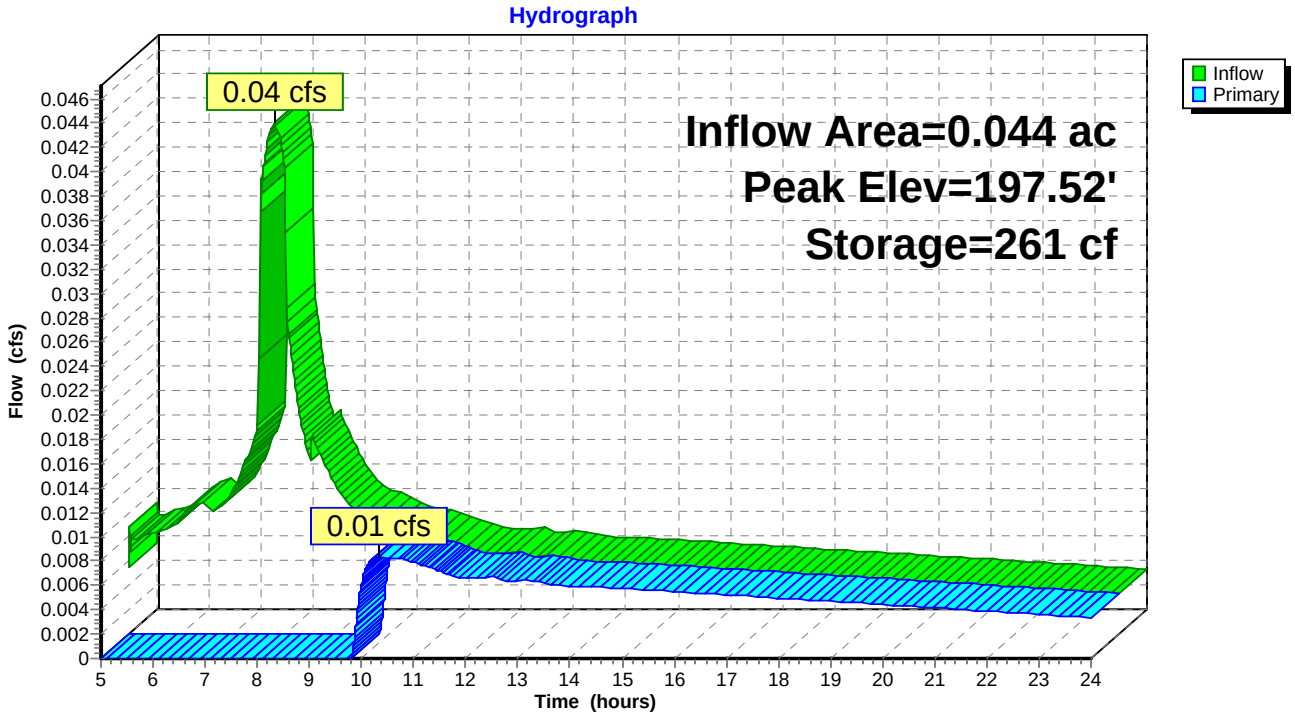
| Elevation (feet) | Surf.Area (sq-ft) | Inc.Store (cubic-feet) | Cum.Store (cubic-feet) |
|---|---|---|---|
| 195.50 | 283 | 0 | 0 |
| 197.00 | 283 | 425 | 425 |

| Elevation (feet) | Surf.Area (sq-ft) | Inc.Store (cubic-feet) | Cum.Store (cubic-feet) |
|---|---|---|---|
| 197.00 | 283 | 0 | 0 |
| 197.83 | 283 | 235 | 235 |

| Device | Routing | Invert | Outlet Devices |
|---|---|---|---|
| #1 | Device 2 | 197.50' | **4.0" Horiz. Orifice/Grate** Limited to weir flow C= 0.610 |
| #2 | Primary | 194.82' | **4.0" x 33.3' long Culvert** Ke= 0.500<br>Outlet Invert= 194.65' S= 0.0051 '/' Cc= 0.900 n= 0.013 |

**Primary OutFlow** Max=0.01 cfs @ 10.33 hrs HW=197.52' TW=194.89' (Dynamic Tailwater)
└─**2=Culvert** (Passes 0.01 cfs of 0.45 cfs potential flow)
  └─**1=Orifice/Grate** (Weir Controls 0.01 cfs @ 0.44 fps)

## Pond 3P: PLANTER



## Summary for Pond 4P: PLANTER

Inflow Area = 0.032 ac,100.00% Impervious, Inflow Depth > 3.33" for 25 YEAR event
Inflow = 0.03 cfs @ 7.78 hrs, Volume= 0.009 af
Outflow = 0.00 cfs @ 14.87 hrs, Volume= 0.003 af, Atten= 86%, Lag= 425.5 min
Primary = 0.00 cfs @ 14.87 hrs, Volume= 0.003 af

Routing by Dyn-Stor-Ind method, Time Span= 5.00-24.00 hrs, dt= 0.01 hrs
Peak Elev= 197.51' @ 14.87 hrs Surf.Area= 891 sf Storage= 272 cf

Plug-Flow detention time= 702.0 min calculated for 0.003 af (31% of inflow)
Center-of-Mass det. time= 406.7 min ( 1,120.2 - 713.5 )

| Volume | Invert | Avail.Storage | Storage Description |
|---|---|---|---|
| #1 | 194.50' | 98 cf | **1' Drain Rock (Prismatic)**Listed below (Recalc)<br>297 cf Overall x 33.0% Voids |
| #2 | 195.50' | 22 cf | **1.5' Growing Medium (Prismatic)**Listed below (Recalc)<br>446 cf Overall x 5.0% Voids |
| #3 | 197.00' | 247 cf | **Ponding Depth (Prismatic)**Listed below (Recalc) |
| | | 367 cf | Total Available Storage |

| Elevation (feet) | Surf.Area (sq-ft) | Inc.Store (cubic-feet) | Cum.Store (cubic-feet) |
|---|---|---|---|
| 194.50 | 297 | 0 | 0 |
| 195.50 | 297 | 297 | 297 |

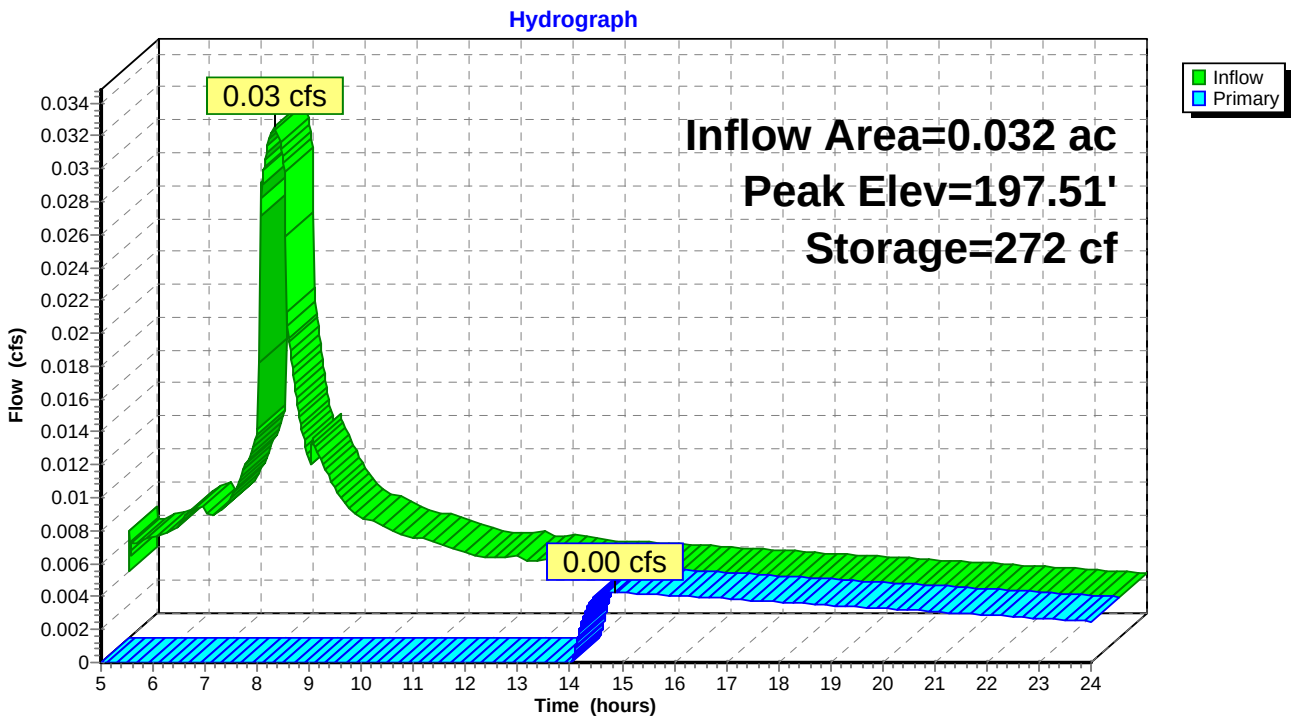
| Elevation (feet) | Surf.Area (sq-ft) | Inc.Store (cubic-feet) | Cum.Store (cubic-feet) |
|---|---|---|---|
| 195.50 | 297 | 0 | 0 |
| 197.00 | 297 | 446 | 446 |

| Elevation (feet) | Surf.Area (sq-ft) | Inc.Store (cubic-feet) | Cum.Store (cubic-feet) |
|---|---|---|---|
| 197.00 | 297 | 0 | 0 |
| 197.83 | 297 | 247 | 247 |

| Device | Routing | Invert | Outlet Devices |
|---|---|---|---|
| #1 | Device 2 | 197.50' | **4.0" Horiz. Orifice/Grate** Limited to weir flow C= 0.610 |
| #2 | Primary | 194.99' | **4.0" x 33.2' long Culvert** Ke= 0.500<br>Outlet Invert= 194.82' S= 0.0051 '/' Cc= 0.900 n= 0.013 |

**Primary OutFlow** Max=0.00 cfs @ 14.87 hrs HW=197.51' TW=194.87' (Dynamic Tailwater)
└─**2=Culvert** (Passes 0.00 cfs of 0.44 cfs potential flow)
  └─**1=Orifice/Grate** (Weir Controls 0.00 cfs @ 0.35 fps)

## Pond 4P: PLANTER



# APPENDIX 3.1
# WATER QUALITY FLOW CALCULATIONS (PAC)

**Exhibit 1-2**: Stormwater Hierarchy

## Stormwater Infiltration and Discharge Hierarchy

**Impervious area reduction techniques:** Applying an impervious area reduction technique can affect which design approach is required and can reduce the amount of impervious area that requires stormwater management. Examples of impervious area reduction techniques include ecoroofs, trees, and pervious pavement.

### Onsite Infiltration

**Category 1**: Requires total onsite infiltration with vegetated infiltration facilities. Examples of vegetated infiltration facilities include infiltration swales, planters and basins.

**Category 2**: Requires total onsite infiltration with vegetated facilities that overflow to subsurface infiltration facilities. Examples of subsurface infiltration facilities include infiltration drywells, soakage trenches and sumps.

### Offsite Discharge

**Category 3**: Requires onsite detention with vegetated facilities that overflow to a drainageway, river, or storm-only pipe. Vegetated facilities must meet pollution reduction and flow and volume control requirements to the maximum extent feasible prior to offsite discharge.

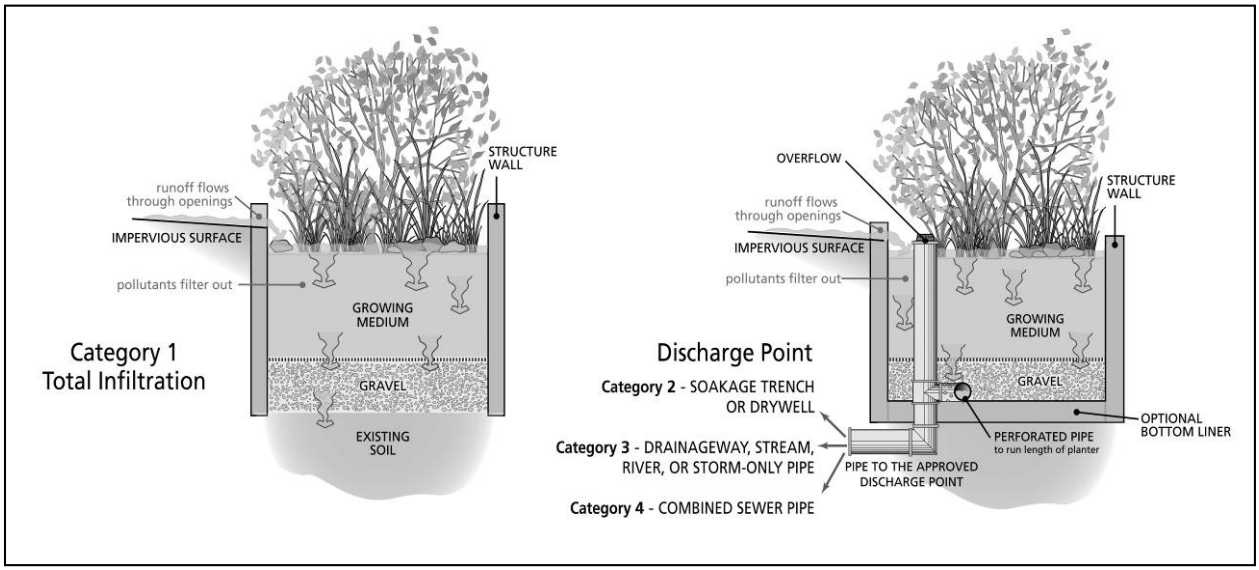
**Category 4**: Requires onsite detention with vegetated facilities that overflow to the combined sewer system. Vegetated facilities must meet pollution reduction and flow and volume control requirements to the maximum extent feasible prior to offsite discharge.

## Stormwater Hierarchy

Decisions regarding the degree of onsite infiltration and the discharge point (when complete onsite infiltration is not feasible) are based on the stormwater hierarchy, as shown in **Exhibit 1-2**[2] and **Exhibit 1-3.** Following any use of impervious area reduction techniques, the highest technically feasible category must be used (1 = highest, 4 = lowest). Applicants must provide the appropriate technical analysis and evaluation to demonstrate the need to move from Category 1 through each consecutive category. Infiltration testing is required to determine the feasibility of onsite infiltration and the existing infiltration rate.

Roof runoff is exempt from pollution reduction requirements and may drain directly to a UIC. See **Section 1.4** for further clarification of UIC requirements.

**Exhibit 1-3:** Stormwater Hierarchy Illustration

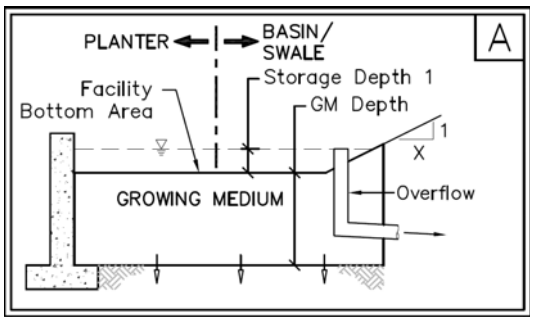



[2] The stormwater hierarchy is based on the City's WPCF permit with DEQ regarding onsite infiltration and offsite discharge. The hierarchy is how the City satisfies the requirements of Oregon Administrative Rules (OAR) 340-040 for the protection of groundwater.

facility. These facilities use two-stage calculations to model the configuration. For additional information on two-stage calculations, refer to **Section 4. Overview of PAC Calculations.** These facilities can also be selected for any other Stormwater Hierarchy Category. These facilities are sized so that at a minimum, the Pollution Reduction event infiltrates through the growing medium, but to meet Stormwater Hierarchy Category 1, the facility must be sized to infiltrate the 10-yr storm without overtopping. Where the surface storage is exceeded, overflow is to the approved discharge. Configurations A and B are limited by the surface infiltration capacity through the growing medium even if there are higher infiltration rates through the native soils.

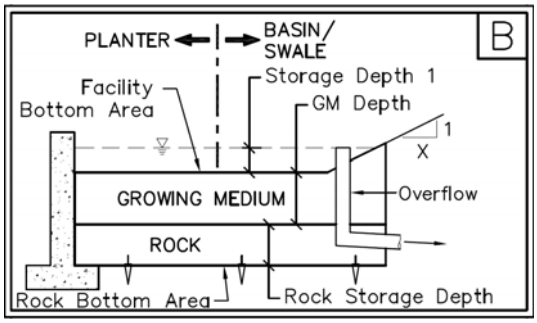
The difference between configuration A and B can be summarized by the statements below:

**Configuration A**




- No rock storage provided below grade. This configuration is best applied when the design infiltration rate for the native soil is greater than the design infiltration rate for the growing medium of 2 inches per hour.
- If the below grade infiltration capacity is less than the above grade infiltration capacity, the PAC uses the lower native soil infiltration capacity for the Stage I calculations.

**Configuration B**




- Rock storage is provided below grade. This configuration is best applied when the design infiltration rate for the native soil is less than the design infiltration rate for the growing medium of 2 inches per hour.
- The rock storage provides additional contact area with the native soils than with configuration A and increases the potential for infiltration.

