EXHIBIT PC-1: APPLICANT SUBMITTAL

City of West Linn
Planning & Development • 22500 Salamo Rd #1000 • West Linn, Oregon 97068
Telephone 503.656.4211 • Fax 503.656.4106 • westlinnoregon.gov

DEVELOPMENT REVIEW APPLICATION

For Office Use Only			
STAFF CONTACT: Myers	PROJECT NO(S): CUP-21-02, DR-21-04, WRG-21-02, VAR-21-06, MISC-21-04, VAR-21-01, LLA-21-02		PRE-APPLICATION NO.: PA-20-15
NON-REFUNDABLE FEE(S): $4,100	REFUNDABLE DEPOSIT(S): $27,250	TOTAL: $31,350	

Type of Review (Please check all that apply):

- [ ] Annexation (ANX)
- [ ] Appeal and Review (AP)
- [x] Conditional Use (CUP)
- [x] Design Review (DR)
- [ ] Easement Vacation
- [ ] Extraterritorial Ext. of Utilities
- [ ] Final Plat or Plan (FP)
- [x] Flood Management Area
- [ ] Hillside Protection & Erosion Control
- [ ] Historic Review
- [ ] Legislative Plan or Change
- [x] Lot Line Adjustment (LLA)
- [ ] Minor Partition (MIP) (Preliminary Plat or Plan)
- [ ] Non-Conforming Lots, Uses & Structures
- [ ] Planned Unit Development (PUD)
- [ ] Pre-Application Conference (PA)
- [ ] Street Vacation
- [ ] Subdivision (SUB)
- [ ] Temporary Uses
- [ ] Time Extension
- [x] Variance (VAR)
- [ ] Water Resource Area Protection/Single Lot (WAP)
- [ ] Water Resource Area Protection/Wetland (WAP)
- [x] Willamette & Tualatin River Greenway (WRG)
- [ ] Zone Change

Home Occupation, Pre-Application, Sidewalk Use, Sign Review Permit, and Temporary Sign Permit applications require different or additional application forms, available on the City website or at City Hall.

Site Location/Address: 945 Dollar Street

Assessor's Map No.: 21334C | 31E34DC
Tax Lot(s): 600 | 1900 and 1001
Total Land Area: 22.11 acres

Brief Description of Proposal:
The West Linn-Wilsonville School District proposes to construct a new Athey Creek Middle School on the Dollar Street property and seeks concurrent approval of a Type III Conditional Use Permit, Design Review Application, Variance, and Lot Consolidation Application

Applicant Name: (please print) West Linn-Wilsonville School District
Phone: 503-673-7988
Address: 2755 SW Borland Road
Email: douglasr@wlwv.k12.or.us
City State Zip: Tualatin, OR 97062

Owner Name (required): (please print) West Linn-Wilsonville School District
Phone: 503-673-7988
Address: 2755 SW Borland Road
Email: douglasr@wlwv.k12.or.us
City State Zip: Tualatin, OR 97062

Consultant Name: (please print) 3J Consulting, Inc.
Phone: 503-946-9365 x211
Address: 9600 SW Nimbus Avenue, Suite 100
Email: mercedes.serra@3j-consulting.com
City State Zip: Beaverton, OR 97008

1. All application fees are non-refundable (excluding deposit). **Any overruns to deposit will result in additional billing.**
2. The owner/applicant or their representative should be present at all public hearings.
3. A decision may be reversed on appeal. No permit will be in effect until the appeal period has expired.
4. **One complete hard-copy set of application materials must be submitted with this application.**
   One complete digital set of application materials must also be submitted electronically in PDF format.
   If large sets of plans are required in application please submit one set.

The undersigned property owner(s) hereby authorizes the filing of this application, and authorizes on site review by authorized staff. I hereby agree to comply with all code requirements applicable to my application. Acceptance of this application does not infer a complete submittal. All amendments to the Community Development Code and to other regulations adopted after the application is approved shall be enforced where applicable. Approved applications and subsequent development is not vested under the provisions in place at the time of the initial application.

Applicant's signature _____ Date _____ Owner's signature (required) _____ Date 3-17-21

Received 3/18/21
by LSchroder

3J CONSULTING
CIVIL ENGINEERING | WATER RESOURCES | LAND USE PLANNING

West Linn-Wilsonville School District

IBI

kpff

W|M

ATHEY CREEK MIDDLE SCHOOL

DOLLAR STREET | WEST LINN, OREGON

APPLICANT'S REPRESENTATIVE

3J CONSULTING, INC.
9600 NW NIMBUS AVENUE, SUITE 100
BEAVERTON, OR 97008
CONTACT: MERCEDES SERRA
PHONE: (503) 946-9365

OWNER | APPLICANT:

WEST LINN-WILSONVILLE SCHOOL DISTRICT
2755 SW BORLAND ROAD
TUALATIN, OR 97062
CONTACT: REMO DOUGLAS
PHONE: (503) 673-7988

APPLICATION TYPE

CONDITIONAL USE PERMIT
TYPE II DESIGN REVIEW
CLASS II VARIANCES

SUBMITTAL DATE

MARCH 18, 2021

West Linn – Wilsonville Schools

To: Chris Myers, Associate Planner, City of West Linn

From: Remo Douglas, Capital Construction Program Manager

Subject: Proposed Athey Creek Middle School at 840/945 Dollar Street Conditional Use Permit

Date: April 30,2021

The West Linn – Wilsonville School District proposes the construction of an 850 student middle school on District-Owned property in West Linn.

On August 5th, 2019, having considered safety advisory committee recommendations, high school study group recommendations, enrollment projections and bond summit feedback, the West Linn – Wilsonville School District Board of Directors adopted Board Resolution #2019-2. This resolution directed staff to file for a measure election. West Linn – Wilsonville voters approved Measure #3-554 in the November 5, 2019 election. The text provided to voters included: "Construct an enlarged Athey Creek Middle School on District-owned property in West Linn to meet enrollment needs". The community supported the expenditure of public funds to pursue this project and the selected property offers the only suitably sized site that will fulfill this mandate set by the voters.

The 2019 Capital Bond Program not only included the construction of this proposed new Athey Creek Middle School on Dollar Street, but also contemplated the following benefits: addressing excess enrollment at the high school level, including West Linn High School, and providing unique educational programming. The District committed to voters that it will "Relocate and expand Arts and Technology High School to the Athey Creek Middle School site". The students drawn to this new Third Option High School at the existing Athey Creek Middle School building on Borland Road, with its unique program pathways, will relieve enrollment pressure on the two comprehensive high schools.

The proposed new Athey Creek Middle School on Dollar Street will bring a second middle school to West Linn, within walking and biking distance of many students. That will match the two middle schools serving Wilsonville. The new Third Option High School (at the existing Athey Creek Middle School on Borland Road) will provide a central third school at the high school level, in the same way that Athey Creek did for middle schools for many years. The third high school will also be well positioned in the event that development expands into the central area of the District in the coming decades.

Further, this is not the first time that this property has been considered for use as a middle school. In 1994, the City Planning Commission granted conditional use approval for a middle school on this property. However, due in part to the location of the then-new Athey Creek Middle School and the areas targeted for development by the City, the location of Rosemont Ridge Middle School was deemed preferable and the approval was denied on appeal. The site is suitable in 2020 for multiple reasons, including improved infrastructure in the area and the balance of middle schools across the District. A

more complete history of this decision is provided in a response to question 1 of 129 from the Frequently Asked Questions document in Appendix C of this application, which was posted to the District website. Additional context for the siting of the new middle school, and other aspects of the application, is provided throughout the land use narrative and the 129 community questions answered.

This project location, siting and design represents the culmination of years of study and community conversation. The District's 2019 Long Range Facilities Plan, included in Appendix D of this application, describes the basis for the selection of projects for construction. A brief outline of this document, which is broken into two parts, is provided below:

"Part 1 – West Linn-Wilsonville School District Long Range Plan" provides a summary of the District's framework for facilities planning in three sections:

- A - FRAMEWORK FOR EXCELLENCE: Describes the values, themes and educational needs and approaches that are the basis of facility planning and maintenance decisions.
- B - SCHOOL FACILITIES: Identifies the existing school capacity, potential growth and educational trends and factors that could impact the future facility needs.
- C - CAPITAL IMPROVEMENTS: Outlines the capital improvement planning process and identifies criteria for identifying future capital improvement projects.

"Part 2 – West Linn-Wilsonville School District Capital Improvement Program" supports consideration of a capital bond measure in the near future by providing background information relating to issues facing the District over the next 10-years and the potential improvements that could address them. The report is organized to answer four questions:

- OVERVIEW: What is the District's mission, what are the challenges, and what is the Capital Improvement Program?
- EXCELLENCE IN EDUCATION: Why does the District's goal for excellence in education serve as the basis for the Capital Improvement Program?
- CAPITAL IMPROVEMENT PLANNING PROCESS: How is the Capital Improvement Program developed and how will the proposed projects support the District's commitment to excellence?
- CAPITAL PROJECTS LIST AND NEXT STEPS: When will the Capital Improvement Program projects be prioritized and implemented?

The design process included community outreach, student feedback, staff and administrator conversations and study of lessons learned from recent school projects in the area. It was led by a dedicated team of construction, architecture, engineering, education and land use professionals.

The six community meetings are listed below by date, and host organization:

- January 8, 2020 Willamette Falls Neighborhood Association
- May 14, 2020 West Linn – Wilsonville School District
- June 25, 2020 West Linn – Wilsonville School District
- October 20, 2020 West Linn – Wilsonville School District
- November 18, 2020 Willamette Falls Neighborhood Association
- January 27, 2021 West Linn – Wilsonville School District

Conceptual drawings were not presented until the third community meeting to provide the opportunity to hear from the community before narrowing the design options. This was in direct response to community feedback received during and after the January 8, 2020 meeting. The District considered the feedback received alongside the needs for the school and regulatory requirements as the conceptual plan solidified over the rest of the year. Specialty consultants were brought in to address technical topics at select meetings. Numerous details in the design are direct responses to the feedback received, including:

- Traffic calming measures
- Lowering the building
- Lowering site improvements
- Pickup/drop-off drive location
- Pickup/drop-off zone capacity
- Vehicle queueing capacity on site
- Parking lot locations
- Retaining and replacing trees
- Native plantings
- Balancing retaining walls, slopes
- Setback distances
- Vegetative buffering
- Fencing along Dollar Street
- Traditional building exterior
- Personal scale at entries
- "Homestead" feel at entries

The design was further informed by a variety of supporting technical studies included in this application, which have also been made publicly available on the District website. The technical reports confirm the suitability of the site and proposed improvements, and are found in Appendix D of the application:

- Exhibit 10: Transportation Impact Study, DKS and Associates – October 21, 2020
- Exhibit 11: Supplemental Traffic Memo, DKS and Associates – January 27, 2021
- Exhibit 12: Preliminary Drainage Report, KPFF Consulting – January 2021
- Exhibit 13: Geotechnical Report, GeoDesign Inc. October 20, 2020
- Exhibit 14: Phase 1 Environmental Report, PBS, April 2019
- Exhibit 15: Phase 2 Environmental Report, PBS, August 2020
- Exhibit 16: Soil Management Recommendation Memo, PBS, September 28, 2020
- Exhibit 17: Natural Resource Review, Pacific Habitat Services, March 16, 2021
- Exhibit 18: Bald Eagle and Raptor Assessment, Pacific Habitat Services, August 27, 2020
- Exhibit 19: Pacific Resource Group Arborist Report, March 5, 2021
- Exhibit 20: Listen Acoustics Noise Study Memo, February 25, 2021
- Exhibit 21: West Linn-Wilsonville Long Range Facilities Plan – 2019 Edition

In addition to these more formal community engagement efforts, a series of 35 listening sessions were held with individual neighbors wishing to speak in a smaller setting. In March 2021, I personally knocked on the door of each residence directly adjacent to or directly across Dollar Street from the subject property. I spoke with each neighbor that answered their door if they wished, listening to concerns and answering questions they still had regarding the proposed project. I also left a copy of a letter offering to set a time to speak individually them. The majority of the neighbors that responded were supportive of the project. Lastly, at the request of a few of these community members the District posted an online survey for feedback regarding the proposed planting plan. The results served as the basis for modest adjustments in response.

The proposed design directly benefits the neighborhood and West Linn – Wilsonville community. Restoring the connection between Willamette Falls Drive and Dollar Street provides improved access for

emergency responders as well as additional egress for the neighborhood. The existing Athey Creek Middle School on Borland Road has no Safe Routes to School due to unimproved county roads. The proposed project will bring the school closer to students and includes street improvements along Dollar Street, Willamette Falls Drive and the Brandon Place extension, providing safe access. The application includes a Safe Routes to School Map as part of Exhibit 11 in Appendix D. The map contemplates sidewalk infill opportunities to further expand the Safe Routes to School. District and City staff have traditionally worked together to consider these additional improvements, which are prioritized by City Council.

Each West Linn – Wilsonville school provides a series of amenities available to the community. The proposed playground, track and field and pathways will be available for community use outside of school hours. Spaces within the proposed facility will also be made available for use. These amenities are expected to encourage pursuit of performing and visual arts, STEM, and recreation among other activities.

The documents compiled in this application demonstrate that the proposed project meets all applicable land use criteria, is responsive to community feedback received within the bounds of functional needs and regulatory requirements, and that it provide material benefits to the neighborhood and community. The District looks forward to answering any questions that may arise related to the application.

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APPENDICES

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Appendix B – Pre-Application Meeting Notes - November 18, 2020

Appendix C – Neighborhood Meeting Information – November 18, 2020

- Exhibit 1: Certified Letter to Neighborhood Association with Return Receipt
- Exhibit 2: Letter to Property Owners within 500 Feet
- Exhibit 3: Affidavit of Mailing Notice
- Exhibit 4: Mailing List
- Exhibit 5: Copy of Posted Notice
- Exhibit 6: Affidavit of Posting Notice
- Exhibit 7: Willamette Neighborhood Association Meeting Minutes
- Exhibit 8: Recording of Meeting
- Exhibit 9: Frequently Asked Questions

Appendix D – Technical Reports

- Exhibit 10: Transportation Impact Study, DKS and Associates – October 21, 2020
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Appendix E – Land Use Plan

Civil Drawings:

- LU1.000 Overall Site Analysis and Land Types
- LU1.00 Overall Site Analysis
- LU1.01-LU1.07 Site Analysis
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Easement Drawings:

E-1 Easement Map
E-2 Easement Map

GENERAL INFORMATION

Property Owner:	**West Linn-Wilsonville School District** 2755 SW Borland Rd Tualatin, OR 97062 Contact: Remo Douglas Phone: 503-673-7988 Email: douglasr@wlwv.k12.or.us
Planning Consultant:	**3J Consulting, Inc.** 9600 SW Nimbus Avenue, Suite 100 Beaverton, OR 97008 Contact: Mercedes Serra Phone: 503-946-9365 x211 Email: mercedes.serra@3j-consulting.com
Architect:	**IBI Group** 907 SW Harvey Milk Street Portland, OR 97205 Contact: Jim Fitzpatrick Phone: 503-226-6950 Email: jim.fitzpatrick@IBIGroup.com
Civil Engineer:	**KPFF Consulting** 111 SE Fifth Avenue, Suite 2500 Portland, Oregon 97204 Contact: Mark Wharry Phone: 503-542-3860 Email: mark.wharry@kpff.com
Landscape Architect:	**Walker Macy** 111 SW Oak Street, Suite 200 Portland, OR 97204 Contact: Mike Zilis Phone: 503-228-3122 Email: mzilis@walkermacy.com

SITE INFORMATION

Parcel Numbers:	21E34C00600, 21E34DC00900 and 21E34DC01001
Address:	945 Dollar Street
Gross Site Area:	22.11 acres
Zoning Designation:	Single Family R10
Existing Use:	Vacant
Surrounding Zoning:	The properties to the north are zoned R10, R7 and NC. The properties to the east are zoned R10 and R4.5. The properties to the south are zoned R10, R20 and R-5.
Street Classification:	Willamette Falls Drive is classified as a minor arterial. Dollar Street is classified as a local street.

INTRODUCTION

APPLICANT'S REQUEST

The West Linn-Wilsonville School District ("the District") proposes to construct a new Athey Creek Middle School on the Dollar Street property and seeks concurrent approval of a Type III Conditional Use Permit, Design Review Application, Variance, and Lot Consolidation Application. This narrative has been prepared to describe the proposed development and to document compliance with the relevant sections of West Linn's Community Development Code (CDC). This narrative describes the proposed development and demonstrates compliance with the relevant approval standards of West Linn's Community Development Code ("CDC")

A Conditional Use Permit application and a Design Review application are evaluated under the Type III quasi-judicial decision process. The City's Planning Commission will render the Type III decision after a public hearing on the application is held.

SITE DESCRIPTION/SURROUNDING LAND USE

The proposed middle school will be located at 945 Dollar Street within the City of West Linn (the "City"). The site consists of three tax lots 21E34C00600, 21E34DC00900 and 21E34DC01001. The site is approximately 22.11 acres in gross size and is zoned Single Family R-10. The site has frontage on Dollar Street to the north, a local street. To the south, the site has frontage on Willamette Drive, a minor arterial street. The site generally slopes from Dollar Street to the southwest.

The properties to the north of Dollar Street are zoned Single-Family R-10, Single-Family R-7 and Neighborhood Commercial NC and developed with residential homes. The properties to the west are located in unincorporated Clackamas County and zoned RRFF-5. The properties to the east are zoned Single-Family R-4.5 and Single-Family R-10 and developed with residential homes. The properties to the south of Willamette Drive are zoned Single-Family R-5, Single-Family R-10, Single-Family R-20 and developed with residential homes and Fields Bridge Park.

PROPOSAL

The West Linn-Wilsonville School District is proposing to construct a new 110,972 square-foot middle school on the District's vacant 22.11-acre Dollar Street site. The project was approved by District voters under Ballot Measure #3-554. The new facility will relocate the existing Athey Creek Middle School currently located in unincorporated Clackamas County.

The new school building will have 25 standard classrooms and capacity for 850 students and staff. The proposed building will be two stories in height with a maximum height of 48 feet. The building has been designed to step down with the natural topography of the site. Site improvements will include both a west and east entry plaza, soft and hard surface play areas, a running track, a turf athletic field, and outdoor learning areas. Staff parking and bus loading will be accessed from Dollar Street and will be located southeast of the building. Visitor Parking will be accessed from a newly

constructed extension of Brandon Place and will be located west of the building. A total of 186 parking stalls will be provided on site. Pedestrian pathways will connect the main school building with site facilities and surrounding pedestrian infrastructure. The site will include pedestrian level lighting within the parking lot and around the building for safety. The track and field will also include LED lighting for sporting and special events.

The proposed development will include frontage and offsite improvements to Dollar Street and Willamette Falls Drive. An extension of Brandon Place from Dollar Street to Willamette Falls Drive, consistent with the West Linn's 2016 Transportation System Plan is proposed to meet the City's access standards. A roundabout is proposed at the new intersection of Willamette Falls Drive and Brandon Place. Sidewalks will be installed along the property frontage on Dollar Street and Willamette Falls Drive. The proposed extension of Brandon Place will include sidewalks on both sides, providing a pedestrian connection between Dollar Street and Willamette Falls Drive. There will also be a path constructed off of Brandon Place to provide connection to the City walking path below Fields Bridge, to the park. Other offsite improvements include frontage improvements on Dollar Street and Willamette Falls Drive, including pavement replacement, planter strips and street trees.

As part of the proposed development, the District is proposing to consolidate the three tax lots that property is comprised of into a single tax lot.

NEIGHBORHOOD MEETING

In accordance with the Governor's Executive Order 20-12 requiring social distancing, a web-based virtual meeting was held with neighboring property owners within 500 feet of the site and members of the Willamette Neighborhood Association. Included within this application is a copy of the certified letter sent to the neighborhood association board members, a copy of the return mail receipts, a copy of the letter sent to neighbors, a mailing list, a copy of the required posting, affidavits of mailing and posting, the neighborhood association meeting minutes, and an audiotape of the meeting. In addition to the required notices, the District posted notice of the meeting on the District website and distributed notice to the project's ListServ email list. The ListServ currently has 442 subscribers.

The required neighborhood meeting was held November 18th, 2020. This was the fifth of six total community meetings held regarding the project. In addition to these meetings, 35 listening sessions were held with community members that requested them. The presentations, recordings and technical studies discussed in the community meetings were made publicly available on the District website. The question and answer page for the project addresses 129 questions raised by community members during community meetings, listening sessions and through online surveys posted after community meetings.

Community Meetings:

Community Meeting #1 held on January 8, 2020 with Willamette Falls Neighborhood Association
Community Meeting #2 held on May 14, 2020

Community Meeting #3 held on June 25, 2020
Community Meeting #4 held on October 20, 2020
Community Meeting #5 held on November 18, 2020 with Willamette Falls Neighborhood Association
Community Meeting #6 held on January 27, 2021

APPLICABLE CRITERIA

The following sections of West Linn's Community Development Code have been extracted as they have been deemed to be applicable to the proposal. Following each **bold** applicable criteria or design standard, the Applicant has provided a series of draft findings. The intent of providing code and detailed responses and findings is to document, with absolute certainty, that the proposed development has satisfied the approval criteria for a Type III Conditional Use Permit, Design Review Application, and Lot Consolidation.

WEST LINN COMMUNITY DEVELOPMENT CODE

DIVISION 2. ZONING PROVISIONS
Chapter 11 SINGLE-FAMILY RESIDENTIAL DETACHED, R-10
11.060 CONDITIONAL USES
The following are conditional uses which may be allowed in this zoning district subject to the provisions of Chapter 60 CDC, Conditional Uses.

7. **Schools.**

Finding: Schools are conditional use, subject to the conditional use standards of CDC Chapter 60. Chapter 60 is addressed below.

11.070 DIMENSIONAL REQUIREMENTS, USES PERMITTED OUTRIGHT AND USES PERMITTED UNDER PRESCRIBED CONDITIONS
Except as may be otherwise provided by the provisions of this code, the following are the requirements for uses within this zone:

1. **The minimum lot size shall be 10,000 square feet for a single-family detached unit.**
2. **The minimum front lot line length or the minimum lot width at the front lot line shall be 35 feet.**
3. **The average minimum lot width shall be 50 feet.**
4. **Repealed by Ord. 1622.**

Finding: The minimum lot size for conditional uses per CDC 11.080 shall be determined by the approval authority at the time of consideration of the application based on the criteria in CDC 60.070 (A) and (B). Chapter 60 has been addressed within this narrative. As a result, the requirements of this section are not applicable to the proposed conditional use.

5. **Except as specified in CDC 25.070(C)(1) through (4) for the Willamette Historic District, the minimum yard dimensions or minimum building setback area from the lot line shall be:**
   a. **For the front yard, 20 feet; except for steeply sloped lots where the provisions of CDC 41.010 shall apply.**
   b. **For an interior side yard, seven and one-half feet.**

c. For a side yard abutting a street, 15 feet.

d. For a rear yard, 20 feet.

Finding: The minimum setback and yard requirements of this section have been met by the proposed development. The City considers public schools to be government buildings. Government buildings have additional applicable setback and yard provisions under CDC Chapter 41.040.B. The provisions of CDC 41.040 have been addressed within this narrative.

6. The maximum building height shall be 35 feet, except for steeply sloped lots in which case the provisions of Chapter 41 CDC shall apply.

Finding: The City considers public schools to be government buildings. Government buildings have a maximum building height of 50 feet per the provisions of CDC 41.040. The provisions of CDC 41.040 have been addressed within this narrative. As a result, the requirements of this provision are not applicable.

7. The maximum lot coverage shall be 35 percent.

Finding: The City's definition of lot coverage is the area covered by a building or buildings. The subject site has a total net area of 932,184 square feet. The building lot coverage of the site is 77,670 square feet. The total lot coverage of the site is 8.3 percent. The extension of Brandon Place will create a small area of the site west of Brandon Place which will not be developed. Excluding this area from the lot coverage standards, the total site area is 914,760 square feet. The building lot coverage of the site is 77,670 square feet. The total lot coverage of the site is 8.5 percent. The building lot coverage is provided on the Building Sections & Site Plan (Sheet LU3.04). This standard is met.

8. The minimum width of an accessway to a lot which does not abut a street or a flag lot shall be 15 feet.

Finding: The subject site is not flag lot. The requirements of this section are not applicable.

9. The maximum floor area ratio shall be 0.45. Type I and II lands shall not be counted toward lot area when determining allowable floor area ratio, except that a minimum floor area ratio of 0.30 shall be allowed regardless of the classification of lands within the property. That 30 percent shall be based upon the entire property including Type I and II lands. Existing residences in excess of this standard may be replaced to their prior dimensions when damaged without the requirement that the homeowner obtain a non-conforming structures permit under Chapter 66 CDC.

Finding: The total net area of the site is 932,184 square feet or 21.4 acres. A total area of 3.6 acres of Type I and II lands have been mapped on the site, excluding the area of Type I and II lands within the right-of-way dedication areas. Type I, II, III and IV lands have been mapped on the site and have been shown on the Overall Site Analysis Land Types Plan (Sheet LU1.000) included under Appendix E.

The total lot area for the purpose of the floor area ratio calculation is 775,368 square feet. The total building floor area is 110,972 square feet. Based on the area of the site and the building, the FAR is 0.14, which does not exceed the maximum allowed. The FAR is provided on the Building Sections & Site Plan (Sheet LU3.04). The requirements of this section have been met.

10. The sidewall provisions of Chapter 43 CDC shall apply.

Finding: While the provisions listed in Chapter 43 CDC are specific to residential homes, the design of the proposed elevations is subject to the provisions of Chapter 55, which has been addressed within this narrative. Several steps have been utilized to reduce bulk of the school and the impact of the sidewall elevations of the school on surrounding homes. These include setbacks exceeding 20 feet on all sides, the use of projections and recessions, roof plane changes, material changes, and a planted buffer area along the frontage of Dollar Street.

11.080 DIMENSIONAL REQUIREMENTS, CONDITIONAL USES

Except as may otherwise be established by this code, the appropriate lot or parcel size for a conditional use shall be determined by the approval authority at the time of consideration of the application based upon the criteria set forth in CDC 60.070(A) and (B).

Finding: Schools are conditional use in the R-10 zone. The criteria in CDC 60.070 (A) and (B). Chapter 60 has been addressed within this narrative.

Chapter 28 WILLAMETTE AND TUALATIN RIVER PROTECTION

28.030 APPLICABILITY

A. The Willamette and Tualatin River Protection Area is an overlay zone. The zone boundaries are identified on the City's zoning map, and include:

1. **All land within the City of West Linn's Willamette River Greenway Area.**
2. **All land within 200 feet of the ordinary low water mark of the Tualatin River, and all land within the 100-year floodplain of the Tualatin River.**
3. **In addition to the Willamette Greenway and Tualatin River Protection Area boundaries, this chapter also relies on the HCA Map to delineate where development should or should not occur. Specifically, the intent is to keep out of, or minimize disturbance of, the habitat conservation areas (HCAs). Therefore, if all, or any part, of a lot or parcel is in the Willamette Greenway and Tualatin River Protection Area boundaries, and there are HCAs on the lot or parcel, a Willamette and Tualatin River Protection Area permit shall be required unless the development proposal is exempt per CDC 28.040.**

B. At the confluence of a stream or creek with either the Tualatin or Willamette River, the standards of this chapter shall apply only to those portions of the lot or parcel fronting the river. Meanwhile, development in those portions of the property facing or adjacent to the stream or creek shall meet the transition, setbacks and other provisions of Chapter 32 CDC, Water Resource Area Protection.

C. All uses permitted under the provisions of the underlying base zone and within the Willamette and Tualatin River Protection Area zone are allowed in the manner prescribed by the base zone subject to applying for and obtaining a permit issued under the provisions of this chapter unless specifically exempted per CDC 28.040.

D. The construction of a structure in the HCA or the expansion of a structure into the HCA when the new intrusion is closer to the protected water feature than the pre-existing structure.

Finding: In accordance with WLCDC 28.030(A)(2), All land within 200 feet of the ordinary low water mark of the Tualatin River, and all land within the 100-year floodplain of the Tualatin River are within the Tualatin River Protection Area. PHS mapped the ordinary high-water mark of the Tualatin River adjacent to the project area. A 200' foot buffer was applied to the ordinary high-water mark to determine the Tualatin River Protection Area within the project site. The Tualatin River protection area is portrayed on Figure 5 within the Natural Resource Review (Exhibit 17). A total of 10,980 sf of the protection area will be impacted to facilitate the construction of the school campus.

28.090 SUBMITTAL REQUIREMENTS: APPLICATION

A. An application for a protection area permit shall be initiated by the property owner or the owner's authorized agent. Evidence shall be provided to demonstrate that the applicant has the legal right to use the land above the OLW. The property owner's signature is required on the application form.

B. A prerequisite to the filing of an application is a pre-application conference at which time the Planning Director shall explain the provisions of this chapter and provide appropriate forms as set forth in CDC 99.030(B).

C. An application for a protection area permit shall include the completed application and:

1. Narrative which addresses the approval criteria of CDC 28.110.

Finding: A detailed narrative addressing the requirements of CDC 28.110 has been provided in the Natural Resource Review (Exhibit 17). CDC 28.110 has also been addressed within this narrative.

2. A site plan, with HCA boundaries shown and by low, moderate, high type shown (CDC 28.120).

Finding: A site plan with HCA boundaries (Figures 6-6G) has been provided in the Natural Resource Review (Exhibit 17).

3. A grading plan if applicable (CDC 28.130).

Finding: A grading plan (Figures 7-7G) has been provided in the Natural Resource Review (Exhibit 17).

4. Architectural drawings if applicable (CDC 28.140).

Finding: Architectural Drawings (Figures 10-10C) has been provided in the Natural Resource Review (Exhibit 17).

5. **A landscape plan if applicable (CDC 28.150).**

Finding: A Landscape Plan (Figures 9A-9L) has been provided in the Natural Resource Review (Exhibit 17).

6. **A mitigation plan if applicable (CDC 28.160).**

Finding: A Mitigation Plan (Figures 11A-11D) has been provided in the Natural Resource Review (Exhibit 17).

7. **A storm detention and treatment plan and narrative statement pursuant to CDC 92.010(E).**

Finding: A Preliminary Drainage Report (Exhibit 12) has been provided under Appendix D.

One original application form must be submitted. One copy at the original scale and one copy reduced to 11 inches by 17 inches or smaller of all drawings and plans must be submitted. One copy of all other items, including the narrative, must be submitted. The applicant shall also submit one copy of the complete application in a digital format acceptable to the city. When the application submittal is determined to be complete, additional copies may be required as determined by the Planning Director.

Finding: An application form has been provided under Appendix A.

D. The applicant shall pay the requisite fees.

Finding: The applicant has paid all requisite fees.

E. The applicant shall be responsible for, and shall apply for, all applicable State and/or federal permits.

Finding: The proposed development does not require state or federal permits. This standard is not applicable.

F. The applicant shall include a map, approved or acknowledged by DSL, of the preference rights and authorized areas if a water surface structure is proposed.

Finding: A Letter of Concurrence from DSL (Attachment C) has been included within the Habitat Conservation Area Report which has been provided in the Natural Resource Review (Exhibit 17).

28.110 APPROVAL CRITERIA

No application for development on property within the protection area shall be approved unless the decision-making authority finds that the following standards have been met or can be met by conditions of approval. The development shall comply with the following criteria as applicable:

A. Development: All sites.

1. **Sites shall first be reviewed using the HCA Map to determine if the site is buildable or what portion of the site is buildable. HCAs shall be verified by the Planning Director**

per CDC 28.070 and site visit. Also, "tree canopy only" HCAs shall not constitute a development limitation and may be exempted per CDC 28.070(A). The municipal code protection for trees and Chapters 55 and 85 CDC tree protection shall still apply.

Finding: The HCA map is attached as Figure 5 in the Natural Resource Review (Exhibit 17). The applicant is requesting HCA map verification in this submittal. Slopes within the mapped HCA areas do not exceed 25%, and these areas are located more than 150' from the nearest surface stream or wetland. As such, PHS has determined that HCA areas identified on the HCA map have been assigned by Metro based on presence of tree canopy within 150 feet of a mapped flood area. Previous construction and disturbance has fragmented the mapped HCAs from the floodway of the Tualatin River, minimizing the functions provided by the HCA. The HCAs onsite total 36,955 sf, or approximately 4% of the nearly 22-acre project site. The remainder of the project site contains similar habitat as the mapped HCAs; however, The City of West Linn in accordance with Metro Title 13 recommendations, has determined that these forested areas are buildable and can allow development. Due to the abundance of similar habitat on-site, it is appropriate to revise the HCA designation in accordance with WLCDC.

2. **HCAs shall be avoided to the greatest degree possible and development activity shall instead be directed to the areas designated "Habitat and Impact Areas Not Designated as HCAs," consistent with subsection (A)(3) of this section.**

Finding: HCAs have been avoided to the extent practicable. Impacts to HCAs are associated with construction of a roundabout, and new roadways to connect Dollar Street and Borland Road.

3. **If the subject property contains no lands designated "Habitat and Impact Areas Not Designated as HCAs" and development within HCA land is the only option it shall be directed towards the low HCA areas first, then medium HCA areas and then to high HCA as the last choice. The goal is to, at best, avoid or, at least, minimize disturbance of the HCAs. (Water-dependent uses are exempt from this provision.)**

Finding: HCAs have been avoided to the extent practicable. Impacts to HCAs are associated with construction of a roundabout, and new roadways to connect Dollar Street and Borland Road. Due to the existing locations of these roads, impacts to HCAs cannot be avoided.

4. **All development, including exempted activities of CDC 28.040, shall have approved erosion control measures per Clackamas County Erosion Prevention and Sediment Control Planning and Design Manual, rev. 2008, in place prior to site disturbance and be subject to the requirements of CDC 32.070 and 32.080 as deemed applicable by the Planning Director.**

Finding: An Erosion Prevention and Sediment Control Plan prepared in accordance with CDC 28.040 will be submitted for review prior to site disturbance. This standard is met.

B. Single-family or attached residential. Development of single-family homes or attached housing shall be permitted on the following HCA designations and in the following order of preference with "a" being the most appropriate and "d" being the least appropriate:

Finding: The proposed development is not residential. The requirements of this section are not applicable.

C. Setbacks from top of bank.

Finding: The proposed development is not residential. The requirements of this section are not applicable.

D. Development of lands designated for industrial, commercial, office, public and other non-residential uses.

1. **Development of lands designated for industrial, multi-family, mixed use, commercial, office, public and other non-single-family residential uses shall be permitted on the following land designations and in the following order of preference with "a" being the most appropriate for development and "d" being the least appropriate:**
   a. **"Habitat and Impact Areas Not Designated as HCAs"**
   b. **Low HCA**
   c. **Moderate HCA**
   d. **High HCA**
2. **Developing HCA land.**
   a. **Where non-HCA or areas designated as "Habitat and Impact Areas Not Designated as HCAs" are lacking or are in such limited supply as to render uses allowed by the underlying zone (e.g., general industrial) functionally impractical, the HCA may be utilized and built upon but shall emphasize "b" and "c" designations.**
   b. **Where it is proposed that a "d" or high HCA classification be used, the property owner must demonstrate that the proposed use is clearly a water-dependent use. Proximity to the river for the purpose of views is not valid grounds. However, public interpretive facilities of historic facilities such as the government locks will be permitted as well as wildlife interpretive facilities and ADA-accessible platforms.**

Finding: Impacts to high and moderate HCA land is proposed; however, the impacts to the HCA is the minimum necessary to construct a roundabout and surface street connection between Borland Road, Dollar Street and Brandon Place. Given the location of the existing roadways, no practicable alternative exists which would not result in impacts to the HCAs. This impact is allowable in accordance with CDC 28.110 L.

E. <u>Hardship provisions and non-conforming structures</u>.

Finding: The applicant is not proposing hardship provisions or non-conforming structures. The requirements of this section are not applicable.

F. <u>Access and property rights</u>.

1. **Private lands within the protection area shall be recognized and respected.**
2. **Where a legal public access to the river or elsewhere in the protection area exists, that legal public right shall be recognized and respected.**

Finding: No public access to the protection area exists within the project area. A connection to existing trails is proposed. The requirements of this section are not applicable.

3. **To construct a water-dependent structure such as a dock, ramp, or gangway shall require that all pre-existing legal public access or similar legal rights in the protection area be recognized and respected. Where pre-existing legal public access, such as below the OLW, is to be obstructed by, for example, a ramp, the applicant shall provide a reasonable alternate route around, over or under the obstruction. The alternate route shall be as direct as possible. The proposed route, to include appropriate height clearances under ramps/docks and specifications for safe passage over or around ramps and docks, shall be reviewed and approved by the Planning Director for adequacy.**

Finding: Work is not proposed below the OLW. The requirements of this section are not applicable.

4. **Any public or private water-dependent use or facility shall be within established DSL-authorized areas.**

Finding: The proposed development is not water dependent. The requirements of this section are not applicable.

5. **Legal access to, and along, the riverfront in single-family residential zoned areas shall be encouraged and pursued especially when there are reasonable expectations that a continuous trail system can be facilitated. The City recognizes the potential need for compensation where nexus and proportionality tests are not met. Fee simple ownership by the City shall be preferred. The trail should be dimensioned and designed appropriate to the terrain it traverses and the user group(s) it can reasonably expect to attract. The City shall be responsible for signing the trail and delineating the boundary between private and public lands or access easements.**

Finding: The proposed development is not single-family residential. The requirements of this section are not applicable.

G. Incentives to encourage access in industrial, multi-family, mixed use, commercial, office, public and non-single-family residential zoned areas.

1. **For all industrial, multi-family, mixed use, commercial, office, public and other non-single-family residential zones, this section encourages the dedication or establishment of access easements to allow legal public access to, and along, the river. Support for access may be found in the Parks Master Plan, a neighborhood plan or any applicable adopted sub-area plans. The emphasis will be upon locating paths where there is a reasonable expectation that the path can be extended to adjacent properties to form a connective trail system in the future, and/or where the trail will provide opportunities for appreciation of, and access to, the river.**

Finding: A connection between the existing trail system and the new Brandon Place extension will be constructed to maintain opportunities for appreciation of, and access to, the river. This standard is met.

2. **Height or density incentives may be available to developers who provide public access. Specifically, commercial, industrial, multi-family, mixed use, and public projects may be constructed to a height of 60 feet. No variance is required for the 60-**

foot height allowance regardless of the underlying zone height limitations; however, the following conditions must be met:

a. **Provide a minimum 20-foot-wide all-weather public access path along the project's entire river frontage (reduced dimensions would only be permitted in response to physical site constraints such as rock outcroppings, significant trees, etc.); and**
b. **Provide a minimum 10-foot-wide all-weather public access path from an existing public right-of-way to that riverfront path or connect the riverfront path to an existing riverfront path on an adjoining property that accesses a public right-of-way.**
c. **Fencing may be required near steep dropoffs or grade changes.**

Finding: The proposed development does not require a height or density incentive. The requirements of this section are not applicable.

H. Partitions, subdivisions and incentives.

Finding: The proposed development is not a land division. The requirements of this section are not applicable.

I. Docks and other water-dependent structures.

J. Joint docks.

K. Non-conforming docks and other water-related structures.

Finding: The proposed development does not include docks or water-dependent structures. The requirements of this section are not applicable.

L. Roads, driveways, utilities, or passive use recreation facilities.

Finding: Impacts to high and moderate HCA land is proposed; however, the impacts to the HCA is the minimum necessary to construct a roundabout and surface street connection between Borland Road, Dollar Street and Brandon Place. Given the location of the existing roadways, no practicable alternative exists which would not result in impacts to the HCAs.

M. Structures.

Finding: The proposed development does not include structures within the HCA. The requirements of this section are not applicable.

N. Water-permeable materials for hardscapes. The use of water-permeable materials for parking lots, driveways, patios, and paths as well as flow-through planters, box filters, bioswales and drought tolerant plants are strongly encouraged in all "a" and "b" land classifications and shall be required in all "c" and "d" land classifications. The only exception in the "c" and "d" classifications would be where it is demonstrated that water-permeable driveways/hardscapes could not structurally support the axle weight of vehicles or equipment/storage load using those areas. Flow through planters, box filters, bioswales, drought tolerant plants and other measures of treating and/or detaining runoff would still be required in these areas.

Finding: Water-permeable materials are not proposed. The requirements of this section are not applicable.

O. Signs and graphics. No sign or graphic display inconsistent with the purposes of the protection area shall have a display surface oriented toward or visible from the Willamette or Tualatin River. A limited number of signs may be allowed to direct public access along legal routes in the protection area.

Finding: Signage, if necessary, will be consistent with the purposes of the protection area.

P. Lighting. Lighting shall not be focused or oriented onto the surface of the river except as required by the Coast Guard. Lighting elsewhere in the protection area shall be the minimum necessary and shall not create off-site glare or be omni-directional. Screens and covers will be required.

Finding: The proposed site lighting will not be oriented onto the surface of the river. The proposed lighting has been shown on the Light Coverage Plan (Onsite) (Sheet LU4.01)

Q. Parking. Parking and unenclosed storage areas located within or adjacent to the protection area boundary shall be screened from the river in accordance with Chapter 46 CDC, Off-Street Parking, Loading and Reservoir Areas. The use of water-permeable material to construct the parking lot is either encouraged or required depending on HCA classification per CDC 28.110(N)(4).

Finding: Parking is not proposed within the HCA. The requirements of this section are not applicable.

R. Views. Significant views of the Willamette and Tualatin Rivers shall be protected as much as possible as seen from the following public viewpoints: Mary S. Young Park, Willamette Park, Cedar Oak Park, Burnside Park, Maddox Park, Cedar Island, the Oregon City Bridge, Willamette Park, and Fields Bridge Park.

Where options exist in the placement of ramps and docks, the applicant shall select the least visually intrusive location as seen from a public viewpoint. However, if no options exist, then the ramp, pilings and dock shall be allowed at the originally proposed location.

Finding: The proposed development will not impact significant views of the Willamette and Tualatin River. This standard is met.

S. Aggregate deposits. Extraction of aggregate deposits or dredging shall be conducted in a manner designed to minimize adverse effects on water quality, fish and wildlife, vegetation, bank stabilization, stream flow, visual quality, noise and safety, and to promote necessary reclamation.

Finding: Extraction of aggregate deposits and dredging are not proposed. The requirements of this section are not applicable.

T. Changing the landscape/grading.

1. **Existing predominant topographical features of the bank line and escarpment shall be preserved and maintained except for disturbance necessary for the construction or establishment of a water related or water dependent use. Measures necessary to reduce potential bank and escarpment erosion, landslides, or flood hazard conditions shall also be taken.**

   Any construction to stabilize or protect the bank with rip rap, gabions, etc., shall only be allowed where there is clear evidence of erosion or similar hazard and shall be the minimum needed to stop that erosion or to avoid a specific and identifiable hazard.

A geotechnical engineer's stamped report shall accompany the application with evidence to support the proposal.

Finding: The proposed development does not include the construction of a water related or water dependent use. A Geotechnical Report prepared by GeoDesign has been submitted under Appendix D of this application. This standard is met.

2. **The applicant shall establish to the satisfaction of the approval authority that steps have been taken to minimize the impact of the proposal on the riparian environment (areas between the top of the bank and the low water mark of the river including lower terrace, beach and river edge).**

Finding: The river protection zone extends onto the project area; however, lower terraces and the River edge are located off-site on adjacent tax lots. No disturbance to these features will occur as a result of the project. This standard is met.

3. **The applicant shall demonstrate that stabilization measures shall not cause subsequent erosion or deposits on upstream or downstream properties.**

Finding: An Erosion Prevention and Sediment Control Plan prepared in accordance with CDC 28.040 will be submitted for review prior to site disturbance. This standard is met.

4. **Prior to any grading or development, that portion of the HCA that includes wetlands, creeks, riparian areas and water resource area shall be protected with an anchored chain link fence (or approved equivalent) at its perimeter and shall remain undisturbed except as specifically allowed by an approved Willamette and Tualatin River Protection and/or water resource area (WRA) permit. Such fencing shall be maintained until construction is complete. That portion of the HCA that includes wetlands, creeks, riparian areas and water resource area shall be identified with City-approved permanent markers at all boundary direction changes and at 30- to 50-foot intervals that clearly delineate the extent of the protected area.**

Finding: Anchored chain link fencing will be installed along undisturbed portions of the Tualatin River protection area. This standard is met.

5. **Full erosion control measures shall be in place and approved by the City Engineer prior to any grading, development or site clearing.**

Finding: An Erosion Prevention and Sediment Control Plan prepared in accordance with CDC 28.040 will be submitted for review prior to site disturbance. This standard is met.

U. <u>Protect riparian and adjacent vegetation</u>. Vegetative ground cover and trees upon the site shall be preserved, conserved, and maintained according to the following provisions:

1. **Riparian vegetation below OHW removed during development shall be replaced with indigenous vegetation, which shall be compatible with and enhance the riparian environment and approved by the approval authority as part of the application.**

Finding: The proposed development will not require the disturbance of vegetation below the OHW. The requirements of this section are not applicable.

2. **Vegetative improvements to areas within the protection area may be required if the site is found to be in an unhealthy or disturbed state by the City Arborist or their designated expert. "Unhealthy or disturbed" includes those sites that have a**

combination of native trees, shrubs, and groundcover on less than 80 percent of the water resource area and less than 50 percent tree canopy coverage in the primary and secondary habitat conservation area to be preserved. "Vegetative improvements" will be documented by submitting a revegetation plan meeting CDC 28.160 criteria that will result in the primary and secondary habitat conservation area to be preserved having a combination of native trees, shrubs, and groundcover on more than 80 percent of its area, and more than 50 percent tree canopy coverage in its area. The vegetative improvements shall be guaranteed for survival for a minimum of two years. Once approved, the applicant is responsible for implementing the plan prior to final inspection.

Finding: Vegetation improvements to HCAs will occur in accordance with the Mitigation Plan (Figures 11A-11D) has been provided in the Natural Resource Review (Exhibit 17). This standard is met.

3. **Tree cutting shall be prohibited in the protection area except that:**
   a. **Diseased trees or trees in danger of falling may be removed with the City Arborist's approval; and**
   b. **Tree cutting may be permitted in conjunction with those uses listed in CDC 28.030 with City Arborist approval; to the extent necessary to accommodate the listed uses;**
   c. **Selective cutting in accordance with the Oregon Forest Practices Act, if applicable, shall be permitted with City Arborist approval within the area between the OHW and the greenway boundary provided the natural scenic qualities of the greenway are maintained.**

Finding: The proposed development will not require tree cutting within the protected areas The requirements of this section are not applicable.

Chapter 32 WATER RESOURCE AREA PROTECTION

32.020 APPLICABILITY

A. This chapter applies to all development, activity or uses within WRAs identified on the WRA Map. It also applies to all verified, unmapped WRAs. The WRA Map shall be amended to include the previously unmapped WRAs.

B. The burden is on the property owner to demonstrate that the requirements of this chapter are met, or are not applicable to the land, development activity, or other proposed use or alteration of land. The Planning Director may make a determination of applicability based on the WRA Map, field visits, and any other relevant maps, site plans and information, as to:

1. **The existence of a WRA;**
2. **The exact location of the WRA; and/or**
3. **Whether the proposed development, activity or use is within the WRA boundary.**

   In cases where the location of the WRA is unclear or disputed, the Planning Director may require a survey, delineation, or sworn statement prepared by a natural resource professional/wetland biologist or specialist that no WRA exists on the site. Any required survey, delineation, or statement shall be prepared at the applicant's sole expense.

Finding: A wetland delineation has been prepared by Pacific Habitat Services showing the location of the proposed water resource area in the northeast corner of the site. The Wetland Delineation Report has been provided under Appendix D. The District will connect to an existing sanitary sewer line located within the WRA by connecting to an existing manhole. A franchise telecom utility connection will be provided at the east property line. The utility connections will not be located within the delineated WRA boundary. The proposed development will not include any work within the WRA boundary. This standard is met.

Chapter 34 ACCESSORY STRUCTURES, ACCESSORY DWELLING UNITS, AND ACCESSORY USES

34.020 ACCESSORY USES

Accessory uses are permitted uses which are customary and incidental to principal uses permitted in the zone and shall be permitted outright, or by prescribed conditions as identified below, and may be either attached or separated from the principal dwelling. Accessory uses on designated historic resources are subject to additional regulations in CDC 25.060(B).

A. A greenhouse may be a maintained accessory to a dwelling provided the activity does not exceed that which requires a license under Chapter 571 of the Oregon Revised Statutes, Nurseries.

Finding: The school site will include accessory structures consistent with the school use. The accessory structures proposed include a greenhouse, a concession stand and a track and field storage building. The proposed greenhouse will not be used for commercial purposes and will not require a license pursuant to Chapter 571 of the Oregon Revised Statutes.

34.060 SETBACK PROVISIONS FOR ACCESSORY STRUCTURES (NON-DWELLING)

A. Accessory structures shall comply with all requirements for the principal use except as provided in CDC 34.040 and where specifically modified by this code as follows.

Finding: The three proposed accessory structures comply with the requirements of the principle use of the site as a school site, allowed as a conditional use in the R-10 zone. The accessory structures meet the minimum setback requirements of the R-10 zone, as provided below.

	Structure Area	Side Yard Setback	Building Height
Greenhouse	1,200 sq. ft.	89 ft. 5in.	14 ft. 3 in.
Concession Stand	720 sq. ft.	24 ft. 6 in.	12 ft. 5 in.
Track and Field Storage	667 sq. ft.	41 ft.	10 ft.

Compliance with all applicable standards has been demonstrated within this narrative.

B. A side yard or rear yard requirement may be reduced to three feet for an accessory structure except for a side or rear yard abutting a street, with the exception of alleys platted and dedicated prior to September 30, 1984, as defined in this code; provided, that:

1. **The structure is erected more than 60 feet from the front lot line;**
2. **The structure does not exceed one story or 15 feet in height;**
3. **The structure does not exceed an area of 500 square feet; and**
4. **The structure does not violate any existing utility easements.**

Finding: The three accessory structures have not been located in the required side or rear yard setbacks. A reduction in the required setback has not been requested for any of the proposed accessory structures.

C. Attached accessory structures. When an accessory structure is attached to the main structure (wall to wall or by any permanent attachment), including via a covered walkway, such accessory structure shall be considered as part of the main structure.

Finding: Attached accessory structures are not proposed. The requirements of this section are not applicable.

Chapter 41 BUILDING HEIGHT, STRUCTURES ON STEEP LOTS, EXCEPTIONS

41.005 DETERMINING HEIGHT OF BUILDING

A. For all zoning districts, building height shall be the vertical distance above a reference datum measured to the highest point of a flat roof or to the deck line of a mansard roof or to the highest gable, ridgeline or peak of a pitched or hipped roof, not including projections above roofs such as cupolas, towers, etc. The reference datum shall be selected by either of the following, whichever yields a greater height of building.

1. **For relatively flat sites where there is less than a 10-foot difference in grade between the front and rear of the building, the height of the building shall be measured from grade five feet out from the exterior wall at the front of the building; or**
2. **For steeper lots where there is more than a 10-foot difference in grade between the front and rear of the building, the height of the building is measured from grade at a point five feet out from the exterior wall on the lowest side (front or rear) of the building. One then measures vertically to the peak or ridgeline of the roof to determine the height.**
3. **Buildings on cross slopes or side slopes are measured at either the front or rear of the building using methods described in subsections (A)(1) and (2) of this definition only. Even if the cross slope creates a tall elevation on the side, the method of determining height is not modified.**

Finding: The subject site has more than a 10-foot difference in grade. The grade elevation of the building along the frontage of Dollar Street is 198.34 feet. The grade elevation of the building along Willamette Falls Drive is 175.00 feet. The total grade change across the building is 23.34 feet. The building height has been measured from grade at a point five feet out from the exterior wall on the lowest side of the building. The City

considers public schools to be government buildings, as noted in the pre-application conference notes provided under Appendix B of this application.

The school has a maximum height of 48 feet, which does not exceed the 50-foot maximum height allowed for government buildings per CDC 41.040. The table below provides the height of the principal structure at each corresponding yard. Where the height exceeds 35 feet, the minimum height allowance of the underlying zone, the required yard dimension has been calculated as two-thirds of the building height of the principal structure at the corresponding yard. The required yard dimension has been met and exceeded.

	Building Height	Required Yard Dim.	Proposed Yard Dim.
Front Yard (Brandon Pl)	48 ft. 0 in.	32 ft.	466.6 ft.
Rear Yard	44 ft. 9 in.	29 ft. 10 in.	639.2 ft.
Street Side Yard (Dollar St.)	33 ft. 3 in.	15 ft.	40.1 ft.
Street Side Yard (Willamette Falls Dr)	44 ft. 9 in.	29 ft. 10 in.	89.0 ft.

The height requirements of section 41.040 are applicable. Section 41.040 has been addressed within this narrative.

41.040 PLACES OF WORSHIP OR GOVERNMENT BUILDINGS

The height of a place of worship or governmental building may be built to a maximum height of 50 feet provided:

A. The total floor area of the building does not exceed one and one-half times the area of the site;

B. The yard dimensions in each case are equal to at least two-thirds of the building height of the principal structure; and

C. The approval of this exception is a part of the approval of the conditional use allowed under Chapter 60 CDC.

Finding: The school has a maximum height of 48 feet, which does not exceed the 50-foot maximum height allowed for government buildings. The total floor area for the school site is 110,972 square feet. The site has a total net area excluding Type I and II lands of 775,368 square feet. The total floor area of the buildings on site is approximately 14.3 percent of the site. The floor area does not exceed one and one-half times the area of the site.

The table below provides the height of the principal structure at each corresponding yard. Where the height exceeds 35 feet, the minimum height allowance of the underlying zone, the required yard dimension has been calculated as two-thirds of the building height of the principal structure at the corresponding yard. The required yard dimension has been met and exceeded.

	Building Height	Required Yard Dim.	Proposed Yard Dim.
Front Yard (Brandon Pl)	48 ft. 0 in.	32 ft.	466.6 ft.
Rear Yard	44 ft. 9 in.	29 ft. 10 in.	639.2 ft.
Street Side Yard (Dollar St.)	33 ft. 3 in.	15 ft.	40.1 ft.
Street Side Yard (Willamette Falls Dr)	44 ft. 9 in.	29 ft. 10 in.	89.0 ft.

The building heights have been illustrated on the Building Sections (Sheet LU3.04) submitted under Appendix E. The proposed yard dimensions have been shown on the Site Plan (Sheet LU1.10). This proposed school is a Conditional Use subject to Chapter 60. The requirements of this section have been met.

Chapter 42 CLEAR VISION AREAS

42.020 CLEAR VISION AREAS REQUIRED, USES PROHIBITED

A. A clear vision area shall be maintained on the corners of all property adjacent to an intersection as provided by CDC 42.040 and 42.050.

B. A clear vision area shall contain no planting, fence, wall, structure or temporary or permanent obstruction (except for an occasional utility pole or tree) exceeding three feet in height, measured from the top of the curb, or, where no curb exists, from the street centerline grade, except that trees exceeding this height may be located in this area, provided all branches below eight feet are removed.

Finding: A clear vision area will be maintained at the intersection of Brandon Place and Dollar Street, at the intersection of Brandon Place and Willamette Falls Drive and at the proposed parking lot accessways on Dollar Street and Brandon Place. The clear vision area will not contain plantings, fences, walls, or structures exceeding three feet in height. Clear Vision Triangles have been shown at all intersections on the Overall Site Plan (SheetLU1.10). The proposed monument sign has been located outside of the vision clearance triangle areas. This requirement is met.

42.050 COMPUTATION; ACCESSWAY LESS THAN 24 FEET IN WIDTH

The clear vision area for street and accessway intersections (accessways having less than 24 feet in width) shall be that triangular area whose base extends 30 feet along the street right-of-way line in both directions from the centerline of the accessway at the front setback line of a single-family and two-family residence, and 30 feet back from the property line on all other types of uses.

Finding: The proposed parking lot accessways are 24 feet wide measured curb-to-curb. Clear vision area triangles consistent with the requirements of this section have been shown on the Overall Site Plan (Sheet LU1.10). This standard is met.

Chapter 44 FENCES

44.020 SIGHT-OBSCURING FENCE; SETBACK AND HEIGHT LIMITATIONS

A. A sight- or non-sight-obscuring fence may be located on the property line or in a yard setback area subject to the following:

1. **The fence is located within:**
    a. **A required front yard area, and it does not exceed three feet, except pillars and driveway entry features subject to the requirements of Chapter 42 CDC, Clear Vision Areas, and approval by the Planning Director;**
    b. **A required side yard which abuts a street and it is within that portion of the side yard which is also part of the front yard setback area and it does not exceed three feet;**
    c. **A required side yard which abuts a street and it is within that portion of the side yard which is not also a portion of the front yard setback area and it does not exceed six feet provided the provisions of Chapter 42 CDC are met;**
    d. **A required rear yard which abuts a street and it does not exceed six feet; or**
    e. **A required side yard area which does not abut a street or a rear yard and it does not exceed six feet.**

Finding: The proposed development will include a chain-link fence within the street side yard along Dollar Street. The proposed fencing will be four feet in height. The location of the proposed fencing has been shown on the Landscape Materials Plans (Sheets L1102, L1103, L1105 and L1106). This standard is met.

B. Fence or wall on a retaining wall. When a fence is built on a retaining wall or an artificial berm, the following standards shall apply:

1. **When the retaining wall or artificial berm is 30 inches or less in height from finished grade, the maximum fence or wall height on top of the retaining wall shall be six feet.**
2. **When the retaining wall or earth berm is greater than 30 inches in height, the combined height of the retaining wall and fence or wall from finished grade shall not exceed eight and one-half feet.**
3. **Fences or walls located on top of retaining walls or earth berms in excess of 30 inches above finished grade may exceed the total allowed combined height of eight and one-half feet; provided, that the fence or wall is located a minimum of two feet from the retaining wall and the fence or wall height shall not exceed six feet.**

Finding: The District is not proposing retaining walls within the yard setbacks. The service yard retaining wall will have a wall of eight feet in height above finished grade as measured on the north side of the wall along Dollar Street. The proposed wall will act as noise buffer for the school generator. The retaining wall located at the hard-scaped play area will have a wall height of 31.2 inches and a fence height of 42 inches above finished grade, as measured from the north side of the wall along Dollar Street. Both wall and fence combinations are consistent with the requirements of subsection 2 above. The proposed retaining walls have been shown on the Overall Grading and Drainage Plan (Sheet LU1.20). This standard is met.

44.040 LANDSCAPING

Landscaping which is located on the fence line and which impairs sight vision shall not be located within the clear vision area as provided in Chapter 42 CDC.

Finding: Landscaping which impairs sight vision will not be located in the clear vision areas. This standard is met.

44.050 STANDARDS FOR CONSTRUCTION

A. The structural side of the fence shall face the owner's property; and

B. The sides of the fence abutting adjoining properties and the street shall be maintained.

Finding: The structural side of all proposed fences will face the owner's property. The sides of the fence abutting adjoining properties and the street will be maintained. This standard is met.

Chapter 46 OFF-STREET PARKING, LOADING AND RESERVOIR AREAS

46.020 APPLICABILITY AND GENERAL PROVISIONS

A. At the time a structure is erected or enlarged, or the use of a structure or unit of land is changed within any zone, parking spaces, loading areas and reservoir areas shall be provided in accordance with the requirements of this chapter unless other requirements are otherwise established as a part of the development approval process.

Finding: The parking requirement for the new school has been calculated under CDC 46.090 based on the floor area of the building and the number of full-time employees. A total of 186 parking spaces is required. The site will provide a total of 186 parking spaces. Parking spaces have been provided in accordance with the requirements of this chapter. This standard is met.

B. The provision and maintenance of off-street parking and loading spaces are the continuing obligation of the property owner.

Finding: The applicant acknowledges that the provision and maintenance of off-street parking and loading spaces are the continuing obligation of the property owner. This standard is met.

C. No building or other permit shall be issued until plans are approved that show the property that is and will remain available for exclusive use as off-street parking and loading space as required by this chapter.

Finding: The applicant acknowledges that no building or other permits will be issued until plans are approved that show the property that is and will remain for the exclusive use as off-street parking. This standard is met.

D. Required parking spaces and loading areas shall be improved to the standards contained in this chapter and shall be available for use at the time of the final building inspection except as provided in CDC 46.150.

Finding: All proposed parking stalls have been designed to meet the City's requirements for 90- degree parking. The standard parking stalls are 9 feet wide and 18 feet long, with

a minimum drive aisle width of 24 feet. The compact parking stalls are 8 feet wide and 16 feet long. Based on the floor area of the school, two loading berths are required. A double loading berth that is approximately 40 feet wide and 30 feet long has been provided in the northwest corner of the school. All proposed parking spaces will be improved to the standards contained in this chapter. This standard is met.

46.030 SUBMITTAL REQUIREMENTS

For any application requiring design review approval, which includes parking areas, the applicant shall submit, within the design review package, a plan drawn to scale showing all the elements necessary to indicate that the requirements of Chapter 55 CDC are met and it shall include but not be limited to:

A. The delineation of individual parking and loading spaces and their dimensions;

B. The identification of compact parking spaces;

C. The location of the circulation area necessary to serve spaces;

D. The access point(s) to streets, alleys, and properties to be served;

E. The location of curb cuts;

F. The location and dimensions of all landscaping, including the type and size of plant material to be used, as well as any other landscape material incorporated into the overall plan;

G. The proposed grading and drainage plans and the slope (percentage) of parking lot;

H. Specifications as to signs and bumper guards;

I. Identification of disabled parking spaces;

J. Location of pedestrian walkways and crossings; and

K. Location of bicycle racks.

Finding: An Overall Site Plan (Sheet LU1.10), as well as detailed Site Plans (Sheets LU1.11-LU1.17), an Overall Grading And Storm Plan (Sheet LU1.20) as well as detailed Grading and Storm Plans (Sheets LU1.21-LU1.27), and a landscape Materials Plan Overall (Sheet L1100) as well as detailed landscape Materials Plans (Sheets L1101-LU1107), have been submitted illustrating requirements A-K above. This standard is met.

46.040 APPROVAL STANDARDS

Approval shall be based on the standards set forth in this chapter and Chapter 48 CDC, Access, Egress and Circulation; Chapter 52 CDC, Signs; and Chapter 54 CDC, Landscaping.

Finding: Chapter 48 CDC, Access, Egress and Circulation; Chapter 52 CDC, Signs; and Chapter 54 CDC, Landscaping has been addressed within this narrative. This standard is met.

46.050 JOINT USE OF A PARKING AREA

A. Joint use of required parking spaces may occur where two or more uses on the same or separate sites are able to share the same parking spaces because their parking demands occur at different times. Joint use of required parking spaces is allowed if the following documentation is submitted in writing to the Planning Director as part of a building or zoning permit application or land use review:

1. **The names and addresses of the owners or tenants that are sharing the parking and the uses at those locations;**
2. **The location and number of parking spaces that are being shared;**
3. **An analysis showing that the peak parking times of the uses occur at different times and that the parking area will be large enough for the anticipated demands of both uses; and**
4. **A legal instrument such as an easement or deed restriction that guarantees access to the parking for all uses.**

B. If a joint use arrangement is subsequently terminated, the requirements of this chapter will apply to each use separately.

Finding: The school does not utilize a joint parking agreement. The requirements of this section are not applicable.

46.060 STORAGE IN PARKING AND LOADING AREAS PROHIBITED

Required parking spaces shall be available for the parking of passenger automobiles of residents, customers, patrons and employees only, and the required parking spaces shall not be used for storage of vehicles or materials or for the parking of trucks connected with the business or use with the exception of small (under one-ton) delivery trucks or cars.

Finding: The school will not use required parking spaces for storage of vehicles or materials. This standard is met.

46.070 MAXIMUM DISTANCE ALLOWED BETWEEN PARKING AREA AND USE

A. Off-street parking spaces for single- and two-family dwellings shall be located on the same lot with the dwelling.

B. Off-street parking spaces for uses not listed in subsection A of this section shall be located not farther than 200 feet from an entryway to the building or use they are required to serve, measured in a straight line from the building, with the following exceptions:

1. **Shared parking areas for commercial uses which require more than 40 parking spaces may provide for the spaces in excess of the required 40 spaces up to a distance of 300 feet from the entryway to the commercial building or use.**
2. **Industrial and manufacturing uses which require in excess of 40 spaces may locate the required spaces in excess of the 40 spaces up to a distance of 300 feet from the entryway to the building.**
3. **Employee parking areas for carpools and vanpools shall be located closer to the entryway to the building than general employee parking.**
4. **Stacked or valet parking is allowed if an attendant is present to move vehicles. If stacked parking is used for required parking spaces, the applicant shall ensure that an attendant will always be present when the lot is in operation. The requirements for minimum or maximum spaces and all parking area development standards continue to apply for stacked parking.**

5. **All disabled parking shall be placed closest to building entrances than all other parking. Appropriate ADA curb cuts and ramps to go from the parking lot to the ADA-accessible entrance shall be provided unless exempted by ADA code.**

Finding: The school campus consists of a main school building with multiple entrances, recreation facilities, and outdoor learning spaces to serve the students and teachers. There are two parking areas on site.

The west parking lot will primarily serve parents and visitors to the school. All parking stalls within the parking lot are located within 200 feet of the main covered entryway, or within 200 feet of the entryway to the band and choir rooms as measured from the nearest point of each parking space.

The east parking lot will primarily serve as a bus loading zone and staff parking lot, with parking for special events on site associated with the recreation facilities. The majority of the parking stalls within the east parking lot are located within 200 feet of the entrance to the multi-use track and field, located on the south side of the field, or within 200 feet of the building entrance to the southern classroom wing. A total of three parking stalls in the east parking lot are not compliant with the maximum 200 - foot spacing requirement of this section. These three parking stalls are located within 230 feet of the southern classroom wing, and 225 feet of the multi-use track and field entrance.

A class II variance has been requested for the off-street parking lot spacing. The class II variance criteria have been addressed within this narrative.

46.080 COMPUTATION OF REQUIRED PARKING SPACES AND LOADING AREA

A. Where several uses occupy a single structure or unit of land, a combination of uses is included in one business, or a combination of uses in the same or separate buildings share a common parking area as in the case of a shopping center, the total off-street parking spaces and loading area shall be the sum of the requirements of the several uses, computed separately. For example, parking for an auto sales and repair business would be calculated using the "retail-bulky" calculation for the sales area and the "service and repair" calculation for the repair area. In another example, parking for a shopping center with a grocery store, a restaurant, and a medical office would be calculated using the "general retail store" calculation for the grocery store, the "restaurant" calculation for the restaurant, and the "medical/dental clinics" calculation for the medical office. The total number of required parking spaces may be reduced by up to 10 percent to account for cross-patronage (when a customer visits several commercial establishments during one visit to the commercial center) of adjacent businesses or services in a commercial center with five or more separate commercial establishments.

B. To calculate building square footage as a basis for determining how many parking spaces are needed, the area measured shall be gross floor area under the roof measured from the faces of the structure, including all habitable floors and excluding only space devoted to covered off-street parking or loading.

C. Where employees are specified, the employees counted are the persons who work on the premises including proprietors, executives, professional people, production, sales, and distribution employees, during the largest shift.

D. Fractional space requirements shall be counted as a whole space.

E. On-street parking along the immediate property frontage(s) may be counted toward the minimum parking requirement with approval from the City Engineer.

F. When an office or commercial development is proposed which has yet to identify its tenants, the parking requirement shall be based upon the "office" or "general retail" categories, respectively.

G. As permitted uses are replaced with new permitted uses within an existing commercial or business center, modification of the number of parking spaces relative to the new mix of uses is not required unless other modifications of the site which require design review approval pursuant to Chapter 55 CDC are proposed.

46.090 MINIMUM OFF-STREET PARKING SPACE REQUIREMENTS

B. Public and semi-public buildings/uses.

6. Primary school, middle school, or equivalent private or parochial school.	**One space for every employee, plus 1 space for each 1,000 square feet of floor area.**

Finding: The floor area of the new middle school is 110,972 square feet and will have 75 employees. A total of 186 parking spaces is required. The site will provide a total of 186 parking spaces. The minimum parking requirement is met.

F. Maximum parking. Parking spaces (except for single-family and two-family residential uses) shall not exceed the minimum required number of spaces by more than 10 percent.

Finding: Based on a minimum requirement of 186 stalls, the maximum number of parking stalls allowed on the site is 205 stalls. A total of 186 parking stalls are provided. This standard is met.

G. Parking reductions. An applicant may reduce parking up to 10 percent for development sites within one-quarter mile of a transit corridor or within a mixed-use commercial area, and up to 10 percent for commercial development sites adjacent to multi-family residential sites with the potential to accommodate more than 20 dwelling units.

Finding: A reduction in parking spaces is not requested. The requirements of this section are not applicable.

H. For office, industrial, and public uses where there are more than 20 parking spaces for employees on the site, at least 10 percent of the required employee parking spaces shall be reserved for carpool use before 9:00 a.m. on weekdays. The spaces will be the closest to the building entrance, except for any disabled parking and those signed for exclusive customer use. The carpool/vanpool spaces shall be clearly marked "Reserved – Carpool/Vanpool Before 9:00 a.m."

Finding: The school parking lot will have 75 employee parking spaces. A total of eight parking spaces will be designated as carpool/vanpool spaces. The carpool spaces are in the east parking lot and have been shown on the Overall Site Plan (Sheet LU1.14). This standard is met.

I. Existing developments along transit streets or near transit stops may redevelop up to 10 percent of the existing parking spaces to provide transit-oriented facilities, including bus pullouts, bus stops and shelters, park and ride stations, and other similar facilities.

Finding: A reduction in parking spaces is not requested. The requirements of this section are not applicable.

J. Development in water resource areas may reduce the required number of parking spaces by up to 25 percent. Adjacent improved street frontage with curb and sidewalk may also be counted towards the parking requirement at a rate of one parking space per 20 lineal feet of street frontage adjacent to the property.

Finding: Development is not proposed in a water resource area. The requirements of this section are not applicable.

46.120 DRIVEWAYS REQUIRED ON SITE

Any school or other meeting place which is designed to accommodate more than 25 people at one time shall provide a 15-foot-wide driveway designed for continuous forward flow of passenger vehicles for the purpose of loading and unloading passengers. Depending on functional requirements, the width may be increased with Planning Director approval.

Finding: The driveways for the proposed parking lots have been designed for two direction travel with a 24-foot wide paved area. The travel lane at the western parking lot widens to 30 feet along the student drop-off area for 457 feet of curb length to allow for the continuous forward flow of passenger vehicles for the purpose of loading and unloading passengers. The eastern parking lot will be utilized for staff parking and buses. The travel lane from Dollar Street has been designed for two direction travel with 24-foot wide paved areas. The travel lane widens to 34 feet along the bus loading areas for 595 feet of curb length to allow for continuous forward flow of passenger vehicles. The proposed driveway widths have been shown on the Site Plans (Sheet LU1.11-LU1.17). This standard is met.

46.130 OFF-STREET LOADING SPACES

Buildings or structures to be built or substantially altered, which receive and distribute material or merchandise by truck, shall provide and maintain off-street loading and maneuvering space. The dimensional standard for loading spaces is a minimum of 14 feet wide by 20 feet long or proportionate to accommodate the size of delivery trucks that typically serve the proposed use as follows:

Land Use	Gross Floor Area

Institutional:	At Which First Berth Is Required	At Which Second Berth Is Required
Schools	10,000	100,000

Finding: The new middle school has a gross floor area of 110,972 square feet; therefore, two loading berths are required. A double loading berth that is approximately 40 feet wide and 30 feet long has been provided in the northwest corner of the school. The loading area has been shown on the Site Plan (Sheet LU1.12) and the Level 01 Floor Plan (Sheet LU3.01). This standard is met.

46.140 EXEMPTIONS TO PARKING REQUIREMENTS

To facilitate the design requirements of Chapter 58 CDC, properties in the Willamette Falls Drive Commercial Design District, located between 10th and 16th Streets, shall be exempt from the minimum parking and off-street loading requirements as identified in this chapter. Any off-street parking or loading spaces voluntarily provided shall be designed and installed per the dimensional standards of this code.

Finding: The proposed development is not located within the Willamette Falls Drive Commercial Design District. This standard does not apply.

46.150 DESIGN AND STANDARDS

The following standards apply to the design and improvement of areas used for vehicle parking, storage, loading, and circulation:

A. Design standards.

1. **"One standard parking space" means a minimum for a parking stall of eight feet in width and 16 feet in length. These stalls shall be identified as "compact." To accommodate larger cars, 50 percent of the required parking spaces shall have a minimum dimension of nine feet in width and 18 feet in length (nine feet by 18 feet). When multi-family parking stalls back onto a main driveway, the stalls shall be nine feet by 20 feet. Parking for development in water resource areas may have 100 percent compact spaces.**

   Finding: All proposed standard parking stalls meet a minimum dimension of nine feet in width and 18 feet in length. All proposed compact parking stalls will meet a minimum dimension of eight feet in width and 16 feet in length. Of the 186 parking stalls on site, a total of 70, or 37.6 percent will be compact. Compact parking spaces have been labeled on the Site Plans (Sheet LU1.11-LU1.17). This standard is met.

2. **Disabled parking and maneuvering spaces shall be consistent with current federal dimensional standards and subsection B of this section and placed nearest to accessible building entryways and ramps.**

   Finding: All proposed disabled parking and maneuvering spaces have been designed to be consistent with current federal dimensional standards. The location of the accessible parking spaces has been shown on the Overall Site Plan (Sheet LU1.10). This requirement is met.

3. **Repealed by Ord. 1622.**
4. **Service drives shall be designed and constructed to facilitate the flow of traffic, provide maximum safety of traffic access and egress, and maximum safety of pedestrians and vehicular traffic on the site.**

Finding: All service drives have been designed to facilitate the flow of traffic, provide maximum safety of traffic access and egress, and maximum safety of pedestrians and vehicular traffic on site. The two access drives to the school building have been designed with queuing areas for drop-off and pick-up to allow for the continuous flow of traffic on site and within the surrounding neighborhood. The parking areas and drop off areas on site have been separated to provide a parent parking and drop-off and pick-up zone in the west parking lot and bus loading and staff parking in the east parking lot. The separation of the parking functions on site will help to minimize neighborhood impacts during drop-off and pick-up times. The west and east parking lots have been shown on the Overall Site Plan (Sheet LU1.10). This standard is met.

5. **Each parking and/or loading space shall have clear access, whereby the relocation of other vehicles to utilize the parking space is not required.**

Finding: Each proposed parking space will have clear access. This standard is met.

6. **Except for single- and two-family residences, any area intended to be used to meet the off-street parking requirements as contained in this chapter shall have all parking spaces clearly marked using a permanent paint. All interior drives and access aisles shall be clearly marked and signed to show direction of flow and maintain vehicular and pedestrian safety. Permeable parking surface spaces may have an alternative delineation for parking spaces.**

Finding: All proposed areas intended to be used to meet the off-street parking requirements will have all parking spaces clearly marked using permanent paint. All interior drives and access aisles will be clearly marked and signed to show direction of flow and maintain vehicular and pedestrian safety. This standard is met.

7. **Except for residential parking, and parking for public parks and trailheads, at least 50 percent of all areas used for the parking and/or storage and/or maneuvering of any vehicle, boat and/or trailer shall be improved with asphalt or concrete surfaces according to the same standards required for the construction and acceptance of City streets. The remainder of the areas used for parking may use a permeable paving surface designed to reduce surface runoff. Parking for public parks or trailheads may use a permeable paving surface designed to reduce surface runoff for all parking areas. Where a parking lot contains both paved and unpaved areas, the paved areas shall be located closest to the use which they serve.**

Finding: The proposed parking areas will be improved with asphalt according to the same standard required for the construction and acceptance of City streets. This standard is met.

8. **Off-street parking spaces for single- and two-family residences shall be improved with an asphalt or concrete surface, or a permeable parking surface designed to reduce surface runoff, to specifications as approved by the Building Official. Other parking facilities for two- and single-family homes that are to accommodate additional vehicles, boats, recreational vehicles, and trailers, etc., need not be paved. All parking for multi-family residential development shall be paved with concrete or asphalt. Driveways shall measure at least 20 feet from the back of sidewalk to garage or the end of the parking pad to accommodate cars and sport utility vehicles without the vehicles blocking the public sidewalk.**

   Finding: The proposed development is an institutional use. The requirements of this section are not applicable to the proposed development.

9. **Access drives from the street to off-street parking or loading areas shall be designed and constructed to facilitate the flow of traffic and provide maximum safety for pedestrian and vehicular traffic on the site. The number of access drives shall be limited to the minimum that will allow the property to accommodate and service the anticipated traffic. Access drives shall be clearly and permanently marked and defined through use of rails, fences, walls, or other barriers or markers on frontage not occupied by service drives.**

   Finding: All proposed access drives have been designed and will be constructed to facilitate the flow of traffic to provide maximum safety for pedestrian and vehicular traffic on the site. The number of access drives will be limited to the minimum to accommodate and service the anticipated traffic. All access drives will be clearly and permanently marked. The length of the access drives has been maximized to the extent possible on the site and will provide for additional car queuing length on the site to minimize traffic backing up onto City streets. The access drives have been shown on the Overall Site Plan (Sheet LU1.10) included under Appendix E. A Transportation Impact Analysis and Supplemental Memo prepared by DKS and Associates has been prepared for the site and has been included under Appendix D. This standard is met.

10. **Access drives shall have a minimum vision clearance as provided in Chapter 42 CDC, Clear Vision Areas.**

    Finding: Clear vision area triangles consistent with Chapter 42 have been shown on the Overall Site Plan (Sheet LU1.10). This standard is met.

11. **Parking spaces along the boundaries of a parking lot or adjacent to interior landscaped areas or sidewalks shall be provided with a wheel stop at least four inches high located two feet back from the front of the parking stall. Such parking spaces may be provided without wheel stops if the sidewalks or landscaped areas adjacent the parking stalls are two feet wider than the minimum width.**

Finding: Wheel stops have not been proposed within the parking areas. Where parking spaces abut sidewalks, the sidewalks have been widened to eight feet. Where parking spaces abut interior landscaping, a minimum landscape island width of 10 feet has been provided. This standard is met.

12. **Off-street parking and loading areas shall be drained in accordance with plans and specifications approved by the City Engineer. Storm drainage at commercial sites may also have to be collected to treat oils and other residue.**

Finding: The proposed parking areas will be drained in accordance with the City's plans and specifications. The Preliminary Storm Water Report submitted under Appendix D provides a detailed analysis of the proposed stormwater management system. This standard is met.

13. **Artificial lighting on all off-street parking facilities shall be designed to deflect all light downward away from surrounding residences and so as not to create a hazard to the public use of any road or street.**

Finding: The proposed parking lot lighting has been designed to deflect all light downward away from surrounding residences. The parking lot lighting for the site has been designed to meet ASHRAE 90.1 code standards. Compliance with the ASHRAE lighting standards and the parking lot lighting coverage has been demonstrated on the Light Coverage Plan (Sheet LU4.01). This standard is met.

14. **Directional arrows and traffic control devices which are placed on parking lots shall be identified.**

Finding: All traffic control devices in the proposed parking lot will be identified. This standard is met.

15. **The maximum driveway grade for single-family housing shall be 15 percent. The 15 percent shall be measured along the centerline of the driveway only. Grades elsewhere along the driveway shall not apply. Variations require approval of a Class II variance by the Planning Commission pursuant to Chapter 75 CDC. Regardless, the last 18 feet in front of the garage must maintain a maximum grade of 12 percent as measured along the centerline of the driveway only. Grades elsewhere along the driveway shall not apply.**

Finding: The proposed development is not residential. The requirements of this section are not applicable.

16. **Visitor or guest parking must be identified by painted "GUEST" or "VISITOR."**

Finding: The school parking lot does not have specific parking spaces designated as visitor or guest parking. The west parking lot is for the primary use of guests and visitors of the school. This standard is met.

17. **The parking area shall have less than a five percent grade. No drainage across adjacent sidewalks or walkways is allowed.**

Finding: An Overall Grading and Drainage Plan (Sheet LU1.20) as well as detailed Grading and Drainage Plans (Sheets LU1.21-LU1.27) showing the proposed parking lot grading has been provided under Appendix E. The requirements of this section are met.

18. **Commercial, office, industrial, and public parking lots may not occupy more than 50 percent of the main lot frontage of a development site. The remaining frontage shall comprise buildings or landscaping. If over 50 percent of the lineal frontage comprises parking lot, the landscape strip between the right-of-way and parking lot shall be increased to 15 feet wide and shall include terrain variations (e.g., one-foot-high berm) plus landscaping. The defensible space of the parking lot should not be compromised.**

Finding: The total site frontage on Dollar Street is approximately 1,692 linear feet. The west parking lot has been located approximately 15 feet from the property line on Dollar Street at its closest point and has a total frontage length on Dollar Street of 188 linear feet, or 11.5 percent of the total frontage. The site has a total frontage of approximately 1680 feet on Willamette Falls Drive. The east parking lot has been located approximately 89 feet from the property line along Willamette Falls Drive and has a total frontage on Willamette Falls Drive of 370 linear feet, or 22 percent of the total frontage. This standard is met.

19. **Areas of the parking lot improved with asphalt or concrete surfaces shall be designed into areas of 12 or less spaces through the use of defined landscaped area. Groups of 12 or less spaces are defined as:**
    a. **Twelve spaces in a row, provided there are no abutting parking spaces, as in the case when the spaces are abutting the perimeter of the lot; or**
    b. **Twelve spaces in a group with six spaces abutting together; or**
    c. **Two groups of 12 spaces abutting each other, but separated by a 15-foot-wide landscape area including a six-foot-wide walkway.**
    d. **Parking areas improved with a permeable parking surface may be designed using the configurations shown in subsections (A)(19)(a), (b) and (c) of this section except that groups of up to 18 spaces are allowed.**
    e. **The requirements of this chapter relating to total parking lot landscaping, landscaping buffers, perimeter landscaping, and landscaping the parking lot islands and interior may be waived or reduced pursuant to CDC 32.110(F) in a WRA application without a variance being required.**

Finding: The proposed parking lot has been designed with groups of 12 or less parking spaces, defined by landscape islands consistent with the requirements of this section. The western parking lot seems to meet subsection c with a parallel 15’ wide landscape island separating the stall groups. The eastern parking lot meets this with a 22’ wide landscape island that is perpendicular to the stalls. The parking lot landscaping has been shown on the Planting Plans (Sheet LU1400A-LU1407). This standard is met.

20. **Pedestrian walkways shall be provided in parking areas having 20 or more spaces. Walkways or sidewalks shall be constructed between major buildings/activity areas (an example in multi-family housing: between recreation center, swimming pool, manager's office, park or open space areas, parking lots, etc.) within a development, between adjacent developments and the new development, as feasible, and between major buildings/activity areas within the development and adjacent streets and all adjacent transit stops. Internal parking lot circulation and design should maintain ease of access for pedestrians from streets and transit stops. Walkways shall be constructed using a material that visually contrasts with the parking lot and driveway surface. Walkways shall be further identifiable to pedestrians and motorists by grade separation, walls, curbs, surface texture (surface texture shall not interfere with safe use of wheelchairs, baby carriages, shopping carts, etc.), and/or landscaping. Walkways shall be six feet wide. The arrangement and layout of the paths shall depend on functional requirements.**

Finding: The school will feature new walking pathways on site which will connect the school facilities to new and existing sidewalks along Dollar Street, Brandon Place and Willamette Falls Drive. The District has provided a Safe-Routes to School improvements analysis with recommended improvements, including sidewalk infill, crossing improvements and bicycle route improvements, in the Traffic Impact Analysis completed by DKS and Associates and included in Appendix D. All walkways will be constructed with a material that contrasts with the parking lot and driveway surface. This standard is met.

21. **The parking and circulation patterns are easily comprehended and defined. The patterns shall be clear to minimize traffic hazards and congestion and to facilitate emergency vehicles.**

Finding: The parking and circulation pattern on the school site has been designed and will be constructed to facilitate the flow of traffic to provide maximum safety for pedestrian and vehicular traffic on the site. The number of access drives will be limited to the minimum to accommodate and service the anticipated traffic. All access drives will be clearly and permanently marked. The length of the access drives has been maximized to the extent possible on the site will provide for additional car queuing length on the site to minimize traffic backing up onto City streets. Pedestrian crossings within the vehicle circulation and parking areas have been minimized to the extent possible and will be clearly marked. The parking and vehicle circulation areas have been shown on the Overall Site Plan (Sheet LU1.10) included under Appendix E. A Transportation Impact Analysis and Supplemental Memo prepared by DKS and Associates has been prepared for the site and has been included under Appendix D. This standard is met.

22. **The parking spaces shall be close to the related use.**

Finding: The proposed parking areas will be located on the school site and serve Athey Creek Middle School and the associated school facilities. This standard is met.

23. Permeable parking spaces shall be designed and built to City standards.

Finding: The proposed parking area has not been designed using permeable surfaces. The requirements of this standard are not applicable.

B. Accessible parking standards for persons with disabilities. If any parking is provided for the public or visitors, or both, the needs of the people with disabilities shall be based upon the following standards or current applicable federal standards, whichever are more stringent:

1. Minimum number of accessible parking space requirements (see following table):

MINIMUM REQUIRED NUMBER OF TOTAL PARKING SPACES	TOTAL NUMBER OF ACCESSIBLE SPACES	NUMBER OF VAN-ACCESSIBLE SPACES REQUIRED, OF TOTAL	SPACES SIGNED "WHEELCHAIR USE ONLY"
151-200	6	-	1

2. Location of parking spaces. Parking spaces for the individual with a disability that serve a particular building shall be located on the shortest possible accessible circulation route to an accessible entrance to a building. In separate parking structures or lots that do not serve a particular building, parking spaces for the persons with disabilities shall be located on the shortest possible circulation route to an accessible pedestrian entrance of the parking facility.

3. Accessible parking space and aisle shall meet ADA vertical and horizontal slope standards.

4. Where any differences exist between this section and current federal standards, those standards shall prevail over this code section.

5. One in every eight accessible spaces, but not less than one, shall be served by an access aisle 96 inches wide.

6. Van-accessible parking spaces shall have an additional sign marked "Van Accessible" mounted below the accessible parking sign. A van-accessible parking space reserved for wheelchair users shall have a sign that includes the words "Wheelchair Use Only." Van-accessible parking shall have an adjacent eight-foot-wide aisle. All other accessible stalls shall have a six-foot-wide aisle. Two vehicles may share the same aisle if it is between them. The vertical clearance of the van space shall be 96 inches.

Finding: The site has a total of 186 parking stalls; therefore, six ADA stalls are required. A total of nine ADA stalls, including two van stalls have been provided on site. The west parking lot has been designed with three ADA parking stalls, including one van stall. The east parking lot has been designed with six ADA parking stalls, including one van stall. The ADA parking stalls have been located on the shortest possible accessible circulation route to an accessible entrance to the building. This standard is met.

C. Landscaping in parking areas. Reference Chapter 54 CDC, Landscaping.

Finding: Chapter 54 CDC has been addressed within this narrative.

D. Bicycle facilities and parking.

1. **Provisions shall be made for pedestrian and bicycle ways if such facilities are shown on an adopted plan.**
2. **Bicycle parking facilities shall either be lockable enclosures in which the bicycle is stored, or secure stationary racks which accommodate bicyclist's locks securing the frame and both wheels. The bicycle parking shall be no more than 50 feet from the entrance to the building, well-lit, observable, and properly signed.**
3. **Bicycle parking must be provided in the following amounts:**

LAND USE CATEGORY	MINIMUM REQUIRED BICYCLE PARKING SPACES	MINIMUM COVERED AMOUNT
Schools – Jr. High or Middle Schools	**4 spaces per classroom**	**50%**

Finding: The proposed school will have a total of 25 classrooms. Based on the number of classrooms, 100 bicycle parking stalls are required, with 50 covered bicycle parking stalls. A total of 102 bicycle parking stalls have been provided on the school campus, with 50 covered. Three bicycle parking areas have been dispersed on the site to provide bicycle parking adjacent to both the west entrance and the east entrance as well as the recreation facilities on site.

WEST BUILDING ENTRANCE

The bicycle parking area located at the west entrance provides 36 bicycle parking stalls and is located within 50 feet of the main covered entryway as shown on the Site Plan (Sheet LU1.12) and Landscape Planting Plan (Sheet LU1400A).

EAST BUILDING ENTRANCES

The bicycle parking area located at the east entrance provides 36 bicycle parking stalls, including 20 covered stalls, and is located within 50 feet from the main covered entryway and auxiliary gym entryway as shown on the Site Plan (Sheet LU1.13) and Landscape Planting Plan (Sheet LU1400A).

SITE RECREATION AREAS

The school use of the site provides several site amenities and facilities for use by students and visitors during and after school hours. A bicycle parking area of 30 covered parking stalls has been centrally located within the recreation area of the school campus. This bicycle parking area has been located within 50 feet of a building entrance located within the classroom wing and within 50 feet of recreation areas that include basketball courts and hardscape play areas as illustrated on the Site Plan (Sheet LU1.13) and Landscape Planting Plan (Sheet LU1400A).

This standard is met.

E. Office or industrial developments shall be allowed a 10 percent reduction in the number of required parking spaces when the property owner agrees to a demand management program that includes three or more of the following measures:

Finding: The proposed development is not an office or industrial development. The requirements of this section are not applicable.

F. (See Figures 1 and 2 below.)

ANGLE OF PARKING	DIRECTION OF PARKING	AISLE WIDTH		DIMENSION 'A'		DIMENSION 'B'	
		STALL WIDTH		STALL WIDTH		STALL WIDTH	
		9.0'	8.0'	9.0'	8.0'	9.0'	8.0'
30°	DRIVE-IN	12.5'	12.5'	16.8'	13.8'	18.0'	16.0'
45°	DRIVE-IN	12.5'	12.5'	19.1'	17.0'	12.7'	11.3'
60°	DRIVE-IN	19.0'	18.0'	20.1'	17.8'	10.4'	9.2'
60°	BACK-IN	17.0'	17.0'	20.1'	17.8'	10.4'	9.2'
90°	DRIVE-IN	23.0'	23.0'	18.0'	16.0'	9.0'	8.0'
90°	BACK-IN	22.0'	22.0'	18.0'	16.0'	9.0'	8.0'

Finding: All proposed stalls will be 90 degrees. The standard stalls have been designed to be 9.0 feet in width, 18.0 feet in length with 24.0-foot minimum drive aisles. The compact stalls have been designed to be 8.0 feet in width, 16.0 feet in length with 23.0-foot minimum drive aisles. The parking lot stall dimensions have been illustrated on the detailed Site Plans (Sheet LU1.12, LU1.14 and LU1.15). This standard is met.

Chapter 48 ACCESS, EGRESS AND CIRCULATION

48.020 APPLICABILITY AND GENERAL PROVISIONS

A. The provisions of this chapter do not apply where the provisions of the Transportation System Plan or land division chapter are applicable and set forth differing standards.

Finding: The provisions of this chapter have been addressed as they are applicable to the proposed development. Where sections of the City's 2016 Transportation System Plan relating capital projects, access spacing, roadway design standards, frontage improvements and the Safe Routes to School Program are applicable, they have been addressed within this narrative and within the Traffic Impact Study and Supplemental Memo prepared by DKS and Associates included under Appendix E. This standard is met.

B. All lots shall have access from a public street or from a platted private street approved under the land division chapter.

Finding: The subject site has access from the extension of Brandon Place and from Dollar Street, both public streets. This standard is met.

C. No building or other permit shall be issued until scaled plans are presented to the City and approved by the City as provided by this chapter, and show how the access, egress, and

circulation requirements are to be fulfilled. Access to State or County roads may require review, approval, and permits from the appropriate authority.

Finding: As demonstrated within this narrative, the access, egress and circulation requirements of this section have been met.

D. Should the owner or occupant of a lot, parcel or building enlarge or change the use to which the lot, parcel or building is put, resulting in increasing any of the requirements of this chapter, it shall be unlawful and a violation of this code to begin or maintain such altered use until the provisions of this chapter have been met, and, if required, until the appropriate approval authority under Chapter 99 CDC has approved the change.

Finding: The provisions of this chapter have been addressed as applicable to the proposed school. The proposed development is subject to quasi-judicial review under Chapter 99 CDC. This standard is met.

E. Owners of two or more uses, structures, lots, parcels, or units of land may agree to utilize jointly the same access and egress when the combined access and egress of both uses, structures, or parcels of land satisfies the requirements as designated in this code; provided, that satisfactory legal evidence is presented to the City Attorney in the form of deeds, easements, leases, or contracts to establish joint use. Copies of said instrument shall be placed on permanent file with the City Recorder.

F. Property owners shall not be compelled to access their homes via platted stems of flag lots if other driveways and easements are available and approved by the City Engineer.

Finding: The site is used solely for the purpose of a middle school and the associated activities related to the operation of the middle school. The standards in Subsections E. and F. are not applicable to the proposed development.

48.025 ACCESS CONTROL

A. Purpose. The following access control standards apply to public, industrial, commercial and residential developments including land divisions. Access shall be managed to maintain an adequate level of service and to maintain the functional classification of roadways as required by the West Linn Transportation System Plan.

B. Access control standards.

1. **Traffic impact analysis requirements. The City or other agency with access jurisdiction may require a traffic study prepared by a qualified professional to determine access, circulation and other transportation requirements. (See also CDC 55.125, Transportation Impact Analysis.)**

Finding: A Traffic Impact Analysis for the site prepared by DKS Associates has been submitted under Appendix D. In addition, a supplementary memo was provided by DKS Associates in response to community questions and concerns regarding traffic. This memo has been included under Appendix D. This standard is met.

2. **The City or other agency with access permit jurisdiction may require the closing or consolidation of existing curb cuts or other vehicle access points, recording of reciprocal access easements (i.e., for shared driveways), development of a frontage street, installation of traffic control devices, and/or other mitigation as a condition of granting an access permit, to ensure the safe and efficient operation of the street and highway system. Access to and from off-street parking areas shall not permit backing onto a public street.**

Finding: As a result of a coordinated effort between City Staff and expert guidance from DKS and Associates, the development will include right-of-way improvements to Dollar Street and Willamette Falls Drive, and an extension of Brandon Place from Dollar Street to Willamette Falls Drive. The proposed extension of Brandon Place will provide a needed secondary emergency access route to the neighborhood. Vehicular access to the site will be provided on Dollar Street and on Brandon Place Drive. All required traffic control devices will be installed. The proposed parking lot access will not require backing onto Dollar Street or Brandon Place. This standard is met.

3. **Access options. When vehicle access is required for development (i.e., for off-street parking, delivery, service, drive-through facilities, etc.), access shall be provided by one of the following methods (planned access shall be consistent with adopted public works standards and TSP). These methods are "options" as approved by the City Engineer.**
   a) **Option 1. Access is from an existing or proposed alley or mid-block lane. If a property has access to an alley or lane, direct access to a public street is not permitted.**
   b) **Option 2. Access is from a private street or driveway connected to an adjoining property that has direct access to a public street (i.e., "shared driveway"). A public access easement covering the driveway shall be recorded in this case to assure access to the closest public street for all users of the private street/drive.**
   c) **Option 3. Access is from a public street adjacent to the development lot or parcel. If practicable, the owner/developer may be required to close or consolidate an existing access point as a condition of approving a new access. Street accesses shall comply with the access spacing standards in subsection (B)(6) of this section.**

Finding: The proposed parking lots will take access from Dollar Street and Brandon Place, both public streets. Other existing vehicular access to the site will be eliminated as shown on the plans. This standard is met.

4. **Subdivisions fronting onto an arterial street. New residential land divisions fronting onto an arterial street shall be required to provide alleys or secondary (local or collector) streets for access to individual lots. When alleys or secondary streets cannot be constructed due to topographic or other physical constraints, access may be provided by consolidating driveways for clusters of two or more lots (e.g., includes flag lots and mid-block lanes).**

Finding: The proposed development is not a subdivision. The requirements of this section are not applicable.

5. **Double-frontage lots. When a lot or parcel has frontage onto two or more streets, access shall be provided first from the street with the lowest classification. For example, access shall be provided from a local street before a collector or arterial street. When a lot or parcel has frontage opposite that of the adjacent lots or parcels, access shall be provided from the street with the lowest classification.**

Finding: The subject property has frontage on Willamette Falls Drive, an arterial street, Dollar Street, and the proposed extension of Brandon Place. The proposed parking lots will take access from Brandon Place and Dollar Street, which are classified as local streets. This standard is met.

6. **Access spacing.**
   a. **The access spacing standards found in the adopted Transportation System Plan (TSP) shall be applicable to all newly established public street intersections and non-traversable medians. Deviation from the access spacing standards may be granted by the City Engineer if conditions are met as described in the access spacing variances section in the adopted TSP.**
   b. **Private drives and other access ways are subject to the requirements of CDC 48.060.**

Finding: Dollar Street is classified as a local street with an intersection spacing requirement of 150 feet. The distance between intersection of Brandon Place and Dollar Street and the intersection of River Heights Circle and Dollar Street is approximately 260 feet.

Willamette Falls Drive is classified as an arterial street with an intersection spacing requirement of 500 feet. The extension of Brandon Place to Willamette Falls Drive will align with a secondary driveway to Fields Bridge Park, via a proposed roundabout. The primary access to Fields Bridge Park is located approximately 730 feet east from the proposed intersection of Brandon Place and Willamette Falls Drive. The access spacing standards have been met.

The proposed access drives have been addressed within this narrative under the requirements of CDC 48.060.

7. **Number of access points. For single-family (detached and attached), two-family, and duplex housing types, one street access point is permitted per lot or parcel, when alley access cannot otherwise be provided; except that two access points may be permitted corner lots (i.e., no more than one access per street), subject to the access spacing standards in subsection (B)(6) of this section. The number of street access points for multiple family, commercial, industrial, and public/institutional developments shall be minimized to protect the function, safety and operation of the street(s) and sidewalk(s) for all users. Shared access may be required, in conformance with subsection (B)(8) of**

this section, in order to maintain the required access spacing, and minimize the number of access points.

Finding: The school is classified as a public/institutional development. The proposed access points for the new parking lots are the minimum number to serve the needs of the school and have been located to protect the function, safety and operation of the street and sidewalk for all users. The access spacing standards for a local street have been met. This standard is met.

8. **Shared driveways. The number of driveway and private street intersections with public streets shall be minimized by the use of shared driveways with adjoining lots where feasible. The City shall require shared driveways as a condition of land division or site design review, as applicable, for traffic safety and access management purposes in accordance with the following standards:**
   a. **Shared driveways and frontage streets may be required to consolidate access onto a collector or arterial street. When shared driveways or frontage streets are required, they shall be stubbed to adjacent developable parcels to indicate future extension. "Stub" means that a driveway or street temporarily ends at the property line, but may be extended in the future as the adjacent lot or parcel develops. "Developable" means that a lot or parcel is either vacant or it is likely to receive additional development (i.e., due to infill or redevelopment potential).**
   b. **Access easements (i.e., for the benefit of affected properties) shall be recorded for all shared driveways, including pathways, at the time of final plat approval or as a condition of site development approval.**
   c. **Exception. Shared driveways are not required when existing development patterns or physical constraints (e.g., topography, lot or parcel configuration, and similar conditions) prevent extending the street/driveway in the future.**

Finding: A shared driveway is not proposed or feasible for the proposed development. The requirements of this section are not applicable to the proposed development.

C. Street connectivity and formation of blocks required. In order to promote efficient vehicular and pedestrian circulation throughout the City, land divisions and large site developments shall produce complete blocks bounded by a connecting network of public and/or private streets, in accordance with the following standards:

1. **Block length and perimeter. The maximum block length shall not exceed 800 feet or 1,800 feet along an arterial.**
2. **Street standards. Public and private streets shall also conform to Chapter 92 CDC, Required Improvements, and to any other applicable sections of the West Linn Community Development Code and approved TSP.**
3. **Exception. Exceptions to the above standards may be granted when blocks are divided by one or more pathway(s), in conformance with the provisions of CDC 85.200(C), Pedestrian and Bicycle Trails, or cases where extreme topographic (e.g., slope, creek,**

wetlands, etc.) conditions or compelling functional limitations preclude implementation, not just inconveniences or design challenges.

Finding: The proposed development will include the extension of Brandon Place from the intersection at Dollar Street to Willamette Falls Drive, aligning with a secondary driveway for Fields Bridge Park. The proposed street connection will provide through access from Dollar Street, which is currently a dead-end street. The Brandon Place and Willamette Falls Drive intersection is located approximately 1,780 feet from the intersection of Willamette Falls Drive and Epperly Way. The block length standards for an arterial have been met by the proposed Brandon Place extension. Chapter 92 has been addressed within this narrative. This standard is met.

48.040 MINIMUM VEHICLE REQUIREMENTS FOR NON-RESIDENTIAL USES

Access, egress, and circulation system for all non-residential uses shall not be less than the following:

A. Service drives for non-residential uses shall be fully improved with hard surface pavement:

1. **With a minimum of 24-foot width when accommodating two-way traffic; or**
2. **With a minimum of 15-foot width when accommodating one-way traffic. Horizontal clearance shall be two and one-half feet wide on either side of the driveway.**
3. **Meet the requirements of CDC 48.030(E)(3) through (6).**
4. **Pickup window driveways may be 12 feet wide unless the Fire Chief determines additional width is required.**

B. All non-residential uses shall be served by one or more service drives as determined necessary to provide convenient and safe access to the property and designed according to CDC 48.030(A). In no case shall the design of the service drive or drives require or facilitate the backward movement or other maneuvering of a vehicle within a street, other than an alley.

C. All on-site maneuvering and/or access drives shall be maintained pursuant to CDC 46.130.

D. Gated accessways to non-residential uses are prohibited unless required for public safety or security.

Finding: All on-site maneuvering and access drives have been designed to provide convenient and safe access to the property, with a minimum of 24-foot wide hard surface pavement to provide two-way traffic. This standard is met.

48.050 ONE-WAY VEHICULAR ACCESS POINTS

Where a proposed parking facility plan indicates only one-way traffic flow on the site, it shall be accommodated by a specific driveway serving the facility, and the entrance drive shall be situated closest to oncoming traffic, and the exit drive shall be situated farthest from oncoming traffic.

Finding: The proposed parking facilities will provide for two-way traffic flow on site. The requirements of this section are not appliable.

48.060 WIDTH AND LOCATION OF CURB CUTS AND ACCESS SEPARATION REQUIREMENTS

A. Minimum curb cut width shall be 16 feet.

B. Maximum curb cut width shall be 36 feet, except along Highway 43 in which case the maximum curb cut shall be 40 feet. For emergency service providers, including fire stations, the maximum shall be 50 feet.

Finding: The proposed driveway on Brandon Place has a width of 24 feet. The driveway has been designed to meet Brandon Place with a curb return with a 28-foot radius rather than a driveway apron to accommodate both bus and fire truck traffic into the site. The proposed driveway on Dollar Street has a width that tapers from 28 feet to 24 feet. The driveway has been designed with a curb return with a 28-foot radius rather than a driveway apron to accommodate both bus and fire truck traffic into the site. The proposed driveway is preferred by the District to prevent buses from having to oversteer into oncoming traffic to turn into the site. The width of the curb cut at Brandon Place is 71.2 feet. The width of the curb cut at Dollar street is 83.8 feet.

C. No curb cuts shall be allowed any closer to an intersecting street right-of-way line than the following:

1. **On an arterial when intersected by another arterial, 150 feet**
2. **On an arterial when intersected by a collector, 100 feet.**
3. **On an arterial when intersected by a local street, 100 feet.**
4. **On a collector when intersecting an arterial street, 100 feet**
5. **On a collector when intersected by another collector or local street, 35 feet.**
6. **On a local street when intersecting any other street, 35 feet.**

Finding: Brandon Place is classified as a local street. The proposed curb cut on Brandon Place is 39 feet from the right-of-way on Dollar Street, and 242 feet from Willamette Falls Drive. Dollar Street is classified as a local street. The proposed curb cut is located 358 feet from River Heights Circle and 139 feet from Fields Drive. The curb cut spacing for both driveways exceeds the minimum requirement for a local street of 35 feet. This standard is met.

D. There shall be a minimum distance between any two adjacent curb cuts on the same side of a public street, except for one-way entrances and exits, as follows:

1. **On an arterial street, 150 feet.**
2. **On a collector street, 75 feet.**
3. **Between any two curb cuts on the same lot or parcel on a local street, 30 feet.**

Finding: The proposed driveway on Dollar Street is located 210 feet from the nearest curb cut on the same side of the street, which exceeds the minimum requirement of 30 feet on a local road. The proposed driveway on Brandon Place will be the only driveway on the block. This standard is met.

E. A rolled curb may be installed in lieu of curb cuts and access separation requirements.

Finding: A rolled curb is not proposed. The requirements of this section are not applicable.

F. Curb cuts shall be kept to the minimum, particularly on Highway 43. Consolidation of driveways is preferred. The standard on Highway 43 is one curb cut per business if consolidation of driveways is not possible.

Finding: The site will have two access drives, one on Brandon Place and one on Dollar Street, both local roads. The number of curb cuts has been kept to a minimum. The site is not located on Highway 43. This standard is met.

G. Adequate line of sight pursuant to engineering standards should be afforded at each driveway or accessway.

Finding: A clear vision area will be maintained at the intersection of Brandon Place and Dollar Street, at the intersection of Brandon Place and Willamette Falls Drive and at the proposed parking lot accessways on Dollar Street and Brandon Place. The clear vision area will not contain plantings, fences, walls, or structures exceeding three feet in height. Clear Vision Triangles have been shown at all intersections on the Overall Site Plan (SheetLU1.10). The proposed monument sign has been located outside of the vision clearance triangle areas. This requirement is met.

48.080 BICYCLE AND PEDESTRIAN CIRCULATION

A. Within all multi-family developments (except two-family/duplex dwellings), each residential dwelling shall be connected to vehicular parking stalls, common open space, and recreation facilities by a pedestrian pathway system having a minimum width of six feet and constructed of an all-weather material. The pathway material shall be of a different color or composition from the driveway. (Bicycle routes adjacent to the travel lanes do not have to be of different color or composition.)

B. Bicycle and pedestrian ways within a subdivision shall be constructed according to the provisions in CDC 85.200(A)(3).

C. Bicycle and pedestrian ways at commercial or industrial sites shall be provided according to the provisions of Chapter 55 CDC, Design Review.

Finding: The proposed development is a public institutional use. The requirements of this section are not applicable.

Chapter 52 SIGNS

52.210 APPROVAL STANDARDS

All signs shall meet the following standards:

A. The scale of the sign and its components shall be appropriate for its location and consistent with the applicable design standards.

Finding: The District is proposing one monument sign at the driveway on Brandon Place. The sign will be setback from the right-of-way five feet and will meet the City's dimensional requirements for a Public Use, as demonstrated in the response to CDC Chapter 52.300 within this narrative. The monument sign elevation has been shown on the Monument and Building Signage Plan (LU3.06). The District is requesting a Class II variance for size of the proposed on-wall sign. The Class II Variance and Sign Variance criteria has been addressed within this narrative.

B. The size, location, or manner of illumination shall not create a traffic hazard and shall not hide from view any traffic or street sign or signal.

Finding: The proposed monument sign has been located five feet from the right-of-way on Brandon Place Drive. The sign will not be located in the clear vision area and will not create a traffic hazard or hide from view any traffic or street signs and signals, as demonstrated on the Overall Site Plan (Sheet LU1.10).

C. The sign shall be located in compliance with Chapter 42 CDC, Clear Vision Area.

Finding: The proposed monument sign has been located outside of the Clear Vision Area, as described in Chapter 42 CDC. Clear Vision Triangles have been shown on the Overall Site Plan (Sheet LU1.10).

D. Signs and sign structures located over vehicular driveways and pedestrian walkways shall allow at least 15 feet of clearance over driveways and eight feet of clearance over walkways.

Finding: The District is not proposing signs or sign structures over vehicular driveways or pedestrian walkways. The requirements of this section are not applicable.

E. The light from any illuminated sign shall be shaded, fully shielded such that no light is emitted above the horizontal plane, and directed or reduced so that glare is minimized.

Finding: The monument sign will feature a manual diffused backlit message board. The light illuminated from the sign will minimize glare. This standard is met.

F. Signs shall be located to preserve existing trees, topography and natural drainage, to the extent possible consistent with the installation of the sign.

Finding: The extension of Brandon Place will require the removal of several trees on the site. The monument sign located along Brandon Place will not require the removal of any additional trees on site. The monument sign has been located to preserve existing trees, topography, and natural drainage to the extent possible. A Tree Removal Plan (Sheet LU1001) has been included under Appendix E. This standard is met.

G. All permanent signs shall be located within a landscaped area or installed on a wood, stone, or other base structure that meets the following standards:

1. **Signs shall be installed on a base with a maximum height of two feet, a minimum width at least one-half as wide as the sign face, and a depth equal to or greater than the depth of the sign. The sign height includes any portion of the base located above street grade (also refer to Sign Definitions – Grade).**
2. **In the event a sign is erected on a multiple-pole or piling structure, the base required by subsection (G)(1) of this section shall be apportioned among each of the upright members.**
3. **Any wood used in a base shall be treated against water damage and insect assault.**

Finding: The proposed monument sign will be located in a landscaped area and installed on a masonry brick base structure. The base of the proposed sign is 1.7 feet in height, including the concrete pad foundation. The sign face is five feet wide, with a sign base of six feet seven inches. The sign base will have a depth equal to the depth of the sign. This standard is met.

H. Manual changeable copy signs shall be designed to minimize the opportunity for unauthorized personnel to change the sign copy.

Finding: A manual changeable copy sign will have a lockable cover that has been designed to minimize the opportunity for unauthorized personnel to change the sign copy. This standard is met.

I. Electronic changeable copy signs are permitted in business centers only, either as separate signs or as part of a larger sign. The approval authority may impose conditions of approval regarding the frequency of copy change, the hours of operation, and the methods by which the message is changed in order to assure compliance with the standards of this section and this chapter. Electronic changeable copy signs are subject to the following requirements:

1. **The sign face for the electronic changeable copy sign or portion of a sign may not exceed 24 square feet; provided, however, that electronic changeable copy signs with greater than 24 square feet may be approved through the conditional use process.**
2. **The design and placement of the sign shall not adversely affect vehicular and pedestrian safety.**
3. **The sign shall comply with all other requirements of this chapter.**

Finding: Electronic changeable copy signs are not proposed. This standard is not applicable.

J. Where both sides of a sign may be viewed from a right-of-way, the signs shall be double-faced.

Finding: The proposed monument sign will be double faced. This standard is met.

52.300 PERMANENT SIGN DESIGN STANDARDS

			Freestanding Signs				On-Wall Signs		
	City Apprl. Reqd.	Illumination	No. Allowed	Max. Sq. Ft.	Max. Ht. (Ft.)	ROW Setback	No. Allowed	Max. Sq. Ft.	Max. Ht. (ft.)
Public Uses	Yes	Yes	1[5]	24	20	5	No Limit	18 total	25

[5]Parks may have two signs per frontage. Signs in parks directed at pedestrians or cyclists within the parks are not limited in number or size. Schools may have two signs.

Finding: The District is proposing one illuminated monument sign at the driveway on Brandon Place. The sign will be setback from the right-of-way five feet, with a maximum height of six feet seven inches and a total sign area of 16.24 square feet.

The monument sign has been shown on the Monument and Building Signage Plan (Sheet LU3.06).

The District is proposing one on-wall sign, located on the west face of the building. The on-wall sign will have a combined area of 110 square feet, which exceeds the maximum allowed square footage. The building sign lettering has a total area of 21 square feet. The proposed wall sign has been illustrated on Monument and Building Signage Plan (LU3.06). A Class II variance has been requested for the proposed on-wall sign. The Class II variance criteria have been addressed within this narrative.

52.110 VARIANCES

A. Sign height and sign area variances shall be a Class II variance, and shall be reviewed pursuant to the provisions of subsection C of this section and Chapter 75 CDC.

B. All other sign variances shall be treated as Class I variance, and shall be reviewed pursuant to the provisions of subsection C of this section and CDC 75.050.

Finding: The proposed on-wall sign exceeds the allowable maximum area of 18 square feet for public uses. A Class II variance is required. The provisions of subsection C of this section and Chapter 75 CDC have been addressed within this narrative.

C. The granting authority may grant a variance from the requirements of this chapter if it is established that:

1. **The architectural design of a building, the location of a building site or location of building thereon, or some other circumstance relating to the sign proposal, is unusual or unique and that, because of this, a hardship will be created in that the applicant will be denied an opportunity to identify their business or location relatively equal to the opportunity accorded other members of the community not burdened with such unusual or unique architectural design, building site, or other circumstance;**

Finding: The proposed on-wall sign will be located on the west face of the building at the primary building entrance for students, parents, and visitors. The access for visitors to the school from Brandon Place is approximately 466.6 feet from the west face of the building. The proposed sign variance to increase the size of the sign to 110 square feet is necessary for readability for vehicles and pedestrians traveling from Brandon Place. An 18-square foot sign area is not readable from Brandon Place and would create a hardship for the applicant to identify the school building, which has unique architectural and site needs as a community building. The building signage has been illustrated on the Monument and Building Signage Plan (LU3.06). This standard is met.

2. **The design is consistent with the request and will not be injurious to the neighborhood in which the property is located or to property established to be affected by the request; and**

Finding: The proposed on-wall sign will be oriented towards the west and will not be visible from the residential neighborhoods to the north and east. The sign will consist of individual metal letter type, mounted to the wall of the west façade without a continuous sign backing. This will reduce the overall visual impact of the larger sign, allowing for readability while reducing the overall mass of the sign. This standard is met.

3. The request is the minimum variance necessary to provide reasonable signage for the property affected.

Finding: The proposed sign variance to increase the size of the sign to 110 square feet is necessary for readability for vehicles and pedestrians traveling from Brandon Place. An 18-square foot sign area is not readable from Brandon Place and would create a hardship for the applicant to identify the school building, which has unique architectural and site needs as a community building. The building signage has been illustrated on the Monument and Building Signage Plan (LU3.06). This standard is met.

Chapter 54 LANDSCAPING

54.020 APPROVAL CRITERIA

A. Every development proposal requires inventorying existing site conditions which include trees and landscaping. In designing the new project, every reasonable attempt should be made to preserve and protect existing trees and to incorporate them into the new landscape plan. Similarly, significant landscaping (e.g., bushes, shrubs) should be integrated. The rationale is that saving a 30-foot-tall mature tree helps maintain the continuity of the site, they are qualitatively superior to two or three two-inch caliper street trees, they provide immediate micro-climate benefits (e.g., shade), they soften views of the street, and they can increase the attractiveness, marketability, and value of the development.

Finding: A Tree Removal Schedule (Sheet L1000A-L1000C), Tree Removal Plan (Sheet L1001-L1002) and Arborist Report have been provided in the land use application. The District has preserved existing trees on site to the extent possible for the proposed development. Tree preservation has been concentrated particularly along Willamette Falls Drive and the eastern property line. The proposed landscaping on site will provide an enhanced planting buffer along Dollar Street, where trees will need to be removed. This standard is met.

B. To encourage tree preservation, the parking requirement may be reduced by one space for every significant tree that is preserved in the parking lot area for a maximum reduction of 10 percent of the required parking. The City Parks Supervisor or Arborist shall determine the significance of the tree and/or landscaping to determine eligibility for these reductions.

Finding: The District has considered the needs of the school and surrounding neighborhood with regards to on-site parking. The school will meet the parking requirements of the City's code. A reduction in required parking is not requested. The District has considered natural site features in the design and placement of site improvements

to maximize the preservation of natural features of the site, while balancing the need for parking at the school. This standard is met.

C. Developers must also comply with the municipal code chapter on tree protection.

Finding: The District will comply with all municipal code requirements for tree protection. An Arborist Report has been included under Appendix D. This standard is met.

D. Heritage trees. Heritage trees are trees which, because of their age, type, notability, or historical association, are of special importance. Heritage trees are trees designated by the City Council following review of a nomination. A heritage tree may not be removed without a public hearing at least 30 days prior to the proposed date of removal. Development proposals involving land with heritage tree(s) shall be required to protect and save the tree(s). Further discussion of heritage trees is found in the municipal code.

Finding: The District and City's arborist performed an in-person evaluation of the trees on site. No heritage trees have been identified on this site. The requirements of this section are not applicable.

E. Landscaping – By type, location and amount.

1. **Residential uses (non-single-family). A minimum of 25 percent of the gross area including parking, loading and service areas shall be landscaped, and may include the open space and recreation area requirements under CDC 55.100. Parking lot landscaping may be counted in the percentage.**
2. **Non-residential uses. A minimum of 20 percent of the gross site area shall be landscaped. Parking lot landscaping may be counted in the percentage.**

Finding: The site has a gross area of 962,676 square feet. The total landscape area at full build out of the site, including parking lot landscaping for the site is 488,861 square feet, or 50.8 percent of the gross site area. This standard is met.

3. **All uses (residential uses (non-single-family) and non-residential uses):**
   a. **The landscaping shall be located in defined landscaped areas which are uniformly distributed throughout the parking or loading area. There shall be one shade tree planted for every eight parking spaces. These trees shall be evenly distributed throughout the parking lot to provide shade. Parking lots with over 20 spaces shall have a minimum 10 percent of the interior of the parking lot devoted to landscaping. Pedestrian walkways in the landscaped areas are not to be counted in the percentage. The perimeter landscaping, explained in subsection (E)(3)(d) of this section, shall not be included in the 10 percent figure. Parking lots with 10 to 20 spaces shall have a minimum five percent of the interior of the parking lot devoted to landscaping. The perimeter landscaping, as explained above, shall not be included in the five percent. Parking lots with fewer than 10 spaces shall have the standard perimeter landscaping and at least two shade trees. Non-residential parking areas paved with a permeable parking surface may reduce the required**

minimum interior landscaping by one-third for the area with the permeable parking surface only.

Finding: Parking on the school site will exceed 20 parking spaces, therefore a minimum of 10 percent of the interior of the parking lot is required to be landscaped. The west parking lot has 71 parking stalls and a total area of 38,067 square feet. The west parking lot has a total of 14 shade trees located within the interior parking area, or one shade tree per 5 parking spaces. This exceeds the minimum requirement of one shade tree per 8 parking spaces. The total interior landscape area for the west parking lot is 5,177 square feet, or 13.5 percent.

The east parking lot has 115 parking stalls and a total area of 58,604 square feet. The east parking lot has a total of 24 shade trees located within the interior parking area, or one shade tree per 4.8 parking stalls. This exceeds the minimum requirement of one shade tree per 8 parking spaces. The total interior landscape area for the east parking lot is 7,922 square feet, or 13.5 percent. The parking lot landscaping has been shown on the Planting Plans (Sheets L1400A-L1407). The requirements of this section have been met.

b. The landscaped areas shall not have a width of less than five feet.

Finding: All proposed parking lot landscape areas have a width of at least five feet. This standard is met.

c. The soils, site, proposed soil amendments, and proposed irrigation system shall be appropriate for the healthy and long-term maintenance of the proposed plant species.

Finding: The soils, site, proposed soil amendments, and proposed irrigation system are appropriate for the healthy and long-term maintenance of the proposed plant species. This standard is met.

d. A parking, loading, or service area which abuts a street shall be set back from the right-of-way line by perimeter landscaping in the form of a landscaped strip at least 10 feet in width. When a parking, loading, or service area or driveway is contiguous to an adjoining lot or parcel, there shall be an intervening five-foot-wide landscape strip. The landscaped area shall contain:

1) Street trees spaced as appropriate to the species, not to exceed 50 feet apart on the average;

2) Shrubs, not to reach a height greater than three feet, six inches, spaced no more than five feet apart on the average; or

3) Vegetative ground cover such as grass, wildflowers, or other landscape material to cover 100 percent of the exposed ground within two growing seasons. No bark mulch shall be allowed except under the canopy of low level shrubs.

Finding: The western parking lot abuts Dollar Street at one end. The parking lot is located more than 15 feet away from Dollar Street and will be landscaped with a minimum five-foot landscape strip along the perimeter abutting Dollar Street. In addition to the street trees proposed along Dollar Street, the proposed landscape strip will be planted with trees, shrubs, and vegetative ground cover consistent with the requirements of this section. The requirements of this section are not applicable to the eastern parking lot as it is located more than 80 feet from the property line along Willamette Falls Drive.

e. If over 50 percent of the lineal frontage of the main street or arterial adjacent to the development site comprises parking lot, the landscape strip between the right-of-way and parking lot shall be increased to 15 feet in width and shall include terrain variations (e.g., one-foot-high berm) plus landscaping. This extra requirement only applies to one street frontage.

Finding: The proposed parking lots do not exceed 50 percent of the lineal frontage on the streets abutting the property. The parking lots have been located at least 15 feet from all street frontages abutting the property. The requirements of this section are met.

f. A parking, loading, or service area which abuts a property line shall be separated from the property line by a landscaped area at least five feet in width and which shall act as a screen and noise buffer, and the adequacy of the screen and buffer shall be determined by the criteria set forth in CDC 55.100(C) and (D), except where shared parking is approved under CDC 46.050.

Finding: The proposed parking lots are not abutting any neighboring residential property lines. The west parking lot is located along Dollar Street and has been separated from the property line by a minimum 15-foot wide landscape buffer. The eastern parking lot is located 80 feet from Willamette Falls Drive and 130 feet from the nearest residential property line. Existing landscaping along the eastern and southern property lines will buffer the east parking lot from view. The proposed loading area is located 26 feet from the property line on Dollar Street be sunk down from Dollar Street and will be surrounding by a 13-foot-tall retaining wall which will act as a screen and noise buffer. This standard is met.

g. All areas in a parking lot not used for parking, maneuvering, or circulation shall be landscaped.

Finding: All proposed parking lot areas not used for parking, maneuvering and circulation will be landscaped. This standard is met.

h. The landscaping in parking areas shall not obstruct lines of sight for safe traffic operation.

Finding: The proposed parking lot landscaping will not obstruct lines of sight for safe traffic operation. A vision clearance triangle has been provided on the Overall Site Plan (Sheet LU1.10). This standard is met.

i. Outdoor storage areas, service areas (loading docks, refuse deposits, and delivery areas), and above-ground utility facilities shall be buffered and screened to obscure their view from adjoining properties and to reduce noise levels to acceptable levels at the property line. The adequacy of the buffer and screening shall be determined by the criteria set forth in CDC 55.100(C)(1).

Finding: Outdoor storage areas, service areas, and above-ground utility facilities will be buffered and screened to obscure their view from adjoining properties and to reduce noise levels to acceptable levels at the property line. The proposed loading area is located 26 feet from the property line on Dollar Street be sunk down from Dollar Street and will be surrounding by a 13-foot-tall retaining wall which will act as a screen and noise buffer. The track and field storage building will be not located within the required street side yard setback. The storage building will be sunk down into the site and shield from view with the proposed plantings. A Noise Study was conducted for the proposed school and has been included under Appendix D. This standard is met.

j. Crime prevention shall be considered and plant materials shall not be located in a manner which prohibits surveillance of public and semi-public areas (shared or common areas).

Finding: Crime prevention and natural surveillance of the site has been considered in the layout and design of the school building and site facilities. The location main office at the western building entrance will allow for natural surveillance of the site and those within the parking facilities. The plantings adjacent to the main office will be low to allow for views across the site. The proposed plant materials have been located in a manner that will not prohibit the surveillance of public and semi-public areas. This standard is met.

k. Irrigation facilities shall be located so that landscaped areas can be properly maintained and so that the facilities do not interfere with vehicular or pedestrian circulation.

Finding: The irrigation facilities will be located so that landscaped areas can be properly maintained and so that the facilities do not interfere with vehicular or pedestrian circulation. The irrigation facilities have been described on the Materials Plan Overall (Sheet LU1100) and noted on the Planting Schedule (Sheet 1400B). This standard is met.

l. For commercial, office, multi-family, and other sites, the developer shall select trees that possess the following characteristics:

1) **Provide generous "spreading" canopy for shade.**
2) **Roots do not break up adjacent paving.**
3) **Tree canopy spread starts at least six feet up from grade in, or adjacent to, parking lots, roads, or sidewalks unless the tree is columnar in nature.**
4) **No sticky leaves or sap-dripping trees (no honey-dew excretion).**

5) **No seed pods or fruit-bearing trees (flowering trees are acceptable).**
6) **Disease-resistant.**
7) **Compatible with planter size.**
8) **Drought-tolerant unless irrigation is provided.**
9) **Attractive foliage or form all seasons.**

m. Plant materials (shrubs, ground cover, etc.) shall be selected for their appropriateness to the site, drought tolerance, year-round greenery and coverage, staggered flowering periods, and avoidance of nuisance plants (Scotch broom, etc.).

Finding: A Planting Plan Overall (Sheet L1400A), Planting Schedule (Sheet L1400B), and detailed Planting Plans (Sheets L1401-L1407) prepared by a professional landscape architect have been provided under Appendix E of this application. All trees that have been selected meet the characteristics provided in subsection 1-9 above. This standard is met.

F. Landscaping (trees) in new subdivision.

Finding: The proposed development is not a subdivision. The requirements of this section are not applicable.

G. Landscaping requirements in water resource areas (WRAs). Pursuant to CDC 32.110(E)(3) the requirements of this chapter relating to total site landscaping, landscaping buffers, landscaping around parking lots, and landscaping the parking lot interior may be waived or reduced in a WRA application without a variance being required.

Finding: Landscaping is not proposed in a water resource area. The requirements of this section are not applicable.

54.030 PLANTING STRIPS FOR MODIFIED AND NEW STREETS

All proposed changes in width in a public street right-of-way or any proposed street improvement shall, where feasible, include allowances for planting strips. Plans and specifications for planting such areas shall be integrated into the general plan of street improvements. This chapter requires any multi-family, commercial, or public facility which causes change in public right-of-way or street improvement to comply with the street tree planting plan and standards.

Finding: As part of the proposed development, sidewalks will be installed along the property frontage on Dollar Street and Willamette Falls Drive. The proposed extension of Brandon Place will include sidewalks on both sides, providing a pedestrian connection between Dollar Street and Willamette Falls Drive. All proposed sidewalks will be at least six feet in width. Sidewalks on Dollar Street will be buffered from the roadway by a landscape strip with a width of at least six feet in width. The proposed sidewalk infill on Willamette Falls Drive east of the roundabout will be buffered by a landscape strip with a width of four and one-half-feet. The sidewalks along the western side of Brandon Place and on the eastern side of Brandon Place north of the school driveway will be buffered from the roadway by a landscape strip of at least six

feet. The section of the sidewalk from the school driveway on Brandon Place south to Willamette Falls Drive will transition to a 10-foot wide curb-tight multi-use sidewalk, which will act as a transition area for bicycles and pedestrians traveling from the Willamette Falls Drive multi-use path. This standard is met.

54.040 INSTALLATION

A. All landscaping shall be installed according to accepted planting procedures.

B. The soil and plant materials shall be of good quality.

C. Landscaping shall be installed in accordance with the provisions of this code.

D. Certificates of occupancy shall not be issued unless the landscaping requirements have been met or other arrangements have been made and approved by the City such as the posting of a bond.

Finding: All landscaping installation will meet the requirements of this section. This standard is met.

54.060 MAINTENANCE

A. The owner, tenant and their agent, if any, shall be jointly and severally responsible for the maintenance of all landscaping which shall be maintained in good condition so as to present a healthy, neat, and orderly appearance and shall be kept free from refuse and debris.

B. All plant growth in interior landscaped areas shall be controlled by pruning, trimming, or otherwise so that:

1. **It will not interfere with the maintenance or repair of any public utility;**
2. **It will not restrict pedestrian or vehicular access; and**
3. **It will not constitute a traffic hazard because of reduced visibility.**

Finding: The applicant acknowledges that the owner is responsible for the maintenance of the landscaping on site. This standard is met.

DIVISION 4. DESIGN REVIEW

Chapter 55 DESIGN REVIEW

55.020 CLASSES OF DESIGN REVIEW

B. Class II Design Review. Class II design review applies to all uses/activities except those uses/activities listed under Class I design review, and the exemptions of CDC 55.025. Class II design review applies to the proposed improvements listed in this section when the proposed improvement (e.g., new sidewalk) is part of a major commercial, office, industrial, public, or multi-family construction project (e.g., a new shopping center).

Finding: The proposed development is classified as a major public construction project; therefore, Class II design review is applicable.

55.100 APPROVAL STANDARDS – CLASS II DESIGN REVIEW

The approval authority shall make findings with respect to the following criteria when approving, approving with conditions, or denying a Class II design review application:

A. The provisions of the following chapters shall be met:

1. **Chapter 34 CDC, Accessory Structures, Accessory Dwelling Units, and Accessory Uses.**
2. **Chapter 38 CDC, Additional Yard Area Required; Exceptions to Yard Requirements; Storage in Yards; Projections into Yards.**
3. **Chapter 41 CDC, Building Height, Structures on Steep Lots, Exceptions.**
4. **Chapter 42 CDC, Clear Vision Areas**
5. **Chapter 44 CDC, Fences.**
6. **Chapter 46 CDC, Off-Street Parking, Loading and Reservoir Areas.**
7. **Chapter 48 CDC, Access, Egress and Circulation.**
8. **Chapter 52 CDC, Signs.**
9. **Chapter 54 CDC, Landscaping.**

Finding: The provisions of Chapter 34, 41, 42, 44, 46, 48, 52, and 54 have been addressed in this narrative as they have been deemed applicable. Chapter 38 is not applicable to the proposed development. As demonstrated in this application, the applicable CDC standards will be satisfied.

B. Relationship to the natural and physical environment.

1. **The buildings and other site elements shall be designed and located so that all heritage trees, as defined in the municipal code, shall be saved. Diseased heritage trees, as determined by the City Arborist, may be removed at his/her direction.**

Finding: Heritage Trees have not been identified on the site. The requirements of this section are not applicable.

2. **All heritage trees, as defined in the municipal code, all trees and clusters of trees ("cluster" is defined as three or more trees with overlapping driplines; however, native oaks need not have an overlapping dripline) that are considered significant by the City Arborist, either individually or in consultation with certified arborists or similarly qualified professionals, based on accepted arboricultural standards including consideration of their size, type, location, health, long term survivability, and/or numbers, shall be protected pursuant to the criteria of subsections (B)(2)(a) through (f) of this section. In cases where there is a difference of opinion on the significance of a tree or tree cluster, the City Arborist's findings shall prevail. It is important to acknowledge that all trees are not significant and, further, that this code section will not necessarily protect all trees deemed significant.**
    a. **Non-residential and residential projects on Type I and II lands shall protect all heritage trees and all significant trees and tree clusters by limiting development in the protected area. The protected area includes the protected tree, its dripline, and an additional 10 feet beyond the dripline, as depicted in the figure below. Development of Type I and II lands shall require the careful layout of streets, driveways, building pads, lots, and utilities to avoid heritage trees and significant trees and tree clusters, and other natural resources pursuant to this code. The**

method for delineating the protected trees or tree clusters ("dripline plus 10 feet") is explained in subsection (B)(2)(b) of this section. Exemptions of subsections (B)(2)(c), (e), and (f) of this section shall apply.

Finding: Type I, II, III and IV lands have been mapped on the site and have been shown on the Overall Site Analysis Land Types Plan (Sheet LU1.000) included under Appendix E. The gross site is 22.1 acres in size, with 2.8 acres of Type I lands and 0.9 acres of Type II lands. The net area of the site after right-of-way dedications is 21.4 acres. The total area of Type I and II lands mapped on the net site is 3.6 acres. The net developable area of the site excluding Type I and II lands is 17.8 acres. The Type I and II lands are primarily located along the eastern and southern property lines.

Heritage trees have not been identified on the site. A total of 42 significant trees on site have been identified, of which 19 will remain and 23 will be removed. Five significant trees will be removed from the Type I and II lands. These trees include a 20-inch DBH Red Alder and a 12-inch DBH Red Alder, which are in a small patch of Type I and II lands. These trees are required to be removed for site grading. Three significant trees are required to be removed to provide improvements to Willamette Falls Drive. These are a 30-inch DBH Big Leaf Maple, a 22-inch DBH Big Leaf Maple, and a 17-inch DBH Big Leaf Maple. The tree protection fencing area will include the protected tree, its dripline and an additional 10 feet of dripline. The District has preserved existing trees on site to the extent possible for the proposed development. Tree preservation has been concentrated particularly along Willamette Falls Drive and the eastern property line. This standard is met.

b. Non-residential and residential projects on non-Type I and II lands shall set aside up to 20 percent of the protected areas for significant trees and tree clusters, plus any heritage trees. Therefore, in the event that the City Arborist determines that a significant tree cluster exists at a development site, then up to 20 percent of the non-Type I and II lands shall be devoted to the protection of those trees by limiting development in the protected areas. The exact percentage is determined by establishing the driplines of the trees or tree clusters that are to be protected. In order to protect the roots which typically extend further, an additional 10-foot measurement beyond the dripline shall be added. The square footage of the area inside this "dripline plus 10 feet" measurement shall be the basis for calculating the percentage (see figure below). The City Arborist will identify which tree(s) are to be protected. Development of non-Type I and II lands shall also require the careful layout of streets, driveways, building pads, lots, and utilities to avoid significant trees, tree clusters, heritage trees, and other natural resources pursuant to this code. Exemptions of subsections (B)(2)(c), (e), and (f) of this section shall apply. Please note that in the event that more than 20 percent of the non-Type I and II lands comprise significant trees or tree clusters, the developer shall not be required to save the excess trees, but is encouraged to do so.

Finding: Type I, II, III and IV lands have been mapped on the site and have been shown on the Overall Site Analysis Land Types Plan (Sheet LU1.000) included under Appendix E. The gross site is 22.1 acres in size, with 2.8 acres of Type I lands and 0.9 acres of Type II lands. The net area of the site after right-of-way dedications is 21.4 acres. The total area of Type I and II lands mapped on the net site is 3.9 acres. The net developable area of the site excluding Type I and II lands is 17.8 acres. The Type I and II lands are primarily located along the eastern and southern property lines.

Heritage trees have not been identified on the site. A total of 42 significant trees on site have been identified, of which 19 will remain and 23 will be removed. A total of 45 percent of the significant trees on site will be maintained. A total of 57 percent of the tree canopy on site will be retained. Of the total trees on site, 48 percent will be retained. The tree protection fencing area will include the protected tree, its dripline and an additional 10 feet of dripline. The District has preserved existing trees on site to the extent possible for the proposed development. Tree preservation has been concentrated particularly along Willamette Falls Drive and the eastern property line. This standard is met.

c. Where stubouts of streets occur on abutting properties, and the extension of those streets will mean the loss of significant trees, tree clusters, or heritage trees, it is understood that tree loss may be inevitable. In these cases, the objective shall be to minimize tree loss. These provisions shall also apply in those cases where access, per construction code standards, to a lot or parcel is blocked by a row or screen of significant trees or tree clusters.

Finding: An extension of Brandon Place from Dollar Street to Willamette Falls Drive, consistent with the West Linn's 2016 Transportation System Plan is proposed to meet the City's access standards. A roundabout is proposed at the new intersection of Willamette Falls Drive and Brandon Place. The extension of Brandon Place and new roundabout will require the removal of trees. The proposed alignment of Brandon Place meets intersection spacing requirements on Willamette Falls Drive and street grade requirements of the City. The proposed extension is not located in an area of the site that is heavily forested. This standard is met.

d. For both non-residential and residential development, the layout shall achieve at least 70 percent of maximum density for the developable net area. The developable net area excludes all Type I and II lands and up to 20 percent of the remainder of the site for the purpose of protection of stands or clusters of trees as defined in subsection (B)(2) of this section.

Finding: Type I, II, III and IV lands have been mapped on the site and have been shown on the Overall Site Analysis Land Types Plan (Sheet LU1.000) included under Appendix E. The gross site is 22.1 acres in size, with 2.8 acres of Type I lands and 0.9 acres of Type II lands. The net area of the site after right-of-way dedications is 21.4 acres. The total area of Type I and II lands mapped on the net site is 3.6 acres. The net developable area of the site excluding Type I and II lands is 17.8 acres. The Type I

and II lands are primarily located along the eastern and southern property lines. Of the net developable area, 15.5 acres will be developed, or 87 percent of the net developable area. This standard is met.

e. For arterial and collector street projects, including Oregon Department of Transportation street improvements, the roads and graded areas shall avoid tree clusters where possible. Significant trees, tree clusters, and heritage tree loss may occur, however, but shall be minimized.

Finding: The proposed development will include frontage and offsite improvements to and Willamette Falls Drive, an arterial street. An extension of Brandon Place from Dollar Street to Willamette Falls Drive, consistent with the West Linn's 2016 Transportation System Plan is proposed to meet the City's access standards. A roundabout is proposed at the new intersection of Willamette Falls Drive and Brandon Place. Sidewalks will be installed along the property frontage Willamette Falls Drive. The proposed alignment of Brandon Place meets intersection spacing requirements on Willamette Falls Drive and street grade requirements of the City. The proposed extension is not located in an area of the site that is heavily forested. This standard is met.

f. If the protection of significant tree(s) or tree clusters is to occur in an area of grading that is necessary for the development of street grades, per City construction codes, which will result in an adjustment in the grade of over or under two feet, which will then threaten the health of the tree(s), the applicant will submit evidence to the Planning Director that all reasonable alternative grading plans have been considered and cannot work. The applicant will then submit a mitigation plan to the City Arborist to compensate for the removal of the tree(s) on an "inch by inch" basis (e.g., a 48-inch Douglas fir could be replaced by 12 trees, each four-inch). The mix of tree sizes and types shall be approved by the City Arborist.

Finding: The proposed development will include frontage and offsite improvements to and Willamette Falls Drive, an existing arterial street. The realignment of this right-of-way is not feasible, as it is an existing arterial road. An extension of Brandon Place from Dollar Street to Willamette Falls Drive, consistent with the West Linn's 2016 Transportation System Plan is proposed to meet the City's access standards. A roundabout is proposed at the new intersection of Willamette Falls Drive and Brandon Place. Sidewalks will be installed along the property frontage Willamette Falls Drive. The proposed alignment of Brandon Place meets intersection spacing requirements on Willamette Falls Drive and street grade requirements of the City.

The proposed development will require the removal of five trees located within type I and II lands. These trees include a 20-inch DBH Red Alder and a 12-inch DBH Red Alder. These trees are required to be removed for site grading. Three significant trees are required to be removed to provide improvements to Willamette Falls Drive. These are a 30-inch DBH Big Leaf Maple, a 22-inch DBH Big Leaf Maple, and a 17-inch

DBH Big Leaf Maple. The total mitigation required for the five trees is 101 inches. As shown on the proposed planting schedule, the proposed tree planting on the school site will exceed 101 inches. This standard is met.

3. **The topography and natural drainage shall be preserved to the greatest degree possible.**

Finding: The topography and natural drainage will be preserved to the greatest degree possible. The site improvements were design to avoid natural drainages and steeper portions of the site. A Grading Plan and Drainage Plan (Sheet LU1.20) has been submitted under Appendix E. This standard is met.

4. **The structures shall not be located in areas subject to slumping and sliding. The Comprehensive Plan Background Report's Hazard Map, or updated material as available and as deemed acceptable by the Planning Director, shall be the basis for preliminary determination.**

Finding: No large-scale active slope failures or significant erosion are mapped at the site or were observed during our site observations and explorations. A Geotechnical Report prepared by GeoDesign provides specific site grading, wall, and drainage design and construction recommendations for development in consideration of the existing steep slope areas at the site. The Geotechnical Report has been submitted under Appendix D of this application. This standard is met.

5. **There shall be adequate distance between on-site buildings and on-site and off-site buildings on adjoining properties to provide for adequate light and air circulation and for fire protection.**

Finding: The proposed school will not be located directly adjacent to off-site buildings on adjoining properties. The design of the school site will follow the natural topography of the site, which will provide a 10-foot vertical separation of the school site from Dollar Street and the surrounding neighborhood. The site's natural grade will provide natural noise, light, and visual buffering from the surrounding homes. Adequate spacing for light, air circulation and fire protection has been provided. This standard is met.

6. **Architecture.**
   a. **The proposed structure(s) scale shall be compatible with the existing structure(s) on site and on adjoining sites. Contextual design is required. Contextual design means respecting and incorporating prominent architectural styles, building lines, roof forms, rhythm of windows, building scale and massing of surrounding buildings in the proposed structure. The materials and colors shall be complementary to the surrounding buildings.**

Finding: The proposed school will be located in a predominantly residential neighborhood. Key architectural features of the surrounding neighborhood are two-story homes with gabled roof forms, and a mix of wood siding, brick, and stone materials.

The proposed school will be two-stories and will be of a similar height to the surrounding residential homes. The building will sunken into the grade along Dollar Street to reduce the overall impact of the building massing on adjacent residential homes.

The orientation and massing of the building will fan along the hillside which will provide for views of the surrounding landscape from the interior of the building while breaking up the building massing to reduce the overall impact of the building on the site. The building utilizes both flat and pitched roof forms to provide a residential style to the building. The school building will utilize a mix of wood-like fiber cement panels, brick, and metal paneling. This standard is met.

b. While there has been discussion in Chapter 24 CDC about transition, it is appropriate that new buildings should architecturally transition in terms of bulk and mass to work with, or fit, adjacent existing buildings. This transition can be accomplished by selecting designs that "step down" or "step up" from small to big structures and vice versa (see figure below). Transitions may also take the form of carrying building patterns and lines (e.g., parapets, windows, etc.) from the existing building to the new one.

Finding: The proposed school building has been designed to be sunk into the grade along Dollar Street to reduce the overall height and visual impact of the building on adjacent homes. The building height along Dollar Street will be compatible with the height of the surrounding homes. Enhanced landscape buffering along Dollar Street will further reduce the overall visual impact of the building within the neighborhood. This standard is met.

c. Contrasting architecture shall only be permitted when the design is manifestly superior to adjacent architecture in terms of creativity, design, and workmanship, and/or it is adequately separated from other buildings by distance, screening, grade variations, or is part of a development site that is large enough to set its own style of architecture.

Finding: The proposed school will be located in a predominantly residential neighborhood. Key architectural features of the surrounding neighborhood are two-story homes with gabled roof forms, and a mix of wood siding, brick, and stone materials. The two-story school has been designed to incorporate several of the elements of the surrounding residential neighborhood including a mix of wood siding and brick materials and gabled roof forms at the main entrances. Special consideration has been given to the massing and height of the building adjacent to the homes along Dollar Street to increase the compatibility of the building with the residential neighborhood. In addition, the school building and site improvements have been buffered from adjacent residential properties through distance, screening, and grade variations. The building will sunken into the grade along Dollar Street to reduce the overall impact of the building massing on adjacent residential homes. The 21-acre site is large enough to utilize its own architectural style. This standard is met.

d. Human scale is a term that seeks to accommodate the users of the building and the notion that buildings should be designed around the human scale (i.e., their size and the average range of their perception). Human scale shall be accommodated in all designs by, for example, multi-light windows that are broken up into numerous panes, intimately scaled entryways, and visual breaks (exaggerated eaves, indentations, ledges, parapets, awnings, engaged columns, etc.) in the facades of buildings, both vertically and horizontally.

The human scale is enhanced by bringing the building and its main entrance up to the edge of the sidewalk. It creates a more dramatic and interesting streetscape and improves the "height and width" ratio referenced in this section.

Finding: The design of the school building is influenced by the historic homestead character of the region, which is meant to bring both historical and human scale elements into the design. The school features several design elements that are meant to provide a human scale to the building and site. These elements include the use of multiple paned windows, intimately scaled covered entryways, visual breaks along the facades of the building, exaggerated eaves, indentations, and parapets. Exterior Elevations (Sheet LU3.03) and Exterior Materials (LU3.06) have been included under Appendix D. This standard is met.

e. The main front elevation of commercial and office buildings shall provide at least 60 percent windows or transparency at the pedestrian level to create more interesting streetscape and window shopping opportunities. One side elevation shall provide at least 30 percent transparency. Any additional side or rear elevation, which is visible from a collector road or greater classification, shall also have at least 30 percent transparency. Transparency on other elevations is optional. The transparency is measured in lineal fashion. For example, a 100-foot-long building elevation shall have at least 60 feet (60 percent of 100 feet) in length of windows. The window height shall be, at minimum, three feet tall. The exception to transparency would be cases where demonstrated functional constraints or topography restrict that elevation from being used. When this exemption is applied to the main front elevation, the square footage of transparency that would ordinarily be required by the above formula shall be installed on the remaining elevations at pedestrian level in addition to any transparency required by a side elevation, and vice versa. The rear of the building is not required to include transparency. The transparency must be flush with the building elevation.

Finding: The proposed school is not an office or commercial building; therefore, the requirements of this section are not directly applicable. The design of the school building will utilize the strategic placement of glazing and window elements to provide beneficial daylight within the school building, connection of interior spaces to the site and to emphasize transparency within the building.

f. Variations in depth and roof line are encouraged for all elevations. To vary the otherwise blank wall of most rear elevations, continuous flat elevations of over 100 feet in length should be avoided by indents or variations in the wall. The use of decorative brick, masonry, or stone insets and/or designs is encouraged. Another way to vary or soften this elevation is through terrain variations such as an undulating grass area with trees to provide vertical relief.

Finding: Variation has been provided by changes in roof form and massing of the building, material changes, projections and recessions, window patterns, and the natural grade of the site. Elevations over 100 feet in length have been avoided to the extent possible. Building Elevations (Sheet LU3.06) have been included under Appendix E. This standard is met.

g. Consideration of the micro-climate (e.g., sensitivity to wind, sun angles, shade, etc.) shall be made for building users, pedestrians, and transit users, including features like awnings.

Finding: The school design will utilize window sunshades, inset playground areas, a sheltered central courtyard, canopy trees, covered bicycle parking areas and covered bus waiting areas which provide for a variety of micro-climate conditions on the site. This standard is met.

h. The vision statement identified a strong commitment to developing safe and attractive pedestrian environments with broad sidewalks, canopied with trees and awnings.

Finding: The District is committed to providing a safe and attractive multi-modal transportation system on the site and in the surrounding area. The site will include separate parking areas for parents/visitors and school buses and staff. Parent loading zones and bus loading zones have been clearly identified and provided with sufficient room for vehicle maneuvering. Pedestrian pathways have been provided throughout the site, with minimal crossing of vehicle circulation areas. Canopied trees will be planted on site and covered building entryways and bus shelters will provide shelter for pedestrians. The District has provided a Safe-Routes to School improvement plan within the Traffic Impact Analysis prepared by DKS and Associates. This standard is met.

i. Sidewalk cafes, kiosks, vendors, and street furniture are encouraged. However, at least a four-foot-wide pedestrian accessway must be maintained per Chapter 53 CDC, Sidewalk Use.

Finding: The school will not include sidewalk cafes, kiosks, vendors or street furniture. The requirements of this section are not applicable.

7. Transportation. The automobile shall be shifted from a dominant role, relative to other modes of transportation, by the following means:

a. Commercial and office development shall be oriented to the street. At least one public entrance shall be located facing an arterial street; or, if the project does not front on an arterial, facing a collector street; or, if the project does not front on a collector, facing the local street with highest traffic levels. Parking lots shall be placed behind or to the side of commercial and office development. When a large and/or multi-building development is occurring on a large undeveloped tract (three plus acres), it is acceptable to focus internally; however, at least 20 percent of the main adjacent right-of-way shall have buildings contiguous to it unless waived per subsection (B)(7)(c) of this section. These buildings shall be oriented to the adjacent street and include pedestrian-oriented transparencies on those elevations.

For individual buildings on smaller individual lots, at least 30 lineal feet or 50 percent of the building must be adjacent to the right-of-way unless waived per subsection (B)(7)(c) of this section. The elevations oriented to the right-of-way must incorporate pedestrian-oriented transparency.

Finding: The proposed development is not a commercial or office use. The requirements of this section are not applicable. However, pedestrian and bicycle accessways are provided throughout the site, and sidewalk widths are increased in areas expected to experience larger volumes of pedestrian and bicycle traffic.

b. Multi-family projects shall be required to keep the parking at the side or rear of the buildings or behind the building line of the structure as it would appear from the right-of-way inside the multi-family project. For any garage which is located behind the building line of the structure, but still facing the front of the structure, architectural features such as patios, patio walls, trellis, porch roofs, overhangs, pergolas, etc., shall be used to downplay the visual impact of the garage, and to emphasize the rest of the house and front entry.

The parking may be positioned inside small courtyard areas around which the units are built. These courtyard spaces encourage socialization, defensible space, and can provide a central location for landscaping, particularly trees, which can provide an effective canopy and softening effect on the courtyard in only a few years. Vehicular access and driveways through these courtyard areas is permitted.

Finding: The proposed development is not a multifamily use. The requirements of this section are not applicable.

c. Commercial, office, and multi-family projects shall be built as close to the adjacent main right-of-way as practical to facilitate safe pedestrian and transit access. Reduced frontages by buildings on public rights-of-way may be allowed due to extreme topographic (e.g., slope, creek, wetlands, etc.) conditions or compelling functional limitations, not just inconveniences or design challenges.

Finding: The school is not a commercial, office or multi-family development. The requirements of this section are not appliable. However, wide sidewalks are contemplated in the design to facilitate safe pedestrian and bicycle access.

d. Accessways, parking lots, and internal driveways shall accommodate pedestrian circulation and access by specially textured, colored, or clearly defined footpaths at least six feet wide. Paths shall be eight feet wide when abutting parking areas or travel lanes. Paths shall be separated from parking or travel lanes by either landscaping, planters, curbs, bollards, or raised surfaces. Sidewalks in front of storefronts on the arterials and main store entrances on the arterials identified in CDC 85.200(A)(3) shall be 12 feet wide to accommodate pedestrians, sidewalk sales, sidewalk cafes, etc. Sidewalks in front of storefronts and main store entrances in commercial/OBC zone development on local streets and collectors shall be eight feet wide.

Finding: All proposed sidewalks adjacent to the proposed parking lot and access will be separated from parking and travel lanes through the use of curbs. Sidewalk widths have been increased to 12 feet in areas expecting high volume of pedestrian and bicycle traffic and 8 feet along vehicle parking areas. This standard is met.

e. Paths shall provide direct routes that pedestrians will use between buildings, adjacent rights-of-way, and adjacent commercial developments. They shall be clearly identified. They shall be laid out to attract use and to discourage people from cutting through parking lots and impacting environmentally sensitive areas.

Finding: The proposed sidewalks provide direct routes for pedestrians between the new parking lot, adjacent streets, and the school and site facilities. Sidewalks have been shown on the Overall Site Plan (Sheet LU1.10). This standard is met.

f. At least one entrance to the building shall be on the main street, or as close as possible to the main street. The entrance shall be designed to identify itself as a main point of ingress/egress.

Finding: The main building entrance is oriented towards Brandon Place, where primary vehicular access is proposed for parents and students. A second entrance will be oriented towards the east, where the bus loading area and staff access from Dollar Street is proposed. This standard is met.

g. Where transit service exists, or is expected to exist, there shall be a main entrance within a safe and reasonable distance of the transit stop. A pathway shall be provided to facilitate a direct connection.

Finding: Transit service is not currently provided on Dollar Street or Willamette Falls Drive along the school site frontage. The requirements of this section are not applicable.

h. Projects shall bring at least part of the project adjacent to or near the main street right-of-way in order to enhance the height-to-width ratio along that particular

street. (The "height-to-width ratio" is an architectural term that emphasizes height or vertical dimension of buildings adjacent to streets. The higher and closer the building is, and the narrower the width of the street, the more attractive and intimate the streetscape becomes.) For every one foot in street width, the adjacent building ideally should be one to two feet higher. This ratio is considered ideal in framing and defining the streetscape.

Finding: School buildings within the R10 zone are allowed as a conditional use subject to the Conditional Use standards of Chapter 60 and the Government Building standards of CDC 41.040. Per the requirements of CDC 41.040, the school building has been set back from Brandon Place and Dollar Street. Given the residential nature of the surrounding neighborhood, special considerations to setbacks have been made to reduce the impact of the school site on the surrounding neighborhood. These impacts include the overall size and massing of the school, traffic and vehicle circulation, noise, and light generation.

The requirements of this section conflict with the requirements of CDC 41.040 and Chapter 60 and are therefore not applicable to the proposed development.

i. These architectural standards shall apply to public facilities such as reservoirs, water towers, treatment plants, fire stations, pump stations, power transmission facilities, etc. It is recognized that many of these facilities, due to their functional requirements, cannot readily be configured to meet these architectural standards. However, attempts shall be made to make the design sympathetic to surrounding properties by landscaping, setbacks, buffers, and all reasonable architectural means.

Finding: This application does not contemplate these types of public facilities. The requirements of this section are not applicable to the proposed school.

j. Parking spaces at trailheads shall be located so as to preserve the view of, and access to, the trailhead entrance from the roadway. The entrance apron to the trailhead shall be marked: "No Parking," and include design features to foster trail recognition.

Finding: This application does not contemplate trailheads. The requirements of this section are not applicable to the proposed school.

C. Compatibility between adjoining uses, buffering, and screening.

1. In addition to the compatibility requirements contained in Chapter 24 CDC, buffering shall be provided between different types of land uses; for example, buffering between single-family homes and apartment blocks. However, no buffering is required between single-family homes and duplexes or single-family attached units. The following factors shall be considered in determining the adequacy of the type and extent of the buffer:

a. **The purpose of the buffer, for example to decrease noise levels, absorb air pollution, filter dust, or to provide a visual barrier.**
b. **The size of the buffer required to achieve the purpose in terms of width and height.**
c. **The direction(s) from which buffering is needed.**
d. **The required density of the buffering.**
Whether the viewer is stationary or mobile.

2. **On-site screening from view from adjoining properties of such things as service areas, storage areas, and parking lots shall be provided and the following factors will be considered in determining the adequacy of the type and extent of the screening:**
a. **What needs to be screened?**
b. **The direction from which it is needed.**
c. **How dense the screen needs to be.**
d. **Whether the viewer is stationary or mobile.**
e. **Whether the screening needs to be year-round.**

Finding: The District has considered both the noise impacts of the school site and visual impacts of the school on the surrounding neighborhood. The existing landscaping and topography of the site has been utilized to the extent possible to provide natural buffering. Tree retention on the site has been primarily focused along Willamette Falls Drive. The building has been sunk down into the site from Dollar Street, which creates a vertical buffer from the properties on Dollar Street. Enhanced landscaping has been provided along Dollar Street to provide additional visual buffering. Retaining walls have been utilized at the children's play area and the waste and recycling storage area to provide additional noise buffering on site. The proposed lighting on site has been located to prevent light trespass on adjacent properties. The District has considered the implications of the use on site and has buffered the school from the surrounding neighborhood in a method that is consistent with the requirements of this section while still providing an inviting community school. Landscaping and buffering have been shown on the Planting Plan (Sheet LU1400A). The proposed retaining walls have been shown on the Overall Grading and Drainage Plan (Sheet LU1.20) This standard is met.

3. **Rooftop air cooling and heating systems and other mechanical equipment shall be screened from view from adjoining properties.**

Finding: Mechanical equipment will be screened from view from adjoining properties. The mechanical screens have been illustrated on the Exterior Elevations Plan (Sheet LU3.03). This standard is met.

D. Privacy and noise.

1. **Structures which include residential dwelling units shall provide private outdoor areas for each ground floor unit which is screened from view from adjoining units.**

Finding: The school does not include residential dwelling units. This standard is not applicable.

2. **Residential dwelling units shall be placed on the site in areas having minimal noise exposure to the extent possible. Natural-appearing sound barriers shall be used to lessen noise impacts where noise levels exceed the noise standards contained in West Linn Municipal Code Section 5.487.**

Finding: The school does not include residential dwelling units. This standard is not applicable.

3. **Structures or on-site activity areas which generate noise, lights, or glare shall be buffered from adjoining residential uses in accordance with the standards in subsection C of this section where applicable.**

Finding: The District has considered both the noise impacts of the school site and visual impacts of the school on the surrounding neighborhood. The existing landscaping and topography of the site has been utilized to the extent possible to provide natural buffering. Tree retention on the site has been primarily focused along Willamette Falls Drive. The building has been sunk down into the site from Dollar Street, which creates a vertical buffer from the properties on Dollar Street. Enhanced landscaping has been provided along Dollar Street to provide additional visual buffering. Retaining walls have been utilized at the children's play area and the waste and recycling storage area to provide additional noise buffering on site. The proposed lighting on site has been located to prevent light trespass on adjacent properties. The District has considered the implications of the use on site and has buffered the school from the surrounding neighborhood in a method that is consistent with the requirements of this section while still providing an inviting community school. Landscaping and buffering have been shown on the Planting Plan (Sheet LU1400A). The proposed retaining walls have been shown on the Overall Grading and Drainage Plan (Sheet LU1.20). This standard is met.

4. **Businesses or activities that can reasonably be expected to generate noise in excess of the noise standards contained in West Linn Municipal Code Section 5.487 shall undertake and submit appropriate noise studies and mitigate as necessary to comply with the code. (See CDC 55.110(B)(11) and 55.120(M).)**

   If the decision-making authority reasonably believes a proposed use may generate noise exceeding the standards specified in the municipal code, then the authority may require the applicant to supply professional noise studies from time to time during the user's first year of operation to monitor compliance with City standards and permit requirements.

Finding: The proposed school is not expected to generate noise in excess of the noise standards contained in West Linn Municipal Code Section 5.487. A Noise Study was conducted for the proposed school and has been included under Appendix D. The requirements of this section are not applicable.

E. Private outdoor area. This section only applies to multi-family projects.

Finding: The proposed development is not a multi-family project. The requirements of this section are not applicable.

F. Shared outdoor recreation areas. This section only applies to multi-family projects and projects with 10 or more duplexes or single-family attached dwellings on lots under 4,000 square feet. In those cases, shared outdoor recreation areas are calculated on the duplexes or single-family attached dwellings only. It also applies to qualifying PUDs under the provisions of CDC 24.170.

Finding: The proposed development is not a multi-family project. The requirements of this section are not applicable.

G. Demarcation of public, semi-public, and private spaces. The structures and site improvements shall be designed so that public areas such as streets or public gathering places, semi-public areas, and private outdoor areas are clearly defined in order to establish persons having a right to be in the space, to provide for crime prevention, and to establish maintenance responsibility. These areas may be defined by:

1. **A deck, patio, fence, low wall, hedge, or draping vine;**
2. **A trellis or arbor;**
3. **A change in level;**
4. **A change in the texture of the path material;**
5. **Sign; or**
6. **Landscaping.**

Use of gates to demarcate the boundary between a public street and a private access driveway is prohibited.

Finding: The school is a semi-public use. The structures and site improvements have been designed so that public areas, semi-public areas and private areas are defined. This standard is met.

H. Public transit.

1. **Provisions for public transit may be required where the site abuts an existing or planned public transit route. The required facilities shall be based on the following:**
   a. **The location of other transit facilities in the area.**
   b. **The size and type of the proposed development.**
   c. **The rough proportionality between the impacts from the development and the required facility.**
2. **The required facilities shall be limited to such facilities as the following:**
   a. **A waiting shelter with a bench surrounded by a three-sided covered structure, with transparency to allow easy surveillance of approaching buses.**
   b. **A turnout area for loading and unloading designed per regional transit agency standards.**

c. Hard-surface paths connecting the development to the waiting and boarding areas.

d. Regional transit agency standards shall, however, prevail if they supersede these standards.

3. The transit stop shall be located as close as possible to the main entrance to the shopping center, public or office building, or multi-family project. The entrance shall not be more than 200 feet from the transit stop with a clearly identified pedestrian link.

4. All commercial business centers (over three acres) and multi-family projects (over 40 units) may be required to provide for the relocation of transit stops to the front of the site if the existing stop is within 200 to 400 yards of the site and the exaction is roughly proportional to the impact of the development. The commercial or multi-family project may be required to provide new facilities in those cases where the nearest stop is over 400 yards away. The transit stop shall be built per subsection (H)(2) of this section.

Finding: Transit service is not provided on the school frontage at Willamette Falls Drive or Dollar Street. The requirements of this section are not applicable.

I. Public facilities. An application may only be approved if adequate public facilities will be available to provide service to the property prior to occupancy.

1. Streets. Sufficient right-of-way and slope easement shall be dedicated to accommodate all abutting streets to be improved to the City's Improvement Standards and Specifications. The City Engineer shall determine the appropriate level of street and traffic control improvements to be required, including any off-site street and traffic control improvements, based upon the transportation analysis submitted. The City Engineer's determination of developer obligation, the extent of road improvement and City's share, if any, of improvements and the timing of improvements shall be made based upon the City's systems development charge ordinance and capital improvement program, and the rough proportionality between the impact of the development and the street improvements.

In determining the appropriate sizing of the street in commercial, office, multi-family, and public settings, the street should be the minimum necessary to accommodate anticipated traffic load and needs and should provide substantial accommodations for pedestrians and bicyclists. Road and driveway alignment should consider and mitigate impacts on adjacent properties and in neighborhoods in terms of increased traffic loads, noise, vibrations, and glare.

The realignment or redesign of roads shall consider how the proposal meets accepted engineering standards, enhances public safety, and favorably relates to adjacent lands and land uses. Consideration should also be given to selecting an alignment or design that minimizes or avoids hazard areas and loss of significant natural features (drainageways, wetlands, heavily forested areas, etc.) unless site mitigation can

clearly produce a superior landscape in terms of shape, grades, and reforestation, and is fully consistent with applicable code restrictions regarding resource areas.

Streets shall be installed per Chapter 85 CDC standards. The City Engineer has the authority to require that street widths match adjacent street widths. Sidewalks shall be installed per CDC 85.200(A)(3) for commercial and office projects, and CDC 85.200(A)(16) and 92.010(H) for residential projects, and applicable provisions of this chapter. Where streets bisect or traverse water resource areas (WRAs) the street width shall be reduced to the appropriate "constrained" cross-section width indicated in the TSP or alternate configurations which are appropriate to site conditions, minimize WRA disturbance or are consistent with an adopted transportation system plan. The street design shall also be consistent with habitat friendly provisions of CDC 32.060(I).

Based upon the City Manager's or Manager's designee's determination, the applicant shall construct or cause to be constructed, or contribute a proportionate share of the costs, for all necessary off-site improvements identified by the transportation analysis commissioned to address CDC 55.125 that are required to mitigate impacts from the proposed development. Proportionate share of the costs shall be determined by the City Manager or Manager's designee, who shall assume that the proposed development provides improvements in rough proportion to identified impacts of the development.

Finding: As part of the proposed development, sidewalks will be installed along the property frontage on Dollar Street and Willamette Falls Drive. The District worked city staff to determine the alignment and configuration of the proposed extension of Brandon Place and roundabout on Willamette Falls Drive. The proposed extension will provide a needed secondary emergency access route to the neighborhood and is indicated in the City TSP. The Traffic Impact Analysis prepared by DKS and Associates, notes that one intersection will operate below the city's standards, however city staff does not wish to pursue mitigation at this time. All other traffic related issues are addressed within the Traffic Impact Analysis and Supplemental Memo prepared by DKS and Associates. The configuration of access points on the site has been designed to encourage out-of-neighborhood traffic using Willamette Falls Drive and Brandon Place to access the school from Brandon Place, with buses and staff access from Dollar. The configuration has been designed to minimize the traffic impact on Dollar Street and in the adjacent neighborhood.

The proposed extension of Brandon Place will include sidewalks on both sides, providing a pedestrian connection between Dollar Street and Willamette Falls Drive. All proposed sidewalks will be at least six feet in width. Sidewalks on Dollar Street will be buffered from the roadway by a landscape strip with a width of at least six feet in width. The proposed sidewalk infill on Willamette Falls Drive east of the roundabout will be buffered by a landscape strip with a width of four feet. The sidewalks along the western side of Brandon Place and on the eastern side of Brandon Place north of the school driveway will be buffered from the roadway by a landscape strip of at least six feet. The section of the sidewalk from the school

driveway on Brandon Place south to Willamette Falls Drive will transition to a 10-foot wide curb-tight multi-use sidewalk, which will act as a transition area for bicycles and pedestrians traveling from the Willamette Falls Drive multi-use path. This standard is met.

2. **Storm detention and treatment and geologic hazards. Per the submittals required by CDC 55.130 and 92.010(E), all proposed storm detention and treatment facilities must comply with the standards for the improvement of public and private drainage systems located in the West Linn Public Works Design Standards, there will be no adverse off-site impacts caused by the development (including impacts from increased intensity of runoff downstream or constrictions causing ponding upstream), and the applicant must provide sufficient factual data to support the conclusions of the submitted plan.**

   Per the submittals required by CDC 55.130(E), the applicant must demonstrate that the proposed methods of rendering known or potential hazard sites safe for development, including proposed geotechnical remediation, are feasible and adequate to prevent landslides or other damage to property and safety. The review authority may impose conditions, including limits on type or intensity of land use, which it determines are necessary to mitigate known risks of landslides or property damage.

Finding: A Preliminary Stormwater Report detailing the proposed storm treatment system for the school has been submitted under Appendix D of this application. The proposed stormwater system drains directly to the Tualatin River and therefore no stormwater detention shall be required per Public Works Design Standards section 2.0041. The majority of stormwater generated by onsite improvements will be captured in a piped system and routed to a grassy swale for water quality treatment. A Geotechnical Report prepared by GeoDesign has provided an analysis and recommendation for the proposed stormwater system on the site and has been submitted under Appendix D. This standard is met.

3. **Municipal water. A registered civil engineer shall prepare a plan for the provision of water which demonstrates to the City Engineer's satisfaction the availability of sufficient volume, capacity, and pressure to serve the proposed development's domestic, commercial, and industrial fire flows. All plans will then be reviewed by the City Engineer.**

Finding: An Overall Utility Plan (Sheet LU1.30) prepared by a registered engineer in coordination with city engineering staff showing the proposed water connections has been submitted under Appendix E of this application. This standard is met.

4. **Sanitary sewers. A registered civil engineer shall prepare a sewerage collection system plan which demonstrates sufficient on-site capacity to serve the proposed development. The City Engineer shall determine whether the existing City system has sufficient capacity to serve the development.**

5. **Solid waste and recycling storage areas. Appropriately sized and located solid waste and recycling storage areas shall be provided. Metro standards shall be used.**

Finding: An Overall Utility Plan (Sheet LU1.30) prepared by a registered engineer in coordination with city engineering staff showing the proposed sanitary sewer connections has been submitted under Appendix E of this application. Solid waste and recycling storage will be provided in a screened enclosure as shown on the Overall Site Plan (Sheet LU1.10). This standard is met.

J. Crime prevention and safety/defensible space.

1. **Windows shall be located so that areas vulnerable to crime can be surveyed by the occupants.**

Finding: Crime prevention and natural surveillance of the site has been considered in the layout and design of the school building and site facilities. The location main office at the western building entrance will allow for natural surveillance of the site and those within the parking facilities. The plantings adjacent to the main office will be low to allow for views across the site. The proposed plant materials have been located in a manner that will not prohibit the surveillance of public and semi-public areas. Windows have been located to provide natural surveillance by staff at the eastern building entrance. This standard is met.

2. **Interior laundry and service areas shall be located in a way that they can be observed by others.**

Finding: The design does not include interior laundry and service areas, however, all service areas on site have been located so that they can be observed by others. The requirements of this section are not applicable to the proposed school.

3. **Mailboxes, recycling, and solid waste facilities shall be located in lighted areas having vehicular or pedestrian traffic.**

Finding: The solid waste and recycling facilities are in the northwest corner of the school building in the service yard area. The area will be lighted, fully enclosed, and screened from view. This standard is met.

4. **The exterior lighting levels shall be selected and the angles shall be oriented towards areas vulnerable to crime.**
5. **Light fixtures shall be provided in areas having heavy pedestrian or vehicular traffic and in potentially dangerous areas such as parking lots, stairs, ramps, and abrupt grade changes.**
6. **Fixtures shall be placed at a height so that light patterns overlap at a height of seven feet which is sufficient to illuminate a person. All commercial, industrial, residential, and public facility projects undergoing design review shall use low or high pressure sodium bulbs and be able to demonstrate effective shielding so that the light is directed downwards rather than omni-directional. Omni-directional lights of an ornamental nature may be used in general commercial districts only.**

Finding: The proposed parking lot lighting and pedestrian lighting coverage levels have been illustrated on the Lighting Coverage Plan (Sheet LU4.01) included under Appendix E of this application. The exterior lighting selected are consistent with the requirements of this section. The lines of sight haven been maintained as much as possible on site. This standard is met.

7. Lines of sight shall be reasonably established so that the development site is visible to police and residents.

Finding: As shown on the Overall Site Plan (Sheet LU1.10), the primary entry for visitors to the site is from the west on Brandon Place. The driveway, pedestrian pathways entering the site and west parking lot have been located to be in the line of sight of the main school office, located at the main building entry. Service areas outside of the line of sight will be secured from outside entry. The long west driveway entering the site allows for visitors approaching the school to observe the building and parking lot areas. The location of staff areas and classrooms along the eastern site entrance will provide for natural surveillance of the site by building occupants. The eastern driveway allows for visitors approaching the school to observe the building and parking areas. The site frontage along Dollar Street and Brandon Place, as well as driveways and parking lots as proposed reasonably establish lines of site for police and residents. This standard is met.

8. Security fences for utilities (e.g., power transformers, pump stations, pipeline control equipment, etc.) or wireless communication facilities may be up to eight feet tall in order to protect public safety. No variances are required regardless of location.

Finding: Security fences for utilities are not proposed. The requirements of this section are not applicable.

K. Provisions for persons with disabilities.

1. The needs of a person with a disability shall be provided for. Accessible routes shall be provided between all buildings and accessible site facilities. The accessible route shall be the most practical direct route between accessible building entries, accessible site facilities, and the accessible entry to the site. An accessible route shall connect to the public right-of-way and to at least one on-site or adjacent transit stop (if the area is served by transit). All facilities shall conform to, or exceed, the Americans with Disabilities Act (ADA) standards, including those included in the Uniform Building Code.

Finding: A total of nine ADA stalls, including two van stalls have been provided on site. The west parking lot has been designed with three ADA parking stalls, including one van stall. The east parking lot has been designed with six ADA parking stalls, including one van stall. The ADA parking stalls have been located on the shortest possible accessible circulation route to an accessible entrance to the building. The proposed site improvements will include accessible routes connecting the site facilities including building entrances, the multi-use track and other site facilities. This standard is met.

L. Signs.

1. Based on considerations of crime prevention and the needs of emergency vehicles, a system of signs for identifying the location of each residential unit, store, or industry shall be established.

Finding: The school is proposing a monument sign, located on Brandon Place and an on-wall sign which will be visible from Brandon Place and will allow for the identification of the building by emergency vehicles. This standard is met.

2. The signs, graphics, and letter styles shall be designed to be compatible with surrounding development, to contribute to a sense of project identity, or, when appropriate, to reflect a sense of the history of the area and the architectural style.

Finding: The proposed monument sign will be constructed of masonry brick, a material used on the main school building to provide for a project identity and style. The on-wall sign has been designed to be compatible with the school design with a minimalist metal letter style and no sign backing, which will create a relief and shadowing. The building signage has been illustrated on the Monument and Building Signage Plan (LU3.06). The on-wall sign has been shown on the Exterior Elevations (Sheet LU3.03). This standard is met.

3. The sign graphics and letter styles shall announce, inform, and designate particular areas or uses as simply and clearly as possible.

Finding: The sign graphics and letter styles will be simple and will provide the school name, address, and simple and clear announcements on the manual change copy area of the sign. This standard is met.

4. The signs shall not obscure vehicle driver's sight distance.

Finding: As shown on the Overall Site Plan (Sheet LU1.10), and the Planting Plan (Sheet LU1400A), the proposed monument sign on Brandon Place has been located outside of the clear vision triangle area and will not obscure the vehicle driver's sight distance. This standard is met.

5. Signs indicating future use shall be installed on land dedicated for public facilities (e.g., parks, water reservoir, fire halls, etc.).

Finding: Signs indicating a future use are not applicable to the proposed development.

6. Signs and appropriate traffic control devices and markings shall be installed or painted in the driveway and parking lot areas to identify bicycle and pedestrian routes.

Finding: Signs and appropriate traffic control devices and markings will be provided in the driveway and parking lot areas to identify bicycle and pedestrian routes, consistent with the requirements of this section. This standard is met.

M. Utilities. The developer shall make necessary arrangements with utility companies or other persons or corporations affected for the installation of underground lines and facilities. Electrical lines and other wires, including but not limited to communication, street lighting, and cable television, shall be placed underground, as practical. The design standards of Tables 1 and 2 above, and of subsection 5.487 of the West Linn Municipal Code relative to existing high ambient noise levels shall apply to this section.

Finding: The District will make the necessary arrangements with utility companies. This standard is met.

N. Wireless communication facilities (WCFs). (This section only applicable to WCFs.) WCFs as defined in Chapter 57 CDC may be required to go through Class I or Class II design review. The approval criteria for Class I design review is that the visual impact of the WCF shall be minimal to the extent allowed by Chapter 57 CDC. Stealth designs shall be sufficiently camouflaged so that they are not easily seen by passersby in the public right-of-way or from any adjoining residential unit. WCFs that are classified as Class II design review must respond to all of the approval criteria of this chapter.

Finding: The proposed development is not a wireless communication facility. The requirements of this section are not applicable.

O. Refuse and recycling standards.

1. **All commercial, industrial and multi-family developments over five units requiring Class II design review shall comply with the standards set forth in these provisions. Modifications to these provisions may be permitted if the Planning Commission determines that the changes are consistent with the purpose of these provisions and the City receives written evidence from the local franchised solid waste and recycling firm that they are in agreement with the proposed modifications.**

Finding: While the school is a public use and not a commercial, industrial, or multi-family use, refuse and recycling areas have been provided on-site and the standards set forth in these provisions have been addressed as applicable.

2. **Compactors, containers, and drop boxes shall be located on a level Portland cement concrete pad, a minimum of four inches thick, at ground elevation or other location compatible with the local franchise collection firm's equipment at the time of construction. The pad shall be designed to discharge surface water runoff to avoid ponding.**

Finding: The solid waste and recycling facilities are in the northwest corner of the school building in the service yard. As shown on the Site Plan (Sheet LU1.12), the containers will be located on heavy concrete pavement consistent with the requirements of this section. This standard is met.

3. **Recycling and solid waste service areas.**

a. **Recycling receptacles shall be designed and located to serve the collection requirements for the specific type of material.**
b. **The recycling area shall be located in close proximity to the garbage container areas and be accessible to the local franchised collection firm's equipment.**
c. **Recycling receptacles or shelters located outside a structure shall have lids and be covered by a roof constructed of water and insect-resistive material. The maintenance of enclosures, receptacles and shelters is the responsibility of the property owner.**
d. **The location of the recycling area and method of storage shall be approved by the local fire marshal.**
e. **Recycling and solid waste service areas shall be at ground level and/or otherwise accessible to the franchised solid waste and recycling collection firm.**
f. **Recycling and solid waste service areas shall be used only for purposes of storing solid waste and recyclable materials and shall not be a general storage area to store personal belongings of tenants, lessees, property management or owners of the development or premises.**
g. **Recyclable material service areas shall be maintained in a clean and safe condition.**

Finding: Recycling and solid waste service areas will be located near each other on the ground floor of the building within the service yard in the northwest corner of the building, as shown on the Level 01 Floor Plan (Sheet LU3.01). The recycling areas will be covered by a shelter, as shown on the Building Elevations (Sheet LU3.03). This standard is met.