### 2.D.2. Facility Configurations C & D

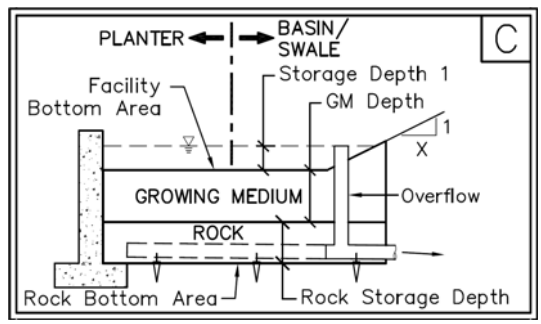
These facilities are referred to as flow-through facilities since an assumption is made that no runoff will infiltrate into the native subgrade. All the runoff that enters the facility is assumed to be discharged either as percolated runoff collected by the underdrain pipe or as overflow that is collected and conveyed to the same discharge pipe. This discharge through the underdrain pipe eliminates Stormwater Hierarchy

Category 1 as a goal. Since it is assumed that there is no interface with the native subgrade, only the first stage of the two stage calculation is required to model the configuration. These facilities are sized so that at a minimum, the Pollution Reduction event infiltrates through the growing medium, but any larger storm events would overflow to the approved discharge.

The difference between configuration C and D can be summarized by the statements below:

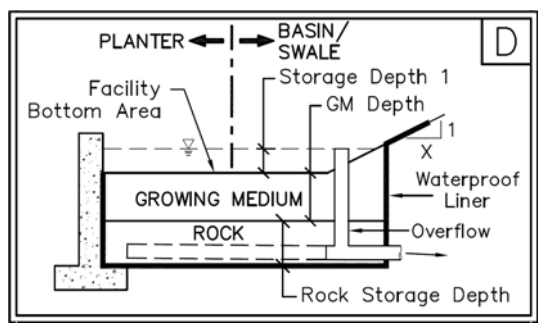
**Configuration C**

- No impermeable liner is placed around the facility.
- Some minor infiltration may be realized under the built condition, but the PAC calculations do not estimate this volume.




**Configuration D**

- An impermeable liner is placed around the facility in areas where required setbacks can not be met due to site conditions.



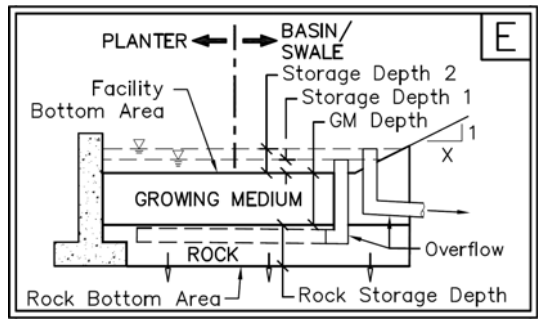

### 2.D.3. Facility Configurations E & F

These are the only facilities that allow overflow stormwater to bypass the growing medium to the rock storage, which requires them to be registered as a UIC, similar to a soakage trench or drywell. These facilities are sized so that at a minimum the Pollution Reduction event infiltrates through the growing medium, but larger storm events are allowed to overflow to the rock storage layer below. This overflow eliminates Stormwater Hierarchy Category 1 as a goal. These configurations can be especially useful on sites where there is not space available for configurations A or B (generally larger than E or F) or on sites were the native infiltration rate is greater than that of the growing medium. Providing a direct connection to the below grade rock storage allows the facility to take advantage of the higher native infiltration capacity or provide additional below grade storage to reduce the size of the facility. Because E & F allow minimum sizing of the surface component based on the Pollution Reduction event like

Configurations C & D and allow a portion of larger events to bypass the growing medium like a UIC, they can be thought of as a "hybrid" configuration design.

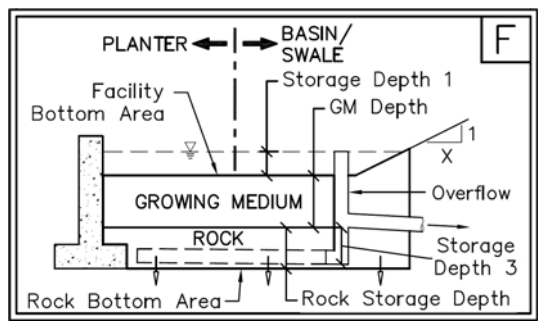
The difference between configuration E and F can be summarized by the statements below:

**Configuration E**




- Can allow greater surface storage above what is needed for the Pollution Reduction event.
- In the condition where the below grade infiltration capacity is less than the surface infiltration capacity, and the rock storage becomes full, the below grade restriction will limit the infiltration rate on the surface and cause the water on the surface to remain longer through and after a storm event.

**Configuration F**




- For projects where minimal surface depth is important, such as near a school, this configuration allows maximum sub-surface storage while ensuring that the surface storage drains freely based on the surface infiltration capacity of the facility.
- Contrary to Configuration E, any limitation of below grade infiltration relative to surface percolation or overflow flows will accumulate in the rock storage and discharge through the below grade outflow pipe without restricting infiltration of the water on the surface.

## 2.E. Interpreting the Results

As each sizing calculation is performed, the results are summarized in the Results box at the bottom of the Facility Design Data worksheet. The PAC does not automate sizing iterations, and requires variables to be edited manually between calculations. As noted above in **Section 2.C.3. Facility Design Data**, different data is displayed in the results depending upon the Stormwater Hierarchy Category and Facility Configuration selected for the facility.

### 2.E.1. General Information

There are up to four pieces of data generated for both the Pollution Reduction sizing and 10-yr sizing results. These are the "PASS" or "FAIL" text, the overflow volume, the

# Presumptive Approach Calculator ver. 1.2

*Catchment Data*

**Catchment ID:** Total-Post1S

| | |
|---|---|
| **Project Name:** | Friendsview |
| **Project Address:** | Newberg |
| **Designer:** | Stefano Natalini |
| **Company:** | AKS Engineering & Forestry |
| **Date:** | 10/28/15 |
| **Permit Number:** | 0 |

Run Time 10/28/2015 10:30:28 AM

## Drainage Catchment Information

| | | |
|---|---|---|
| Catchment ID | Total-Post1S | |
| | **Catchment Area** | |
| Impervious Area | 9,028 | SF |
| Impervious Area | 0.21 | ac |
| Impervious Area Curve Number, $CN_{imp}$ | 98 | |
| Time of Concentration, Tc, minutes | 5 | min. |

## Site Soils & Infiltration Testing Data

| | | |
|---|---|---|
| Infiltration Testing Procedure: | Open Pit Falling Head | |
| Native Soil Field Tested Infiltration Rate ($I_{test}$): | 1 | in/hr |
| Bottom of Facility Meets Required Separation From High Groundwater Per BES SWMM Section 1.4: | Yes | |

**Correction Factor Component**

| | | |
|---|---|---|
| $CF_{test}$ (ranges from 1 to 3) | 2 | |

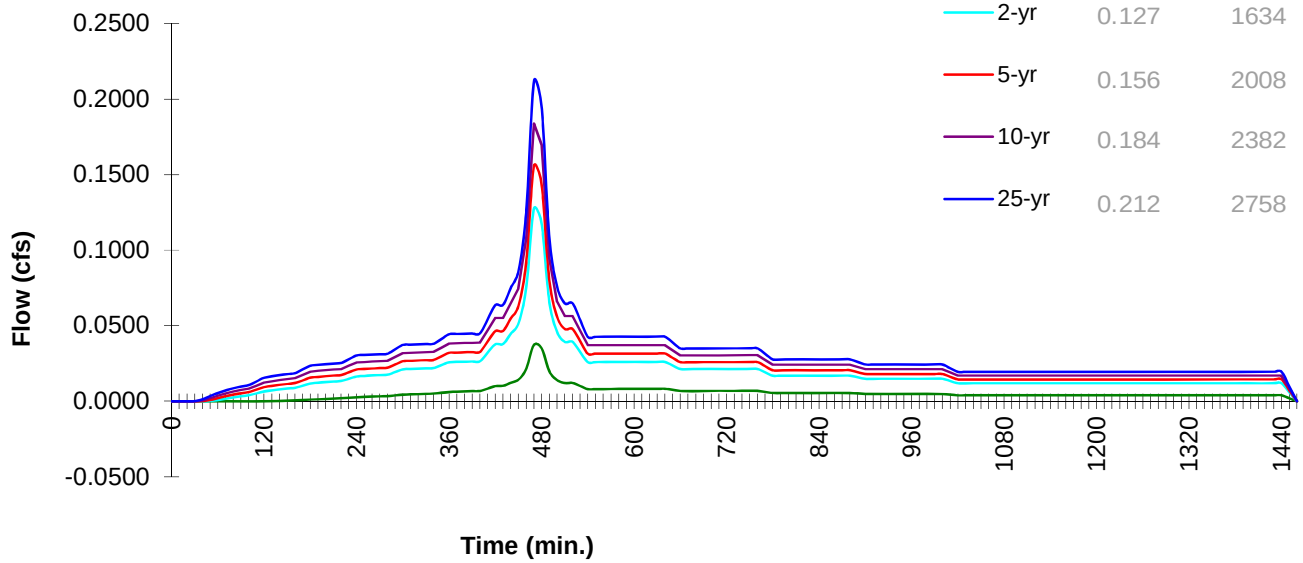
**Design Infiltration Rates**

| | | |
|---|---|---|
| $I_{dsgn}$ for Native ($I_{test}$ / $CF_{test}$): | 0.50 | in/hr |
| $I_{dsgn}$ for Imported Growing Medium: | 2.00 | in/hr |

**Execute SBUH Calculations**

## SBUH Results

| | Peak Rate (cfs) | Volume (cf) |
|---|---|---|
| PR | 0.037 | 472 |
| 2-yr | 0.127 | 1634 |
| 5-yr | 0.156 | 2008 |
| 10-yr | 0.184 | 2382 |
| 25-yr | 0.212 | 2758 |

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# Presumptive Approach Calculator ver. 1.2

**Catchment ID:** otal-Post1S

Run Time 10/28/2015 10:30:28 AM

**Project Name:** Friendsview **Catchment ID:** Total-Post1S **Date:** 10/28/2015

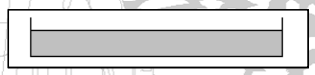
**Instructions:**
1. Identify which Stormwater Hierarchy Category the facility.
2. Select Facility Type.
3. Identify facility shape of surface facility to more accurately estimate surface volume, except for Swales and sloped planters that use the PAC Sloped Facility Worksheet to enter data.
4. Select type of facility configuration.
5. Complete data entry for all highlighted cells.

Catchment facility will meet Hierarchy Category: 3

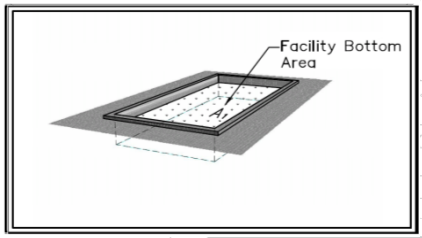
Goal Summary:

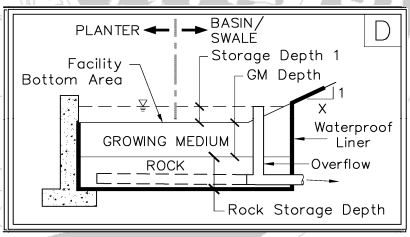
| Hierarchy Category | SWMM Requirement | RESULTS box below needs to display… | |
|---|---|---|---|
| | | Pollution Reduction as a | 10-yr (aka disposal) as a |
| 3 | Off-site flow to drainageway, river, or storm-only pipe system. | PASS | N/A |

**Facility Type =** Planter (Flat)



**Facility Shape:** Rectangle/Square **Facility Configuration:** D




| Calculation Guide |
|---|
| Max. Rock Stor. Bottom Area |
| **568 SF** |

**DATA FOR ABOVE GRADE STORAGE COMPONENT**

| | | |
|---|---|---|
| Facility Bottom Area = | 568 | sf |
| Bottom Width = | 10.0 | ft |
| Facility Side Slope = | 0 | to 1 |
| Storage Depth 1 = | 6 | in |
| Growing Medium Depth = | 18 | in |
| Freeboard Depth = | N/A | in |

| | | |
|---|---|---|
| Surface Capacity at Depth 1 = | 284 | cf |
| GM Design Infiltration Rate = | 2.00 | in/hr |
| Infiltration Capacity = | 0.026 | cfs |

**BELOW GRADE STORAGE**

| | | |
|---|---|---|
| Rock Storage Capacity = | | cf |
| Native Design Infiltration Rate = | | in/hr |
| Infiltration Capacity = | | cfs |

**RESULTS**

| | | Overflow Volume | | |
|---|---|---|---|---|
| Pollution Reduction | PASS | 0 CF | 4% | Surf. Cap. Used |

Run PAC

Output File

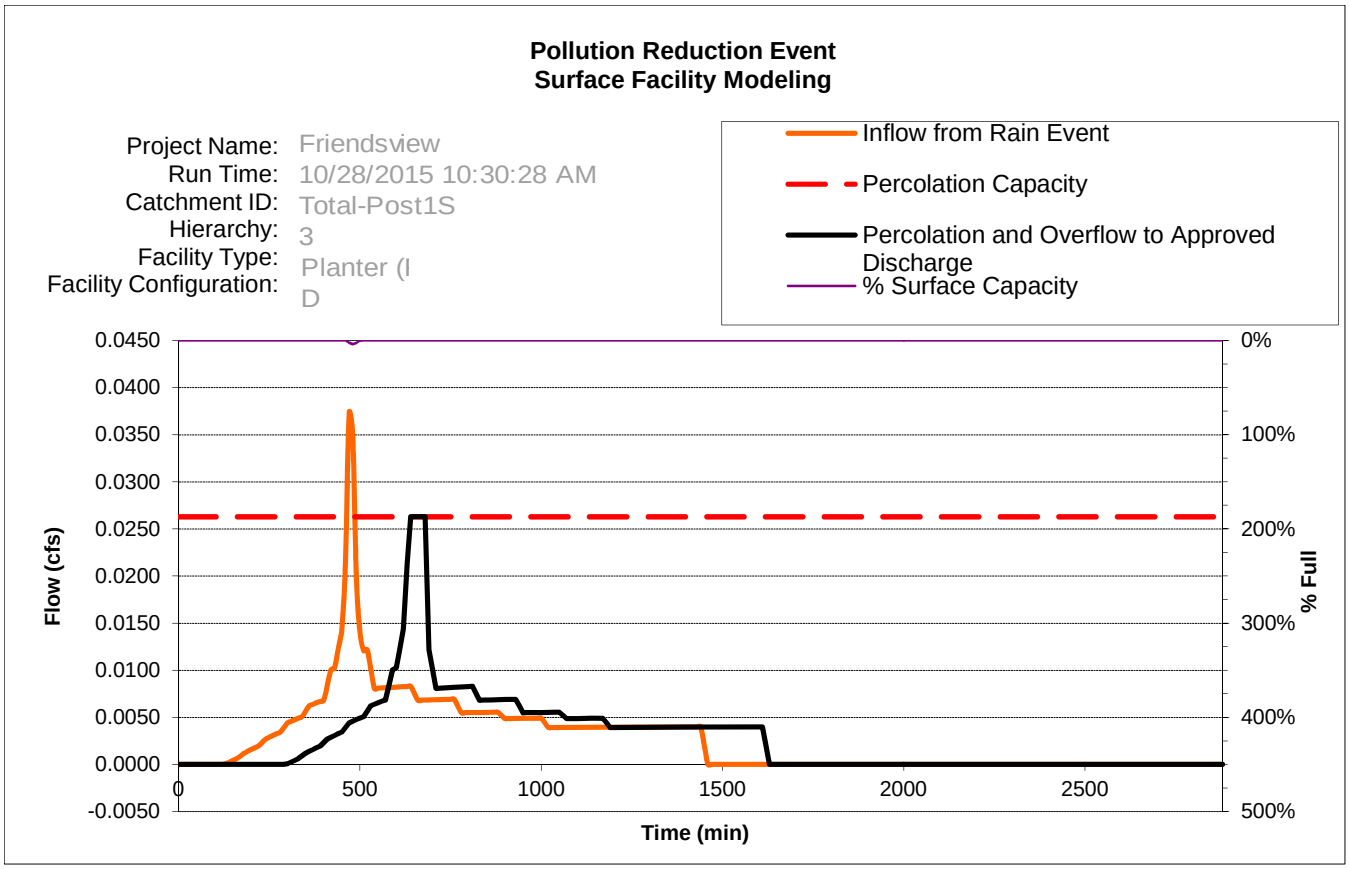
| | 2-yr | 5-yr | 10-yr | 25-yr |
|---|---|---|---|---|
| Peak cfs | 0.026 | 0.080 | 0.184 | 0.212 |

**FACILITY FACTS**

| | |
|---|---|
| Total Facility Area Including Freeboard = | 568 SF |
| Sizing Ratio (Total Facility Area / Catchment Area) = | 0.063 |

# BES - Presumptive Approach Calculator - Ver 1.2

*PR Con-D*

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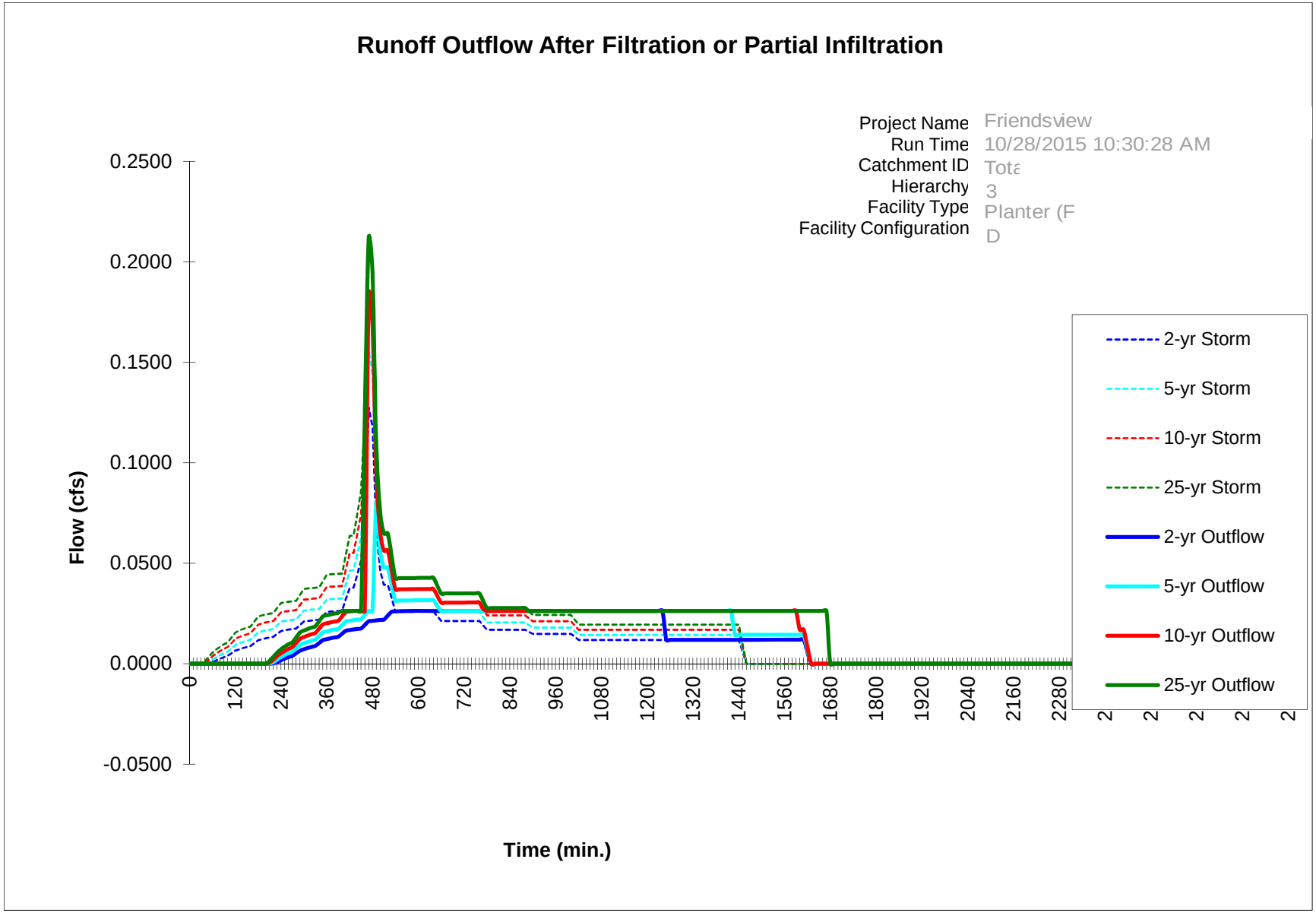
# BES - Presumptive Approach Calculator - Ver 1.2

*Output Chart*



# Presumptive Approach Calculator ver. 1.2

*Catchment Data*

**Catchment ID:** Total-Post 2S

| | |
|---|---|
| **Project Name:** | Friendsview |
| **Project Address:** | Newberg |
| **Designer:** | Stefano Natalini |
| **Company:** | AKS Engineering and Forestry |
| **Date:** | 10/28/15 |
| **Permit Number:** | 0 |

Run Time 10/28/2015 10:51:18 AM

## Drainage Catchment Information

| | | |
|---|---|---|
| Catchment ID | Total-Post 2S | |
| | **Catchment Area** | |
| Impervious Area | 2,233 | SF |
| Impervious Area | 0.05 | ac |
| Impervious Area Curve Number, $CN_{imp}$ | 98 | |
| Time of Concentration, Tc, minutes | 5 | min. |

## Site Soils & Infiltration Testing Data

| | | |
|---|---|---|
| Infiltration Testing Procedure: | Open Pit Falling Head | |
| Native Soil Field Tested Infiltration Rate ($I_{test}$): | 1 | in/hr |
| Bottom of Facility Meets Required Separation From High Groundwater Per BES SWMM Section 1.4: | Yes | |

**Correction Factor Component**

| | | |
|---|---|---|
| $CF_{test}$ (ranges from 1 to 3) | 2 | |

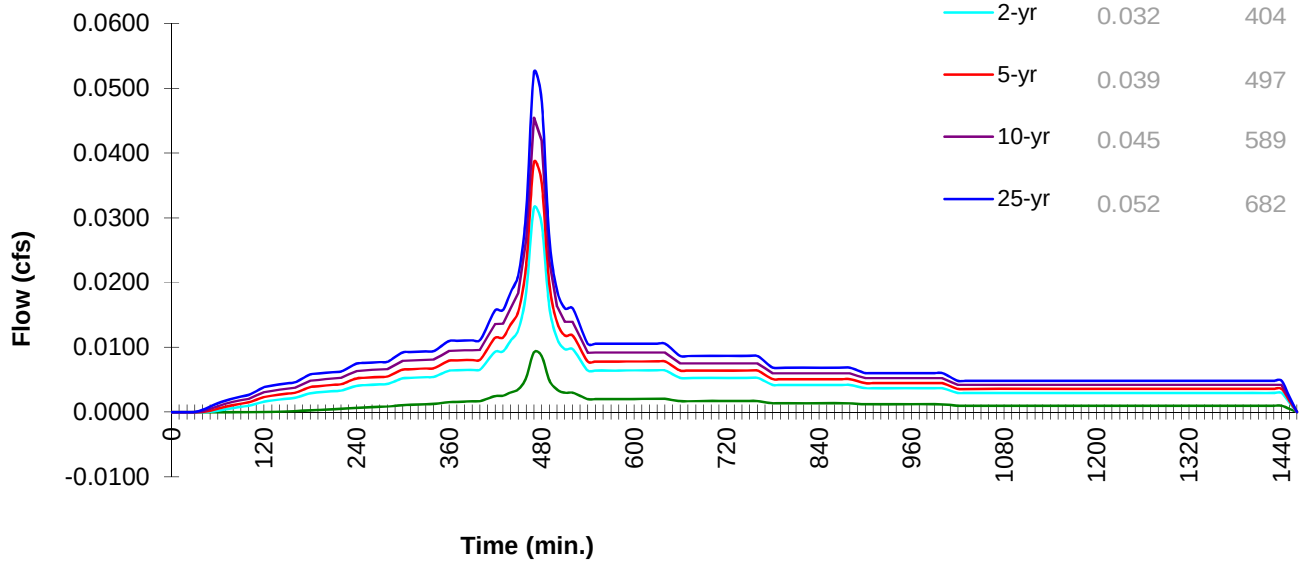
**Design Infiltration Rates**

| | | |
|---|---|---|
| $I_{dsgn}$ for Native ($I_{test}$ / $CF_{test}$): | 0.50 | in/hr |
| $I_{dsgn}$ for Imported Growing Medium: | 2.00 | in/hr |

**Execute SBUH Calculations**

## SBUH Results

| | Peak Rate (cfs) | Volume (cf) |
|---|---|---|
| PR | 0.009 | 117 |
| 2-yr | 0.032 | 404 |
| 5-yr | 0.039 | 497 |
| 10-yr | 0.045 | 589 |
| 25-yr | 0.052 | 682 |




Printed: 10/28/2015 10:51 AM

# Presumptive Approach Calculator ver. 1.2

**Catchment ID:** tal-Post 2S

Run Time 10/28/2015 10:51:18 AM

**Project Name:** Friendsview **Catchment ID:** Total-Post 2S **Date:** 10/28/2015

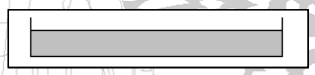
**Instructions:**
1. Identify which Stormwater Hierarchy Category the facility.
2. Select Facility Type.
3. Identify facility shape of surface facility to more accurately estimate surface volume, except for Swales and sloped planters that use the PAC Sloped Facility Worksheet to enter data.
4. Select type of facility configuration.
5. Complete data entry for all highlighted cells.

Catchment facility will meet Hierarchy Category: **3**

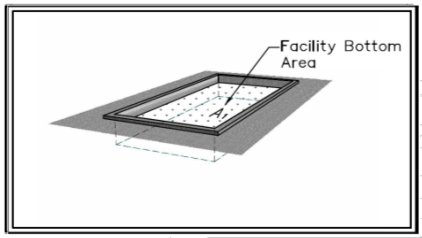
Goal Summary:

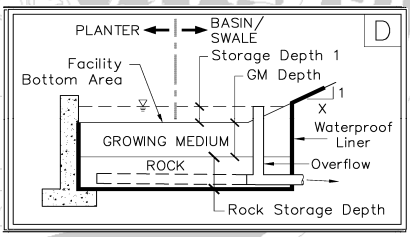
| Hierarchy Category | SWMM Requirement | RESULTS box below needs to display… | |
|---|---|---|---|
| | | Pollution Reduction as a | 10-yr (aka disposal) as a |
| 3 | Off-site flow to drainageway, river, or storm-only pipe system. | PASS | N/A |

**Facility Type =** Planter (Flat)



**Facility Shape:** Rectangle/Square **Facility Configuration:** D




| Calculation Guide |
|---|
| Max. Rock Stor. Bottom Area |
| **266 SF** |

**DATA FOR ABOVE GRADE STORAGE COMPONENT**

| | | |
|---|---|---|
| Facility Bottom Area = | 266 | sf |
| Bottom Width = | 8.0 | ft |
| Facility Side Slope = | 0 | to 1 |
| Storage Depth 1 = | 6 | in |
| Growing Medium Depth = | 18 | in |
| Freeboard Depth = | N/A | in |

| | | |
|---|---|---|
| Surface Capacity at Depth 1 = | 133 | cf |
| GM Design Infiltration Rate = | 2.00 | in/hr |
| Infiltration Capacity = | 0.012 | cfs |

**BELOW GRADE STORAGE**

| | | |
|---|---|---|
| Rock Storage Capacity = | | cf |
| Native Design Infiltration Rate = | | in/hr |
| Infiltration Capacity = | | cfs |

**RESULTS**

| Pollution Reduction | Overflow Volume | | |
|---|---|---|---|
| PASS | 0 CF | 0% | Surf. Cap. Used |

Run PAC

Output File

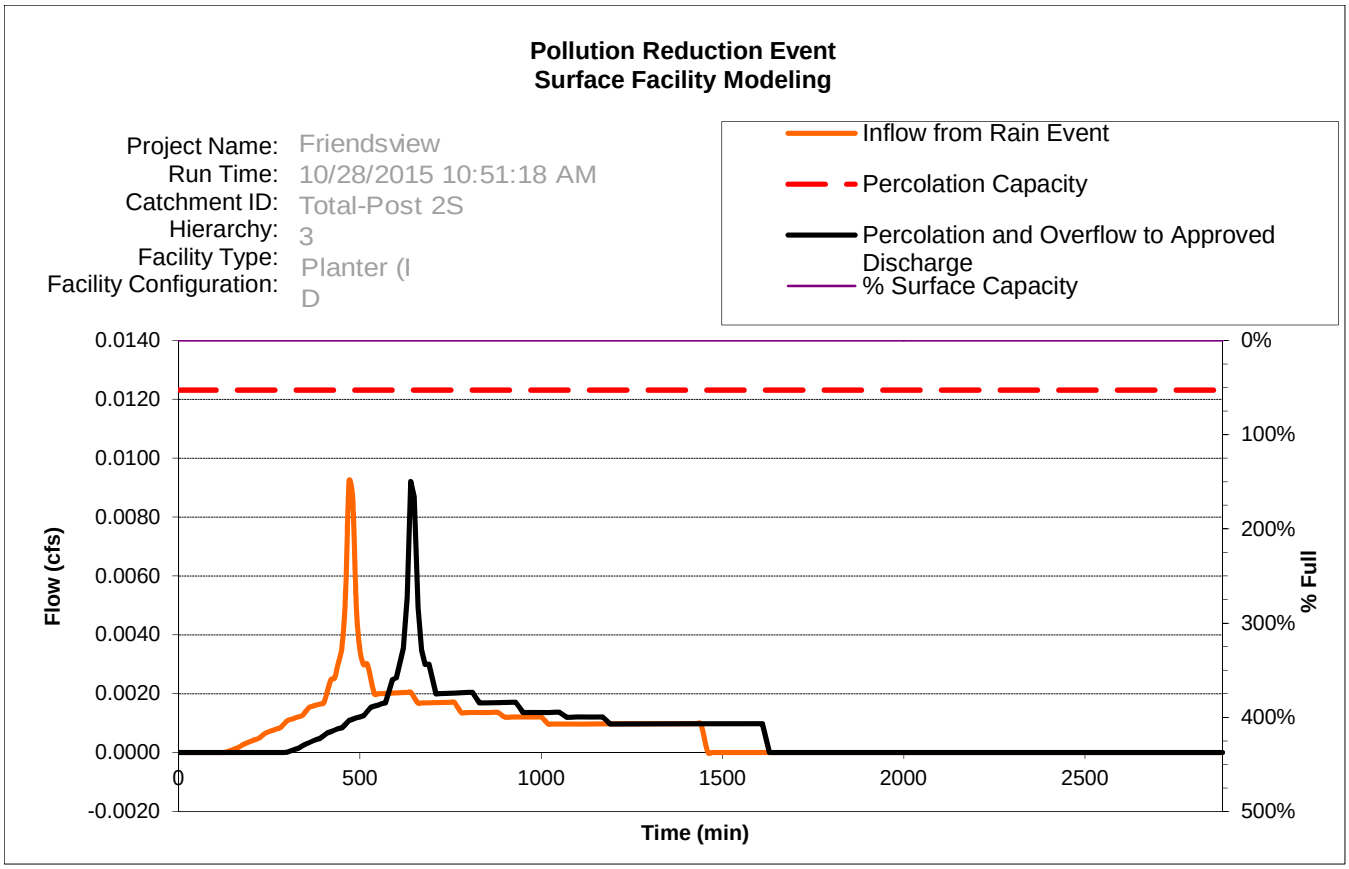
| | 2-yr | 5-yr | 10-yr | 25-yr |
|---|---|---|---|---|
| Peak cfs | 0.012 | 0.012 | 0.012 | 0.012 |

**FACILITY FACTS**

| | |
|---|---|
| Total Facility Area Including Freeboard = | 266 SF |
| Sizing Ratio (Total Facility Area / Catchment Area) = | 0.119 |