4. **Special wastes or recyclable materials.**
   a. **Environmentally hazardous wastes defined in ORS 466.005 shall be located, prepared, stored, maintained, collected, transported, and disposed in a manner acceptable to the Oregon Department of Environmental Quality.**
   b. **Containers used to store cooking oils, grease or animal renderings for recycling or disposal shall not be located in the principal recyclable materials or solid waste storage areas. These materials shall be stored in a separate storage area designed for such purpose.**

Finding: The school will not require any special waste material containers. The requirements of this section are not applicable.

5. **Screening and buffering.**
   a. **Enclosures shall include a curbed landscape area at least three feet in width on the sides and rear. Landscaping shall include, at a minimum, a continuous hedge maintained at a height of 36 inches.**

b. Placement of enclosures adjacent to residentially zoned property and along street frontages is strongly discouraged. They shall be located so as to conceal them from public view to the maximum extent possible.

c. All dumpsters and other trash containers shall be completely screened on all four sides with an enclosure that is comprised of a durable material such as masonry with a finish that is architecturally compatible with the project. Chain link fencing, with or without slats, will not be allowed.

Finding: The service yard will be sunk down from Dollar Street and be enclosed and shielded from view with a retaining wall along the north and east and an ornamental gate to the west shown on the Building Elevations (Sheet LU3.03). Enhanced landscaping along Dollar Street as shown on the Planting Plan (Sheet LU1404) will provide additional visual buffering. This standard is met.

6. Litter receptacles.

a. Location. Litter receptacles may not encroach upon the minimum required walkway widths.

b. Litter receptacles may not be located within public rights-of-way except as permitted through an agreement with the City in a manner acceptable to the City Attorney or his/her designee.

c. Number. The number and location of proposed litter receptacles shall be based on the type and size of the proposed uses. However, at a minimum, for non-residential uses, at least one external litter receptacle shall be provided for every 25 parking spaces for first 100 spaces, plus one receptacle for every additional 100 spaces.

Finding: The school parking lot has 186 parking spaces; therefore, five litter receptacles are required. Litter receptacle locations will be determined by the District and will be placed to not encroach on the minimum walkway widths. This standard is met.

55.110 SITE ANALYSIS

The site analysis shall include:

A. A vicinity map showing the location of the property in relation to adjacent properties, roads, pedestrian and bike ways, transit stops and utility access.

B. A site analysis on a drawing at a suitable scale (in order of preference, one inch equals 10 feet to one inch equals 30 feet) which shows:

1. The property boundaries, dimensions, and gross area.

2. Contour lines at the following minimum intervals:

a. Two-foot intervals for slopes from zero to 25 percent; and

b. Five- or 10-foot intervals for slopes in excess of 25 percent.

3. Tables and maps identifying acreage, location and type of development constraints due to site characteristics such as slope, drainage and geologic hazards, including a slope

analysis which identifies portions of the site according to the land types (I, II, III and IV) defined in Chapter 02 CDC.

4. **The location and width of adjoining streets.**
5. **The drainage patterns and drainage courses on the site and on adjacent lands.**
6. **Potential natural hazard areas including:**
   a. **Floodplain areas pursuant to the site's applicable FEMA Flood Map panel;**
   b. **Water resource areas as defined by Chapter 32 CDC;**
   c. **Landslide areas designated by the Natural Hazard Mitigation Plan, Map 16; and**
   d. **Landslide vulnerable analysis areas, designated by the Natural Hazard Mitigation Plan, Map 17.**
7. **Resource areas including:**
   a. **Wetlands;**
   b. **Riparian corridors;**
   c. **Streams, including intermittent and ephemeral streams;**
   d. **Habitat conservation areas; and**
   e. **Large rock outcroppings.**
8. **Potential historic landmarks and registered archaeological sites. The existence of such sites on the property shall be verified from records maintained by the Community Development Department and other recognized sources.**
9. **Identification information including the name and address of the owner, developer, project designer, lineal scale and north arrow.**
10. **Identify Type I and II lands in map form. Provide a table which identifies square footage of Type I and II lands also as percentage of total site square footage.**

Finding: An Overall Site Analysis Plan (Sheet LU1.00) consistent with the requirements of this section has been submitted under Appendix E. A geological assessment of the subject site was performed by a licensed geotechnical engineer. A detailed Geotechnical Report prepared by Geodesign has been submitted under Appendix D of this application. The Geotechnical Report provides a site-specific analysis of the potential risk from seismic hazards referenced in the *Earthquake Hazards Area Map.* The site-specific analysis is found under Appendix F of the Geotechnical Report. Guidance has been provided within the report for the design of the building to ensure the safety and stability of the site. This standard is met.

55.120 SITE PLAN

The site plan shall be at the same scale as the site analysis (CDC 55.110) and shall show:

A. The applicant's entire property and the surrounding property to a distance sufficient to determine the relationship between the applicant's property and proposed development and adjacent property and development.

B. Boundary lines and dimensions for the perimeter of the property and the dimensions for all proposed lot or parcel lines.

C. Streams and stream corridors.

D. Identification information, including the name and address of the owner, developer, project designer, lineal scale and north arrow.

E. The location, dimensions, and names of all existing and proposed streets, public pathways, easements on adjacent properties and on the site, and all associated rights-of-way.

F. The location, dimensions and setback distances of all:

1. **Existing and proposed structures, improvements, and utility facilities on site; and**
2. **Existing structures and driveways on adjoining properties.**

G. The location and dimensions of:

1. **The entrances and exits to the site;**
2. **The parking and circulation areas;**
3. **Areas for waste disposal, recycling, loading, and delivery;**
4. **Pedestrian and bicycle routes, including designated routes, through parking lots and to adjacent rights-of-way;**
5. **On-site outdoor recreation spaces and common areas;**
6. **All utilities, including stormwater detention and treatment; and**
7. **Sign locations.**

H. The location of areas to be landscaped.

Finding: An Overall Site Plan (Sheet LU1.10) consistent with the requirements of this section has been provided under Appendix E. All proposed and existing easements to remain have been shown on Easement Map E-1 and Easement Map E-2, which have been provided under Appendix E. This standard is met.

55.125 TRANSPORTATION ANALYSIS

Certain development proposals required that a Traffic Impact Analysis (TIA) be provided which may result in modifications to the site plan or conditions of approval to address or minimize any adverse impacts created by the proposal. The purpose, applicability and standards of this analysis are found in CDC 85.170(B)(2).

Finding: A Transportation Impact Analysis prepared by DKS and Associates and supplemental memo which was prepared by DKS and Associates to address specific traffic related concerns raised by members of the community have been submitted under Appendix D of this application. This standard is met.

55.130 GRADING AND DRAINAGE PLANS

For Type I, II and III lands (refer to definitions in Chapter 02 CDC), a registered civil engineer must prepare a grading plan and a storm detention and treatment plan pursuant to CDC 92.010(E), at a scale sufficient to evaluate all aspects of the proposal, and a statement that demonstrates:

A. The location and extent to which grading will take place indicating general contour lines, slope ratios, slope stabilization proposals, and location and height of retaining walls, if proposed.

B. All proposed storm detention and treatment facilities comply with the standards for the improvement of public and private drainage systems located in the West Linn Public Works Design Standards.

C. There is sufficient factual data to support the conclusions of the plan.

D. Per CDC 99.035, the Planning Director may require the information in subsections A, B and C of this section for Type IV lands if the information is needed to properly evaluate the proposed site plan.

E. For Type I, II and III lands (refer to definitions in Chapter 02 CDC), the applicant must provide a geologic report, with text, figures and attachments as needed to meet the industry standard of practice, prepared by a certified engineering geologist and/or a geotechnical professional engineer, that includes:

1. **Site characteristics, geologic descriptions and a summary of the site investigation conducted;**
2. **Assessment of engineering geological conditions and factors;**
3. **Review of the City of West Linn's Natural Hazard Mitigation Plan and applicability to the site; and**
4. **Conclusions and recommendations focused on geologic constraints for the proposed land use or development activity, limitations and potential risks of development, recommendations for mitigation approaches and additional work needed at future development stages including further testing and monitoring.**

F. Identification information, including the name and address of the owner, developer, project designer, and the project engineer.

Finding: A geological assessment of the subject site was performed by a licensed geotechnical engineer. A detailed Geotechnical Report prepared by Geodesign has been submitted under Appendix D of this application. The Geotechnical Report provides a site-specific analysis of the potential risk from seismic hazards referenced in the *Earthquake Hazards Area Map.* The site-specific analysis is found under Appendix F of the Geotechnical Report. Guidance has been provided within the report for the design of the building to ensure the safety and stability of the site. Grading and Drainage Plans (Sheets LU1.20-LU1.27) consistent with the requirements of this section have been submitted under Appendix E. This standard is met.

55.140 ARCHITECTURAL DRAWINGS

This section does not apply to single-family residential subdivisions or partitions, or up to two duplexes or single-family attached dwellings.

Architectural drawings shall be submitted showing:

A. Building elevations and sections tied to curb elevation;

B. Building materials: color and type; and

C. The name of the architect or designer

Finding: Architectural Drawings consistent with the requirements of this section have been submitted under Appendix E. This standard is met.

55.150 LANDSCAPE PLAN

This section does not apply to detached single-family residential subdivisions or partitions, or up to two duplexes or single-family attached dwellings.

A. The landscape plan shall be prepared and shall show the following:

1. **Preliminary underground irrigation system, if proposed;**
2. **The location and height of fences and other buffering of screening materials, if proposed;**
3. **The location of terraces, decks, patios, shelters, and play areas, if proposed;**
4. **The location, size, and species of the existing and proposed plant materials, if proposed; and**
5. **Building and pavement outlines.**

B. The landscape plan shall be accompanied by:

1. **The erosion controls that will be used, if necessary;**
2. **Planting list; and**
3. **Supplemental information as required by the Planning Director or City Arborist.**

Finding: A landscape Materials Plan Overall (Sheet L1100), Materials Plans (Sheets LU1101-LU1107), Planting Plan Overall (Sheet L1400A), Planting Schedule (Sheet L1400B), and detailed Planting Plans (Sheets L1401-L1407) illustrating the proposed irrigation system; the location and height of fences, buffering and screening materials; the location of outdoor play and gathering areas; building and pavement outlines, replanting areas for erosion controls; and planting list have been provided under Appendix E of this application. This standard is met.

55.180 MAINTENANCE

All on-site improvements shall be the ongoing responsibility of the property owner or occupant.

Finding: The applicant acknowledges that all on-site improvements will be the ongoing responsibility of the property owner. This standard is met.

55.190 SHARED OPEN SPACE

Where the open space is designated on the plan as common open space, the following shall apply:

A. The open space area shall be shown on the final plan and recorded with the Planning Director.

B. The open space shall be conveyed in accordance with one of the following methods:

1. **By dedication to the City as publicly owned and maintained as open space. Open space proposed for dedication to the City must be acceptable to it with regard to the size, shape, location, improvement, and budgetary and maintenance limitations.**
2. **By leasing or conveying title (including beneficial ownership) to a corporation, home association, or other legal entity with the City retaining the development rights to the property. The terms of such lease or other instrument of conveyance must include provisions suitable to the City Attorney for guaranteeing the following:**

a. The continued use of such land for intended purposes.

b. Continuity of property maintenance.

c. When appropriate, the availability of funds required for such maintenance.

d. Adequate insurance protection.

e. Recovery for loss sustained by casualty and condemnation, or otherwise.

3. By any method that achieves the objectives set forth in subsection (B)(2) of this section.

Finding: The site does not have areas designated as common open space. The requirements of this section are not applicable.

DIVISION 7. DISCRETIONARY PROVISIONS

Chapter 60 CONDITIONAL USES

60.070 APPROVAL STANDARDS AND CONDITIONS

A. The Planning Commission shall approve, approve with conditions, or deny an application for a conditional use, except for a manufactured home subdivision in which case the approval standards and conditions shall be those specified in CDC 36.030, or to enlarge or alter a conditional use based on findings of fact with respect to each of the following criteria:

1. The site size and dimensions provide:

a. Adequate area for the needs of the proposed use; and

Finding: The site is approximately 21.4 acres in size, with a net developable area of 17 acres. The West Linn-Wilsonville School District's 2019 Long Range Plan identifies the Dollar Street school site as an appropriate site to provide an increase in student capacity along with a track and field, appropriate parking, and site circulation facilities. The increase in capacity from the current Athey Creek site would be responsive to the projected growth in middle school students in the West Linn area for the next 10-plus years. The site is of adequate area for the needs of the proposed use, as identified in the schools 2019 Long Range Plan.

b. Adequate area for aesthetic design treatment to mitigate any possible adverse effect from the use on surrounding properties and uses.

Finding: The District has given special consideration the impact of the school building on the surrounding neighborhood, which is predominately residential. These impacts include the overall size and massing of the school, traffic, connectivity, noise, and light generation. Several mitigation treatments and design choices have been provided on the site to reduce the overall impact of the school mon the surrounding neighborhood.

The school building has been set back from Brandon Place and Dollar Street beyond the minimum yard requirements to provide additional buffering and enhanced landscaping. The District has considered both the noise impacts of the school site and visual impacts of the school on the surrounding neighborhood. The existing landscaping and topography of the site has been utilized to the extent possible to provide natural buffering. Tree retention on the site has been primarily focused

along Willamette Falls Drive and along the eastern property line adjacent to neighboring homes.

Special consideration has been given to the massing and height of the building along Dollar Street. The building and track will be sunken into the grade along Dollar Street to increase the compatibility of the building with the residential neighborhood. Enhanced landscaping has been provided along the frontage to provide additional visual buffering. Retaining walls have been utilized at the children's play area and the waste and recycling storage area to provide additional noise buffering on site. The lighting on site has been located to prevent light trespass on adjacent properties as shown on the Light Coverage Plan (Sheet LU4.01). Landscaping and buffering have been shown on the Planting Plan (Sheet LU1400A). The proposed retaining walls have been shown on the Overall Grading and Drainage Plan (Sheet LU1.20).

Key architectural features of the surrounding neighborhood are two-story homes with gabled roof forms, and a mix of wood siding, brick, and stone materials. The school building will be two-stories in height and will incorporate gabled roof forms and a mix of wood and brick materials. The orientation and massing of the building will fan along the hillside which will provide for views of the surrounding landscape from the interior of the building while breaking up the building massing to reduce the overall impact of the building on the site. The building utilizes both flat and pitched roof forms to provide a residential style to the building.

As a result of a coordinated effort between City Staff and expert guidance from DKS and Associates, the development will include right-of-way improvements to Dollar Street and Willamette Falls Drive, and an extension of Brandon Place from Dollar Street to Willamette Falls Drive. The proposed extension of Brandon Place will provide a needed secondary emergency access route to the neighborhood.
Sidewalks will be installed along the property frontage on Dollar Street and Willamette Falls Drive which will increase neighborhood connectivity. The Traffic Impact Analysis prepared by DKS and Associates, notes that the intersection at Willamette Falls Drive and Ostman Road will operate below the City's standards, however city staff does not wish to pursue mitigation at this time. All other traffic related issues are addressed within the Traffic Impact Analysis and Supplemental Memo prepared by DKS and Associates. The configuration of access points on the site has been designed to encourage out-of-neighborhood traffic using Willamette Falls Drive and Brandon Place to access the school from Brandon Place, with buses and staff access from Dollar. The configuration has been designed to minimize the traffic impact on Dollar Street and in the adjacent neighborhood.

On-site Pedestrian pathways will connect the main school building with site facilities and surrounding pedestrian infrastructure, including Fields Bridge Park. On-site pathway facilities have been designed to meet the needs of the school, while also providing a path for use by the surrounding community. This standard is met.

2. **The characteristics of the site are suitable for the proposed use considering size, shape, location, topography, and natural features.**

Finding: The 21.4-acre site is adequately sized and shaped to meet the needs of the proposed middle school. The site improvements will include a 110,972 square foot building, outdoor hardscape play areas, an athletic track and field, walking paths, and two parking areas. The new school facility will provide capacity for 850 students. The school will be located centrally within the community it serves. Access to the proposed school will be provided through Dollar Street and Brandon Place, both local classification streets.

Type I, II, III and IV lands have been mapped on the site and have been shown on the Overall Site Analysis Land Types Plan (Sheet LU1.000) included under Appendix E. The gross site is 22.1 acres in size, with 2.8 acres of Type I lands and 0.9 acres of Type II lands. The Type I and II lands are primarily located along the eastern and southern property lines. The existing topography and significant trees in these areas have been largely preserved in the proposed site design for the school. A Geotechnical Report prepared by GeoDesign provides specific site grading, wall, and drainage design and construction recommendations for development in consideration of the existing steep slope areas at the site.

The proposed conditional use includes two Class II Variance requests. A variance to CDC Chapter 46.070.B, which requires that all parking spaces be located within 200 feet of a building entrance or site facility and a variance to CDC Chapter 52.300 for the size of the on-wall sign. The proposed variances will not impact the functionality of the site as a school and all relevant functional standards of the West Linn CDC have been met, as demonstrated within this narrative.

3. **The granting of the proposal will produce a facility that provides an overall benefit to the City.**

Finding: The existing Athey Creek school building has learning space capacity for 669 students. As shown in the 2019 West Linn-Wilsonville Long Range Facility Plan included under Appendix D, the total enrollment at Athey Creek for the 2018/2019 school year was 702 students. The existing school building does not have capacity to meet the current enrollment numbers. The new school building will provide capacity for 850 students, which exceeds the current enrollment numbers.

The relocation of Athey Creek Middle School to the Dollar Street site will provide a school that is more centrally located to the school population, withing walking and cycling distance to a large portion of the community, all allowing for safer accessibility to City-resident students and parents. The existing Athey Creek Middle School site has no walking boundary due to the lack of Safe Routes to School in unincorporated Clackamas County.

The relocation of the school was approved by West Linn – Wilsonville voters as part of Measure #3-554, the 2019 West Linn-Wilsonville School District Capital Bond

Program. The school will have on-site facilities that are available for public use during non-school hours, including walking paths, playground, outdoor recreation facilities, and indoor recreation and meeting spaces. Some of these facilities have been included in direct response to community feedback. The facility is being designed with emergency generator power capacity to provide community support in the event of emergencies. The project will also include right-of-way improvements such as street paving of drive lanes and parking, traffic calming, landscaping, bicycle and pedestrian paths. Furthermore, system development fees associated with the project will provide the City with additional funding for further improvement and maintenance of public facilities. This standard is met.

4. Adequate public facilities will be available to provide service to the property at the time of occupancy.

Finding: The District worked with city staff to determine the alignment and configuration of the proposed extension of Brandon Place and roundabout on Willamette Falls Drive. The proposed extension will provide a needed secondary emergency access route to the neighborhood. The Traffic Impact Analysis prepared by DKS and Associates, notes that one intersection will operate below the city's standards, however city staff does not wish to pursue mitigation at this time. All other traffic related issues are addressed within the Traffic Impact Analysis and Supplemental Memo prepared by DKS and Associates. The configuration of access points on the site has been designed to encourage out-of-neighborhood traffic using Willamette Falls Drive and Brandon Place to access the school from Brandon Place, with buses and staff access from Dollar. The configuration has been designed to minimize the traffic impact on Dollar Street and in the adjacent neighborhood. An Overall Utility Plan (Sheet LU1.30) prepared by a registered engineer in coordination with city engineering staff has been provided which demonstrates that the school site can be adequately served by public utilities. A Preliminary Stormwater Report detailing the proposed storm detention and treatment system for the new middle school has been submitted under Appendix D of this application. Storm water plans detailing the proposed storm detention and treatment system have been included in Appendix E. The proposed design complies with applicable code and design standards, and there will be no adverse off-site impacts, including impacts from increased intensity of runoff downstream or constrictions causing ponding. The data in the preliminary stormwater report provides sufficient factual data to support the conclusions of the plan. This standard is met.

5. The applicable requirements of the zone are met, except as modified by this chapter.

Finding: The proposed conditional use includes two Class II Variance requests. A variance to CDC Chapter 46.070.B, which requires that all parking spaces be located within 200 feet of a building entrance or site facility and a variance to CDC Chapter 52.300 for the size of the on-wall sign. The proposed variances will not impact the functionality of the site as a school and all relevant functional standards of the West Linn CDC have been met, as demonstrated within this narrative. The Class II Variance Criteria has been addressed within this narrative for each variance request.

6. **The supplementary requirements set forth in Chapters 52 to 55 CDC and CDC 92.010(E) are met, if applicable.**

7. **Finding:** The proposed conditional use includes two Class II Variance requests. A variance to CDC Chapter 46.070.B, which requires that all parking spaces be located within 200 feet of a building entrance or site facility and a variance to CDC Chapter 52.300 for the size of the on-wall sign. The proposed variances will not impact the functionality of the site as a school and all relevant functional standards of the West Linn CDC have been met, as demonstrated within this narrative. The supplementary requirements set forth in Chapters 52 to 55 CDC and CDC 92.010(E) have been addressed within this narrative. This standard is met.

8. **The use will comply with the applicable policies of the Comprehensive Plan.**

Finding: The following goals and policies have been identified as potentially applicable to the proposed use and are addressed below:

Goal 2 - Land Use Planning

***Policy 3* - Develop incentives to encourage superior design, preserve environmentally sensitive open space, and include recreational amenities.**

Response: Recreational amenities, including hardscape play areas, an athletic track and field and walking paths have been provided on the site for school and community use. A total of 42 significant trees were identified on site, of which 19 will be retained. The habitat corridor along the eastern boundary will be preserved as open space. This policy is met.

***Policy 5* - New construction and remodeling shall be designed to be compatible with the existing neighborhood through appropriate design and scale**

Response: Special consideration has been given to the massing and height of the building along Dollar Street. The building will be sunken into the grade along Dollar Street to increase the compatibility of the building with the residential neighborhood. Enhanced landscaping has been provided along the frontage to provide additional visual buffering. Retaining walls have been utilized at the children's play area and the waste and recycling storage area to provide additional noise buffering on site. The lighting on site has been located to prevent light trespass on adjacent properties as shown on the Light Coverage Plan (Sheet LU4.01). Landscaping and buffering have been shown on the Planting Plan (Sheet LU1400A). The proposed retaining walls have been shown on the Overall Grading and Drainage Plan (Sheet LU1.20). Key architectural features of the surrounding neighborhood are two-story homes with gabled roof forms, and a mix of wood siding, brick, and stone materials. The school building will be two-stories in height and will incorporate gabled roof forms and a mix of wood and brick materials. The orientation and massing of the building will fan along the hillside which will provide for views of the surrounding landscape from the interior of the building while breaking up the building massing to reduce the overall impact of

the building on the site. The building utilizes both flat and pitched roof forms to provide a residential style to the building. This policy is met.

***Policy 8* - Protect residentially zoned areas from the negative impacts of commercial, civic, and mixed-use development, and other potentially incompatible land uses.**

Response: Public Schools are located within the community they serve. The relocation of Athey Creek Middle School to the Dollar Street site will provide a school that is more centrally located to the school population, withing walking distance to a large portion of the community, all allowing for safer accessibility to students and parents. The existing Athey Creek Middle School site has no walking boundary due to the lack of Safe Routes to School in unincorporated Clackamas County. The relocation of the school was approved by West Linn – Wilsonville voters as part of Measure #3-554, the 2019 West Linn-Wilsonville School District Capital Bond Program. The new school has been designed to be compatible with the existing neighborhood to the extent possible. Several mitigation efforts have been identified to reduce the impact of the school, as addressed above in CDC Chapter 60.070.A.1.b.

***Policy 9* - Foster land use planning that emphasizes livability and carrying capacity.**

Response: The City participated in siting of future schools through staff conversations, safe-routes-to-school planning, and the Bond Summit. The District is committed to providing a safe and attractive multi-modal transportation system on the site and in the surrounding area. The design provides safe transportation options for buses, cars, bicycles, and pedestrians. Separate bus and parent drop-off areas provide adequate queuing and control of the site for the safety of all users. The new walking pathways on site connect into new and existing sidewalks along Dollar Street, Brandon Place and Willamette Falls Drive. The District will work to partner with the City on the Safe-Routes to School Program and associated improvements for the school. A Traffic Impact Analysis and Supplementary Memo with a Safe-Routes to School analysis has been included in Appendix D.

Goal 11 – Public Facilities and Services
Section 7: Schools
Policy 1 - Encourage the School District to build schools on collectors or arterial streets and, where possible, along transit lines.

Response: The proposed school will be located along Willamette Falls Drive, an arterial street. General parent access to the school will be provided from Brandon Place, a local street. Staff and bus access to the school site will be provided from Dollar Street, a local street.

Policy 2 - Encourage the use of energy-responsive materials and processes in the design of schools where economically feasible.

Response: The design includes energy responsive materials and design including appropriate thermal rating of the building envelope systems, sunshades on south-

facing windows, and photovoltaic systems (solar power) to reduce energy use. High-efficiency mechanical, plumbing and lighting systems with modern digital controls will further contribute to reduced energy use.

Policy 3 - The City shall participate in the siting of future school facilities, per the currently approved Intergovernmental Agreement with the School District.

Response: The City and West Linn-Wilsonville School District participated in siting of future schools through staff conversations, safe-routes-to-school planning, and the Bond Summit. Confirmation of the success of the pre-election process was found in the joint letter in support of Measure #3-554 from the mayors of West Linn and Wilsonville, a first in West Linn – Wilsonville history. The City has also been indirectly informed of the siting through community emails, meetings, and local media coverage.

Policy 4 - School design, use, and parking will be responsive to and compatible with surrounding neighborhoods and existing land uses.

Response: Special consideration has been given to the massing and height of the building along Dollar Street. The building will be sunken into the grade along Dollar Street to increase the compatibility of the building with the residential neighborhood. Enhanced landscaping has been provided along the frontage to provide additional visual buffering. Retaining walls have been utilized at the children's play area and the waste and recycling storage area to provide additional noise buffering on site. The lighting on site has been located to prevent light trespass on adjacent properties as shown on the Light Coverage Plan (Sheet LU4.01). Landscaping and buffering have been shown on the Planting Plan (Sheet LU1400A). The proposed retaining walls have been shown on the Overall Grading and Drainage Plan (Sheet LU1.20). Key architectural features of the surrounding neighborhood are two-story homes with gabled roof forms, and a mix of wood siding, brick, and stone materials. The school building will be two-stories in height and will incorporate gabled roof forms and a mix of wood and brick materials. The orientation and massing of the building will fan along the hillside which will provide for views of the surrounding landscape from the interior of the building while breaking up the building massing to reduce the overall impact of the building on the site. The building utilizes both flat and pitched roof forms to provide a residential style to the building. This policy is met.

Policy 5 - Work cooperatively with the school district to develop a safe-routes to school program and incorporate related improvements into the transportation capital improvements program

Response: The relocation of Athey Creek Middle School to the Dollar Street site will provide a school that is more centrally located to the school population, withing walking distance to a large portion of the community, all allowing for safer accessibility to students and parents. The existing Athey Creek Middle School site has no walking boundary due to the lack of Safe Routes to School in unincorporated

Clackamas County. The Dollar Street location and school design provides safe transportation options for buses, cars, bicycles, and pedestrians. Separate bus and parent drop-off areas provide adequate queuing and control of the site for the safety of all users. The new walking pathways on site connect into new and existing sidewalks along Dollar Street, Brandon Place and Willamette Falls Drive. The District will work to partner with the City on the Safe-Routes to School Program and associated improvements for the school. A Traffic Impact Analysis and Supplementary Memo with a Safe-Routes to School analysis has been included in Appendix D. This goal is met.

B. An approved conditional use or enlargement or alteration of an existing conditional use shall be subject to the development review provisions set forth in Chapter 55 CDC.

Finding: The provisions of Chapter 55 of the CDC have been addressed in this narrative. This standard is met.

C. The Planning Commission may impose conditions on its approval of a conditional use which it finds are necessary to assure the use is compatible with other uses in the vicinity. These conditions may include, but are not limited to, the following:

1. **Limiting the hours, days, place, and manner of operation.**
2. **Requiring design features which minimize environmental impacts such as noise, vibration, air pollution, glare, odor, and dust.**
3. **Requiring additional setback areas, lot area, or lot depth, or width.**
4. **Limiting the building height, size or lot coverage, or location on the site.**
5. **Designating the size, number, location and design of vehicle access points.**
6. **Requiring street right-of-way to be dedicated and the street to be improved including all steps necessary to address future street improvements identified in the adopted Transportation System Plan.**
7. **Requiring participation in making the intersection improvement or improvements identified in the Transportation System Plan when a traffic analysis (compiled as an element of a conditional use application for the property) indicates the application should contribute toward.**
8. **Requiring landscaping, screening, drainage, and surfacing of parking and loading areas.**
9. **Limiting the number, size, location, height, and lighting of signs.**
10. **Limiting or setting standards for the location and intensity of outdoor lighting.**
11. **Requiring berming, screening, or landscaping and the establishment of standards for their installation and maintenance.**
12. **Requiring and designating the size, height, location, and materials for fences.**
13. **Requiring the protection and preservation of existing trees, soils, vegetation, watercourses, habitat areas, and drainage areas.**

Finding: The applicant acknowledges that the Planning Commission may impose conditions of approval on a conditional use, including those listed in subsections 1-13 above. The

applicant has conducted a robust community engagement program including six community meetings to understand the interests and concerns of the neighborhood and has endeavored to be responsive to feedback received. This standard is met.

D. Aggregate extraction uses shall also be subject to the provisions of ORS 541.605.

Finding: The proposed use is not an aggregate extraction use. The requirements of this section are not applicable.

E. The Historic Review Board shall review an application for a conditional use, or to enlarge a conditional use on a property designated as a historic resource, based on findings of fact that the use will

1. **Preserve or improve a historic resource which would probably not be preserved or improved otherwise; and**
2. **Utilize existing structures rather than new structures.**

Finding: The subject site is not designated as a historic resource. The requirements of this section are not applicable.

60.080 SITE PLAN AND MAP

A. All site plans and maps shall include the name, address, and telephone number of the applicant, the scale of the site plan, north arrow, and a vicinity map.

B. The applicant shall submit a site plan drawn to an appropriate scale (in order of preference, one inch equals 10 feet to one inch equals 30 feet) which contains the following information:

1. **The subdivision name, block, and lot number or the section, township, range, and tax lot number.**
2. **The lot or parcel boundaries, dimensions, and gross area.**
3. **The applicant's property and the surrounding property to a distance sufficient to determine the relationship between the applicant's property and proposed development to the adjacent property and development.**
4. **The location, dimensions, and names of all existing and platted streets and other public ways and easements on adjacent property and on the site.**
5. **The location, dimensions, and setback distances of all:**
   a. **Existing structures, improvements, utilities, and drainage facilities on adjoining properties;**
   b. **Existing structures, improvements, utilities, and drainage facilities to remain on the site; and**
   c. **Proposed structures or changes to existing structures, improvements, utilities, and drainage facilities.**
6. **The existing and proposed dimensions of:**
   a. **The entrances and exits to the site;**
   b. **The parking and circulation areas;**
   c. **Loading and service areas for waste disposal, loading and delivery;**

d. Pedestrian and bicycle circulation area;

e. On-site outdoor recreation spaces and common areas; and

f. Above-ground utilities.

7. The location of areas to be landscaped and the proposed landscape plan.

8. The location of all trees having a six-inch caliper at a height of five feet.

C. The applicant shall submit the site plan on a map showing two-foot contours up to 20 percent grade and 10-foot contours on grades above 20 percent.

Finding: An Overall Site analysis Plan (Sheet LU1.00), an Overall Site Plan (Sheet LU1.10), an Overall Utility Plan (Sheet LU1.30) and an Overall Grading Plan (Sheet LU1.20) consistent with the requirements of this section have been submitted under Appendix E. An application accepted as complete requires compliance with this provision. This standard is met.

60.100 ADDITIONAL CRITERIA FOR SCHOOLS AND OTHER GOVERNMENT FACILITIES

Schools and other government facilities that attract a regular and significant volume of users shall, to the greatest extent possible, be centrally located relative to the majority of the population that they will serve and be serviceable by sidewalks and bike routes/lanes. Police and fire stations shall meet these standards to the greatest extent possible but it is acknowledged that access to arterials remains a key locational determinant for those uses.

Finding: The proposed location of Athey Creek Middle School will be more centrally located to the population it serves than the existing location of Athey Creek Middle School, which is in unincorporated Clackamas County. The current location has no walking boundary due to the lack of pedestrian and bicycle routes and lanes. The new location will be accessible by sidewalks and bike routes. New right-of-way improvements including pedestrian and bicycle routes and lanes are included in the proposed design. This standard is met.

Chapter 75 VARIANCES AND SPECIAL WAIVERS

75.020 CLASSIFICATION OF VARIANCES

A. Class I Variance. Class I variances provide minor relief from certain code provisions where it can be demonstrated that the modification will not harm adjacent properties, and it conforms with any other code requirements. Class I variances are allowed for the following code provisions:

B. Class II Variance. Class II variances may be utilized when strict application of code requirements would be inconsistent with the general purpose of the CDC and would create a burden upon a property owner with no corresponding public benefit. A Class II variance will involve a significant change from the code requirements and may create adverse impacts on adjacent property or occupants. It includes any variance that is not classified as a Class I variance or special waiver.

1. Class II Variance Approval Criteria. The approval authority may impose appropriate conditions to ensure compliance with the criteria. The appropriate approval

authority shall approve a variance request if all the following criteria are met and corresponding findings of fact prepared.

a. The variance is the minimum variance necessary to make reasonable use of the property. To make this determination, the following factors may be considered, together with any other relevant facts or circumstances:

1) Whether the development is similar in size, intensity and type to developments on other properties in the City that have the same zoning designation.

2) Physical characteristics of the property such as lot size or shape, topography, or the existence of natural resources.

3) The potential for economic development of the subject property.

b. The variance will not result in violation(s) of any other code standard, and the variance will meet the purposes of the regulation being modified.

c. The need for the variance was not created by the applicant and/or owner requesting the variance.

d. If more than one variance is requested, the cumulative effect of the variances results in a project that is consistent with the overall purpose of the zone.

Finding: The applicant is requesting two class II variances for the proposed renovations. A variance to CDC Chapter 46.070.B which requires all parking stalls be located within 200 feet of a building entrance and a variance to CDC Chapter 52.300 which limits on-wall signs to 18 square feet in area.

Class II Variance to CDC Chapter 46.070.B

CDC Chapter 46.070.B requires that all parking spaces be located within 200 feet of a building entrance.

The school campus consists of a main school building with multiple entrances, recreation facilities, and outdoor learning spaces to serve the students and teachers. There are two parking areas on site. The proposed parking lots have been located as close as possible to the main entrance of the building, given the needs of a school use and fulfillment of other requirements of the CDC. The Site Plan (Sheet LU1.10) included in Appendix E illustrates the extent of parking within 200 feet of the entrance to the various destinations on the site. This development is similar in size, intensity, and type to Rosemont Ridge Middle School, the other middle school located in the City. Rosemont Ridge has a site area of 20.61 acres and a total student capacity of 713 students, as provided in the 2019 West Linn-Wilsonville Long Range Facility Plan. The variance does not cause a violation of other code standards and meets the purpose of the regulation being modified by placing parking stalls as close as practical to the entries. ADA parking has been located closest to the primary entrance on each side of the building. Specific details for each lot are provided below.

The west parking lot will primarily serve parents and visitors to the school. All parking stalls within the parking lot are located within 200 feet of the main covered entryway, or within 200 feet of the entryway to the band and choir rooms as measured from the

nearest point of each parking space. The west parking lot is bordered on three sides by a wide sidewalk and drop off lane to maximize safe and efficient student arrival and dismissal. The drop off lane is 450 feet long, facilitating 17-20 vehicles simultaneously. These features prevent designing parking stalls along the nearest edges of the parking lot. The design also preserves natural resources in the form of existing trees and shrubs that contribute to the natural buffer between the parking lot and Willamette Falls Drive, and in the form of proposed trees and shrubs that will create the natural buffer between the parking lot and Dollar Street.

The east parking lot will primarily serve as a bus loading zone and staff parking lot, with parking for special events on site associated with the recreation facilities. The majority of the parking stalls within the east parking lot are located within 200 feet of the entrance to the multi-use track and field, located on the south side of the field, or within 200 feet of the building entrance to the southern classroom wing. A total of three parking stalls in the east parking lot are not compliant with the maximum 200 - foot spacing requirement of this section. These three parking stalls are located within 230 feet of the southern classroom wing, and 225 feet of the multi-use track and field entrance. Additionally, the east parking lot is proposed to be far from and lower than neighboring properties along Dollar Street to reduce the potential noise impact. The east parking lot is bordered on the north and west sides by a wide sidewalk and bus loading and unloading lane to facilitate safe and efficient student arrival and dismissal. The parking lot location was also influenced by anticipated pedestrian traffic, including students. The playground, sports field, greenhouse, and southern pathway can all be accessed without the need to cross a vehicle drive lane, which maximizes student and pedestrian safety. The design also preserves natural resources in the form of existing trees and shrubs that contribute to the natural buffer between the parking lot and Willamette Falls Drive, and in the form of proposed trees and shrubs that will create the natural buffer between the sports field, parking lot and Dollar Street.

The need for the proposed parking distance variance has not been created by the District, given the size and topography of the site and parking requirements unique to a school use. This variance is the minimum variance necessary for the reasonable and safe use of the property as a school, preservation of natural resources, buffering, and addressing community feedback regarding the development.

Class II Variance to CDC Chapter 52.300

CDC Chapter 52.300 limits on-wall building signs to a maximum area of 18 square feet.

The District is proposing one on-wall sign, located on the west face of the building. The on-wall sign will have a combined area of 110 square feet, which exceeds the maximum allowed square footage. The proposed wall sign has been illustrated on the Monument and Building Signage Plan (Sheet LU3.06.

The proposed on-wall sign will be located on the west face of the building at the primary building entrance for students, parents, and visitors. The access for visitors to the school from Brandon Place is approximately 466.6 feet from the west face of the building. The proposed sign variance to increase the size of the sign to 110

square feet is necessary for readability for vehicles and pedestrians traveling from Brandon Place. The total area of just the lettering will be 21 square-feet, with no backing material. An 18-square foot sign area is not readable from Brandon Place and would create a hardship for the applicant to identify the school building, which has unique architectural and site needs as a community building. This standard is met.

The proposed sign variance will not result in a violation of other standards of the Community Development Code. The need for the proposed sign variance has not been created by the District.

The cumulative effect of the two proposed Class II Variances will result in a project that is consistent with the overall purpose of the zone and the conditional use of the site as a school. This standard is met.

Chapter 85 GENERAL PROVISIONS

85.210 PROPERTY LINE ADJUSTMENTS – APPROVAL STANDARDS

A. The Director shall approve or deny a request for a property line adjustment based on the criteria stated below:

1. An additional lot or parcel shall not be created by the property line adjustment.

Finding: As part of the proposed development, the District is proposing to consolidate the three tax lots that property is comprised of into a single tax lot. The proposed lot consolidation will not create an additional lot or parcel. This standard is met.

2. The existing property shall not be reduced in size by the adjustments below the minimum lot or parcel size established by the approved zoning for that district. The property line adjustment shall not enlarge, increase or extend the non-conformity of a non-conforming lot or non-conforming structure.

Finding: The site is in the R-10 residential zone. The minimum lot size is 10,000 square feet. The consolidation of the three tax lots will result in a gross lot area of 962,676 square feet, which exceeds the minimum requirement of the R-10 zone. This standard is met.

3. Property line adjustments shall be either:

a. A straight line (see Figure 1 example);

b. A line with maximum of two 45- to 90-degree turns (see Figure 2 example); or

c. A maximum of three turns less than 45 degrees

Finding: The proposed adjustment will consolidate the three lots owned by the school district into a single lot. The adjustment will not result in new property lines. This standard is met.

4. The property line adjustment shall not create a lot or parcel that violates applicable site development regulations.

Finding: The proposed lot consolidation will not result in a new lot or parcel that violates the site development regulations. This standard is met.

5. The property line adjustment will not adversely affect existing easements or existing utilities unless an easement vacation is obtained, replacement easements are established, or any required utility relocations are paid for by the applicant.

Finding: The proposed lot consolidation will adversely affect existing easements or existing utilities except where easement vacations or replacement easements are established in accordance with the development plans submitted for the site. This standard is met.

6. Proposed property line adjustments that cannot meet these standards are subject to review under CDC 99.060(B)(2)(e).

Finding: The proposed lot consolidation meets the standards of this section. The requirements of CDC 99.060(B)(2)(e) are not applicable.

7. Any appeal must be filed in accordance with CDC 99.240.

Finding: The applicant acknowledges that any appeal must be filed in accordance with CDC 99.240.

Chapter 92 REQUIRED IMPROVEMENTS

92.010 PUBLIC IMPROVEMENTS FOR ALL DEVELOPMENT

The following improvements shall be installed at the expense of the developer and meet all City codes and standards:

A. Streets within subdivisions.

1. All streets within a subdivision, including alleys, shall be graded for the full right-of-way width and improved to the City's permanent improvement standards and specifications which include sidewalks and bicycle lanes, unless the decision-making authority makes the following findings:

a. The right-of-way cannot be reasonably improved in a manner consistent with City road standards or City standards for the protection of wetlands and natural drainageways.

b. The right-of-way does not provide a link in a continuous pattern of connected local streets, or, if it does provide such a link, that an alternative street link already exists or the applicant has proposed an alternative street which provides the necessary connectivity, or the applicant has proven that there is no feasible location on the property for an alternative street providing the link.

2. When the decision-making authority makes these findings, the decision-making authority may impose any of the following conditions of approval:

a. A condition that the applicant initiate vacation proceedings for all or part of the right-of-way.

b. A condition that the applicant build a trail, bicycle path, or other appropriate way. If the applicant initiates vacation proceedings pursuant to subsection (A)(2)(a) of this section, and the right-of-way cannot be vacated because of opposition from adjacent property owners, the City Council shall consider and decide whether to process a City-initiated street vacation pursuant to Chapter 271 ORS.

Construction staging area shall be established and approved by the City Engineer. Clearing, grubbing, and grading for a development shall be confined to areas that have been granted approval in the land use approval process only. Clearing, grubbing, and grading outside of land use approved areas can only be approved through a land use approval modification and/or an approved Building Department grading permit for survey purposes. Catch basins shall be installed and connected to pipe lines leading to storm sewers or drainageways.

B. Extension of streets to subdivisions. The extension of subdivision streets to the intercepting paving line of existing streets with which subdivision streets intersect shall be graded for the full right-of-way width and improved to a minimum street structural section and width of 24 feet.

C. Local and minor collector streets within the rights-of-way abutting a subdivision shall be graded for the full right-of-way width and approved to the City's permanent improvement standards and specifications. The City Engineer shall review the need for street improvements and shall specify whether full street or partial street improvements shall be required. The City Engineer shall also specify the extent of storm drainage improvements required. The City Engineer shall be guided by the purpose of the City's systems development charge program in determining the extent of improvements which are the responsibility of the subdivider.

D. Monuments. Upon completion of the first pavement lift of all street improvements, monuments shall be installed and/or reestablished at every street intersection and all points of curvature and points of tangency of street centerlines with an iron survey control rod. Elevation benchmarks shall be established at each street intersection monument with a cap (in a monument box) with elevations to a U.S. Geological Survey datum that exceeds a distance of 800 feet from an existing benchmark.

Finding: The proposed school development is not a subdivision; however, it will include an extension of Brandon Place from Dollar Street to Willamette Falls Drive. The proposed extension is consistent with the 2016 West Linn Transportation System Plan and has been designed to meet the City's local street improvement standards and specification. This standard is met.

E. Storm detention and treatment. For Type I, II and III lands (refer to definitions in Chapter 02 CDC), a registered civil engineer must prepare a storm detention and treatment plan, at a scale sufficient to evaluate all aspects of the proposal, and a statement that demonstrates:

1. The location and extent to which grading will take place indicating general contour lines, slope ratios, slope stabilization proposals, and location and height of retaining walls, if proposed.

2. **All proposed storm detention and treatment facilities comply with the standards for the improvement of public and private drainage systems located in the West Linn Public Works Design Standards.**
3. **There will be no adverse off-site impacts, including impacts from increased intensity of runoff downstream or constrictions causing ponding upstream.**
4. **There is sufficient factual data to support the conclusions of the plan.**
5. **Per CDC 99.035, the Planning Director may require the information in subsections (E)(1), (2), (3) and (4) of this section for Type IV lands if the information is needed to properly evaluate the proposed site plan.**

Finding: A Preliminary Stormwater Report detailing the proposed storm detention and treatment system for the new middle school has been submitted under Appendix D of this application. Storm water plans detailing the proposed storm treatment system have been included in Appendix E. The proposed design complies with applicable code and design standards, and there will be no adverse off-site impacts, including impacts from increased intensity of runoff downstream or constrictions causing ponding. The data in the preliminary stormwater report provides sufficient factual data to support the conclusions of the plan. This standard is met.

F. Sanitary sewers. Sanitary sewers shall be installed to City standards to serve the subdivision and to connect the subdivision to existing mains.

1. **If the area outside the subdivision to be directly served by the sewer line has reached a state of development to justify sewer installation at the time, the Planning Commission may recommend to the City Council construction as an assessment project with such arrangement with the subdivider as is desirable to assure financing his or her share of the construction.**
2. **If the installation is not made as an assessment project, the City may reimburse the subdivider an amount estimated to be a proportionate share of the cost for each connection made to the sewer by property owners outside of the subdivision for a period of 10 years from the time of installation of the sewers. The actual amount shall be determined by the City Administrator considering current construction costs.**

Finding: The school is serviceable by an existing sanitary sewer line located along the eastern boundary of the property. The proposed sanitary connection has been shown on the Overall Utility Plan (Sheet LU1.30) and the detailed Utility Plans (Sheets LU1.31-LU1.37). The proposed sanitary sewer connection will be installed to City standards. This standard is met.

G. Water system. Water lines with valves and fire hydrants providing service to each building site in the subdivision and connecting the subdivision to City mains shall be installed. Prior to starting building construction, the design shall take into account provisions for extension beyond the subdivision and to adequately grid the City system. Hydrant spacing is to be based on accessible area served according to the City Engineer's recommendations and City standards. If required water mains will directly serve property outside the subdivision, the City

may reimburse the developer an amount estimated to be the proportionate share of the cost for each connection made to the water mains by property owners outside the subdivision for a period of 10 years from the time of installation of the mains. If oversizing of water mains is required to areas outside the subdivision as a general improvement, but to which no new connections can be identified, the City may reimburse the developer that proportionate share of the cost for oversizing. The actual amount and reimbursement method shall be as determined by the City Administrator considering current or actual construction costs.

Finding: The school is serviceable by an existing water line located in Dollar Street. The proposed water connection has been shown on the Overall Utility Plan (Sheet LU1.30) and the detailed Utility Plans (Sheets LU1.31-LU1.37). The proposed water line will be installed to City standards. This standard is met.

H. Sidewalks.

1. **Sidewalks shall be installed on both sides of a public street and in any special pedestrian way within the subdivision, except that in the case of primary or secondary arterials, or special type industrial districts, or special site conditions, the Planning Commission may approve a subdivision without sidewalks if alternate pedestrian routes are available.**

   In the case of the double-frontage lots, provision of sidewalks along the frontage not used for access shall be the responsibility of the developer. Providing front and side yard sidewalks shall be the responsibility of the land owner at the time a request for a building permit is received. Additionally, deed restrictions and CC&Rs shall reflect that sidewalks are to be installed prior to occupancy and it is the responsibility of the lot or homeowner to provide the sidewalk, except as required above for double-frontage lots.
2. **On local streets serving only single-family dwellings, sidewalks may be constructed during home construction, but a letter of credit shall be required from the developer to ensure construction of all missing sidewalk segments within four years of final plat approval pursuant to CDC 91.010(A)(2).**
3. **The sidewalks shall measure at least six feet in width and be separated from the curb by a six-foot minimum width planter strip. Reductions in widths to preserve trees or other topographic features, inadequate right-of-way, or constraints, may be permitted if approved by the City Engineer in consultation with the Planning Director.**
4. **Sidewalks should be buffered from the roadway on high volume arterials or collectors by landscape strip or berm of three and one-half-foot minimum width.**
5. **The City Engineer may allow the installation of sidewalks on one side of any street only if the City Engineer finds that the presence of any of the factors listed below justifies such waiver:**
   a. **The street has, or is projected to have, very low volume traffic density;**
   b. **The street is a dead-end street;**
   c. **The housing along the street is very low density; or**

d. The street contains exceptional topographic conditions such as steep slopes, unstable soils, or other similar conditions making the location of a sidewalk undesirable.

Finding: As part of the proposed development, sidewalks will be installed along the property frontage on Dollar Street and Willamette Falls Drive. The proposed extension of Brandon Place will include sidewalks on both sides, providing a pedestrian connection between Dollar Street and Willamette Falls Drive. All proposed sidewalks will be at least six feet in width. Sidewalks on Dollar Street will be buffered from the roadway by a landscape strip with a width of at least six feet in width. The proposed sidewalk infill on Willamette Falls Drive east of the roundabout will be buffered by a landscape strip with a width of four feet. The sidewalks along the western side of Brandon Place and on the eastern side of Brandon Place north of the school driveway will be buffered from the roadway by a landscape strip of at least six feet. The section of the sidewalk from the school driveway on Brandon Place south to Willamette Falls Drive will transition to a 10-foot wide curb-tight multi-use sidewalk, which will act as a transition area for bicycles and pedestrians traveling from the Willamette Falls Drive multi-use path. This standard is met.

I. Bicycle routes. If appropriate to the extension of a system of bicycle routes, existing or planned, the Planning Commission may require the installation of separate bicycle lanes within streets and separate bicycle paths.

Finding: The proposed development will a new sidewalk and separated bike path along Willamette Falls Drive. The proposed bicycle and pedestrian improvements have been shown on the Site Plan (Sheet LU1.11-LU1.17) and have been detailed in the Traffic Impact Analysis Report prepared by DKS and Associates and included under Appendix D of this application. The District acknowledges that the Planning Commission may require additional bicycle route improvements as a condition of approval. This standard is met.

J. Street name signs. All street name signs and traffic control devices for the initial signing of the new development shall be installed by the City with sign and installation costs paid by the developer.

Finding: While the proposed development is not a subdivision, the District acknowledges that all street name signs, and traffic control devices will be installed by the City at the cost of the District. This standard is met.

K. Dead-end street signs. Signs indicating "future roadway" shall be installed at the end of all discontinued streets. Signs shall be installed by the City per City standards, with sign and installation costs paid by the developer.

Finding: The proposed development will not include dead-end streets. The requirements of this section are not applicable.

L. Signs indicating future use shall be installed on land dedicated for public facilities (e.g., parks, water reservoir, fire halls, etc.). Sign and installation costs shall be paid by the developer.

Finding: The proposed development does not include land dedicated for future public facilities. The requirements of this section are not applicable.

M. Street lights. Street lights shall be installed and shall be served from an underground source of supply. The street lighting shall meet IES lighting standards. The street lights shall be the shoe-box style light (flat lens) with a 30-foot bronze pole in residential (non-intersection) areas. The street light shall be the cobra head style (drop lens) with an approximate 50-foot (sized for intersection width) bronze pole. The developer shall submit to the City Engineer for approval of any alternate residential, commercial, and industrial lighting, and alternate lighting fixture design. The developer and/or homeowners association is required to pay for all expenses related to street light energy and maintenance costs until annexed into the City.

Finding: All proposed street lights will be a shoe-box style light with a 30-foot bronze pole and will be installed and served from an underground source of supply. This standard is met.

N. Utilities. The developer shall make necessary arrangements with utility companies or other persons or corporations affected for the installation of underground lines and facilities. Electrical lines and other wires, including but not limited to communication, street lighting, and cable television, shall be placed underground.

Finding: The District will make all necessary arrangements with utility companies or other persons affected for the installation of underground lines and facilities. This standard is met.

O. Curb cuts and driveways. Curb cuts and driveway installations are not required of the subdivider at the time of street construction, but, if installed, shall be according to City standards. Proper curb cuts and hard-surfaced driveways shall be required at the time buildings are constructed.

Finding: The proposed parking lots will require curb cuts and driveways. The access will be provided according to City Standards. This standard is met.

P. Street trees. Street trees shall be provided by the City Parks and Recreation Department in accordance with standards as adopted by the City in the Municipal Code. The fee charged the subdivider for providing and maintaining these trees shall be set by resolution of the City Council.

Finding: While the proposed development is not a subdivision, the District acknowledges that street trees may be required. Street trees will be provided along the frontage of Dollar Street, along both sides of Brandon Place and along Willamette Falls Drive where road improvements are proposed. The proposed street trees will be provided in accordance with City standards.

Q. Joint mailbox facilities shall be provided in all residential subdivisions, with each joint mailbox serving at least two, but no more than eight, dwelling units. Joint mailbox structures shall be placed in the street right-of-way adjacent to roadway curbs. Proposed locations of joint mailboxes shall be designated on a copy of the tentative plan of the subdivision, and shall be approved as part of the tentative plan approval. In addition, sketch plans for the joint mailbox structures to be used shall be submitted and approved by the City Engineer prior to final plat approval.

Finding: The proposed development does not require joint mailbox facilities. The applicant will coordinate with the Post Master to determine the appropriate location for the school mailbox. The requirements of this section are not applicable.

Chapter 96 STREET IMPROVEMENT CONSTRUCTION
96.010 CONSTRUCTION REQUIRED

A. New construction.

1. **Building permits shall not be issued for the construction of any new building or structure, or for the remodeling of any existing building or structure, which results in an increase in size or includes a change in use, including building permits for single-family dwellings but excepting building permits for alteration or addition to an existing single-family dwelling, unless the applicant for said building permit agrees to construct street improvements as required by the land use decision authorizing the construction activity. The placement of new curbs and the drainage facilities required shall be determined by the City Manager or the Manager's designee.**
2. **If the building permit did not require a prior land use decision, the applicant shall construct street improvements which shall include curbs, sidewalks, drainage facilities, and pavement widening to meet new curbs, along all City streets which abut the property described in the building permits.**
3. **An applicant for a building permit may apply for a waiver of street improvements and the option to make a payment in lieu of construction. The option is available if the City Manager or the Manager's designee determines the transportation system plan does not include the street improvement for which the waiver is requested.**
4. **When an applicant applies for and is granted a waiver of street improvements under subsection (A)(3) of this section, the applicant shall pay an in-lieu fee equal to the estimated cost, accepted by the City Engineer, of the otherwise required street improvements. As a basis for this determination, the City Engineer shall consider the cost of similar improvements in recent development projects and may require up to three estimates from the applicant. The in-lieu fee shall be used for in kind or related improvements.**

B. Remodeling of an existing building.

C. Replacement of an existing building.

D. Notwithstanding any other provisions of this chapter, in cases where the issuance of the building permit pertains to the construction or reconstruction of a building or structure within a large development owned by the same owner or owners, the City Council may, in its sole discretion, authorize the installation of street improvements of equivalent cost on another portion of the total development area.

Finding: The District is proposing street improvements to Dollar Street, Brandon Place and Willamette Falls Drive. The applicant acknowledges that a development agreement with the City may be required for the proposed improvements. This standard is met.

96.020 STANDARDS

Street improvements shall be installed according to the City standards and shall be completed prior to the issuance of any occupancy permit for the new or remodeled structure or building. In unimproved areas of the City, the City Engineer may grant a time extension of the provisions of this section; provided, that the applicant provides sufficient security in amount and quantity satisfactory to the City Attorney to assure payment of such improvement costs.

Finding: All proposed street improvements will be installed according to City Standards and will be completed prior to occupancy. This standard is met.

SUMMARY AND CONCLUSION

The mission of the West Linn-Wilsonville School District 2019 Bond is to provide a high-quality safe learning environment at Athey Creek Middle School. The new school has been thoughtfully designed, with collaboration from members of the community.

The District has given special consideration to the overall impact of the school on the surrounding neighborhood. The new school has been designed and sited to minimize and mitigate identified impacts to the extent possible while providing for the operational needs of the school. The site circulation has been designed strategically to separate parent drop-off traffic and staff and bus drop-off traffic, and minimize off-site traffic impacts.

Based upon the analysis and findings described above for the Type III Conditional Use Application, Design Review Application, Class II Variance Application and Lot Consolidation Application, Athey Creek Middle School meets the requirements as described in the West Linn Community Development Code. The District respectfully requests approval from the City's Planning Department and Planning Commission.

City of West Linn
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DEVELOPMENT REVIEW APPLICATION

For Office Use Only		
STAFF CONTACT	PROJECT NO(S).	PRE-APPLICATION NO.
NON-REFUNDABLE FEE(S)	REFUNDABLE DEPOSIT(S)	TOTAL

Type of Review (Please check all that apply):

- ☐ Annexation (ANX)
- ☐ Appeal and Review (AP)
- ☒ Conditional Use (CUP)
- ☒ Design Review (DR)
- ☐ Easement Vacation
- ☐ Extraterritorial Ext. of Utilities
- ☐ Final Plat or Plan (FP)
- ☐ Flood Management Area
- ☐ Hillside Protection & Erosion Control
- ☐ Historic Review
- ☐ Legislative Plan or Change
- ☐ Lot Line Adjustment (LLA)
- ☐ Minor Partition (MIP) (Preliminary Plat or Plan)
- ☐ Non-Conforming Lots, Uses & Structures
- ☐ Planned Unit Development (PUD)
- ☐ Pre-Application Conference (PA)
- ☐ Street Vacation
- ☐ Subdivision (SUB)
- ☐ Temporary Uses
- ☐ Time Extension
- ☒ Variance (VAR)
- ☐ Water Resource Area Protection/Single Lot (WAP)
- ☐ Water Resource Area Protection/Wetland (WAP)
- ☐ Willamette & Tualatin River Greenway (WRG)
- ☐ Zone Change

Home Occupation, Pre-Application, Sidewalk Use, Sign Review Permit, and Temporary Sign Permit applications require different or additional application forms, available on the City website or at City Hall.

Site Location/Address:
945 Dollar Street

Assessor's Map No.: 21334C | 31E34DC
Tax Lot(s): 600 | 1900 and 1001
Total Land Area: 22.11 acres

Brief Description of Proposal:
The West Linn-Wilsonville School District proposes to construct a new Athey Creek Middle School on the Dollar Street property and seeks concurrent approval of a Type III Conditional Use Permit, Design Review Application, Variance, and Lot Consolidation Application

Applicant Name: (please print) West Linn-Wilsonville School District
Address: 2755 SW Borland Road
City State Zip: Tualatin, OR 97062
Phone: 503-673-7988
Email: douglasr@wlwv.k12.or.us

Owner Name (required): (please print) West Linn-Wilsonville School District
Address: 2755 SW Borland Road
City State Zip: Tualatin, OR 97062
Phone: 503-673-7988
Email: douglasr@wlwv.k12.or.us

Consultant Name: (please print) 3J Consulting, Inc.
Address: 9600 SW Nimbus Avenue, Suite 100
City State Zip: Beaverton, OR 97008
Phone: 503-946-9365 x211
Email: mercedes.serra@3j-consulting.com

1. All application fees are non-refundable (excluding deposit). **Any overruns to deposit will result in additional billing.**
2. The owner/applicant or their representative should be present at all public hearings.
3. A decision may be reversed on appeal. No permit will be in effect until the appeal period has expired.
4. **One complete hard-copy set of application materials must be submitted with this application.**
   One complete digital set of application materials must also be submitted electronically in PDF format.
   If large sets of plans are required in application please submit one set.

The undersigned property owner(s) hereby authorizes the filing of this application, and authorizes on site review by authorized staff. I hereby agree to comply with all code requirements applicable to my application. Acceptance of this application does not infer a complete submittal. All amendments to the Community Development Code and to other regulations adopted after the application is approved shall be enforced where applicable. Approved applications and subsequent development is not vested under the provisions in place at the time of the initial application.

Applicant's signature _____ Date _____ Owner's signature *(required)* _____ Date 3-17-21

City of West Linn
PRE-APPLICATION CONFERENCE
MEETING SUMMARY NOTES
November 18,
2020

SUBJECT: Proposal to build new Athey Creek Middle School at 840 and 945 Dollar Street.

FILE: PA-20-15

ATTENDEES: **APPLICANT:** West Linn – Wilsonville School District
Keith Liden WWSD, Angela Caffrey WWSD, Remo Douglas WWSD, Matt Manzer KPFF, Mark Wharry KPFF, Mercedes Serra 3J Consulting, Rebecca Grant IBI Architecture, Ian Holzworth IBI Architecture, Kate Barbaria IBI Architecture
STAFF: Chris Myers Associate Planner, Darren Wyss Interim Planning Manager, Jennifer Arnold Associate Planner, Lynn Schroder Administrator, Erich Lais Assistant City Engineer
PUBLIC: Jim Byaosai, Dana Clarke, Kathie Halicki, Shannen Knight, John McCabe, Elizabeth Rocchia

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The following is a summary of the meeting discussion provided to you from staff meeting notes. Additional information may be provided to address any "follow-up" items identified during the meeting. These comments are PRELIMINARY in nature. Please contact the Planning Department with any questions regarding approval criteria, submittal requirements, or any other planning-related items. Please note disclaimer statement below.

Site Information

Site Address:	840 and 945 Dollar Street
Tax Lot No.:	21E34C 600, 21E34DC 900 and 1001
Zoning:	Single Family Residential Detached, R-10
Neighborhood:	Willamette
Applicable Code:	CDC Chapters:

11: Single-Family Residential
27: Flood Management
28: Willamette and Tualatin River Protection
32: Water Resource Area Protection
41: Building Height, Structures on Steep Lots, Exceptions
42: Clear Vision Areas
44: Fences
46: Off-Street Parking, Loading, and Reservoir Areas
48: Access, Egress, and Circulation
52: Signs
54: Landscaping
55: Design Review
60: Conditional Uses
75: Variances and Special Waivers
92: Required Improvements
96: Street Improvements Construction
99: Procedures for Decision Making: Quasi-Judicial

Project Details: The applicant proposes construction of a new middle school at 840 and 945 Dollar Street.

Public Comments: Public comments received during the pre-application meeting focused on several

issues. The first is storm water and how this will be handled. Mark Wharry of KPFF explained that due to the proximity to the river, storm water will need to be collected and treated. The School District will follow all City of West Linn codes and guidelines for this process.

It was also asked if Clackamas County has been involved in the process due to the potential that Fields Bridge on Willamette Falls Drive will be compromised. It was explained that the County will be consulted once an application has been turned in.

One further question focused on the required neighborhood association meeting and the corresponding notice. Specifically the timing for the pre-application and the neighborhood association meeting.

Discussion: Discussion for this proposed application focused on the applicable chapters of the Community Development Code listed under Site Information in this report.

Engineering Division Comments: Assistant City Engineer, Erich Lais, discussed the utility and infrastructure needs that the School District will have based upon the proposed project. Discussion was focused on potential water line locations, potential sewer line locations, and storm water needs such as retention and treatment. Further discussion was had regarding the need for street improvements along Willamette Falls Drive and Dollar Street. And what type of improvements would be required.

Process: The proposal is for a quasi-judicial Conditional Use Permit, which is a Planning Commission decision. For the proposal, address the submittal requirements and standards for decision making in the Community Development Code (CDC) chapters 11, 27, 28, 32, 41, 42, 44, 46, 48, 52, 54, 55, 60, 75, 92, 96, and 99.

N/A is not an acceptable response to the approval criteria. The submittal requirements may be waived, but the applicant must first identify the specific submittal requirement and request, in letter form, that it be waived by the Planning Manager and must identify the specific grounds for that waiver.

Once the application and deposit/fee are submitted, the City has 30 days to determine if the application is complete or not. If the application is not complete, the applicant has 180 days to make it complete or provide written notice to staff that no other information will be provided.

Once the submittal is declared complete, staff will send out public notice of the anticipated Planning Manager's decision date at least 20 days before it occurs. A sign posted on the site. The Planning Manager's decision may be appealed to City Council by the applicant or anyone with standing.

Pre-application notes are void after 18 months. After 18 months with no application approved or in process, a new pre-application conference is required.

Typical land use applications can take 6-10 months from beginning to end.

DISCLAIMER: This summary discussion covers issues identified to date. It does not imply that these are the only issues. The burden of proof is on the applicant to demonstrate that all approval criteria have been met. These notes do not constitute an endorsement of the proposed application ***or provide any assurance of potential outcomes***. Staff responses are based on limited material presented at this pre-application meeting. New issues, requirements, etc. could emerge as the application is developed. ***A new pre-application conference would have to be scheduled one that period lapses and these notes would no longer be valid. Any changes to the CDC standards may require a different design or submittal.***

Pre-application Conference PA 20-15 Athey Creek Middle School

Community Development Code applicable chapters:

Chapter 11: Single-Family Residential Detached, R-10

- 11.060-7 Conditional Use Permit
- 11.080 Dimensional Requirements

Chapter 27: Flood Management Area

- 27.020 Applicability
- 27.050 Application
- 27.060 Approval Criteria
- 27.070 Construction Materials and Methods
- 27.090 Non-Residential Construction

Chapter 28: Willamette and Tualatin River Protection

- 28.030 Applicability
- 28.040 Exemption/Uses Permitted Outright
- 28.090 Submittal Requirements: Application
- 28.110 Approval Criteria

Chapter 32: Water Resource Area Protection

- 32.050 Application
- 32.060 Approval Criteria (Standard Process) Table 32-2
- 32.090 Mitigation Plan

Chapter 41: Building Height, Structures on Steep Lots, Exceptions

- 41.005 Determining Height of Building
- 41.020 Height Exceptions
- 41.040 Places of Worship or Government Buildings

Chapter 42: Clear Vision Areas

- 42.020 Clear Vision Areas Required, Uses Prohibited
- 42.030 Exceptions
- 42.050 Computation; Accessway Less than 24 Feet in Width

Chapter 44: Fences

- 44.020 Sight-Obscuring Fence; Setback and Height Limitations
- 44.040 Landscaping
- 44.050 Standards for Construction

Chapter 46: Off-Street Parking, Loading and Reservoir Areas

- 46.020 Applicability and General Provisions

- 46.040 Approval Standards
- 46.070 Maximum Distance Allowed Between Parking Area and Use
- 46.080 Computation of Required Parking Spaces and Loading Area
- 46.090 Minimum Off-Street Parking Space Requirements

Chapter 48: Access, Egress, and Circulation

- 48.020 Applicability and General Provisions
- 48.025 Access Control
- 48.040 Minimum Vehicle Requirements for Non-Residential Uses
- 48.050 One-Way Vehicular Access Points

Chapter 52: Signs

- 52.210 Approval Standards
- 52.300 Permanent Sign Standards

Chapter 54: Landscaping

- 54.020 Approval Criteria
- 54.030 Planting Strips for Modified and New Streets
- 54.40 Installation

Chapter 55: Design Review

- 55.020 Classes of Design Review
- 55.030 Administration and Approval Process
- 55.070 Submittal Requirements

Chapter 60: Conditional Uses

- 60.030 Administration and Approval Process
- 60.100 Additional Criteria for Schools and Other Government Facilities

Chapter 75: Variances and Special Waivers

- 75.020 Classification of Variances
- 75.030 Administration and Approval Process

Chapter 92: Required Improvements

- 92.010 Public Improvements for All Development
- 92.030 Improvement Procedures

Chapter 96: Street Improvements Construction

- 96.010 Construction Required
- 96.020 Standards

Chapter 99: Procedures for Decision Making: Quasi-Judicial

- 99.038 Neighborhood Contact Required for Certain Applications

- 99.060 Approval Authority
- 99.080 Notice
- 99.125 Staged or Phased Development
- 99.325 Extension of Approval

NEIGHBORHOOD MEETING

AFFIDAVIT OF MAILING

STATE OF OREGON)

SS

County of Clackamas)

I, Elsa Bierwagen, being duly sworn, state that I represent the party initiating interest in West Linn-Wilsonville Dollar Street affecting the land located at 945 Dollar Street and that pursuant to Community development Code Section 99, did on the 27th day of October caused to have mailed, to each of the persons on the attached list, a notice of a meeting to discuss the proposed development of the aforementioned property.

I further state that said notices were enclosed in plainly addressed envelopes to said persons and were deposited on the date indicated above in the United States Post Office with postage prepaid thereon.

This 27th day of October 2020.

Signature

Subscribed and sworn to, or affirmed, before me this 27th day of October, 2020.

OFFICIAL STAMP
AUDREY L JONES
NOTARY PUBLIC - OREGON
COMMISSION NO. 990916
MY COMMISSION EXPIRES SEPTEMBER 03, 2023

Notary Public for the State of Oregon

County of Washington

My Commission Expires: September 3, 2023

3J CONSULTING
9600 SW NIMBUS AVENUE, SUITE 100
BEAVERTON, OREGON 97008
PH: (503) 946.9365
WWW.3JCONSULTING.COM

September 29, 2020

New Middle School at Dollar Street
Neighborhood Meeting Request

Dear Ms. Halicki,

3J Consulting acts on behalf of the West Linn-Wilsonville School District regarding a proposal for the New Middle school at the Dollar Street site. The new middle school is part of the 2019 Capital Bond Program which was approved by West Linn-Wilsonville voters in November 2019. The school property is located at 945 Dollar Street. The property can be legally identified as tax lots 21E34DC00900 and 21E34C00600. The site is zoned R-10 or Single Family Residential. The location of the proposed project is shown on the attached map.

Before finalizing an application to the City's Planning Department for the proposed improvements, we would like to discuss this proposal with the members of the Willamette Neighborhood Association and with property owners residing within 500 feet of the property.

The purpose of this meeting is to provide a forum for surrounding property owners and residents to review the proposal, provide feedback, and ask questions. While one community meeting is required by the City, three have been held to date, and a total of five are expected.

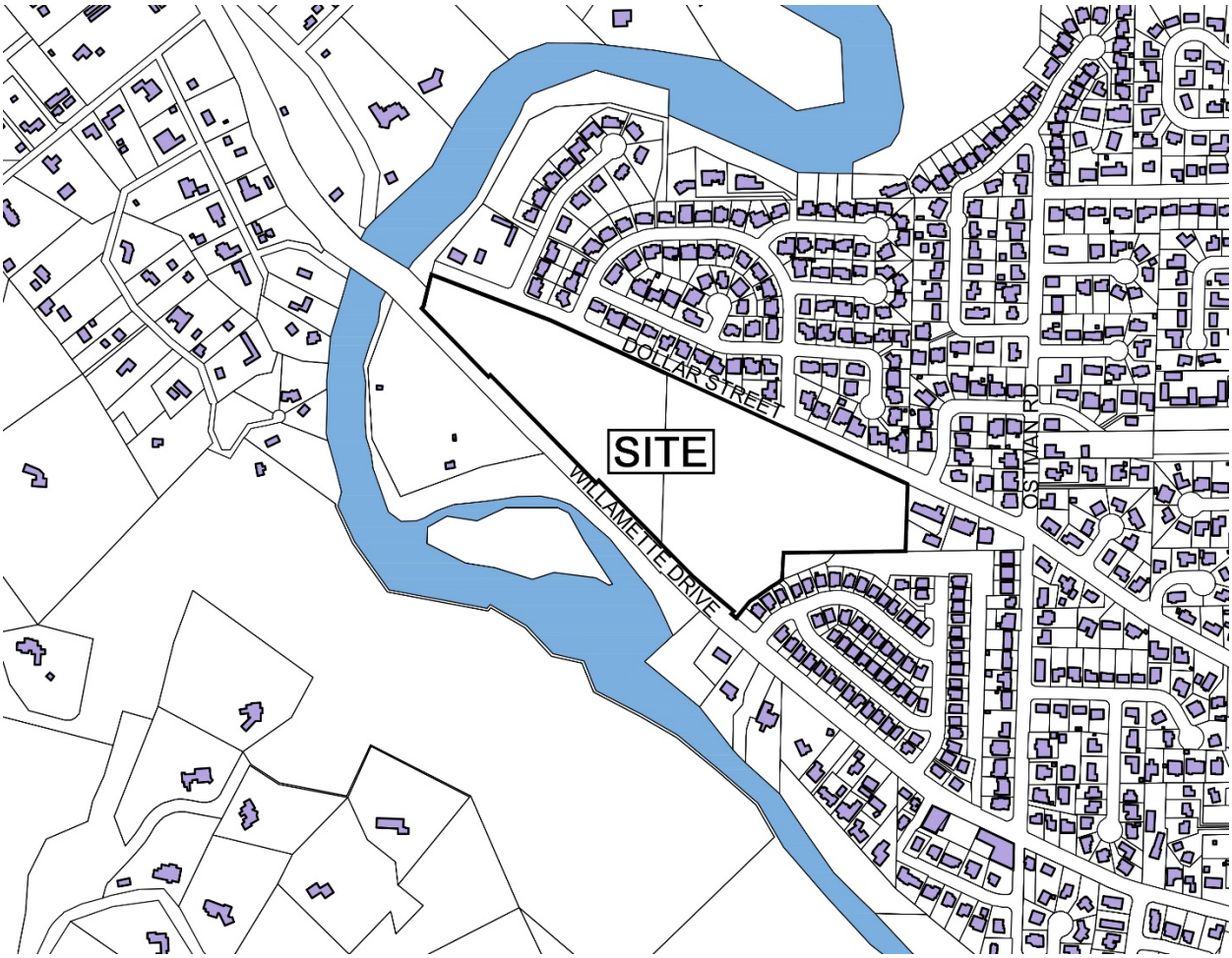
We are writing today to formally request a meeting with the neighborhood association. The City's code requires us to inquire as to whether you have a preferred date and time. If after 20 days from the date of this letter, we have not heard from you with a preferred meeting date, we will schedule a meeting, in accordance with the City's notification requirements.

Please note this will be an informational meeting based upon preliminary development plans and these plans may change before the application is submitted to the City. If the proposed meeting is acceptable, we would ask that you please respond to this letter with an email to mercedes.serra@3j-consulting.com. If you have any questions, feel free to call at 503-946-9365x211.

Sincerely,

Mercedes Serra
Senior Urban Designer
3J Consulting, Inc.

Copy: Julia Simpson, Willamette NA Vice President
Mary Baumgardner, Willamette NA Secretary
Elizabeth Rocchia, Willamette NA Treasurer



Vicinity Map

3J CONSULTING
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BEAVERTON, OREGON 97008
PH: (503) 946.9365
WWW.3JCONSULTING.COM

September 29, 2020

New Middle School at Dollar Street
Neighborhood Meeting Request

Dear Ms. Baumgardner,

3J Consulting acts on behalf of the West Linn-Wilsonville School District regarding a proposal for the New Middle school at the Dollar Street site. The new middle school is part of the 2019 Capital Bond Program which was approved by West Linn-Wilsonville voters in November 2019. The school property is located at 945 Dollar Street. The property can be legally identified as tax lots 21E34DC00900 and 21E34C00600. The site is zoned R-10 or Single Family Residential. The location of the proposed project is shown on the attached map.

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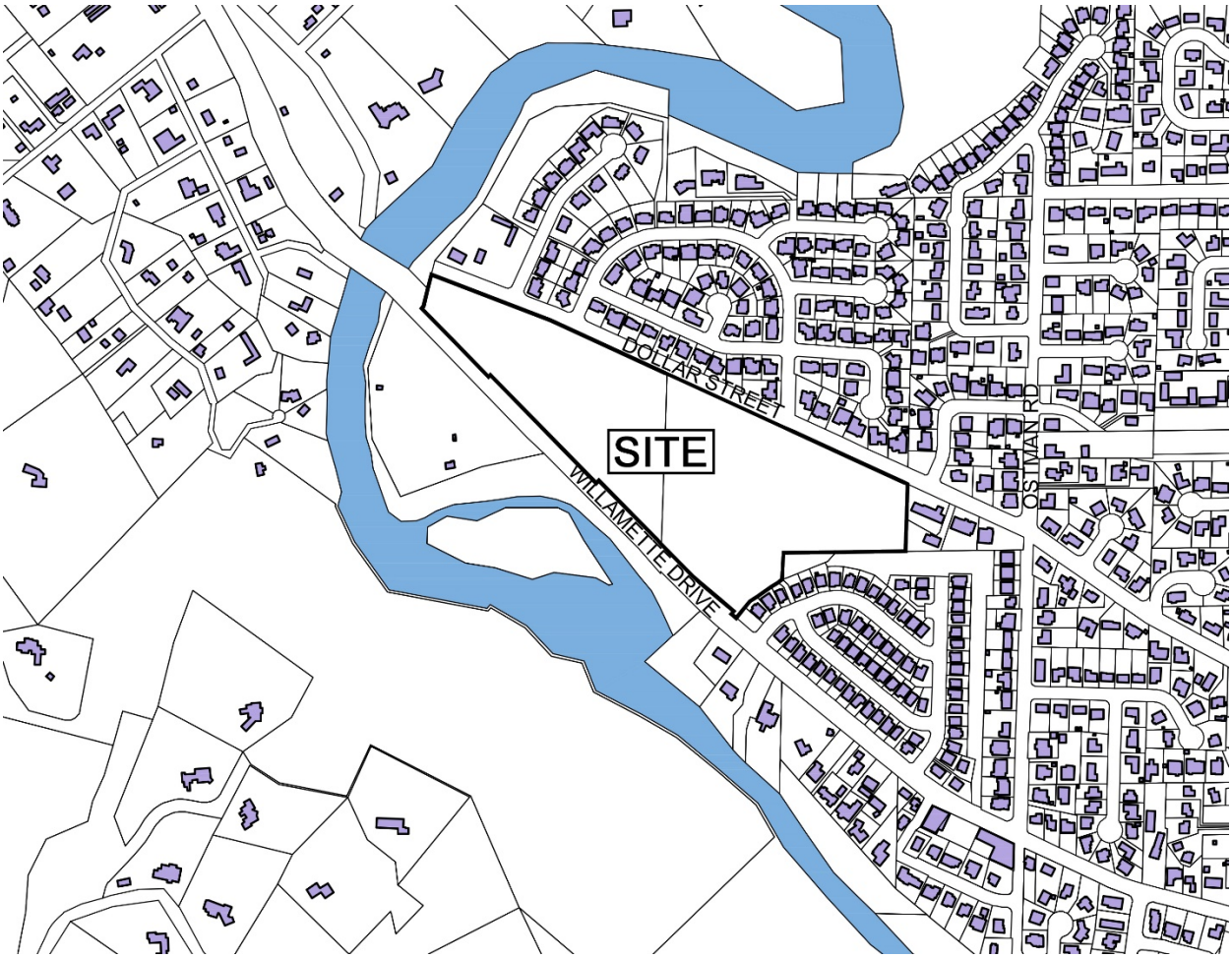
Sincerely,

Mercedes Serra
Senior Urban Designer
3J Consulting, Inc.

Copy: Kathie Halicki, Willamette NA President
Julia Simpson, Willamette NA Vice President
Elizabeth Rocchia, Willamette NA Treasurer



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WWW.3JCONSULTING.COM

September 29, 2020

New Middle School at Dollar Street
Neighborhood Meeting Request

Dear Ms. Rocchia,

3J Consulting acts on behalf of the West Linn-Wilsonville School District regarding a proposal for the New Middle school at the Dollar Street site. The new middle school is part of the 2019 Capital Bond Program which was approved by West Linn-Wilsonville voters in November 2019. The school property is located at 945 Dollar Street. The property can be legally identified as tax lots 21E34DC00900 and 21E34C00600. The site is zoned R-10 or Single Family Residential. The location of the proposed project is shown on the attached map.

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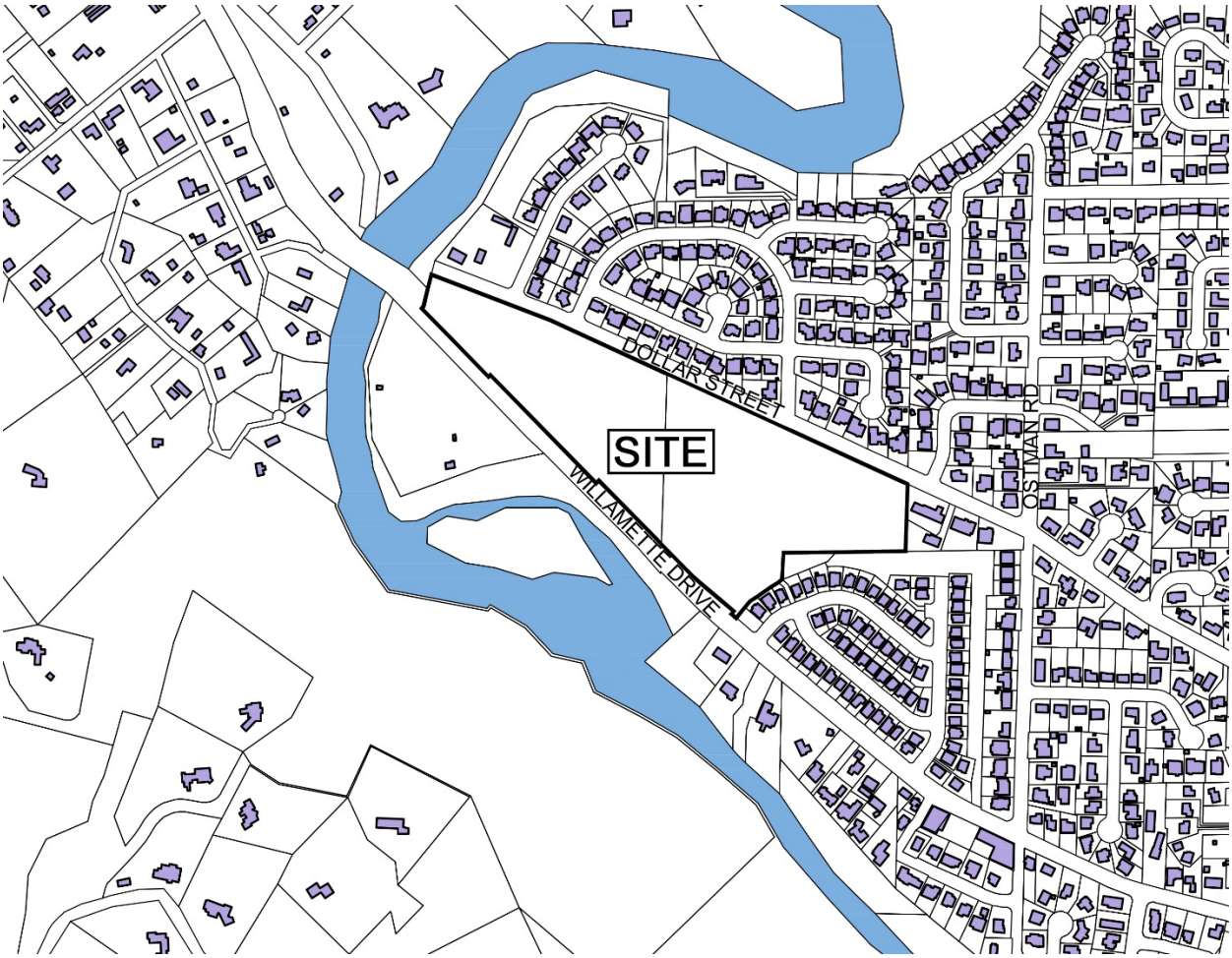
Sincerely,

Mercedes Serra
Senior Urban Designer
3J Consulting, Inc.

Copy: Kathie Halicki, Willamette NA President
Julia Simpson, Willamette NA Vice President
Mary Baumgardner, Willamette NA Secretary



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WWW.3JCONSULTING.COM

September 29, 2020

New Middle School at Dollar Street
Neighborhood Meeting Request

Dear Ms. Simpson,

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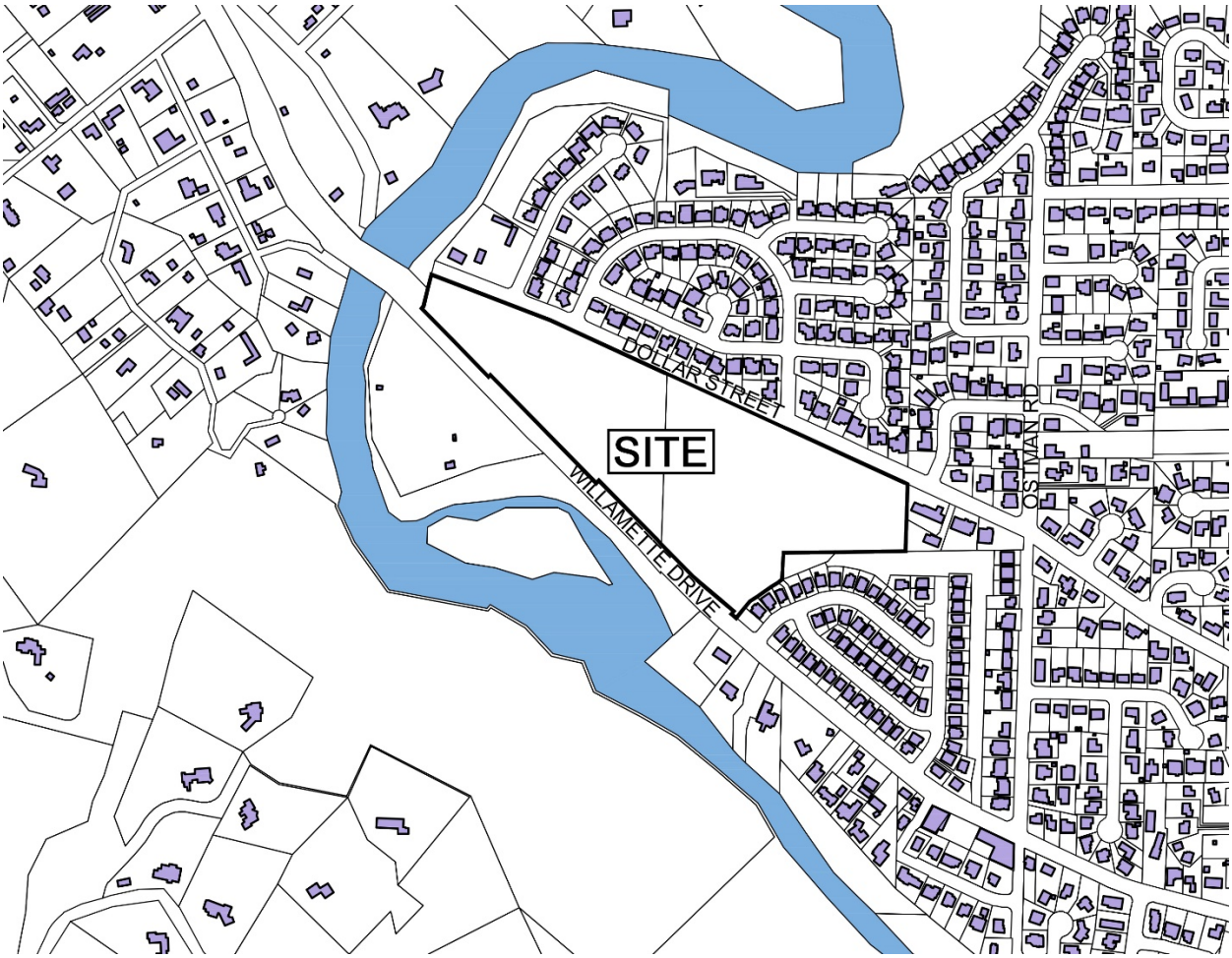
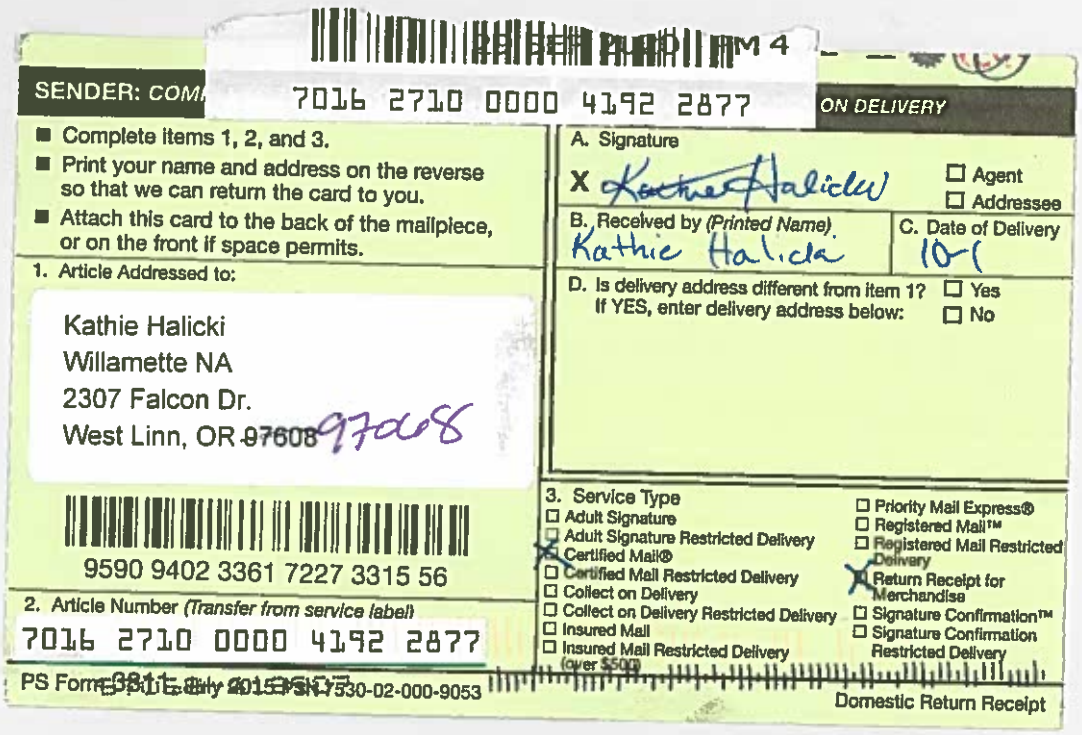
Sincerely,

Mercedes Serra
Senior Urban Designer
3J Consulting, Inc.