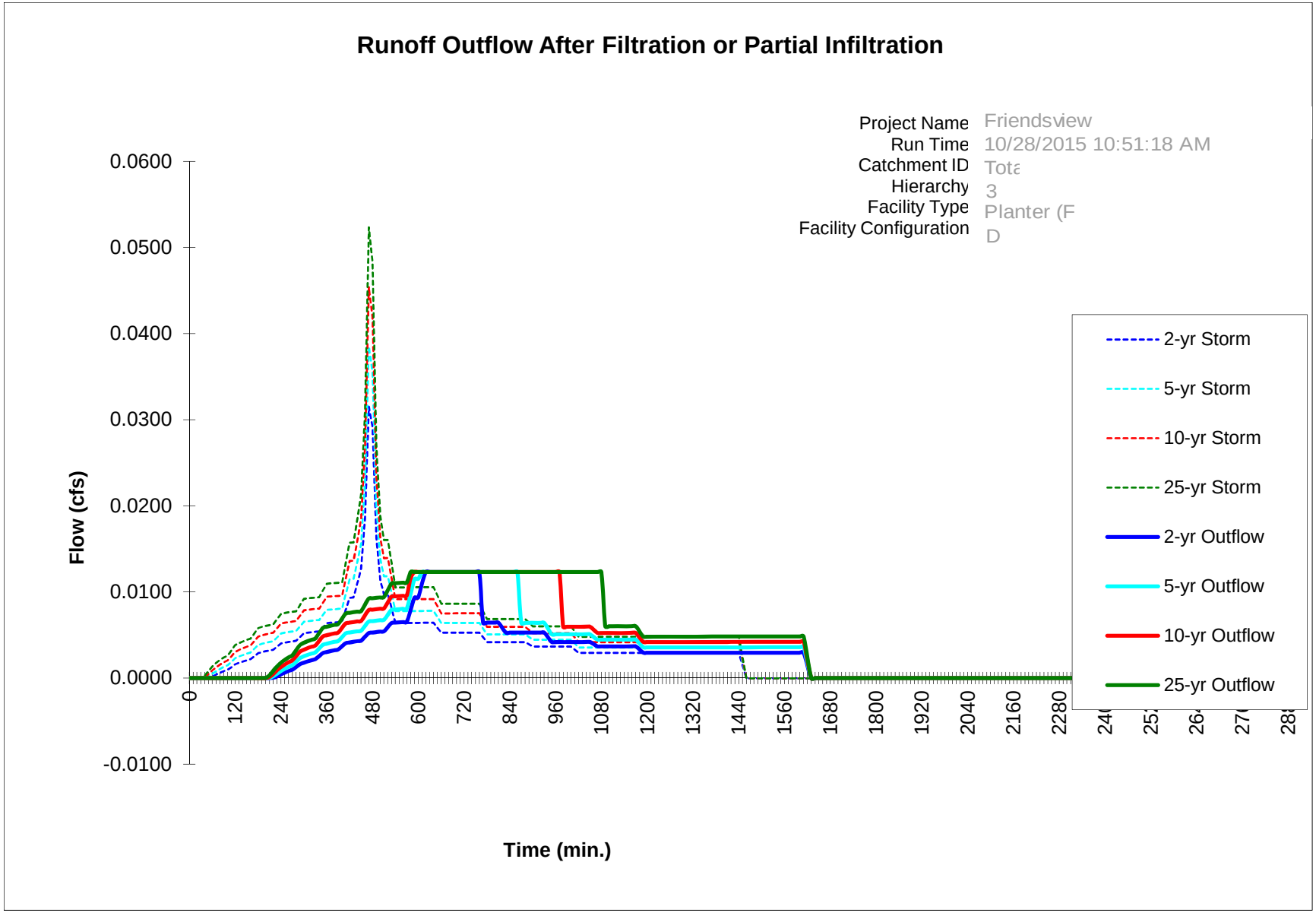
# BES - Presumptive Approach Calculator - Ver 1.2

*PR Con-D*



# BES - Presumptive Approach Calculator - Ver 1.2

*Output Chart*



# Presumptive Approach Calculator ver. 1.2

*Catchment Data*

**Catchment ID:** Total-Post 3S

| | |
|---|---|
| **Project Name:** | Friendsview |
| **Project Address:** | Newberg |
| **Designer:** | Stefano Natalini |
| **Company:** | AKS Engineering and Forestry |
| **Date:** | 10/28/15 |
| **Permit Number:** | 0 |

Run Time 10/28/2015 10:56:31 AM

## Drainage Catchment Information

| | | |
|---|---|---|
| Catchment ID | Total-Post 3S | |
| | **Catchment Area** | |
| Impervious Area | 1,910 | SF |
| Impervious Area | 0.04 | ac |
| Impervious Area Curve Number, $CN_{imp}$ | 98 | |
| Time of Concentration, Tc, minutes | 5 | min. |

## Site Soils & Infiltration Testing Data

| | | |
|---|---|---|
| Infiltration Testing Procedure: | Open Pit Falling Head | |
| Native Soil Field Tested Infiltration Rate ($I_{test}$): | 1 | in/hr |
| Bottom of Facility Meets Required Separation From High Groundwater Per BES SWMM Section 1.4: | Yes | |

**Correction Factor Component**

| | | |
|---|---|---|
| $CF_{test}$ (ranges from 1 to 3) | 2 | |

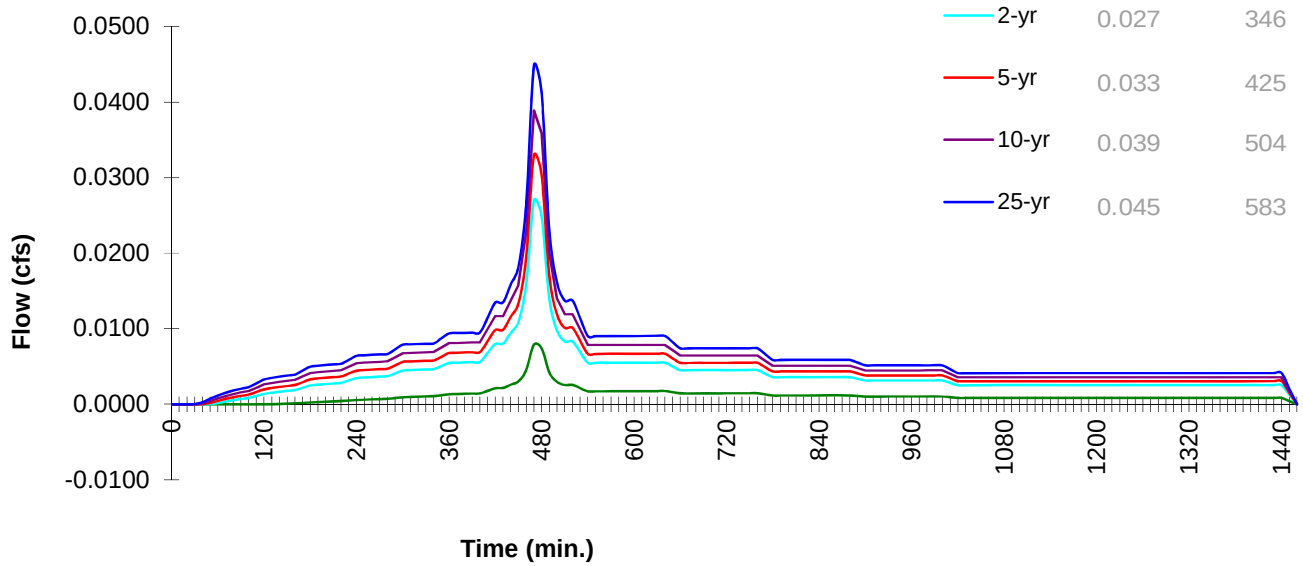
**Design Infiltration Rates**

| | | |
|---|---|---|
| $I_{dsgn}$ for Native ($I_{test}$ / $CF_{test}$): | 0.50 | in/hr |
| $I_{dsgn}$ for Imported Growing Medium: | 2.00 | in/hr |

**Execute SBUH Calculations**

## SBUH Results

| | Peak Rate (cfs) | Volume (cf) |
|---|---|---|
| PR | 0.008 | 100 |
| 2-yr | 0.027 | 346 |
| 5-yr | 0.033 | 425 |
| 10-yr | 0.039 | 504 |
| 25-yr | 0.045 | 583 |




Printed: 10/28/2015 10:56 AM

# Presumptive Approach Calculator ver. 1.2

**Catchment ID:** tal-Post 3S

Run Time 10/28/2015 10:56:31 AM

**Project Name:** Friendsview **Catchment ID:** Total-Post 3S **Date:** 10/28/2015

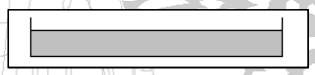
**Instructions:**
1. Identify which Stormwater Hierarchy Category the facility.
2. Select Facility Type.
3. Identify facility shape of surface facility to more accurately estimate surface volume, except for Swales and sloped planters that use the PAC Sloped Facility Worksheet to enter data.
4. Select type of facility configuration.
5. Complete data entry for all highlighted cells.

Catchment facility will meet Hierarchy Category: **3**

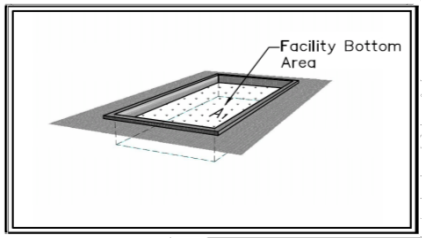
Goal Summary:

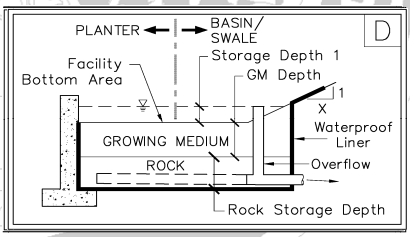
| Hierarchy Category | SWMM Requirement | RESULTS box below needs to display… | |
|---|---|---|---|
| | | Pollution Reduction as a | 10-yr (aka disposal) as a |
| 3 | Off-site flow to drainageway, river, or storm-only pipe system. | PASS | N/A |

**Facility Type =** Planter (Flat)



**Facility Shape:** Rectangle/Square **Facility Configuration:** D




| Calculation Guide |
|---|
| Max. Rock Stor. Bottom Area |
| **283 SF** |

**DATA FOR ABOVE GRADE STORAGE COMPONENT**

| | | |
|---|---|---|
| Facility Bottom Area = | 283 | sf |
| Bottom Width = | 8.0 | ft |
| Facility Side Slope = | 0 | to 1 |
| Storage Depth 1 = | 6 | in |
| Growing Medium Depth = | 18 | in |
| Freeboard Depth = | N/A | in |

| | | |
|---|---|---|
| Surface Capacity at Depth 1 = | 142 | cf |
| GM Design Infiltration Rate = | 2.00 | in/hr |
| Infiltration Capacity = | 0.013 | cfs |

**BELOW GRADE STORAGE**

| | | |
|---|---|---|
| Rock Storage Capacity = | | cf |
| Native Design Infiltration Rate = | | in/hr |
| Infiltration Capacity = | | cfs |

**RESULTS**

| | | Overflow Volume | | |
|---|---|---|---|---|
| Pollution Reduction | PASS | 0 CF | 0% | Surf. Cap. Used |

Run PAC

Output File

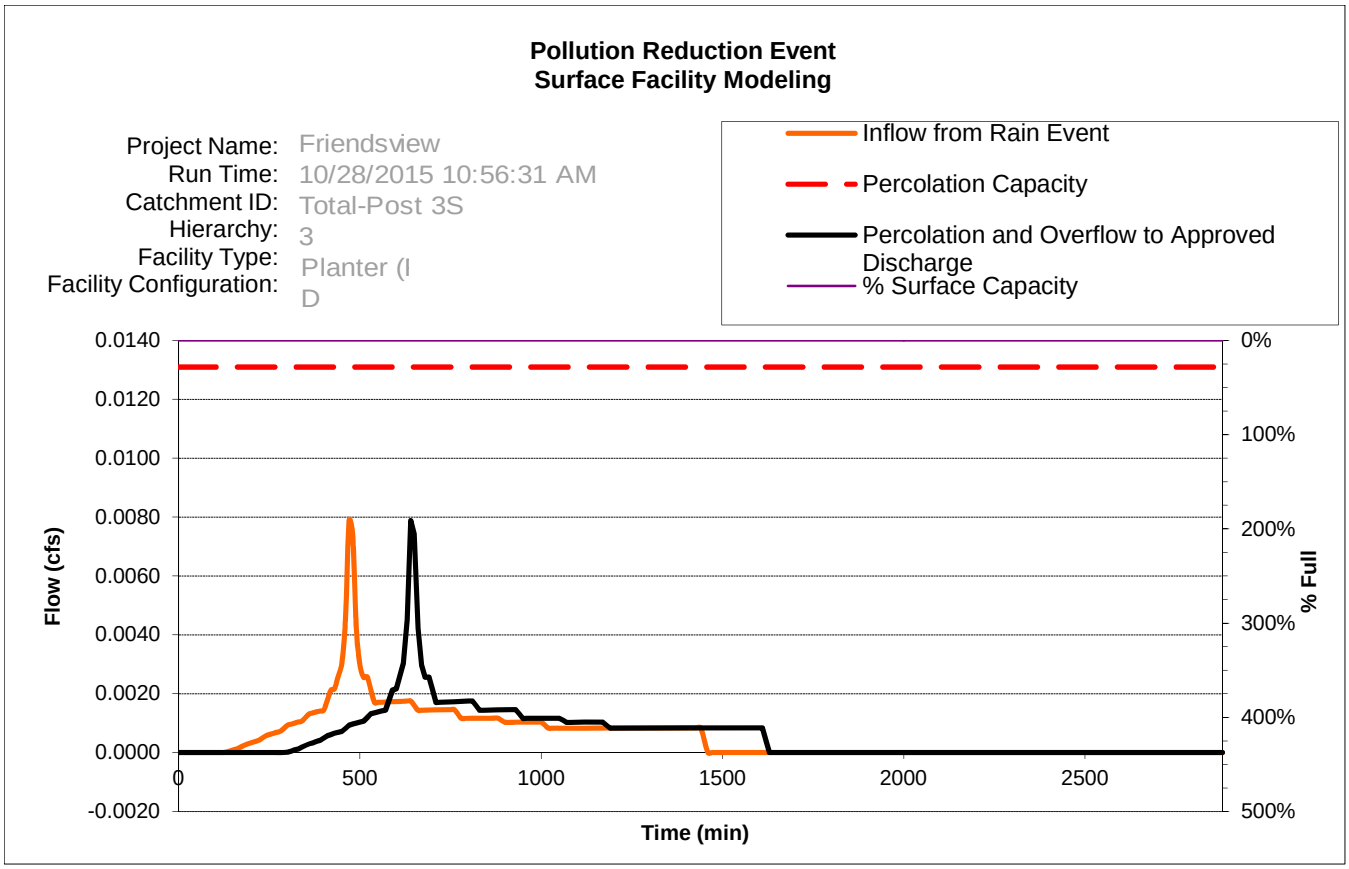
| | 2-yr | 5-yr | 10-yr | 25-yr |
|---|---|---|---|---|
| Peak cfs | 0.013 | 0.013 | 0.013 | 0.013 |

**FACILITY FACTS**

| | |
|---|---|
| Total Facility Area Including Freeboard = | 283 SF |
| Sizing Ratio (Total Facility Area / Catchment Area) = | 0.148 |

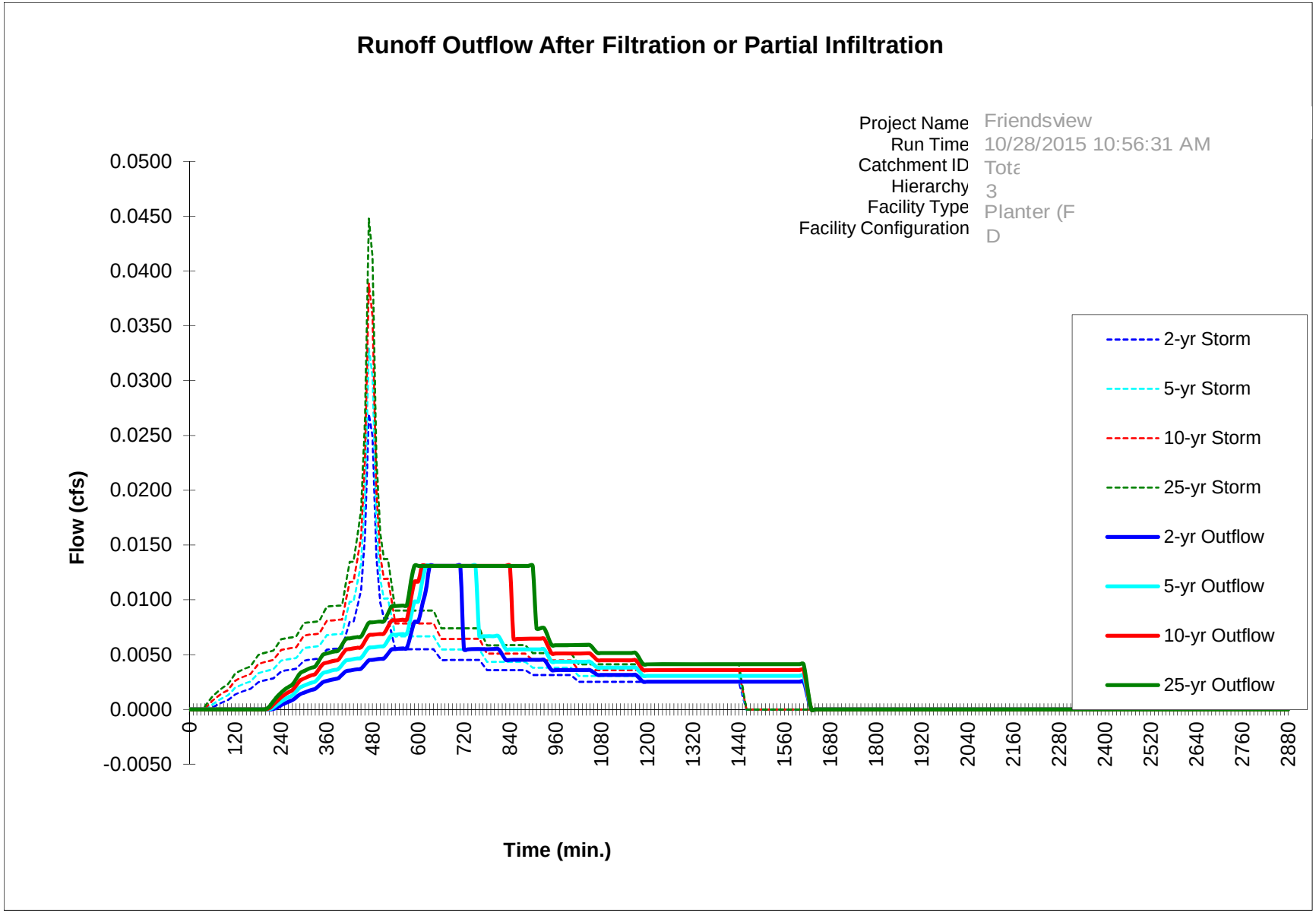
# BES - Presumptive Approach Calculator - Ver 1.2

*PR Con-D*



# BES - Presumptive Approach Calculator - Ver 1.2

*Output Chart*



# Presumptive Approach Calculator ver. 1.2

*Catchment Data*

**Catchment ID:** Total-Post 4S

| | |
|---|---|
| **Project Name:** | Friendsview |
| **Project Address:** | Newberg |
| **Designer:** | Stefano Natalini |
| **Company:** | AKS Engineering and Forestry |
| **Date:** | 10/28/15 |
| **Permit Number:** | 0 |

Run Time 10/28/2015 11:02:20 AM

## Drainage Catchment Information

| | | |
|---|---|---|
| Catchment ID | Total-Post 4S | |
| | **Catchment Area** | |
| Impervious Area | 1,412 | SF |
| Impervious Area | 0.03 | ac |
| Impervious Area Curve Number, $CN_{imp}$ | 98 | |
| Time of Concentration, Tc, minutes | 5 | min. |

## Site Soils & Infiltration Testing Data

| | | |
|---|---|---|
| Infiltration Testing Procedure: | Open Pit Falling Head | |
| Native Soil Field Tested Infiltration Rate ($I_{test}$): | 1 | in/hr |
| Bottom of Facility Meets Required Separation From High Groundwater Per BES SWMM Section 1.4: | Yes | |

**Correction Factor Component**

| | | |
|---|---|---|
| $CF_{test}$ (ranges from 1 to 3) | 2 | |

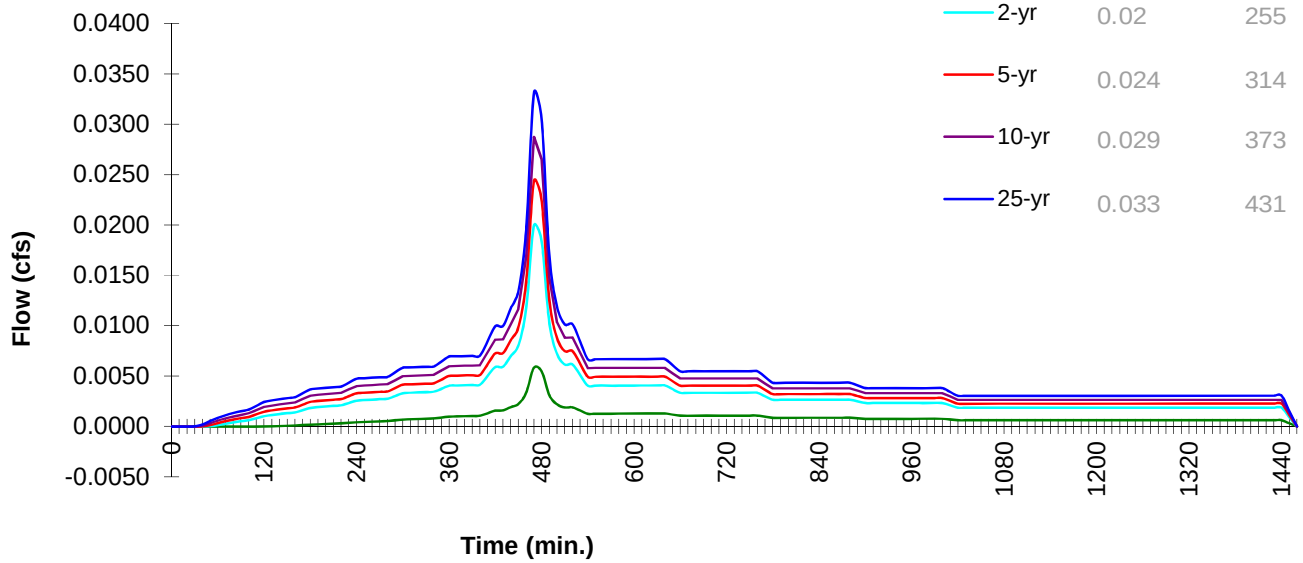
**Design Infiltration Rates**

| | | |
|---|---|---|
| $I_{dsgn}$ for Native ($I_{test}$ / $CF_{test}$): | 0.50 | in/hr |
| $I_{dsgn}$ for Imported Growing Medium: | 2.00 | in/hr |

**Execute SBUH Calculations**

## SBUH Results

| | Peak Rate (cfs) | Volume (cf) |
|---|---|---|
| PR | 0.006 | 74 |
| 2-yr | 0.02 | 255 |
| 5-yr | 0.024 | 314 |
| 10-yr | 0.029 | 373 |
| 25-yr | 0.033 | 431 |




Printed: 10/28/2015 11:02 AM

# Presumptive Approach Calculator ver. 1.2

**Catchment ID:** tal-Post 4S

Run Time 10/28/2015 11:02:20 AM

**Project Name:** Friendsview **Catchment ID:** Total-Post 4S **Date:** 10/28/2015

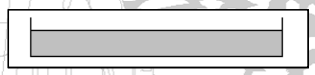
**Instructions:**
1. Identify which Stormwater Hierarchy Category the facility.
2. Select Facility Type.
3. Identify facility shape of surface facility to more accurately estimate surface volume, except for Swales and sloped planters that use the PAC Sloped Facility Worksheet to enter data.
4. Select type of facility configuration.
5. Complete data entry for all highlighted cells.

Catchment facility will meet Hierarchy Category: **3**

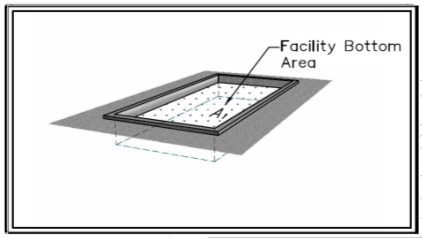
Goal Summary:

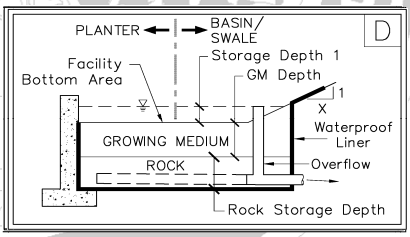
| Hierarchy Category | SWMM Requirement | RESULTS box below needs to display… | |
|---|---|---|---|
| | | Pollution Reduction as a | 10-yr (aka disposal) as a |
| 3 | Off-site flow to drainageway, river, or storm-only pipe system. | PASS | N/A |

**Facility Type =** Planter (Flat)



**Facility Shape:** Rectangle/Square **Facility Configuration:** D




| Calculation Guide |
|---|
| Max. Rock Stor. Bottom Area |
| **297 SF** |

**DATA FOR ABOVE GRADE STORAGE COMPONENT**

| | | |
|---|---|---|
| Facility Bottom Area = | 297 | sf |
| Bottom Width = | 8.0 | ft |
| Facility Side Slope = | 0 | to 1 |
| Storage Depth 1 = | 6 | in |
| Growing Medium Depth = | 18 | in |
| Freeboard Depth = | N/A | in |
| Surface Capacity at Depth 1 = | 149 | cf |
| GM Design Infiltration Rate = | 2.00 | in/hr |
| Infiltration Capacity = | 0.014 | cfs |

**BELOW GRADE STORAGE**

| | | |
|---|---|---|
| Rock Storage Capacity = | | cf |
| Native Design Infiltration Rate = | | in/hr |
| Infiltration Capacity = | | cfs |

**RESULTS**

| Pollution Reduction | PASS | Overflow Volume 0 CF | 0% Surf. Cap. Used | Run PAC |
|---|---|---|---|---|

Output File

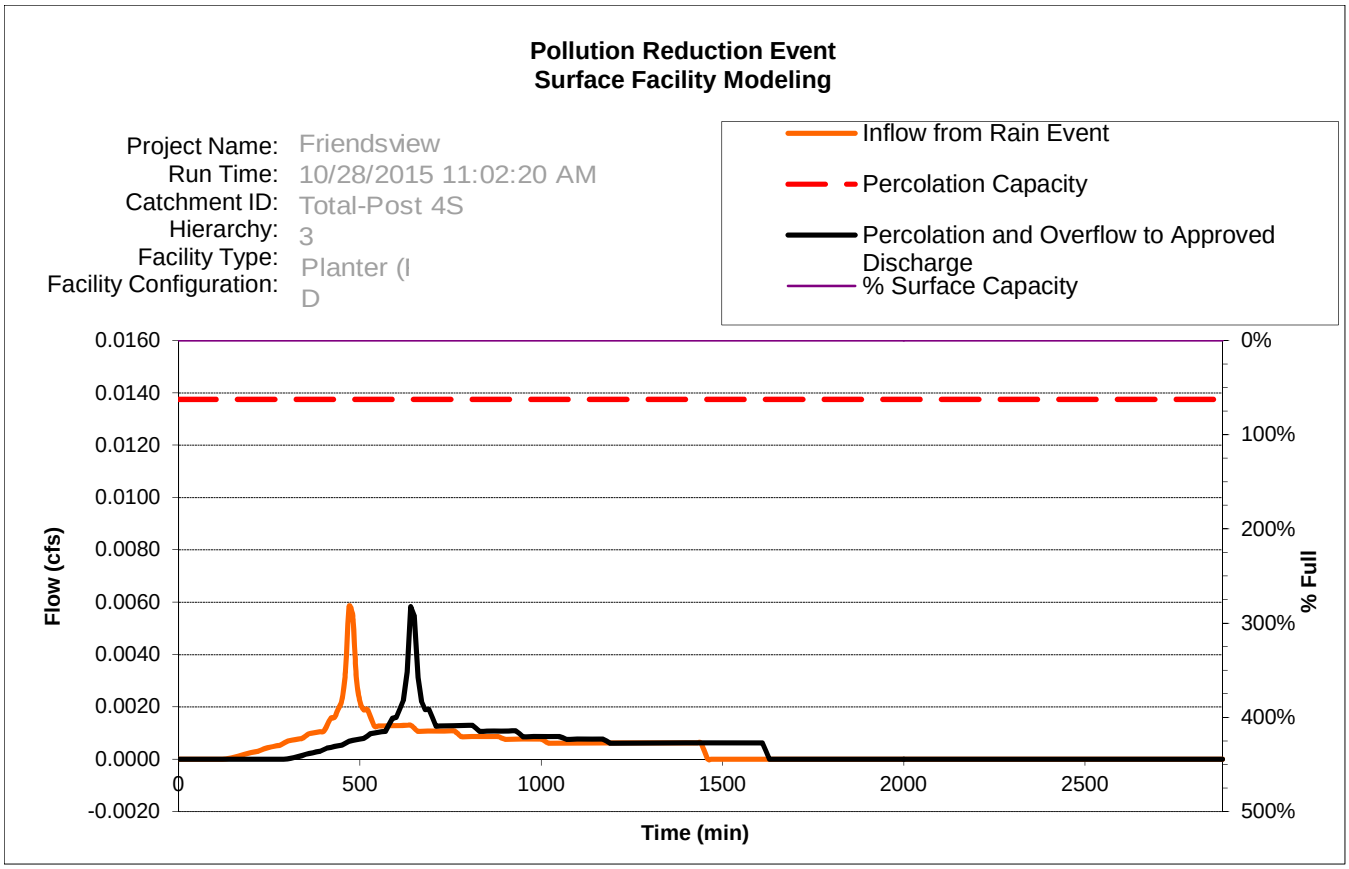
| | 2-yr | 5-yr | 10-yr | 25-yr |
|---|---|---|---|---|
| Peak cfs | 0.014 | 0.014 | 0.014 | 0.014 |

**FACILITY FACTS**

| | |
|---|---|
| Total Facility Area Including Freeboard = | **297 SF** |
| Sizing Ratio (Total Facility Area / Catchment Area) = | **0.210** |

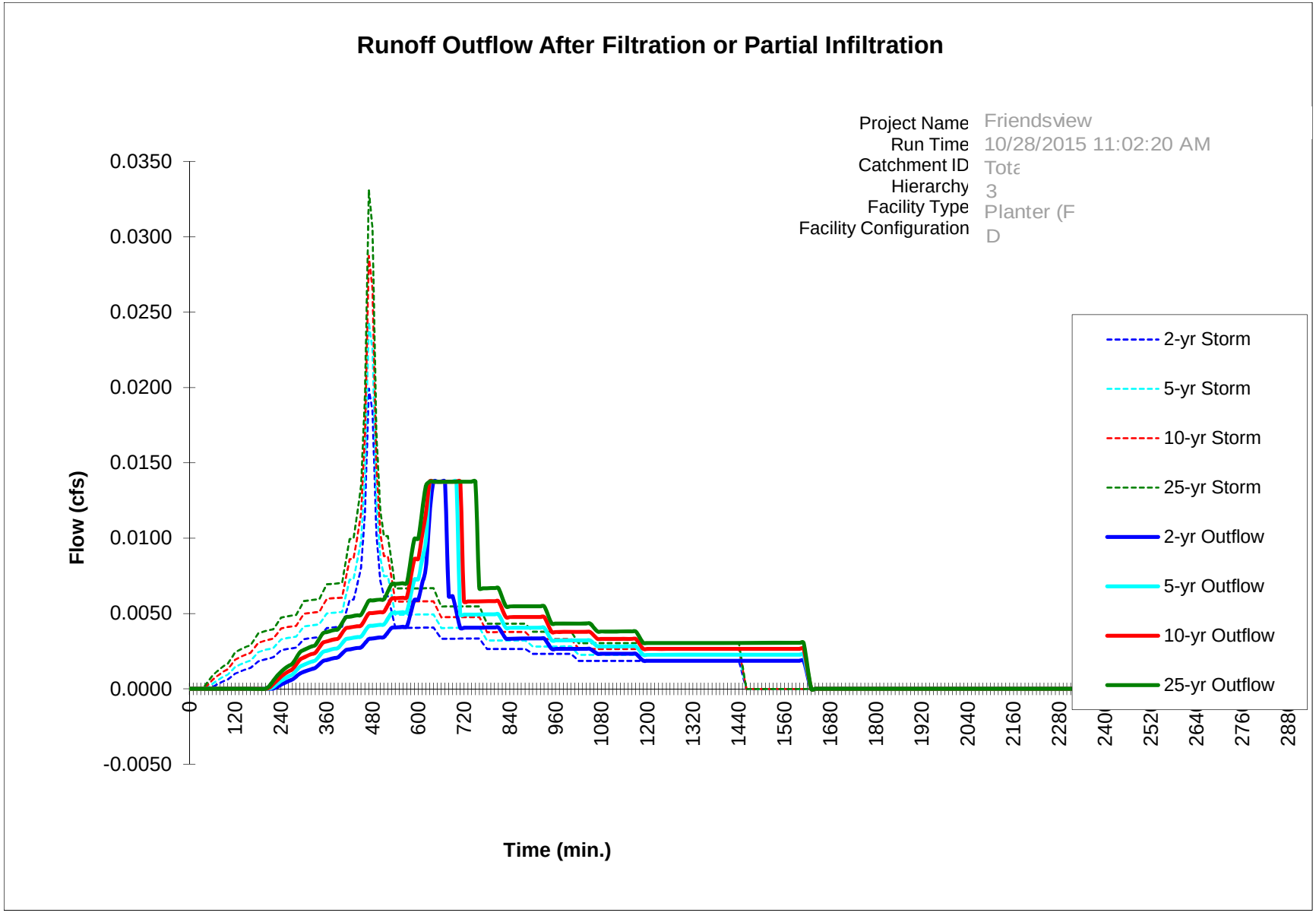
# BES - Presumptive Approach Calculator - Ver 1.2

*PR Con-D*



# BES - Presumptive Approach Calculator - Ver 1.2

*Output Chart*



# APPENDIX 4.1
# SITE SOIL INFORAMTINO AND CURVE NUMBERS

United States Department of Agriculture

NRCS

Natural Resources Conservation Service

A product of the National Cooperative Soil Survey, a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local participants

# Custom Soil Resource Report for

# Yamhill County, Oregon

September 15, 2015

# Preface

Soil surveys contain information that affects land use planning in survey areas. They highlight soil limitations that affect various land uses and provide information about the properties of the soils in the survey areas. Soil surveys are designed for many different users, including farmers, ranchers, foresters, agronomists, urban planners, community officials, engineers, developers, builders, and home buyers. Also, conservationists, teachers, students, and specialists in recreation, waste disposal, and pollution control can use the surveys to help them understand, protect, or enhance the environment.

Various land use regulations of Federal, State, and local governments may impose special restrictions on land use or land treatment. Soil surveys identify soil properties that are used in making various land use or land treatment decisions. The information is intended to help the land users identify and reduce the effects of soil limitations on various land uses. The landowner or user is responsible for identifying and complying with existing laws and regulations.