Copy: Kathie Halicki, Willamette NA President
Mary Baumgardner, Willamette NA Secretary
Elizabeth Rocchia, Willamette NA Treasurer



Vicinity Map



SENDER: COM

7016 2710 0000 4192 2877

ON DELIVERY

- Complete items 1, 2, and 3.
- Print your name and address on the reverse so that we can return the card to you.
- Attach this card to the back of the mailpiece, or on the front if space permits.

1. Article Addressed to:

Kathie Halicki
Willamette NA
2307 Falcon Dr.
West Linn, OR ~~97608~~ 97068

9590 9402 3361 7227 3315 56

2. Article Number *(Transfer from service label)*

7016 2710 0000 4192 2877

A. Signature

X Kathie Halicki ☐ Agent ☐ Addressee

B. Received by *(Printed Name)* Kathie Halicki

C. Date of Delivery 10-1

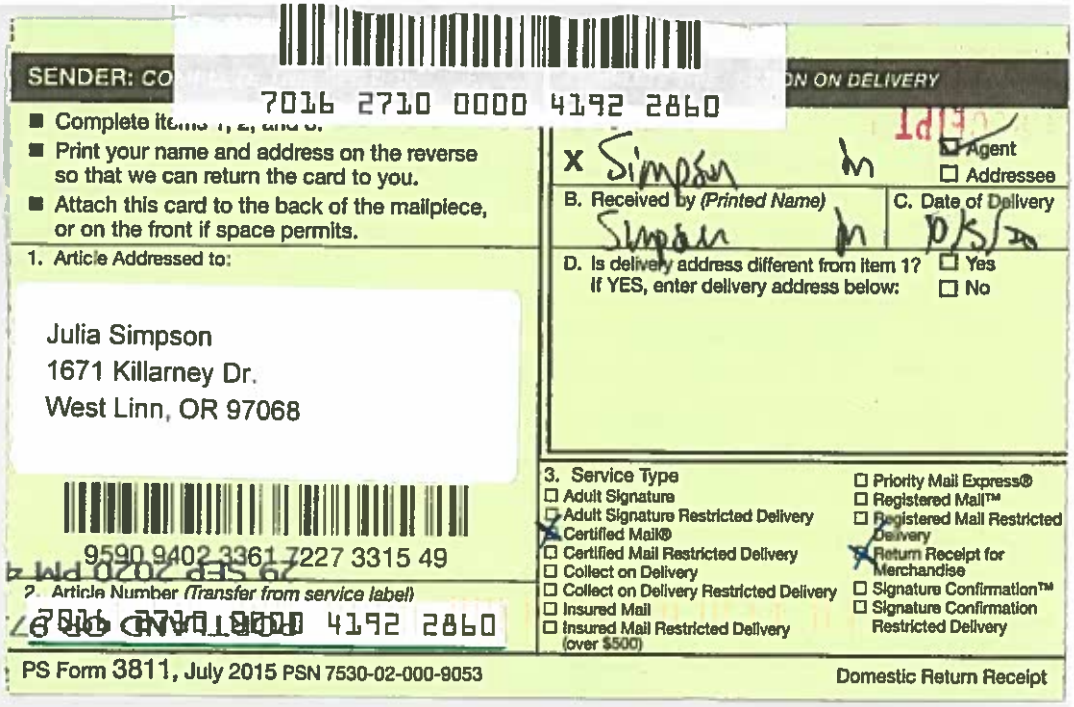
D. Is delivery address different from item 1? ☐ Yes
If YES, enter delivery address below: ☐ No

3. Service Type

- ☐ Adult Signature
- ☐ Adult Signature Restricted Delivery
- ☒ Certified Mail®
- ☐ Certified Mail Restricted Delivery
- ☐ Collect on Delivery
- ☐ Collect on Delivery Restricted Delivery
- ☐ Insured Mail
- ☐ Insured Mail Restricted Delivery (over $500)
- ☐ Priority Mail Express®
- ☐ Registered Mail™
- ☐ Registered Mail Restricted Delivery
- ☒ Return Receipt for Merchandise
- ☐ Signature Confirmation™
- ☐ Signature Confirmation Restricted Delivery

PS Form 3811, July 2015 PSN 7530-02-000-9053

Domestic Return Receipt



SENDER: CO

7016 2710 0000 4192 2860

ON ON DELIVERY

- Complete items 1, 2, and 3.
- Print your name and address on the reverse so that we can return the card to you.
- Attach this card to the back of the mailpiece, or on the front if space permits.

1. Article Addressed to:

Julia Simpson
1671 Killarney Dr.
West Linn, OR 97068

9590 9402 3361 7227 3315 49

2. Article Number (Transfer from service label)

7016 2710 0000 4192 2860

A. Signature

X Simpson

☐ Agent
☐ Addressee

B. Received by (Printed Name)

Simpson

C. Date of Delivery

9/5/20

D. Is delivery address different from item 1? ☐ Yes
If YES, enter delivery address below: ☐ No

3. Service Type

- ☐ Adult Signature
- ☐ Adult Signature Restricted Delivery
- ☒ Certified Mail®
- ☐ Certified Mail Restricted Delivery
- ☐ Collect on Delivery
- ☐ Collect on Delivery Restricted Delivery
- ☐ Insured Mail
- ☐ Insured Mail Restricted Delivery (over $500)
- ☐ Priority Mail Express®
- ☐ Registered Mail™
- ☐ Registered Mail Restricted Delivery
- ☒ Return Receipt for Merchandise
- ☐ Signature Confirmation™
- ☐ Signature Confirmation Restricted Delivery

PS Form 3811, July 2015 PSN 7530-02-000-9053 Domestic Return Receipt

7016 2710 0000 4192 2853

HIS SECTION ON DELIVERY

- Complete items 1, 2, and 3.
- Print your name and address on the reverse so that we can return the card to you.
- Attach this card to the back of the mailpiece, or on the front if space permits.

1. Article Addressed to:

Mary Baumgardner
1855 Joseph Fields St.
West Linn, OR 97068

9590 9402 3361 7227 3315 32

2. Article Number (Transfer from service label)

7016 2710 0000 4192 2853

A. Signature

X Robert F Bayly

☐ Agent
☐ Addressee

B. Received by (Printed Name)

Robert F Bayly

C. Date of Delivery

D. Is delivery address different from item 1? ☐ Yes
If YES, enter delivery address below: ☐ No

3. Service Type

- ☐ Adult Signature
- ☐ Adult Signature Restricted Delivery
- ☒ Certified Mail®
- ☐ Certified Mail Restricted Delivery
- ☐ Collect on Delivery
- ☐ Collect on Delivery Restricted Delivery
- ☐ Insured Mail
- ☐ Insured Mail Restricted Delivery (over $500)
- ☐ Priority Mail Express®
- ☐ Registered Mail™
- ☐ Registered Mail Restricted Delivery
- ☒ Return Receipt for Merchandise
- ☐ Signature Confirmation™
- ☐ Signature Confirmation Restricted Delivery

PS Form 3811, July 2015 PSN 7530-02-000-9053 Domestic Return Receipt

7016 2710 0000 4192 2846

SENDER: COMPLETE THIS SECTION

- Complete items 1, 2, and 3.
- Print your name and address on the reverse so that we can return the card to you.
- Attach this card to the back of the mailpiece, or on the front if space permits.

1. Article Addressed to:

Elizabeth Rocchia
957 Willamette Falls Dr.
West Linn, OR 97068
97068

9590 9402 3361 7227 3315 25

2. Article Number *(Transfer from service label)*
7016 2710 0000 4192 2846

COMPLETE THIS SECTION ON DELIVERY

A. Signature
X [signature] ☐ Agent ☐ Addressee

B. Received by *(Printed Name)* Eliz. Rocchia
C. Date of Delivery

D. Is delivery address different from item 1? ☐ Yes
If YES, enter delivery address below: ☐ No

3. Service Type
- ☐ Adult Signature
- ☐ Adult Signature Restricted Delivery
- ☒ Certified Mail®
- ☐ Certified Mail Restricted Delivery
- ☐ Collect on Delivery
- ☐ Collect on Delivery Restricted Delivery
- ☐ Insured Mail
- ☐ Insured Mail Restricted Delivery (over $500)
- ☐ Priority Mail Express®
- ☐ Registered Mail™
- ☐ Registered Mail Restricted Delivery
- ☒ Return Receipt for Merchandise
- ☐ Signature Confirmation™
- ☐ Signature Confirmation Restricted Delivery

PS Form 3811, July 2015 PSN 7530-02-000-9053 Domestic Return Receipt

3J CONSULTING
9600 SW NIMBUS AVENUE, SUITE 100
BEAVERTON, OREGON 97008
PH: (503) 946.9365
WWW.3JCONSULTING.COM

October 26, 2020

Athey Creek Middle School at Dollar Street
Neighborhood Meeting

Dear Neighbors,

3J Consulting acts on behalf of the West Linn-Wilsonville School District regarding a proposal for the new middle school at Dollar Street. The new middle school is part of the 2019 Capital Bond Program which was approved by West Linn-Wilsonville voters in November 2019. The school property is located at 945 Dollar Street. The property can be legally identified as tax lots 21E34DC00900 and 21E34C00600. The site is zoned R-10 or Single Family Residential. The location of the proposed project is shown on the attached map.

Before finalizing an application to the City's Planning Department for the proposed project, we would like to discuss this proposal with the members of the Willamette Neighborhood Associations and with property owners residing within 500 feet of the property. This is a special meeting hosted by the Willamette Neighborhood Association and will be the only item on the agenda for the evening.

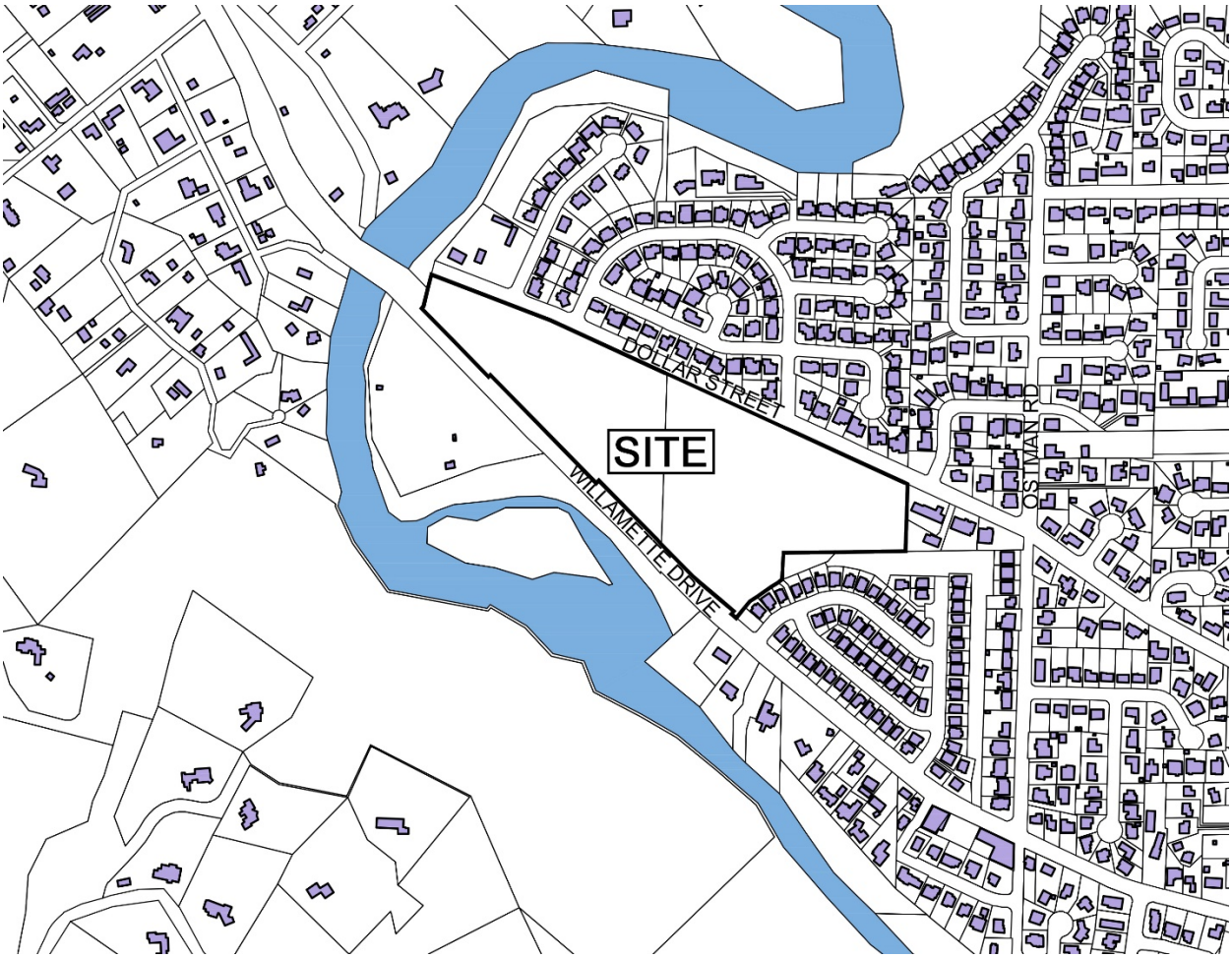
You are invited to attend a **VIRTUAL** zoom meeting on:
Wednesday, November 18, 2020 at 7:00pm
The meeting will be held via a web-based meeting platform
facilitated by the Willamette Neighborhood Association

The purpose of these meetings is to provide a forum for surrounding property owners and residents to review the proposal and identify issues so they can be given proper consideration. We invite you to join us, review the preliminary plans, and share any special information you may have about the property. The project team will try to answer questions related to how the project meets the relevant development standards consistent with West Linn's land use regulations. Please note that this will be an informational meeting based upon preliminary development plans and that these plans may change before the application is submitted to the City.

The ZOOM link will be provided in the Mail Chimp or on the City's website under the 11/18 Willamette Neighborhood Association Special Meeting. **If you would like to attend this web-based meeting, we would invite you to visit the City's website https://westlinnoregon.gov/Willamette.** We look forward to discussing the proposal with you. If you have questions on how to participate in the proposed meeting, please contact us at mercedes.serra@3j-consulting or (503) 946-9365x211.

Sincerely,

Mercedes Serra
Senior Urban Designer
3J Consulting, Inc.



Vicinity Map

21E34C 00100
Michael Hellweg
405 Miken Ln
West Linn, OR 97068-9112

21E34C 00200
Susie Mae Douglas-Matlock
420 Miken Ln
West Linn, OR 97068-9112

21E34C 00300-00500
City Of West Linn
22500 Salamo Rd #600
West Linn, OR 97068-8306

21E34CA00100
Caroline Attanasio
761 Nicole Dr
West Linn, OR 97068-4055

21E34CA00200
David & Joyce Deyoung
759 Nicole Dr
West Linn, OR 97068-4055

21E34CA00300
Christopher Williams
757 Nicole Dr
West Linn, OR 97068-4055

21E34CA00400
Alan Harvey Rosenus
20621 Lomita Ave
Saratoga, CA 95070-6023

21E34CA00500
Travis & Caroline Eddy
751 Nicole Dr
West Linn, OR 97068-4055

21E34CA00600
Michael & Julie Donovan
762 Nicole Dr
West Linn, OR 97068-4054

21E34CA00700
William & Lisa Prentice
758 Nicole Dr
West Linn, OR 97068-4054

21E34CA00800
Kenneth Cooper
754 Nicole Dr
West Linn, OR 97068-4054

21E34CA00900
Wu Yang
2250 River Heights Cir
West Linn, OR 97068-4052

21E34CA01000
Lee Schaber
2230 River Heights Cir
West Linn, OR 97068-4051

21E34CA01100
Debra Meyers
2220 River Heights Cir
West Linn, OR 97068-4051

21E34CA01400
Ronald Klimeck-Jones
2215 River Heights Cir
West Linn, OR 97068-4050

21E34CA01500
James & Robin Day
2225 River Heights Cir
West Linn, OR 97068-4050

21E34CA01600
Zachary & Kelly Nye
2235 River Heights Cir
West Linn, OR 97068-4053

21E34CA01700
Xiao Jun
2245 River Heights Cir
West Linn, OR 97068-4053

21E34CA01800
Donald & Diana Kunstel
2255 River Heights Cir
West Linn, OR 97068-4053

21E34CA01900
Kenneth Wong
2265 River Heights Cir
West Linn, OR 97068-4053

21E34CA02000
K & D Haag
2275 River Heights Cir
West Linn, OR 97068-

21E34CA02100
Kyle & Julianne Haskin
2195 Brandon Pl
West Linn, OR 97068-4056

21E34CA02200
P Shevlinsa II
2205 Brandon Pl
West Linn, OR 97068-4056

21E34CA02300
Dennis Allen
2215 Brandon Pl
West Linn, OR 97068-4056

21E34CA02400
Elizabeth & Adam Ballner
2225 Brandon Pl
West Linn, OR 97068-4056

21E34CA02500
Emanuela Anca
2245 Brandon Pl
West Linn, OR 97068-4056

21E34CA02600
Dennis & Victoria Vysotskiy
2255 Brandon Pl
West Linn, OR 97068-4057

21E34CA02700
Susan Groh
2275 Brandon Pl
West Linn, OR 97068-4057

21E34CA03500
Douglas & Olesya Denney
2230 Brandon Pl
West Linn, OR 97068-4056

21E34CA03600
James & Carol Markovics
2220 Brandon Pl
West Linn, OR 97068-4056

31E03AB02218
Rosalin & Richard Brooke
1047 Meek Way
West Linn, OR 97068-5401

21E34CA03900
Cindy Vandemarr
65 Dollar St
West Linn, OR 97068-9115

21E34CB00600
Frederic Ciccotelli
449 SW Alderwood Dr
West Linn, OR 97068-9102

21E34CB00700
Coombes
442 SW Alderwood Dr
West Linn, OR 97068-9102

21E34CB00800
Lesley Arle
444 SW Alderwood Dr
West Linn, OR 97068-9102

21E34CB00900
Lonnie & Mevelyn Kesterson
446 SW Alderwood Dr
West Linn, OR 97068-9102

21E34CC00500
Brandon Paxton
23750 SW Elderberry Ln
West Linn, OR 97068-9111

21E34DB02301
R Krippaehne
2125 River Heights Cir
West Linn, OR 97068-

21E34DB02302
Dennis Bresnahan
Po Box 2401
Wilsonville, OR 97070-2401

21E34DB02329
Rickey Holderbaum
2160 River Heights Cir
West Linn, OR 97068-4030

21E34DB02330
William & Laura Stallard II
2150 River Heights Cir
West Linn, OR 97068-4030

21E34DB02331
Earl Molander
2140 River Heights Cir
West Linn, OR 97068-4030

21E34DB02332
Garrett Winiecki
2130 River Heights Cir
West Linn, OR 97068-4030

21E34DB03000
Janet Smith
2200 River Heights Cir
West Linn, OR 97068-4045

21E34DB03100
Wallace & Barbara Fulbright
2190 River Heights Cir
West Linn, OR 97068-4045

21E34DB03200
Samuel Ray Bugarsky
2180 River Heights Cir
West Linn, OR 97068-4045

21E34DB03300
Margaret Schecter
2170 River Heights Cir
West Linn, OR 97068-4058

21E34DB03400
Katherine Stepp
772 Nicole Dr
West Linn, OR 97068-4048

21E34DB03500
Andrew & Kathryn Walker
2132 Johnyne Ct
West Linn, OR 97068-4049

21E34DB03600
Ekaete Ime Udoh
2142 Johnyne Ct
West Linn, OR 97068-4049

21E34DB03700
Karen Jarrett
2147 Johnyne Ct
West Linn, OR 97068-4049

21E34DB03800
Gregg & Dina Stults
2137 Johnyne Ct
West Linn, OR 97068-4049

21E34DB03900
Erik Miller
2133 Johnyne Ct
West Linn, OR 97068-4049

21E34DB04000
Timothy & Dana Edvalson
766 Nicole Dr
West Linn, OR 97068-

21E34DB04100
Bernd Scholz
763 Nicole Dr
West Linn, OR 97068-4046

21E34DB04200
Sandra Barton
767 Nicole Dr
West Linn, OR 97068-

21E34DB04300
Martha Robinson
4234 247th St
Little Neck, NY 11363-1641

21E34DB04400
Amy Mead
771 Nicole Dr
West Linn, OR 97068-

21E34DC00700
Gary & Marcia Saunders
940 Dollar St
West Linn, OR 97068-4026

21E34DC00800
Charles Orourke
950 Dollar St
West Linn, OR 97068-4005

21E34DC00801
Daniel & Diane Garrett
960 Dollar St
West Linn, OR 97068-4005

21E34DC01001
West Linn-Wils Sch Dist #3
22210 SW Stafford Rd
Tualatin, OR 97062-7738

21E34DC01002
Troy & Leslie Soenen
1028 Epperly Way
West Linn, OR 97068-5400

21E34DC01003
Daniel Peter Smith
1032 Epperly Way
West Linn, OR 97068-

21E34DC01004
Cornelia Taylor
1036 Epperly Way
West Linn, OR 97068-5400

21E34DC01005
Jake & Caroline Allbright
1044 Epperly Way
West Linn, OR 97068-5400

21E34DC01006
Bradley Kehm
1048 Epperly Way
West Linn, OR 97068-5400

21E34DC01007
Steve & Carol Elliott
1052 Epperly Way
West Linn, OR 97068-5400

21E34DC01008
Mary Ulinski
1056 Epperly Way
West Linn, OR 97068-5400

21E34DC01009
Familtrust Watt
1064 Epperly Way
West Linn, OR 97068-5400

21E34DC01010
Aaron Todde & Shauna Overman
1068 Epperly Way
West Linn, OR 97068-5400

21E34DC01011
Richard Baker
1072 Epperly Way
West Linn, OR 97068-5400

21E34DC01012
Derek Ryan Sandell
1076 Epperly Way
West Linn, OR 97068-5400

21E34DC01013
Youxiang Cheng
16889 Wight Ln
Lake Oswego, OR 97035-4521

21E34DC01014
Jill Mallery
1084 Epperly Way
West Linn, OR 97068-5400

21E34DC01015
Angela & Maximillian Morgan
1092 Epperly Way
West Linn, OR 97068-5400

21E34DC01016
Nicholas & Brittney Salisbury
1098 Epperly Way
West Linn, OR 97068-5400

21E34DC01017
Joi & William Ball
1834 Joseph Fields St
West Linn, OR 97068-4683

21E34DC01018
Daniel & Kasandra Anderson
1846 Joseph Fields St
West Linn, OR 97068-4683

21E34DC01019
Stacie & Jason Erdahl
1850 Joseph Fields St
West Linn, OR 97068-4683

21E34DC01020
Michael and Mary Baumgardner
1855 Joseph Fields St
West Linn, OR 97068-4683

21E34DC01021
Pat Gregg
1849 Joseph Fields St
West Linn, OR 97068-4683

21E34DC01022
Christopher & Lindsay Kane
1837 Joseph Fields St
West Linn, OR 97068-4683

21E34DC01023
Benjamin & Melissa Kirkup
1825 Joseph Fields St
West Linn, OR 97068-4683

21E34DC01024
Darrin & Micki Vanderberg
1813 Joseph Fields St
West Linn, OR 97068-4683

21E34DC01025
Rose & Peter Titterington
1801 Joseph Fields St
West Linn, OR 97068-4683

21E34DC01026
John & Dawn Mieras
1797 Joseph Fields St
West Linn, OR 97068-4682

21E34DC01027
Paul Moredock
1785 Joseph Fields St
West Linn, OR 97068-4682

21E34DC01032 & 05300
Jeffrey Jones
2025 Fields Dr
West Linn, OR 97068-4073

21E34DC01033
Amy & Dino Lenarduzzi
1053 Epperly Way
West Linn, OR 97068-5400

21E34DC01034
Elise Kunde
1065 Epperly Way
West Linn, OR 97068-5400

21E34DC01035
Huanfeng Zhu
1071 Epperly Way
West Linn, OR 97068-5400

21E34DC01036
Jeffrey & Sara Pisan
1075 Epperly Way
West Linn, OR 97068-5400

21E34DC01037
Nakita & Danny Hui
1079 Epperly Way
West Linn, OR 97068-5400

21E34DC01038
Michael Matthew Taylor
1085 Epperly Way
West Linn, OR 97068-5400

21E34DC01039
Tyrone Kohler
1089 Epperly Way
West Linn, OR 97068-5400

21E34DC01040
Kurt Shusterich
1093 Epperly Way
West Linn, OR 97068-5400

21E34DC01041
Matthew Hemsley
1097 Epperly Way
West Linn, OR 97068-5400

21E34DC01042
Kathleen Atkins
1096 Meek Way
West Linn, OR 97068-5401

21E34DC01043
Kuo-Hsin Huang
1088 Meek Way
West Linn, OR 97068-5401

21E34DC01044
Peter & Lynette Mihalik
1082 Meek Way
West Linn, OR 97068-5401

21E34DC01045
Roshan Fernando
1078 Meek Way
West Linn, OR 97068-5401

21E34DC01046
Chen Jung Tsai
1074 Meek Way
West Linn, OR 97068-5401

21E34DC01047
Xiaogang Du
21 Nightshade
Irvine, CA 92603-0640

21E34DC01048
John & Carly Bermensolo
1066 Meek Way
West Linn, OR 97068-5401

21E34DC01049
Doughlas Keil
1062 Meek Way
West Linn, OR 97068-5401

21E34DC01050
Property Owner
1058 Meek Way
West Linn, OR 97068-5401

21E34DC01051
Edward Mackin
1054 Meek Way
West Linn, OR 97068-5401

31E03AB02219
Dean & Jennifer Clark
1043 Meek Way
West Linn, OR 97068-5401

21E34DC01200
Cheryl & Fred Hall
1007 Dollar St
West Linn, OR 97068-4007

21E34DC01201
Jeff Kraus
1025 Dollar St
West Linn, OR 97068-4007

21E34DC01300
Dirk & Debra Hicks
1045 Dollar St
West Linn, OR 97068-4007

21E34DC01400
Michael Hironimus
1095 Dollar St
West Linn, OR 97068-

21E34DC01502-01504
Rosemarie Elze
16181 S Moore Rd
Oregon City, OR 97045-8377

21E34DC01505
Shirley Harkleroad
1970 Ostman Rd
West Linn, OR 97068-4320

21E34DC01600 & 01601
Brady Thurman Goss
1960 Ostman Rd
West Linn, OR 97068-4320

21E34DC01700
Michael & Kelsey Loverro
801 Nicole Ct
West Linn, OR 97068-4042

21E34DC01800
Timothy & Stacey Spengler
805 Nicole Ct
West Linn, OR 97068-4042

21E34DC01900
Wade & Bogdana Clarke
811 Nicole Ct
West Linn, OR 97068-

21E34DC02000
William Markt
20490 S Sweetbriar Rd
West Linn, OR 97068-9339

21E34DC02100
Charles & Teresa Wessling
851 Nicole Ct
West Linn, OR 97068-4042

21E34DC02200
Ronald & Janet Mobley
854 Nicole Ct
West Linn, OR 97068-4042

21E34DC02300
Kristine Albright
850 Nicole Ct
West Linn, OR 97068-4042

21E34DC02400
Bradley Stewart
455 Twilight Trl
West Linn, OR 97068-9357

21E34DC02500
Charles Herring
840 Nicole Ct
West Linn, OR 97068-4042

21E34DC02600
Barry Desbiens
836 Nicole Ct
West Linn, OR 97068-4042

21E34DC02700
Matthew Uelmen
830 Nicole Ct
West Linn, OR 97068-4042

21E34DC03200
Jason & Aubre Wessling
806 Nicole Ct
West Linn, OR 97068-4042

21E34DC03300
F Morgan & Janet Wheeler
800 Nicole Ct
West Linn, OR 97068-4042

21E34DC03400
Reita Campbell
2120 River Heights Cir
West Linn, OR 97068-4030

21E34DC03500
Pamela & Rex Bybee
770 Nicole Dr
West Linn, OR 97068-4047

21E34DC03600
Deborah Maria
773 Nicole Dr
West Linn, OR 97068-4046

21E34DC03700
Tara Menon
781 Nicole Dr
West Linn, OR 97068-4046

21E34DC03800
Gregg & Anita Havemann
2100 River Heights Cir
West Linn, OR 97068-4028

21E34DC04000
Philip Jr & Anne Culbertson
2206 Michael Dr
West Linn, OR 97068-4032

21E34DC04200
Jorge & Lindsay Torralba
2048 Fields Dr
West Linn, OR 97068-4072

21E34DC04300
Dana Myers
2036 Fields Dr
West Linn, OR 97068-4072

21E34DC04400
Jack Warren Snook
2024 Fields Dr
West Linn, OR 97068-4072

21E34DC04500
Eric & Nancy Christenson
3008 Hunter Ct
West Linn, OR 97068-2276

21E34DC04600
Michael & Nicole Rusk
2001 Fields Dr
West Linn, OR 97068-4073

21E34DC04700
Ryan & Maegan Tedmus
1088 Dollar St
West Linn, OR 97068-4071

21E34DC04800
Brian Lee & Carrie Brewer
2032 Ostman Rd
West Linn, OR 97068-4012

21E34DC04900
Roger & Jeannie Woehl
2054 Ostman Rd
West Linn, OR 97068-4012

21E34DC05000
Ryan Mathew Wirtz
2076 Ostman Rd
West Linn, OR 97068-4012

21E34DC05100
Craig Morgan
2007 Fields Dr
West Linn, OR 97068-4073

21E34DC05200
Deborah Fernando
2013 Fields Dr
West Linn, OR 97068-4073

21E34DC05400
Wade & Hannah Hall
2071 Fields Dr
West Linn, OR 97068-4073

21E34DC05500
Jeffrey & Megan Cox
2087 Fields Dr
West Linn, OR 97068-

21E34DC05700
Carly & James Bykoski
2074 Fields Dr
West Linn, OR 97068-4072

21E34DC05800
Todd & Stacey Mickey
2062 Fields Dr
West Linn, OR 97068-4072

21E34DC05900
William & Diane Mulligan
2050 Fields Dr
West Linn, OR 97068-4072

31E03AB01400
Andy and Elizabeth Rocchia
957 Willamette Falls Dr
West Linn, OR 97068-9101

31E03AB01500
Maureen Ann Bonfiglio
955 Willamette Falls Dr
West Linn, OR 97068-9101

31E03AB01600
Carol Dejardin
Po Box 193
West Linn, OR 97068-0193

31E03AB01700
Mark Tabor
951 Willamette Falls Dr
West Linn, OR 97068-9101

31E03AB01800
Jeffrey & Victoria Hood
949 Willamette Falls Dr
West Linn, OR 97068-9101

31E03AB02220
Andre & Leslie Abraham
1035 Meek Way
West Linn, OR 97068-5401

31E03AB02214
Holly Brown
1063 Meek Way
West Linn, OR 97068-5401

31E03AB02215
Marcus & Ellen Price
1059 Meek Way
West Linn, OR 97068-5401

31E03AB02216
Hyo Be An
1055 Meek Way
West Linn, OR 97068-5401

31E03AB02217
Michael & Darcy Hansen
1051 Meek Way
West Linn, OR 97068-5401

Kathie Halicki, President
Willamette NA
2307 Falcon Dr.
West Linn, OR 97068

Julia Simpson, Vice President
Willamette NA
1671 Killarney Dr
West Linn, OR 97068

NEIGHBORHOOD MEETING

AFFIDAVIT OF POSTING

STATE OF OREGON)

SS

County of Clackamas)

I, John Howorth, being duly sworn, state that I represent the party initiating interest in Type III Conditional Use Permit affecting the land located at 945 Dollar Street (Parcel Numbers 21E34C00600, 21E34DC00900 and 21E34DC01001) and that pursuant to Community development Code Section 99, did on the 27th day of October personally post notice indicating that the site may be proposed for a Conditional Use Permit application.

Six signs were posted along the frontage of the property along Willamette Falls Drive across from the west entrance to Fields Bridge Community Park; across from the east entrance to Fields Bridge Community Park; at the east end of the property nearest the crosswalk; and along Dollar Street across from the intersection of Brandon Place, River Heights Circle (west), and River Heights Circle (east).

(Location of sign on property)

This 27th day of October 2020.

Signature

Subscribed and sworn to, or affirmed, before me this 27th day of October 2020.

OFFICIAL STAMP
AUDREY L JONES
NOTARY PUBLIC - OREGON
COMMISSION NO. 990916
MY COMMISSION EXPIRES SEPTEMBER 03, 2023

Audrey Jones

Notary Public for the State of Oregon

County of Washington

My Commission Expires: September 3, 2023

NEIGHBORHOOD MEETING NOTICE

CONDITIONAL USE PERMIT

MEETING INFORMATION:

WEDNESDAY, NOVEMBER 18 AT 7:00PM

VIRTUAL COMMUNITY MEETING

TO ATTEND, PLEASE VISIT

HTTPS://WESTLINNOREGON.GOV/WILLAMETTE

OR CONTACT:

MERCEDES SERRA

MERCEDES.SERRA@3J-CONSULTING.COM

PHONE NUMBER: 503-946-9365 X211

Willamette Neighborhood Assoc. Special Meeting ZOOM 11/18/2020

Proposed building of Athey Creek Middle School on Dollar St.

Kathie brought the meeting to order at 7:00

The reading of the updates were waived until a later date.

This meeting was informational meeting as per Mercedes letter dated Sept. 29, 2020.

The documents (PDF and Google Drive) that were to be used in presentation, did not arrive until 4:04 on 11/18. We asked that they be supplied to us on or before the 9th of Nov.

The district had a pre-app meeting with the city on Nov. 18th at 10:00 am, leaving us just 7 hours to go through the information given by the city. There were no notes from the city due to small window of time. The email for the city went down on the 18th and did not come back up until the 23rd, so the public was not able to see information.

We had 98 ZOOM attendees.

Presentation = Dollar St. School (Athey Creek) is to be built to hold 850 students plus staff. There are 2 entrances to the school, one off Dollar (for staff and buses) and one off Brandon Lane (parent drop off and visitors). The staff entrance is at grade for the second floor while the visitor entrance is at grade for the first floor. Brandon Place is cut through the property to link up Dollar St. and Willamette Falls Dr. and is mandated by the city. There is to be a track with stadium lighting, at the top/flat part of the property (across Dollar St. from residents), but lower than Dollar St. The district will restrict lighting after 10:00pm.

Construction is to start in summer of 2021 and conclude by opening day in Sept. of 2023. Geo will be on site when construction is occurring.

The district is suggesting a round-about on Willamette Falls Dr. at the bridge. Clackamas County is the owner of the bridge and has not been made aware. Round-about would include both directions of Willamette Falls Dr., Brandon Place, Fields Bridge Park.

The school is to be 2 story and be built into the side of the hill. The outside construction will consist of dark brick, sheet metal trim in green and brown, storefront windows and “wood” siding. Most of the trees would be removed (with the exception of perhaps the perimeter).

Traffic count was done in May 2019 (prior to COVID-19 Impacts). AM peak hour trips for 850 students
In = 152 Out = 127 total of 279 (student, staff and buses).

Safe routes to school walking boundary = 1 mile wide sidewalk with separated bicycle facilities on WFD to be built along school frontage. Many residents thought that the traffic and walking numbers were not in the ball park, especially since tolling was not taken into account and neither was poor weather. Kids will not walk in the rain/cold.

Will submit application in late Jan. mid Feb. for this project.

May request another Willamette Neighborhood Assoc. meeting.

Verbal Questions & Answers

1). Any compensation for diminished value of home? NO

2). Does anybody on the School Council or on this project, live in this neighborhood?

3). Why don't you just expand at current Athey Creek campus?

4). frustration with I-205 tolling, round-about

4). Ostman not in compliance

5). Currently there are 9 fields at Athey Creek, why move school to property that can only have 1

6). Adjustment of round-about = too much slope, to close to bridge, must have city wide vote to encroach on Fields Bridge Park. (No impact to bridge for round-about)

7). Speed bumps on Dollar

8). Need to take the access off of Brandon Place and put it on WFD, otherwise that negates the benefit of Brandon Place, twice a day.

9). Flo Analitics states no need for this school for 10 years,

10). Issues with traffic (both on WFD and on Dollar) insufficient parking –especially for large events

11). Gate to stay closed on Dollar, but emergency vehicles can use

12). Likes design walks the property daily. Would like to be able to continue walking property.

13). Poor location for round-about not enough acreage, no good vision, safety issue.

14). Concerns with parents using Meek Way (Arbor Cove) to drop off/pick up students. Serious impact, people doing 35mph already.

15) Parking in neighborhood = fence along track to the edge of visitor parking. Slope may also deter.

16). Concerned that parents will use Fields Dr. to drop off/pick up students. Increase bus route in Safe Routes to school. Kids won't walk in poor weather.

17). Obligated to get rid of perimeter trees overhanging WFD

18). Is the decision already made? Negotiable? Are we just going through the motions?

19). How are questions to be answered? On the district website.

20). Safety issues = 2 rivers, no lighting on WFD, need flashing light/signal for students to cross WFD

Kathie adjourned the meeting at 9:32 pm

www.wlwv.k12.or.us/Domain/1963 click on link to survey then click on link to questions

steve.faust@3J-consulting.com

Questions & Comments from the chat of the meeting:

1). District has already spent more than $1.2 million, to date, on this project.

2). Such a shameless waste of money… this whole thing is fiscally irresponsible

3). The parking lot will be more than 200 ft. from the building

4). Are speed bumps allowed?

5). Middle schools in the district are down 81 students this year. Next year it will down an additional 106 students.

6). Primary schools are more than 1,200 under capacity.

Yes, the district enrollment is down this year…but this is due to COVID. Mr. McCabe's enrollment numbers did not provide this important context. Our district is down in enrolment this year, due to COVID, similar to every public school district in Oregon.

Kathy, it was down 126 students for 2019/20year, you need to tell the truth tonight.

"Our high school enrollment numbers and middle school enrollment numbers remain relatively stable to last year". The proceeding statement was provided by Kathy Ludwig. Problem is the middle school enrollment is down 81 students. We must hear the truth, and we are not tonight.

The kids that live within 1 mile is less than 100 students.

7). And yet the district proceeds with shoving this down our throats… what is their motive?

8). The motive is so that the Capital Projects employees will have jobs, even though we have plenty of capacity at the schools.

9) Why will leaning trees along WFD be removed? Is the street being widened?

10). Mr. Faust mentioned 20 responses after the last meeting – was that from the post-meeting survey or does it also include the concerns that were expressed in all of the Q & A during the meeting? I thought I remember about 70 questions during that meeting.

70 questions is correct

We are in the process of adding questions from the live session at the last meeting to the Q&A document available on the website. An updated document should be ready in the few weeks.

11). "We will do a study and get feedback" however regardless of the results and the feedback the project will go on. This is unfortunately about minimizing fallout.

12). So there is absolutely nothing that will stop this insanity? What about a lawsuit?

13). The traffic measurements made will be meaningless if I-205 eventually gets tolls, forcing both morning and afternoon traffic to turn Willamette Falls Drive into a near parking lot (along with parents, cars, and multiple buses, pedestrians, and kids on bikes). Plus, air quality in the morning and afternoon will be unhealthy on a regular basis with all the traffic. This is not good short/medium/long term planning for West Linn.

14). Are you aware that tolling is not in the distant future, but will start in 2023? No. How many of you (those working on this project) took the tolling survey? None responded. How much was the projected

increase in traffic come 2023? It needs to be expanded vastly more than just increased papulation as the tolling going in on 205 that is going to greatly increase traffic on WFD.

15). Did the traffic study take into effect, likely 205 tolls that will turn WFD into a major bypass?

16). In the Oct. 20th meeting we were informed that Art/Tech would be closed. This year sophomores are not allowed to attend. There is no reason for present Athey Creek to become Art/Tech.

17). Will people's comments on the online forum be provided ***verbatim*** to the public and for the record?

18). Will you be giving additional updated information from the last meeting or is the information the same?

19). Will the school be visible from Willamette Falls Dr. or will there be trees and vegetation planted to replace the trees being cut down?

20).What is the purpose of Brandon connecting to Dollar St.?

According to WL Planning the city has mandated that Brandon Pl. be put through.

Because Dollar St. is an illegal cul-de-sac.

This occurred when Dollars St. was vacated with the construction of Fields Creek Bridge. This is what makes this application different than the 1990's application when Dollar St. was not vacated. The large cul-de-sac that is now Dollar St. will make emergencies difficult if not impossible.

The school district didn't object to the vacating of Dollar Street which was done Fields Creek Bridge was built..

So the City of West Linn closed off Dollar Street against code and installed a stop sign that does not meet standards? So I guess we cannot expect them to do the right thing by not approving the permit to build a school…?

We are aware that Dollar St. is illegal and the district wants to make it worse?

21). Will solar collectors be used? Huge amount of roof surface.

22).Where are the 100+ cars going to park during school conferences, and larger events?

23) Concerned about the event parking impact on the River Heights Neighborhood. Where are all the cars going to park?

In your neighborhood and Arbor Cove. If the path is developed it will end up with parents parking cars in Arbor Cove neighborhood to access the school. If the path is improved from Arbor Cove, it will absolutely increase drop off/pick up traffic and overflow parking from the school. I would prefer not to see it improved/encouraged. Remember that the Arbor Cove path is very steep. I am 64 and it is not an easy walk up. It is not a practical path.

When WLHS was expended, the parking was not expanded sufficiently. The district came to a temporary "solution" to parking issue by getting permission for students to park on the bridges that go over 205. In the next 2-5 years those bridges will go away and parking will be back to where it started. Yes, this bond has added parking to school but it is for stadium use, so is still insufficient.

24). Where are the preferred event parking areas? There is not enough room in the visitor lot.

25). For those of us who live adjacent to Dollar St., this is obviously going to impact property values in a negative way. Will there be money set aside to compensate homeowners for diminished property values? No

26). Athey Creed Middle School currently has 9 fields. What is the thought process on why this proposed location will only have 1 field? At the last meeting, I believe you mentioned that students would be using Fields Bridge Park for sports activities. How does this impact the neighborhood use of the park if it is basically an extension of the school grounds?

27). Security question = most schools have just one unlocked primary entrance, but this design seems to have 2 primary entrances. How will security be handled?

28). Noise from school event will be intolerable. Was that even taken into consideration?

29). What plans do they have in case of either emergency lockdown/or emergency evacuation for the school and adjacent neighborhoods? Eg. When both kids and residents need to evacuate? What would be an active shooter emergency response plan? Has TVFR had an opportunity to review these plans?

30). When is the proposed breaking ground day?

31). Such a pretty design, but no regard for the neighbors. Not nearly enough parking for events. I can't even imagine how we will get into River Heights during construction. Will the Brandon Pl. connector be something the general public can use?

32).What a total disregard the district has for the citizens!!

33). What is the plan to help mitigate sound/noise/light and exhaust pollution that will increase for the residents of surrounding neighborhoods? Including 205 noise? The current trees provide sound buffer and absorb pollution.

34). The photometric map does not take into account the fog and mist we have during all and winter nights which amplifies and carries the light beyond the expected radius.

35). What is Rosemont's walking boundary student papulation? What percentage of kids that can walk, walk regularly?

36). The last meeting had an adjustment for walk/bike. 29% is incredibly optimistic.

37). What is the setback distance between the north edge of the proposed athletic field facility and the nearest residential property line? What criteria was used to determine that this setback distance is acceptable (please reference specific West Linn CDC code number). Do site constraints prohibit a greater setback distance? The 20 ft. setback that the architects reference from WL CDC is the dimension from a residence to the property line of that residence for a front or rear yard. This is very different situation than an athletic field. How does the architect team justify using this setback distance for the athletic field?

38). 150 kids currently live within walking radius. There is ***NO*** way 29% of the kids will walk/bike. Yep, they need to plan for ZERO. The walk/bike percentage at 29% is way too high. Completely unrealistic. Are they saying that 29% of 850 students would walk to school? That is 247 students!! What do they consider waking distance for 6^{th} – 8^{th} graders? Do we even have 250 students living within the walking distance? In Oct. 20^{th} meeting the 29% is based on only 450 students that will attend the Middle School here.

39). Isn't there a district mandated 1 mile no-bus zone? Couldn't that be where the data is from? Only 157 kids currently live within walking bounds, so that is nowhere near the estimate 250 that they assumed.

40). I never saw ANY evidence of a traffic study! Imagine 153 cars on WFD in the morning, all trying to drop off the kid. Gridlock! We live on Brandon Place and are terrified of the potential traffic and parking on our street. (We don' want the same situation the WL High School has). During rush hour, there will likely have diversion starting at Brandon Pl, and going through to Dollar/WFD. I noticed that Dollar/WFD was not included in the traffic area study. What happens when the tolling on I-205 begins and the traffic on WFD increases tremendously? Afternoon peak queue is mostly irrelevant. What is the queue for morning peak? How can a traffic study be complete without the street that the only other exit of the area? The public connection road to Brandon Pl. will significantly decrease safety for children in the neighborhood, and will have devastating impacts on traffic and home values. Have traffic studies been conducted specifically for Dollar and Brandon Pl.? The huge traffic impact to the failed intersection at Ostman & WFD has to be addressed. This is not a benefit to the West Linn Community.

41). What is the feasibility of re-evaluating the need for an 840 student school as we will NEVER go back to the way we were after COVID.

42). Wonderful design. Biggest issue is the roundabout. Why have it when there is little cross road traffic, primarily R & L turn movements. There is no room for the roundabout, there are vision impacts due to grade and the bridge. A center turn lane is much safer. So the queue goes halfway across the bridge. Is it structurally able to have cars, busses, and trucks sitting on it for long periods of time? Willamette Falls Dr. is not wide enough by the bridge to handle a roundabout, and the speed of cars coming down towards the potential roundabout will be too fast, as most of them are now.

43) Will you be reviewing and taking into consideration an independent traffic study, not paid for by the district?

44). I don't think the district is in touch with the community. Example: we have buses in the neighborhood providing lunches to students. Really, in this neighborhood… and at what cost with bus drivers and bus costs? Doesn't make sense.

45). How will a roundabout be placed onto the edge of the bridge? Bridge modifications are very costly. Can a roundabout be put there without impacting the bridge structure?

46). Will the district be building a sidewalk along WFD? How is it safe to walk now? Wait until the City adds sidewalks? What about lighting on WFD and crosswalks from the school across WFD? (Needs to be signal) In the meantime what is the traffic mitigation plan? There is not even a continuous sidewalk on Ostman. How will kids from Arbor Cove and Willamette area theoretically enter?

47). What is the distance of Safe Route to School? No scale on map. Would students have walked on day like today? (Cold, rainy). Can the School District provide scenarios for kids waking/biking to school from various points of waking boundary to pressure test the system and identify any gaps? Eg. No lights, no sidewalks, no crosswalks. Will the Safer Routes to School be completed by fall 2023? If not, what is the interim plan for students to safely walk or for additional car traffic for walking boundary residents? Are there ped entrances besides the roadway (Brandon Pl.)? That is a long way around to walk. It appears that there are not enough pedestrian access points fir walking/biking students to encourage walkability. Save the money…Kids will not walk.

48) We will have to live through 2 years of construction!!

49).When do you expect to submit your application?

50). There is usually 2-3 months after the pre – application conference before the required meeting with the affected neighborhood. Why the rush? Why isn't there a meeting before the design is submitted? It seems the district was more interested in engaging the school community early on, than the affected neighborhood. So many "Community Meetings!"

51). The district plans for a growth of an additional 200 students. What neighborhoods will they come from and how will that impact transportation and traffic? (Long Range Planning Report assumes minimal

growth N=23 students in the next 10 years for Willamette, so this increase will NOT walk). The Long Range Plan was off by 424 students last year, now it is 1000 students below plan.

52). What's the LED rating?

53). All parties engaged and employed on this project, including School Board members, should disclose any/all real or potential vested professional interest in housing developments, particularly Stafford/Borland Housing Developments.

54). We have all asked these questions… the District is marching on… "listening," is just a "check the box" activity on the project plan. It is indeed a "check the box" exercise.

55). The first NA meeting was mostly Q & A with very few As.

56). We need speed bumps on Dollar.

57) When drivers get stuck in traffic on Dollar they will find another route. I am very concerned about rush hour drivers diverting from WFD onto Brandon Pl. and then driving up Dollar St. to avoid the backup. It seems that additional slowing devices should be incorporated into the design –perhaps speed bumps on Dollar St: speed bumps on Brandon Pl. and additional stop signs on Dollar St. between Brandon Pl. and Ostman. First responders don't like speed bumps.

58). Other than planting a few additional trees, what specifically has changed given all the community input saying the school is not needed?

59). Just reckless spending

59). By the time the City process begins, the plans are set unless it can be shown they do not meet code. When you say you submit the application to the city, is it the city council who will ultimately approve or not approve the final plan? When exactly will this decision by the city be made? The city council would decide an appeal. This will get kicked to the City Council after the Planning Commission's decision, and then perhaps to LUBA. Do the WL City Commissioners need to approve the district's and WL Planning Commission recommendations? It seems that efforts should be focused on the city council. It is clear that the process is just another box checked. It is more than that since 39% that attend Willamette, and many of those live on the other side of the freeway, and cannot walk to Dollar Street. The number who live near the school is less than 100. Not a neighborhood school

59). This is another Sunset Primary situation.

60) You are deflecting and not provided substantive feedback and actively hearing the concerns.

61) You mentioned minimizing parent traffic on Dollar. What about minimizing or discouraging public traffic on Dollar? If there is means put in to dissuade parents from dropping off kids on Dollar, which seems good to reduce traffic on Dollar. But how can 30% of kids walk to school when you aren't putting in pedestrian entrances because we also want to avoid incentivizing kid drop offs on Dollar St.

62). According to Andrew Tull of 3j Consulting, the Athey Creek site is being saved for all of the houses that will be built in the Stafford Hamlet. OMG I hope not. That does help explain the district's motive for shoving this down our throats…

63) My questions of the district were not answered.

64) This is not an appropriate site for a school of this size, the project should have been paused early on when the district was presented with so much opposition, But, the district just keep moving forward.

65). Other than the building contractors, who really benefits from this school project? It is, Andrew Tull with 3j, he has been an officer with the Home Builders Assoc. The belief everybody will want to live near 205 to get around. To make way for development at Stafford in the distant future. Who will make mega bucks if current ACMS is converted to housing? I guess me for one, as I live in Stafford, but I have no desire to sell until I die. But there are some that want to sell their land, but it is not supposed to occur until after 2030. Home Builders want it now.

66). Too many open enrollment students in the district. Last year 400 students.

67) First they destroy Historic Willamette charm and now this, so sad.

68) The district should just lease new space, it's just 70 students (Art/Tech) now. There are several vacant office properties because of economic downturn and COVID, including World of Speed. What a perfect place for Art/Tech. orientated 3rd high school.

69).They could convert one of the many under enrollment primaries, such as Bolton or Cedar Oak at less than 50% capacity. So many other options that the district seems hell-ben on NOT considering… A remodel of a primary is much cheaper, since nobody really wants to go to Art/Tech as it is now 70 students. They just need to build a new Art/Tech school some place, like where most of the Art/Tech students are from, Wilsonville.

There is more money in new construction. Interesting that he is using "cost" of building in the future, but not the excessive cost to build THIS school on this property!!!

How is this property best suited for the population that it serves? 60% live outside the Willamette area and the growth expected is outside the area as well.

70). If they slow down the traffic that we are already frustrated with, how is this going to help us?

71)The bond was passed and they are required to do this project due to the bond. That is why they are shoving it down our throats and why we should not have approved the bon. They are now legally required to try to do the project. That is why it doesn't matter what we say. They will push this through. It has to be stopped by Planning Commission and City Council, and then LUBA, higher court. That is the only way it will not happen. But we have to have all the correct legal reasons to make it not get pushed through by the higher courts. It was rather despicable how it was placed on the ballot… started off with "necessary electrical upgrades.. blah blah blah…Dollar Wood School. The bond did specifically have the Dollar School in it. It was the bulk of the bond at over $80M. They can give the money back to bond holder and forget the whole thing. Problem is they issued the bonds at 5% to get a $10M dollar premium. I listened to the school board meetings leading u to them putting the bond together. They basically said they needed to figure out a way to spend $200M to renew the bond. If they renewed the bond for less money, the it would be hard to pass in the future, To justify the $200M, they needed a big project, like the Dollar School. But not all of the bond has been issued, so even though they asked for many things, but they are also building items that were not listed. I asked the district what would happen if they couldn't build. Could bond money be refunded? He said no. They would spend it somewhere else, so this was all a ploy to get money. I was shocked that is how we manage budgets, spend and Bonds existing and added to our property taxes, and no I'm not against taxes, just appreciate proper governance and budget management. These school board members should be sued for fiscal irresponsibility!! They have 3 years t use the bond funds or send it back to the bond holders (federal law). There are so many other ways that public dollars could bring more "good" to our community. The district did not want to give up the $3/$1000 of assessed value for CIP as previous Bonds expire. District didn't want taxpayers to get to paying less and then have to come back when there was a real need for more schools.

72). It seems, that as a first concrete step, the focus should be on getting things changed through the City Council. There are less expensive and disruptive alternatives that can much better meet the needs of WL.

73). Perhaps suing is an option, but there is an election for 3 positions in May 2021. Choose people who will listen.

74). If Brandon Pl. extension is required by code for emergency access, have you considered gating the entrance from Brandon so that public traffic isn't allowed, but it is still accessible for emergency vehicles? So a gate would work?

75). What is sidewalk infill?

76). There are 185 proposed parking spaces in this Athey Creek plan. That is not enough for back to school nights as Athey now fills in Stafford and Athey parking for back to school nights.

77). Parents will drop off on River Heights Circle, and the kids will walk to the staff parking lot, then traffic will go down River Heights to Brandon PL

78). The school district already sold it to developer, who didn't build in time and lost $500.K…the district collected $500.K and kept the land. The River Heights developer was offered the land at the time they built River Heights and TURNED IT DOWN because it was TOO EXPENSIVE to build on. But they could sell it again, right? Yes, but it's not easily buildable land, it is expensive to make it buildable which is one of the issues. It is true they could sell it and houses could be built. Or they could build a smaller school, like an outpost of CREST. They could sell it, or we as citizens could fundraise to buy the land as a park for the city, similar to how Savanna Oaks Park was saved. Yes, they could sell it. The developer who put money down was going to build but housing went south so he had to back out. It was my understanding that he has the first chance to buy, if they do decide to sell. Yes, I think we would all have an easier time to support an outdoor school. They did sell it to Renaissance Homes as the lack of population growth showed no need for the land. But in 2008 he defaulted on the purchase and the value of the land crashed. So the board was holding the land until the market would really recover. The developer planned a densely developed neighborhood, and then had to give up the property in 2008 when he was hit by recession and declared bankruptcy. The neighborhood he proposed would probably have caused more traffic issues than a school. It wasn't going to be high density, just go to River's Edge at Blankenship (those are not high density) The best use of the property is a nice park. Everybody walks through the woods first, then through Fields Bridge Park. Walking up and down Dollar St. is now done. METRO can also buy the land. They have purchased 2 parcels within 1,000 ft. of this site, one being more than 40 acres in just the past 3 years. If you go to the METRO site to see the land purchases. Just contact the METRO representatives to get it started, I have. This only works if the district is willing to sell, which they are not.

79). How do we get a special election to call out the misleading language of the bond which has led us here? All bonds are written to pass, it is incumbent on each of us to do our due diligence before voting. Great question, is that even possible? They used the listserv, which should not be done, to mislead the voters. It should never be done again. Look at all the elections to recall officials, repeal legislation, ect.

80). I don't think that anyone on this call is against education/children... and the info shared about taxes is deeply disturbing. It would be great if we could save in property taxes, get together, buy this property from the district and save as a shared natural space. This property needs to be a park.

81). When will the district provide a comprehensive side by side comparison of facilities provided at the current Athey Creek School and those at the proposed new middle school? This has been requested numerous times through various avenues and has not yet been provided.

82) Having the required meeting with WNA just 9 hrs. following the pre-application conference required by the city is deliberately circumventing the public process intended by City code..

83). How many students at 3rd high school to open in 2023? They say 300 – 500, but Art/Tech is closing after next year and right now they only have 70 students. The truth is the 3rd high school s for homes being built in Stafford, even though it will be more than 10 years from now. They say look at all of the development at Frog Pond. After the Street of Dreams last year, no additional building has taken place in Frog Pond. People are afraid to move to Wilsonville and have to go to one primary that is more than 250

students below capacity as the test scores for that primary school on average are below 50% of standard.

84). Q & A Neighborhood meeting (WNA) please, rather than just a listen webinar. Thank you.

WEST LINN ATHEY CREEK MIDDLE SCHOOL RELOCATION

TRANSPORTATION IMPACT STUDY

OCTOBER 21, 2020

PREPARED FOR:

West Linn-Wilsonville School District

PREPARED FOR WEST LINN-WILSONVILLE SCHOOL DISTRICT

Remo Douglas, Office of Capital Construction

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INTRODUCTION

The purpose of this transportation evaluation is to determine the transportation impacts of the proposed relocation of Athey Creek Middle School from the current location north of Borland Road to the proposed site approximately three miles southeast along Willamette Falls Drive near Dollar Street. The new school will be approximately 109,000 square feet with an estimated future student population of 850. It is anticipated that the school will be completed and open for the 2023-2024 school year. Table 1 provides more details regarding the study area and characteristics of the proposed project.

TABLE 1: STUDY AREA AND PROPOSED PROJECT CHARACTERISTICS

STUDY AREA	
NUMBER OF STUDY INTERSECTIONS	Four
ANALYSIS PERIODS	Weekday AM (8:00 to 10:00) and Midday (3:00 to 5:00) peak hours
PROPOSED DEVELOPMENT	
SIZE AND LAND USE	850 student middle school Currently Vacant 21 Acre Lot
PROJECT TRIPS	279 AM Peak Hour Trips (152 in, 127 out) 211 Midday Peak Hour Trips (98 in, 113 out)
VEHICLE ACCESS POINTS	Access to the school will be provided via a new extension road, Brandon Place. One full access driveway will connect to the Brandon Place extension, and an entrance for busses and staff only will be included off of Dollar Street.
OTHER TRANSPORTATION FACILITIES	
PEDESTRIAN AND BICYCLE FACILITIES	There is an existing multi-use path on the south side of Willamette Falls Drive.
TRANSIT FACILITIES	The nearest bus stops are located approximately 500 feet north of Dollar Street on Ostman Road, on the northwest corner of Willamette Falls Drive/Ostman Road, and approximately 1,000 feet east of Ostman Road on Willamette Falls Drive for Route 154-Willamette/Clackamas Heights.

EXISTING CONDITIONS

This section discusses the conditions of the existing site including the study area, existing traffic volumes, and traffic operations.

STUDY AREA

Athey Creek Middle School has a 684-student population[1] and is located just north of I-205 off SW Borland Road in Clackamas County. The proposed location for the relocated Athey Creek Middle School is approximately three miles southeast of the existing location in the City of West Linn. The existing school location and driveways, proposed relocation site, and study intersections are shown in Figure 1. The area where the relocated middle school is proposed is currently zoned as low-density residential (R-10) which allows for schools as a conditional use.

The following sections present the existing characteristics of the study area for the proposed relocation including the bicycle and pedestrian facilities, the public transportation services provided in the study area, and a summary of the roadway network. Additionally, any City projects that are currently planned near the proposed school relocation are discussed.

FIGURE 1: STUDY AREA

[1] Student enrollment was 684 in March 2019 when the traffic counts were collected.

ROADWAY NETWORK

Key roadways near the proposed school site include Willamette Falls Drive, Ostman Road, and Dollar Street. The jurisdiction, functional classifications, and characteristics of each of the study area roadways are listed in Table 2.

TABLE 2: STUDY AREA ROADWAY CHARACTERISTICS

ROADWAY	FUNCTIONAL CLASSIFICATION	JURISDICTION	LANES	POSTED SPEED	SIDEWALKS	BIKE FACILITIES
WILLAMETTE FALLS DRIVE	Minor Arterial	West Linn	2	30	Partial [a]	Partial [a]
OSTMAN ROAD	Collector	West Linn	2	25	Partial [b]	No
DOLLAR STREET	Local	West Linn	2	25	Yes	Partial [c]

[a] There are sidewalks and a bicycle lane along the north side of Willamette Falls Drive for approximately 1,350 feet west of Ostman Road to the marked pedestrian crossing. A shared-use path is provided along the south side of Willamette Falls Drive between the marked pedestrian crossing and the Tualatin River Bridge.
[b] Sidewalk currently exists on most of the east side of Ostman and along a some stretches on the west side.
[c] There is an unmarked 6-foot lane along the north side of Dollar Street.

BICYCLE AND PEDESTRIAN FACILITIES

The site for the proposed relocated middle school is substantially more accessible by walking and biking since it is adjacent to an existing neighborhood within the City of West Linn as compared to the current Athey Creek Middle School location that is in rural Clackamas County. There is a multi-use path that connects Fields Bridge Park to Willamette Falls Drive at Epperly Way. There are sidewalks and bicycle lanes along the north side of Willamette Falls Drive from Ostman Road to Epperly Way, where there is a marked crosswalk with signage connecting to the multi-use path. West of this crossing there are no sidewalks or bicycle lanes along Willamette Falls Drive. Ostman Road and Dollar Street do not have marked bicycle lanes; however, Dollar Street has a large paved shoulder. There are sidewalks along the North side of Dollar Street while there are partial sidewalks along Ostman Road.

PUBLIC TRANSIT SERVICE

TriMet provides public transportation services between West Linn's Willamette neighborhood and Clackamas Heights via Oregon City Transit Center, traveling along Willamette Falls Drive, Abernethy, and Holcomb on route 154-Willamette/Clackamas Heights. Currently, the closest bus stops to the proposed school site are located approximately 500 feet north of Dollar Street on Ostman Road, on the northwest corner of the Willamette Falls Drive/Ostman Road intersection, and approximately 1,000 feet east of Ostman Road on Willamette Falls Drive.

PLANNED PROJECTS

The 2016 City of West Linn Transportation System Plan (TSP) lists the following capital projects that impact the key roadways near the proposed school site.[2]

- Willamette Falls Drive/Ostman Road: Widen Willamette Falls Drive with center median 500' on each side of intersection to allow for two-stage left turn from Ostman Road. Install all-way stop-control when warranted. (Project M4-Low Priority)

It should be noted that an all-way stop-control was installed at the intersection in 2016. The two-way center turn lane has not been installed.

EXISTING TRAFFIC VOLUMES

Traffic counts were collected for the AM peak period (8:00 am – 10:00 am) and Midday peak period (3:00 pm – 5:00 pm) on a Thursday when school was in session.[3] These peak periods were selected for traffic count collection in order to capture the start and end of school.

The traffic volumes were collected during the spring of 2019 (prior to the COVID-19 pandemic that has impacted traffic volumes). In order to analyze the study intersections for the 2020 existing conditions, the 2019 traffic volumes were grown by an annual rate of 1.15% for one year. The average annual growth rate was estimated from the Metro Travel Demand Model. The 2020 traffic volumes used in the existing conditions analysis are shown in Figure 2. The detailed two-hour traffic counts are included in Appendix A.

[2] West Linn Transportation System Plan., March 28, 2016.

[3] Traffic counts were collected on May 16, 2019 by All Traffic Data.

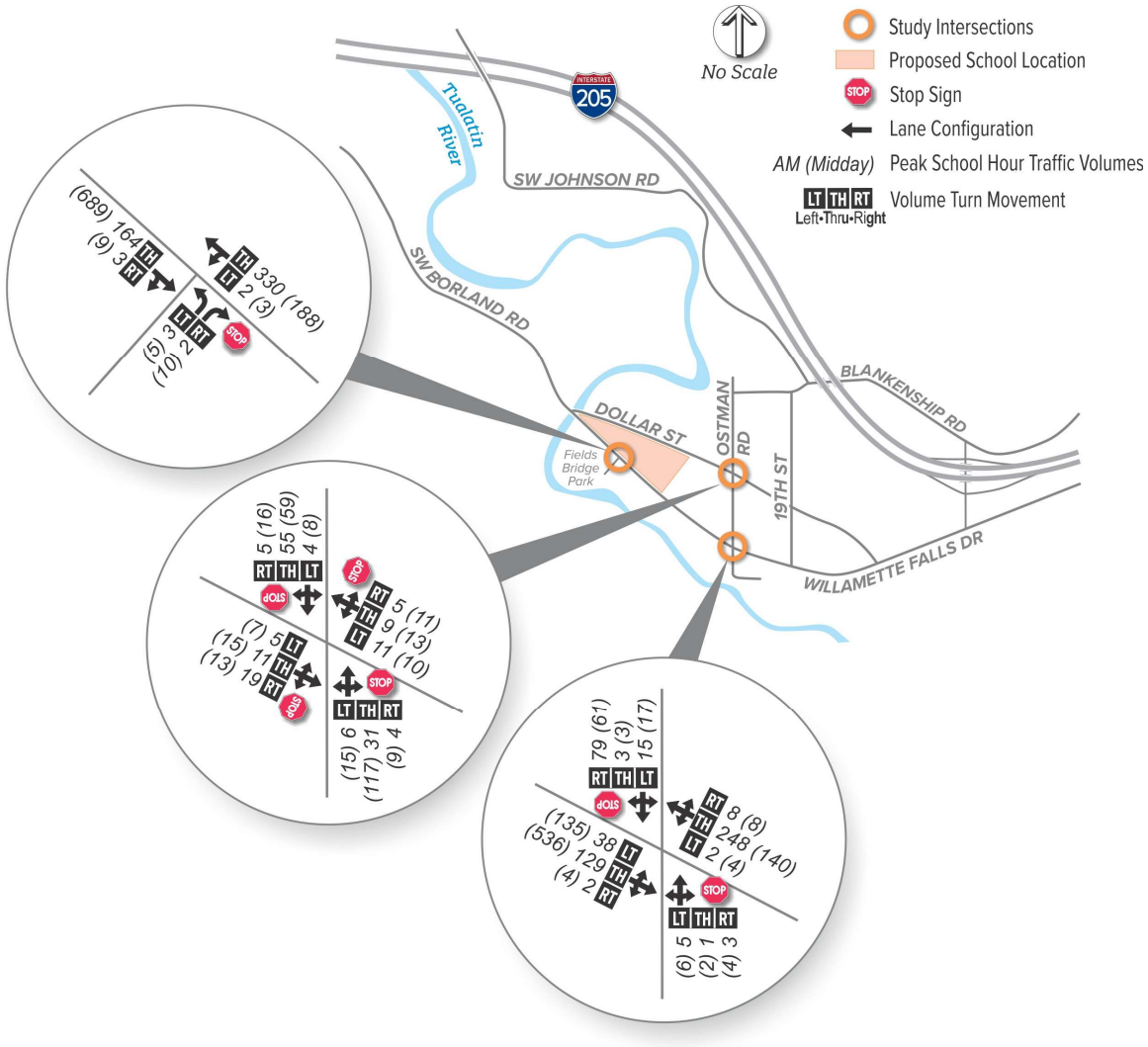

FIGURE 2: 2020 EXISTING TRAFFIC VOLUMES, LANE GEOMETRIES, AND TRAFFIC CONTROL

EXISTING TRAFFIC OPERATIONS

An analysis of the 2020 existing intersection operations was performed for the study intersections to determine the current operating conditions of the study area transportation network. Intersection operations were analyzed for the AM and Midday peak hours, which is when project and study area traffic volumes are expected to be the highest due to typical work, school, and commuter trends. Three existing study intersections were identified for data collection and analysis:

- Willamette Falls Drive/Fields Bridge Park
- Willamette Falls Drive/Ostman Road
- Dollar Street/Ostman Road

INTERSECTION PERFORMANCE MEASURES

Level of service (LOS) ratings and volume-to-capacity (v/c) ratios are two commonly used performance measures that provide a good representation of intersection operations. In addition, they are often incorporated into agency mobility standards.

- Level of service (LOS): A "report card" rating (A through F) based on the average delay experienced by vehicles at the intersection. LOS A, B, and C indicate conditions where traffic moves without significant delays over periods of peak hour travel demand. LOS D and E are progressively worse operating conditions. LOS F represents conditions where average vehicle delay has become excessive and demand has exceeded capacity. This condition is typically evident in long queues and delays.
- Volume-to-capacity (v/c) ratio: A decimal representation (typically between 0.00 and 1.00) of the proportion of capacity that is being used at a turn movement, approach leg, or intersection. It is determined by dividing the peak hour traffic volume by the hourly capacity of a given intersection or movement. A lower ratio indicates smooth operations and minimal delays. As the ratio approaches 0.95, congestion increases, and performance is reduced. If the ratio is greater than 1.00, the turn movement, approach leg, or intersection is oversaturated and usually results in excessive queues and long delays.

The study intersections are required to meet the City of West Linn standard for an unsignalized intersections to operate at or below LOS D.[4]

INTERSECTION ANALYSIS

The existing traffic operations at the study intersections were evaluated for each peak hour using HCM 6th Edition Highway Capacity Manual methodology for unsignalized intersections.[5]

The volume to capacity (v/c) ratio, delay, and level of service (LOS) of each study intersection are listed in Table 3. The HCM reports are provided in Appendix B. For further explanation on how the LOS is determined, please refer to Appendix B.

As shown, all study intersections meet the operating standard (LOS D) for the existing conditions.

[4] Comprehensive Plan, Goal 12, Page T-8, West Linn, Updated July 2017.

[5] Highway Capacity Manual, 6th Edition, Transportation Research Board, 2017.

TABLE 3: EXISTING 2020 STUDY INTERSECTION OPERATIONS

INTERSECTION	CITY OPERATING STANDARD	AM PEAK			MIDDAY PEAK		
		V/C	DELAY	LOS	V/C	DELAY	LOS
TWO-WAY STOP CONTROLLED							
WILLAMETTE FALLS DR/FIELDS BRIDGE PARK	LOS D	0.01	11.6	A/B	0.05	16.2	A/C
ALL-WAY STOP CONTROLLED							
WILLAMETTE FALLS DR/OSTMAN RD	LOS D	0.35	9.8	A/A	0.91	35.0	B/D
DOLLAR ST/OSTMAN RD	LOS D	0.09	7.9	A/A	0.21	8.7	A/A

v/c = Volume-to-Capacity Ratio of Worst Movement
Delay = Critical Movement Approach Delay (sec)
LOS = Level of Service of Major Street/Minor Street

SAFETY ANALYSIS

The most recent five years (2014-2018) of available crash data for the study area was obtained from the ODOT crash database and used to evaluate the safety conditions near the proposed middle school site. Between 2014 and 2018, a total of 11 collisions occurred on the streets near the project site (Willamette Falls Drive, Ostman Road, and Dollar Street were evaluated). All crash data is provided in Appendix G and a map of the 11 crashes are shown in Figure 3.

The severity of the crashes in the study area were predominantly either property damage only (5 crashes, 45%) or possible injury (5 crashes, 45%). One minor injury crash occurred on Willamette Falls Drive at the pedestrian crosswalk (located west of Epperly Drive). This accident was categorized as rear-end and was likely due to pedestrian activity in the crosswalk, which caused vehicles to suddenly stop on Willamette Falls Drive. Between 2013 and 2017, the most common crash type along the corridor was rear-end crashes (10 crashes, 90%) and seven of those rear-end crashes occurred near the pedestrian crosswalk on Willamette Falls Drive west of Epperly Street. The City intends to relocate this pedestrian crosswalk to the intersection of Epperly Street.

FIGURE 3: 2014–2018 COLLISION

SCHOOL RELOCATION

This section presents the methods and assumptions used in estimating the trip generation and trip distribution associated with the relocated middle school. This includes considerations for mode split, enrollment zones, site access, and traffic pattern adjustments after the school is relocated.

STUDENT ENROLLMENT ZONES

Based on discussion with West Linn-Wilsonville School District staff, the enrollment of the Athey Creek Middle School was 684 students (when traffic counts were collected in 2019) and it is anticipated that the new, relocated middle school will have capacity for 850 students. The West Linn-Wilsonville School District enrollment zone map identifies which schools students can attend based on their residence location.[6] There are three zones that are assigned to Athey Creek Middle School: exclusive Athey Creek zone, Athey Creek/Meridian zone, Rosemont, and Athey Creek/Rosemont zone. It is assumed that these zones will remain the same after the school relocates. Athey Creek middle school is currently located within the split Athey Creek/Meridian zone, while the new site will be located at the edge of the exclusive Athey Creek enrollment zone.

[6] District Maps–School Locator. https://www.wlwv.k12.or.us/Page/195, Accessed May 26, 2020.

Figure 4 shows the estimated percentages of students of the total enrollment that would come from the three enrollment zones. The percentages are based on the school districts 2018 – 2028 enrollment forecasts. As shown, the exclusive Athey Creek zone would generate the highest percentage of students (approximately 40%) and the Athey Creek/Meridian Creek Zone would generate 30% of the student population. The other zones would generate a much smaller percentage of enrollment (10% from Rosemont, 10% from Athey Creek/Rosemont, and 10% from out of district or other enrollment zones). Percentages were based on review of actual attendance at Athey Creek Middle School from 2018-2019.

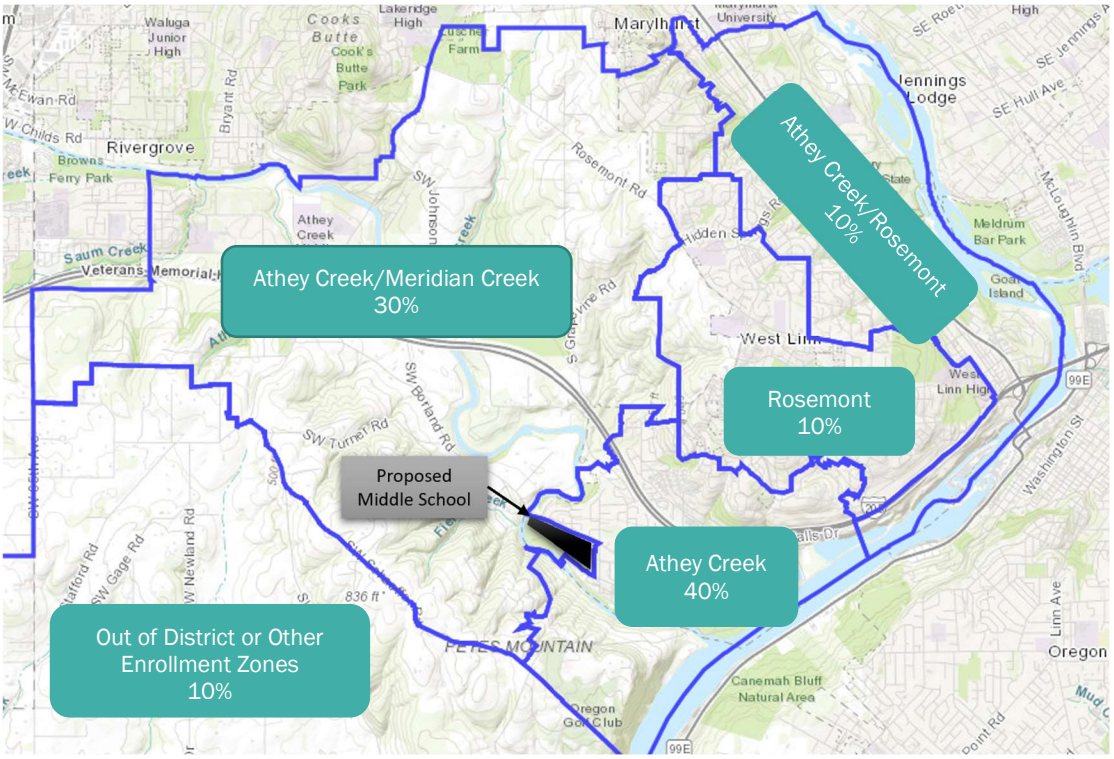

FIGURE 4: APPROXIMATE PROPORTIONS OF TOTAL ENROLLMENT

TRIP GENERATION OVERVIEW

This project is unique because the proposed project is to relocate an existing school. There will not be an additional middle school in the City and therefore, the relocated Athey Creek Middle School will not double the existing amount of middle school trips on the existing roadway system; the relocation will redistribute existing trips on the City and County transportation network. Another unique element of this project is that the middle school relocation is expected to have an impact on the mode split for trips to and from school (more walking and biking trips due to the neighborhood proximity). The following steps were conducted to determine the trip generation impact of relocating the middle school:

- Determine mode split and trip generation of the relocated middle school (850 students).
- Add vehicle trips for an 850-student relocated middle school to the study area.
- Remove vehicle trips for a 684-student Athey Creek Middle School from the study area.

MODAL SPLIT

The modal split for the existing Athey Creek Middle School was provided by the School District and is shown in Table 4. As shown, 72% of Athey Creek Middle School students take the bus to/from school and 28% are driven to/from school. Essentially 0% of the Athey Creek Middle School students walk or bike to school.

TABLE 4: EXISTING ESTIMATED MODAL SPLIT

TIME OF DAY	DRIVE	BUS	WALK/BIKE
AM PEAK	29%	71%	0%
MIDDAY PEAK	27%	73%	0%
AVERAGE	28%	72%	0%

The West Linn School District staff estimate that approximately 450 students (about 53% of total students) will be bused to the relocated middle school on 12 school buses. The number students being bused from each school zone was estimated using enrollment information (Figure 4) from the School District as well as engineering judgement.

The remaining students would walk, bike, or be driven. For purposes of modal split estimates, it was assumed that the walking boundary for the new school location would be an approximate 1 mile radius around the school.

Table 5 shows the anticipated modal split for each enrollment zone for the proposed relocated middle school. As shown, it is estimated that 250 (29%) of students will walk or bike to school, 450 (53%) students will take the bus, and 150 (18%) students will be driven.

TABLE 5: FUTURE PROPOSED MODAL SPLIT

SCHOOL ZONE	DRIVE	BUS	WALK/BIKE	TOTAL
ATHEY CREEK	30	60	250	340
ATHEY CREEK/MERIDIAN	30	225	0	255
ATHEY CREEK/ROSEMONT	15	70	0	85
ROSEMONT	15	70	0	85
OTHER AREAS	60	25	0	85
TOTAL NUMBER OF STUDENTS	**150**	**450**	**250**	**850**
TOTAL PERCENTAGE	**18%**	**53%**	**29%**	**100%**

TRIP GENERATION RATES COMPARISON

Trip generation is the method used to estimate the number of vehicles a development adds to site driveways and the adjacent roadway network during a specified period (e.g. the AM or Midday peak hour). Table 6 shows three sets of trip generation rates for middle schools.

- The first set of trip generation rates shown is the international average rate found in the Institute of Transportation Engineers (ITE) Trip Generation Manual, 10th Edition.[7] The ITE trip generation rates include vehicle trips associated with the entire development, which includes both students and staff.
- The second set is the existing Athey Creek trip generation, which was calculated based on driveway counts that were collected in the spring of 2019 when school was in session. These traffic counts included trips for students and staff.
- The third set of trip generation rates are the proposed rates for the relocated Athey Creek Middle School. These trip rates were estimated using the modal split information presented in the previous section. The process is discussed on the following page.

TABLE 6: VEHICLE TRIP GENERATION COMPARISON

SOURCE	LAND USE	NUMBER OF STUDENTS	AM PEAK TRIP RATE	AM PEAK TRIPS			MIDDAY PEAK TRIP RATE	MIDDAY PEAK TRIPS		
				IN	OUT	TOTAL		IN	OUT	TOTAL
ITE TRIP GENERATION MANUAL	Middle School (ITE Code 522)	684	0.67 trips per student	253	207	460	0.33 trips per student	103	120	223
COLLECTED TRAFFIC DATA	Athey Creek MS (existing)	684	0.46 trips per student	128	191	319	0.34 trips per student	56	180	236
-	Relocated Athey Creek MS (proposed)	850	0.30 trips per student	140	115	255	0.22 trips per student	86	101	187

[7] Trip Generation Manual, 10th Edition, Institute of Transportation Engineers, 2017.

Over 70% of students currently take the bus to Athey Creek Middle School because it is outside of the exclusive Athey Creek enrollment zone and is not in a walkable location (see Table 4). Therefore, it is expected to have a lower vehicle trip generation rate than a typical middle school, which is reflected in Table 6 (0.67 trips per student vs. 0.46 trips per student).

For the relocated middle school, the estimated future number of students being driven to school (18% from Table 5) is lower than the existing modal split at Athey Creek Middle School (28% from Table 4). This would indicate that the new middle school will have a lower vehicle trip generation rate than the existing Athey Creek Middle School. This is a percentage change of 35%, which was applied to the existing Athey Creek Middle School trip generation rates (0.46 AM peak and 0.34 Midday peak) to determine the proposed relocated middle school trip generation rates (0.30 trips per student and 0.22 trips per student).

FINAL TRIP GENERATION

The final trip generation is shown in Table 7 and is estimated to generate 279 trips (152 in, 127 out) during the AM peak hour and 211 trips (98 in, 113 out) during the Midday peak hour. These trips account for both staff, student, and bus trips. This trip generation includes the 12 school buses that will be used to transport students to and from the relocated middle school, resulting in a total 24 school bus trips in each peak hour.

The split of vehicle trips in and out of the site were based on the ITE percentages, 55% in and 45% out during the AM peak hour and 46% in and 54% out during the Midday peak hour.

TABLE 7: PROJECT TRIP GENERATION SUMMARY (VEHICLE AND SCHOOL BUS TRIPS)

TYPE OF TRIP	NUMBER OF STUDENTS	AM PEAK TRIP RATE	AM PEAK			MIDDAY PEAK TRIP RATE	MIDDAY PEAK		
			IN	*OUT*	*TOTAL*		*IN*	*OUT*	*TOTAL*
VEHICLE	850	0.30 trips per student	140	115	255	0.22 trips per student	86	101	187
SCHOOL BUS	-	-	12	12	24	-	12	12	24
	TOTAL TRIPS	**-**	**152**	**127**	**279**	**-**	**98**	**113**	**211**

VEHICLE TRIP DISTRIBUTION

Vehicle trip distribution provides an estimation of where vehicles would be coming from and going to. It is given as a percentage at key gateways to the study area and is used to route project trips through the study intersections.

TRIP ADDITION – RELOCATED MIDDLE SCHOOL

The vehicle trip distribution for the relocated middle school is shown in Figure 5. It is estimated that 40% of vehicle trips will travel to/from the site via Willamette Falls Drive east, 45% will come from the west of the Tualatin River, and the remaining 15% will come from the neighborhoods just to the east of Ostman Road or from the north side of I-205. These trips were distributed amongst the study intersections using existing traffic counts, the Metro Regional Travel Demand Model, and the school district enrollment zones.

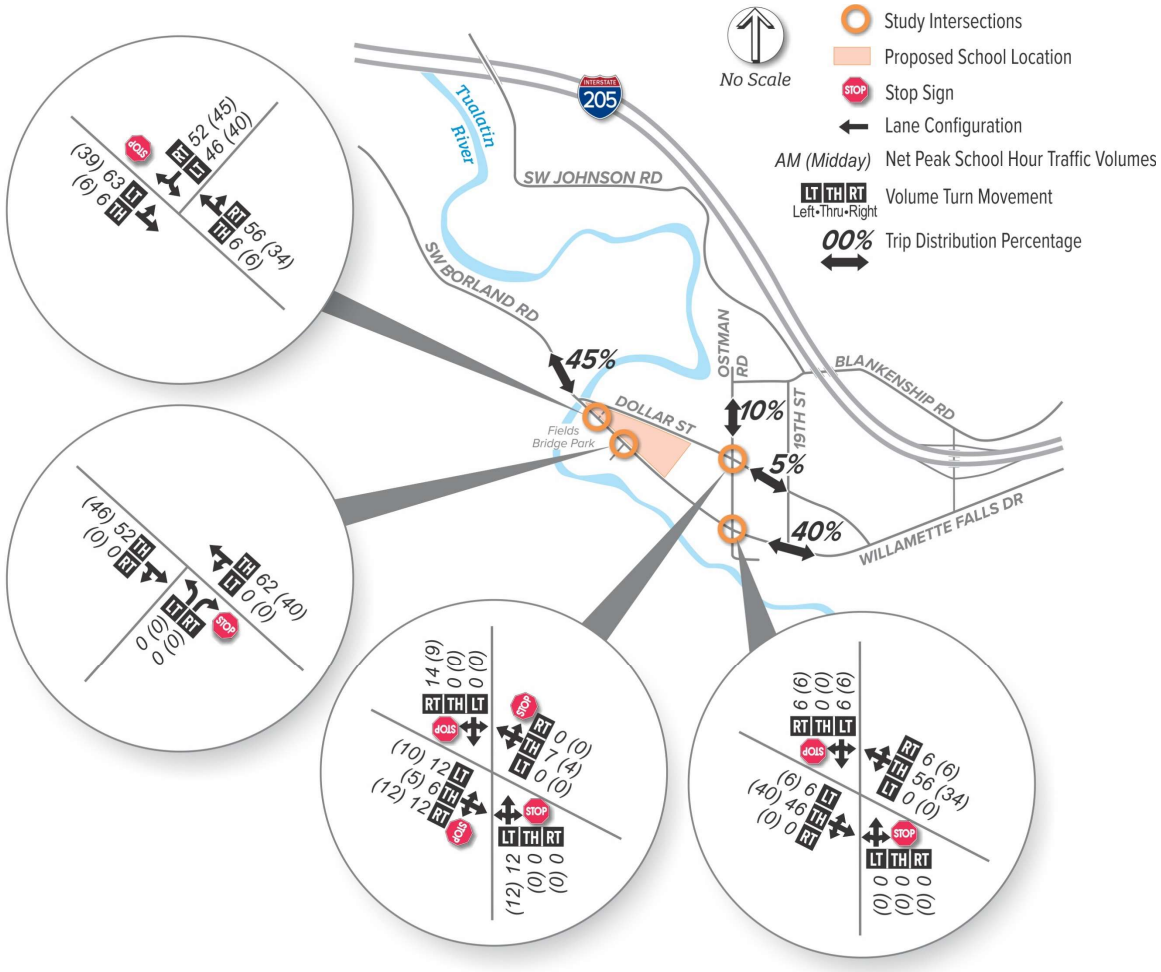

FIGURE 5: RELOCATED MIDDLE SCHOOL TRIP DISTRIBUTION AND PROJECT TRIP ADDITION

TRIP REMOVAL – EXISTING ATHEY CREEK MIDDLE SCHOOL

The vehicle trips that were removed from the study area at the study intersections for the existing Athey Creek Middle School is shown in Figure 6. Approximately, 35% of trips from the existing Athey Creek Middle School currently travel through the study area near the location of the future middle school. These trips will be removed from the network as they are now accounted for in the new middle school trip generation. The estimated trip distribution percentages for Athey Creek Middle School were determined using existing traffic counts, the Metro Regional Travel Demand Model, and the school district enrollment zones.