Although soil survey information can be used for general farm, local, and wider area planning, onsite investigation is needed to supplement this information in some cases. Examples include soil quality assessments (http://www.nrcs.usda.gov/wps/portal/nrcs/main/soils/health/) and certain conservation and engineering applications. For more detailed information, contact your local USDA Service Center (http://offices.sc.egov.usda.gov/locator/app?agency=nrcs) or your NRCS State Soil Scientist (http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/contactus/?cid=nrcs142p2_053951).

Great differences in soil properties can occur within short distances. Some soils are seasonally wet or subject to flooding. Some are too unstable to be used as a foundation for buildings or roads. Clayey or wet soils are poorly suited to use as septic tank absorption fields. A high water table makes a soil poorly suited to basements or underground installations.

The National Cooperative Soil Survey is a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local agencies. The Natural Resources Conservation Service (NRCS) has leadership for the Federal part of the National Cooperative Soil Survey.

Information about soils is updated periodically. Updated information is available through the NRCS Web Soil Survey, the site for official soil survey information.

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Map Unit Legend.....8
**Soil Information for All Uses**.....9
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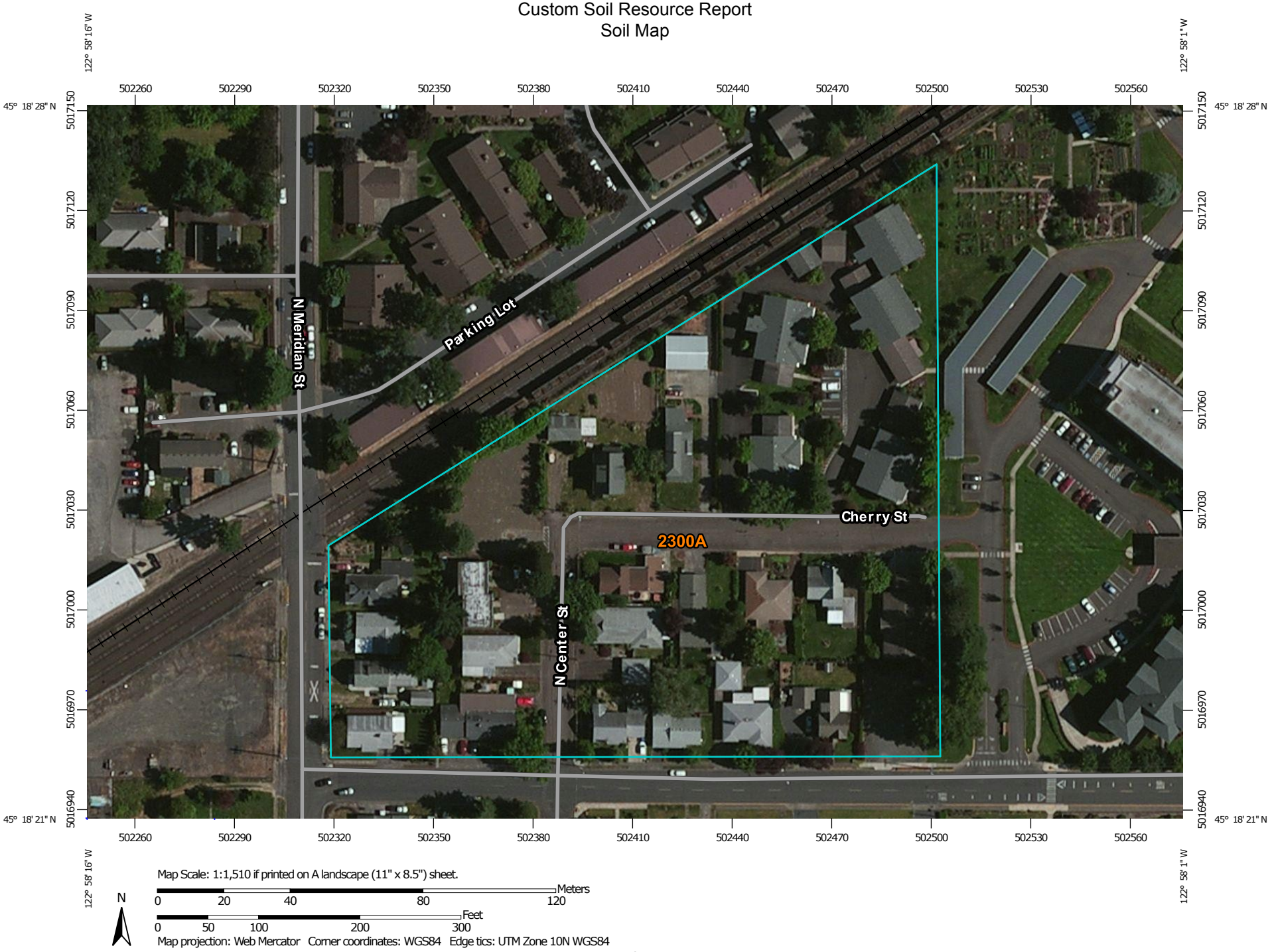
Soil Qualities and Features.....9
Hydrologic Soil Group.....9
Soil Reports.....14
Soil Physical Properties.....14
Engineering Properties.....14

# Soil Map

The soil map section includes the soil map for the defined area of interest, a list of soil map units on the map and extent of each map unit, and cartographic symbols displayed on the map. Also presented are various metadata about data used to produce the map, and a description of each soil map unit.

# Custom Soil Resource Report
## Soil Map




Map Scale: 1:1,510 if printed on A landscape (11" x 8.5") sheet.

N

Meters: 0 20 40 80 120

Feet: 0 50 100 200 300

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 10N WGS84

## MAP LEGEND

**Area of Interest (AOI)**

Area of Interest (AOI)

**Soils**

Soil Map Unit Polygons

Soil Map Unit Lines

Soil Map Unit Points

**Special Point Features**

Blowout

Borrow Pit

Clay Spot

Closed Depression

Gravel Pit

Gravelly Spot

Landfill

Lava Flow

Marsh or swamp

Mine or Quarry

Miscellaneous Water

Perennial Water

Rock Outcrop

Saline Spot

Sandy Spot

Severely Eroded Spot

Sinkhole

Slide or Slip

Sodic Spot

Spoil Area

Stony Spot

Very Stony Spot

Wet Spot

Other

Special Line Features

**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: http://websoilsurvey.nrcs.usda.gov
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 2, Sep 24, 2014

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Jul 8, 2010—Sep 4, 2011

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.

# Map Unit Legend

| Yamhill County, Oregon (OR071) | | | |
|---|---|---|---|
| **Map Unit Symbol** | **Map Unit Name** | **Acres in AOI** | **Percent of AOI** |
| 2300A | Aloha silt loam, 0 to 3 percent slopes | 5.5 | 100.0% |
| **Totals for Area of Interest** | | **5.5** | **100.0%** |

# Soil Information for All Uses

## Soil Properties and Qualities

The Soil Properties and Qualities section includes various soil properties and qualities displayed as thematic maps with a summary table for the soil map units in the selected area of interest. A single value or rating for each map unit is generated by aggregating the interpretive ratings of individual map unit components. This aggregation process is defined for each property or quality.

## Soil Qualities and Features

Soil qualities are behavior and performance attributes that are not directly measured, but are inferred from observations of dynamic conditions and from soil properties. Example soil qualities include natural drainage, and frost action. Soil features are attributes that are not directly part of the soil. Example soil features include slope and depth to restrictive layer. These features can greatly impact the use and management of the soil.

### Hydrologic Soil Group

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.

# Map—Hydrologic Soil Group

Map Scale: 1:1,510 if printed on A landscape (11" x 8.5") sheet.

N

Meters: 0 20 40 80 120

Feet: 0 50 100 200 300

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 10N WGS84

## MAP LEGEND

**Area of Interest (AOI)**

Area of Interest (AOI)

**Soils**

**Soil Rating Polygons**

A

A/D

B

B/D

C

C/D

D

Not rated or not available

**Soil Rating Lines**

A

A/D

B

B/D

C

C/D

D

Not rated or not available

**Soil Rating Points**

A

A/D

B

B/D

C

C/D

D

Not rated or not available

**Water Features**

Streams and Canals

**Transportation**

Rails

Interstate Highways

US Routes

Major Roads

Local Roads

**Background**

Aerial Photography

## MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL: http://websoilsurvey.nrcs.usda.gov
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 2, Sep 24, 2014

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Jul 8, 2010—Sep 4, 2011

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.

## Table—Hydrologic Soil Group

| Hydrologic Soil Group— Summary by Map Unit — Yamhill County, Oregon (OR071) | | | | |
|---|---|---|---|---|
| **Map unit symbol** | **Map unit name** | **Rating** | **Acres in AOI** | **Percent of AOI** |
| 2300A | Aloha silt loam, 0 to 3 percent slopes | C/D | 5.5 | 100.0% |
| **Totals for Area of Interest** | | | **5.5** | **100.0%** |

## Rating Options—Hydrologic Soil Group

*Aggregation Method:* Dominant Condition

*Component Percent Cutoff: None Specified*

*Tie-break Rule:* Higher

# Soil Reports

The Soil Reports section includes various formatted tabular and narrative reports (tables) containing data for each selected soil map unit and each component of each unit. No aggregation of data has occurred as is done in reports in the Soil Properties and Qualities and Suitabilities and Limitations sections.

The reports contain soil interpretive information as well as basic soil properties and qualities. A description of each report (table) is included.

# Soil Physical Properties

This folder contains a collection of tabular reports that present soil physical properties. The reports (tables) include all selected map units and components for each map unit. Soil physical properties are measured or inferred from direct observations in the field or laboratory. Examples of soil physical properties include percent clay, organic matter, saturated hydraulic conductivity, available water capacity, and bulk density.

## Engineering Properties

This table gives the engineering classifications and the range of engineering properties for the layers of each soil in the survey area.

*Hydrologic soil group* is a group of soils having similar runoff potential under similar storm and cover conditions. The criteria for determining Hydrologic soil group is found in the National Engineering Handbook, Chapter 7 issued May 2007(http://directives.sc.egov.usda.gov/OpenNonWebContent.aspx?content=17757.wba). Listing HSGs by soil map unit component and not by soil series is a new concept for the engineers. Past engineering references contained lists of HSGs by soil series. Soil series are continually being defined and redefined, and the list of soil series names changes so frequently as to make the task of maintaining a single national list virtually impossible. Therefore, the criteria is now used to calculate the HSG using the component soil properties and no such national series lists will be maintained. All such references are obsolete and their use should be discontinued. Soil properties that influence runoff potential are those that influence the minimum rate of infiltration for a bare soil after prolonged wetting and when not frozen. These properties are depth to a seasonal high water table, saturated hydraulic conductivity after prolonged wetting, and depth to a layer with a very slow water transmission rate. Changes in soil properties caused by land management or climate changes also cause the hydrologic soil group to change. The influence of ground cover is treated independently. There are four hydrologic soil groups, A, B, C, and D, and three dual groups, A/D, B/D, and C/D. In the dual groups, the first letter is for drained areas and the second letter is for undrained areas.

The four hydrologic soil groups are described in the following paragraphs:

*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.

*Depth* to the upper and lower boundaries of each layer is indicated.

*Texture* is given in the standard terms used by the U.S. Department of Agriculture. These terms are defined according to percentages of sand, silt, and clay in the fraction of the soil that is less than 2 millimeters in diameter. "Loam," for example, is soil that is 7 to 27 percent clay, 28 to 50 percent silt, and less than 52 percent sand. If the content of particles coarser than sand is 15 percent or more, an appropriate modifier is added, for example, "gravelly."

*Classification* of the soils is determined according to the Unified soil classification system (ASTM, 2005) and the system adopted by the American Association of State Highway and Transportation Officials (AASHTO, 2004).

The Unified system classifies soils according to properties that affect their use as construction material. Soils are classified according to particle-size distribution of the fraction less than 3 inches in diameter and according to plasticity index, liquid limit, and organic matter content. Sandy and gravelly soils are identified as GW, GP, GM, GC, SW, SP, SM, and SC; silty and clayey soils as ML, CL, OL, MH, CH, and OH; and highly organic soils as PT. Soils exhibiting engineering properties of two groups can have a dual classification, for example, CL-ML.

The AASHTO system classifies soils according to those properties that affect roadway construction and maintenance. In this system, the fraction of a mineral soil that is less than 3 inches in diameter is classified in one of seven groups from A-1 through A-7 on the basis of particle-size distribution, liquid limit, and plasticity index. Soils in group A-1 are coarse grained and low in content of fines (silt and clay). At the other extreme, soils in group A-7 are fine grained. Highly organic soils are classified in group A-8 on the basis of visual inspection.

If laboratory data are available, the A-1, A-2, and A-7 groups are further classified as A-1-a, A-1-b, A-2-4, A-2-5, A-2-6, A-2-7, A-7-5, or A-7-6. As an additional refinement, the suitability of a soil as subgrade material can be indicated by a group index number. Group index numbers range from 0 for the best subgrade material to 20 or higher for the poorest.

*Rock fragments* larger than 10 inches in diameter and 3 to 10 inches in diameter are indicated as a percentage of the total soil on a dry-weight basis. The percentages are estimates determined mainly by converting volume percentage in the field to weight percentage.

*Percentage (of soil particles) passing designated sieves* is the percentage of the soil fraction less than 3 inches in diameter based on an ovendry weight. The sieves, numbers 4, 10, 40, and 200 (USA Standard Series), have openings of 4.76, 2.00,

0.420, and 0.074 millimeters, respectively. Estimates are based on laboratory tests of soils sampled in the survey area and in nearby areas and on estimates made in the field.

*Liquid limit* and *plasticity index* (Atterberg limits) indicate the plasticity characteristics of a soil. The estimates are based on test data from the survey area or from nearby areas and on field examination.

References:

American Association of State Highway and Transportation Officials (AASHTO). 2004. Standard specifications for transportation materials and methods of sampling and testing. 24th edition.

American Society for Testing and Materials (ASTM). 2005. Standard classification of soils for engineering purposes. ASTM Standard D2487-00.

Absence of an entry indicates that the data were not estimated. The asterisk '*' denotes the representative texture; other possible textures follow the dash. The criteria for determining the hydrologic soil group for individual soil components is found in the National Engineering Handbook, Chapter 7 issued May 2007(http://directives.sc.egov.usda.gov/OpenNonWebContent.aspx?content=17757.wba).

| Engineering Properties–Yamhill County, Oregon | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Map unit symbol and soil name | Pct. of map unit | Hydrologic group | Depth | USDA texture | Classification | | Fragments | | Percentage passing sieve number— | | | | Liquid limit | Plasticity index |
| | | | | | Unified | AASHTO | >10 inches | 3-10 inches | 4 | 10 | 40 | 200 | | |
| | | | *In* | | | | *Pct* | *Pct* | | | | | *Pct* | |
| 2300A—Aloha silt loam, 0 to 3 percent slopes | | | | | | | | | | | | | | |
| Aloha | 96 | C/D | 0-8 | Silt loam | ML, CL-ML, CL | A-6, A-4 | 0- 0- 0 | 0- 0- 0 | 100-100-100 | 95-100-100 | 95-97-100 | 85-85-95 | 25-35-40 | 5-9 -15 |
| | | | 8-15 | Loam, silt loam | ML, CL-ML, CL | A-4, A-6 | 0- 0- 0 | 0- 0- 0 | 100-100-100 | 95-100-100 | 95-97-100 | 75-85-95 | 25-35-40 | 5-9 -15 |
| | | | 15-22 | Silt loam, loam | CL | A-6 | 0- 0- 0 | 0- 0- 0 | 100-100-100 | 100-100-100 | 95-97-100 | 75-85-95 | 30-36-40 | 10-13-15 |
| | | | 22-31 | Silt loam, loam | CL | A-6 | 0- 0- 0 | 0- 0- 0 | 100-100-100 | 100-100-100 | 95-98-100 | 75-82-95 | 30-36-40 | 10-13-15 |
| | | | 31-46 | Silt loam, loam | CL | A-6 | 0- 0- 0 | 0- 0- 0 | 100-100-100 | 100-100-100 | 90-98-100 | 65-82-95 | 30-36-40 | 10-13-15 |
| | | | 46-60 | Silt loam, loam | CL, CL-ML | A-6, A-4 | 0- 0- 0 | 0- 0- 0 | 100-100-100 | 100-100-100 | 90-98-100 | 65-80-95 | 25-30-40 | 5-10-15 |
| | | | 60-65 | Silt loam, loam, very fine sandy loam | CL, CL-ML | A-4, A-6 | 0- 0- 0 | 0- 0- 0 | 100-100-100 | 100-100-100 | 90-97-100 | 60-64-95 | 25-28-40 | 5-8 -15 |

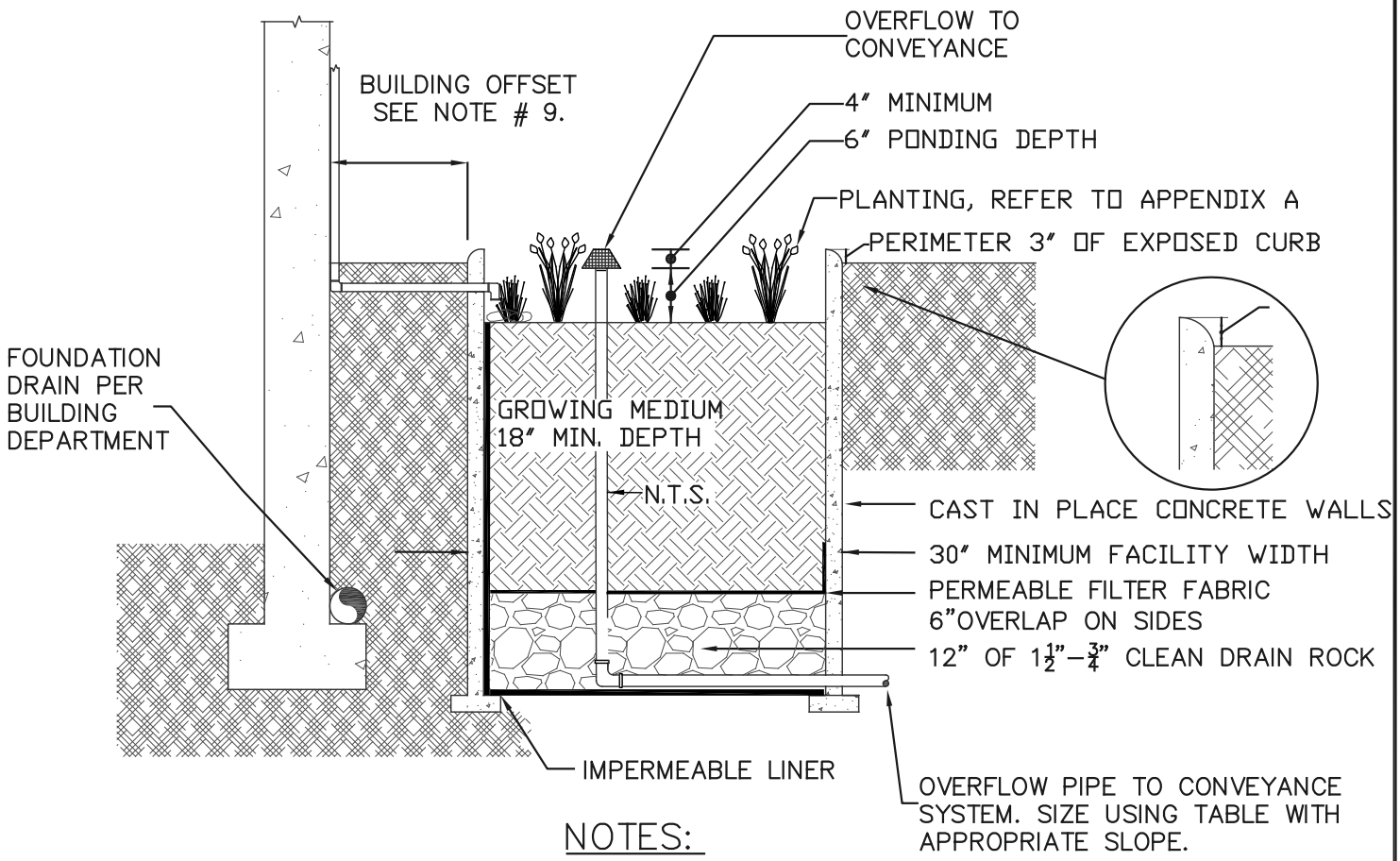
**Table 2-2a** Runoff curve numbers for urban areas [1]

| Cover description: Cover type and hydrologic condition | Average percent impervious area [2] | Curve numbers for hydrologic soil group: A | B | C | D |
|---|---|---|---|---|---|
| *Fully developed urban areas (vegetation established)* | | | | | |
| Open space (lawns, parks, golf courses, cemeteries, etc.) [3]: | | | | | |
| Poor condition (grass cover < 50%) | | 68 | 79 | 86 | 89 |
| Fair condition (grass cover 50% to 75%) | | 49 | 69 | 79 | 84 |
| Good condition (grass cover > 75%) | | 39 | 61 | 74 | 80 |
| Impervious areas: | | | | | |
| Paved parking lots, roofs, driveways, etc. (excluding right-of-way) | | 98 | 98 | 98 | 98 |
| Streets and roads: | | | | | |
| Paved; curbs and storm sewers (excluding right-of-way) | | 98 | 98 | 98 | 98 |
| Paved; open ditches (including right-of-way) | | 83 | 89 | 92 | 93 |
| Gravel (including right-of-way) | | 76 | 85 | 89 | 91 |
| Dirt (including right-of-way) | | 72 | 82 | 87 | 89 |
| Western desert urban areas: | | | | | |
| Natural desert landscaping (pervious areas only) [4] | | 63 | 77 | 85 | 88 |
| Artificial desert landscaping (impervious weed barrier, desert shrub with 1- to 2-inch sand or gravel mulch and basin borders) | | 96 | 96 | 96 | 96 |
| Urban districts: | | | | | |
| Commercial and business | 85 | 89 | 92 | 94 | 95 |
| Industrial | 72 | 81 | 88 | 91 | 93 |
| Residential districts by average lot size: | | | | | |
| 1/8 acre or less (town houses) | 65 | 77 | 85 | 90 | 92 |
| 1/4 acre | 38 | 61 | 75 | 83 | 87 |
| 1/3 acre | 30 | 57 | 72 | 81 | 86 |
| 1/2 acre | 25 | 54 | 70 | 80 | 85 |
| 1 acre | 20 | 51 | 68 | 79 | 84 |
| 2 acres | 12 | 46 | 65 | 77 | 82 |
| *Developing urban areas* | | | | | |
| Newly graded areas (pervious areas only, no vegetation) [5] | | 77 | 86 | 91 | 94 |
| Idle lands (CN's are determined using cover types similar to those in table 2-2c). | | | | | |

1 Average runoff condition, and $I_a = 0.2S$.
2 The average percent impervious area shown was used to develop the composite CN's. Other assumptions are as follows: impervious areas are directly connected to the drainage system, impervious areas have a CN of 98, and pervious areas are considered equivalent to open space in good hydrologic condition. CN's for other combinations of conditions may be computed using figure 2-3 or 2-4.
3 CN's shown are equivalent to those of pasture. Composite CN's may be computed for other combinations of open space cover type.
4 Composite CN's for natural desert landscaping should be computed using figures 2-3 or 2-4 based on the impervious area percentage (CN = 98) and the pervious area CN. The pervious area CN's are assumed equivalent to desert shrub in poor hydrologic condition.
5 Composite CN's to use for the design of temporary measures during grading and construction should be computed using figure 2-3 or 2-4 based on the degree of development (impervious area percentage) and the CN's for the newly graded pervious areas.

# APPENDIX 5.1
# STORMWATER MANAGEMENT DETIAILS

# PRIVATE/ PUBLIC WATER QUALITY & QUANTITY TREATMENT




| OVERFLOW PIPE SIZE (1/8 in./ft. SLOPE) | |
|---|---|
| MAX PROJECT ROOF AREA (ft.) | OVERFLOW PIPE SIZE (in.) |
| 822 | 3 |
| 1,880 | 4 |
| 3,340 | 6 |

| OVERFLOW PIPE SIZE (1/4 in./ft. SLOPE) | |
|---|---|
| MAX PROJECT ROOF AREA (ft.) | OVERFLOW PIPE SIZE (in.) |
| 1,160 | 3 |
| 2,650 | 4 |
| 4,720 | 6 |

## NOTES:

1. MAXIMUM SLOPE OF PLANTER 0.5%.
2. NO TREES OR DEEP ROOTED VEGETATION OVER PIPING IS ALLOWED IN FACILITY.
3. STORM PIPING TO FACILITY THROUGH WALL CORE HOLES, MAINTAIN MAXIMUM DISTANCE FROM THE OVERFLOW PIPE AS POSSIBLE.
4. PRIVATE OVERFLOW PIPE TO BE MINIMUM SPECIFIED IN PLUMBING CODE, SEE TABLE. PUBLIC FACILITIES SHALL BE SIZED TO CONVEY THE 25 YEAR STORM.
5. ENERGY DISSIPATERS REQUIRED AT WATER ENTRANCES MINIMUM 18"X18"X6" OF 4 TO 6 INCH ANGULAR RIPRAP.
6. PERMEABLE FILTER FABRIC REQUIRED BETWEEN LAYERS
7. IMPERMEABLE LINER REQUIRED AT FACILITY BOTTOM AND ON WALLS ADJACENT TO STRUCTURES (AS SHOWN).
8. "PARTIAL" INFILTRATION FACILITIES ARE ENCOURAGED. IMPERMEABLE LINER LOCATED AT FACILITY BOTTOM, MAY BE REMOVED FOR "PARTIAL" INFILTRATION, APPROVAL BY DESIGN PROFESSIONAL AND BUILDING DEPARTMENT REQUIRED.
9. BUILDING OFFSET REQUIRED ONLY WHEN INFILTRATING, 10 FT MINIMUM.
10. MUST BE LOCATED A MINIMUM OF 3 FT FROM ADJACENT PROPERTY LINE.

City of Newberg
PUBLIC WORKS ENGINEERING DIVISION
414 E. FIRST STREET NEWBERG, OR 97132
PHONE: 503-537-1240
FAX: 503-537-1277

REVISIONS:

FLOW THROUGH PLANTER

SCALE: N.T.S.
DATE: MARCH 2014
APPROVED BY: JAY H.
STANDARD DRAWING 452

# APPENDIX 6.1
# OPERATIONS AND MATAINANCE

# Stormwater Operations & Maintenance Plan
# Friendsview
# Newberg, Oregon

**Responsibility:**

The stormwater management facilities for the project are comprised of flow through planters, rain gardens, and water quality treatment structures. The facilities will be maintained by the property owners / developer.

*A copy of the O&M Plan shall be located on site.*

**Description:**

Runoff from the proposed impervious surface areas and landscaped areas will be directed into the proposed stormwater management facilities. The facilities will provide both water quality treatment and water quantity control for the runoff from within the boundary of the project.

**Facilities Description:**

Flow through planters and rain gardens are shallow landscaped depressions used to collect and hold stormwater runoff, allowing pollutants to settle and filter out as the water infiltrates into the ground. They are either excavated or created with bermed side slopes. An inlet pipe or sheet flow over impervious area conveys the stormwater into the planter or rain garden. The stormwater is then temporarily stored until it infiltrates into the ground or flows through the overflow and routed downstream.

The water quality treatment structure is a catch basin which routs runoff through a filter to provide water quality treatment.

**Inspection and Maintenance Schedule:**

The stormwater system must be inspected and maintained at a minimum of four times a year for the first three years and twice a year thereafter. Also the system should be inspected within 48 hours after a major storm event and maintained if required. A major storm event is defined as 1 inch or more of rain in a 24-hour period. Stormwater must drain out of catch basins within 24 hours after a rainfall ends, all structural components, including inlets and outlets must freely convey stormwater. Desirable vegetation in flow through planters, low impact development swales and detention ponds must cover at least ninety percent of the facility.

Postponed system inspection and maintenance can lead to malfunction of the storm system components as described above and a reduction in effective system function.

The facility owner shall keep a log recording all inspection dates, observations, and maintenance activities. Standard forms for inspection and maintenance are included in this plan. Receipts shall be saved when maintenance to a stormwater component is performed to provide a record of the maintenance work.

**Inspection and Maintenance Procedures:**

The following stormwater management facilities shall be inspected and maintained as follows:

***Flow through Planter and Rain Garden***

- Access to Flow through Planters shall be safe and efficient. Obstacles preventing access shall be removed.
- Debris and litter shall be removed to prevent channelization, clogging and interference with plant growth. Fallen leaves and debris should be raked and removed.
- Erosion damage shall be identified and controlled if native soil is exposed or eroded channels are forming.
- Grass in Flow through Planters should be mowed twice a year (height 4" to 9") and clippings removed.
- Infiltrating Flow through Planters shall be excavated and cleaned if necessary to correct reduced infiltration rates.
- Inlets, outlets and overflows shall be cleared of debris to ensure free flow of stormwater.
- Mulch shall be replenished as needed to ensure healthy plant growth.
- Invasive vegetation shall be removed when discovered.
- Built up sediment can be removed by hand to minimize damage to garden vegetation.
- Dead vegetation shall be removed to maintain less than 10% of area coverage or when swale function is impaired. Vegetation shall be replaced within 3 months or immediately if the season is appropriate in order to maintain cover density and control erosion where soils are exposed.

***Spill Prevention***

Spill prevention measures shall be exercised when handling substances that can contaminate stormwater. Danger from spills is present at virtually all sites, including residential and commercial. Activities that pose the chance of hazardous material spills shall not take place near collection facilities. The following spill prevention measures shall be employed:

- The proper authority and the property owner shall be contacted immediately if a spill occurs.
- A spill kit shall be kept near spill-prone operations and refreshed annually.
- Employees shall be trained on spill control measures.
- Released pollutants shall be corrected within 12 hours of spill occurrence.

***Insects and Rodents***

Insects and rodents shall not be harbored in any part of the storm system.

- Pest control measures shall be taken when insects or rodents are found to be present. Standing water and food sources shall be prevented.
- If sprays are considered, a mosquito larvicide such as Bacillus thurendensis or Altoside formulations can be applied only when absolutely necessary and shall not be used where it will enter groundwater or come in contact with any standing water. Sprays shall only be applied by licensed individuals or contractors.
- Holes in the ground located in and around the stormwater facilities shall be filled.
- Outfalls draining into vegetated swales shall be inspected and cleaned regularly to ensure no rodent activity, which can clog or decrease the efficiency of the storm system.

## Stormwater Facility Monitoring Log:

**Infiltration –** 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 the local Fire Department and the Department of Environmental Quality for immediate assistance with responding to spills. Record time, date, weather, and site conditions if site activities are found to contaminate stormwater.

**Vectors (mosquitoes and rodents) –** Stormwater facilities shall not harbor mosquito larvae or rats that pose a threat to public health or undermine the facility structure. Monitor standing water for small wiggling sticks perpendicular to the water's surface. Note holes and burrows in and around facilities. Call the Yamhill County Environmental Services at 503-434-7525 or contact the Oregon Mosquito and Vector control Association at www.omvca.com for immediate assistance with eradicating vectors. Record time, date, weather, and site conditions when vectors are observed.

**Maintenance:**
Record date, description, and contractor's name (if applicable) for all structural repairs, landscape maintenance, and facility cleanout activities.

**Supplemental Materials:**

- **Contech StormFilter Inspection and Maintenance Procedures**
- **Stormwater Planters Facility Maintenance Form**
- **Manufactured Treatment Technology Facility Maintenance Form**
- **Stormwater Management Facility Inspection & Maintenance Log**

**Construction Details (City of Newberg)**

- **Agreement to Maintain Private Stormwater Facilities**
- **Flow through Planter**
- **Rain Garden**
- **Stormfilter Standard Detail**

**Site Specific As-built Plans:**

- **To be provided at completion of project**

CONTECH
CONSTRUCTION PRODUCTS INC.

# StormFilter Inspection and Maintenance Procedures

The Stormwater Management
StormFilter®

## Maintenance Guidelines

The primary purpose of the Stormwater Management StormFilter® is to filter out 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 likely many effective maintenance options, we believe the following procedure is efficient and can be implemented using common equipment and existing maintenance protocols. A two step procedure is recommended as follows:

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, in late summer to early fall when flows into the system are not likely to be present.

## Maintenance Frequency

The primary factor controlling timing of maintenance of 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.

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.

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.

Prior to the development of the maintenance database, the following maintenance frequencies should be followed:

**Inspection**

One time per year

After major storms

**Maintenance**

As needed, based on results of inspection (The average maintenance lifecycle is approximately 1-3 years)

Per Regulatory requirement

In the event of a chemical spill

Frequencies should be updated as required. The recommended initial frequency for inspection is one time per year. StormFilter units should be inspected after major storms.

Sediment removal and cartridge replacement on an as needed basis is recommended unless site conditions warrant.

Once an understanding of site characteristics has been established, maintenance may not be needed for one to three years, but inspection is warranted and recommended annually.

## 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 Construction Products 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.

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 weather 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)

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 in the cartridge bay for more that 24 hours after end of rain event, maintenance is required.
4. Plugged media.
   a. 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 ≥ 1/4" thick) is present above top cap, maintenance is required.
8. Calendar Lifecycle.
   a. If system has not been maintained for 3 years maintenance is required.

**Assumptions**

- No rainfall for 24 hours or more
- No upstream detention (at least not draining into StormFilter)
- Structure is online
- Outlet pipe is clear of obstruction
- Construction bypass is plugged

## 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 Construction Products.

**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 Construction Products 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). Unscrew (counterclockwise rotations) each filter cartridge from the underdrain connector. 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 Construction Products for suggested attachment devices.

**Important:** Note that cartridges containing leaf media (CSF) do not require unscrewing from their connectors. Take care not to damage the manifold connectors. This connector should remain installed in the manifold and could be capped during the maintenance activity to prevent sediments from entering the underdrain manifold.