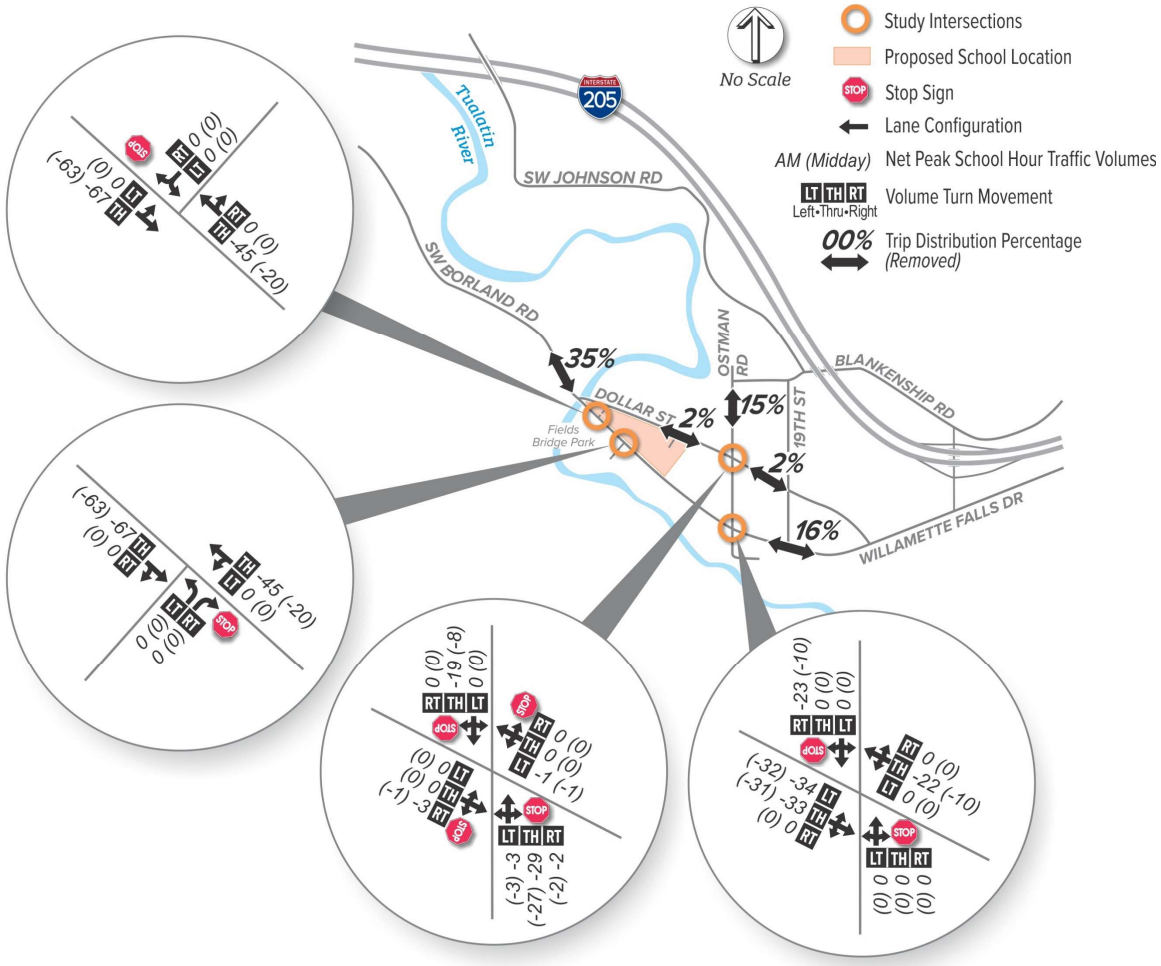

FIGURE 6: EXISTING ATHEY CREEK TRIP DISTRIBUTION AND PROJECT TRIP REMOVAL

The project trips shown in Figure 5 were added to 2023 No Build traffic volumes (described in the next section) and the project trips shown in Figure 6 were removed from the 2023 No Build traffic volumes. The resulting volumes are the 2023 Build volumes, which are presented in the next section.

FUTURE CONDITIONS

This section contains an analysis for the AM and Midday peak hours under future conditions as well as a site plan evaluation for the middle school relocation.

FUTURE 2023 TRAFFIC VOLUMES

The anticipated year of completion and occupancy for the relocated middle school is 2023. The future 2023 No Build traffic volumes were forecasted using future growth estimates from the Metro Future Travel Demand Model (average annual rate of 1.15%). The 2023 No Build scenario only includes the background traffic growth and assumes Athey Creek Middle School remains at its current location. The 2023 Build scenario includes the background traffic growth and project trips modifications as previously discussed. Figure 7 and Figure 8 on the following pages show the peak hour traffic volumes for the 2023 No Build and 2023 Build scenarios, respectively.

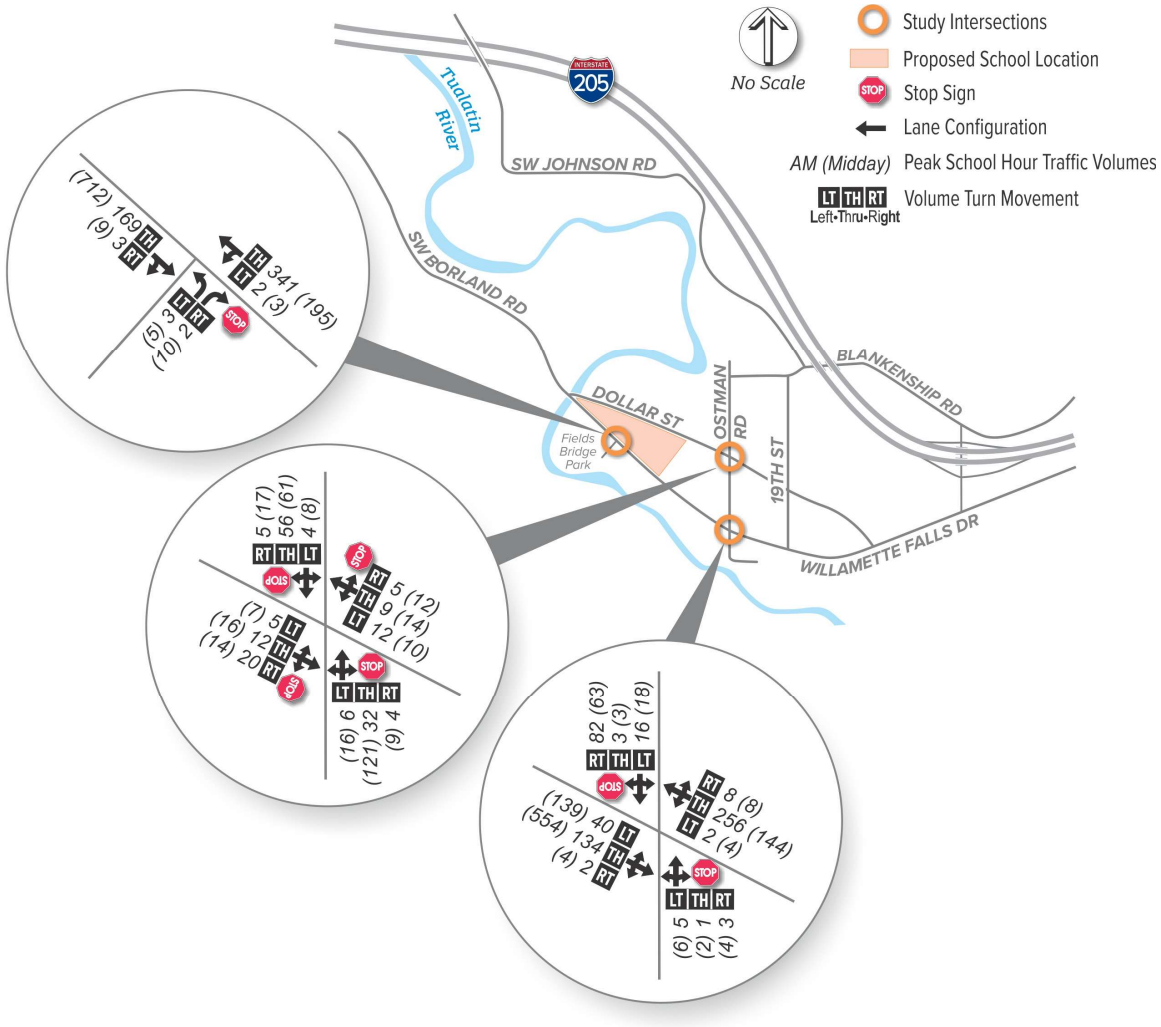

FIGURE 7: 2023 NO BUILD PEAK HOUR TRAFFIC VOLUMES

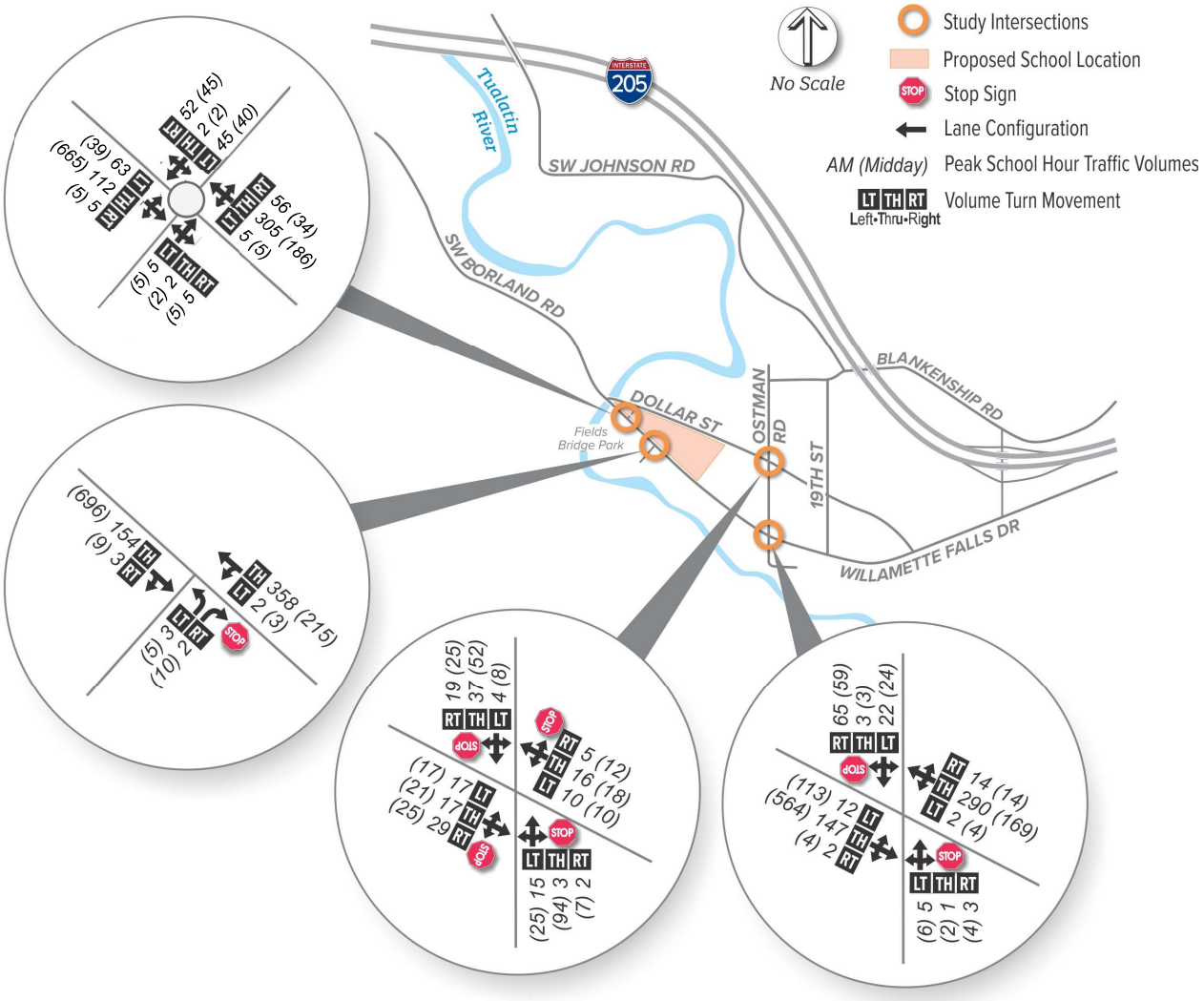

FIGURE 8: 2023 BUILD PEAK HOUR TRAFFIC VOLUMES

FUTURE TRAFFIC OPERATIONS

Future 2023 operating conditions were analyzed based on the 2023 No Build and 2023 Build traffic volumes. Table 8 shows the intersection operations for the study intersections in the AM and Midday peak hour for the 2023 No Build scenario. As shown, the Willamette Falls Drive/Ostman Road intersection fails to meet operating standard (LOS D) in the Midday peak hour. The HCM reports can be found in Appendix C.

TABLE 8: 2023 NO BUILD INTERSECTION OPERATIONS

INTERSECTION	OPERATING STANDARD	AM PEAK			MIDDAY PEAK		
		V/C	DELAY	LOS	V/C	DELAY	LOS
TWO-WAY STOP CONTROLLED							
WILLAMETTE FALLS DR/FIELDS BRIDGE PARK	LOS D	0.01	11.7	A/B	0.05	16.7	A/C
ALL-WAY STOP CONTROLLED							
WILLAMETTE FALLS DR/OSTMAN RD	LOS D	0.37	10.0	A/A	0.94	**40.9**	**B/E**
DOLLAR ST/OSTMAN RD	LOS D	0.09	7.9	A/A	0.22	8.8	A/A

v/c = Volume-to-Capacity Ratio of Worst Movement
Delay = Critical Movement Approach Delay (sec)
LOS = Level of Service of Major Street/Minor Street

Bold & Highlighted: The intersection fails to meet the City's operating standard.

PROPOSED PROJECT CHANGES

Based on the proposed site plan and discussions with the City of West Linn, access to the relocated middle school will be provided via a public road extension of Brandon Place from Dollar Street to Willamette Falls Drive. At the new intersection of Willamette Falls Drive and Brandon Place, a roundabout has been assumed.

Table 9 on the following page shows the intersection operations for the study intersections in the AM and Midday peak hour for the 2023 Build scenario. The HCM reports can be found in Appendix E.

The proposed site driveway (that serves staff and buses only) on Dollar Street was also analyzed under the 2023 Build scenario as well (not pictured to the right). The operations for this intersection are not reported in the following table but the HCM reports can be found in Appendix D.

TABLE 9: 2023 BUILD INTERSECTION OPERATIONS

INTERSECTION	OPERATING STANDARD	AM PEAK			MIDDAY PEAK		
		V/C	DELAY	LOS	V/C	DELAY	LOS
TWO-WAY STOP CONTROLLED							
WILLAMETTE FALLS DR/FIELDS BRIDGE PARK	LOS D	0.01	11.7	A/B	0.05	16.6	A/C
ROUNDABOUT							
WILLAMETTE FALLS DR/BRANDON PLACE EXTENSION	LOS D	0.32	5.1	A	0.62	8.5	A
ALL-WAY STOP CONTROLLED							
WILLAMETTE FALLS DR/OSTMAN RD	LOS D	0.42	10.5	A/B	0.93	**38.9**	**B/E**
DOLLAR ST/OSTMAN RD	LOS D	0.06	7.8	A/A	0.19	8.7	A/A

v/c = Volume-to-Capacity Ratio of Worst Movement
Delay = Critical Movement Approach Delay (sec) [For roundabouts, the average delay for the intersection is reported]
LOS = Level of Service of Major Street/Minor Street [For roundabouts, the LOS for the intersection is reported]
Bold & Highlighted: The intersection fails to meet the City's operating standard.

As shown, the Willamette Falls Drive/Ostman Road intersection fails to meet operating standard (LOS D) in the Midday peak hour.

QUEUING

Vehicle queuing analysis was performed at the proposed roundabout for the AM and Midday peak hour based on the 2023 Build traffic volumes to determine the 95th percentile queues. The 95th percentile queue is the queue length for a given intersection movement that has only a 5% chance of being exceeded during the peak traffic hour.

The 95th percentile queues at the Willamette Falls Drive/Brandon Place Extension intersection were estimated using SIDRA software and the reports can be found in Appendix D. The results are shown in Table 10.

TABLE 10: 95TH PERCENTILE QUEUES (2023 BUILD SCENARIO)

APPROACH	AM PEAK HOUR QUEUE	MIDDAY PEAK HOUR QUEUE
EASTBOUND (WILLAMETTE FALLS DR)	25 feet	150 feet
WESTBOUND (WILLAMETTE FALL DR)	50 feet	25 feet
SOUTHBOUND (BRANDON PLACE EXT)	25 feet	25 feet
NORTHBOUND (PARK DRIVEWAY)	0 feet	0 feet

As shown in the table, the longest estimated 95th percentile queue at the intersection is the eastbound movement during the midday peak hour (150 feet or 6 vehicles). This queue will extend onto the Tualatin River bridge. It should be noted that the midday peak hour is 3:10pm – 4:10pm.

SENSITIVITY ANALYSIS

As requested by the School District, a sensitivity analysis was conducted which evaluated the intersection operations under two alternate modal split assumptions. These are shown in Table 11 below. Sensitivity Analysis #1 assumed that 200 students would walk or bike to school (50 less than the current assumption). Subsequently, the number of students driven to school would increase, increasing the vehicle trip generation. Sensitivity Analysis #2 assumed that 100 students would walk or bike to school.

TABLE 11: SENSITIVITY ANALYSIS PROPOSED MODAL SPLIT

	CURRENT ASSUMPTION			SENSITIVITY ANALYSIS #1			SENSITIVITY ANALYSIS #2		
MODE OF TRAVEL	DRIVE	BUS	WALK/ BIKE	DRIVE	BUS	WALK/ BIKE	DRIVE	BUS	WALK/ BIKE
NUMBER OF STUDENTS	150	450	250	200	450	200	300	450	100
TOTAL PERCENTAGE	**18%**	**53%**	**29%**	**24%**	**53%**	**24%**	**35%**	**53%**	**12%**

Table 12 shows the intersection operations for the study intersections in the AM and Midday peak hour for the 2023 Build scenario. The HCM reports can be found in Appendices E and F. As shown, the Willamette Falls Drive/Ostman Road intersection fails to meet operating standard (LOS D) in the Midday peak hour.

TABLE 12: 2023 BUILD INTERSECTION OPERATIONS (SENSITIVITY ANALYSIS #1)

INTERSECTION	OPERATING STANDARD	AM PEAK			MIDDAY PEAK		
		V/C	DELAY	LOS	V/C	DELAY	LOS
TWO-WAY STOP CONTROLLED							
WILLAMETTE FALLS DR/FIELDS BRIDGE PARK	LOS D	0.01	12	A/B	0.05	16.9	A/C
ROUNDABOUT							
WILLAMETTE FALLS DR/BRANDON PLACE EXTENSION	LOS D	0.33	5.3	A	0.63	8.7	A
ALL-WAY STOP CONTROLLED							
WILLAMETTE FALLS DR/OSTMAN RD	LOS D	0.44	10.8	A/B	0.95	**42.6**	**B/E**
DOLLAR ST/OSTMAN RD	LOS D	0.06	7.8	A/A	0.19	8.8	A/A

v/c = Volume-to-Capacity Ratio of Worst Movement
Delay = Critical Movement Approach Delay (sec) [For roundabouts, the average delay for the intersection is reported]
LOS = Level of Service of Major Street/Minor Street [For roundabouts, the LOS for the intersection is reported]

Bold & Highlighted: The intersection fails to meet the City's operating standard.

Table 13 shows the intersection operations for the study intersections in the AM and Midday peak hour for the Sensitivity Analysis #2. As shown, the Willamette Falls Drive/Ostman Road intersection fail to meet operating standard (LOS D) in the Midday peak hour.

TABLE 13: 2023 BUILD INTERSECTION OPERATIONS (SENSITIVITY ANALYSIS #2)

INTERSECTION	OPERATING STANDARD	AM PEAK			MIDDAY PEAK		
		V/C	DELAY	LOS	V/C	DELAY	LOS
TWO-WAY STOP CONTROLLED							
WILLAMETTE FALLS DR/FIELDS BRIDGE PARK	LOS D	0.01	12.7	A/B	0.06	17.5	A/C
ROUNDABOUT							
WILLAMETTE FALLS DR/BRANDON PLACE EXTENSION	LOS D	0.38	5.9	A	0.67	9.5	A
ALL-WAY STOP CONTROLLED							
WILLAMETTE FALLS DR/OSTMAN RD	LOS D	0.49	11.7	A/B	1.00	**52.5**	**B/F**
DOLLAR ST/OSTMAN RD	LOS D	0.07	7.9	A/A	0.20	8.8	A/A

v/c = Volume-to-Capacity Ratio of Worst Movement
Delay = Critical Movement Approach Delay (sec) **[For roundabouts, the average delay for the intersection is reported]**
LOS = Level of Service of Major Street/Minor Street **[For roundabouts, the LOS for the intersection is reported]**

Bold & Highlighted: The intersection fails to meet the City's operating standard.

As shown, the Willamette Falls Drive/Ostman Road intersection continues to fail to meet standards under both of the Sensitivity Analysis scenarios. However, the other study intersections are expected to meet the City's operating standards.

WILLAMETTE FALLS DRIVE/OSTMAN ROAD INTERSECTION

As shown in the previous subsections, the Willamette Falls Drive/Ostman Road intersection fails to meet the operating standard under all of the future scenarios. Based on discussions with City staff,[8] the all-way stop control (installed in 2016) at this intersection provides multi-faceted benefits.

- Reduces crash risk associated with sight distance limitations for the southbound approach.
- Reduces side-street delay and allows for improved mobility on the local street system when volumes on Willamette Falls Drive are high (e.g., during I-205 traffic events).
- Discourages drivers from using Willamette Falls Drive as a diversion route when there are traffic events on I-205.

Because of these benefits and the infeasibility of a traffic signal (due to right-of-way constraints), there is currently no desire to change the traffic control at Willamette Falls Drive/Ostman Road.

[8] Meeting with School District and City staff on August 6th, 2020.

Additionally, once the roundabout is built at Willamette Falls Drive/Brandon Place intersection, I-205 cut-through traffic on Willamette Falls Drive may reroute due to the reduced travel speeds. Therefore, the City would like to wait until after school project is built to determine if additional improvements are needed at the Willamette Falls Drive/Ostman Rd intersection. Therefore, no mitigations or capacity improvements are identified or recommended at this time.

SITE REVIEW

The proposed site plan for relocated middle school is provided in the Appendix H. The following sections summarize the requirements that will be applicable for site plan submittals to the City of West Linn.

Access to the relocated middle school is provided via a public road extension of Brandon Place from Dollar Street to Willamette Falls Drive (see Figure 9) and via a full access driveway on Dollar Street, which will be for staff and school buses only.

The intersection of the Brandon Place extension with Willamette Falls Drive will align with the existing park driveway near the Tualatin River bridge. This intersection of Brandon Place/Willamette Falls Drive is currently proposed to be a roundabout.

The intersection of Brandon Place and Dollar Street will be realigned to become a three-leg intersection (north, south, and east legs). The west leg of the intersection is proposed to become a private driveway with the implementation of the relocated middle school.

FIGURE 9: BRANDON PLACE EXTENSION CONCEPT

SIGHT DISTANCE

With a posted speed of 25 miles per hour, the sight distance requirement along Dollar Street is 280 feet for turning left from a stopped approach and 240 feet for vehicles turning right from a stopped approach. Preliminary sight distance was evaluated at the proposed staff and bus driveway location on Dollar Street. The driveway was found to be sufficient to meet the stated requirements. Prior to occupancy, sight distance at any new or modified access points will need to be verified, documented, and stamped by a registered professional Civil or Traffic Engineer licensed in the State of Oregon.

It should be noted that the intersection of Willamette Falls Drive/Brandon Place is assumed to be a roundabout and therefore, sight distance requirements for a typical stopped approach would not apply there.

ACCESS SPACING

The required spacing between a driveway and a street intersection on an arterial road (Willamette Falls Drive) is 500 feet from centerline to centerline per the City's TSP.[9] This requirement is met for the proposed extension of Brandon Place at Willamette Falls Drive, which will align with the existing park access near the Tualatin River bridge. The nearest driveway to this intersection is the driveway to Fields Bridge Park, which is approximately 700 feet away.

There is no required spacing between two accesses on a local residential road (Dollar Street). There is, however, a requirement of 35 feet between driveways and street intersections.[10] Because the Brandon Place extension on Dollar Street is proposed to be aligned with Brandon Place, this driveway meets access spacing requirements. The eastern driveway on Dollar Street is located approximately 200 feet to the west of Fields Drive and therefore, also meets the City's spacing requirements.

FRONTAGE IMPROVEMENTS

It is required that half-street improvements be built along the project site frontage on Willamette Falls Drive and Dollar Street.

Half-street frontage improvements to Willamette Falls Drive should be consistent for a minor arterial. This includes upgraded facilities for vehicles, bicycles, and pedestrians as indicated in the City TSP roadway standards.[11] Per the TSP, minor arterial roadways are required to have two 12-foot travel lanes, a 7-foot cycle track on both sides, and a minimum of 6-foot sidewalks on both sides. Optional cross sections include a 14-foot center turn lane, 5-foot planter strips on both sides, and 10- to 12-foot sidewalks on either side.

[9] West Linn Transportation System Plan, March 28, 2016, Table 15.

[10] West Linn Transportation System Plan, March 28, 2016, Table 15.

[11] West Linn Transportation System Plan, March 28, 2016, Exhibit 6 and Table 27.

Half-street frontage improvements to Dollar Street should be consistent for a local street. This includes upgraded facilities for vehicles, bicycles and pedestrians as indicated in the City TSP roadway standards.[12] Per the TSP, local streets are required to have two 10-foot travel lanes and a minimum of 6-foot sidewalks on both sides. Additionally, the City will require 6-foot landscape strips and 8-foot-wide on-street parking along the project frontage.

The extension of Brandon Place from Dollar Street to Willamette Falls Drive through the project site is required to meet the City's roadway standards for a local street as well. The anticipated cross section will include two 10-foot travel lanes, 7-foot parking on one side (straight segment only), 6-foot wide landscape strips, and 6-foot wide sidewalks. This local street extension will provide one of two accesses to the school site.

PARKING

The proposed project is required to comply with the City code for the number of vehicular parking stalls and bicycle parking spaces that are provided on site.[13] Table 14 lists the vehicular and bicycle parking requirements for the project site. The parking requirements are based on the building use, number of staff, and square footage of the building.

TABLE 14: VEHICLE AND BICYCLE PARKING REQUIREMENTS

LAND USE	NUMBER OF STAFF/SIZE[A] /CLASSROOMS	SPACES REQUIRED BY CODE			
		VEHICLE MINIMUM	VEHICLE MAXIMUM	ACCESSIBLE PARKING MINIMUM	BICYCLE MINIMUM
MIDDLE SCHOOL/JUNIOR HIGH SCHOOL	60 Staff 113 KSF 28 Classrooms	173	190	6	112
Proposed Parking Stalls		**185 vehicle stalls**			**100 stalls**

[A] KSF= 1,000 square feet

The City code requires a minimum of 1 vehicle parking space per employee, plus 1 vehicle parking space for each 1,000 square feet of floor area. As shown above, 173 vehicular stalls are needed to meet the minimum Code requirements for the project. Of the 173 vehicular stalls, 6 are required to be accessible spaces. The maximum number of parking stalls is 190 stalls according to the rates provided in the City Code.

The current site plan proposes 185 total vehicle parking stalls, meeting the City's requirement.

The City code requires a minimum of 4 bicycle parking spaces per classroom in a middle school. A minimum of 112 bicycle parking spaces are required at the project site to meet the Code

[12] West Linn Transportation System Plan, March 28, 2016, Exhibit 9 and Table 30.

[13] West Linn Community Development Code, Section 46.090, updated October 2019.

requirements and 50% of the spaces must be covered. The bicycle parking spaces should be located within 50 feet from the primary building entrance, as measured along a direct pedestrian access route. It is recommended that all future site plans show the minimum required number of bicycle parking stalls.

OFF-SITE PARKING

On-street parking will be added to the south side of Dollar Street along the school site frontage as part of the recommended half-street improvements. Approximately 43 to 54 parking spaces are expected to be added to Dollar Street and 8 to 12 on the straight portion of the Brandon Place extension.

SAFE ROUTES TO SCHOOL

Safe Routes to School are safe walking and biking routes to and from schools. They are typically characterized by marked pedestrian crossings, sidewalks, and bike lanes, flashing beacons, and other enhancements. Safe Routes to School aim to make it safe, convenient, and fun for children to walk and bicycle to and from schools. The goal is to improve safety while increasing health and physical activity.

The school walk zone, or walking boundary, is typically a subset of the enrollment zone. School walking boundaries may be defined by State or Local policy, but if not, a general rule of thumb is that the walking boundary is 1/2 mile or 1-mile out from an elementary school, sometimes farther for middle and high schools. Walk zones defined by policy typically indicate the area within which students are NOT provided with bus service.

Ideally, the walking boundary would be represented by a circular area with the school located at the center, but rarely is the walk zone an exact circle. A child's route to school should have a minimal number of busy street crossings or require crossing bodies of water or other barriers. Some students will live too far away from the school to reasonably be expected to walk, and they are typically provided with bus service.

As discussed in the *School Relocation* section, the School District estimated to have approximately 250 students walk or bike to school based on proximity to adjacent neighborhoods. For the proposed middle school location, the walking boundary is assumed to be approximately 1-mile around the school. As stated earlier, it is not an exact circle, however, due to physical barriers such as the Tualatin River and I-205. For purposes of this study, the majority of the students living within the walking boundary are assumed to walk or bike to school.

Based on the existing street network and infrastructure, we do not recommend that Johnson Road (north of 19th Street) be included in 1-mile walking boundary as there are no existing sidewalks or pathways for safe pedestrian or bicycle travel along it, and right of way constraints make sidewalk infill prohibitively expensive.

SAFETY PERFORMANCE

Under the existing conditions on Willamette Falls Drive, most crashes from the last five years of data (2014 – 2018) were rear-end collisions due to pedestrian activity at the pedestrian crossing west of Epperly Street. Because of this, any future school crossing of Willamette Falls Drive should be considered carefully and pedestrian crossing enhancements and advanced warning devices should be installed to increase driver awareness. This is discussed in the *Recommended Improvements Section.*

FIELD VISIT

A field visit to the proposed project site and study area was completed on May 27th, 2020. Key locations within the walking boundary were observed to determine the need for pedestrian improvements. Figure 10 supplies a visual representation of where the existing, proposed, and recommended improvements are located. Not shown on the figure are bicycle facilities. There are no existing bike lanes on Willamette Falls Drive or Dollar Street, both of which front the project site.

RECOMMENDED IMPROVEMENTS TO SAFE ROUTES TO SCHOOL

Recommendations for improved connectivity and continuity of pedestrian and bicycle facilities within the walking boundary were based on an evaluation of the existing infrastructure and safety performance. The location of the recommended improvements can be found in Figure 10 and are discussed in the following sections.

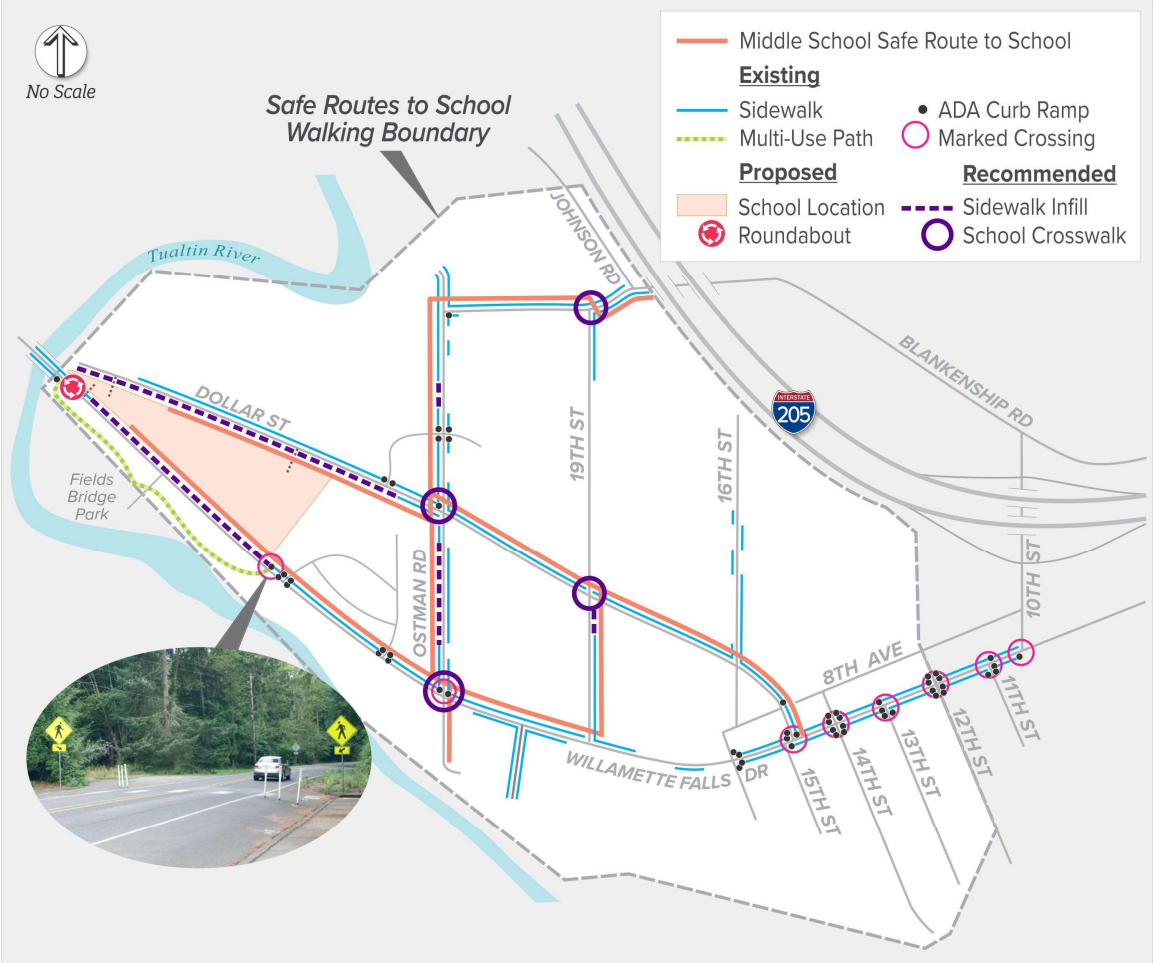

FIGURE 10: SCHOOL SAFE ROUTES TO SCHOOL AND WALKING BOUNDARY

SIDEWALK INFILL

Students within the 1-mile walking boundary would not be provided bus transportation to school. As such, it is recommended that sidewalk infill (i.e. new sidewalk) be installed where gaps have been identified in Figure 10. These gaps in sidewalk connectivity are located along the proposed safe routes to the middle school. Proposed safe routes are located on Dollar Street, Ostman Road, 19th Street, Willamette Falls Drive, and Blankenship Road. Some of the sidewalk infill are located along the site frontage and are anticipated to be built as part of the frontage improvements. However, for the remining segments, sidewalk infill is recommended to be completed with asphalt rather than concrete sidewalks to reduce costs while still providing for school safety.

MARKED CROSSING IMPROVEMENTS

Enhancements to key crossing locations are also being recommended to supplement the sidewalk infill previously discussed. The proposed crossing improvements are shown in Figure 10 and include the following:

- **Dollar Street/Ostman Road:** It is recommended to install a marked crossing on the north leg and west leg with ADA improvements on the southwest corner.

- **Dollar Street/19th Street:** It is recommended to install a marked crossing on the north leg and east leg with ADA improvements on the northwest, northeast, and southeast corners.


- **Blankenship Road/19th Street:** It is recommended to install a marked crossing on the north leg with ADA improvements on the northeast corner.


- **Willamette Falls Drive/Ostman Road:** It is recommended to install a marked school crossing on the west leg of the intersection.

- **Enhanced Crossing on Willamette Falls Drive/Dollar Street:** Because this intersection is located on a recommended Safe Route to School, it is recommended that the installation of an enhanced pedestrian crossing treatment, such as an RRFB, be considered. The current layout of Willamette Falls Drive at the Dollar Street intersection is a three-lane cross section with parking. However, this section of roadway is currently under construction and the final Safe Route to School plan should be refined once the construction of Willamette Falls Drive is completed.

- **Mid-Block Crossing on Willamette Falls Drive:**
As stated earlier in the report, the City plans to relocate this mid-block crossing to the intersection of Epperly Street in the future. It is recommended that the existing crosswalk be thoroughly reviewed and coordinated with the City for safety improvements or relocated to a safer crossing location.

- **School Speed Zone:** It is also recommended that a school speed zone 20 mph be installed along Willamette Falls Drive and Dollar Street adjacent to the relocated middle school, as well as on the Brandon Place extension. The reduced vehicle speeds will improve safety for students using Willamette Falls Drive to access the school.

SUMMARY OF PROJECT IMPACTS

The key findings of this transportation impact study are discussed below.

INTERSECTION OPERATIONS

- For the No Build and Build scenarios, the study intersections continue to meet operating standards during the AM and Midday peak periods with the exception of the Willamette Falls Drive/Ostman Road intersection. There is no recommendation for capacity or operations improvements at the intersection per the request of the City.

FRONTAGE IMPROVEMENTS

- It is recommended that half-street improvements be made along the project site frontage on Willamette Falls Drive that include cycle tracks and sidewalks.
- It is recommended that half-street improvements be made along the project site frontage on Dollar Street that include sidewalks and on-street parking.

PARKING

- The current site plan proposes 185 total parking stalls on-site, meeting the City's requirement.
- Approximately 43 to 54 parking off-site parking spaces are expected to be added to Dollar Street and 8 to 12 parking stalls are expected to be added on the straight portion of the Brandon Place extension.
- The site is required to provide 112 bicycle parking stalls.

SAFE ROUTES TO SCHOOL

- It is recommended that sidewalk infill is installed on Dollar Street, Ostman Road, 19th Street, and Willamette Falls Drive as shown in Figure 9.
- Additionally, it is recommended that marked crossings and ADA ramps be installed at five different intersections:
    - Dollar Street/Ostman Road intersection
    - Dollar Street/19th Street intersection
    - Blankenship Road/19th Street intersection
    - Willamette Falls Drive/Ostman Road intersection
- It is recommended that an enhanced pedestrian crossing be considered on the east leg of the Willamette Falls Drive/Dollar Street intersection once the current reconstruction of Willamette Falls Drive is complete.
- It is recommended that the existing crosswalk west of Epperly Street be thoroughly reviewed and coordinated with the City for safety improvements or relocated to a safer crossing location.
- It is also recommended that a school speed zone is installed along Willamette Falls Drive, Dollar Street, and the Brandon Place extension.

APPENDIX

CONTENTS

DKS

117 COMMERCIAL STREET NE, SUITE 310, SALEM, OR 97301 • 503.391.8773 • DKSASSOCIATES.COM

APPENDIX A.

TRAFFIC COUNT DATA

Total Vehicle Summary

All Traffic Data Services Inc.
Clay Carney
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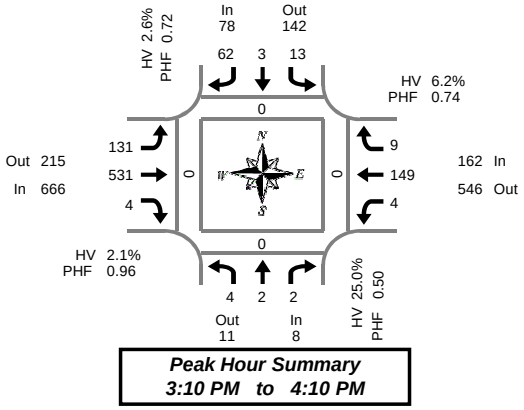


Peak Hour Summary
3:10 PM to 4:10 PM

Ostman Rd & Willamette Falls Dr

Thursday, May 16, 2019
3:00 PM to 5:00 PM

5-Minute Interval Summary
3:00 PM to 5:00 PM

Interval Start Time	Northbound Ostman Rd				Southbound Ostman Rd				Eastbound Willamette Falls Dr				Westbound Willamette Falls Dr				Interval Total	Pedestrians Crosswalk			
	L	T	R	Bikes	L	T	R	Bikes	L	T	R	Bikes	L	T	R	Bikes		North	South	East	West
3:00 PM	1	0	0	0	3	0	3	0	8	35	0	0	0	9	2	0	61	0	0	0	0
3:05 PM	0	0	2	0	1	1	1	0	9	42	0	0	0	10	1	0	67	0	0	0	0
3:10 PM	0	0	0	0	2	0	5	0	15	39	0	2	0	8	0	0	69	0	0	0	0
3:15 PM	1	0	0	0	2	0	3	0	10	49	0	0	0	12	1	0	78	0	0	0	0
3:20 PM	0	0	0	0	0	0	4	0	8	46	0	0	1	17	0	0	76	0	0	0	0
3:25 PM	0	0	0	0	0	0	7	0	9	50	0	0	0	12	1	0	79	0	0	0	0
3:30 PM	0	0	0	0	1	0	6	0	7	44	0	0	1	18	1	0	78	0	0	0	0
3:35 PM	0	0	0	0	2	1	8	0	9	41	0	0	0	19	1	0	81	0	0	0	0
3:40 PM	1	0	1	0	0	0	9	0	9	47	1	0	0	15	0	0	83	0	0	0	0
3:45 PM	0	0	0	0	2	0	5	0	9	47	0	0	1	15	1	0	80	0	0	0	0
3:50 PM	1	0	0	0	0	0	5	0	7	49	2	0	0	5	1	0	70	0	0	0	0
3:55 PM	1	1	0	0	0	2	3	0	14	45	0	0	1	10	1	0	78	0	0	0	0
4:00 PM	0	0	0	0	1	0	3	0	19	36	0	1	0	13	0	0	72	0	0	0	0
4:05 PM	0	1	1	0	3	0	4	0	15	38	1	0	0	5	2	0	70	0	0	0	0
4:10 PM	1	0	0	0	3	0	5	0	12	39	0	0	0	8	0	0	68	0	0	0	0
4:15 PM	1	0	1	0	0	0	3	0	9	50	0	0	1	13	0	0	78	0	0	0	0
4:20 PM	0	0	0	0	1	0	5	0	15	42	0	0	0	7	0	0	70	1	0	0	0
4:25 PM	1	0	1	0	4	0	4	0	8	52	0	0	0	10	1	0	81	0	0	0	0
4:30 PM	1	0	0	0	0	1	1	0	17	42	0	0	1	13	1	0	77	0	0	0	0
4:35 PM	1	0	0	0	0	0	4	0	11	43	0	0	0	9	0	0	68	0	0	0	0
4:40 PM	0	0	0	0	0	0	3	0	7	51	0	0	0	11	3	0	75	0	0	0	0
4:45 PM	0	0	1	0	0	0	3	0	10	51	0	0	0	17	1	0	83	0	0	0	0
4:50 PM	0	0	1	0	3	0	5	0	11	46	1	0	0	14	1	0	82	0	0	0	0
4:55 PM	0	0	0	0	0	1	6	0	16	44	0	0	0	8	1	0	76	0	0	0	0
Total Survey	10	2	8	0	28	6	105	0	264	1,068	5	3	6	278	20	0	1,800	1	0	0	0

15-Minute Interval Summary
3:00 PM to 5:00 PM

Interval Start Time	Northbound Ostman Rd				Southbound Ostman Rd				Eastbound Willamette Falls Dr				Westbound Willamette Falls Dr				Interval Total	Pedestrians Crosswalk			
	L	T	R	Bikes	L	T	R	Bikes	L	T	R	Bikes	L	T	R	Bikes		North	South	East	West
3:00 PM	1	0	2	0	6	1	9	0	32	116	0	2	0	27	3	0	197	0	0	0	0
3:15 PM	1	0	0	0	2	0	14	0	27	145	0	0	1	41	2	0	233	0	0	0	0
3:30 PM	1	0	1	0	3	1	23	0	25	132	1	0	1	52	2	0	242	0	0	0	0
3:45 PM	2	1	0	0	2	2	13	0	30	141	2	0	2	30	3	0	228	0	0	0	0
4:00 PM	1	1	1	0	7	0	12	0	46	113	1	1	0	26	2	0	210	0	0	0	0
4:15 PM	2	0	2	0	5	0	12	0	32	144	0	0	1	30	1	0	229	1	0	0	0
4:30 PM	2	0	0	0	0	1	8	0	35	136	0	0	1	33	4	0	220	0	0	0	0
4:45 PM	0	0	2	0	3	1	14	0	37	141	1	0	0	39	3	0	241	0	0	0	0
Total Survey	10	2	8	0	28	6	105	0	264	1,068	5	3	6	278	20	0	1,800	1	0	0	0

Peak Hour Summary
3:10 PM to 4:10 PM

By Approach	Northbound Ostman Rd				Southbound Ostman Rd				Eastbound Willamette Falls Dr				Westbound Willamette Falls Dr				Total	Pedestrians Crosswalk			
	In	Out	Total	Bikes	In	Out	Total	Bikes	In	Out	Total	Bikes	In	Out	Total	Bikes		North	South	East	West
Volume	8	11	19	0	78	142	220	0	666	215	881	3	162	546	708	0	914	0	0	0	0
%HV	25.0%				2.6%				2.1%				6.2%				3.1%				
PHF	0.50				0.72				0.96				0.74				0.94				

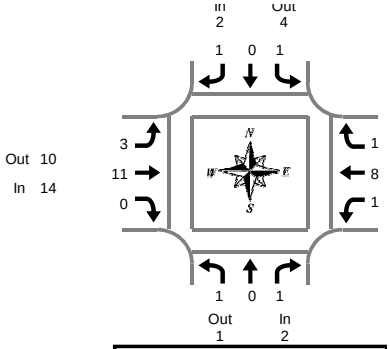
By Movement	Northbound Ostman Rd				Southbound Ostman Rd				Eastbound Willamette Falls Dr				Westbound Willamette Falls Dr				Total
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	
Volume	4	2	2	8	13	3	62	78	131	531	4	666	4	149	9	162	914
%HV	25.0%	0.0%	50.0%	25.0%	7.7%	0.0%	1.6%	2.6%	2.3%	2.1%	0.0%	2.1%	25.0%	5.4%	11.1%	6.2%	3.1%
PHF	0.50	0.25	0.50	0.50	0.81	0.38	0.67	0.72	0.68	0.92	0.33	0.96	0.50	0.72	0.75	0.74	0.94

Rolling Hour Summary
3:00 PM to 5:00 PM

Interval Start Time	Northbound Ostman Rd				Southbound Ostman Rd				Eastbound Willamette Falls Dr				Westbound Willamette Falls Dr				Interval Total	Pedestrians Crosswalk			
	L	T	R	Bikes	L	T	R	Bikes	L	T	R	Bikes	L	T	R	Bikes		North	South	East	West
3:00 PM	5	1	3	0	13	4	59	0	114	534	3	2	4	150	10	0	900	0	0	0	0
3:15 PM	5	2	2	0	14	3	62	0	128	531	4	1	4	149	9	0	913	0	0	0	0
3:30 PM	6	2	4	0	17	3	60	0	133	530	4	1	4	138	8	0	909	1	0	0	0
3:45 PM	7	2	3	0	14	3	45	0	143	534	3	1	4	119	10	0	887	1	0	0	0
4:00 PM	5	1	5	0	15	2	46	0	150	534	2	1	2	128	10	0	900	1	0	0	0

Heavy Vehicle Summary

All Traffic Data Services Inc.
Clay Carney
(503) 833-2740



Ostman Rd & Willamette Falls Dr

Thursday, May 16, 2019
3:00 PM to 5:00 PM

Peak Hour Summary
3:10 PM to 4:10 PM

Heavy Vehicle 5-Minute Interval Summary
3:00 PM to 5:00 PM

Interval Start Time	Northbound Ostman Rd				Southbound Ostman Rd				Eastbound Willamette Falls Dr				Westbound Willamette Falls Dr				Interval Total
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	
3:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:05 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:10 PM	0	0	0	0	1	0	0	1	0	0	0	0	0	1	0	1	2
3:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	1
3:20 PM	0	0	0	0	0	0	0	0	0	1	0	1	0	1	0	1	2
3:25 PM	0	0	0	0	0	0	0	0	0	1	0	1	0	1	0	1	2
3:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	1
3:35 PM	0	0	0	0	0	0	0	0	1	0	0	1	0	2	0	2	3
3:40 PM	1	0	1	2	0	0	1	1	0	1	0	1	0	1	0	1	5
3:45 PM	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	1
3:50 PM	0	0	0	0	0	0	0	0	1	1	0	2	0	0	0	0	2
3:55 PM	0	0	0	0	0	0	0	0	0	2	0	2	1	0	0	1	3
4:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:05 PM	0	0	0	0	0	0	0	0	1	4	0	5	0	0	1	1	6
4:10 PM	1	0	0	1	1	0	0	1	3	3	0	6	0	0	0	0	8
4:15 PM	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	1
4:20 PM	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	1
4:25 PM	1	0	0	1	0	0	0	0	0	1	0	1	0	3	1	4	6
4:30 PM	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	1
4:35 PM	0	0	0	0	0	0	0	0	1	2	0	3	0	0	0	0	3
4:40 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:50 PM	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	1
4:55 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Survey	3	0	1	4	4	0	1	5	7	19	0	26	1	11	2	14	49

Heavy Vehicle 15-Minute Interval Summary
3:00 PM to 5:00 PM

Interval Start Time	Northbound Ostman Rd				Southbound Ostman Rd				Eastbound Willamette Falls Dr				Westbound Willamette Falls Dr				Interval Total
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	
3:00 PM	0	0	0	0	1	0	0	1	0	0	0	0	0	1	0	1	2
3:15 PM	0	0	0	0	0	0	0	0	0	2	0	2	0	3	0	3	5
3:30 PM	1	0	1	2	0	0	1	1	1	1	0	2	0	4	0	4	9
3:45 PM	0	0	0	0	0	0	0	0	1	4	0	5	1	0	0	1	6
4:00 PM	1	0	0	1	1	0	0	1	4	7	0	11	0	0	1	1	14
4:15 PM	1	0	0	1	1	0	0	1	0	2	0	2	0	3	1	4	8
4:30 PM	0	0	0	0	0	0	0	0	1	3	0	4	0	0	0	0	4
4:45 PM	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	1
Total Survey	3	0	1	4	4	0	1	5	7	19	0	26	1	11	2	14	49

Heavy Vehicle Peak Hour Summary
3:10 PM to 4:10 PM

By Approach	Northbound Ostman Rd			Southbound Ostman Rd			Eastbound Willamette Falls Dr			Westbound Willamette Falls Dr			Total
	In	Out	Total	In	Out	Total	In	Out	Total	In	Out	Total	
Volume	2	1	3	2	4	6	14	10	24	10	13	23	28
PHF	0.25			0.50			0.50			0.63			0.78

By Movement	Northbound Ostman Rd				Southbound Ostman Rd				Eastbound Willamette Falls Dr				Westbound Willamette Falls Dr				Total
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	
Volume	1	0	1	2	1	0	1	2	3	11	0	14	1	8	1	10	28
PHF	0.25	0.00	0.25	0.25	0.25	0.00	0.25	0.50	0.75	0.46	0.00	0.50	0.25	0.50	0.25	0.63	0.78

Heavy Vehicle Rolling Hour Summary
3:00 PM to 5:00 PM

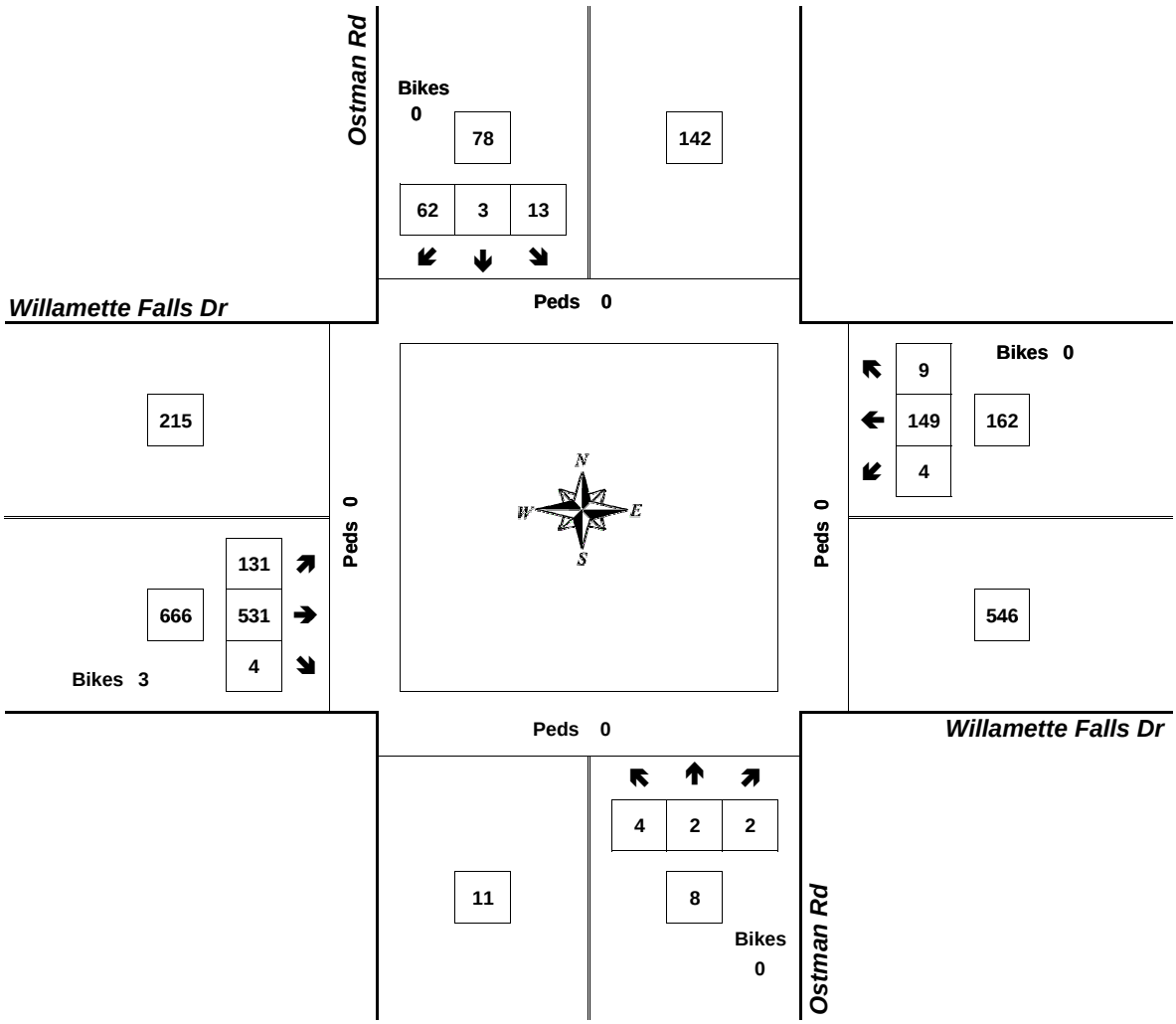
Interval Start Time	Northbound Ostman Rd				Southbound Ostman Rd				Eastbound Willamette Falls Dr				Westbound Willamette Falls Dr				Interval Total
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	
3:00 PM	1	0	1	2	1	0	1	2	2	7	0	9	1	8	0	9	22
3:15 PM	2	0	1	3	1	0	1	2	6	14	0	20	1	7	1	9	34
3:30 PM	3	0	1	4	2	0	1	3	6	14	0	20	1	7	2	10	37
3:45 PM	2	0	0	2	2	0	0	2	6	16	0	22	1	3	2	6	32
4:00 PM	2	0	0	2	3	0	0	3	5	12	0	17	0	3	2	5	27

Peak Hour Summary

All Traffic Data Services Inc.
Clay Carney
(503) 833-2740

Ostman Rd & Willamette Falls Dr

3:10 PM to 4:10 PM
Thursday, May 16, 2019

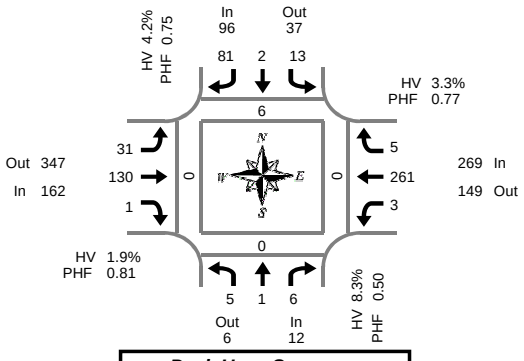


Approach	PHF	HV%	Volume
EB	0.96	2.1%	666
WB	0.74	6.2%	162
NB	0.50	25.0%	8
SB	0.72	2.6%	78
Intersection	0.94	3.1%	914

Count Period: 3:00 PM to 5:00 PM

Total Vehicle Summary

All Traffic Data Services Inc.
Clay Carney
(503) 833-2740



Peak Hour Summary
8:00 AM to 9:00 AM

Ostman Rd & Willamette Falls Dr

Thursday, May 16, 2019
8:00 AM to 10:00 AM

5-Minute Interval Summary
8:00 AM to 10:00 AM

Interval Start Time	Northbound Ostman Rd				Southbound Ostman Rd				Eastbound Willamette Falls Dr				Westbound Willamette Falls Dr				Interval Total	Pedestrians Crosswalk			
	L	T	R	Bikes	L	T	R	Bikes	L	T	R	Bikes	L	T	R	Bikes		North	South	East	West
8:00 AM	0	1	0	0	0	0	8	0	5	7	0	0	0	26	0	0	47	1	0	0	0
8:05 AM	0	0	2	0	1	0	3	0	4	13	0	0	1	23	0	0	47	1	0	0	0
8:10 AM	0	0	2	0	1	0	9	0	2	18	0	0	0	16	0	0	48	0	0	0	0
8:15 AM	0	0	2	0	1	1	9	0	2	10	1	0	0	22	1	0	49	1	0	0	0
8:20 AM	0	0	0	0	4	0	7	0	2	7	0	0	0	18	0	0	38	0	0	0	0
8:25 AM	1	0	0	0	1	0	2	0	2	12	0	0	1	21	0	0	40	0	0	0	0
8:30 AM	0	0	0	0	0	1	4	0	1	8	0	0	1	26	1	0	42	1	0	0	0
8:35 AM	0	0	0	0	0	0	9	0	6	7	0	0	0	28	0	0	50	1	0	0	0
8:40 AM	1	0	0	0	2	0	5	0	3	13	0	0	0	30	1	0	55	0	0	0	0
8:45 AM	1	0	0	0	1	0	9	0	1	7	0	0	0	19	1	0	39	0	0	0	0
8:50 AM	2	0	0	0	1	0	9	0	1	9	0	0	0	18	0	0	40	0	0	0	0
8:55 AM	0	0	0	0	1	0	7	0	2	19	0	0	0	14	1	0	44	1	0	0	0
9:00 AM	0	0	1	0	3	0	9	0	4	12	0	0	0	14	1	0	44	0	0	0	0
9:05 AM	0	0	0	0	0	0	5	0	7	8	1	0	0	17	0	0	38	0	0	0	0
9:10 AM	0	0	0	0	1	1	3	0	7	16	0	0	0	18	2	0	48	1	0	0	0
9:15 AM	1	0	0	0	0	0	3	0	3	6	0	0	0	15	0	0	28	0	0	0	0
9:20 AM	0	0	0	0	0	0	5	0	2	9	1	0	0	18	2	0	37	0	0	0	0
9:25 AM	0	0	0	0	0	0	0	0	4	12	0	0	0	13	1	0	30	0	0	0	0
9:30 AM	0	0	1	0	0	0	2	0	6	3	1	0	0	3	1	0	17	0	0	0	0
9:35 AM	0	1	0	0	0	0	2	0	1	10	0	0	1	10	0	0	25	0	0	0	0
9:40 AM	1	0	0	0	0	0	3	0	0	8	0	0	0	11	0	1	23	0	0	0	0
9:45 AM	0	0	0	0	0	0	3	0	4	11	0	0	0	13	2	0	33	0	0	0	0
9:50 AM	0	0	0	0	0	0	2	0	2	10	0	0	0	5	0	0	19	0	0	0	0
9:55 AM	0	0	0	0	0	0	2	0	1	9	0	0	0	7	1	0	20	0	0	0	0
Total Survey	7	2	8	0	17	3	120	0	72	244	4	0	4	405	15	1	901	7	0	0	0

15-Minute Interval Summary
8:00 AM to 10:00 AM

Interval Start Time	Northbound Ostman Rd				Southbound Ostman Rd				Eastbound Willamette Falls Dr				Westbound Willamette Falls Dr				Interval Total	Pedestrians Crosswalk			
	L	T	R	Bikes	L	T	R	Bikes	L	T	R	Bikes	L	T	R	Bikes		North	South	East	West
8:00 AM	0	1	4	0	2	0	20	0	11	38	0	0	1	65	0	0	142	2	0	0	0
8:15 AM	1	0	2	0	6	1	18	0	6	29	1	0	1	61	1	0	127	1	0	0	0
8:30 AM	1	0	0	0	2	1	18	0	10	28	0	0	1	84	2	0	147	2	0	0	0
8:45 AM	3	0	0	0	3	0	25	0	4	35	0	0	0	51	2	0	123	1	0	0	0
9:00 AM	0	0	1	0	4	1	17	0	18	36	1	0	0	49	3	0	130	1	0	0	0
9:15 AM	1	0	0	0	0	0	8	0	9	27	1	0	0	46	3	0	95	0	0	0	0
9:30 AM	1	1	1	0	0	0	7	0	7	21	1	0	1	24	1	1	65	0	0	0	0
9:45 AM	0	0	0	0	0	0	7	0	7	30	0	0	0	25	3	0	72	0	0	0	0
Total Survey	7	2	8	0	17	3	120	0	72	244	4	0	4	405	15	1	901	7	0	0	0

Peak Hour Summary
8:00 AM to 9:00 AM

By Approach	Northbound Ostman Rd				Southbound Ostman Rd				Eastbound Willamette Falls Dr				Westbound Willamette Falls Dr				Total	Pedestrians Crosswalk			
	In	Out	Total	Bikes	In	Out	Total	Bikes	In	Out	Total	Bikes	In	Out	Total	Bikes		North	South	East	West
Volume	12	6	18	0	96	37	133	0	162	347	509	0	269	149	418	0	539	6	0	0	0
%HV	8.3%				4.2%				1.9%				3.3%				3.2%				
PHF	0.50				0.75				0.81				0.77				0.92				

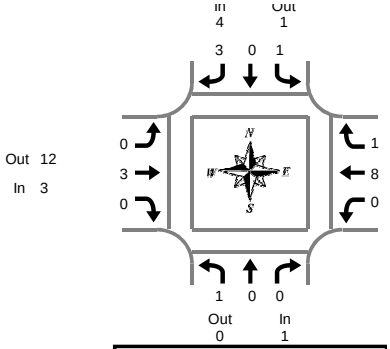
By Movement	Northbound Ostman Rd				Southbound Ostman Rd				Eastbound Willamette Falls Dr				Westbound Willamette Falls Dr				Total
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	
Volume	5	1	6	12	13	2	81	96	31	130	1	162	3	261	5	269	539
%HV	20.0%	0.0%	0.0%	8.3%	7.7%	0.0%	3.7%	4.2%	0.0%	2.3%	0.0%	1.9%	0.0%	3.1%	20.0%	3.3%	3.2%
PHF	0.31	0.25	0.25	0.50	0.54	0.50	0.81	0.75	0.70	0.79	0.25	0.81	0.38	0.78	0.63	0.77	0.92

Rolling Hour Summary
8:00 AM to 10:00 AM

Interval Start Time	Northbound Ostman Rd				Southbound Ostman Rd				Eastbound Willamette Falls Dr				Westbound Willamette Falls Dr				Interval Total	Pedestrians Crosswalk			
	L	T	R	Bikes	L	T	R	Bikes	L	T	R	Bikes	L	T	R	Bikes		North	South	East	West
8:00 AM	5	1	6	0	13	2	81	0	31	130	1	0	3	261	5	0	539	6	0	0	0
8:15 AM	5	0	3	0	15	3	78	0	38	128	2	0	2	245	8	0	527	5	0	0	0
8:30 AM	5	0	1	0	9	2	68	0	41	126	2	0	1	230	10	0	495	4	0	0	0
8:45 AM	5	1	2	0	7	1	57	0	38	119	3	0	1	170	9	1	413	2	0	0	0
9:00 AM	2	1	2	0	4	1	39	0	41	114	3	0	1	144	10	1	362	1	0	0	0

Heavy Vehicle Summary

All Traffic Data Services Inc.
Clay Carney
(503) 833-2740



Ostman Rd & Willamette Falls Dr

Thursday, May 16, 2019
8:00 AM to 10:00 AM

Peak Hour Summary
8:00 AM to 9:00 AM

Heavy Vehicle 5-Minute Interval Summary
8:00 AM to 10:00 AM

Interval Start Time	Northbound Ostman Rd				Southbound Ostman Rd				Eastbound Willamette Falls Dr				Westbound Willamette Falls Dr				Interval Total
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	
8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:05 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:10 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:15 AM	0	0	0	0	1	0	1	2	0	0	0	0	0	1	0	1	3
8:20 AM	0	0	0	0	0	0	0	0	0	2	0	2	0	0	0	0	2
8:25 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1
8:35 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:40 AM	0	0	0	0	0	0	0	0	0	1	0	1	0	1	0	1	2
8:45 AM	1	0	0	1	0	0	1	1	0	0	0	0	0	3	0	3	5
8:50 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	3	3
8:55 AM	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	1
9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:05 AM	0	0	0	0	0	0	0	0	0	1	0	1	0	1	0	1	2
9:10 AM	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	1
9:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:20 AM	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	1
9:25 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:30 AM	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	1
9:35 AM	0	1	0	1	0	0	0	0	0	1	0	1	0	0	0	0	2
9:40 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:50 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:55 AM	0	0	0	0	0	0	0	0	1	0	0	1	0	0	0	0	1
Total Survey	1	1	0	2	2	0	3	5	1	6	1	8	0	9	1	10	25

Heavy Vehicle 15-Minute Interval Summary
8:00 AM to 10:00 AM

Interval Start Time	Northbound Ostman Rd				Southbound Ostman Rd				Eastbound Willamette Falls Dr				Westbound Willamette Falls Dr				Interval Total
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	
8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:15 AM	0	0	0	0	1	0	1	2	0	2	0	2	0	1	0	1	5
8:30 AM	0	0	0	0	0	0	0	0	0	1	0	1	0	1	1	2	3
8:45 AM	1	0	0	1	0	0	2	2	0	0	0	0	0	6	0	6	9
9:00 AM	0	0	0	0	1	0	0	1	0	1	0	1	0	1	0	1	3
9:15 AM	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	1
9:30 AM	0	1	0	1	0	0	0	0	0	1	1	2	0	0	0	0	3
9:45 AM	0	0	0	0	0	0	0	0	1	0	0	1	0	0	0	0	1
Total Survey	1	1	0	2	2	0	3	5	1	6	1	8	0	9	1	10	25

Heavy Vehicle Peak Hour Summary
8:00 AM to 9:00 AM

By Approach	Northbound Ostman Rd			Southbound Ostman Rd			Eastbound Willamette Falls Dr			Westbound Willamette Falls Dr			Total
	In	Out	Total	In	Out	Total	In	Out	Total	In	Out	Total	
Volume	1	0	1	4	1	5	3	12	15	9	4	13	17
PHF	0.25			0.50			0.38			0.32			0.43

By Movement	Northbound Ostman Rd				Southbound Ostman Rd				Eastbound Willamette Falls Dr				Westbound Willamette Falls Dr				Total
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	
Volume	1	0	0	1	1	0	3	4	0	3	0	3	0	8	1	9	17
PHF	0.25	0.00	0.00	0.25	0.25	0.00	0.38	0.50	0.00	0.38	0.00	0.38	0.00	0.29	0.25	0.32	0.43

Heavy Vehicle Rolling Hour Summary
8:00 AM to 10:00 AM

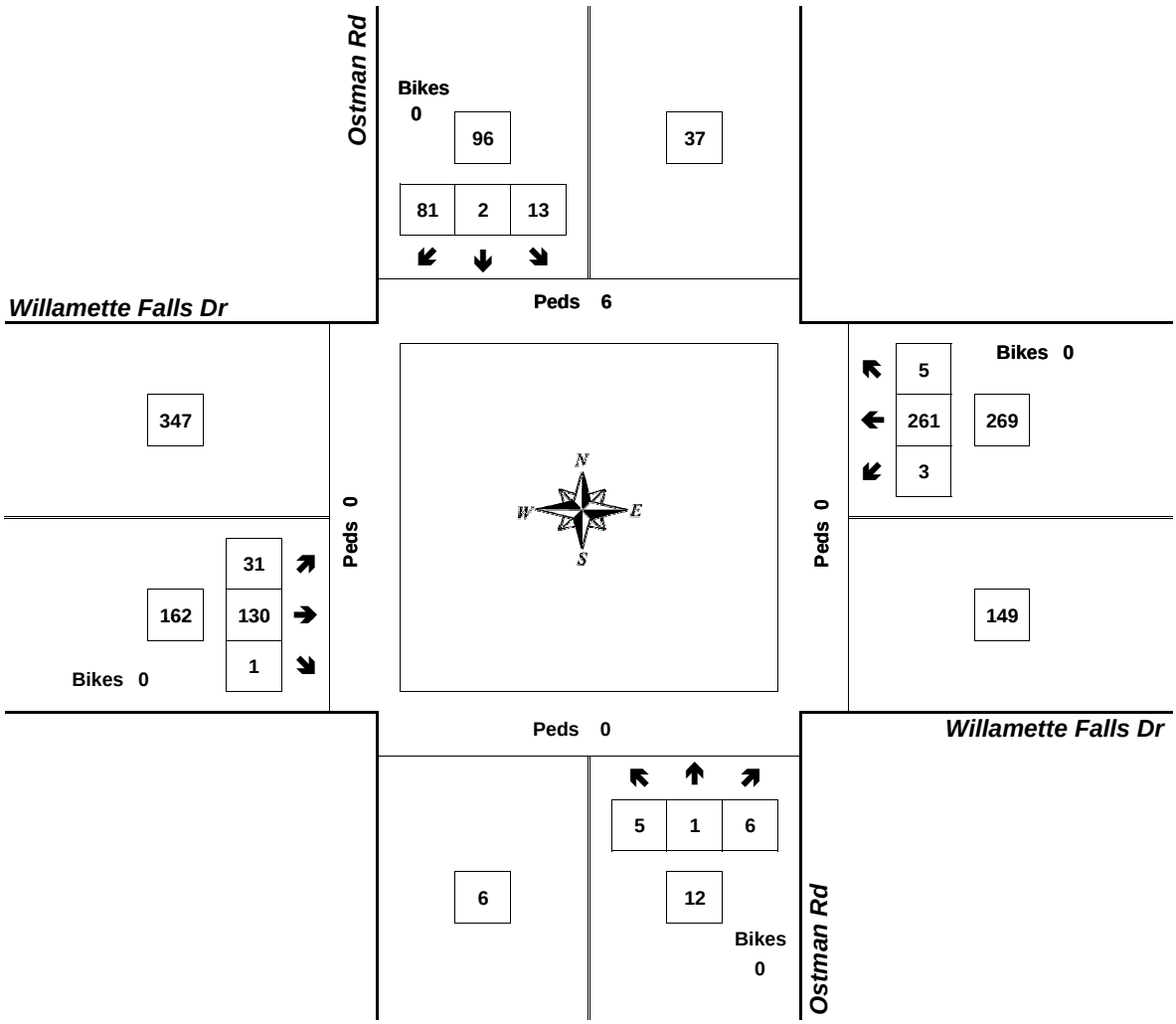
Interval Start Time	Northbound Ostman Rd				Southbound Ostman Rd				Eastbound Willamette Falls Dr				Westbound Willamette Falls Dr				Interval Total
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	
8:00 AM	1	0	0	1	1	0	3	4	0	3	0	3	0	8	1	9	17
8:15 AM	1	0	0	1	2	0	3	5	0	4	0	4	0	9	1	10	20
8:30 AM	1	0	0	1	1	0	2	3	0	3	0	3	0	8	1	9	16
8:45 AM	1	1	0	2	1	0	2	3	0	3	1	4	0	7	0	7	16
9:00 AM	0	1	0	1	1	0	0	1	1	3	1	5	0	1	0	1	8

Peak Hour Summary

Clay Carney
(503) 833-2740

Ostman Rd & Willamette Falls Dr

8:00 AM to 9:00 AM
Thursday, May 16, 2019

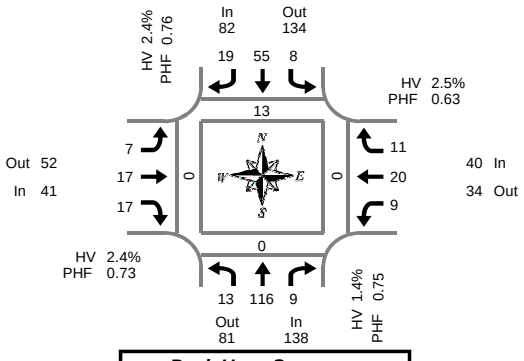


Approach	PHF	HV%	Volume
EB	0.81	1.9%	162
WB	0.77	3.3%	269
NB	0.50	8.3%	12
SB	0.75	4.2%	96
Intersection	0.92	3.2%	539

Count Period: 8:00 AM to 10:00 AM

Total Vehicle Summary

All Traffic Data Services Inc.
Clay Carney
(503) 833-2740



Peak Hour Summary
3:10 PM to 4:10 PM

Ostman Rd & Dollar St

Thursday, May 16, 2019
3:00 PM to 5:00 PM

5-Minute Interval Summary
3:00 PM to 5:00 PM

Interval Start Time	Northbound Ostman Rd				Southbound Ostman Rd				Eastbound Dollar St				Westbound Dollar St				Interval Total	Pedestrians Crosswalk			
	L	T	R	Bikes	L	T	R	Bikes	L	T	R	Bikes	L	T	R	Bikes		North	South	East	West
3:00 PM	1	7	1	0	1	4	4	0	1	4	1	0	0	5	0	0	29	0	1	0	0
3:05 PM	0	7	2	0	1	1	0	0	2	6	1	0	0	4	1	0	25	0	0	0	0
3:10 PM	2	13	1	0	1	4	2	0	0	3	1	0	0	2	1	0	30	0	0	0	0
3:15 PM	2	6	2	0	1	4	0	0	1	0	3	0	0	2	0	0	21	0	0	0	0
3:20 PM	0	12	0	0	0	1	2	0	1	3	2	0	1	3	0	1	25	0	0	0	0
3:25 PM	1	8	0	0	1	7	1	0	0	1	0	0	1	3	2	0	25	2	0	0	0
3:30 PM	0	8	1	0	1	3	3	0	1	0	1	0	1	4	1	0	24	1	0	0	0
3:35 PM	3	5	0	0	0	8	2	0	1	2	2	0	1	2	0	0	26	2	0	0	0
3:40 PM	3	7	0	0	1	7	1	0	0	3	1	0	2	1	0	0	26	0	0	0	0
3:45 PM	0	6	2	0	1	5	2	0	1	1	3	0	0	1	1	0	23	3	0	0	0
3:50 PM	0	9	1	0	0	2	0	0	0	1	2	0	1	0	0	0	16	4	0	0	0
3:55 PM	1	12	0	0	0	4	2	0	0	3	0	0	0	0	0	0	22	0	0	0	0
4:00 PM	0	12	2	0	1	4	2	0	1	0	1	0	0	1	6	0	30	0	0	0	0
4:05 PM	1	18	0	1	1	6	2	0	1	0	1	0	2	1	0	0	33	1	0	0	0
4:10 PM	1	10	1	0	2	2	0	0	0	2	0	0	0	1	0	0	19	0	0	0	0
4:15 PM	3	5	2	0	0	4	1	0	0	0	2	0	0	0	1	0	18	1	0	1	0
4:20 PM	2	11	0	0	0	6	0	0	1	1	0	0	1	0	2	0	24	0	0	0	0
4:25 PM	1	13	0	0	1	7	1	0	1	2	0	0	2	2	0	0	30	0	0	0	0
4:30 PM	1	9	1	0	0	2	0	0	1	0	0	0	0	1	0	0	15	5	2	1	0
4:35 PM	1	11	2	0	1	1	1	0	1	0	1	0	0	1	0	0	20	1	0	0	0
4:40 PM	2	7	1	0	0	1	3	0	1	0	2	0	0	0	1	0	18	1	0	0	0
4:45 PM	1	6	2	0	0	2	4	0	0	2	1	0	0	1	1	0	20	1	0	0	0
4:50 PM	1	8	0	0	1	6	0	0	1	0	2	0	0	2	1	0	22	0	0	0	0
4:55 PM	0	13	1	0	0	6	1	0	3	2	1	0	1	2	1	0	31	0	0	0	0
Total Survey	27	223	22	1	15	97	34	0	19	36	28	0	13	39	19	1	572	22	3	2	0

15-Minute Interval Summary
3:00 PM to 5:00 PM

Interval Start Time	Northbound Ostman Rd				Southbound Ostman Rd				Eastbound Dollar St				Westbound Dollar St				Interval Total	Pedestrians Crosswalk			
	L	T	R	Bikes	L	T	R	Bikes	L	T	R	Bikes	L	T	R	Bikes		North	South	East	West
3:00 PM	3	27	4	0	3	9	6	0	3	13	3	0	0	11	2	0	84	0	1	0	0
3:15 PM	3	26	2	0	2	12	3	0	2	4	5	0	2	8	2	1	71	2	0	0	0
3:30 PM	6	20	1	0	2	18	6	0	2	5	4	0	4	7	1	0	76	3	0	0	0
3:45 PM	1	27	3	0	1	11	4	0	1	5	5	0	1	1	1	0	61	7	0	0	0
4:00 PM	2	40	3	1	4	12	4	0	2	2	2	0	2	3	6	0	82	1	0	0	0
4:15 PM	6	29	2	0	1	17	2	0	2	3	2	0	3	2	3	0	72	1	0	1	0
4:30 PM	4	27	4	0	1	4	4	0	3	0	3	0	0	2	1	0	53	7	2	1	0
4:45 PM	2	27	3	0	1	14	5	0	4	4	4	0	1	5	3	0	73	1	0	0	0
Total Survey	27	223	22	1	15	97	34	0	19	36	28	0	13	39	19	1	572	22	3	2	0

Peak Hour Summary
3:10 PM to 4:10 PM

By Approach	Northbound Ostman Rd				Southbound Ostman Rd				Eastbound Dollar St				Westbound Dollar St				Total	Pedestrians Crosswalk			
	In	Out	Total	Bikes	In	Out	Total	Bikes	In	Out	Total	Bikes	In	Out	Total	Bikes		North	South	East	West
Volume	138	81	219	1	82	134	216	0	41	52	93	0	40	34	74	1	301	13	0	0	0
%HV	1.4%				2.4%				2.4%				2.5%				2.0%				
PHF	0.75				0.76				0.73				0.63				0.89				

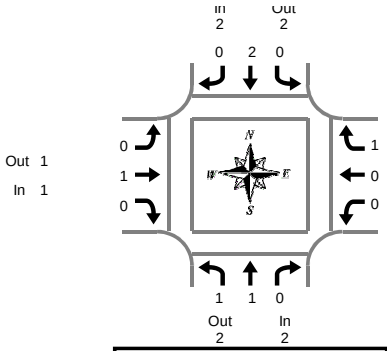
By Movement	Northbound Ostman Rd				Southbound Ostman Rd				Eastbound Dollar St				Westbound Dollar St				Total
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	
Volume	13	116	9	138	8	55	19	82	7	17	17	41	9	20	11	40	301
%HV	7.7%	0.9%	0.0%	1.4%	0.0%	3.6%	0.0%	2.4%	0.0%	5.9%	0.0%	2.4%	0.0%	0.0%	9.1%	2.5%	2.0%
PHF	0.54	0.69	0.75	0.75	1.00	0.69	0.79	0.76	0.88	0.71	0.71	0.73	0.56	0.50	0.46	0.63	0.89

Rolling Hour Summary
3:00 PM to 5:00 PM

Interval Start Time	Northbound Ostman Rd				Southbound Ostman Rd				Eastbound Dollar St				Westbound Dollar St				Interval Total	Pedestrians Crosswalk			
	L	T	R	Bikes	L	T	R	Bikes	L	T	R	Bikes	L	T	R	Bikes		North	South	East	West
3:00 PM	13	100	10	0	8	50	19	0	8	27	17	0	7	27	6	1	292	12	1	0	0
3:15 PM	12	113	9	1	9	53	17	0	7	16	16	0	9	19	10	1	290	13	0	0	0
3:30 PM	15	116	9	1	8	58	16	0	7	15	13	0	10	13	11	0	291	12	0	1	0
3:45 PM	13	123	12	1	7	44	14	0	8	10	12	0	6	8	11	0	268	16	2	2	0
4:00 PM	14	123	12	1	7	47	15	0	11	9	11	0	6	12	13	0	280	10	2	2	0

Heavy Vehicle Summary

All Traffic Data Services Inc.
Clay Carney
(503) 833-2740



Ostman Rd & Dollar St

Thursday, May 16, 2019
3:00 PM to 5:00 PM

Peak Hour Summary
3:10 PM to 4:10 PM

Heavy Vehicle 5-Minute Interval Summary
3:00 PM to 5:00 PM

Interval Start Time	Northbound Ostman Rd				Southbound Ostman Rd				Eastbound Dollar St				Westbound Dollar St				Interval Total
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	
3:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:05 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:10 PM	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	1
3:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:20 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:25 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1
3:35 PM	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
3:40 PM	0	0	0	0	0	1	0	1	0	1	0	1	0	0	0	0	2
3:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:50 PM	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
3:55 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:05 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:10 PM	0	3	0	3	0	0	0	0	0	0	0	0	0	0	0	0	3
4:15 PM	1	0	1	2	0	0	0	0	0	0	1	1	0	0	0	0	3
4:20 PM	0	0	0	0	0	1	0	1	0	1	0	1	0	0	0	0	2
4:25 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:35 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:40 PM	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:50 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:55 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Survey	3	4	1	8	0	3	0	3	0	2	1	3	0	0	1	1	15

Heavy Vehicle 15-Minute Interval Summary
3:00 PM to 5:00 PM

Interval Start Time	Northbound Ostman Rd				Southbound Ostman Rd				Eastbound Dollar St				Westbound Dollar St				Interval Total
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	
3:00 PM	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	1
3:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:30 PM	1	0	0	1	0	1	0	1	0	1	0	1	0	0	1	1	4
3:45 PM	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
4:00 PM	0	3	0	3	0	0	0	0	0	0	0	0	0	0	0	0	3
4:15 PM	1	0	1	2	0	1	0	1	0	1	1	2	0	0	0	0	5
4:30 PM	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Survey	3	4	1	8	0	3	0	3	0	2	1	3	0	0	1	1	15

Heavy Vehicle Peak Hour Summary
3:10 PM to 4:10 PM

By Approach	Northbound Ostman Rd			Southbound Ostman Rd			Eastbound Dollar St			Westbound Dollar St			Total
	In	Out	Total	In	Out	Total	In	Out	Total	In	Out	Total	
Volume	2	2	4	2	2	4	1	1	2	1	1	2	6
PHF	0.50			0.50			0.25			0.25			0.38

By Movement	Northbound Ostman Rd				Southbound Ostman Rd				Eastbound Dollar St				Westbound Dollar St				Total
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	
Volume	1	1	0	2	0	2	0	2	0	1	0	1	0	0	1	1	6
PHF	0.25	0.25	0.00	0.50	0.00	0.50	0.00	0.50	0.00	0.25	0.00	0.25	0.00	0.00	0.25	0.25	0.38