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 unless CONTECH Construction Products performs the maintenance activities and damage is not related to discharges to the system.

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. Enter the vault using appropriate confined space protocols.

B. Unscrew the cartridge cap.

C. Remove the cartridge hood screws (3) hood and float.

D. At location under structure access, tip the cartridge on its side.

**Important**: Note that cartridges containing media other than the leaf media require unscrewing from their threaded connectors. Take care not to damage the manifold connectors. This connector should remain installed in the manifold and capped if necessary.

D. Empty the cartridge onto the vault floor. Reassemble the empty cartridge.

E. Set the empty, used cartridge aside or load onto the hauling truck.

F. 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. The connectors are short sections of 2-inch schedule 40 PVC, or threaded schedule 80 PVC that should protrude about 1" above the floor of the vault. Lightly wash down the vault interior.
   a. Replace any damaged 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 Construction Products.

## 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.

RECYCLED PAPER

CONTECH CONSTRUCTION PRODUCTS INC.
800.338.1122
www.contech-cpi.com

## Support

- Drawings and specifications are available at contechstormwater.com.
- Site-specific design support is available from our engineers.

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CONTECH Construction Products Inc. provides site solutions for the civil engineering industry. CONTECH's portfolio includes bridges, drainage, sanitary sewer, stormwater and earth stabilization products. For information on other CONTECH division offerings, visit contech-cpi.com or call 800.338.1122

Nothing in this catalog should be construed as an expressed warranty or an implied warranty of merchantability or fitness for any particular purpose. See the CONTECH standard quotation or acknowledgement for applicable warranties and other terms and conditions of sale.

The product(s) described may be protected by one or more of the following US patents: 5,322,629; 5,624,576; 5,707,527; 5,759,415; 5,788,848; 5,985,157; 6,027,639; 6,350,374; 6,406,218; 6,641,720; 6,511,595; 6,649,048; 6,991,114; 6,998,038; 7,186,058; related foreign patents or other patents pending.

# Inspection Report

Date: _____ Personnel: _____

Location: _____ System Size: _____

System Type: Vault ☐ Cast-In-Place ☐ Linear Catch Basin ☐ Manhole ☐ Other ☐

Sediment Thickness in Forebay: _____ Date: _____

Sediment Depth on Vault Floor: _____

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: Yes ☐ No ☐

Sediment Depth in Forebay: _____

Sediment Depth on Vault Floor: _____

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:

_____

_____

_____

_____

_____

_____

_____

## 1. Stormwater Planter

**Stormwater Planters** are designed to allow runoff to filter through layers of topsoil (thus capturing pollutants) and then either infiltrate into the native soils (infiltration planter) or be collected in a pipe to be discharged off-site (filtration planter). The planter is sized to accept runoff and temporarily store the water in a reservoir on top of the soil. The filtration planter is designed with an impervious bottom or is placed on an impervious surface. Water should drain through the planter within 24 hours after a storm event.

**Inspections**

All facility components and vegetation shall be inspected for proper operations and structural stability. *These inspections shall occur, at a minimum, quarterly for the first two years from the date of installation, and two times per year thereafter.* It is recommended that a visual inspection be made within 48 hours after each major storm event to ensure proper function. The facility owner must keep a log, recording all inspection dates, observations, and maintenance activities. The following items shall be inspected and maintained as stated:

Date: ____/____/_____ Inspector's Name: _____

**Downspout** from rooftop or sheet flow from paving allows unimpeded stormwater flow to the planter.

- □ Debris shall be removed routinely and upon discovery.
- □ Damaged pipe shall be repaired upon discovery.

Inspection Comments: _____

_____

**Splash blocks** prevent splashing against adjacent structures and convey water without disrupting media.

- □ Any deficiencies in structure such as cracking, rotting, and failure shall be repaired.

Inspection Comments: _____

_____

**Planter reservoir** receives and detains stormwater prior to infiltration. Water should drain from planter within 24 hours of storm event.

- □ Sources of clogging shall be identified and corrected.
- □ Topsoil may need to be amended with sand or compost, or replaced.

Inspection Comments: _____

_____

**Amended soils** consisting of sand, compost, drain rock, and topsoil shall allow stormwater to percolate uniformly through the planter.

- □ The planter shall be excavated and cleaned, and gravel or soil shall be replaced to correct low infiltration rates.
- □ Holes that are not consistent with the design and allow water to flow directly through the planter to the ground shall be plugged.
- □ Sediment accumulation shall be hand-removed with minimum damage to vegetation using proper erosion control measures. Sediment shall be removed if it is more than 4 inches thick or so thick as to damage or kill vegetation.
- □ Litter and debris shall be removed.

Inspection Comments: _____

_____

## 1. Stormwater Planter (continued)

**Planter** shall contain filter media and vegetation.

- □ Structural deficiencies in the planter including rot, cracks, and failure shall be repaired.

Inspection Comments: _____

_____

**Overflow pipe** safely conveys flow exceeding reservoir capacity to an approved stormwater receiving system**.**

- □ Overflow pipe shall be kept clear at all times.
- □ Damaged pipe shall be repaired or replaced upon discovery.

Inspection Comments: _____

_____

**Vegetation** shall be healthy and dense enough to provide filtering while protecting underlying soils from erosion. Proper horticultural practices shall be employed to ensure plants are vigorous and healthy.

- □ Mulch shall be replenished as needed, but not inhibiting water flow.
- □ Vegetation, large shrubs, or trees that limit access or interfere with planter operation shall be pruned or removed.
- □ Fallen leaves and debris from deciduous plant foliage shall be raked and removed.
- □ Nuisance or prohibited vegetation from the City of Newberg Non-Native Invasive Plant list shall be removed when discovered. Invasive vegetation shall be removed upon discovery.
- □ Dead vegetation shall be removed upon discovery.
- □ Vegetation shall be replaced as soon as possible to maintain cover density and control erosion where soils are exposed.

Inspection Comments: _____

_____

**Debris and litter** shall be removed to ensure stormwater infiltration and to prevent clogging of overflow drains and interference with plant growth.

Inspection Comments: _____

**Spill prevention** measures shall be exercised when handling substances that contaminate stormwater.

- □ Releases of pollutants shall be corrected and reported to the City as soon as identified.

Inspection Comments: _____

**Training and/or written guidance information** for O&M of stormwater planters shall be provided to all property owners and tenants. This Facility Maintenance Form can be used to meet this requirement.

Inspection Comments: _____

**Access** to the stormwater planter shall be safe and efficient. Egress and ingress routes shall be maintained to design standards. Roadways shall be maintained to accommodate size and weight of vehicles, if applicable.

- □ Obstacles preventing maintenance personnel and/or equipment access to the stormwater planter shall be removed.
- □ Gravel or ground cover shall be added if erosion has occurred.

Inspection Comments: _____

_____

## 1. Stormwater Planter (continued)

**Nuisance insects and rodents** shall not be harbored in the stormwater planter.

Pest control measures shall be taken when nuisance insects/rodents are found to be present.

- □ Holes in the ground located in and around the stormwater planter shall be filled and compacted.

Inspection Comments: _____

_____

## 8. Manufactured Treatment Technology

**Manufactured treatment technologies** are proprietary facilities that can be used to meet the stormwater treatment requirements, provided the type of facility has been approved by the City. The *Public Works Design Standards* lists approved facilities. Because requirements vary among the different types of facilities, each facility is to be operated and maintained according to the specifications provided by the manufacturer

Date: ____/____/_____ Inspector's Name: _____

- □ Manufactured treatment devices are being maintained according to manufacturer specifications as approved by the City.
- □ Records of operations/maintenance are being kept on file.

Inspection Comments: _____

_____

**Training and/or written guidance information** for operating and maintaining manufactured treatment technology shall be provided to all property owners and tenants.

Inspection Comments: _____

_____

# STORMWATER MANAGEMENT FACILITY INSPECTION & MAINTENANCE LOG

**Property Address:**

**Inspection Date:**

**Inspection Time:**

**Inspected By:**

**Type of Stormwater Management Facility:**

**Location of Facility on Site (In relation to buildings or other permanent structures):**

**Water levels and observations (ponded water, Oil sheen, smell, etc.):**

**(Approximate Date/Time of Last Significant Rainfall):**

**Sediment accumulation & areas of erosion. Record sediment removal/erosion repair:**

**What is the current condition of vegetation? Record survival rates, invasive species present, number of dead plants, etc.) Record any replacement plants and type of vegetation management (mowing, weeding, etc.)**

**What is the condition of physical properties such as inlets, outlets, piping, fences, and irrigation facilities? Record maintenance performed and replacement activities:**

**Presence of insects or damage from animals. Record control activities:**

**Identify safety hazards present. Record resolution activities:**

**AFTER RECORDING RETURN TO:**
City of Newberg – Engineering Department
PO Box 970 - 414 E. First Street
Newberg, OR 97132

---

*CITY OF NEWBERG*

# AGREEMENT TO MAINTAIN PRIVATE STORMWATER FACILITIES

THIS AGREEMENT is entered into this ___ day of _____, 20__ by and between the City of Newberg, a municipal corporation of the State of Oregon, hereinafter called CITY, and

_____
(Owner name)

_____
(Address)

_____ _____ _____
(City, State, Zip) (Phone) (Email Address)

hereinafter called OWNER.

## RECITALS

1. OWNER has developed the following facilities located at: _____ (Site Address)
Tax Map _____, Tax Lot _____.

(select one, or both if applicable):

☐ Private Stormwater Detention or Retention Facilities

☐ Private Water Quality Treatment Facilities

2. Stormwater Facilities (FACILITIES) enable development of property while mitigating the impacts of additional surface water and pollutants associated with stormwater runoff prior to discharge from the property to the public stormwater system. The consideration for this agreement is connection to the public stormwater system.

3. The property benefited by the FACILITIES and subject to the obligation of this Agreement is described in Exhibit A (PROPERTY). The site specific maintenance plan and checklist for the FACILITIES is to assist with the successful completion of the operation and maintenance is described in Exhibit B. Exhibits A and B are attached hereto and incorporated by reference.

4. The FACILITIES are a required condition of permit approval for the property and are designed by a registered professional engineer in accordance with the City of Newberg Standard Design Manual; and are binding on all current and future owners of the property as described in Section VII below. The owner is required to operate and maintain the FACILITIES in accordance with the attached O&M plans.

5. CITY and OWNER agree that effective maintenance of the FACILITIES will best be facilitated by regular inspections, not less than twice a year, those times being generally described as once in the early spring and again in the fall prior to the onset of fall rains.

6. Failure to inspect and maintain the FACILITIES will constitute a violation of Section 13.25 of the Newberg Municipal Code (NMC) and can result in a notice of violation and penalties, as stated in Section V below:

**NOW, THEREFORE,** it is agreed by and between the parties as follows:

I. OWNER INSPECTIONS

OWNER shall provide inspections of the Facilities in conformance with the requirements set forth in Exhibits B. OWNER shall maintain a log of inspection activities. The log shall be available to the CITY upon request, and submitted yearly to the City as outlined in Section 13.25.300, Maintenance of the NMC.

II. DEFICIENCIES

All aspects in which the FACILITIES fail to satisfy the Operations and Maintenance Plan shall be noted as "Deficiencies" **in the inspection logs.**

III. OWNER CORRECTIONS

All Deficiencies shall be corrected at OWNER'S expense within thirty (30) days after completion of the inspection. If more than 30 days is reasonably needed to correct a Deficiency, OWNER shall have a reasonable period to correct the Deficiency so long as the correction is commenced within the 30-day period and is diligently prosecuted to completion.

IV. CITY INSPECTIONS

OWNER hereby grants CITY the right to access and inspect the FACILITIES. CITY will endeavor to give prior notice (as courtesy to OWNER), except that no notice shall be required in case of an emergency. CITY shall determine whether Deficiencies need to be corrected. OWNER (at the last known address provided to the City) will be notified in writing via first class mail of the Deficiencies and shall make corrections in accordance with the City inspection report and within the timeframe specified in the report.

V. CITY CORRECTIONS

If correction of all CITY identified Deficiencies is not completed within the timeframe specified in the notice of violation, the CITY shall have the right to correct the noted Deficiencies. CITY (i) shall hereby have full access to the Facilities for the purpose of correcting such Deficiencies and (ii) shall bill OWNER in accordance with the summary abatement procedures of NMC 13.25.370.

VI. EMERGENCY MEASURES

If at any time the CITY reasonably determines that the FACILITIES create an immediate threat to public health and safety; potential for damage to public or private property adjacent to or downstream of the FACILITIES; or the potential for damage or negative impacts to water quality, riparian habitat, or channel morphology of the receiving watercourse; the CITY may immediately and without prior notice to OWNER take measures reasonably designed to remedy the threat. CITY shall provide notice of the threat and the measures taken to OWNER as soon as reasonably practicable, and charge OWNER for the cost of these corrective measures as outlined in V above.

VII. FORCE AND EFFECT

This Agreement has the same force and effect as any deed covenant running with the land and shall benefit and bind all OWNERS of the PROPERTY present and future, and their heirs, successors and assigns.

VIII. AMENDMENTS

The terms of this Agreement may be amended only by mutual agreement of the parties and shall not alter the intended purpose, intent, or functionality (NMC 13.25.300) of the FACILITIES. Any amendments shall be in writing, shall refer specifically to this Agreement, and shall be valid only when executed by the owners of the PROPERTY and CITY and recorded in the Official Records of Yamhill County.

IX. PREVAILING PARTY

In any action brought by either party to enforce the terms of this Agreement, the prevailing party shall be entitled to recover all costs, including reasonable attorney's fees as may be determined by the court having jurisdiction, including any appeal.

X. SEVERABILITY

The invalidity of any section, clause, sentence, or provision of this Agreement shall not affect the validity of any other part of this Agreement, which can be given effect without such invalid part or parts.

**IN WITNESS WHEREOF**, OWNER and CITY have signed this Agreement.

OWNER(S): _____ _____

*Signature* *Signature*

_____ _____

*Name (Print or Type)* *Name (Print or Type)*

_____ _____

*Title (Corporate)* *Title (Corporate)*

_____ _____

*Name of Entity (Corporate)* *Name of Entity (Corporate)*

STATE OF _____ )
) s.s.
County of _____ )

This instrument was acknowledged before me this ____ day of _____, 20__, by

_____.

_____
Notary Public for Oregon
My Commission expires:_____

**City Approval:**

_____
Sue Ryan
City Recorder

**Department Approval:**

_____
Kaaren Hofmann
City Engineer

**Approved as to Form and Content:**

_____
Truman A. Stone
City Attorney

# EXHIBIT A

Benefited Property Legal Description and Facility
Agreement Area Meets and Bounds Legal Description with Sketch
(To be Provided by Owner)

# EXHIBIT A

Benefited Property Legal Description and Facility
Agreement Area Meets and Bounds Legal Description with Sketch
(To be Provided by Owner)

# EXHIBIT B

Site Specific Maintenance Plan and Checklist
(To be Provided by Owner)

# APPENDIX 7.1
# PRELIMINARY INFILTRATION FIGURES

## Chris Knight

**From:** Nick Hatch <NHatch@gri.com>
**Sent:** Wednesday, October 28, 2015 8:00 AM
**To:** Chris Knight
**Cc:** 5776 Friendsview Univ Village Ph I
**Subject:** Friendsview University Village (GRI# 5776) / Infiltration Test Results

**Categories:** Filed by Newforma

Chris,

Referencing the numbered locations provided by you, the average unfactored, field-measured infiltration rates measured at a depth of about 5 ft below existing site grades are as follows: 1 – 0.49 in./hr, 3 – 0.06 in./hr, and 4 – 0.21 in./hr. We recommend reducing the filed infiltration rate by at least 50% to account for the reduction in the rate of infiltration over time due to clogging. Please let me know if you have any questions or need any additional information.

Thanks,
Nick

**Nick Hatch, PE**
Project Engineer

**GRI**
9750 SW Nimbus Avenue, Beaverton, OR 97008
p | 503-641-3478 c | 503-708-5332 e | nhatch@gri.com
**gri.com**

*Providing geotechnical and environmental consulting services since 1984*

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**From:** Chris Knight [mailto:KnightC@aks-eng.com]
**Sent:** Thursday, September 24, 2015 11:54 AM
**To:** Nick Hatch
**Subject:** Infiltration Testing

Nick,

Newberg's stormwater facility selection hierarchy prefers use of LIDA Facilities which utilize infiltration as part of their design. We need testing to design these facilities or to prove to the city that LIDA Facilities will not work. We can accept a reduction in the number of tests to three, dropping test 3 and keeping testing locations 1,2 and 4 from my previous exhibits sent to you 9/23.

Thanks,

Chris

**Christopher Knight, EI**

**AKS ENGINEERING & FORESTRY, LLC**
12965 SW Herman Road, Suite 100 | Tualatin, OR 97062
P: 503.563.6151 Ext. 252 | F: 503.563.6152 | www.aks-eng.com | ReneeG@aks-eng.com
Offices in: Tualatin, OR | Salem-Keizer, OR | Vancouver, WA

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