Heavy Vehicle Rolling Hour Summary
3:00 PM to 5:00 PM

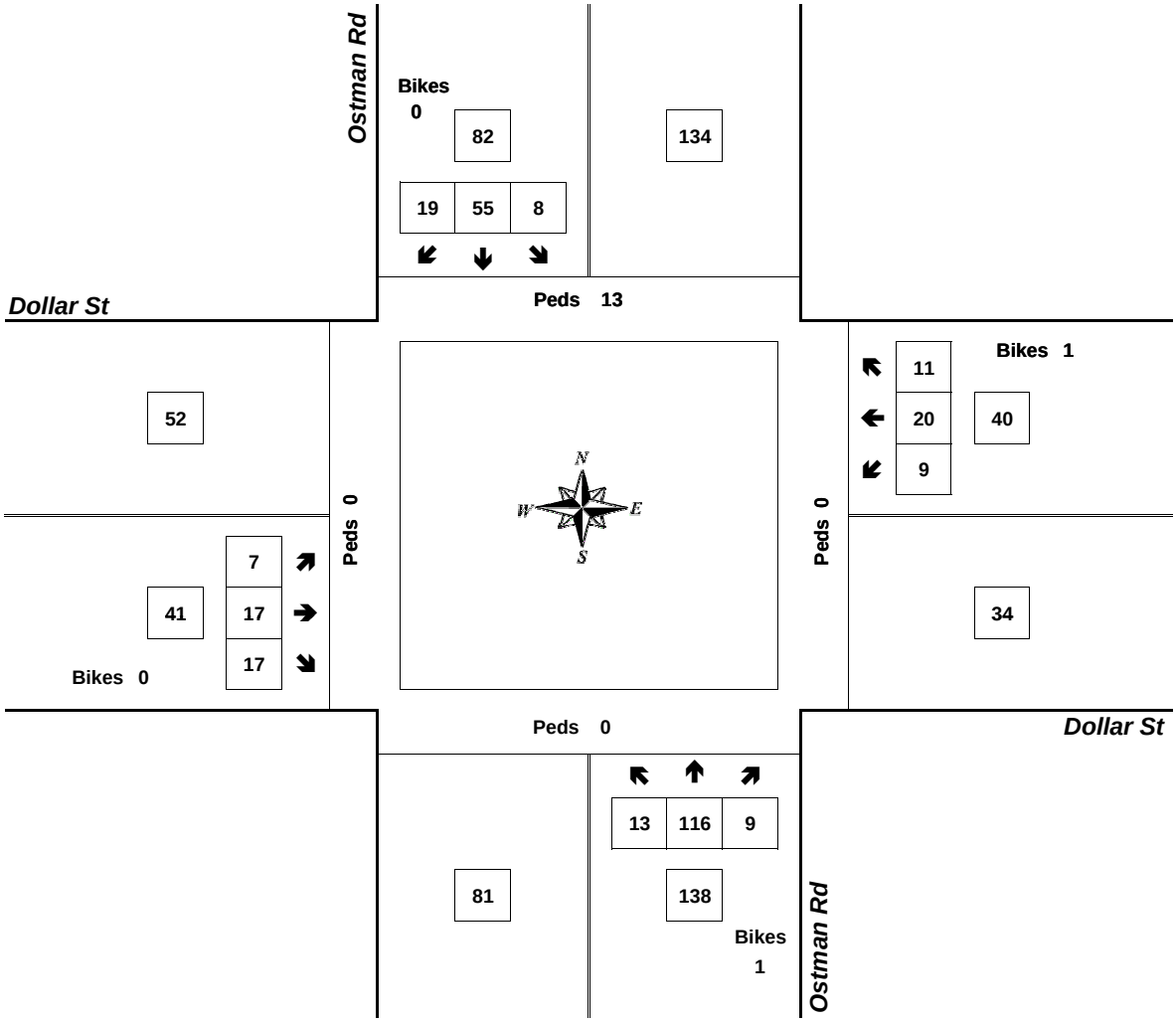
Interval Start Time	Northbound Ostman Rd				Southbound Ostman Rd				Eastbound Dollar St				Westbound Dollar St				Interval Total
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	
3:00 PM	1	1	0	2	0	2	0	2	0	1	0	1	0	0	1	1	6
3:15 PM	1	4	0	5	0	1	0	1	0	1	0	1	0	0	1	1	8
3:30 PM	2	4	1	7	0	2	0	2	0	2	1	3	0	0	1	1	13
3:45 PM	2	4	1	7	0	1	0	1	0	1	1	2	0	0	0	0	10
4:00 PM	2	3	1	6	0	1	0	1	0	1	1	2	0	0	0	0	9

Peak Hour Summary

All Traffic Data Services Inc.
Clay Carney
(503) 833-2740

Ostman Rd & Dollar St

3:10 PM to 4:10 PM
Thursday, May 16, 2019

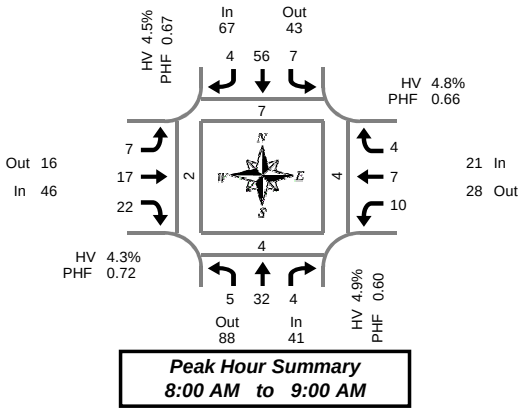


Approach	PHF	HV%	Volume
EB	0.73	2.4%	41
WB	0.63	2.5%	40
NB	0.75	1.4%	138
SB	0.76	2.4%	82
Intersection	0.89	2.0%	301

Count Period: 3:00 PM to 5:00 PM

Total Vehicle Summary

All Traffic Data Services Inc.
Clay Carney
(503) 833-2740



Peak Hour Summary
8:00 AM to 9:00 AM

Ostman Rd & Dollar St

Thursday, May 16, 2019
8:00 AM to 10:00 AM

5-Minute Interval Summary
8:00 AM to 10:00 AM

Interval Start Time	Northbound Ostman Rd				Southbound Ostman Rd				Eastbound Dollar St				Westbound Dollar St				Interval Total	Pedestrians Crosswalk			
	L	T	R	Bikes	L	T	R	Bikes	L	T	R	Bikes	L	T	R	Bikes		North	South	East	West
8:00 AM	4	6	0	0	0	2	0	0	0	4	3	0	1	0	2	0	22	2	0	0	0
8:05 AM	0	4	0	0	1	2	1	0	0	2	1	0	0	2	0	0	13	0	1	0	0
8:10 AM	0	2	1	0	2	7	0	0	2	2	2	0	0	1	0	0	19	1	0	1	2
8:15 AM	0	4	1	0	1	8	0	0	1	1	1	0	0	0	0	0	17	0	0	0	0
8:20 AM	0	1	0	0	0	6	1	0	0	0	1	0	1	0	0	0	10	0	0	0	0
8:25 AM	0	2	0	0	1	1	0	0	0	0	0	0	1	0	1	0	6	2	0	0	0
8:30 AM	0	1	0	0	1	2	1	0	3	0	2	0	1	0	1	0	12	0	0	0	0
8:35 AM	0	4	1	0	0	6	0	0	0	4	2	0	1	1	0	0	19	0	0	0	0
8:40 AM	1	3	0	0	0	4	0	0	1	1	1	0	0	0	0	0	11	1	0	0	0
8:45 AM	0	2	1	0	0	8	1	0	0	2	0	0	2	0	0	0	16	0	3	3	0
8:50 AM	0	0	0	0	0	5	0	0	0	0	2	0	3	1	0	0	11	1	0	0	0
8:55 AM	0	3	0	0	1	5	0	0	0	1	7	0	0	2	0	0	19	0	0	0	0
9:00 AM	1	0	0	0	0	5	1	0	0	0	0	0	1	2	1	0	11	1	0	0	1
9:05 AM	1	8	1	0	0	1	1	0	0	1	3	0	0	2	1	0	19	0	0	0	0
9:10 AM	3	3	0	0	0	3	0	0	0	1	0	0	1	1	1	0	13	0	0	0	0
9:15 AM	1	4	0	0	0	2	1	0	0	1	0	0	0	1	0	0	10	0	0	0	0
9:20 AM	1	1	0	0	0	3	0	0	1	1	2	0	1	0	0	0	10	2	0	0	0
9:25 AM	0	1	0	0	0	0	0	0	1	2	1	0	0	0	1	0	6	0	0	0	0
9:30 AM	2	5	0	0	0	1	1	0	0	0	0	0	0	0	0	0	9	0	0	0	0
9:35 AM	1	2	0	0	1	2	0	0	0	2	1	0	0	0	1	0	10	0	0	0	0
9:40 AM	1	0	1	0	1	3	0	0	1	2	0	0	0	1	0	0	10	0	0	1	0
9:45 AM	2	1	0	0	0	1	1	0	0	2	1	0	0	0	0	0	8	0	0	0	0
9:50 AM	1	2	0	0	0	1	0	0	2	0	1	0	0	1	1	0	9	0	0	0	1
9:55 AM	1	1	0	0	1	1	0	0	3	1	1	0	0	1	0	0	10	0	0	0	0
Total Survey	20	60	6	0	10	79	9	0	15	30	32	0	13	16	10	0	300	10	4	5	4

15-Minute Interval Summary
8:00 AM to 10:00 AM

Interval Start Time	Northbound Ostman Rd				Southbound Ostman Rd				Eastbound Dollar St				Westbound Dollar St				Interval Total	Pedestrians Crosswalk			
	L	T	R	Bikes	L	T	R	Bikes	L	T	R	Bikes	L	T	R	Bikes		North	South	East	West
8:00 AM	4	12	1	0	3	11	1	0	2	8	6	0	1	3	2	0	54	3	1	1	2
8:15 AM	0	7	1	0	2	15	1	0	1	1	2	0	2	0	1	0	33	2	0	0	0
8:30 AM	1	8	1	0	1	12	1	0	4	5	5	0	2	1	1	0	42	1	0	0	0
8:45 AM	0	5	1	0	1	18	1	0	0	3	9	0	5	3	0	0	46	1	3	3	0
9:00 AM	5	11	1	0	0	9	2	0	0	2	3	0	2	5	3	0	43	1	0	0	1
9:15 AM	2	6	0	0	0	5	1	0	2	4	3	0	1	1	1	0	26	2	0	0	0
9:30 AM	4	7	1	0	2	6	1	0	1	4	1	0	0	1	1	0	29	0	0	1	0
9:45 AM	4	4	0	0	1	3	1	0	5	3	3	0	0	2	1	0	27	0	0	0	1
Total Survey	20	60	6	0	10	79	9	0	15	30	32	0	13	16	10	0	300	10	4	5	4

Peak Hour Summary
8:00 AM to 9:00 AM

By Approach	Northbound Ostman Rd				Southbound Ostman Rd				Eastbound Dollar St				Westbound Dollar St				Total	Pedestrians Crosswalk			
	In	Out	Total	Bikes	In	Out	Total	Bikes	In	Out	Total	Bikes	In	Out	Total	Bikes		North	South	East	West
Volume	41	88	129	0	67	43	110	0	46	16	62	0	21	28	49	0	175	7	4	4	2
%HV	4.9%				4.5%				4.3%				4.8%				4.6%				
PHF	0.60				0.67				0.72				0.66				0.81				

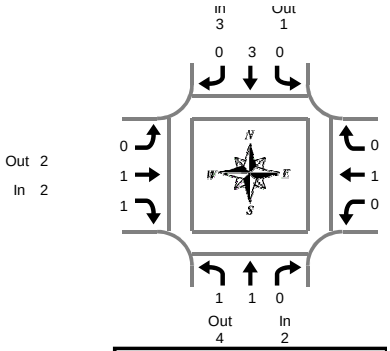
By Movement	Northbound Ostman Rd				Southbound Ostman Rd				Eastbound Dollar St				Westbound Dollar St				Total
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	
Volume	5	32	4	41	7	56	4	67	7	17	22	46	10	7	4	21	175
%HV	20.0%	3.1%	0.0%	4.9%	0.0%	5.4%	0.0%	4.5%	0.0%	5.9%	4.5%	4.3%	0.0%	14.3%	0.0%	4.8%	4.6%
PHF	0.31	0.67	0.50	0.60	0.44	0.67	0.50	0.67	0.44	0.53	0.61	0.72	0.50	0.58	0.50	0.66	0.81

Rolling Hour Summary
8:00 AM to 10:00 AM

Interval Start Time	Northbound Ostman Rd				Southbound Ostman Rd				Eastbound Dollar St				Westbound Dollar St				Interval Total	Pedestrians Crosswalk			
	L	T	R	Bikes	L	T	R	Bikes	L	T	R	Bikes	L	T	R	Bikes		North	South	East	West
8:00 AM	5	32	4	0	7	56	4	0	7	17	22	0	10	7	4	0	175	7	4	4	2
8:15 AM	6	31	4	0	4	54	5	0	5	11	19	0	11	9	5	0	164	5	3	3	1
8:30 AM	8	30	3	0	2	44	5	0	6	14	20	0	10	10	5	0	157	5	3	3	1
8:45 AM	11	29	3	0	3	38	5	0	3	13	16	0	8	10	5	0	144	4	3	4	1
9:00 AM	15	28	2	0	3	23	5	0	8	13	10	0	3	9	6	0	125	3	0	1	2

Heavy Vehicle Summary

Clay Carney
(503) 833-2740



Ostman Rd & Dollar St

Thursday, May 16, 2019
8:00 AM to 10:00 AM

Peak Hour Summary
8:00 AM to 9:00 AM

Heavy Vehicle 5-Minute Interval Summary
8:00 AM to 10:00 AM

Interval Start Time	Northbound Ostman Rd				Southbound Ostman Rd				Eastbound Dollar St				Westbound Dollar St				Interval Total
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	
8:00 AM	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
8:05 AM	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	1
8:10 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:15 AM	0	0	0	0	0	2	0	2	0	0	0	0	0	0	0	0	2
8:20 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:25 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:35 AM	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
8:40 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:45 AM	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	1
8:50 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:55 AM	0	0	0	0	0	0	0	0	0	0	1	1	0	1	0	1	2
9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:05 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:10 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:15 AM	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	1
9:20 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:25 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:35 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:40 AM	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
9:45 AM	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	1
9:50 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1
9:55 AM	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
Total Survey	2	2	0	4	0	4	0	4	0	2	1	3	0	1	1	2	13

Heavy Vehicle 15-Minute Interval Summary
8:00 AM to 10:00 AM

Interval Start Time	Northbound Ostman Rd				Southbound Ostman Rd				Eastbound Dollar St				Westbound Dollar St				Interval Total
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	
8:00 AM	1	0	0	1	0	0	0	0	0	1	0	1	0	0	0	0	2
8:15 AM	0	0	0	0	0	2	0	2	0	0	0	0	0	0	0	0	2
8:30 AM	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
8:45 AM	0	0	0	0	0	1	0	1	0	0	1	1	0	1	0	1	3
9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:15 AM	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	1
9:30 AM	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
9:45 AM	0	1	0	1	0	0	0	0	0	1	0	1	0	0	1	1	3
Total Survey	2	2	0	4	0	4	0	4	0	2	1	3	0	1	1	2	13

Heavy Vehicle Peak Hour Summary
8:00 AM to 9:00 AM

By Approach	Northbound Ostman Rd			Southbound Ostman Rd			Eastbound Dollar St			Westbound Dollar St			Total
	In	Out	Total	In	Out	Total	In	Out	Total	In	Out	Total	
Volume	2	4	6	3	1	4	2	2	4	1	1	2	8
PHF	0.50			0.38			0.50			0.25			0.67

By Movement	Northbound Ostman Rd				Southbound Ostman Rd				Eastbound Dollar St				Westbound Dollar St				Total
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	
Volume	1	1	0	2	0	3	0	3	0	1	1	2	0	1	0	1	8
PHF	0.25	0.25	0.00	0.50	0.00	0.38	0.00	0.38	0.00	0.25	0.25	0.50	0.00	0.25	0.00	0.25	0.67

Heavy Vehicle Rolling Hour Summary
8:00 AM to 10:00 AM

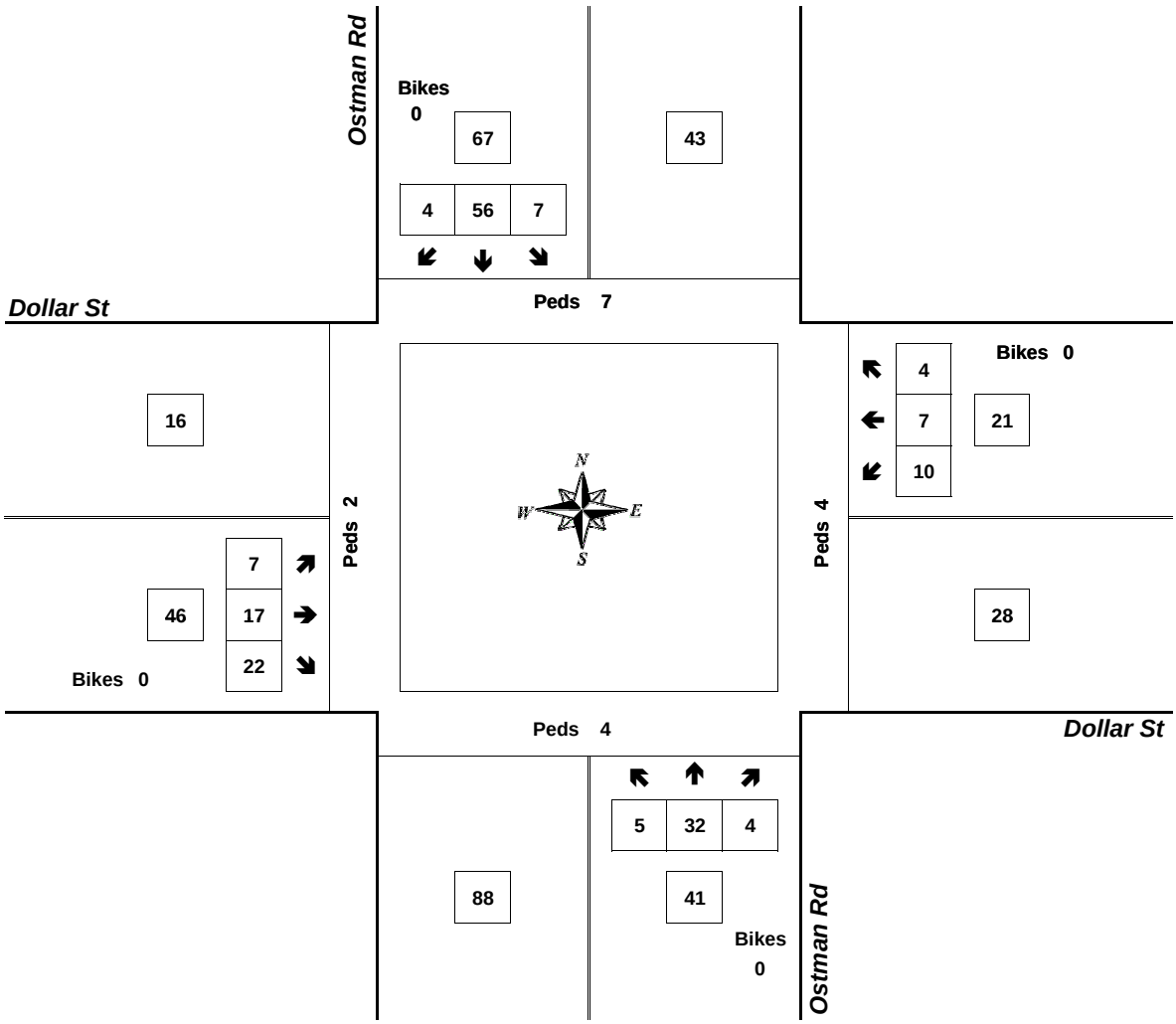
Interval Start Time	Northbound Ostman Rd				Southbound Ostman Rd				Eastbound Dollar St				Westbound Dollar St				Interval Total
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	
8:00 AM	1	1	0	2	0	3	0	3	0	1	1	2	0	1	0	1	8
8:15 AM	0	1	0	1	0	3	0	3	0	0	1	1	0	1	0	1	6
8:30 AM	0	1	0	1	0	2	0	2	0	0	1	1	0	1	0	1	5
8:45 AM	1	0	0	1	0	2	0	2	0	0	1	1	0	1	0	1	5
9:00 AM	1	1	0	2	0	1	0	1	0	1	0	1	0	0	1	1	5

Peak Hour Summary

Clay Carney
(503) 833-2740

Ostman Rd & Dollar St

8:00 AM to 9:00 AM
Thursday, May 16, 2019

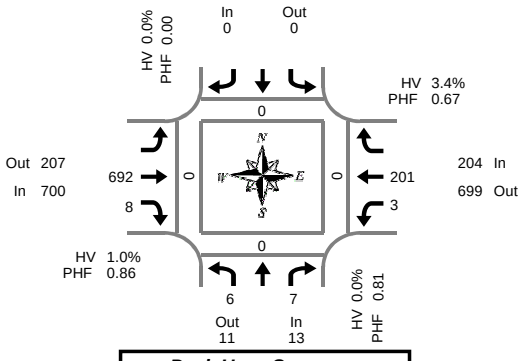


Approach	PHF	HV%	Volume
EB	0.72	4.3%	46
WB	0.66	4.8%	21
NB	0.60	4.9%	41
SB	0.67	4.5%	67
Intersection	0.81	4.6%	175

Count Period: 8:00 AM to 10:00 AM

Total Vehicle Summary

All Traffic Data Services Inc.
Clay Carney
(503) 833-2740



Fields Bridge Park & Willamette Falls Dr

Thursday, May 16, 2019
3:00 PM to 5:00 PM

5-Minute Interval Summary
3:00 PM to 5:00 PM

Interval Start Time	Northbound Fields Bridge Park				Southbound Fields Bridge Park				Eastbound Willamette Falls Dr				Westbound Willamette Falls Dr				Interval Total	Pedestrians Crosswalk			
	L		R	Bikes				Bikes	T	R	Bikes	L	T		Bikes		North	South	East	West
3:00 PM	0		0	0				0	44	1	2	0	15		0	60	0	0	0	0
3:05 PM	0		0	0				0	53	0	0	0	5		0	58	0	0	0	0
3:10 PM	0		2	2				0	50	1	0	1	14		0	68	0	0	0	0
3:15 PM	1		0	0				0	62	0	0	1	14		0	78	0	0	0	0
3:20 PM	1		0	0				0	55	1	0	1	20		0	78	0	0	0	0
3:25 PM	0		0	0				0	61	2	0	0	20		0	83	0	0	0	0
3:30 PM	0		1	0				0	52	0	0	0	16		0	69	0	0	0	0
3:35 PM	3		0	0				0	46	1	0	0	30		0	80	0	0	0	0
3:40 PM	0		0	0				0	53	2	0	0	19		0	74	0	0	0	0
3:45 PM	0		1	0				0	57	1	0	0	27		0	86	0	0	0	0
3:50 PM	0		1	0				0	59	0	0	0	12		0	72	0	0	0	0
3:55 PM	0		2	0				0	77	0	0	0	10		0	89	0	0	0	0
4:00 PM	1		0	0				0	67	0	1	0	14		0	82	0	0	0	0
4:05 PM	0		0	0				0	43	0	0	0	7		0	50	0	0	0	0
4:10 PM	0		1	0				0	62	0	0	1	11		0	75	0	0	0	0
4:15 PM	1		1	0				0	54	3	0	0	13		0	72	0	0	0	0
4:20 PM	0		1	0				0	62	2	0	0	11		0	76	0	0	0	0
4:25 PM	0		2	0				0	49	0	0	2	16		0	69	0	0	0	0
4:30 PM	0		0	0				0	60	0	0	1	9		0	70	0	0	0	0
4:35 PM	1		1	0				0	40	3	0	1	15		0	61	0	0	0	0
4:40 PM	0		0	0				0	56	0	0	0	19		0	75	0	0	0	0
4:45 PM	0		1	0				0	51	1	0	2	13		0	68	0	0	0	0
4:50 PM	0		2	0				0	65	2	0	2	14		0	85	0	0	0	0
4:55 PM	1		1	0				0	53	1	0	3	13		0	72	0	0	0	0
Total Survey	9		17	2				0	1,331	21	3	15	357		0	1,750	0	0	0	0

15-Minute Interval Summary
3:00 PM to 5:00 PM

Interval Start Time	Northbound Fields Bridge Park				Southbound Fields Bridge Park				Eastbound Willamette Falls Dr				Westbound Willamette Falls Dr				Interval Total	Pedestrians Crosswalk			
	L		R	Bikes				Bikes	T	R	Bikes	L	T		Bikes		North	South	East	West
3:00 PM	0		2	2				0	147	2	2	1	34		0	186	0	0	0	0
3:15 PM	2		0	0				0	178	3	0	2	54		0	239	0	0	0	0
3:30 PM	3		1	0				0	151	3	0	0	65		0	223	0	0	0	0
3:45 PM	0		4	0				0	193	1	0	0	49		0	247	0	0	0	0
4:00 PM	1		1	0				0	172	0	1	1	32		0	207	0	0	0	0
4:15 PM	1		4	0				0	165	5	0	2	40		0	217	0	0	0	0
4:30 PM	1		1	0				0	156	3	0	2	43		0	206	0	0	0	0
4:45 PM	1		4	0				0	169	4	0	7	40		0	225	0	0	0	0
Total Survey	9		17	2				0	1,331	21	3	15	357		0	1,750	0	0	0	0

Peak Hour Summary
3:05 PM to 4:05 PM

By Approach	Northbound Fields Bridge Park				Southbound Fields Bridge Park				Eastbound Willamette Falls Dr				Westbound Willamette Falls Dr				Total	Pedestrians Crosswalk			
	In	Out	Total	Bikes	In	Out	Total	Bikes	In	Out	Total	Bikes	In	Out	Total	Bikes		North	South	East	West
Volume	13	11	24	2	0	0	0	0	700	207	907	1	204	699	903	0	917	0	0	0	0
%HV	0.0%				0.0%				1.0%				3.4%				1.5%				
PHF	0.81				0.00				0.86				0.67				0.93				

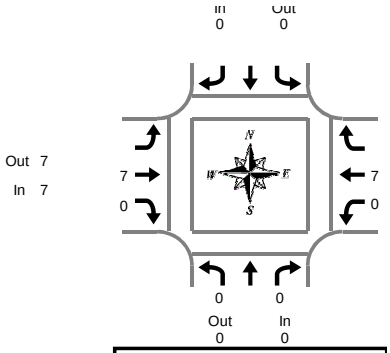
By Movement	Northbound Fields Bridge Park				Southbound Fields Bridge Park				Eastbound Willamette Falls Dr				Westbound Willamette Falls Dr				Total
	L		R	Total				Total		T	R	Total	L	T		Total	
Volume	6		7	13				0		692	8	700	3	201		204	917
%HV	0.0%	NA	0.0%	0.0%	NA	NA	NA	0.0%	NA	1.0%	0.0%	1.0%	0.0%	3.5%	NA	3.4%	1.5%
PHF	0.50		0.44	0.81				0.00		0.85	0.50	0.86	0.25	0.66		0.67	0.93

Rolling Hour Summary
3:00 PM to 5:00 PM

Interval Start Time	Northbound Fields Bridge Park				Southbound Fields Bridge Park				Eastbound Willamette Falls Dr				Westbound Willamette Falls Dr				Interval Total	Pedestrians Crosswalk			
	L		R	Bikes				Bikes	T	R	Bikes	L	T		Bikes		North	South	East	West
3:00 PM	5		7	2				0	669	9	2	3	202		0	895	0	0	0	0
3:15 PM	6		6	0				0	694	7	1	3	200		0	916	0	0	0	0
3:30 PM	5		10	0				0	681	9	1	3	186		0	894	0	0	0	0
3:45 PM	3		10	0				0	686	9	1	5	164		0	877	0	0	0	0
4:00 PM	4		10	0				0	662	12	1	12	155		0	855	0	0	0	0

Heavy Vehicle Summary

All Traffic Data Services Inc.
Clay Carney
(503) 833-2740



Fields Bridge Park & Willamette Falls Dr

Thursday, May 16, 2019
3:00 PM to 5:00 PM

Peak Hour Summary
3:05 PM to 4:05 PM

Heavy Vehicle 5-Minute Interval Summary
3:00 PM to 5:00 PM

Interval Start Time	Northbound Fields Bridge Park				Southbound Fields Bridge Park				Eastbound Willamette Falls Dr				Westbound Willamette Falls Dr				Interval Total
	L		R	Total				Total	T	R	Total		L	T		Total	
3:00 PM	0		0	0				0	0	0	0		0	0		0	0
3:05 PM	0		0	0				0	0	0	0		0	0		0	0
3:10 PM	0		0	0				0	0	0	0		0	0		0	0
3:15 PM	0		0	0				0	0	0	0		0	1		1	1
3:20 PM	0		0	0				0	0	0	0		0	0		0	0
3:25 PM	0		0	0				0	1	0	1		0	1		1	2
3:30 PM	0		0	0				0	0	0	0		0	0		0	0
3:35 PM	0		0	0				0	0	0	0		0	1		1	1
3:40 PM	0		0	0				0	1	0	1		0	3		3	4
3:45 PM	0		0	0				0	0	0	0		0	1		1	1
3:50 PM	0		0	0				0	3	0	3		0	0		0	3
3:55 PM	0		0	0				0	1	0	1		0	0		0	1
4:00 PM	0		0	0				0	1	0	1		0	0		0	1
4:05 PM	0		0	0				0	8	0	8		0	0		0	8
4:10 PM	0		0	0				0	3	0	3		0	0		0	3
4:15 PM	1		0	1				0	0	1	1		0	0		0	2
4:20 PM	0		0	0				0	0	0	0		0	1		1	1
4:25 PM	0		0	0				0	1	0	1		0	1		1	2
4:30 PM	0		0	0				0	2	0	2		0	2		2	4
4:35 PM	0		0	0				0	1	0	1		0	0		0	1
4:40 PM	0		0	0				0	0	0	0		0	0		0	0
4:45 PM	0		0	0				0	0	0	0		0	0		0	0
4:50 PM	0		0	0				0	0	0	0		0	0		0	0
4:55 PM	0		0	0				0	0	0	0		0	0		0	0
Total Survey	1		0	1				0	22	1	23		0	11		11	35

Heavy Vehicle 15-Minute Interval Summary
3:00 PM to 5:00 PM

Interval Start Time	Northbound Fields Bridge Park				Southbound Fields Bridge Park				Eastbound Willamette Falls Dr				Westbound Willamette Falls Dr				Interval Total
	L		R	Total				Total	T	R	Total		L	T		Total	
3:00 PM	0		0	0				0	0	0	0		0	0		0	0
3:15 PM	0		0	0				0	1	0	1		0	2		2	3
3:30 PM	0		0	0				0	1	0	1		0	4		4	5
3:45 PM	0		0	0				0	4	0	4		0	1		1	5
4:00 PM	0		0	0				0	12	0	12		0	0		0	12
4:15 PM	1		0	1				0	1	1	2		0	2		2	5
4:30 PM	0		0	0				0	3	0	3		0	2		2	5
4:45 PM	0		0	0				0	0	0	0		0	0		0	0
Total Survey	1		0	1				0	22	1	23		0	11		11	35

Heavy Vehicle Peak Hour Summary
3:05 PM to 4:05 PM

By Approach	Northbound Fields Bridge Park			Southbound Fields Bridge Park			Eastbound Willamette Falls Dr			Westbound Willamette Falls Dr			Total
	In	Out	Total	In	Out	Total	In	Out	Total	In	Out	Total	
Volume	0	0	0	0	0	0	7	7	14	7	7	14	14
PHF	0.00			0.00			0.35			0.35			0.44

By Movement	Northbound Fields Bridge Park				Southbound Fields Bridge Park				Eastbound Willamette Falls Dr				Westbound Willamette Falls Dr				Total
	L		R	Total				Total	T	R	Total		L	T		Total	
Volume	0		0	0				0	7	0	7		0	7		7	14
PHF	0.00		0.00	0.00				0.00	0.35	0.00	0.35		0.00	0.35		0.35	0.44

Heavy Vehicle Rolling Hour Summary
3:00 PM to 5:00 PM

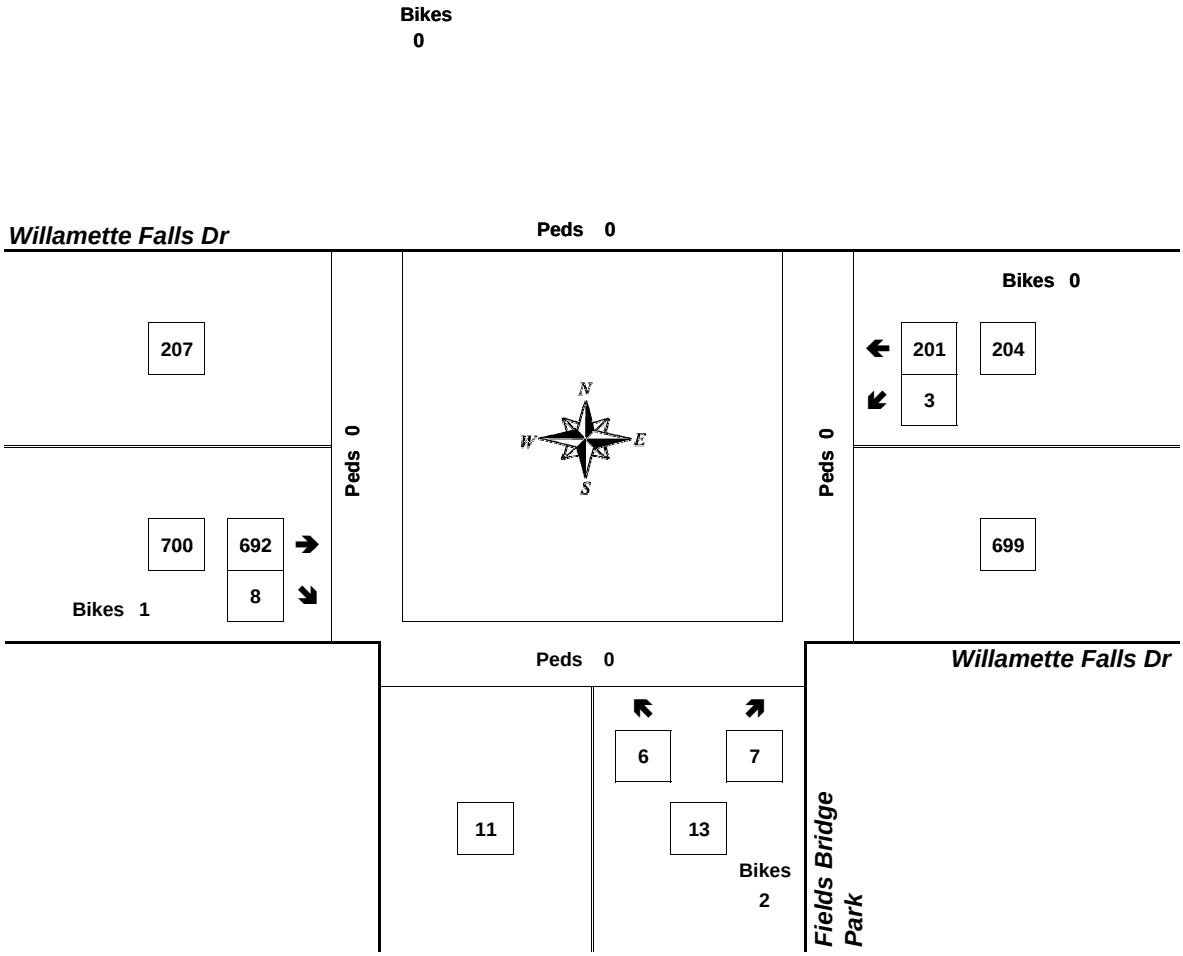
Interval Start Time	Northbound Fields Bridge Park				Southbound Fields Bridge Park				Eastbound Willamette Falls Dr				Westbound Willamette Falls Dr				Interval Total
	L		R	Total				Total	T	R	Total		L	T		Total	
3:00 PM	0		0	0				0	6	0	6		0	7		7	13
3:15 PM	0		0	0				0	18	0	18		0	7		7	25
3:30 PM	1		0	1				0	18	1	19		0	7		7	27
3:45 PM	1		0	1				0	20	1	21		0	5		5	27
4:00 PM	1		0	1				0	16	1	17		0	4		4	22

Peak Hour Summary

Clay Carney
(503) 833-2740

Fields Bridge Park & Willamette Falls Dr

3:05 PM to 4:05 PM
Thursday, May 16, 2019

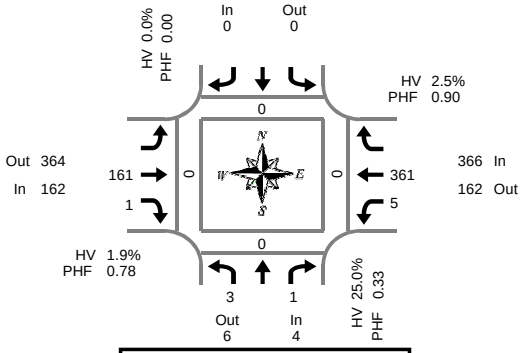


Approach	PHF	HV%	Volume
EB	0.86	1.0%	700
WB	0.67	3.4%	204
NB	0.81	0.0%	13
SB	0.00	0.0%	0
Intersection	0.93	1.5%	917

Count Period: 3:00 PM to 5:00 PM

Total Vehicle Summary

All Traffic Data Services Inc.
Clay Carney
(503) 833-2740



Peak Hour Summary
8:00 AM to 9:00 AM

Fields Bridge Park & Willamette Falls Dr

Thursday, May 16, 2019
8:00 AM to 10:00 AM

5-Minute Interval Summary
8:00 AM to 10:00 AM

Interval Start Time	Northbound Fields Bridge Park				Southbound Fields Bridge Park				Eastbound Willamette Falls Dr				Westbound Willamette Falls Dr				Interval Total	Pedestrians Crosswalk			
	L		R	Bikes				Bikes	T	R	Bikes	L	T		Bikes		North	South	East	West
8:00 AM	0		0	0				0	18	0	0	1	39		0	58	0	0	0	0
8:05 AM	1		0	0				0	17	0	0	1	27		0	46	0	0	0	0
8:10 AM	0		0	0				0	17	0	0	1	29		0	47	0	0	0	0
8:15 AM	1		1	0				0	12	0	0	0	21		0	35	0	0	0	0
8:20 AM	0		0	0				0	8	0	0	0	27		0	35	0	0	0	0
8:25 AM	0		0	0				0	16	0	0	0	29		0	45	0	0	0	0
8:30 AM	0		0	0				0	5	0	0	1	30		0	36	0	0	0	0
8:35 AM	0		0	0				0	14	0	0	0	35		0	49	0	0	0	0
8:40 AM	1		0	0				0	15	0	0	0	36		0	52	0	0	0	0
8:45 AM	0		0	0				0	6	0	0	0	31		0	37	0	0	0	0
8:50 AM	0		0	0				0	13	1	0	0	24		0	38	0	0	0	0
8:55 AM	0		0	0				0	20	0	0	1	33		0	54	0	0	0	0
9:00 AM	0		0	0				0	16	1	0	0	21		0	38	0	0	0	0
9:05 AM	1		0	0				0	17	0	0	0	23		0	41	0	0	0	0
9:10 AM	0		1	0				0	20	1	0	0	16		0	38	0	0	0	0
9:15 AM	0		0	0				0	8	0	0	1	23		0	32	0	0	0	0
9:20 AM	0		0	0				0	12	0	0	0	19		0	31	0	0	0	0
9:25 AM	0		0	0				0	15	1	0	0	17		0	33	0	0	0	0
9:30 AM	0		1	0				0	11	2	0	0	10		0	24	0	0	0	0
9:35 AM	0		1	0				0	9	0	0	0	9		0	19	0	0	0	0
9:40 AM	0		0	0				0	10	0	0	0	16		0	26	0	0	0	0
9:45 AM	0		1	0				0	12	0	0	0	11		1	24	0	0	0	0
9:50 AM	1		0	0				0	7	0	0	0	15		0	23	0	0	0	0
9:55 AM	0		0	0				0	13	0	0	0	8		0	21	0	0	0	0
Total Survey	5		5	0				0	311	6	0	6	549		1	882	0	0	0	0

15-Minute Interval Summary
8:00 AM to 10:00 AM

Interval Start Time	Northbound Fields Bridge Park				Southbound Fields Bridge Park				Eastbound Willamette Falls Dr				Westbound Willamette Falls Dr				Interval Total	Pedestrians Crosswalk			
	L		R	Bikes				Bikes	T	R	Bikes	L	T		Bikes		North	South	East	West
8:00 AM	1		0	0				0	52	0	0	3	95		0	151	0	0	0	0
8:15 AM	1		1	0				0	36	0	0	0	77		0	115	0	0	0	0
8:30 AM	1		0	0				0	34	0	0	1	101		0	137	0	0	0	0
8:45 AM	0		0	0				0	39	1	0	1	88		0	129	0	0	0	0
9:00 AM	1		1	0				0	53	2	0	0	60		0	117	0	0	0	0
9:15 AM	0		0	0				0	35	1	0	1	59		0	96	0	0	0	0
9:30 AM	0		2	0				0	30	2	0	0	35		0	69	0	0	0	0
9:45 AM	1		1	0				0	32	0	0	0	34		1	68	0	0	0	0
Total Survey	5		5	0				0	311	6	0	6	549		1	882	0	0	0	0

Peak Hour Summary
8:00 AM to 9:00 AM

By Approach	Northbound Fields Bridge Park				Southbound Fields Bridge Park				Eastbound Willamette Falls Dr				Westbound Willamette Falls Dr				Total	Pedestrians Crosswalk			
	In	Out	Total	Bikes	In	Out	Total	Bikes	In	Out	Total	Bikes	In	Out	Total	Bikes		North	South	East	West
Volume	4	6	10	0	0	0	0	0	162	364	526	0	366	162	528	0	532	0	0	0	0
%HV	25.0%				0.0%				1.9%				2.5%				2.4%				
PHF	0.33				0.00				0.78				0.90				0.88				

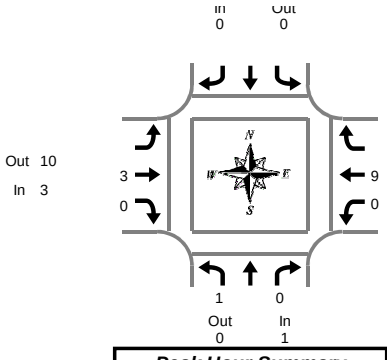
By Movement	Northbound Fields Bridge Park				Southbound Fields Bridge Park				Eastbound Willamette Falls Dr				Westbound Willamette Falls Dr				Total
	L		R	Total				Total		T	R	Total	L	T		Total	
Volume	3		1	4				0		161	1	162	5	361		366	532
%HV	33.3%	NA	0.0%	25.0%	NA	NA	NA	0.0%	NA	1.9%	0.0%	1.9%	0.0%	2.5%	NA	2.5%	2.4%
PHF	0.38		0.25	0.33				0.00		0.77	0.25	0.78	0.42	0.88		0.90	0.88

Rolling Hour Summary
8:00 AM to 10:00 AM

Interval Start Time	Northbound Fields Bridge Park				Southbound Fields Bridge Park				Eastbound Willamette Falls Dr				Westbound Willamette Falls Dr				Interval Total	Pedestrians Crosswalk			
	L		R	Bikes				Bikes	T	R	Bikes	L	T		Bikes		North	South	East	West
8:00 AM	3		1	0				0	161	1	0	5	361		0	532	0	0	0	0
8:15 AM	3		2	0				0	162	3	0	2	326		0	498	0	0	0	0
8:30 AM	2		1	0				0	161	4	0	3	308		0	479	0	0	0	0
8:45 AM	1		3	0				0	157	6	0	2	242		0	411	0	0	0	0
9:00 AM	2		4	0				0	150	5	0	1	188		1	350	0	0	0	0

Heavy Vehicle Summary

All Traffic Data
Services Inc.
Clay Carney
(503) 833-2740



Fields Bridge Park & Willamette Falls Dr

Thursday, May 16, 2019
8:00 AM to 10:00 AM

Peak Hour Summary
8:00 AM to 9:00 AM

Heavy Vehicle 5-Minute Interval Summary
8:00 AM to 10:00 AM

Interval Start Time	Northbound Fields Bridge Park				Southbound Fields Bridge Park				Eastbound Willamette Falls Dr				Westbound Willamette Falls Dr				Interval Total
	L		R	Total				Total		T	R	Total	L	T		Total	
8:00 AM	0		0	0				0		1	0	1	0	0		0	1
8:05 AM	0		0	0				0		0	0	0	0	0		0	0
8:10 AM	0		0	0				0		0	0	0	0	0		0	0
8:15 AM	1		0	1				0		0	0	0	0	0		0	1
8:20 AM	0		0	0				0		1	0	1	0	1		1	2
8:25 AM	0		0	0				0		0	0	0	0	0		0	0
8:30 AM	0		0	0				0		0	0	0	0	0		0	0
8:35 AM	0		0	0				0		0	0	0	0	0		0	0
8:40 AM	0		0	0				0		1	0	1	0	1		1	2
8:45 AM	0		0	0				0		0	0	0	0	3		3	3
8:50 AM	0		0	0				0		0	0	0	0	3		3	3
8:55 AM	0		0	0				0		0	0	0	0	1		1	1
9:00 AM	0		0	0				0		0	0	0	0	1		1	1
9:05 AM	0		0	0				0		0	0	0	0	1		1	1
9:10 AM	0		0	0				0		0	0	0	0	0		0	0
9:15 AM	0		0	0				0		0	0	0	0	0		0	0
9:20 AM	0		0	0				0		0	0	0	0	0		0	0
9:25 AM	0		0	0				0		1	0	1	0	0		0	1
9:30 AM	0		0	0				0		0	1	1	0	0		0	1
9:35 AM	0		1	1				0		1	0	1	0	0		0	2
9:40 AM	0		0	0				0		0	0	0	0	1		1	1
9:45 AM	0		0	0				0		0	0	0	0	0		0	0
9:50 AM	0		0	0				0		0	0	0	0	0		0	0
9:55 AM	0		0	0				0		1	0	1	0	0		0	1
Total Survey	1		1	2				0		6	1	7	0	12		12	21

Heavy Vehicle 15-Minute Interval Summary
8:00 AM to 10:00 AM

Interval Start Time	Northbound Fields Bridge Park				Southbound Fields Bridge Park				Eastbound Willamette Falls Dr				Westbound Willamette Falls Dr				Interval Total
	L		R	Total				Total		T	R	Total	L	T		Total	
8:00 AM	0		0	0				0		1	0	1	0	0		0	1
8:15 AM	1		0	1				0		1	0	1	0	1		1	3
8:30 AM	0		0	0				0		1	0	1	0	1		1	2
8:45 AM	0		0	0				0		0	0	0	0	7		7	7
9:00 AM	0		0	0				0		0	0	0	0	2		2	2
9:15 AM	0		0	0				0		1	0	1	0	0		0	1
9:30 AM	0		1	1				0		1	1	2	0	1		1	4
9:45 AM	0		0	0				0		1	0	1	0	0		0	1
Total Survey	1		1	2				0		6	1	7	0	12		12	21

Heavy Vehicle Peak Hour Summary
8:00 AM to 9:00 AM

By Approach	Northbound Fields Bridge Park			Southbound Fields Bridge Park			Eastbound Willamette Falls Dr			Westbound Willamette Falls Dr			Total
	In	Out	Total	In	Out	Total	In	Out	Total	In	Out	Total	
Volume	1	0	1	0	0	0	3	10	13	9	3	12	13
PHF	0.25			0.00			0.75			0.32			0.41

By Movement	Northbound Fields Bridge Park				Southbound Fields Bridge Park				Eastbound Willamette Falls Dr				Westbound Willamette Falls Dr				Total
	L		R	Total				Total		T	R	Total	L	T		Total	
Volume	1		0	1				0		3	0	3	0	9		9	13
PHF	0.25		0.00	0.25				0.00		0.75	0.00	0.75	0.00	0.32		0.32	0.41

Heavy Vehicle Rolling Hour Summary
8:00 AM to 10:00 AM

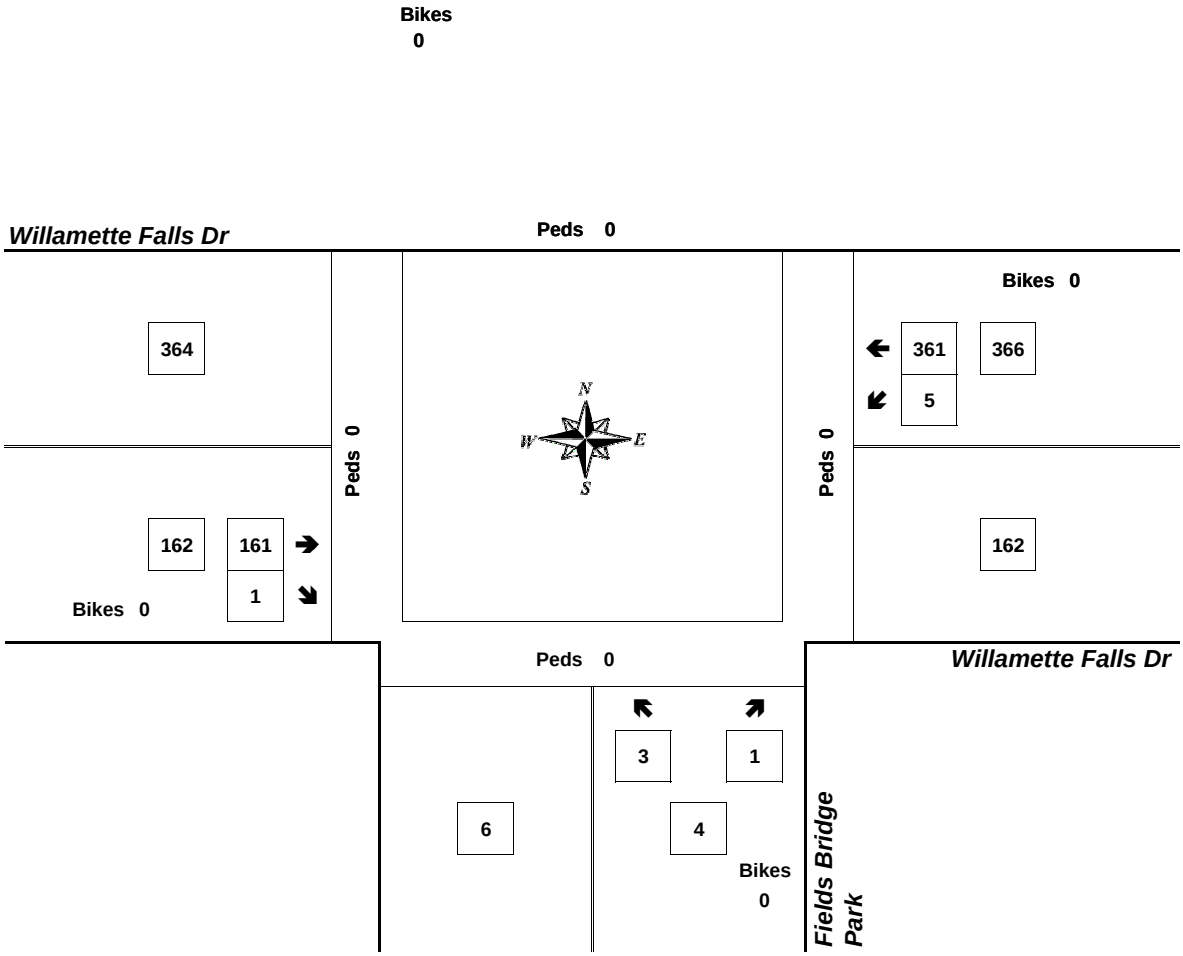
Interval Start Time	Northbound Fields Bridge Park				Southbound Fields Bridge Park				Eastbound Willamette Falls Dr				Westbound Willamette Falls Dr				Interval Total
	L		R	Total				Total		T	R	Total	L	T		Total	
8:00 AM	1		0	1				0		3	0	3	0	9		9	13
8:15 AM	1		0	1				0		2	0	2	0	11		11	14
8:30 AM	0		0	0				0		2	0	2	0	10		10	12
8:45 AM	0		1	1				0		2	1	3	0	10		10	14
9:00 AM	0		1	1				0		3	1	4	0	3		3	8

Peak Hour Summary

Clay Carney
(503) 833-2740

Fields Bridge Park & Willamette Falls Dr

8:00 AM to 9:00 AM
Thursday, May 16, 2019



Approach	PHF	HV%	Volume
EB	0.78	1.9%	162
WB	0.90	2.5%	366
NB	0.33	25.0%	4
SB	0.00	0.0%	0
Intersection	0.88	2.4%	532

Count Period: 8:00 AM to 10:00 AM

APPENDIX B

HCM REPORT – EXISTING CONDITIONS

TRAFFIC LEVELS OF SERVICE

Analysis of traffic volumes is useful in understanding the general nature of traffic in an area, but by itself indicates neither the ability of the street network to carry additional traffic nor the quality of service afforded by the street facilities. For this, the concept of level of service has been developed to subjectively describe traffic performance. Level of service can be measured at intersections and along key roadway segments.

Levels of service categories are similar to report card ratings for traffic performance. Intersections are typically the controlling bottlenecks of traffic flow and the ability of a roadway system to carry traffic efficiently is generally diminished in their vicinities. Levels of Service A, B and C indicate conditions where traffic moves without significant delays over periods of peak travel demand. Level of service D and E are progressively worse peak hour operating conditions and F conditions represent where demand exceeds the capacity of an intersection. Most urban communities set level of service D as the minimum acceptable level of service for peak hour operation and plan for level of service C or better for all other times of the day. The Highway Capacity Manual provides level of service calculation methodology for both intersections and arterials[1]. The following two sections provide interpretations of the analysis approaches.

[1] *2000 Highway Capacity Manual*, Transportation Research Board, Washington D.C., 2000, Chapter 16 and 17.

UNSIGNALIZED INTERSECTIONS (Two-Way Stop Controlled)

Unsignalized intersection level of service is reported for the major street and minor street (generally, left turn movements). The method assesses available and critical gaps in the traffic stream which make it possible for side street traffic to enter the main street flow. The 2010 Highway Capacity Manual describes the detailed methodology. It is not unusual for an intersection to experience level of service E or F conditions for the minor street left turn movement. It should be understood that, often, a poor level of service is experienced by only a few vehicles and the intersection as a whole operates acceptably.

Unsignalized intersection levels of service are described in the following table.

Level-of-Service Criteria: Automobile Mode

Control Delay (s/vehicle)	**LOS by Volume-to-Capacity Ratio**	
	***v/c* ≤ 1.0**	***v/c* > 1.0**
0-10	A	F
>10-15	B	F
>15-25	C	F
>25-35	D	F
>35-50	E	F
>50	F	F

Note: The LOS criteria apply to each lane on a given approach and to each approach on the minor street. LOS is not calculated for major-street approaches or for the intersection as a whole

Intersection	
Int Delay, s/veh	0.1

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	164	3	2	330	3	2
Future Vol, veh/h	164	3	2	330	3	2
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	1	0	0	3	33	0
Mvmt Flow	182	3	2	367	3	2

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	185	0	555	184
Stage 1	-	-	-	-	184	-
Stage 2	-	-	-	-	371	-
Critical Hdwy	-	-	4.1	-	6.73	6.2
Critical Hdwy Stg 1	-	-	-	-	5.73	-
Critical Hdwy Stg 2	-	-	-	-	5.73	-
Follow-up Hdwy	-	-	2.2	-	3.797	3.3
Pot Cap-1 Maneuver	-	-	1402	-	444	864
Stage 1	-	-	-	-	778	-
Stage 2	-	-	-	-	635	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1402	-	443	864
Mov Cap-2 Maneuver	-	-	-	-	443	-
Stage 1	-	-	-	-	776	-
Stage 2	-	-	-	-	635	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0	11.6
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	550	-	-	1402	-
HCM Lane V/C Ratio	0.01	-	-	0.002	-
HCM Control Delay (s)	11.6	-	-	7.6	0
HCM Lane LOS	B	-	-	A	A
HCM 95th %tile Q(veh)	0	-	-	0	-

Intersection	
Intersection Delay, s/veh	9.3
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	38	129	2	2	248	8	5	1	3	15	3	79
Future Vol, veh/h	38	129	2	2	248	8	5	1	3	15	3	79
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Heavy Vehicles, %	0	3	0	0	4	12	20	0	0	13	0	4
Mvmt Flow	43	145	2	2	279	9	6	1	3	17	3	89
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	9	9.8	8.5	8.6
HCM LOS	A	A	A	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	56%	22%	1%	15%
Vol Thru, %	11%	76%	96%	3%
Vol Right, %	33%	1%	3%	81%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	9	169	258	97
LT Vol	5	38	2	15
Through Vol	1	129	248	3
RT Vol	3	2	8	79
Lane Flow Rate	10	190	290	109
Geometry Grp	1	1	1	1
Degree of Util (X)	0.015	0.239	0.353	0.144
Departure Headway (Hd)	5.378	4.538	4.383	4.744
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	664	792	820	755
Service Time	3.425	2.567	2.409	2.78
HCM Lane V/C Ratio	0.015	0.24	0.354	0.144
HCM Control Delay	8.5	9	9.8	8.6
HCM Lane LOS	A	A	A	A
HCM 95th-tile Q	0	0.9	1.6	0.5

Intersection	
Intersection Delay, s/veh	7.5
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	5	11	19	11	9	5	6	31	4	4	55	5
Future Vol, veh/h	5	11	19	11	9	5	6	31	4	4	55	5
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86
Heavy Vehicles, %	0	0	5	0	11	0	0	3	0	0	6	0
Mvmt Flow	6	13	22	13	10	6	7	36	5	5	64	6
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	1

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	2	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	2	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	2	1	1
HCM Control Delay	7.1	7.3	7.4	7.8
HCM LOS	A	A	A	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1	SBLn2
Vol Left, %	15%	14%	44%	7%	0%
Vol Thru, %	76%	31%	36%	93%	0%
Vol Right, %	10%	54%	20%	0%	100%
Sign Control	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	41	35	25	59	5
LT Vol	6	5	11	4	0
Through Vol	31	11	9	55	0
RT Vol	4	19	5	0	5
Lane Flow Rate	48	41	29	69	6
Geometry Grp	5	2	2	7	7
Degree of Util (X)	0.055	0.043	0.033	0.089	0.007
Departure Headway (Hd)	4.148	3.832	4.106	4.68	4.047
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes
Cap	858	919	859	764	882
Service Time	2.201	1.92	2.194	2.415	1.782
HCM Lane V/C Ratio	0.056	0.045	0.034	0.09	0.007
HCM Control Delay	7.4	7.1	7.3	7.9	6.8
HCM Lane LOS	A	A	A	A	A
HCM 95th-tile Q	0.2	0.1	0.1	0.3	0

Intersection	
Int Delay, s/veh	0.3

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	689	9	3	188	5	10
Future Vol, veh/h	689	9	3	188	5	10
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	3	11	0	4	20	0
Mvmt Flow	766	10	3	209	6	11

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	776	0	986	771
Stage 1	-	-	-	-	771	-
Stage 2	-	-	-	-	215	-
Critical Hdwy	-	-	4.1	-	6.6	6.2
Critical Hdwy Stg 1	-	-	-	-	5.6	-
Critical Hdwy Stg 2	-	-	-	-	5.6	-
Follow-up Hdwy	-	-	2.2	-	3.68	3.3
Pot Cap-1 Maneuver	-	-	849	-	255	403
Stage 1	-	-	-	-	426	-
Stage 2	-	-	-	-	780	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	849	-	254	403
Mov Cap-2 Maneuver	-	-	-	-	254	-
Stage 1	-	-	-	-	424	-
Stage 2	-	-	-	-	780	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.1	16.2
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	337	-	-	849	-
HCM Lane V/C Ratio	0.049	-	-	0.004	-
HCM Control Delay (s)	16.2	-	-	9.3	0
HCM Lane LOS	C	-	-	A	A
HCM 95th %tile Q(veh)	0.2	-	-	0	-

Intersection	
Intersection Delay, s/veh	28.4
Intersection LOS	D

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	135	536	4	4	140	8	6	2	4	17	3	61
Future Vol, veh/h	135	536	4	4	140	8	6	2	4	17	3	61
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Heavy Vehicles, %	5	3	0	25	5	25	50	0	25	12	0	2
Mvmt Flow	145	576	4	4	151	9	6	2	4	18	3	66
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	35	10.2	10.2	9.8
HCM LOS	D	B	B	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	50%	20%	3%	21%
Vol Thru, %	17%	79%	92%	4%
Vol Right, %	33%	1%	5%	75%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	12	675	152	81
LT Vol	6	135	4	17
Through Vol	2	536	140	3
RT Vol	4	4	8	61
Lane Flow Rate	13	726	163	87
Geometry Grp	1	1	1	1
Degree of Util (X)	0.025	0.91	0.244	0.139
Departure Headway (Hd)	6.99	4.516	5.375	5.742
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	515	798	664	618
Service Time	4.99	2.563	3.448	3.837
HCM Lane V/C Ratio	0.025	0.91	0.245	0.141
HCM Control Delay	10.2	35	10.2	9.8
HCM Lane LOS	B	D	B	A
HCM 95th-tile Q	0.1	12.6	1	0.5

Intersection	
Intersection Delay, s/veh	8.3
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	7	15	13	10	13	11	15	117	9	8	59	16
Future Vol, veh/h	7	15	13	10	13	11	15	117	9	8	59	16
Peak Hour Factor	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84
Heavy Vehicles, %	0	13	8	0	0	9	13	3	11	0	3	0
Mvmt Flow	8	18	15	12	15	13	18	139	11	10	70	19
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	1

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	2	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	2	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	2	1	1
HCM Control Delay	7.6	7.7	8.7	8
HCM LOS	A	A	A	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1	SBLn2
Vol Left, %	11%	20%	29%	12%	0%
Vol Thru, %	83%	43%	38%	88%	0%
Vol Right, %	6%	37%	32%	0%	100%
Sign Control	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	141	35	34	67	16
LT Vol	15	7	10	8	0
Through Vol	117	15	13	59	0
RT Vol	9	13	11	0	16
Lane Flow Rate	168	42	40	80	19
Geometry Grp	5	2	2	7	7
Degree of Util (X)	0.206	0.051	0.05	0.106	0.022
Departure Headway (Hd)	4.422	4.39	4.439	4.791	4.08
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes
Cap	801	820	811	739	863
Service Time	2.511	2.392	2.441	2.583	1.872
HCM Lane V/C Ratio	0.21	0.051	0.049	0.108	0.022
HCM Control Delay	8.7	7.6	7.7	8.2	7
HCM Lane LOS	A	A	A	A	A
HCM 95th-tile Q	0.8	0.2	0.2	0.4	0.1

APPENDIX C

HCM REPORT – NO BUILD CONDITIONS

Intersection	
Int Delay, s/veh	0.1

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	169	3	2	341	3	2
Future Vol, veh/h	169	3	2	341	3	2
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	1	0	0	3	33	0
Mvmt Flow	188	3	2	379	3	2

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	191	0	573	190
Stage 1	-	-	-	-	190	-
Stage 2	-	-	-	-	383	-
Critical Hdwy	-	-	4.1	-	6.73	6.2
Critical Hdwy Stg 1	-	-	-	-	5.73	-
Critical Hdwy Stg 2	-	-	-	-	5.73	-
Follow-up Hdwy	-	-	2.2	-	3.797	3.3
Pot Cap-1 Maneuver	-	-	1395	-	433	857
Stage 1	-	-	-	-	773	-
Stage 2	-	-	-	-	626	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1395	-	432	857
Mov Cap-2 Maneuver	-	-	-	-	432	-
Stage 1	-	-	-	-	771	-
Stage 2	-	-	-	-	626	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0	11.7
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	539	-	-	1395	-
HCM Lane V/C Ratio	0.01	-	-	0.002	-
HCM Control Delay (s)	11.7	-	-	7.6	0
HCM Lane LOS	B	-	-	A	A
HCM 95th %tile Q(veh)	0	-	-	0	-

Intersection	
Intersection Delay, s/veh	9.5
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	40	134	2	2	256	8	5	1	3	16	3	82
Future Vol, veh/h	40	134	2	2	256	8	5	1	3	16	3	82
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Heavy Vehicles, %	0	3	0	0	4	12	20	0	0	13	0	4
Mvmt Flow	45	151	2	2	288	9	6	1	3	18	3	92
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	9.1	10	8.6	8.7
HCM LOS	A	A	A	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	56%	23%	1%	16%
Vol Thru, %	11%	76%	96%	3%
Vol Right, %	33%	1%	3%	81%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	9	176	266	101
LT Vol	5	40	2	16
Through Vol	1	134	256	3
RT Vol	3	2	8	82
Lane Flow Rate	10	198	299	113
Geometry Grp	1	1	1	1
Degree of Util (X)	0.015	0.251	0.366	0.151
Departure Headway (Hd)	5.426	4.562	4.405	4.785
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	657	787	816	748
Service Time	3.48	2.595	2.435	2.827
HCM Lane V/C Ratio	0.015	0.252	0.366	0.151
HCM Control Delay	8.6	9.1	10	8.7
HCM Lane LOS	A	A	A	A
HCM 95th-tile Q	0	1	1.7	0.5

Intersection	
Intersection Delay, s/veh	7.5
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	5	12	20	12	9	5	6	32	4	4	56	5
Future Vol, veh/h	5	12	20	12	9	5	6	32	4	4	56	5
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86
Heavy Vehicles, %	0	0	5	0	11	0	0	3	0	0	6	0
Mvmt Flow	6	14	23	14	10	6	7	37	5	5	65	6
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	1

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	2	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	2	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	2	1	1
HCM Control Delay	7.1	7.4	7.5	7.8
HCM LOS	A	A	A	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1	SBLn2
Vol Left, %	14%	14%	46%	7%	0%
Vol Thru, %	76%	32%	35%	93%	0%
Vol Right, %	10%	54%	19%	0%	100%
Sign Control	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	42	37	26	60	5
LT Vol	6	5	12	4	0
Through Vol	32	12	9	56	0
RT Vol	4	20	5	0	5
Lane Flow Rate	49	43	30	70	6
Geometry Grp	5	2	2	7	7
Degree of Util (X)	0.056	0.046	0.035	0.091	0.007
Departure Headway (Hd)	4.156	3.837	4.121	4.686	4.054
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes
Cap	855	917	855	763	880
Service Time	2.214	1.927	2.212	2.425	1.793
HCM Lane V/C Ratio	0.057	0.047	0.035	0.092	0.007
HCM Control Delay	7.5	7.1	7.4	7.9	6.8
HCM Lane LOS	A	A	A	A	A
HCM 95th-tile Q	0.2	0.1	0.1	0.3	0

Intersection	
Int Delay, s/veh	0.3

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	712	9	3	195	5	10
Future Vol, veh/h	712	9	3	195	5	10
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	3	11	0	4	20	0
Mvmt Flow	791	10	3	217	6	11

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	801	0	1019	796
Stage 1	-	-	-	-	796	-
Stage 2	-	-	-	-	223	-
Critical Hdwy	-	-	4.1	-	6.6	6.2
Critical Hdwy Stg 1	-	-	-	-	5.6	-
Critical Hdwy Stg 2	-	-	-	-	5.6	-
Follow-up Hdwy	-	-	2.2	-	3.68	3.3
Pot Cap-1 Maneuver	-	-	831	-	243	390
Stage 1	-	-	-	-	414	-
Stage 2	-	-	-	-	773	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	831	-	242	390
Mov Cap-2 Maneuver	-	-	-	-	242	-
Stage 1	-	-	-	-	412	-
Stage 2	-	-	-	-	773	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.1	16.7
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	324	-	-	831	-
HCM Lane V/C Ratio	0.051	-	-	0.004	-
HCM Control Delay (s)	16.7	-	-	9.3	0
HCM Lane LOS	C	-	-	A	A
HCM 95th %tile Q(veh)	0.2	-	-	0	-

Intersection	
Intersection Delay, s/veh	32.7
Intersection LOS	D

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	139	554	4	4	144	8	6	2	4	18	3	63
Future Vol, veh/h	139	554	4	4	144	8	6	2	4	18	3	63
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Heavy Vehicles, %	5	3	0	25	5	25	50	0	25	12	0	2
Mvmt Flow	149	596	4	4	155	9	6	2	4	19	3	68
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	40.9	10.3	10.3	9.9
HCM LOS	E	B	B	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	50%	20%	3%	21%
Vol Thru, %	17%	79%	92%	4%
Vol Right, %	33%	1%	5%	75%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	12	697	156	84
LT Vol	6	139	4	18
Through Vol	2	554	144	3
RT Vol	4	4	8	63
Lane Flow Rate	13	749	168	90
Geometry Grp	1	1	1	1
Degree of Util (X)	0.025	0.944	0.252	0.148
Departure Headway (Hd)	7.078	4.535	5.417	5.912
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	509	794	658	611
Service Time	5.081	2.588	3.501	3.912
HCM Lane V/C Ratio	0.026	0.943	0.255	0.147
HCM Control Delay	10.3	40.9	10.3	9.9
HCM Lane LOS	B	E	B	A
HCM 95th-tile Q	0.1	14.1	1	0.5

Intersection	
Intersection Delay, s/veh	8.3
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	7	16	14	10	14	12	16	121	9	8	61	17
Future Vol, veh/h	7	16	14	10	14	12	16	121	9	8	61	17
Peak Hour Factor	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84
Heavy Vehicles, %	0	13	8	0	0	9	13	3	11	0	3	0
Mvmt Flow	8	19	17	12	17	14	19	144	11	10	73	20
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	1

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	2	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	2	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	2	1	1
HCM Control Delay	7.7	7.7	8.8	8
HCM LOS	A	A	A	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1	SBLn2
Vol Left, %	11%	19%	28%	12%	0%
Vol Thru, %	83%	43%	39%	88%	0%
Vol Right, %	6%	38%	33%	0%	100%
Sign Control	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	146	37	36	69	17
LT Vol	16	7	10	8	0
Through Vol	121	16	14	61	0
RT Vol	9	14	12	0	17
Lane Flow Rate	174	44	43	82	20
Geometry Grp	5	2	2	7	7
Degree of Util (X)	0.214	0.054	0.053	0.11	0.023
Departure Headway (Hd)	4.434	4.41	4.455	4.8	4.092
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes
Cap	798	817	808	736	860
Service Time	2.53	2.412	2.458	2.599	1.889
HCM Lane V/C Ratio	0.218	0.054	0.053	0.111	0.023
HCM Control Delay	8.8	7.7	7.7	8.2	7
HCM Lane LOS	A	A	A	A	A
HCM 95th-tile Q	0.8	0.2	0.2	0.4	0.1

APPENDIX D

HCM REPORT – BUILD CONDITIONS

Intersection	
Int Delay, s/veh	0.1

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	154	3	2	358	3	2
Future Vol, veh/h	154	3	2	358	3	2
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	1	0	0	3	33	0
Mvmt Flow	171	3	2	398	3	2

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	174	0	575	173
Stage 1	-	-	-	-	173	-
Stage 2	-	-	-	-	402	-
Critical Hdwy	-	-	4.1	-	6.73	6.2
Critical Hdwy Stg 1	-	-	-	-	5.73	-
Critical Hdwy Stg 2	-	-	-	-	5.73	-
Follow-up Hdwy	-	-	2.2	-	3.797	3.3
Pot Cap-1 Maneuver	-	-	1415	-	432	876
Stage 1	-	-	-	-	788	-
Stage 2	-	-	-	-	613	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1415	-	431	876
Mov Cap-2 Maneuver	-	-	-	-	431	-
Stage 1	-	-	-	-	788	-
Stage 2	-	-	-	-	612	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0	11.7
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	541	-	-	1415	-
HCM Lane V/C Ratio	0.01	-	-	0.002	-
HCM Control Delay (s)	11.7	-	-	7.5	0
HCM Lane LOS	B	-	-	A	A
HCM 95th %tile Q(veh)	0	-	-	0	-

Intersection	
Intersection Delay, s/veh	9.7
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	12	147	2	2	290	14	5	1	3	22	3	65
Future Vol, veh/h	12	147	2	2	290	14	5	1	3	22	3	65
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Heavy Vehicles, %	0	3	0	0	4	12	20	0	0	13	0	4
Mvmt Flow	13	165	2	2	326	16	6	1	3	25	3	73
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	8.9	10.5	8.6	8.7
HCM LOS	A	B	A	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	56%	7%	1%	24%
Vol Thru, %	11%	91%	95%	3%
Vol Right, %	33%	1%	5%	72%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	9	161	306	90
LT Vol	5	12	2	22
Through Vol	1	147	290	3
RT Vol	3	2	14	65
Lane Flow Rate	10	181	344	101
Geometry Grp	1	1	1	1
Degree of Util (X)	0.015	0.229	0.416	0.138
Departure Headway (Hd)	5.467	4.549	4.352	4.909
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	652	789	829	729
Service Time	3.519	2.581	2.379	2.951
HCM Lane V/C Ratio	0.015	0.229	0.415	0.139
HCM Control Delay	8.6	8.9	10.5	8.7
HCM Lane LOS	A	A	B	A
HCM 95th-tile Q	0	0.9	2.1	0.5

Intersection	
Intersection Delay, s/veh	7.4
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	17	17	29	10	16	5	15	3	2	4	37	19
Future Vol, veh/h	17	17	29	10	16	5	15	3	2	4	37	19
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86
Heavy Vehicles, %	0	0	5	0	11	0	0	3	0	0	6	0
Mvmt Flow	20	20	34	12	19	6	17	3	2	5	43	22
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	1

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	2	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	2	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	2	1	1
HCM Control Delay	7.3	7.3	7.5	7.5
HCM LOS	A	A	A	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1	SBLn2
Vol Left, %	75%	27%	32%	10%	0%
Vol Thru, %	15%	27%	52%	90%	0%
Vol Right, %	10%	46%	16%	0%	100%
Sign Control	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	20	63	31	41	19
LT Vol	15	17	10	4	0
Through Vol	3	17	16	37	0
RT Vol	2	29	5	0	19
Lane Flow Rate	23	73	36	48	22
Geometry Grp	5	2	2	7	7
Degree of Util (X)	0.028	0.079	0.041	0.063	0.025
Departure Headway (Hd)	4.333	3.864	4.082	4.751	4.103
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes
Cap	818	916	866	750	867
Service Time	2.401	1.934	2.158	2.501	1.852
HCM Lane V/C Ratio	0.028	0.08	0.042	0.064	0.025
HCM Control Delay	7.5	7.3	7.3	7.8	7
HCM Lane LOS	A	A	A	A	A
HCM 95th-tile Q	0.1	0.3	0.1	0.2	0.1

LANE SUMMARY

Site: 101 [Future Build AM Peak]

Site Category: (None)
Roundabout

Lane Use and Performance													
	Demand Flows Total veh/h	HV %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Average Delay sec	Level of Service	95% Back of Queue Veh	Dist ft	Lane Config	Lane Length ft	Cap. Adj. %	Prob. Block. %
South: Park Driveway													
Lane 1[d]	13	0.0	1083	0.012	100	3.4	LOS A	0.0	1.2	Full	1600	0.0	0.0
Approach	13	0.0		0.012		3.4	LOS A	0.0	1.2				
East: Willamette Falls Drive													
Lane 1[d]	394	2.5	1247	0.316	100	5.8	LOS A	1.8	45.6	Full	1600	0.0	0.0
Approach	394	2.5		0.316		5.8	LOS A	1.8	45.6				
North: Dollar Middle School Driveway													
Lane 1[d]	106	0.0	967	0.110	100	4.7	LOS A	0.5	11.9	Full	1600	0.0	0.0
Approach	106	0.0		0.110		4.7	LOS A	0.5	11.9				
West: Willamette Falls Drive													
Lane 1[d]	194	0.6	1295	0.149	100	4.0	LOS A	0.7	18.1	Full	1600	0.0	0.0
Approach	194	0.6		0.149		4.0	LOS A	0.7	18.1				
Intersection	706	1.6		0.316		5.1	LOS A	1.8	45.6				

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Sign Control.
Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.
LOS F will result if v/c > 1 irrespective of lane delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 6).
Roundabout Capacity Model: US HCM 6.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

d Dominant lane on roundabout approach

Organisation: DKS ASSOCIATES | Processed: Tuesday, August 11, 2020 3:15:19 PM
Project: \\salfiles3\S-Drive\Projects\2020\P20079-000 (WLWV Dollar Middle School TIA)\Analysis\Willamette Falls Drive Mini RAB.sip8

Intersection	
Int Delay, s/veh	3.5

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	46	0	33	17	0	17
Future Vol, veh/h	46	0	33	17	0	17
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	80	80	80	80	80	80
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	58	0	41	21	0	21

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	58	0	161	58
Stage 1	-	-	-	-	58	-
Stage 2	-	-	-	-	103	-
Critical Hdwy	-	-	4.1	-	6.4	6.2
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	-	-	2.2	-	3.5	3.3
Pot Cap-1 Maneuver	-	-	1559	-	835	1014
Stage 1	-	-	-	-	970	-
Stage 2	-	-	-	-	926	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1559	-	812	1014
Mov Cap-2 Maneuver	-	-	-	-	812	-
Stage 1	-	-	-	-	970	-
Stage 2	-	-	-	-	901	-

Approach	EB	WB	NB
HCM Control Delay, s	0	4.9	8.6
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	1014	-	-	1559	-
HCM Lane V/C Ratio	0.021	-	-	0.026	-
HCM Control Delay (s)	8.6	-	-	7.4	0
HCM Lane LOS	A	-	-	A	A
HCM 95th %tile Q(veh)	0.1	-	-	0.1	-

Intersection	
Int Delay, s/veh	0.3

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	696	9	3	215	5	10
Future Vol, veh/h	696	9	3	215	5	10
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	3	11	0	4	20	0
Mvmt Flow	773	10	3	239	6	11

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	783	0	1023	778
Stage 1	-	-	-	-	778	-
Stage 2	-	-	-	-	245	-
Critical Hdwy	-	-	4.1	-	6.6	6.2
Critical Hdwy Stg 1	-	-	-	-	5.6	-
Critical Hdwy Stg 2	-	-	-	-	5.6	-
Follow-up Hdwy	-	-	2.2	-	3.68	3.3
Pot Cap-1 Maneuver	-	-	844	-	242	400
Stage 1	-	-	-	-	423	-
Stage 2	-	-	-	-	755	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	844	-	241	400
Mov Cap-2 Maneuver	-	-	-	-	241	-
Stage 1	-	-	-	-	421	-
Stage 2	-	-	-	-	755	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.1	16.6
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	328	-	-	844	-
HCM Lane V/C Ratio	0.051	-	-	0.004	-
HCM Control Delay (s)	16.6	-	-	9.3	0
HCM Lane LOS	C	-	-	A	A
HCM 95th %tile Q(veh)	0.2	-	-	0	-

Intersection	
Intersection Delay, s/veh	30.5
Intersection LOS	D

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	113	564	4	4	169	14	6	2	4	24	3	59
Future Vol, veh/h	113	564	4	4	169	14	6	2	4	24	3	59
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Heavy Vehicles, %	5	3	0	25	5	25	50	0	25	12	0	2
Mvmt Flow	122	606	4	4	182	15	6	2	4	26	3	63
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	38.9	10.8	10.3	10.1
HCM LOS	E	B	B	B

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	50%	17%	2%	28%
Vol Thru, %	17%	83%	90%	3%
Vol Right, %	33%	1%	7%	69%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	12	681	187	86
LT Vol	6	113	4	24
Through Vol	2	564	169	3
RT Vol	4	4	14	59
Lane Flow Rate	13	732	201	92
Geometry Grp	1	1	1	1
Degree of Util (X)	0.026	0.931	0.302	0.154
Departure Headway (Hd)	7.138	4.579	5.399	6.009
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	504	784	660	600
Service Time	5.143	2.642	3.491	4.01
HCM Lane V/C Ratio	0.026	0.934	0.305	0.153
HCM Control Delay	10.3	38.9	10.8	10.1
HCM Lane LOS	B	E	B	B
HCM 95th-tile Q	0.1	13.4	1.3	0.5

Intersection	
Intersection Delay, s/veh	8.2
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	17	21	25	10	18	12	25	94	7	8	52	25
Future Vol, veh/h	17	21	25	10	18	12	25	94	7	8	52	25
Peak Hour Factor	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84
Heavy Vehicles, %	0	13	8	0	0	9	13	3	11	0	3	0
Mvmt Flow	20	25	30	12	21	14	30	112	8	10	62	30
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	1

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	2	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	2	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	2	1	1
HCM Control Delay	7.8	7.8	8.7	7.9
HCM LOS	A	A	A	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1	SBLn2
Vol Left, %	20%	27%	25%	13%	0%
Vol Thru, %	75%	33%	45%	87%	0%
Vol Right, %	6%	40%	30%	0%	100%
Sign Control	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	126	63	40	60	25
LT Vol	25	17	10	8	0
Through Vol	94	21	18	52	0
RT Vol	7	25	12	0	25
Lane Flow Rate	150	75	48	71	30
Geometry Grp	5	2	2	7	7
Degree of Util (X)	0.193	0.091	0.059	0.099	0.035
Departure Headway (Hd)	4.62	4.365	4.45	4.966	4.248
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes
Cap	779	822	806	724	845
Service Time	2.637	2.384	2.471	2.684	1.965
HCM Lane V/C Ratio	0.193	0.091	0.06	0.098	0.036
HCM Control Delay	8.7	7.8	7.8	8.2	7.1
HCM Lane LOS	A	A	A	A	A
HCM 95th-tile Q	0.7	0.3	0.2	0.3	0.1

LANE SUMMARY

Site: 101 [Future Build Midday Peak]

Site Category: (None)
Roundabout

Lane Use and Performance													
	Demand Flows Total veh/h	HV %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Average Delay sec	Level of Service	95% Back of Queue Veh	Dist ft	Lane Config	Lane Length ft	Cap. Adj. %	Prob. Block. %
South: Park Driveway													
Lane 1[d]	13	0.0	581	0.023	100	6.5	LOS A	0.1	2.1	Full	1600	0.0	0.0
Approach	13	0.0		0.023		6.5	LOS A	0.1	2.1				
East: Willamette Falls Drive													
Lane 1[d]	250	3.3	1268	0.197	100	4.5	LOS A	1.0	24.9	Full	1600	0.0	0.0
Approach	250	3.3		0.197		4.5	LOS A	1.0	24.9				
North: Dollar Middle School Driveway													
Lane 1[d]	97	0.0	1096	0.088	100	4.0	LOS A	0.4	9.6	Full	1600	0.0	0.0
Approach	97	0.0		0.088		4.0	LOS A	0.4	9.6				
West: Willamette Falls Drive													
Lane 1[d]	788	2.8	1273	0.619	100	10.4	LOS B	5.8	149.4	Full	1600	0.0	0.0
Approach	788	2.8		0.619		10.4	LOS B	5.8	149.4				
Intersection	1148	2.7		0.619		8.5	LOS A	5.8	149.4				

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Sign Control.
Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.
LOS F will result if v/c > 1 irrespective of lane delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 6).
Roundabout Capacity Model: US HCM 6.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

d Dominant lane on roundabout approach

Organisation: DKS ASSOCIATES | Processed: Tuesday, August 11, 2020 3:15:20 PM
Project: \\salfiles3\S-Drive\Projects\2020\P20079-000 (WLWV Dollar Middle School TIA)\Analysis\Willamette Falls Drive Mini RAB.sip8

Intersection	
Int Delay, s/veh	2

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	43	0	12	56	0	20
Future Vol, veh/h	43	0	12	56	0	20
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	80	80	80	80	80	80
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	54	0	15	70	0	25

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	54	0	154	54
Stage 1	-	-	-	-	54	-
Stage 2	-	-	-	-	100	-
Critical Hdwy	-	-	4.1	-	6.4	6.2
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	-	-	2.2	-	3.5	3.3
Pot Cap-1 Maneuver	-	-	1564	-	842	1019
Stage 1	-	-	-	-	974	-
Stage 2	-	-	-	-	929	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1564	-	834	1019
Mov Cap-2 Maneuver	-	-	-	-	834	-
Stage 1	-	-	-	-	974	-
Stage 2	-	-	-	-	920	-

Approach	EB	WB	NB
HCM Control Delay, s	0	1.3	8.6
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	1019	-	-	1564	-
HCM Lane V/C Ratio	0.025	-	-	0.01	-
HCM Control Delay (s)	8.6	-	-	7.3	0
HCM Lane LOS	A	-	-	A	A
HCM 95th %tile Q(veh)	0.1	-	-	0	-

APPENDIX E

HCM REPORT – SENSITIVITY ANALYSIS #1

Intersection	
Int Delay, s/veh	0.1

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	170	3	2	373	3	2
Future Vol, veh/h	170	3	2	373	3	2
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	1	0	0	3	33	0
Mvmt Flow	189	3	2	414	3	2

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	192	0	609	191
Stage 1	-	-	-	-	191	-
Stage 2	-	-	-	-	418	-
Critical Hdwy	-	-	4.1	-	6.73	6.2
Critical Hdwy Stg 1	-	-	-	-	5.73	-
Critical Hdwy Stg 2	-	-	-	-	5.73	-
Follow-up Hdwy	-	-	2.2	-	3.797	3.3
Pot Cap-1 Maneuver	-	-	1394	-	412	856
Stage 1	-	-	-	-	772	-
Stage 2	-	-	-	-	603	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1394	-	411	856
Mov Cap-2 Maneuver	-	-	-	-	411	-
Stage 1	-	-	-	-	770	-
Stage 2	-	-	-	-	603	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0	12
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	519	-	-	1394	-
HCM Lane V/C Ratio	0.011	-	-	0.002	-
HCM Control Delay (s)	12	-	-	7.6	0
HCM Lane LOS	B	-	-	A	A
HCM 95th %tile Q(veh)	0	-	-	0	-

Intersection	
Intersection Delay, s/veh	10
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	12	161	2	2	305	14	5	1	3	22	3	65
Future Vol, veh/h	12	161	2	2	305	14	5	1	3	22	3	65
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Heavy Vehicles, %	0	3	0	0	4	12	20	0	0	13	0	4
Mvmt Flow	13	181	2	2	343	16	6	1	3	25	3	73
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	9.1	10.8	8.7	8.8
HCM LOS	A	B	A	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	56%	7%	1%	24%
Vol Thru, %	11%	92%	95%	3%
Vol Right, %	33%	1%	4%	72%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	9	175	321	90
LT Vol	5	12	2	22
Through Vol	1	161	305	3
RT Vol	3	2	14	65
Lane Flow Rate	10	197	361	101
Geometry Grp	1	1	1	1
Degree of Util (X)	0.016	0.25	0.438	0.14
Departure Headway (Hd)	5.542	4.572	4.374	4.981
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	643	785	822	718
Service Time	3.601	2.607	2.405	3.027
HCM Lane V/C Ratio	0.016	0.251	0.439	0.141
HCM Control Delay	8.7	9.1	10.8	8.8
HCM Lane LOS	A	A	B	A
HCM 95th-tile Q	0	1	2.2	0.5

Intersection	
Intersection Delay, s/veh	7.4
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	20	19	29	10	18	5	15	3	2	4	37	23
Future Vol, veh/h	20	19	29	10	18	5	15	3	2	4	37	23
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86
Heavy Vehicles, %	0	0	5	0	11	0	0	3	0	0	6	0
Mvmt Flow	23	22	34	12	21	6	17	3	2	5	43	27
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	1

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	2	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	2	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	2	1	1
HCM Control Delay	7.3	7.4	7.6	7.5
HCM LOS	A	A	A	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1	SBLn2
Vol Left, %	75%	29%	30%	10%	0%
Vol Thru, %	15%	28%	55%	90%	0%
Vol Right, %	10%	43%	15%	0%	100%
Sign Control	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	20	68	33	41	23
LT Vol	15	20	10	4	0
Through Vol	3	19	18	37	0
RT Vol	2	29	5	0	23
Lane Flow Rate	23	79	38	48	27
Geometry Grp	5	2	2	7	7
Degree of Util (X)	0.028	0.086	0.044	0.063	0.031
Departure Headway (Hd)	4.35	3.898	4.096	4.765	4.117
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes
Cap	814	908	863	748	863
Service Time	2.426	1.972	2.177	2.52	1.872
HCM Lane V/C Ratio	0.028	0.087	0.044	0.064	0.031
HCM Control Delay	7.6	7.3	7.4	7.8	7
HCM Lane LOS	A	A	A	A	A
HCM 95th-tile Q	0.1	0.3	0.1	0.2	0.1

LANE SUMMARY

Site: 101 [Future Build AM Peak - Sensitivity #1]

Site Category: (None)
Roundabout

Lane Use and Performance													
	Demand Flows Total veh/h	HV %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Average Delay sec	Level of Service	95% Back of Queue Veh	Dist ft	Lane Config	Lane Length ft	Cap. Adj. %	Prob. Block. %
South: Park Driveway													
Lane 1[d]	13	0.0	1052	0.012	100	3.5	LOS A	0.0	1.2	Full	1600	0.0	0.0
Approach	13	0.0		0.012		3.5	LOS A	0.0	1.2				
East: Willamette Falls Drive													
Lane 1[d]	403	2.4	1225	0.329	100	6.0	LOS A	1.9	47.9	Full	1600	0.0	0.0
Approach	403	2.4		0.329		6.0	LOS A	1.9	47.9				
North: Dollar Middle School Driveway													
Lane 1[d]	140	0.0	974	0.144	100	5.0	LOS A	0.6	15.9	Full	1600	0.0	0.0
Approach	140	0.0		0.144		5.0	LOS A	0.6	15.9				
West: Willamette Falls Drive													
Lane 1[d]	205	0.6	1275	0.161	100	4.2	LOS A	0.8	19.6	Full	1600	0.0	0.0
Approach	205	0.6		0.161		4.2	LOS A	0.8	19.6				
Intersection	761	1.4		0.329		5.3	LOS A	1.9	47.9				

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Sign Control.
Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.
LOS F will result if v/c > 1 irrespective of lane delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 6).
Roundabout Capacity Model: US HCM 6.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

d Dominant lane on roundabout approach

Intersection	
Int Delay, s/veh	0.3

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	708	9	3	225	5	10
Future Vol, veh/h	708	9	3	225	5	10
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	3	11	0	4	20	0
Mvmt Flow	787	10	3	250	6	11

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	797	0	1048	792
Stage 1	-	-	-	-	792	-
Stage 2	-	-	-	-	256	-
Critical Hdwy	-	-	4.1	-	6.6	6.2
Critical Hdwy Stg 1	-	-	-	-	5.6	-
Critical Hdwy Stg 2	-	-	-	-	5.6	-
Follow-up Hdwy	-	-	2.2	-	3.68	3.3
Pot Cap-1 Maneuver	-	-	834	-	233	392
Stage 1	-	-	-	-	416	-
Stage 2	-	-	-	-	747	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	834	-	232	392
Mov Cap-2 Maneuver	-	-	-	-	232	-
Stage 1	-	-	-	-	414	-
Stage 2	-	-	-	-	747	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.1	16.9
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	319	-	-	834	-
HCM Lane V/C Ratio	0.052	-	-	0.004	-
HCM Control Delay (s)	16.9	-	-	9.3	0
HCM Lane LOS	C	-	-	A	A
HCM 95th %tile Q(veh)	0.2	-	-	0	-

Intersection	
Intersection Delay, s/veh	33.1
Intersection LOS	D

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	113	576	4	4	179	14	6	2	4	24	3	59
Future Vol, veh/h	113	576	4	4	179	14	6	2	4	24	3	59
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Heavy Vehicles, %	5	3	0	25	5	25	50	0	25	12	0	2
Mvmt Flow	122	619	4	4	192	15	6	2	4	26	3	63
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	42.6	11.1	10.4	10.2
HCM LOS	E	B	B	B

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	50%	16%	2%	28%
Vol Thru, %	17%	83%	91%	3%
Vol Right, %	33%	1%	7%	69%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	12	693	197	86
LT Vol	6	113	4	24
Through Vol	2	576	179	3
RT Vol	4	4	14	59
Lane Flow Rate	13	745	212	92
Geometry Grp	1	1	1	1
Degree of Util (X)	0.026	0.951	0.319	0.156
Departure Headway (Hd)	7.204	4.595	5.419	6.067
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	500	782	657	595
Service Time	5.209	2.661	3.516	4.068
HCM Lane V/C Ratio	0.026	0.953	0.323	0.155
HCM Control Delay	10.4	42.6	11.1	10.2
HCM Lane LOS	B	E	B	B
HCM 95th-tile Q	0.1	14.4	1.4	0.5

Intersection	
Intersection Delay, s/veh	8.2
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	20	22	25	10	19	12	25	94	7	8	52	28
Future Vol, veh/h	20	22	25	10	19	12	25	94	7	8	52	28
Peak Hour Factor	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84
Heavy Vehicles, %	0	13	8	0	0	9	13	3	11	0	3	0
Mvmt Flow	24	26	30	12	23	14	30	112	8	10	62	33
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	1

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	2	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	2	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	2	1	1
HCM Control Delay	7.9	7.8	8.8	7.9
HCM LOS	A	A	A	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1	SBLn2
Vol Left, %	20%	30%	24%	13%	0%
Vol Thru, %	75%	33%	46%	87%	0%
Vol Right, %	6%	37%	29%	0%	100%
Sign Control	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	126	67	41	60	28
LT Vol	25	20	10	8	0
Through Vol	94	22	19	52	0
RT Vol	7	25	12	0	28
Lane Flow Rate	150	80	49	71	33
Geometry Grp	5	2	2	7	7
Degree of Util (X)	0.193	0.097	0.061	0.099	0.039
Departure Headway (Hd)	4.64	4.397	4.47	4.984	4.265
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes
Cap	776	817	803	721	841
Service Time	2.657	2.413	2.486	2.701	1.982
HCM Lane V/C Ratio	0.193	0.098	0.061	0.098	0.039
HCM Control Delay	8.8	7.9	7.8	8.2	7.2
HCM Lane LOS	A	A	A	A	A
HCM 95th-tile Q	0.7	0.3	0.2	0.3	0.1

LANE SUMMARY

Site: 101 [Future Build Midday Peak - Sensitivity #1]

Site Category: (None)
Roundabout

Lane Use and Performance													
	Demand Flows Total veh/h	HV %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Average Delay sec	Level of Service	95% Back of Queue Veh	Dist ft	Lane Config	Lane Length ft	Cap. Adj. %	Prob. Block. %
South: Park Driveway													
Lane 1[d]	13	0.0	570	0.023	100	6.6	LOS A	0.1	2.2	Full	1600	0.0	0.0
Approach	13	0.0		0.023		6.6	LOS A	0.1	2.2				
East: Willamette Falls Drive													
Lane 1[d]	256	3.1	1254	0.204	100	4.6	LOS A	1.0	25.8	Full	1600	0.0	0.0
Approach	256	3.1		0.204		4.6	LOS A	1.0	25.8				
North: Dollar Middle School Driveway													
Lane 1[d]	126	0.0	1104	0.114	100	4.2	LOS A	0.5	12.7	Full	1600	0.0	0.0
Approach	126	0.0		0.114		4.2	LOS A	0.5	12.7				
West: Willamette Falls Drive													
Lane 1[d]	792	2.8	1256	0.631	100	10.8	LOS B	6.0	153.1	Full	1600	0.0	0.0
Approach	792	2.8		0.631		10.8	LOS B	6.0	153.1				
Intersection	1187	2.5		0.631		8.7	LOS A	6.0	153.1				

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Sign Control.
Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.
LOS F will result if v/c > 1 irrespective of lane delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 6).
Roundabout Capacity Model: US HCM 6.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

d Dominant lane on roundabout approach

APPENDIX F

HCM REPORT – SENSITIVITY ANALYSIS #2

Intersection	
Int Delay, s/veh	0.1

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	200	3	2	408	3	2
Future Vol, veh/h	200	3	2	408	3	2
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	1	0	0	3	33	0
Mvmt Flow	222	3	2	453	3	2

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	225	0	681	224
Stage 1	-	-	-	-	224	-
Stage 2	-	-	-	-	457	-
Critical Hdwy	-	-	4.1	-	6.73	6.2
Critical Hdwy Stg 1	-	-	-	-	5.73	-
Critical Hdwy Stg 2	-	-	-	-	5.73	-
Follow-up Hdwy	-	-	2.2	-	3.797	3.3
Pot Cap-1 Maneuver	-	-	1356	-	372	820
Stage 1	-	-	-	-	745	-
Stage 2	-	-	-	-	577	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1356	-	371	820
Mov Cap-2 Maneuver	-	-	-	-	371	-
Stage 1	-	-	-	-	744	-
Stage 2	-	-	-	-	577	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0	12.7
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	475	-	-	1356	-
HCM Lane V/C Ratio	0.012	-	-	0.002	-
HCM Control Delay (s)	12.7	-	-	7.7	0
HCM Lane LOS	B	-	-	A	A
HCM 95th %tile Q(veh)	0	-	-	0	-

Intersection	
Intersection Delay, s/veh	10.7
Intersection LOS	B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	12	192	2	2	341	14	5	1	3	22	3	65
Future Vol, veh/h	12	192	2	2	341	14	5	1	3	22	3	65
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Heavy Vehicles, %	0	3	0	0	4	12	20	0	0	13	0	4
Mvmt Flow	13	216	2	2	383	16	6	1	3	25	3	73
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	9.6	11.7	8.9	9.1
HCM LOS	A	B	A	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	56%	6%	1%	24%
Vol Thru, %	11%	93%	96%	3%
Vol Right, %	33%	1%	4%	72%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	9	206	357	90
LT Vol	5	12	2	22
Through Vol	1	192	341	3
RT Vol	3	2	14	65
Lane Flow Rate	10	231	401	101
Geometry Grp	1	1	1	1
Degree of Util (X)	0.016	0.297	0.493	0.145
Departure Headway (Hd)	5.722	4.625	4.426	5.147
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	622	775	814	694
Service Time	3.793	2.666	2.46	3.203
HCM Lane V/C Ratio	0.016	0.298	0.493	0.146
HCM Control Delay	8.9	9.6	11.7	9.1
HCM Lane LOS	A	A	B	A
HCM 95th-tile Q	0	1.2	2.8	0.5

Intersection	
Intersection Delay, s/veh	7.5
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	28	23	29	10	23	5	15	3	2	4	37	32
Future Vol, veh/h	28	23	29	10	23	5	15	3	2	4	37	32
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86
Heavy Vehicles, %	0	0	5	0	11	0	0	3	0	0	6	0
Mvmt Flow	33	27	34	12	27	6	17	3	2	5	43	37
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	1

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	2	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	2	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	2	1	1
HCM Control Delay	7.5	7.4	7.6	7.5
HCM LOS	A	A	A	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1	SBLn2
Vol Left, %	75%	35%	26%	10%	0%
Vol Thru, %	15%	29%	61%	90%	0%
Vol Right, %	10%	36%	13%	0%	100%
Sign Control	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	20	80	38	41	32
LT Vol	15	28	10	4	0
Through Vol	3	23	23	37	0
RT Vol	2	29	5	0	32
Lane Flow Rate	23	93	44	48	37
Geometry Grp	5	2	2	7	7
Degree of Util (X)	0.028	0.103	0.051	0.064	0.043
Departure Headway (Hd)	4.394	3.969	4.129	4.8	4.152
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes
Cap	803	890	854	740	854
Service Time	2.484	2.052	2.22	2.567	1.918
HCM Lane V/C Ratio	0.029	0.104	0.052	0.065	0.043
HCM Control Delay	7.6	7.5	7.4	7.9	7.1
HCM Lane LOS	A	A	A	A	A
HCM 95th-tile Q	0.1	0.3	0.2	0.2	0.1

LANE SUMMARY

Site: 101 [Future Build AM Peak - Sensitivity #2]

Site Category: (None)
Roundabout

Lane Use and Performance													
	Demand Flows Total veh/h	HV %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Average Delay sec	Level of Service	95% Back of Queue Veh	Dist ft	Lane Config	Lane Length ft	Cap. Adj. %	Prob. Block. %
South: Park Driveway													
Lane 1[d]	13	0.0	974	0.013	100	3.8	LOS A	0.1	1.3	Full	1600	0.0	0.0
Approach	13	0.0		0.013		3.8	LOS A	0.1	1.3				
East: Willamette Falls Drive													
Lane 1[d]	441	2.2	1175	0.375	100	6.8	LOS A	2.2	56.4	Full	1600	0.0	0.0
Approach	441	2.2		0.375		6.8	LOS A	2.2	56.4				
North: Dollar Middle School Driveway													
Lane 1[d]	210	0.0	974	0.215	100	5.8	LOS A	1.0	25.3	Full	1600	0.0	0.0
Approach	210	0.0		0.215		5.8	LOS A	1.0	25.3				
West: Willamette Falls Drive													
Lane 1[d]	248	0.5	1234	0.201	100	4.7	LOS A	1.0	25.3	Full	1600	0.0	0.0
Approach	248	0.5		0.201		4.7	LOS A	1.0	25.3				
Intersection	912	1.2		0.375		5.9	LOS A	2.2	56.4				

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Sign Control.
Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.
LOS F will result if v/c > 1 irrespective of lane delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 6).
Roundabout Capacity Model: US HCM 6.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

d Dominant lane on roundabout approach

Organisation: DKS ASSOCIATES | Processed: Tuesday, August 11, 2020 3:15:19 PM
Project: \\salfiles3\S-Drive\Projects\2020\P20079-000 (WLWV Dollar Middle School TIA)\Analysis\Willamette Falls Drive Mini RAB.sip8

Intersection	
Int Delay, s/veh	0.3

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	727	9	3	248	5	10
Future Vol, veh/h	727	9	3	248	5	10
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	3	11	0	4	20	0
Mvmt Flow	808	10	3	276	6	11

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	818	0	1095	813
Stage 1	-	-	-	-	813	-
Stage 2	-	-	-	-	282	-
Critical Hdwy	-	-	4.1	-	6.6	6.2
Critical Hdwy Stg 1	-	-	-	-	5.6	-
Critical Hdwy Stg 2	-	-	-	-	5.6	-
Follow-up Hdwy	-	-	2.2	-	3.68	3.3
Pot Cap-1 Maneuver	-	-	819	-	218	382
Stage 1	-	-	-	-	407	-
Stage 2	-	-	-	-	726	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	819	-	217	382
Mov Cap-2 Maneuver	-	-	-	-	217	-
Stage 1	-	-	-	-	405	-
Stage 2	-	-	-	-	726	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.1	17.5
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	305	-	-	819	-
HCM Lane V/C Ratio	0.055	-	-	0.004	-
HCM Control Delay (s)	17.5	-	-	9.4	0
HCM Lane LOS	C	-	-	A	A
HCM 95th %tile Q(veh)	0.2	-	-	0	-

Intersection	
Intersection Delay, s/veh	39.9
Intersection LOS	E

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	113	602	4	4	202	14	6	2	4	24	3	59
Future Vol, veh/h	113	602	4	4	202	14	6	2	4	24	3	59
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Heavy Vehicles, %	5	3	0	25	5	25	50	0	25	12	0	2
Mvmt Flow	122	647	4	4	217	15	6	2	4	26	3	63
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	52.5	11.7	10.6	10.4
HCM LOS	F	B	B	B

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	50%	16%	2%	28%
Vol Thru, %	17%	84%	92%	3%
Vol Right, %	33%	1%	6%	69%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	12	719	220	86
LT Vol	6	113	4	24
Through Vol	2	602	202	3
RT Vol	4	4	14	59
Lane Flow Rate	13	773	237	92
Geometry Grp	1	1	1	1
Degree of Util (X)	0.026	0.995	0.366	0.159
Departure Headway (Hd)	7.352	4.632	5.568	6.198
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	489	773	651	582
Service Time	5.368	2.709	3.568	4.207
HCM Lane V/C Ratio	0.027	1	0.364	0.158
HCM Control Delay	10.6	52.5	11.7	10.4
HCM Lane LOS	B	F	B	B
HCM 95th-tile Q	0.1	16.7	1.7	0.6

Intersection	
Intersection Delay, s/veh	8.3
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	27	25	25	10	22	12	25	94	7	8	52	34
Future Vol, veh/h	27	25	25	10	22	12	25	94	7	8	52	34
Peak Hour Factor	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84
Heavy Vehicles, %	0	13	8	0	0	9	13	3	11	0	3	0
Mvmt Flow	32	30	30	12	26	14	30	112	8	10	62	40
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	1

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	2	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	2	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	2	1	1
HCM Control Delay	8.1	7.9	8.8	7.9
HCM LOS	A	A	A	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1	SBLn2
Vol Left, %	20%	35%	23%	13%	0%
Vol Thru, %	75%	32%	50%	87%	0%
Vol Right, %	6%	32%	27%	0%	100%
Sign Control	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	126	77	44	60	34
LT Vol	25	27	10	8	0
Through Vol	94	25	22	52	0
RT Vol	7	25	12	0	34
Lane Flow Rate	150	92	52	71	40
Geometry Grp	5	2	2	7	7
Degree of Util (X)	0.195	0.114	0.066	0.1	0.048
Departure Headway (Hd)	4.685	4.458	4.51	5.024	4.304
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes
Cap	767	806	795	714	833
Service Time	2.709	2.478	2.533	2.747	2.028
HCM Lane V/C Ratio	0.196	0.114	0.065	0.099	0.048
HCM Control Delay	8.8	8.1	7.9	8.3	7.2
HCM Lane LOS	A	A	A	A	A
HCM 95th-tile Q	0.7	0.4	0.2	0.3	0.2

LANE SUMMARY

Site: 101 [Future Build Midday Peak - Sensitivity #2]

Site Category: (None)
Roundabout

Lane Use and Performance													
	Demand Flows Total veh/h	HV %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Average Delay sec	Level of Service	95% Back of Queue Veh	Dist ft	Lane Config	Lane Length ft	Cap. Adj. %	Prob. Block. %
South: Park Driveway													
Lane 1[d]	13	0.0	538	0.025	100	7.0	LOS A	0.1	2.3	Full	1600	0.0	0.0
Approach	13	0.0		0.025		7.0	LOS A	0.1	2.3				
East: Willamette Falls Drive													
Lane 1[d]	281	2.8	1222	0.230	100	5.0	LOS A	1.2	29.8	Full	1600	0.0	0.0
Approach	281	2.8		0.230		5.0	LOS A	1.2	29.8				
North: Dollar Middle School Driveway													
Lane 1[d]	187	0.0	1105	0.169	100	4.8	LOS A	0.8	19.8	Full	1600	0.0	0.0
Approach	187	0.0		0.169		4.8	LOS A	0.8	19.8				
West: Willamette Falls Drive													
Lane 1[d]	821	2.7	1221	0.673	100	12.1	LOS B	6.7	171.0	Full	1600	0.0	0.0
Approach	821	2.7		0.673		12.1	LOS B	6.7	171.0				
Intersection	1302	2.3		0.673		9.5	LOS A	6.7	171.0				

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Sign Control.
Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.
LOS F will result if v/c > 1 irrespective of lane delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 6).
Roundabout Capacity Model: US HCM 6.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

d Dominant lane on roundabout approach

Organisation: DKS ASSOCIATES | Processed: Tuesday, August 11, 2020 3:15:21 PM
Project: \\salfiles3\S-Drive\Projects\2020\P20079-000 (WLWV Dollar Middle School TIA)\Analysis\Willamette Falls Drive Mini RAB.sip8

APPENDIX G

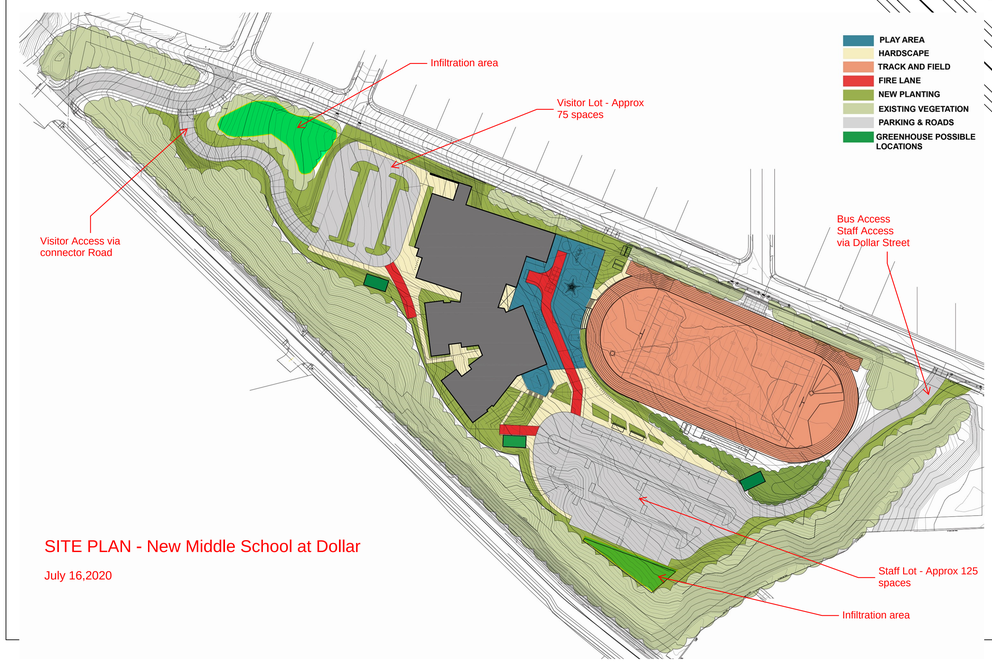
CRASH DATA

Crash ID	Crash Date	Lat	Long	Collision Type	Crash Severity	KABCO	Weather	Road Surface	Light	Crash Event	Crash Cause
1615911	8/11/2015	45.346661	-122.671767	REAR	INJ	B	CLEAR	DRY	DAYLIGHT		FAILED TO AVOID VEHICLE AHEAD
1664747	4/1/2016	45.346544	-122.671567	REAR	INJ	C	CLEAR	DRY	DAYLIGHT	PED INVOLVED	FAILED TO AVOID VEHICLE AHEAD
1740242	7/21/2017	45.346583	-122.671631	REAR	INJ	C	CLEAR	DRY	DAYLIGHT	PED INVOLVED	FAILED TO AVOID VEHICLE AHEAD
1705382	8/5/2016	45.347383	-122.672931	REAR	PDO	O	CLEAR	DRY	DAYLIGHT		FAILED TO AVOID VEHICLE AHEAD
1742193	8/17/2017	45.346583	-122.671633	REAR	INJ	C	CLEAR	DRY	DAYLIGHT		FOLLOW TOO CLOSE
1643136	6/16/2015	45.345814	-122.670233	REAR	PDO	O	CLEAR	DRY	DAYLIGHT	FORCED BY IMPACT	FOLLOW TOO CLOSE
1739094	7/13/2017	45.344317	-122.666969	REAR	INJ	C	CLEAR	DRY	DARK-NO ST LIGHTS		FAILED TO AVOID VEHICLE AHEAD
1763483	10/12/2017	45.344317	-122.666972	REAR	PDO	O	RAIN	WET	DAYLIGHT		FAILED TO AVOID VEHICLE AHEAD
1583758	8/2/2014	45.346525	-122.671531	REAR	INJ	C	CLEAR	DRY	DAYLIGHT	PED INVOLVED	FAILED TO AVOID VEHICLE AHEAD
1689300	1/28/2016	45.344317	-122.666969	SS-O	PDO	O	CLOUDY	WET	DAYLIGHT		IMPROPER OVERTAKE
1756099	6/6/2017	45.348417	-122.674439	REAR	PDO	O	CLEAR	DRY	DAYLIGHT		INATTENTION

APPENDIX H

SITE PLAN

STORMWATER TREATMENT
CONNECTOR PATH TO WATERFRONT TRAIL
BRANDON PLACE INTERSECTION
BRANDON PLACE EXTENTION
MONUMENT SIGN
STORMWATER SWALE
WEST ENTRY DRIVE W/ 6' WIDE SIDEWALK
RETAINING WALL
EXISTING TREES REMAIN UNDER REVIEW
BOLLARDS
VISITOR PARKING LOT- 71 STALLS
STUDENT DROP OFF-480 LF
BUILDING ENTRANCE
FLAG POLES- 3
BIKE RACKS- 15
PLAY AREA RETAINING WALL- UTILIZE WALL FOR PLAY ELEMENTS
STORAGE
FUTURE CONCESSIONS
BIKE RACKS- 20
PAINTED GAMES
OUTDOOR DINING AND ENTRY PLAZA- CONCRETE
BUILDING ENTRANCE
BIKE RACKS- 4
FIRE AERIAL ACCESS ROUTE- ASPHALT
FIRE ACCESS- CONCRETE
COURTYARD PATH- ASPHALT
COURTYARD SEATING
SOCIAL BENCH SEATING
BIKE RACKS- 11
TERRACED RETAINING WALLS
CTE SPILLOUT AND OUTDOOR SOCIAL SPACE- CONCRETE
STAIRS
RAMP
RAMP TO TRACK- 14' WIDE
OUTDOOR PLAY AREA W/ RUBBER SURFACING
SOCIAL SEATING
STAIR
SOCIAL TERRACES W/ RETAINING WALL
BASKETBALL HOOPS
SLOPED TURF
4' CHAIN LINK FENCE
BLEACHER
DOLLAR STREET IMPROVEMENTS
LAWN- SPECTATOR AREA
MONUMENT SI
DISCUS
LONG JUMP / TRIPLE JUMP
8 LANE TRACK W/ RUBBER SURFACE SHOULDER AND INTERIOR CURB
SYNTHETIC TURF W/ FOOTBALL AND SOCCER STRIPING
JAVELIN
HIGH JUMP
SHOT PUT
FIRE ACCESS- CONCRETE
GREENHOUSE YARD
GREENHOUSE GATHERING SPACE
GREENHOUSE
SHELTER
SLOPED WALK
LAWN- SPECTATOR AREA
STAIR
EAST ENTRY DRIVE W/ 8' WIDE SIDEWALK
RAVINE SETBACK- 25' FROM TOP OF BANK
6' TALL CHAIN LINK FENCE
STAFF PARKING LOT- 114 STALLS
BUS DROP OFF-660LF W/ 12' WIDE SIDEWALK
GRADING EXTENTS
WILLAMETTE FALLS DRIVE IMPROVEMENTS



SITE PLAN - New Middle School at Dollar

July 16,2020

DKS 117 COMMERCIAL STREET NE, SUITE 310, SALEM, OR 97301 • 503.391.8773 • DKSASSOCIATES.COM

JANUARY 25, 2020

Remo Douglas
Project Manager
West Linn-Wilsonville School District

SUBJECT: ATHEY CREEK MIDDLE SCHOOL RELOCATION
TRAFFIC IMPACT ANALYSIS - SUPPLEMENTAL INFORMATION

NEIGHBORHOOD QUESTIONS

This memorandum provides supplemental answers to questions raised by the community at a series of neighborhood meetings for the relocated Athey Creek Middle School on Dollar Street in West Linn, Oregon. The questions that will be answered in this memorandum are listed below:

1. How were the modal split numbers determined for the relocated middle school on Dollar Street?
2. How will the middle school traffic impact Dollar Street?
3. Was an alternative traffic control option considered besides the roundabout at the Willamette Falls Drive/Brandon Place intersection?

RESPONSES

The responses below address the questions raised by the community as listed above.

1. HOW WERE THE MODAL SPLIT NUMBERS DETERMINED FOR THE RELOATED MIDDLE SCHOOL ON DOLLAR STREET?

The future middle school will have a capacity of 850 students.

The West Linn School District staff estimated that approximately 450 students (about 53% of total students) will be bused to the relocated middle school on 12 school buses. The number students being bused from each school zone was estimated using middle school residence-based enrollment forecasts from the School District and were verified with standard engineering practices.

The remaining students (400) were assumed to walk, bike, or be driven to school.
Note that students that live within the walking boundary, which was assumed to be a 1-mile radius around the school, are not provided regular school bus service. Using the student enrollment information, it was estimated that approximately 250 students live within the 1-mile radius walking boundary and could walk or bike to school at full buildout (when the school operates at the 850-student capacity). The remaining 150 students were assumed to be driven to school. The traffic

operations based on these assumptions are shown in Table 9 on page 22 of the Transportation Impact Study (TIS).

Additionally, a sensitivity analysis was conducted that analyzed the traffic operations if the student walking and biking assumptions were reduced to 100 students, 300 students were driven to school, and 450 students took the school bus. Refer to pages 23 – 24 of the TIS on the School District website for details. The sensitivity analysis showed that three of the four study intersections met the City's operating standard (average vehicle delay less than 35 seconds). The intersection of Willamette Falls Drive/Ostman Road was shown to have an average vehicle delay of 52 seconds (13 seconds more than when 250 students are assumed to walk or bike) for the midday peak hour.

Due to questions from the public, an additional sensitivity analysis was conducted where only 50 students were assumed to walk or bike, 350 students were driven to school, and 450 students took the school bus. The analysis resulted in similar findings as the previous sensitivity analysis. The average vehicle delay at Willamette Falls Drive/Ostman Road was 59 seconds for the midday peak hour. All other study intersections sufficiently met the City's operating standard.

In summary, even if the number of students that walk or bike to school is as low as 50 students, the study intersections are expected to operate within the City's standards except for Willamette Falls Drive/Ostman Road.

At this time, the City of West Linn does not desire to improve the Willamette Falls Drive/Ostman Road intersection. The existing traffic congestion at the Willamette Falls Drive/Ostman Road intersection is due to local traffic as well as regional traffic. If capacity is increased at the intersection, the City of West Linn is concerned it will encourage more regional trips on Willamette Falls Drive. The School District will pay System Development Charges (SDCs) to the City when the middle school is approved. That money can be used by the City to improve the intersection in the future if the City decides improvements are desired.

2. HOW WILL THE MIDDLE SCHOOL TRAFFIC IMPACT DOLLAR STREET?

There will be two new accesses to the middle school on Dollar Street. One is located on the eastern edge of the site and will provide access to the staff parking lot and the school bus loading area; this driveway is not intended for parent pick-up/drop-off activity. The other access is the Brandon Place extension (public street) from Dollar Street to Willamette Falls Drive, which will provide access to the middle school.

The middle school is estimated to generate approximately 60-100 trips on Dollar Street during the AM peak hour (8 - 9am) and 50-90 trips on Dollar Street during the Midday peak hour (3:10 - 4:10 pm). The traffic operations for these two accesses on Dollar Street are estimated to meet the City's operating standard (average vehicle delay less than 35 seconds) once the middle school is built.

Additional traffic analysis was conducted for the two River Heights Circle intersections on Dollar Street. These intersections are estimated to have an average vehicle delays less than 15 seconds on the River Heights Circle approaches once the middle school is built.

3. WAS AN ALTERNATIVE TRAFFIC CONTROL OPTION CONSIDERED BESIDES THE ROUNDABOUT AT THE WILLAMETTE FALLS DR/BRANDON PL INTERSECTION?

Yes, a two-way stop control was analyzed (stop signs on the Brandon Place and Fields Bridge Park driveway). However, the intersection was not able to meet the City's operating standard (average vehicle delay less than 35 seconds) with the relocated middle school traffic under the sensitivity analysis scenario (100 students walk/bike, 350 students driven, 450 students bussed). Because of the proximity to the Tualatin River bridge, Willamette Falls Drive cannot be widened to the west of Brandon Place to accommodate an eastbound left turn lane at the intersection. A roundabout was determined to provide significantly more capacity than a two-way stop option.

Additionally, a roundabout provides many safety benefits for pedestrians and bicyclists. Roundabouts can reduce the types of crashes where people are seriously hurt or killed by 78% - 82%. The curvature of a roundabout results in lower vehicle speeds (15 mph – 25 mph) and provide shorter crossings for pedestrians by providing a center refuge island at each crossing. To learn more about the benefits of roundabouts, visit the Federal Highway Administration website: www.safety.fhwa.dot.gov/intersection/innovative/roundabouts.

A traffic signal was also considered but was not desired. Again, because of the proximity to the Tualatin River bridge, Willamette Falls Drive cannot be widened to accommodate an eastbound left turn lane at the intersection. With a traffic signal and lack of an eastbound left turn lane, eastbound capacity would be limited as left turn vehicles would block through vehicles. Additionally, a traffic signal would not provide the same safety benefits that a roundabout would provide.

OTHER INFORMATION

Please refer to the Transportation Impact Study (TIS) for other transportation analysis related questions or the School District's Project Website (www.wlwv.k12.or.us/domain/1997).

Let us know if you have any other questions. Thanks!

Scott Mansur, P.E., PTOE
Transportation Engineer
DKS Associates

Preliminary Drainage Report

Dollar Street Middle School

Prepared for: IBI
Prepared by: Nathan Patterson, PE
Project Engineer: Danielle Pruett, PE

January 2021 | KPFF Project #2000067

KPFF'S COMMITMENT TO SUSTAINABILITY

As a member of the US Green Building Council, KPFF is committed to the practice of sustainable design and the use of sustainable materials in our work.

When hardcopy reports are provided by KPFF, they are prepared using recycled and recyclable materials, reflecting KPFF's commitment to using sustainable practices and methods in all of our products.

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Appendix D

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Appendix E

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Project Overview

Purpose of this Report

This report describes the stormwater management design strategies for the proposed development. The basis for this report is the City of West Linn Public Works Design Standards and the 2020 City of Portland Stormwater Management Manual (SWMM) and requirements outlined therein. The purpose of the proposed stormwater management facilities is to protect existing public stormwater infrastructure and to improve the overall health of the watershed.

Project Location and Zoning

The project property is located between Dollar Street and Willamette Falls Drive in West Linn, Oregon. The site extends from approximately the western end of Dollar Street to the edge of private property along Epperly Way. The predevelopment site zoning designation is R-10.

FIGURE 1: Site Vicinity Map

Type of Development and Proposed Improvements

The project includes development of a new West Linn-Wilsonville School District Middle School which will include new parking areas, play areas, a track and field, and site circulation improvements. The development will include half-street improvements along Dollar Street to the north of the project, and reconstruction of

Willamette Falls Drive to the south. An extension of Brandon Place will cross through the site and connect to Willamette Falls Drive.

Watershed Description

The site is located within the Tualatin River and Dollar Creek Drainage Basins as identified by the City of West Linn GIS.

Existing vs. Post Construction Conditions

The project is adjacent to the following existing stormwater infrastructure:

Tualatin River Drainage Basin:

- 24-inch storm sewer main along north side of Willamette Falls Drive.
- 12-inch public stormwater outfall to the Tualatin River at the end of Dollar Street.
- 12-inch public stormwater outfall to the Tualatin River via overland through Fields Bridge Park.
- 12-inch storm sewer along north side of Dollar Street (west of eastern intersection with River Heights Circle).
- Public stormwater pond north of the Willamette Falls Drive at Tualatin River Bridge.

Dollar Creek Drainage Basin:

- 18-inch public stormwater outfall to the Tualatin River via property west of Epperly Way.
- 12-inch storm sewer along north side of Dollar Street (east of eastern intersection with River Heights Circle).
- Surface conveyance ditch on eastern property line from Dollar Street toward Willamette Falls Drive.

The table below describes the outfall location for major onsite and offsite drainage basins. See Basin Maps and subsequent report sections for a more detailed subbasin analysis.

TABLE 1: Proposed Drainage Basin Summary

Proposed Major Basin	Outfall Location	Drainage Basin
Onsite Development (impervious, mixed)	12-inch Tualatin River north of bridge	Tualatin River
Onsite Eastern Slopes (non-impervious)	East Surface Conveyance Ditch	Dollar Creek
Onsite Southern Slopes (non-impervious)	24-inch Willamette Falls Drive Storm Main	Tualatin River
Willamette Falls Drive (northwest)	12-inch Tualatin River north of bridge	Tualatin River
Willamette Falls Drive (central)	12-inch Fields Bridge Park	Tualatin River
Willamette Falls Drive (southeast)	18-inch Main opposite Epperly Way	Dollar Creek
Brandon Place Extension	Public Storm Pond	Tualatin River
Dollar Street (west)	12-inch Dollar Street Storm Main	Tualatin River
Dollar Street (east)	East Surface Conveyance Ditch	Dollar Creek

Geotechnical Engineer Recommendations

GeoDesign, Inc. has provided the geotechnical report titled “Report of Geotechnical Engineering Services” for the project, dated October 20, 2020. The proposed design includes the engineer’s recommended foundation drainage, hard piped roof drainage, and slope drainage improvements for cement treated fill. Specifically, the methodology used to construct and provide drainage for the fill slopes facing Willamette

Falls Drive are unique for this project. An excerpt from the report's conclusions and recommendations are included in Appendix D.

Methodology

Proposed Stormwater Management Narrative

All surface stormwater generated by impervious areas will be collected and treated as described below. Although not required, the majority of developed pervious areas are also captured and treated due to the layout of the proposed improvements. Untreated areas include the fill slopes along the south and southwest sides of the development where slope drainage infrastructure is implemented as recommended by the geotechnical engineer. These collection systems will be connected to the public storm drain system in Willamette Falls Drive due to their lower elevations.

Detention and Flow Control

Both major basins identified in Table 1 drain to the Tualatin River, therefore no stormwater detention shall be required if adequate capacity to convey the 10-year storm is shown to exist or is provided with the development (Public Works Design Standard 2.0040.C.) Stormwater generated from the onsite improvements will utilize an existing outfall location north of the Tualatin River bridge. This line will be reconstructed in-place as needed to provide the additional capacity for the new development. Subsequent submittals will demonstrate the available capacity at each proposed point of connection for the public road improvements, as required.

Water Quality (Onsite)

The majority of stormwater generated by the proposed onsite improvements will be captured in a piped system and routed to a grassy swale parallel to the major driveway access off the Brandon Street Extension. By implementing a downstream treatment system, it is infeasible to hydraulically separate pervious areas from impervious areas, therefore the swale will be sized to treat all flows that enter it rather than for the required treatment of impervious flows only. This grassy swale is configured to meet the City of Portland BES geometric requirements using the Performance Approach and will provide a minimum of nine minutes of residence time. Check dams will be spaced at maximum 50-feet on center and will double as both steps in grade to follow the adjacent roadway and as flow spreaders to ensure the facility functions as designed. The access aisle parallel to the grassy swale will be treated by a small stormwater basin sized using the Portland BES PAC Calculator with a 25% increase in size per West Linn's standards.

Water Quality (Dollar Street)

Surface runoff from the southern half-street improvements is collected at flow through planter basins (FTP). Basins are sized using the Portland BES Presumptive Approach Calculator (PAC) with a 25% increase in size per West Linn's standards.

Water Quality (Brandon Place Extension)

Surface water collection is provided with curb inlets. These curb inlets daylight at a new outfall to an enlarged existing public storm basin north of the proposed roundabout. The enlargement of the existing storm basin will consider the tributary basin from the existing bridge and new roundabout and will be sized using the Portland BES PAC Calculator with a 25% increase in size per West Linn's standards.

Water Quality (Willamette Falls Drive)

Flow through planters are proposed in locations where the road cross section and grading allows for a planter strip. Flow through planters are sized using the Portland BES PAC Calculator with a 25% increase in size per West Linn's standards. In locations where vegetated facilities are infeasible, Contech Stormfilter gutter inlets (SFCB) are proposed. The northern separated bike lane and sidewalk will, pending final selection of paving materials, either be mitigated by using pervious asphalt with underdrain in the bike lane or will shed to the roadway treatment facilities. The southern separated bike lane and sidewalk will shed surface runoff toward each other that will be collected at curb inlets located in the bike lane. This will create an informal gutter along the curb line separating the facilities. Treatment will be provided via a combination of either pervious asphalt, Stormfilter curb inlets, or by routing to another treatment facility. The final treatment design for these areas will be refined in subsequent submittals.

Analysis

Basin Summary

Individual basin maps for each public street frontage and for the onsite development are included in Appendix A. Summaries for onsite (Table 2) and public (Table 3) are below. Hydrographs for the onsite basins are also included in Appendix C along with design assumptions including time of concentration, curve numbers, and design storm rainfall data. Note that all onsite basins flow to the Tualatin River via the reconstructed outfall north of the Tualatin River bridge. The ultimate outfall or connection point for public basins are as shown below in Table 3.

TABLE 2: Onsite Basin Area Breakdown

Basin	Basin Area (sf)	% Impervious	WQ Peak Flow (cfs)	Receiving Facility
A	14,120	100	0.093	FTP-Onsite
B	77,000	100	0.506	Swale
C	50,915	100	0.335	Swale
D	32,675	100	0.215	Swale
E	98,990	100	0.651	Swale
F	42,620	100	0.280	Swale
G	100,645	0	0.030	Swale
H	22,030	0	0.006	Swale
I	101,140	0	0.030	Swale
J	49,600	0	0.015	Swale
K	5,120	0	0.002	Swale
Total	**601,435**		**1.99***	

**Swale peak inflow is not a direct sum of peak flows due to peaks occurring at different times. See hydrographs in Appendix C.*

TABLE 3: Offsite Basin Area and Routing Summary

Basin	Basin Area (sf)	Receiving Facility	Ultimate Outfall or Connection Point
DOL-A	7,190	FTP-A	Brandon Place 12" Storm Main
DOL-B	10,360	FTP-B	Brandon Place 12" Storm Main
DOL-C	10,280	FTP-C	Brandon Place 12" Storm Main
DOL-D1	5,320	FTP-D1	WFD East 18" Outfall
DOL-D2	5,710	FTP-D2	WFD East 18" Outfall
DOL-E	8,485	FTP-E	WFD East 18" Outfall
BRA-A1	25,713	BASIN-A	Tualatin River North of Bridge Outfall
BRA-A2	21,675	BASIN-A	Tualatin River North of Bridge Outfall
WFD-N1	7,950	FTP-N1	Fields Bridge Park East Entry Outfall
WFD-S1	6,060	FTP-S1	Fields Bridge Park East Entry Outfall
WFD-N2A	4,000	FTP-N2A	Fields Bridge Park East Entry Outfall
WFD-S2A	4,150	FTP-S2A	Fields Bridge Park East Entry Outfall
WFD-N2B	4,610	FTP-N2B	Fields Bridge Park East Entry Outfall
WFD-S2B	4,005	FTP-S2B	Fields Bridge Park East Entry Outfall
WFD-N3	3,690	SFCB-N3	Fields Bridge Park East Entry Outfall
WFD-S3	3,590	SFCB-S3	Fields Bridge Park East Entry Outfall
WFD-N4	3,690	SFCB-N4	Fields Bridge Park East Entry Outfall
WFD-S4	4,450	FTP-S4	Fields Bridge Park East Entry Outfall
WFD-N5	1,585	FTP-N5	WFD East 18" Outfall
WFD-S5	2,605	FTP-S5	WFD East 18" Outfall
WFD-PED+BIKE NORTH	17,560	STORMFILTER CURB INLET/PERVIOUS PAVEMENT	Fields Bridge Park East Entry Outfall
WFD-PED+BIKE-SW	5,760	STORMFILTER CURB INLET/PERVIOUS PAVEMENT	Fields Bridge Park East Entry Outfall
WFD-PED+BIKE-SE	12,020	STORMFILTER CURB INLET/PERVIOUS PAVEMENT	Fields Bridge Park East Entry Outfall

Facility Sizing for Water Quality

Grassy Swale

Using the 1.99 cubic feet per second input as shown in Table 2, the swale bottom, longitudinal slope, and treatment flow depth is then adjusted to provide minimum 9-minute residence time for the peak flow of the water quality storm. See Appendix C for the grassy swale sizing calculations.

Flow Through Planters and Basins

To establish a conservative sizing factor, several basins ranging in size were ran through the City of Portland PAC Calculator. 25% basin vegetated area was then added to the City of Portland's minimum size per West Linn's standards. This demonstrated that using a 2% sizing factor (vegetated treatment area / total tributary area) provides the required pollutant removal. All Basin and FTP facilities are sized using this minimum 2% sizing factor. Individual reports for each of the fifteen planters and two basins will be provided in subsequent submittals to demonstrate all necessary requirements are met.

Stormfilter Catch Basin Inlets

Stormfilter cartridges are approved to treat specific peak flows or tributary areas. The 18-inch standard cartridge heights are proposed. ZPG media is proposed as it is the most cost-effective media and it allows single cartridge configurations for the project's basin areas. However, PSORB media is an alternate that may

be implemented if further design revisions increase basin areas to the point that multiple cartridge structures would be required. The following figures show the approved tributary basin areas for each media type. The preliminary design indicates single cartridge concrete gutter inlets are adequate to treat each basin assigned a Stormfilter Catch Basin (SFCB). Dual cartridge units may be required pending the final material selection of sidewalks and bike lanes.

Table 1. Contech StormFilter with ZPG Sizing to Meet City of Portland Pollution Reduction Requirements			
Cartridge Size/Stack Configuration	Cartridge Design Flow Rate (gpm/ cartridge stack)	Maximum Drainage Area (acres/ cartridge stack)	Maximum Drainage Area (square feet/ cartridge stack
12	5	0.065	2838
18	7.5	0.098	4257
27	11.3	0.147	6413

FIGURE 2: City of Portland Stormfilter ZPG Approvals

Table 1. Contech StormFilter with PhosphoSorb Sizing to Meet City of Portland Pollution Reduction Requirements			
Cartridge Size/Stack Configuration	Cartridge Design Flow Rate (gpm/ cartridge stack)	Maximum Drainage Area (acres/ cartridge stack)	Maximum Drainage Area (square feet/ cartridge stack
12	8.35	0.109	4739
18	12.53	0.163	7112
27	18.79	0.245	10665

FIGURE 3: City of Portland Stormfilter PSORB Approvals

Conveyance

The storm drainage for both the private and public improvements will be sized per West Linn Public Works Design Standards section 2.0013.C. Manning's Equation will be used to verify pipe sizes, slopes, and velocities are within specification. The design storm shall be a minimum of the 10-year, 24-hour event as modeled using AutoCAD Storm and Sanitary Analysis 2020 using model inputs as required by the standards and outlined in this report. A time of concentration of 5-minutes will be used for all developed areas. Further analysis and modeling will be provided in subsequent versions of this report.

Engineering Conclusions

The stormwater system will be designed in accordance with the City of West Linn Public Works standards. The proposed stormwater facilities will meet the water quality requirements for the project site. The existing and new facilities and components will be shown to have adequate capacity to handle the required storm events. Therefore, the preliminary stormwater system design meets the intent of the City of West Linn requirements and should be approved as designed.

Operations and Maintenance

The Operations and Maintenance Plan will be included in the final version of this document.

10102000067- pm

Appendix A

Basin Maps

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SHEET NOTES

1. STORMWATER BASINS SHOWN ARE PRELIMINARY. FURTHER CONSIDERATION OF SITE PAVING AND COMPONENTS WILL BE TAKEN IN FINAL DESIGN. PRELIMINARY CALCULATIONS RESULT IN CONSERVATIVELY LARGE WATER QUALITY AND CONVEYANCE FLOWS. THESE FLOWS ARE LIKELY TO DECREASE AS THE DESIGN IS REFINED.

(X) KEY NOTES

BASIN ID	IMPERVIOUS AREA	PERVIOUS AREA	DRAINS TO:
A	14,120	0	FTP-ONSITE
B	77,000	0	GRASSY SWALE
C	50,915	0	GRASSY SWALE
D	32,675	0	GRASSY SWALE
E	98,990	0	GRASSY SWALE
F	42,620	0	GRASSY SWALE
G	0	100,645	GRASSY SWALE
H	0	22,030	GRASSY SWALE
I	0	101,140	GRASSY SWALE
J	0	49,600	GRASSY SWALE
K	0	5120	GRASSY SWALE
GS TOTAL	302,200	278,535	
FTP-ONSITE TOTAL	14,120	0	

SHEET LEGEND

IMPERVIOUS BASIN AREA

PERVIOUS BASIN AREA

CLIENT

West Linn-Wilsonville School District

22210 SW Stafford Rd, Tualatin, OR 97062

ISSUES

No.	DESCRIPTION	DATE
A	100% SCHEMATIC DESIGN	2020-07-31
B	100% DESIGN DEVELOPMENT	2021-01-29

NOT FOR CONSTRUCTION

KEYPLAN

CONSULTANTS

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Portland, OR 97204
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F: 503.274.4681
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SEAL

IBI GROUP
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Portland, OR 97205, USA
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PROJECT

New Athey Creek Middle School

945 Dollar Street
West Linn, OR 97068

PROJECT NO: 124738	
DRAWN BY: **XX**	CHECKED BY: **DP, MW**
PROJECT MGR: **DP**	APPROVED BY: **DP**

SHEET TITLE

PRELIMINARY BASIN MAP

SHEET NUMBER: EXH

ISSUE: A

BIM 360://124738 - WLWV New Middle School R2020/124738_WLWVNewMiddleSchool_R20.rvt

SCALE CHECK 1 in 10mm

File: N:\c\p\2020\2000067-Dollar-Street-MS\CAD\EXH\20200104-EXH-Basin-Map-Onsite.dwg TAB:EXH
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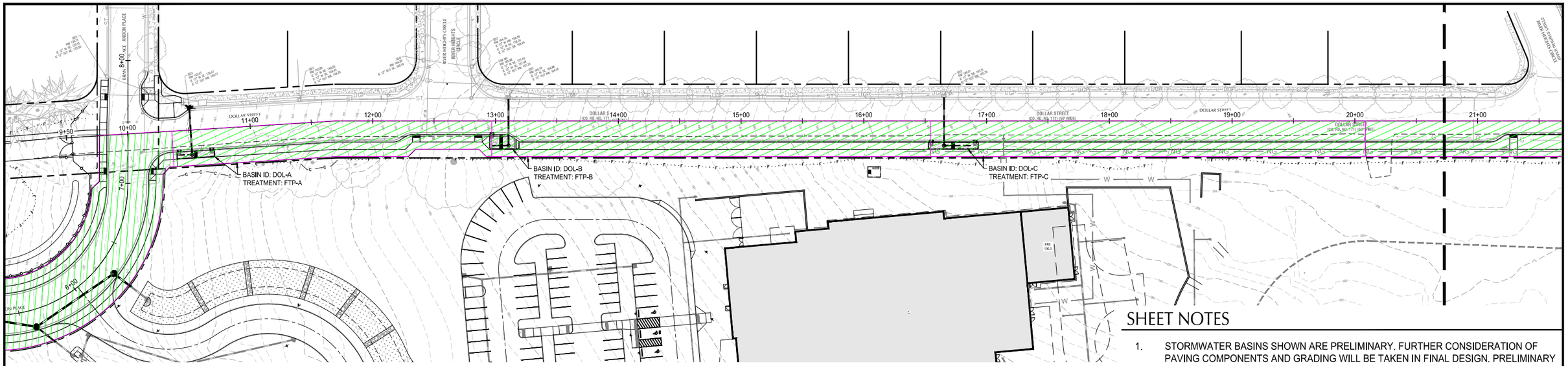
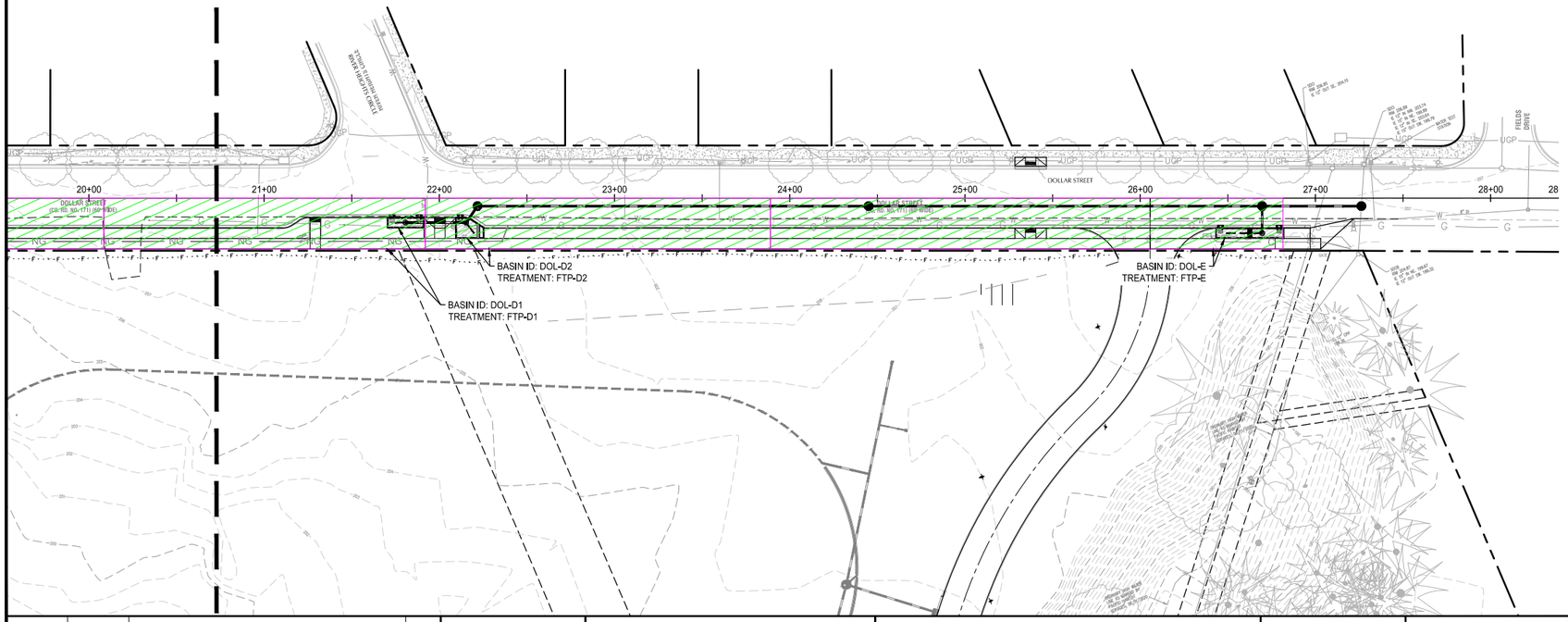


PRELIMINARY BASIN MAP - DOLLAR STREET

SCALE: 1" = 40'



SHEET NOTES

1. STORMWATER BASINS SHOWN ARE PRELIMINARY. FURTHER CONSIDERATION OF PAVING COMPONENTS AND GRADING WILL BE TAKEN IN FINAL DESIGN. PRELIMINARY CALCULATIONS RESULT IN CONSERVATIVELY LARGE WATER QUALITY AND CONVEYANCE FLOWS. THESE FLOWS ARE LIKELY TO DECREASE AS THE DESIGN IS REFINED.

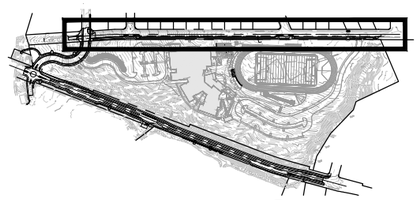
BASIN SUMMARY

BASIN ID	IMPERVIOUS AREA	TREATED (Y/N)	DRAINS TO:
DOL-A	7,190	Y	FTP-A
DOL-B	10,360	Y	FTP-B
DOL-C	10,280	Y	FTP-C
DOL-D1	5,320	Y	FTP-D1
DOL-D2	5,710	Y	FTP-D2
DOL-E	8,485	Y	FTP-E

SHEET LEGEND

TREATED BASIN AREA

UNTREATED BASIN AREA



KEY MAP

REVISION	DATE	DESCRIPTION	BY

SCALE 1 INCH = 40 FEET (40 0 40 80)

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F: 503.224.4681
www.kpff.com

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JOB No.:	2000067.00
DESIGNED BY:	XXX
DRAWN BY:	XXX
CHECKED BY:	XXX
PLOT DATE:	1/20/21 6:59pm
PLOTTED BY:	NPatterson
DWG NAME:	20201228-EXH-Basin-Map-PUB.dwg
TAB NAME:	DOL

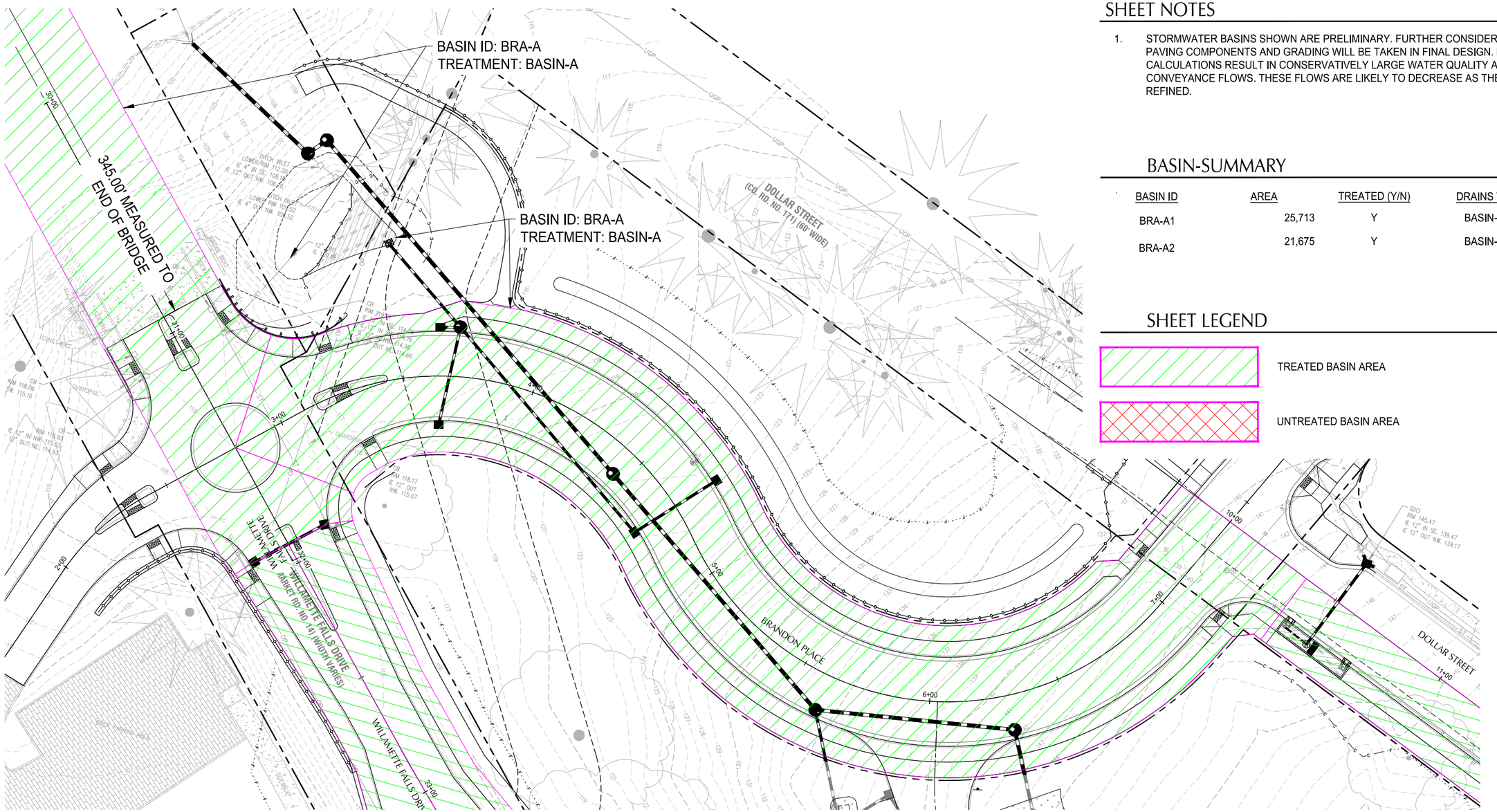
West Linn, OR 97068

NEW MIDDLE SCHOOL AT DOLLAR STREET
PUBLIC IMPROVEMENT PLANS

DOLLAR STREET DRIVE - PRELIMINARY BASIN MAP

SHEET NO.
DOL
SHEET 1 OF XX
RECORD NO.
XXXXX-XX

File: N:\cip\2020\2000067-Dollar-Street-MS\CAD\EXH\20201228-EXH-Basin-Map-PUB.dwg TAB:DOL
Plotted: 1/20/21 at 6:59pm By: NPatterson
22x34



PRELIMINARY BASIN MAP - BRANDON STREET EXTENSION

SCALE: 1" = 20'

SHEET NOTES

1. STORMWATER BASINS SHOWN ARE PRELIMINARY. FURTHER CONSIDERATION OF PAVING COMPONENTS AND GRADING WILL BE TAKEN IN FINAL DESIGN. PRELIMINARY CALCULATIONS RESULT IN CONSERVATIVELY LARGE WATER QUALITY AND CONVEYANCE FLOWS. THESE FLOWS ARE LIKELY TO DECREASE AS THE DESIGN IS REFINED.

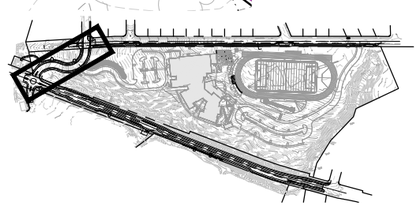
BASIN-SUMMARY

BASIN ID	AREA	TREATED (Y/N)	DRAINS TO:
BRA-A1	25,713	Y	BASIN-A
BRA-A2	21,675	Y	BASIN-A

SHEET LEGEND

TREATED BASIN AREA

UNTREATED BASIN AREA



KEY MAP

REVISION	DATE	DESCRIPTION	BY

SCALE 1 INCH = 20 FEET (20 0 20 40)

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JOB No.:	2000067.00
DESIGNED BY:	XXX
DRAWN BY:	XXX
CHECKED BY:	XXX
PLOT DATE:	1/20/21 6:58pm
PLOTTED BY:	NPatterson
DWG NAME:	20201228-EXH-Basin-Map-PUB.dwg
TAB NAME:	BRA

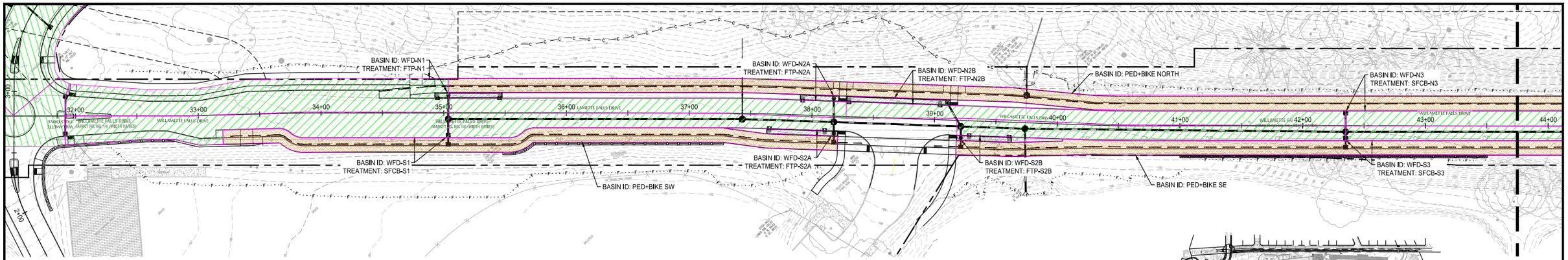
West Linn, OR 97068

NEW MIDDLE SCHOOL AT DOLLAR STREET
PUBLIC IMPROVEMENT PLANS

WILLAMETTE FALLS DRIVE - PRELIMINARY BASIN MAP

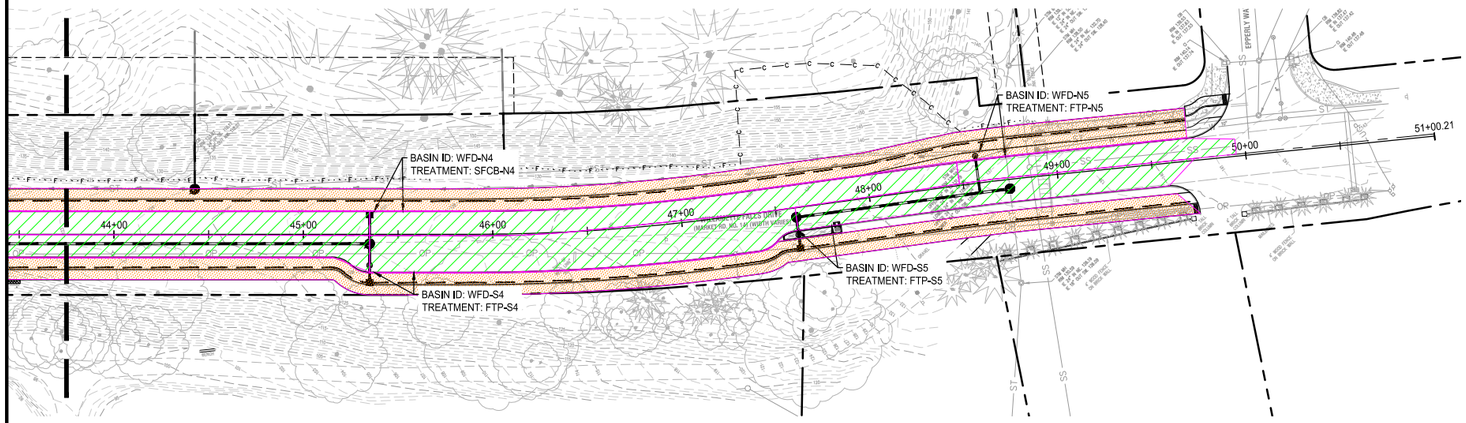
SHEET NO.
BRA
SHEET 1 OF XX
RECORD NO. XXXXX-XX

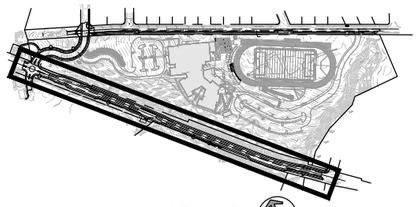
File: N:\cip\2020\2000067-Dollar-Street-MS\CAD\EXH\20201228-EXH-Basin-Map-PUB.dwg TAB:BRA
Plotted: 1/20/21 at 6:59pm By: NPatterson
22x34



PRELIMINARY BASIN MAP - WILLAMETTE FALLS DRIVE

SCALE: 1" = 40'





KEY MAP

SHEET NOTES

1. STORMWATER BASINS SHOWN ARE PRELIMINARY. FURTHER CONSIDERATION OF PAVING COMPONENTS AND GRADING WILL BE TAKEN IN FINAL DESIGN. PRELIMINARY CALCULATIONS RESULT IN CONSERVATIVELY LARGE WATER QUALITY AND CONVEYANCE FLOWS. THESE FLOWS ARE LIKELY TO DECREASE AS THE DESIGN IS REFINED.
2. SEE ROADWAY TYPICAL SECTION FOR BIKE AND PED FACILITY DRAINAGE AND PERVIOUS PAVEMENT APPLICATIONS. PERVIOUS AREAS ARE CONSIDERED UNMANAGED. SOUTHERN SIDEWALK DRAINAGE IS COLLECTED AT CURB INLETS LOCATED IN THE BIKE LANE. TREATMENT TO BE PROVIDED VIA CURB INLETS AS FURTHER DEFINED IN SUBSEQUENT DESIGN SUBMITTALS.

BASIN SUMMARY

BASIN ID	IMPERVIOUS AREA	TREATED (Y/N)	DRAINS TO:
WFD-N1	7,950	Y	FTP-N1
WFD-S1	6,060	Y	SFCB-S1
WFD-N2A	4,000	Y	FTP-N2A
WFD-S2A	4,150	Y	FTP-S2A
WFD-N2B	4,610	Y	FTP-N2B
WFD-S2B	4,005	Y	FTP-S2B
WFD-N3	3,690	Y	SFCB-N3
WFD-S3	3,590	Y	SFCB-S3
WFD-N4	3,690	Y	SFCB-N4
WFD-S4	4,450	Y	FTP-S4
WFD-N5	1,585	Y	FTP-N5
WFD-S5	2,605	Y	FTP-S5
PED+BIKE NORTH	17,560		SEE NOTE 2
PED+BIKE SW	5,760		SEE NOTE 2
PED+BIKE SE	12,020		SEE NOTE 2

SHEET LEGEND

TREATED BASIN AREA

UNTREATED BASIN AREA

BIKE AND PEDESTRIAN FACILITY
SEE SHEET NOTE 2

REVISION	DATE	DESCRIPTION	BY

SCALE 1 INCH = 40 FEET
40 0 40 80

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JOB No.:	2000067.00
DESIGNED BY:	XXX
DRAWN BY:	XXX
CHECKED BY:	XXX
PLOT DATE:	1/20/21 5:29pm
PLOTTED BY:	NPatterson
DWG NAME:	20201228-EXH-Basin-Map-PUB.dwg
TAB NAME:	WFD

West Linn, OR 97068

NEW MIDDLE SCHOOL AT DOLLAR STREET
PUBLIC IMPROVEMENT PLANS

WILLAMETTE FALLS DRIVE - PRELIMINARY BASIN MAP

SHEET NO.
WFD
SHEET 1 OF XX
RECORD NO.
XXXXX-XX

File: N:\cip\2020\2000067-Dollar-Street-MS\CAD\EXH\20201228-EXH-Basin-Map-PUB.dwg TAB:WFD
Plotted: 1/20/21 at 5:29pm By: NPatterson
22x34

Appendix B

Preliminary Stormwater Details

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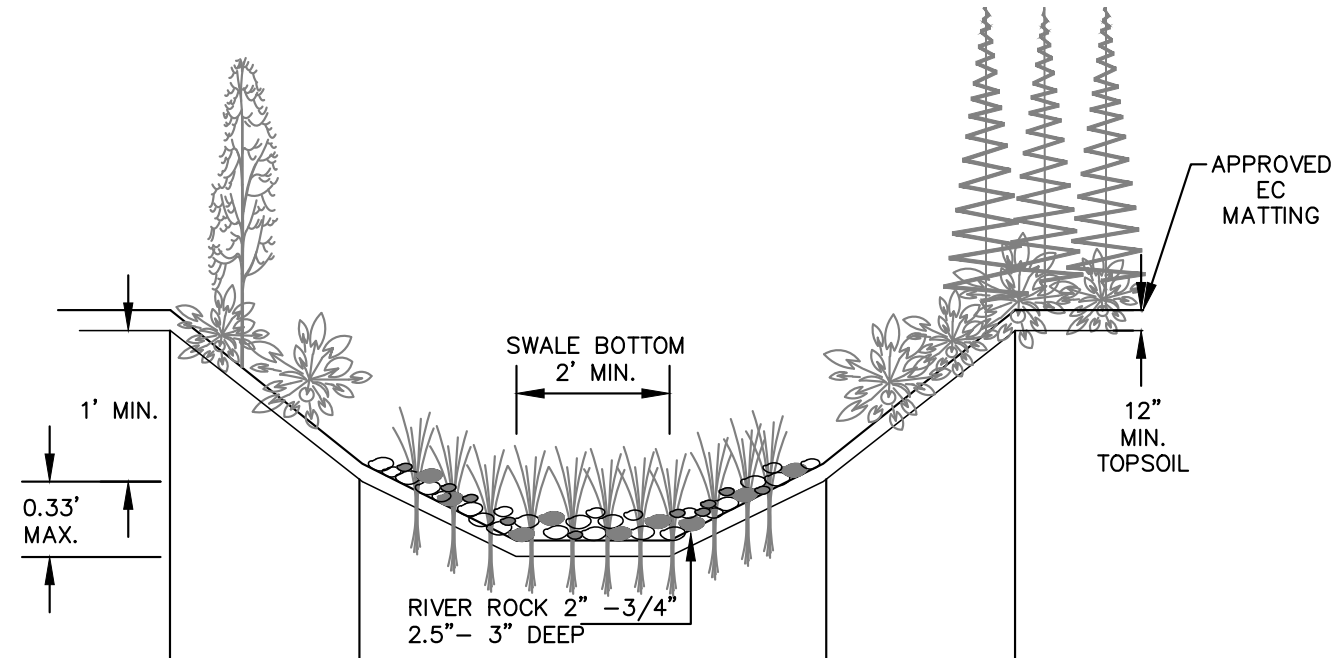


SWALE AREA	FREEBOARD AREA	TREATMENT AREA 6' MINIMUM WIDTH			FREEBOARD AREA	BUFFER/MITIGATION AREA
EC MATTING	ECONOJUTE*	COCONUT FIBER OR GEOJUTE PLUS*			ECONOJUTE*	ECONOJUTE* (S> 20%)
SEED MIX	LOW GROW MIX SEE NOTE #5	NONE			LOW GROW MIX SEE NOTE #5	AS APPROVED BY DISTRICT OR CITY
MAX. SLOPE	2.5:1	4:1	FLAT BOTTOM	4:1	2.5:1	NA

* OR AS APPROVED

NOTES:
1. REFER TO BES DESIGN & CONSTRUCTION STANDARDS, FOR LANDSCAPING REQUIREMENTS INCLUDING TREE PLACEMENT, TOPSOIL AND PLANTING SPECIFICATIONS.
2. JUTE MATTING– GEOJUTE PLUS IN TREATMENT AREA, ECONOJUTE FOR ALL OTHER AREAS, OR SIMILIAR FABRICS. COCONUT FIBER IS ALSO ACCEPTABLE.
3. 12–INCHES OF TOPSOIL SHALL BE PLACED THROUGHOUT THE WATER QUALITY TRACT.
4. FREEBOARD AREA SEED MIX, DWARF TALL FESCUE 40%, DWARF PERENIAL RYE 30%, CREEPING RED FESCUE 25%, COLONIAL BENT GRASS 5%. APPLY AT A RATE OF 120# / ACRE.

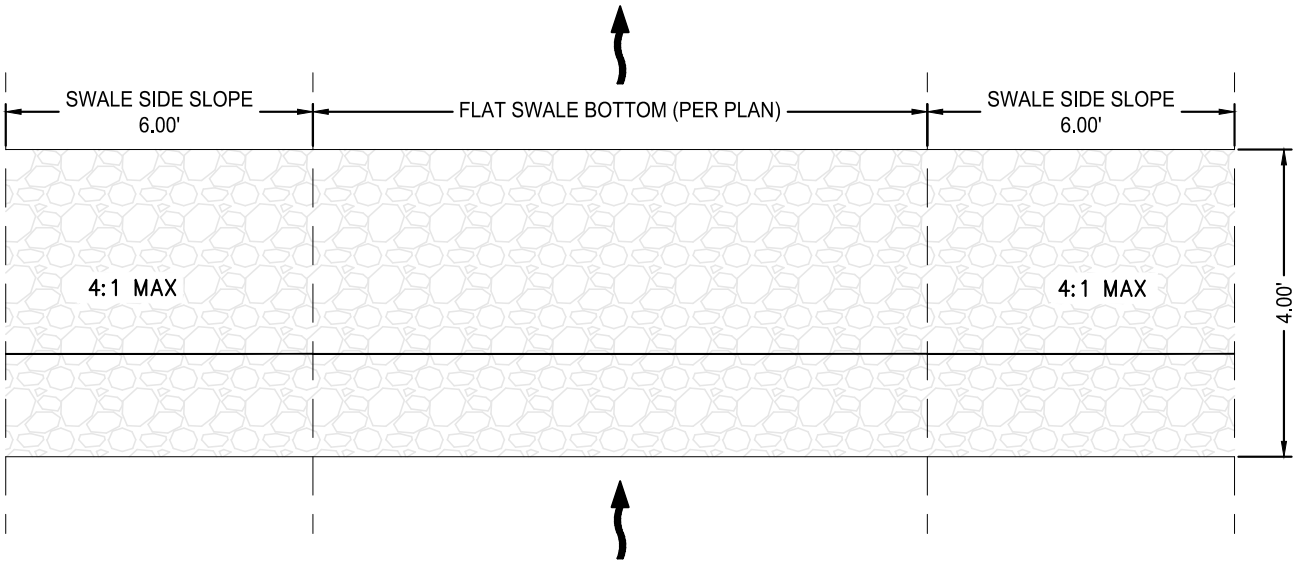
CONSTRUCTION

1. Water Quality Swale shall be over-excavated and filled to final grade with 12-inch amended topsoil. Topsoil amendments shall be garden compost, not conventional fertilizer amendments.
2. A biodegradable Erosion Control Matting shall be placed over the topsoil throughout the swale cross section, fabric shall be held in place in accordance with the manufacturer's installation requirements. Anchor spacing shall be based on 3 fps flow over the fabric.
    a. Treatment area - high-density jute matting (Geojute Plus or other approved equal)
    b. All other areas - low-density jute matting (Econojute or other approved equal)
3. 2.5-3 inches of 2"-$\frac{3}{4}$" river run rock shall be placed over the matting evenly throughout the length and width of the swale.
4. Plant materials shall be placed in accordance with the plan and plant table as shown on approved plans.
5. The water quality swale treatment area plantings can be deemed "substantially complete" once active green growth has occurred to an average growth of 3" and plant density is an average of approx. 6 plants (minimum 1-inch plugs or equivalent) per square foot.

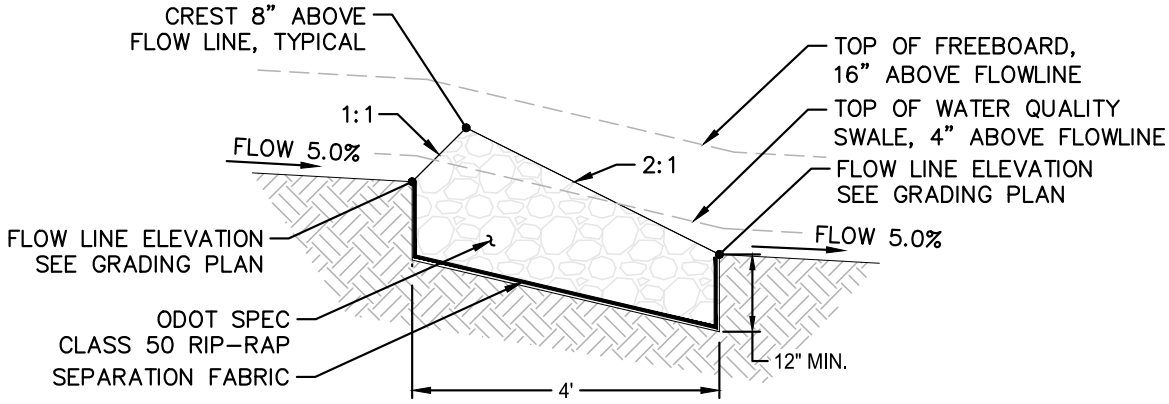
2 GRASSY SWALE

SCALE: NTS

PRELIMINARY GRASSY SWALE FLOW SPREADER DETAIL



TOP VIEW



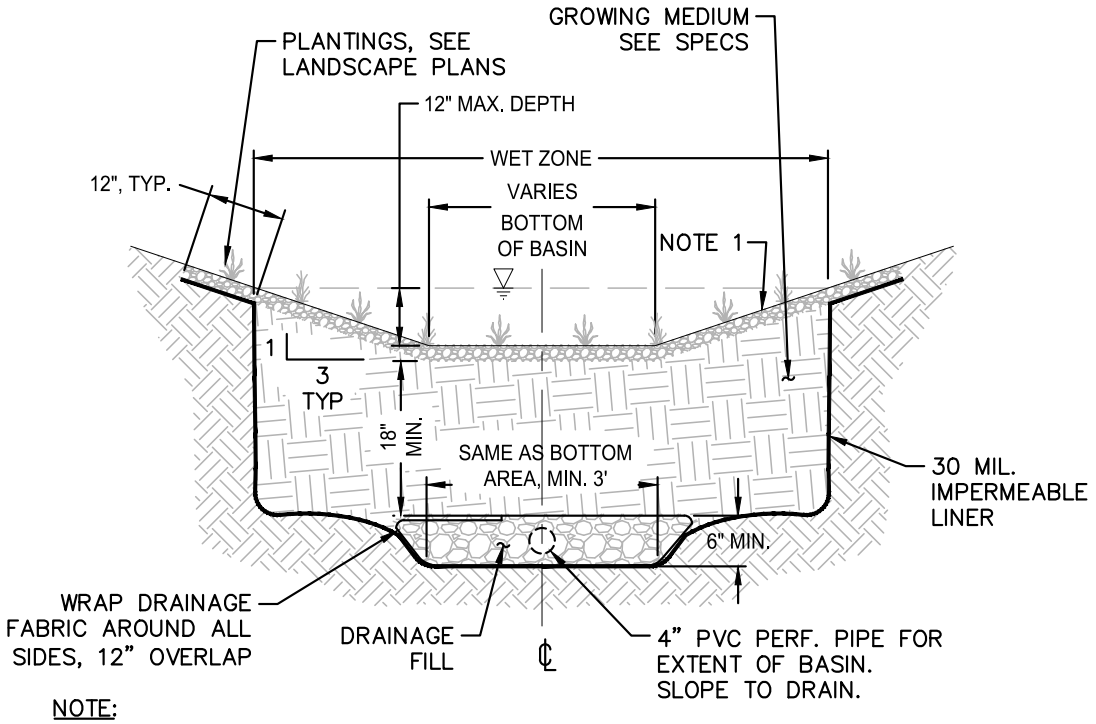
SECTION A

NOTES

1. INSTALL RIP-RAP SPREADER ACROSS FULL WATER QUALITY SEGMENT OF SWALE
2. CREST OF BERM SHALL BE LEVEL AND UNIFORM ACROSS ENTIRE SECTION.
3. SEE GRADING PLAN FOR ELEVATION DROP ACROSS RIP RAP

4 RIP-RAP FLOW SPREADER AND CHECK DAM

SCALE: NTS



NOTE:
1. INSTALL GEOJUTE PLUS OR COCONUT FIBER MATTING, OR 2" THICK LAYER OF PEA GRAVEL OR OTHER NON-FLOATING MULCH AS APPROVED BY LANDSCAPE ARCHITECT.

1 TYP. VEGETATED FILTRATION BASIN (VFB)

SCALE: NTS

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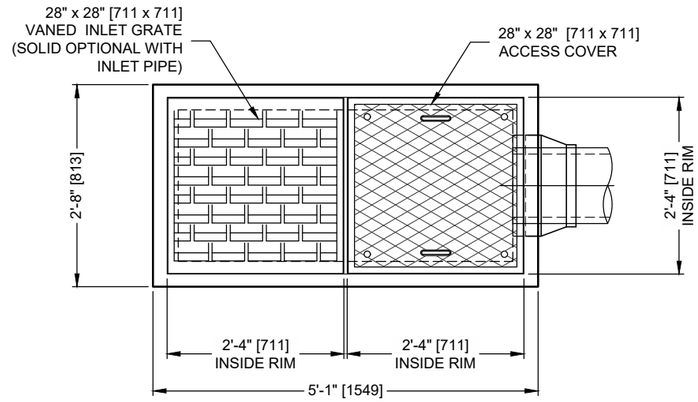
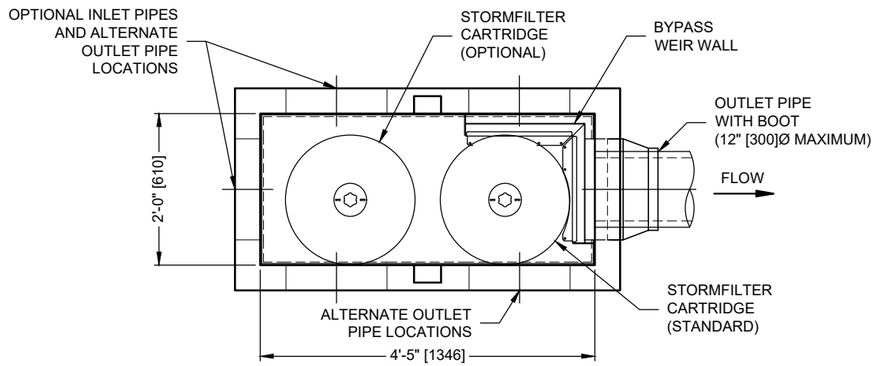
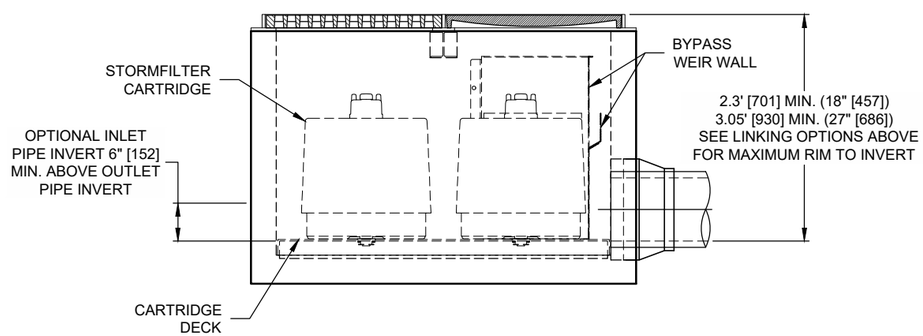


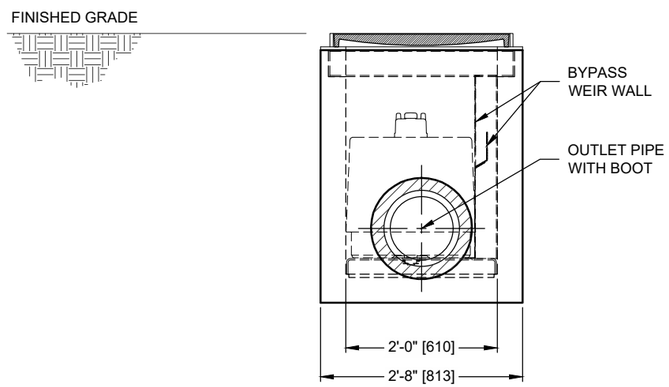
PLAN VIEW



PLAN VIEW
CASTINGS NOT SHOWN



ELEVATION VIEW



RIGHT SIDE VIEW

STORMFILTER DESIGN NOTES

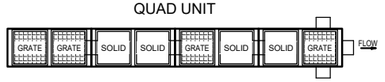
- CONCRETE CATCHBASIN STORMFILTER TREATMENT CAPACITY VARIES BY CARTRIDGE COUNT AND LOCAL APPROVALS
- PEAK CONVEYANCE CAPACITY IS 1.3 CFS
- CONCRETE CATCHBASIN STORMFILTER IS AVAILABLE WITH UP TO TWO (2), 18" [457] OR 27" [686] TALL CARTRIDGES
- UP TO 4 INDIVIDUAL UNITS MAY BE LINKED FOR AN ULTIMATE CAPACITY OF EIGHT (8) CARTRIDGES

CARTRIDGE SIZE (in. [mm])	27 [686]			18 [457]		
ACTIVATION HEAD (ft. [mm])	3.05 [930]			2.3 [701]		
SPECIFIC FLOW RATE (gpm/sf [L/s/m^2])	2 [1.36]	1.67* [1.13]*	1 [0.68]	2 [1.36]	1.67* [1.13]*	1 [0.68]
CARTRIDGE FLOW RATE (gpm [L/s])	22.5 [1.4]	18.79 [1.19]	11.25 [0.71]	15 [0.95]	12.53 [0.79]	7.5 [0.47]

* 1.67 gpm/sf [1.13 L/s/m^2] SPECIFIC FLOW RATE IS APPROVED WITH PHOSPHOSORB® (PSORB) MEDIA ONLY

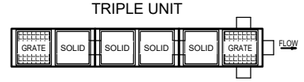
LINKING OPTIONS SHOWN BELOW. FLEXIBLE INLET PIPE, GRATED AND SOLID COVER PLACEMENT. MAXIMUM HEIGHT FOR LINKED UNITS VARIES. CONTACT YOUR CONTECH REPRESENTATIVE FOR MORE INFORMATION

QUAD UNIT



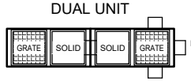
MAXIMUM RIM TO
INVERT = 4.30' [1311]

TRIPLE UNIT



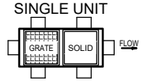
MAXIMUM RIM TO
INVERT = 6.05' [1844]

DUAL UNIT



MAXIMUM RIM TO
INVERT = 6.05' [1844]

SINGLE UNIT



MAXIMUM RIM TO
INVERT = 6.05' [1844]

GENERAL NOTES
1. CONTECH TO PROVIDE ALL MATERIALS UNLESS NOTED OTHERWISE.
2. DIMENSIONS MARKED WITH ( ) ARE REFERENCE DIMENSIONS. ACTUAL DIMENSIONS MAY VARY.
3. ALTERNATE DIMENSIONS ARE MILLIMETERS [mm] UNLESS NOTED OTHERWISE.
4. FOR FABRICATION DRAWINGS WITH DETAILED STRUCTURE DIMENSIONS AND WEIGHTS, PLEASE CONTACT YOUR CONTECH ENGINEERED SOLUTIONS LLC REPRESENTATIVE. www.ContechES.com
5. STORMFILTER WATER QUALITY STRUCTURE SHALL BE IN ACCORDANCE WITH ALL DESIGN DATA AND INFORMATION CONTAINED IN THIS DRAWING. CONTRACTOR TO CONFIRM STRUCTURE MEETS REQUIREMENTS OF PROJECT.
6. FILTER CARTRIDGES SHALL BE MEDIA-FILLED, PASSIVE, SIPHON ACTUATED, RADIAL FLOW, AND SELF CLEANING. RADIAL MEDIA DEPTH SHALL BE 7-INCHES [178]. FILTER MEDIA CONTACT TIME SHALL BE AT LEAST 38 SECONDS.
7. SPECIFIC FLOW RATE IS THE MEASURE OF THE FLOW (GPM [L/S]) DIVIDED BY THE MEDIA SURFACE CONTACT AREA (SF [m^2]).
8. STRUCTURE SHALL MEET AASHTO HS20 LOAD RATING, ASSUMING EARTH COVER OF 0' - 0'-2" [51] AND GROUNDWATER ELEVATION AT, OR BELOW, THE OUTLET PIPE INVERT ELEVATION. ENGINEER OF RECORD TO CONFIRM ACTUAL GROUNDWATER ELEVATION. CASTINGS SHALL MEET AASHTO M306 AND BE CAST WITH THE CONTECH LOGO.

INSTALLATION NOTES
1. ANY SUB-BASE, BACKFILL DEPTH, AND/OR ANTI-FLOTATION PROVISIONS ARE SITE-SPECIFIC DESIGN CONSIDERATIONS AND SHALL BE SPECIFIED BY ENGINEER OF RECORD.
2. CONTRACTOR TO PROVIDE EQUIPMENT WITH SUFFICIENT LIFTING AND REACH CAPACITY TO LIFT AND SET THE STORMFILTER STRUCTURE.
3. CONTRACTOR TO PROVIDE AND INSTALL PIPES. MATCH PIPE INVERTS SHOWN ON PROJECT SPECIFIC DRAWINGS.
4. CONTRACTOR TO TAKE APPROPRIATE MEASURES TO PROTECT CARTRIDGES FROM CONSTRUCTION-RELATED EROSION RUNOFF.

SITE SPECIFIC DATA REQUIREMENTS

STRUCTURE ID	
WATER QUALITY FLOW RATE (cfs [L/s])	
PEAK FLOW RATE (cfs [L/s])	
RETURN PERIOD OF PEAK FLOW (yrs)	
CARTRIDGE SIZE (27, 18)	
CARTRIDGE FLOW RATE	
MEDIA TYPE (PERLITE, ZPG, PSORB)	
NUMBER OF CARTRIDGES REQUIRED	
RIM ELEVATION	

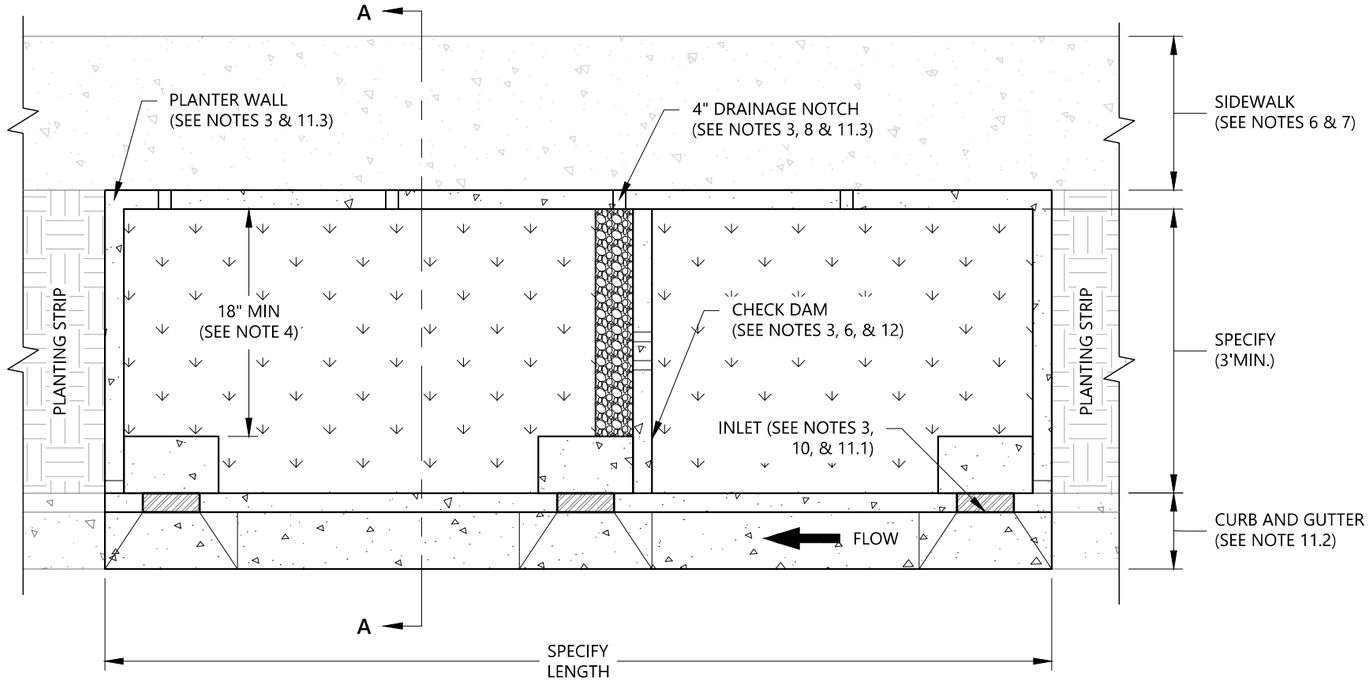
PIPE DATA:	INVERT	MATERIAL	DIAMETER
INLET PIPE 1			
INLET PIPE 2			
OUTLET PIPE			

NOTES/SPECIAL REQUIREMENTS:

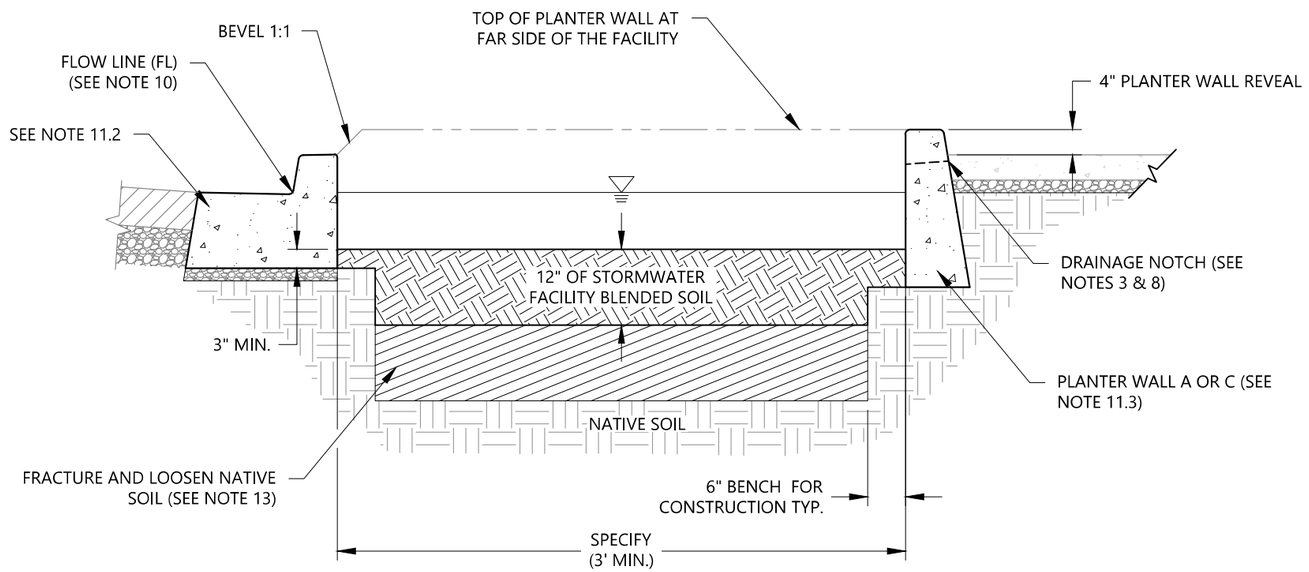
The Stormwater Management StormFilter®

CONTECH® ENGINEERED SOLUTIONS LLC
www.ContechES.com
11815 NE Glenn Widing Drive, Portland, OR 97220
800-548-4667 503-240-3393 800-561-1271 FAX

CONCRETE CATCHBASIN
STORMFILTER
STANDARD DETAIL



PLAN VIEW
(PLANTER WITHOUT PARKING)



SECTION A-A
(PLANTER WITHOUT PARKING)

DESIGNER INFORMATION:

1. Adapt this plan and section view example to your engineered design. Maximize surface storage.
2. Area and depth of facility are based upon engineering calculations and right-of-way constraints.
3. Provide beginning and ending stations for each facility. Provide stationing and/or dimensions and elevations at each inlet, outlet, check dam, notch, and wall corner
4. If less than 18-in between splash pad and planter wall, then extend pad to wall.
5. Show liner, slotted pipe, 24" depth stormwater facility blended soil, and aggregate in section when used. Refer to SWMM detail SW-316: Stormwater Configuration Sections.
6. Sidewalk elevation must be set above check dam and inlet elevations to allow overflow to drain to street before sidewalk.
7. Detail assumes top-of-curb and top-of-sidewalk at approximately the same elevation. Modify detail if site conditions are different
8. Place drainage notch at low point in sidewalk. Space additional notches 6-ft apart.
9. Proposed utility lines to be located out of facility, or per details P-331, P-332, and P-333.
10. Depress gutter pan Flow Line (FL) 2-in to Bottom of Inlet (BI).

RELATED DETAILS AND RESOURCES:

11. City of Portland Standard Drawings:
    - 11.1. P-300: Concrete Inlet, Type Metal.
    - 11.2. P-540: Curbs, 18" Thickened Curb and Gutter typ. When adjacent to a bike lane use 12" Thickened Curb and Gutter.
    - 11.3. P-307: Planter Walls.
    - 11.4. P-332: Utility Coordination Water Service Line Sleeving.
    - 11.5. P-333: Utility Coordination Water Asset Clearances.
12. Stormwater Management Details:
    - 12.1. SW-312: Check Dam - Infiltration Facility.
    - 12.2. SW-313: Check Dam - Infiltration Facility with Rock.
    - 12.3. SW-314: Check Dam - Partial Infiltration Facility with Weep Holes.
    - 12.4. SW-315: Check Dam - Lined Facility with Weep Holes.

CONSTRUCTION NOTES:

13. In facilities that are unlined, fracture and loosen soil - DO NOT TILL - to a depth of 12" below stormwater facility blended soil excavation before installing aggregates or blended soil.

IMPORTANT: Utility conflicts and existing conditions can create major design variables. Locate utilities and survey existing conditions prior to beginning design work and include information on design drawings.

The Portland Bureau of Transportation (PBOT), Portland Water Bureau (PWB), and Bureau of Environmental Services (BES) are responsible for the review and approval of Stormwater Swales in the public right of way. Stormwater facilities in Wellhead Protection Areas may require special containment measures as required by City Code 21.35.

For more information contact:
PBOT (503) 823-7884
BES (503) 823-7761
PWB (503) 823-7368
Urban Forestry (503) 823-8733

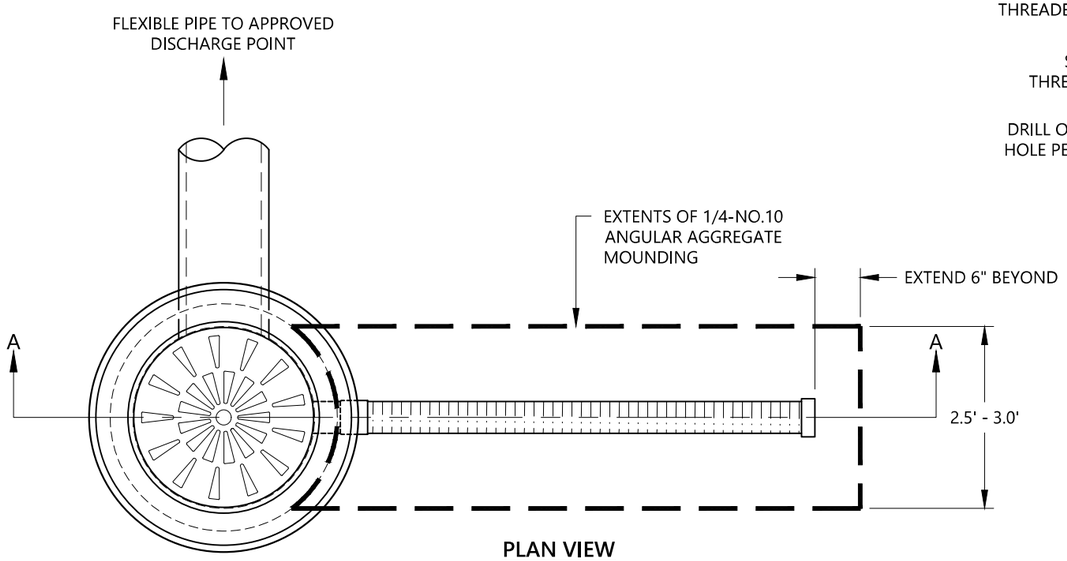
Bureau of Environmental Services
CITY OF PORTLAND, OREGON
2020 STORMWATER MANAGEMENT MANUAL

SWMM Detail Title

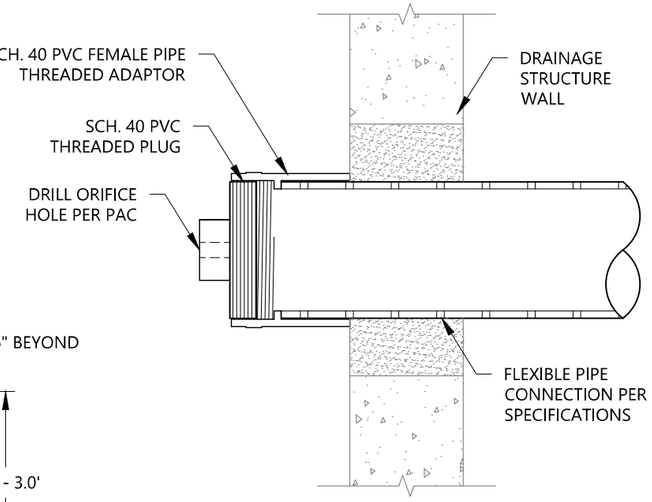
PLANTER - NO PARKING PLAN AND SECTION VIEWS

Effective Date: 12-14-2020	SWMM Detail No. SW-301
Calc. Book No.: N/A	
Baseline Report Date: N/A	

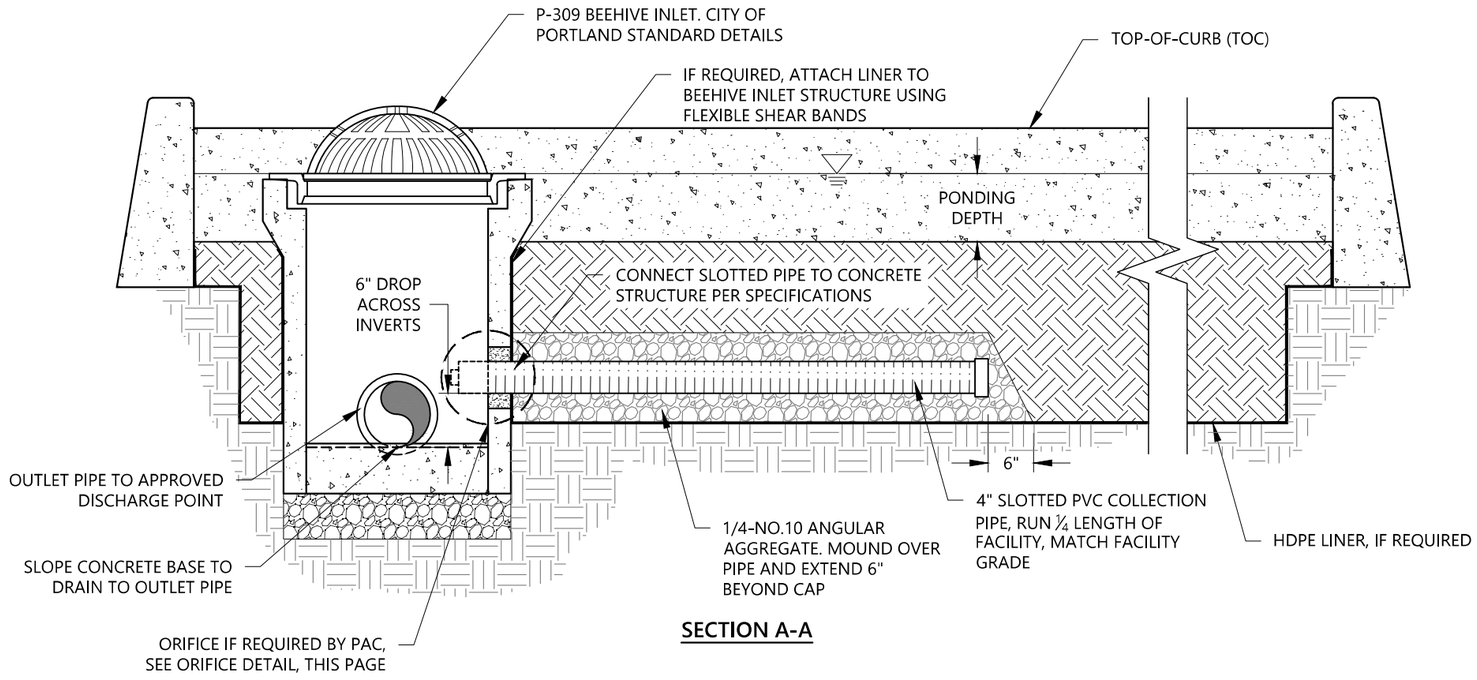
2020SWMM-DETAILS.DWG 12/9/20 11:16 AM SPEREZ



PLAN VIEW



ORIFICE DETAIL



SECTION A-A

DESIGNER INFORMATION:

1. EXAMPLE SHOWN IS FOR A LINED FACILITY. MODIFY DETAIL FOR UNLINED FACILITY.
2. IF CONNECTING TO A COMBINATION SEWER MAINTENANCE HOLE INSTALLTION OF A SWING-CHECK BACKWATER VALVE OR APPROVED EQUAL IS REQUIRED TO PREVENT ODOR EMISSIONS.
3. PRE-DRILL ORIFICE BEFORE INSTALLATION. SMOOTH AND/OR SAND ORIFICE REMOVING ROUGH EDGES. CLEAR PIPE OF ALL DEBRIS BEFORE INSTALLING ORIFICE CAP.

Bureau of Environmental Services
CITY OF PORTLAND, OREGON
2020 STORMWATER MANAGEMENT MANUAL

SWMM Detail Title

OVERFLOW CONFIGURATION
BEEHIVE OVERFLOW STRUCTURE

Effective Date: 12-14-2020	SWMM Detail No. SW-317
Calc. Book No.: N/A	
Baseline Report Date: N/A	

2020SWMM-DETAILS.DWG 12/9/20 11:16 AM SPEREZ

3.2.5.5 Grassy Swales

Grassy swales are grass channels designed primarily for conveying and treating stormwater runoff. Water quality treatment is provided as water moves horizontally through the swale and is filtered through the grass. Grassy swales can be designed to manage flow rates and volume if infiltration rates are adequate. They can be lined if infiltration is prohibited.

Design

Grassy swales must be designed under the Performance Approach.

Site Suitability: Grassy swales are appropriate for all soil types.

Setbacks: See Section 2.2.4 for setback requirements.

Access: See access requirements in Section 3.2.2.1.

Pollution Prevention: See pollution prevention requirements in Section 3.2.2.1.

Sizing: The swale must be designed to treat runoff from the pollution reduction design storm intensity, using the following criteria:

- Maximum design velocity: 0.9 ft/s

- Minimum hydraulic residence time: 9 minutes (i.e., time for the design flow to pass through the swale)
- Manning n value: 0.25
- Maximum ponding depth: 4 inches unless otherwise approved (This is to maximize contact with the grass.)

It is recommended to allow high flows exceeding the pollution reduction design storm to bypass the grassy swale.

Swales without high-flow diversion devices must be sized to safely convey the 25-year storm event (peak 25-year, 5-minute intensity = 3.32 inches per hour), analyzed using the Rational Method. They must also meet the following criteria:

- Have a minimum of 4 inches of freeboard above the water surface.
- Maintain a maximum velocity through the facility of 3 ft/s.

The figures below provide minimum required dimensions (swale length and bottom width) given peak flow rates. The values are derived from the City's Sewer and Drainage Facilities Design Manual.

Figure 3-3. Swale Length at 1.5% Longitudinal Slope

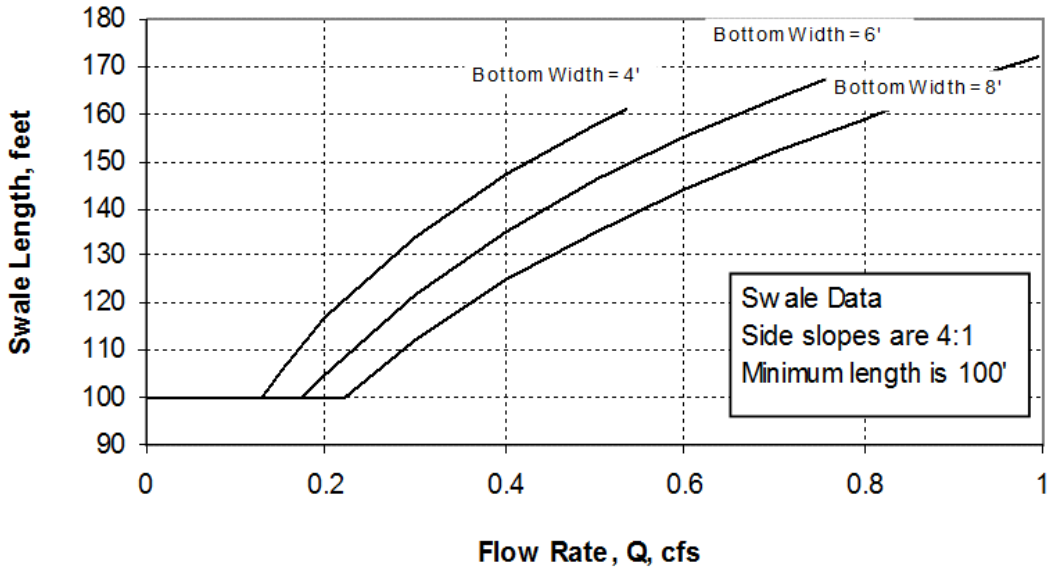


Figure 3-4. Swale Length at 3.0% Longitudinal Slope

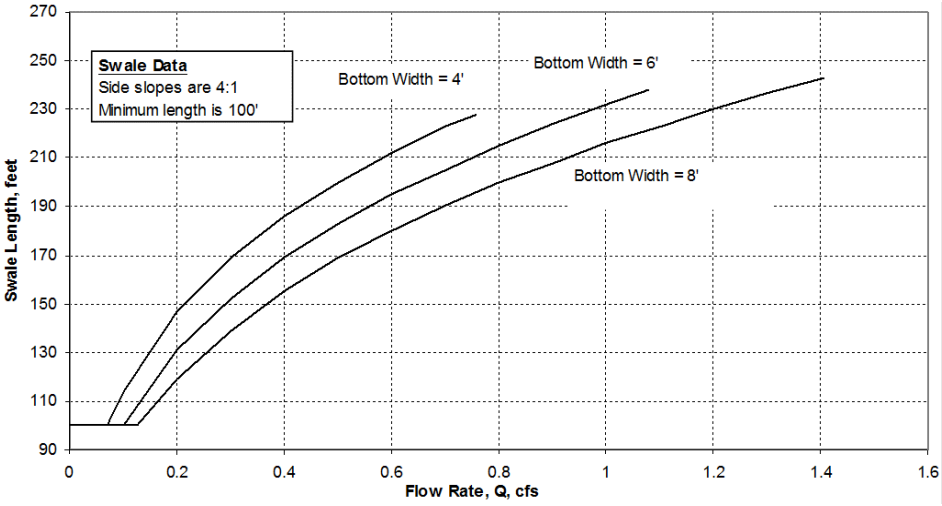
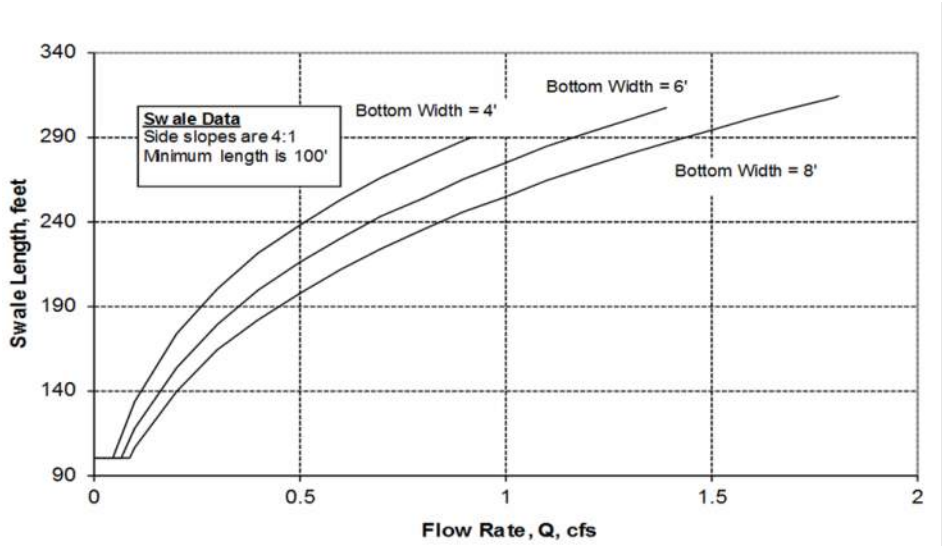


Figure 3-5. Swale Length at 5.0% Longitudinal Slope



Dimensions and Slopes: Minimize the depth of the swale and the steepness of the side slopes to avoid safety risks and prevent erosion within the facility. The bottom of the grassy swale must be smooth with a uniform longitudinal slope to minimize flow channelization. Grassy swales must also meet the following criteria:

All grassy swales:

- Minimum length: 100 ft
- Maximum side slopes: 4 horizontal to 1 vertical (4:1)

Grassy swales on private property:

- Minimum top width: 10 ft
- Minimum bottom width: 2 ft (must be flat)

Grassy swales on public property:

- Minimum top width: 12 ft
- Minimum bottom width: 4 ft (must be flat)

Flow Spreader: Install a flow-spreading device at the inlet to distribute flows evenly across the bottom of the swale. In swales with a bottom width greater than 6 ft, install a flow spreader at least every 50 ft.

Soil: Amend the native soils per the requirements for rain gardens if needed to support plant growth (see Section 3.2.2.2).

Vegetation: Plant the entire surface area of the grassy swale with native grass or swale seed mix to provide 100% coverage of both the swale bottom and the side slopes. For BES-maintained facilities, select native wildflowers and grasses that require minimal mowing (i.e., no more than once or twice annually). BES does not allow lawn-type areas in BES-maintained facilities and exceptions require BES approval. Grassy swales in environmental zones must meet requirements established by PCC Title 33 for grass species in Environmental Zones.

BES may allow trees and shrubs in the flow path if the swale exceeds the length and widths specified. See Section 3.5 for information about trees.

Construction Requirements

See standard construction requirements for bioretention facilities in Section 3.2.2.2.

Seed native grass mixes in the swale flow path. Apply seed at the rates specified by the supplier. Plants must be established by the time the facility is completed and at least 3 months after seeding. Establish grasses as soon as possible after the swale is completed and before water is allowed to enter the facility. Do not allow entry of concentrated stormwater flows until the vegetation is fully established.

Unless vegetation is established prior to completion of construction, install biodegradable erosion control matting that is appropriate for low-velocity flows (approximately 1 ft/s) in the flow path before allowing water into the facility.

Appendix C

Stormwater Calculations and Model Hydrographs

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Design Storm

1.33 inches (SCS Type IA 24-hr storm distribution - 1/2 2-year)

Water Quality Grassy Swale

Tributary Basin Area:	580735	sf	(Impervious+Pervious)
Convert to Acres:	13.332	ac	

Portland BES SWMM: 2.3.4.11 Grassy Swale Criteria:

Minimum Residence Time "T":	9.00	min	
Maximum Water Depth "y":	0.33	feet	
Minimum Freeboard:	1.00	feet	
Maximum Velocity "V":	0.90	ft/s	(for WQ event)
Minimum Length "L":	100.00	feet	
Minimum Slope "s":	0.0050	ft/ft	
Minimum Bottom Width "b":	2.00	feet	
Side Slope in Treatment Area "z":	4.00	zH:1V	
Manning's coefficient "n":	0.25		

Find Water Quality Flow Rate "Q" in cfs:

Q = 1.9900 cfs *(see model hydrographs for peak inflow)*

Assume y=0.33, s=5.0%, Find b: b=(Qn)/(1.49*y^1.67*s^0.5)

Required minimum b = 9.50 ft

Assume b=16', Determine velocity V: V=Q/A(wetted) A(wetted) = by + zy^2 A(wetted)= 1.10 sf

V = 0.35 fps

Find Required Length for 9 minute Residence: L=9(min)*60(s) * V (fps)

L= 188.00 ft

Assume L=250', time of concentration t: t = L / (V*60)

t = 11.90 min

Facility Proposed Design

Bottom width (ft)	16.00	ft	
Design flow depth (ft)	0.33	ft	
Slope (%)	5.00	%	
WQ side slope (H:V)	4:1	H:V	
Length (ft)	250.00	ft	*(includes a 4-ft energy dissipater and (4) 2-ft slope reducing riprap flow spreaders,*
Time of Concentration (min)	11.90	min	
Design velocity	0.35	fps	*(flow splitter MH negates need to meet max 2.0 fps for 25-yr storm)*
Freeboard	1.00	ft	*(not required, as facility is protected from high flows)*
Freeboard area side slope	3:1	H:V, max	*(2.5:1 allowable)*

25-year High Flow Conveyance Check

Max V=	3.00	fps	
Q(25-yr)=	9.11	cfs	*(see model hydrographs for peak inflow)*
y(observed) =	0.60	ft	*(below top of freeboard of 1.33-ft)*
V(observed) =	0.83	fps	

Conclusion

The proposed grassy swale fully treats all water quality flows as specified by the City of Portland Stormwater Management Manual. All minimum and maximum criteria for the VGrassy Swale are met or surpassed. There is no high-flow bypass system for this swale, therefore the swale is shown to be designed to safely pass the 25-year storm event.

Project Description

File Name ..... SSA-DD-LU.SPF

Project Options

Flow Units ..... CFS
Elevation Type ..... Elevation
Hydrology Method ..... Santa Barbara UH
Time of Concentration (TOC) Method ..... SCS TR-55
Link Routing Method ..... Kinematic Wave
Enable Overflow Ponding at Nodes ..... YES
Skip Steady State Analysis Time Periods ..... YES

Analysis Options

Start Analysis On ..... Jun 18, 2020 00:00:00
End Analysis On ..... Jun 19, 2020 00:00:00
Start Reporting On ..... Jun 18, 2020 00:00:00
Antecedent Dry Days ..... 0 days
Runoff (Dry Weather) Time Step ..... 0 01:00:00 days hh:mm:ss
Runoff (Wet Weather) Time Step ..... 0 00:05:00 days hh:mm:ss
Reporting Time Step ..... 0 00:05:00 days hh:mm:ss
Routing Time Step ..... 30 seconds

Rainfall Details

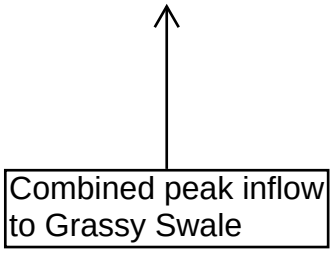
SN	Rain Gage ID	Data Source	Data Source ID	Rainfall Type	Rain Units	State	County	Return Period (years)	Rainfall Depth (inches)	Rainfall Distribution
1	Rain Gage-01	Time Series	1/2-2YR	Cumulative	inches	Oregon	Clackamas	2	1.33	SCS Type IA 24-hr

Subbasin Summary

SN	Subbasin ID	Area (ft²)	Impervious Area (%)	Impervious Area Curve Number	Pervious Area Curve Number	Total Rainfall (in)	Total Runoff (in)	Total Runoff Volume (ac-in)	Peak Runoff (cfs)	Time of Concentration (days hh:mm:ss)
1	BASIN-A	14120.02	100.00	98.00	79.00	1.33	1.11	0.36	0.09	0 00:05:00
2	BASIN-B	77000.01	100.00	98.00	79.00	1.33	1.11	1.96	0.51	0 00:05:00
3	BASIN-C	50915.02	100.00	98.00	79.00	1.33	1.11	1.30	0.34	0 00:05:00
4	BASIN-D	32675.01	100.00	98.00	79.00	1.33	1.11	0.83	0.22	0 00:05:00
5	BASIN-E	98990.01	100.00	98.00	79.00	1.33	1.11	2.52	0.65	0 00:05:00
6	BASIN-F	42620.02	100.00	98.00	79.00	1.33	1.11	1.09	0.28	0 00:05:00
7	BASIN-G	100644.99	0.00	98.00	79.00	1.33	0.18	0.42	0.03	0 00:10:00
8	BASIN-H	22029.99	0.00	98.00	79.00	1.33	0.18	0.09	0.01	0 00:10:00
9	BASIN-I	101140.00	0.00	98.00	79.00	1.33	0.18	0.42	0.03	0 00:10:00
10	BASIN-J	49599.99	0.00	98.00	79.00	1.33	0.18	0.21	0.02	0 00:10:00
11	BASIN-K	5122.00	0.00	98.00	79.00	1.33	0.18	0.02	0.00	0 00:10:00

Node Summary

SN	Element ID	Element Type	Invert Elevation (ft)	Ground/Rim (Max) Elevation (ft)	Initial Water Elevation (ft)	Surcharge Elevation (ft)	Ponded Area (ft²)	Peak Inflow (cfs)	Max HGL Elevation Attained (ft)	Max Surcharge Depth Attained (ft)	Min Freeboard Attained (ft)	Time of Peak Flooding Occurrence (days hh:mm)	Total Flooded Volume (ac-in)	Total Time Flooded (min)
1	FTP-ONSITE	Junction	106.00	120.00	0.00	0.00	0.00	0.09	106.00	0.00	14.00	0 00:00	0.00	0.00
2	GRASSY-SWALE	Junction	106.00	120.00	0.00	0.00	0.00	1.99	106.00	0.00	14.00	0 00:00	0.00	0.00



Subbasin Hydrology

Subbasin : BASIN-A

Input Data

Area (ft²) 14120.02
Impervious Area (%) 100.00
Impervious Area Curve Number 98.00
Pervious Area Curve Number 79.00
Rain Gage ID ..... Rain Gage-01

Composite Curve Number

Soil/Surface Description	Area (ft²)	Soil Group	Curve Number
Composite Area & Weighted CN	14120.02		98

Time of Concentration

TOC Method : SCS TR-55

Sheet Flow Equation :

Tc = (0.007 * ((n * Lf)^0.8)) / ((P^0.5) * (Sf^0.4))

Where :

Tc = Time of Concentration (hr)
n = Manning's roughness
Lf = Flow Length (ft)
P = 2 yr, 24 hr Rainfall (inches)
Sf = Slope (ft/ft)

Shallow Concentrated Flow Equation :

V = 16.1345 * (Sf^0.5) (unpaved surface)
V = 20.3282 * (Sf^0.5) (paved surface)
V = 15.0 * (Sf^0.5) (grassed waterway surface)
V = 10.0 * (Sf^0.5) (nearly bare & untilled surface)
V = 9.0 * (Sf^0.5) (cultivated straight rows surface)
V = 7.0 * (Sf^0.5) (short grass pasture surface)
V = 5.0 * (Sf^0.5) (woodland surface)
V = 2.5 * (Sf^0.5) (forest w/heavy litter surface)
Tc = (Lf / V) / (3600 sec/hr)

Where:

Tc = Time of Concentration (hr)
Lf = Flow Length (ft)
V = Velocity (ft/sec)
Sf = Slope (ft/ft)

Channel Flow Equation :

V = (1.49 * (R^(2/3)) * (Sf^0.5)) / n
R = Aq / Wp
Tc = (Lf / V) / (3600 sec/hr)

Where :

Tc = Time of Concentration (hr)
Lf = Flow Length (ft)
R = Hydraulic Radius (ft)
Aq = Flow Area (ft²)
Wp = Wetted Perimeter (ft)
V = Velocity (ft/sec)
Sf = Slope (ft/ft)
n = Manning's roughness

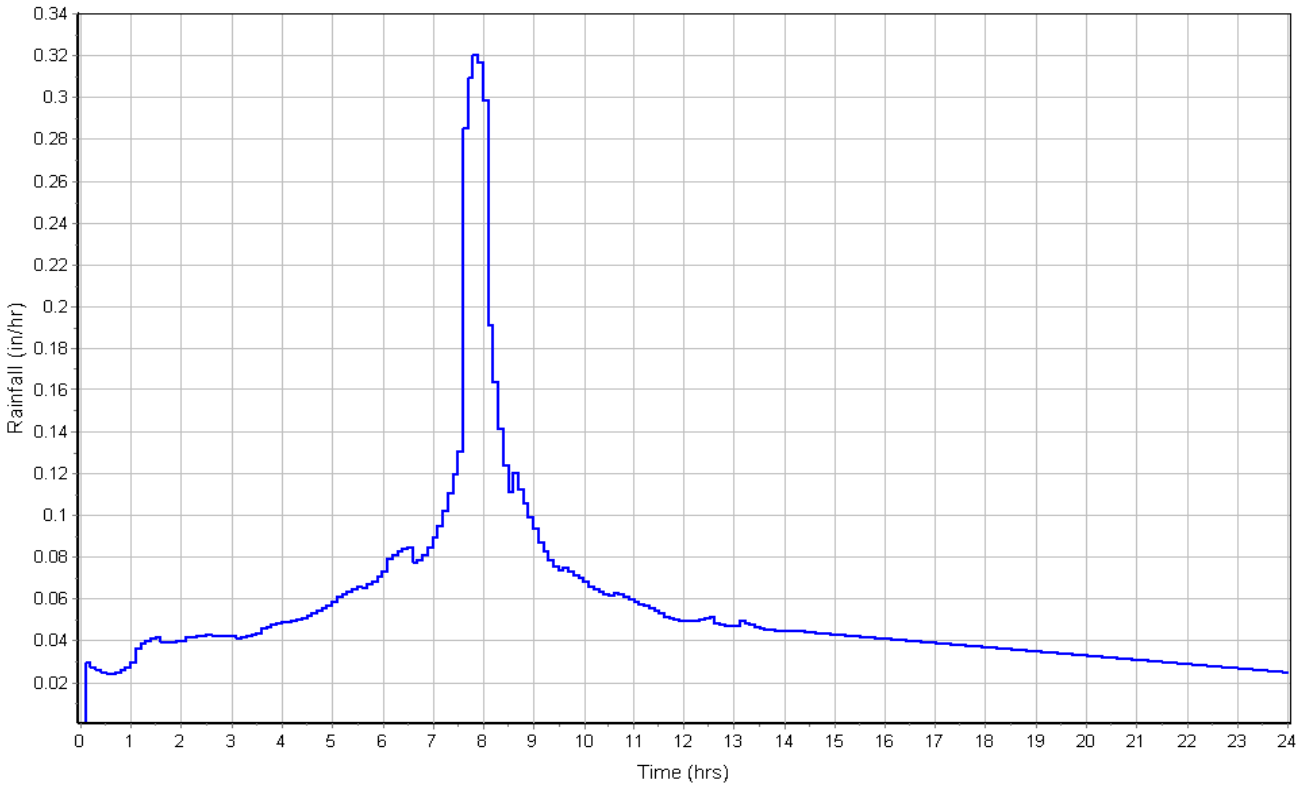
User-Defined TOC override (minutes): 5

Subbasin Runoff Results

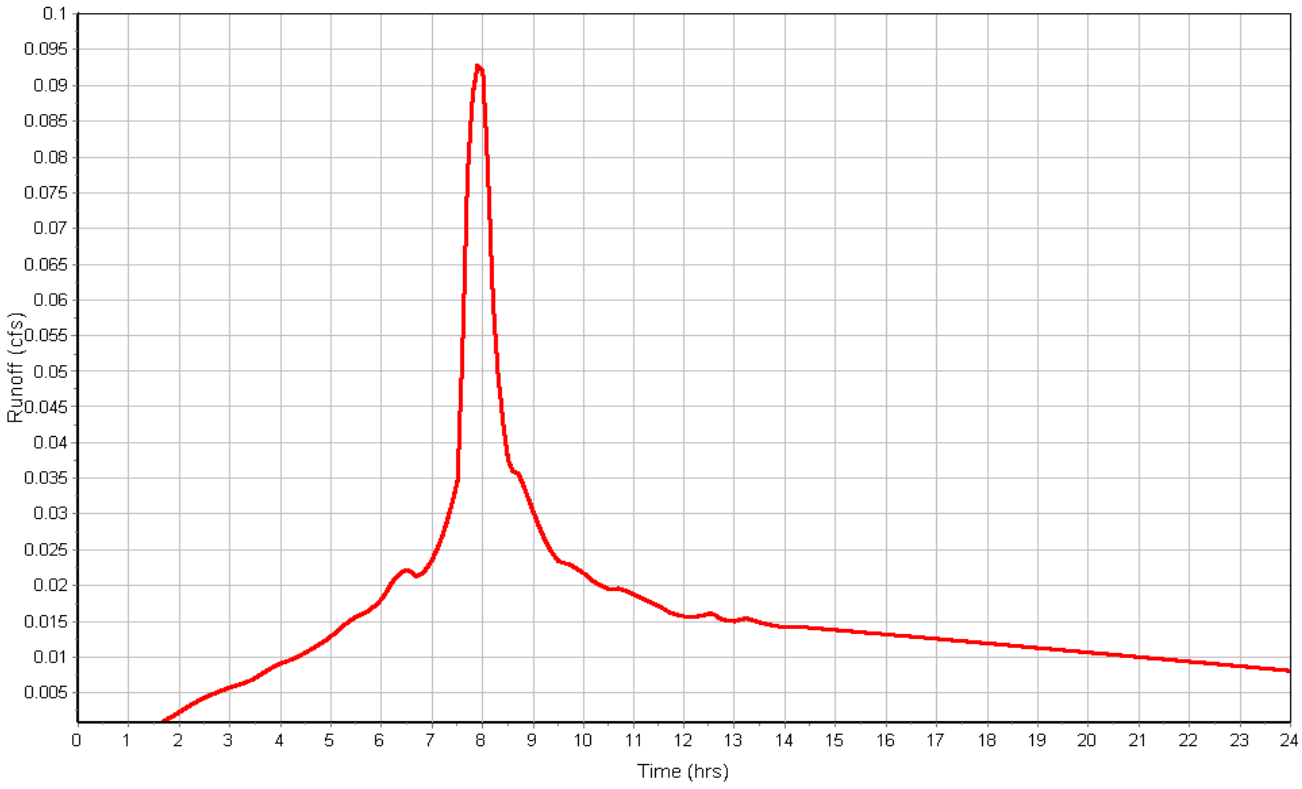
Total Rainfall (in) 1.33
Total Runoff (in) 1.11
Peak Runoff (cfs) 0.09
Weighted Curve Number 98.00
Time of Concentration (days hh:mm:ss) 0 00:05:00

Subbasin : BASIN-A

Rainfall Intensity Graph



Runoff Hydrograph



Subbasin : BASIN-B

Input Data

Area (ft²)	77000.01
Impervious Area (%)	100.00
Impervious Area Curve Number	98.00
Pervious Area Curve Number	79.00
Rain Gage ID	Rain Gage-01

Composite Curve Number

Soil/Surface Description	Area (ft²)	Soil Group	Curve Number
Composite Area & Weighted CN	77000.01		98

Time of Concentration

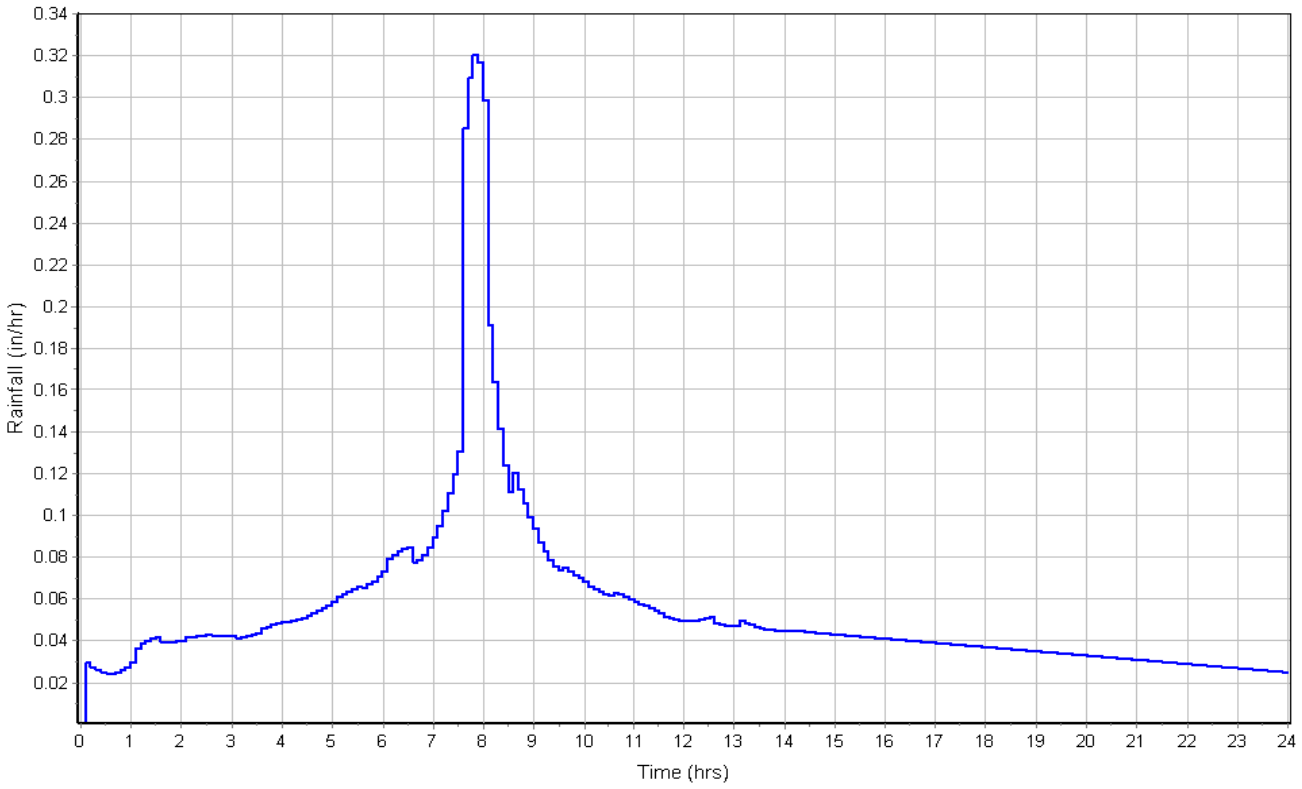
User-Defined TOC override (minutes): 5.00

Subbasin Runoff Results

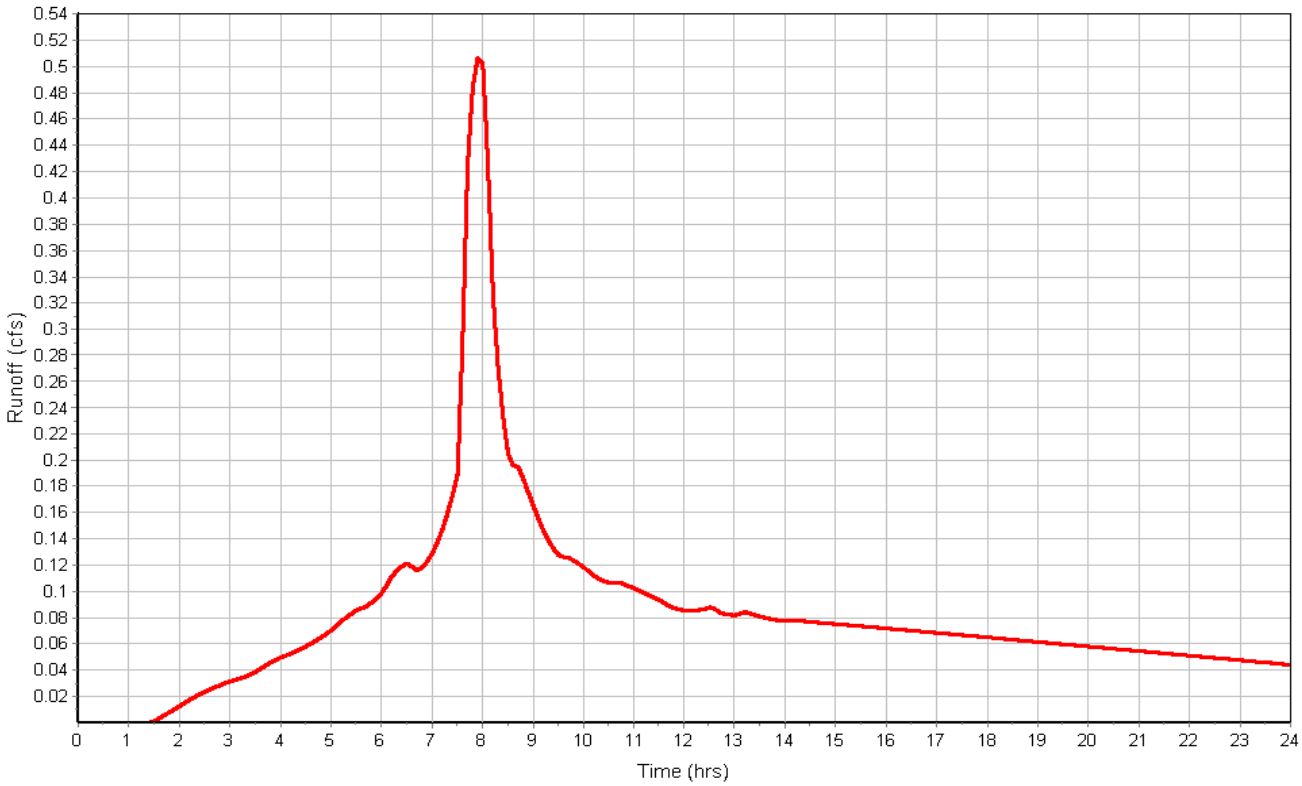
Total Rainfall (in)	1.33
Total Runoff (in)	1.11
Peak Runoff (cfs)	0.51
Weighted Curve Number	98.00
Time of Concentration (days hh:mm:ss)	0 00:05:00

Subbasin : BASIN-B

Rainfall Intensity Graph



Runoff Hydrograph



Subbasin : BASIN-C

Input Data

Area (ft²)	50915.02
Impervious Area (%)	100.00
Impervious Area Curve Number	98.00
Pervious Area Curve Number	79.00
Rain Gage ID	Rain Gage-01

Composite Curve Number

Soil/Surface Description	Area (ft²)	Soil Group	Curve Number
Composite Area & Weighted CN	50915.02		98

Time of Concentration

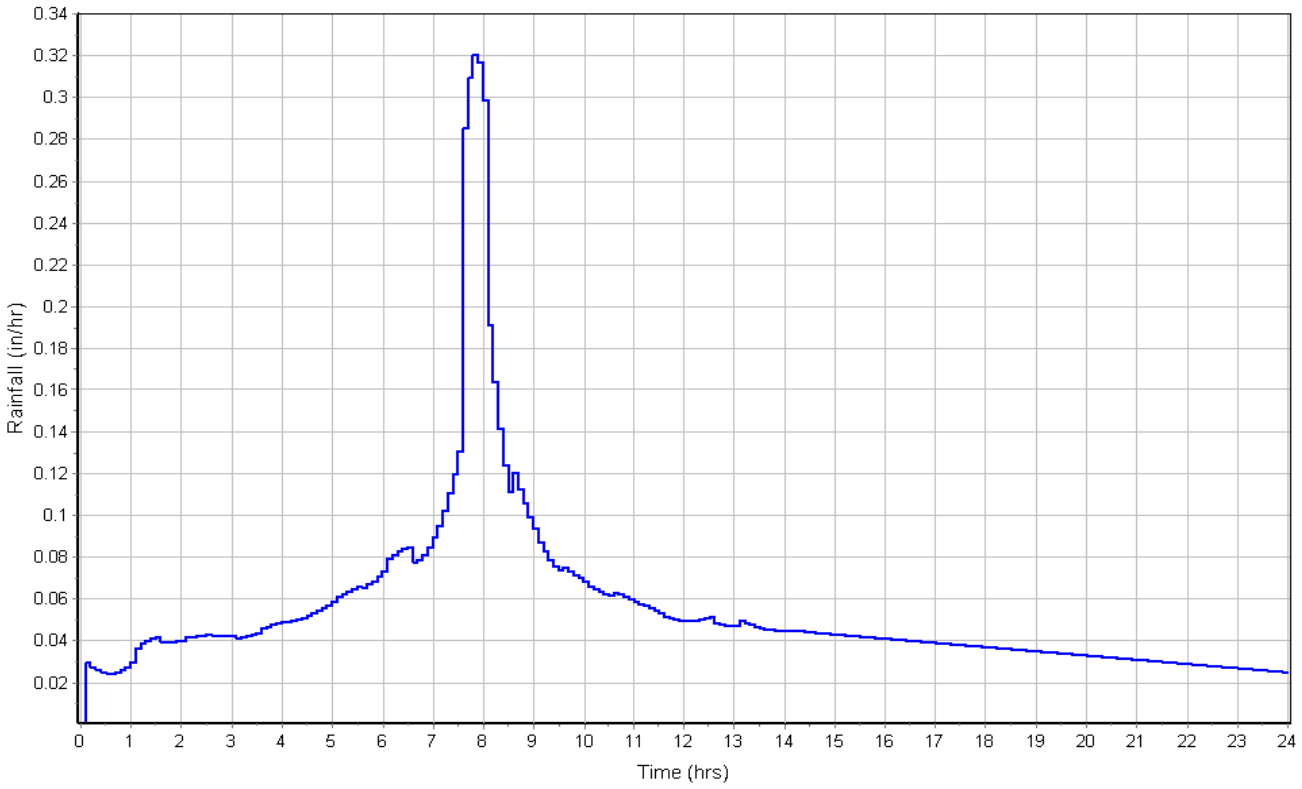
User-Defined TOC override (minutes): 5

Subbasin Runoff Results

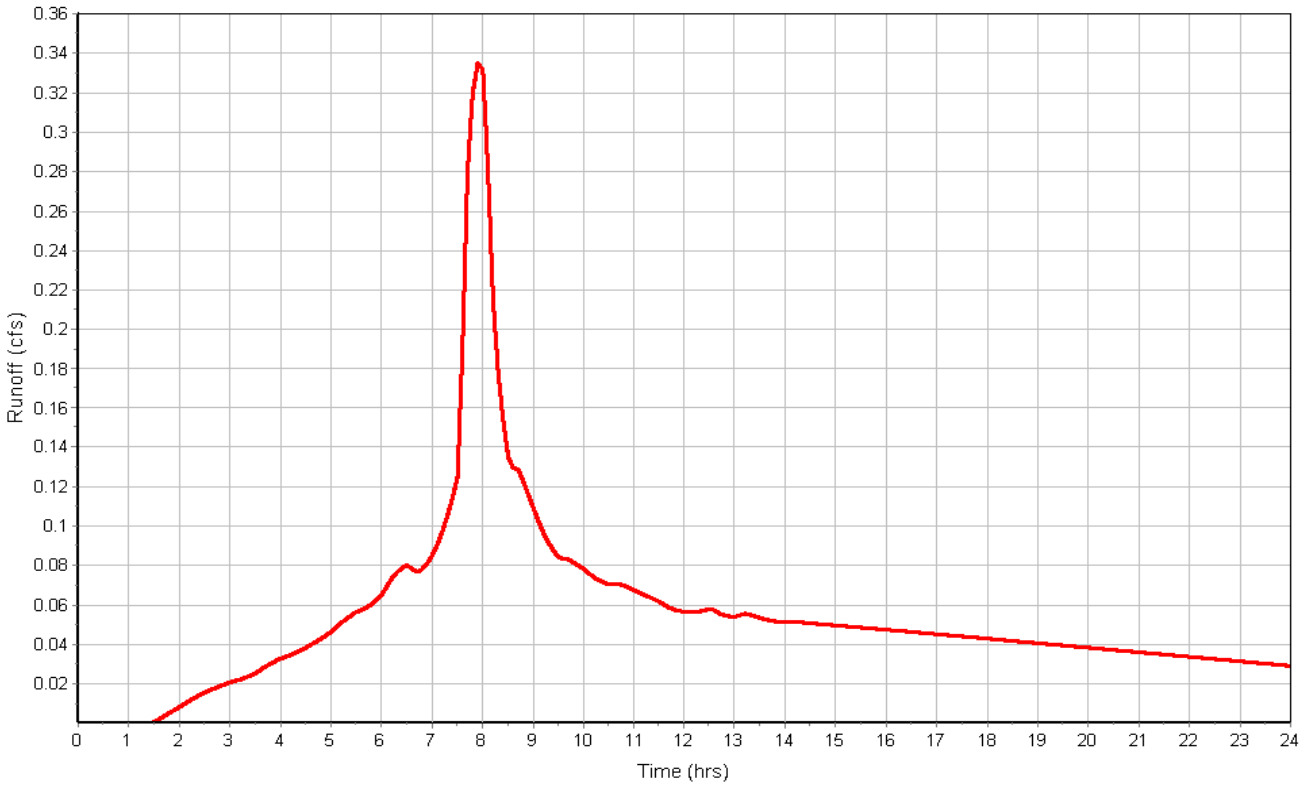
Total Rainfall (in)	1.33
Total Runoff (in)	1.11
Peak Runoff (cfs)	0.34
Weighted Curve Number	98.00
Time of Concentration (days hh:mm:ss)	0 00:05:00

Subbasin : BASIN-C

Rainfall Intensity Graph



Runoff Hydrograph



Subbasin : BASIN-D

Input Data

Area (ft²)	32675.01
Impervious Area (%)	100.00
Impervious Area Curve Number	98.00
Pervious Area Curve Number	79.00
Rain Gage ID	Rain Gage-01

Composite Curve Number

Soil/Surface Description	Area (ft²)	Soil Group	Curve Number
Composite Area & Weighted CN	32675.01		98

Time of Concentration

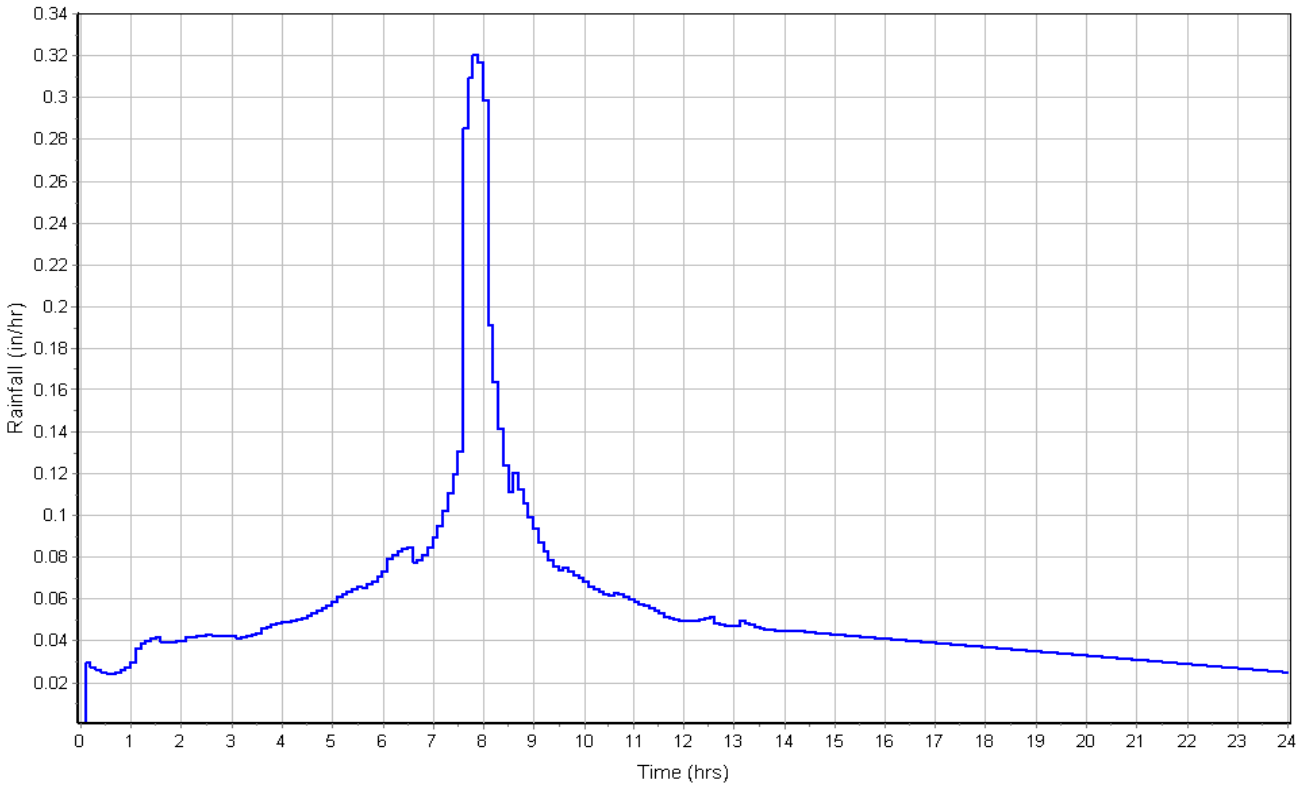
User-Defined TOC override (minutes): 5.00

Subbasin Runoff Results

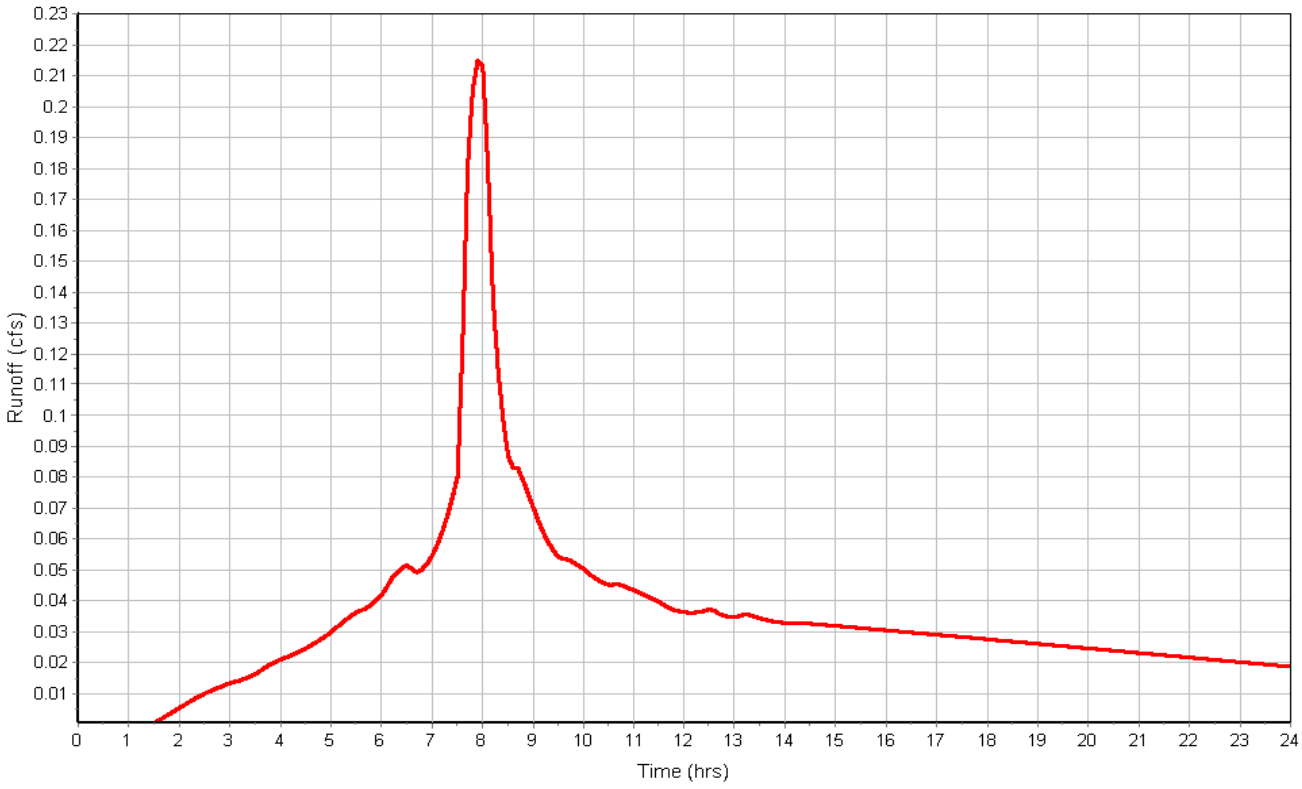
Total Rainfall (in)	1.33
Total Runoff (in)	1.11
Peak Runoff (cfs)	0.22
Weighted Curve Number	98.00
Time of Concentration (days hh:mm:ss)	0 00:05:00

Subbasin : BASIN-D

Rainfall Intensity Graph



Runoff Hydrograph



Subbasin : BASIN-E

Input Data

Area (ft²)	98990.01
Impervious Area (%)	100.00
Impervious Area Curve Number	98.00
Pervious Area Curve Number	79.00
Rain Gage ID	Rain Gage-01

Composite Curve Number

Soil/Surface Description	Area (ft²)	Soil Group	Curve Number
Composite Area & Weighted CN	98990.01		98

Time of Concentration

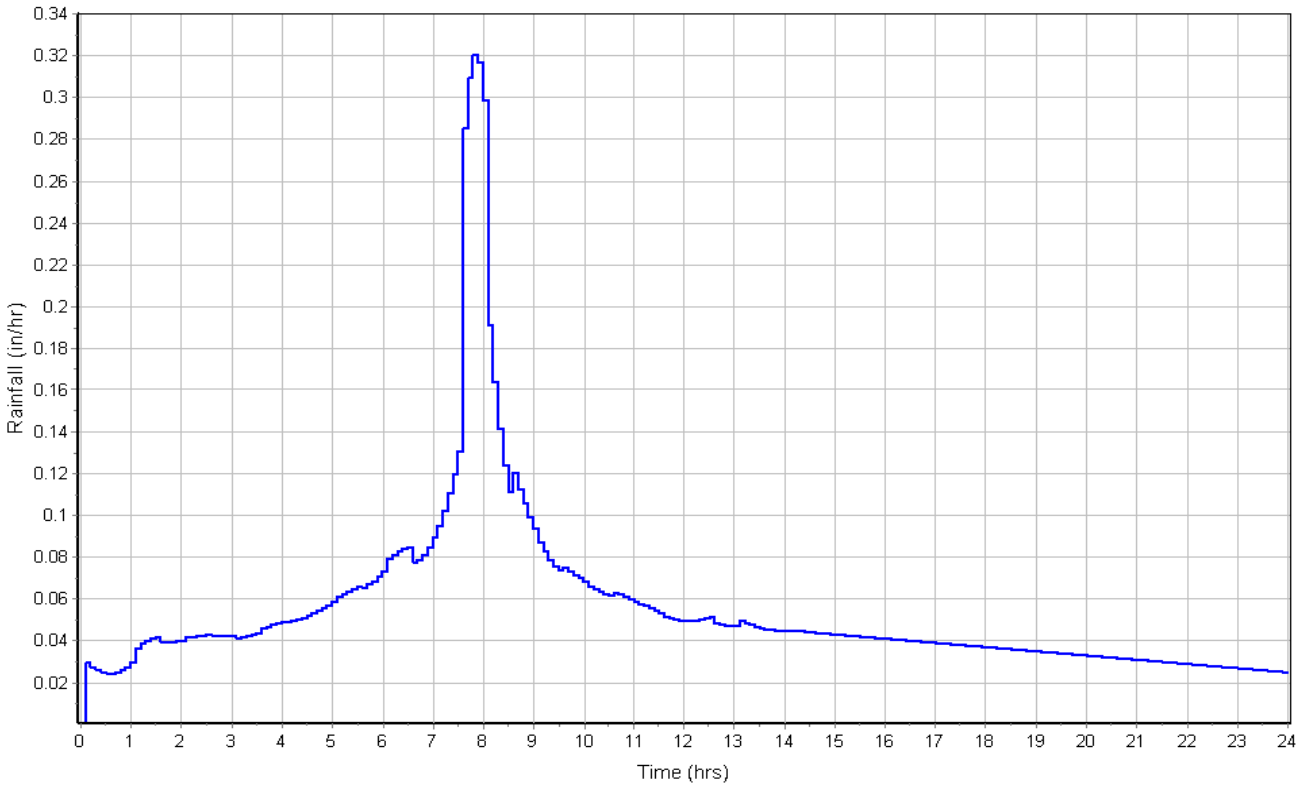
User-Defined TOC override (minutes): 5

Subbasin Runoff Results

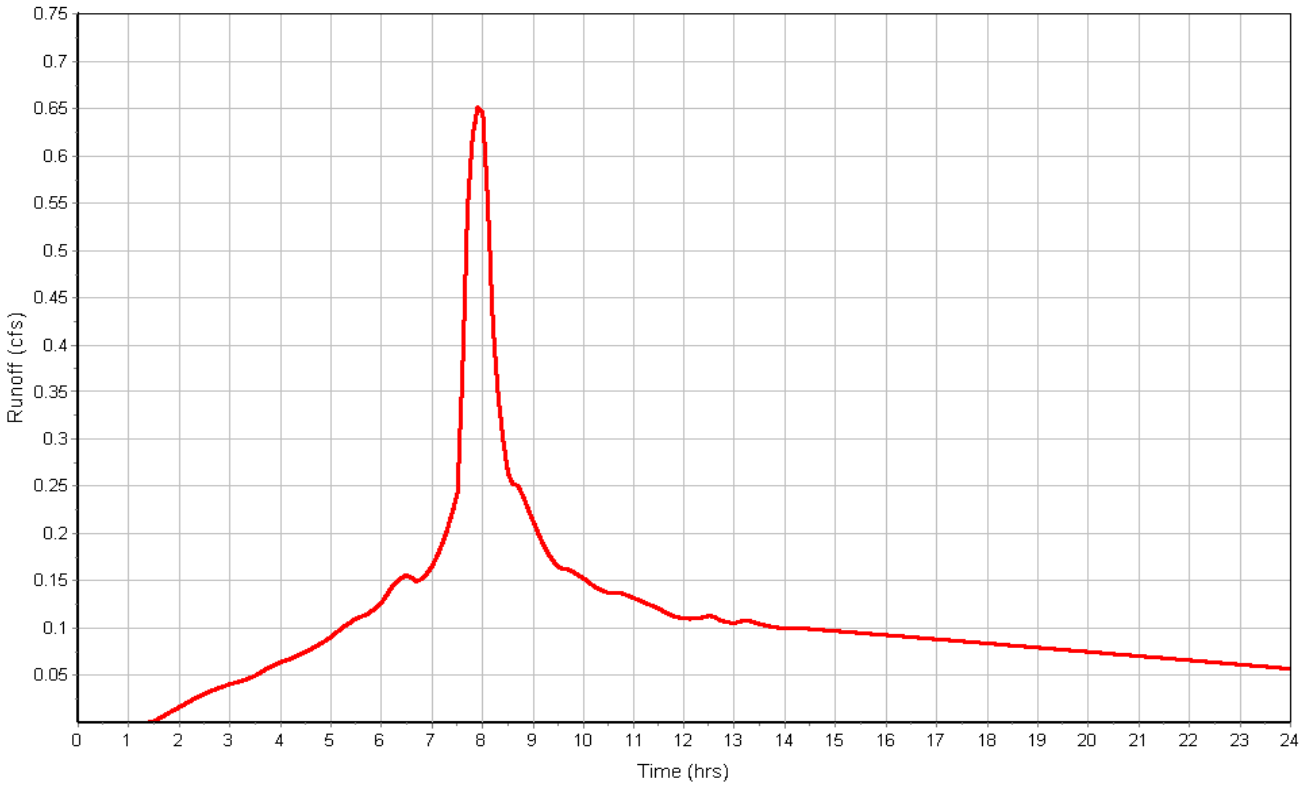
Total Rainfall (in)	1.33
Total Runoff (in)	1.11
Peak Runoff (cfs)	0.65
Weighted Curve Number	98.00
Time of Concentration (days hh:mm:ss)	0 00:05:00

Subbasin : BASIN-E

Rainfall Intensity Graph



Runoff Hydrograph



Subbasin : BASIN-F

Input Data

Area (ft²)	42620.02
Impervious Area (%)	100.00
Impervious Area Curve Number	98.00
Pervious Area Curve Number	79.00
Rain Gage ID	Rain Gage-01

Composite Curve Number

Soil/Surface Description	Area (ft²)	Soil Group	Curve Number
Composite Area & Weighted CN	42620.02		98

Time of Concentration

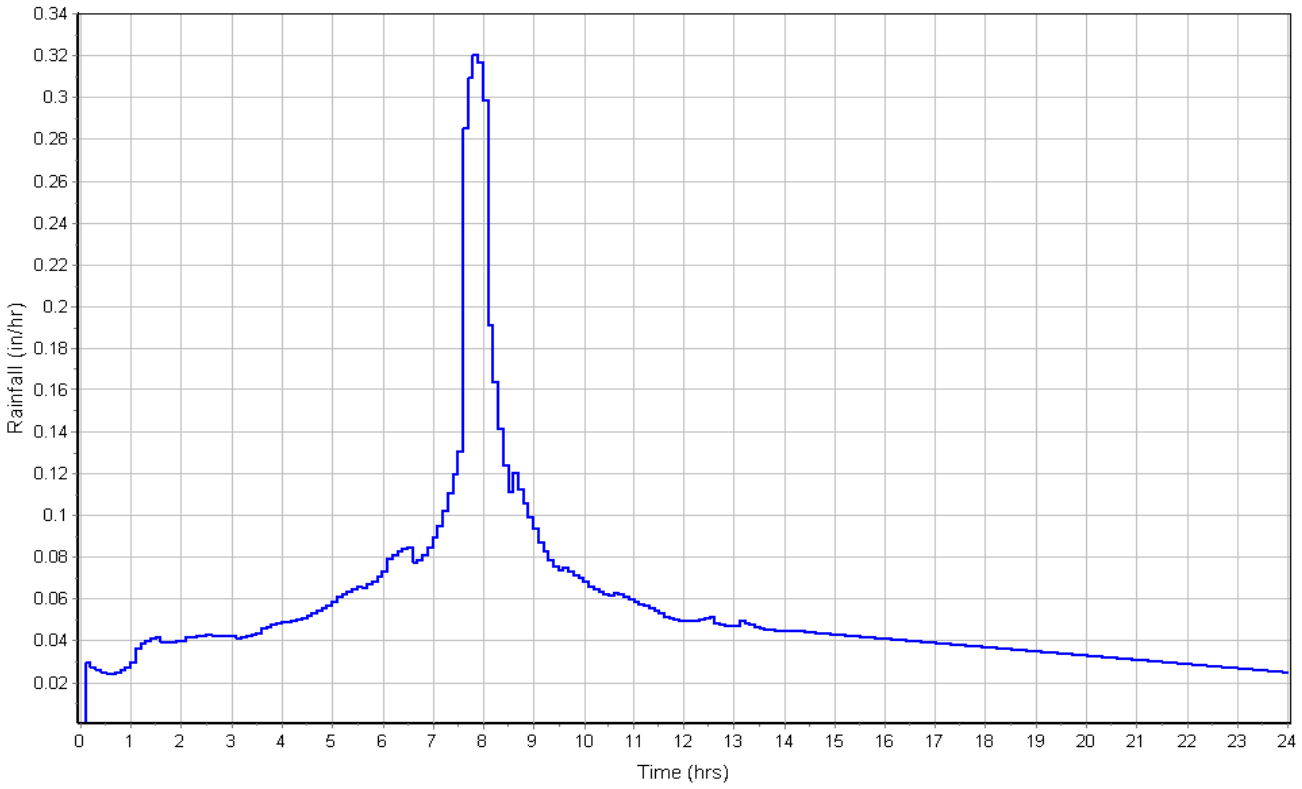
User-Defined TOC override (minutes): 5

Subbasin Runoff Results

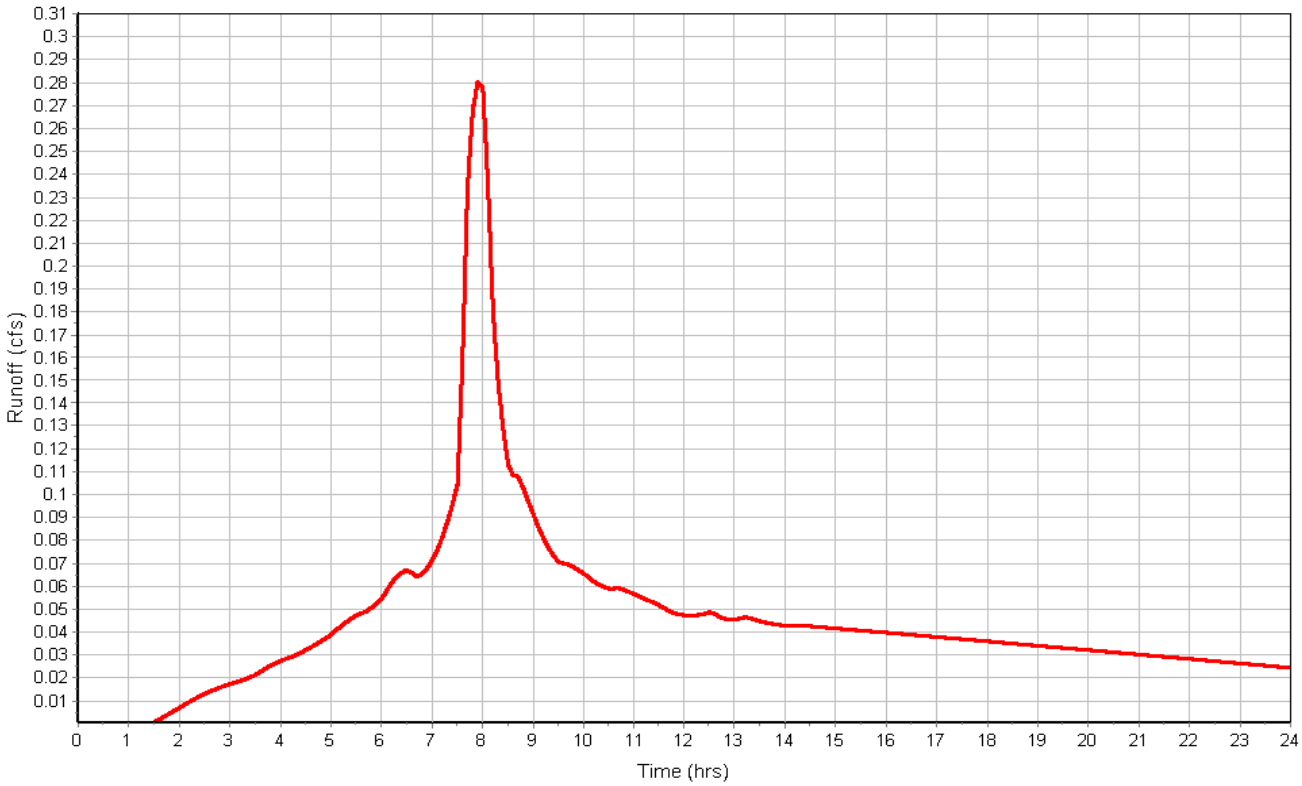
Total Rainfall (in)	1.33
Total Runoff (in)	1.11
Peak Runoff (cfs)	0.28
Weighted Curve Number	98.00
Time of Concentration (days hh:mm:ss)	0 00:05:00

Subbasin : BASIN-F

Rainfall Intensity Graph



Runoff Hydrograph



Subbasin : BASIN-G

Input Data

Area (ft²)	100644.99
Impervious Area (%)	0.00
Impervious Area Curve Number	98.00
Pervious Area Curve Number	79.00
Rain Gage ID	Rain Gage-01

Composite Curve Number

Soil/Surface Description	Area (ft²)	Soil Group	Curve Number
Composite Area & Weighted CN	100644.99		79

Time of Concentration

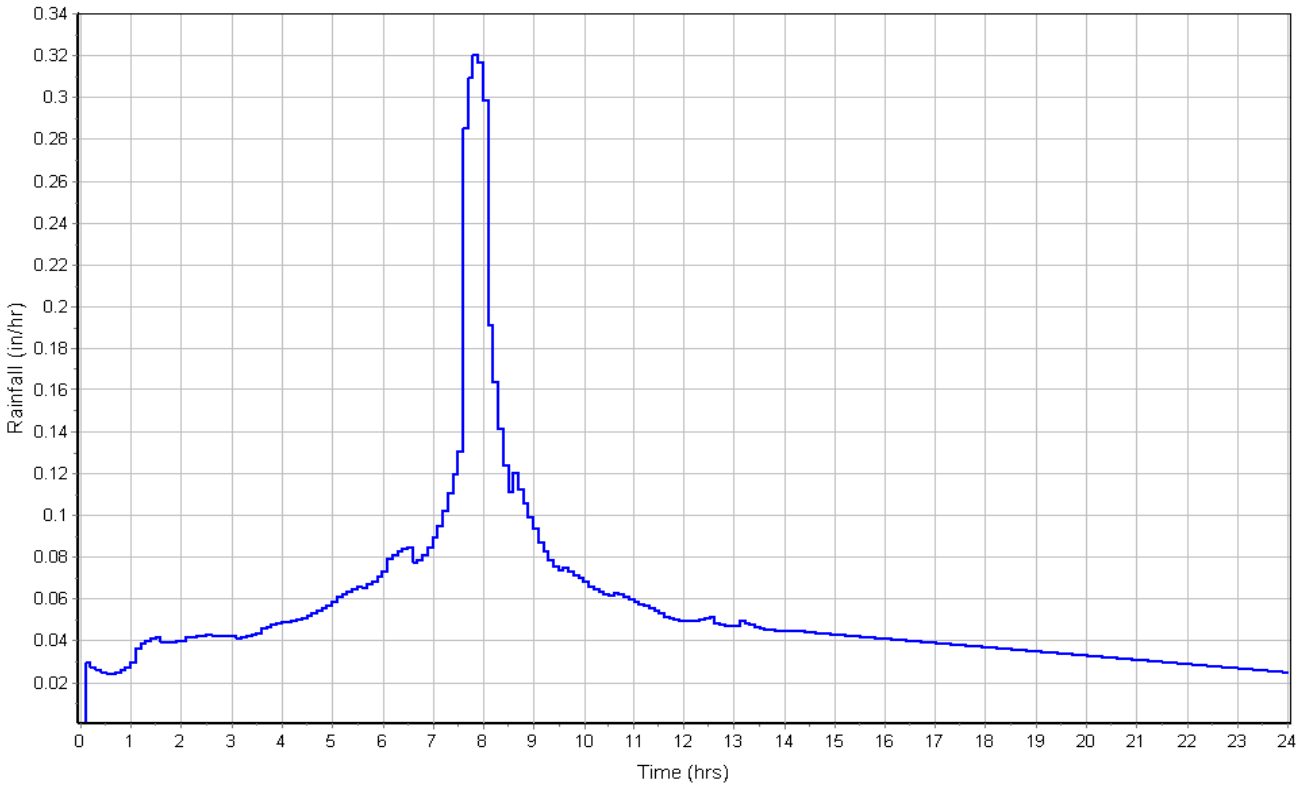
User-Defined TOC override (minutes): 10

Subbasin Runoff Results

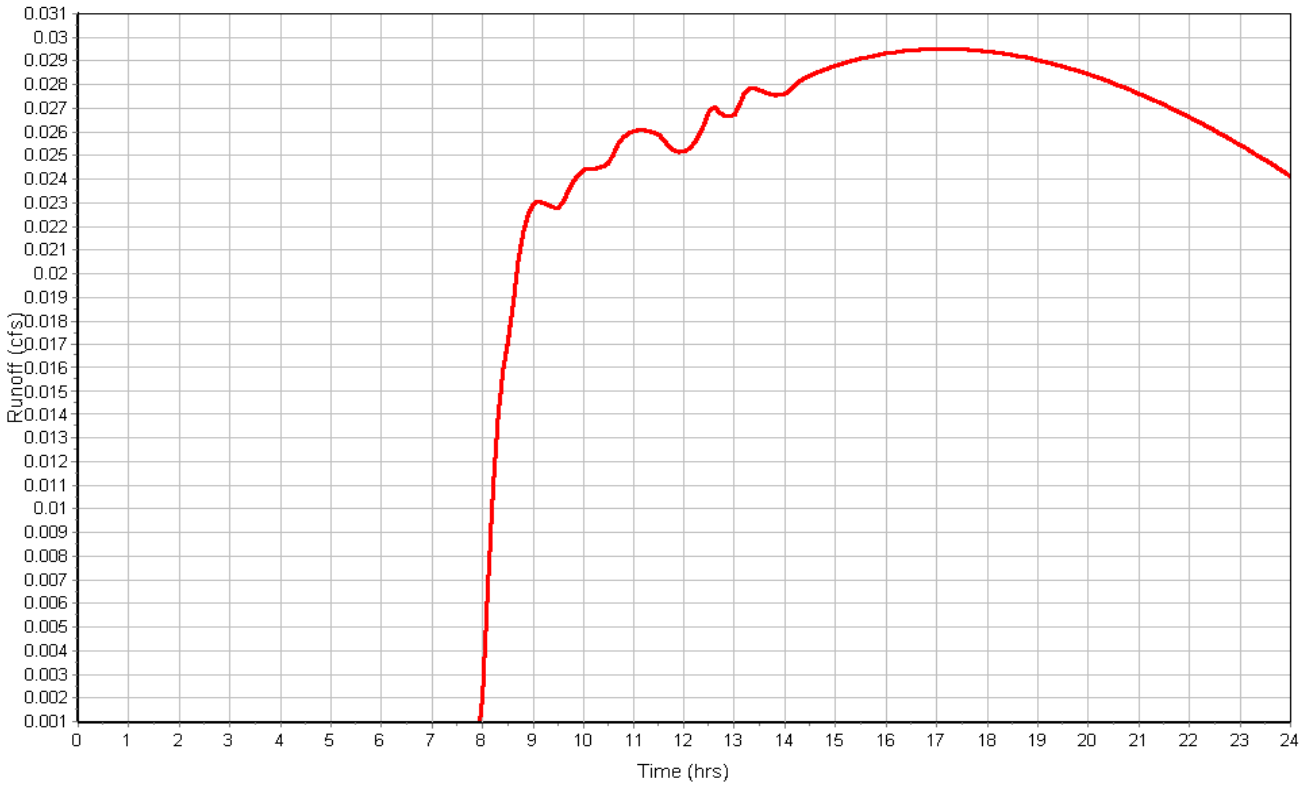
Total Rainfall (in)	1.33
Total Runoff (in)	0.18
Peak Runoff (cfs)	0.03
Weighted Curve Number	79.00
Time of Concentration (days hh:mm:ss)	0 00:10:00

Subbasin : BASIN-G

Rainfall Intensity Graph



Runoff Hydrograph



Subbasin : BASIN-H

Input Data

Area (ft²)	22029.99
Impervious Area (%)	0.00
Impervious Area Curve Number	98.00
Pervious Area Curve Number	79.00
Rain Gage ID	Rain Gage-01

Composite Curve Number

Soil/Surface Description	Area (ft²)	Soil Group	Curve Number
Composite Area & Weighted CN	22029.99		79

Time of Concentration

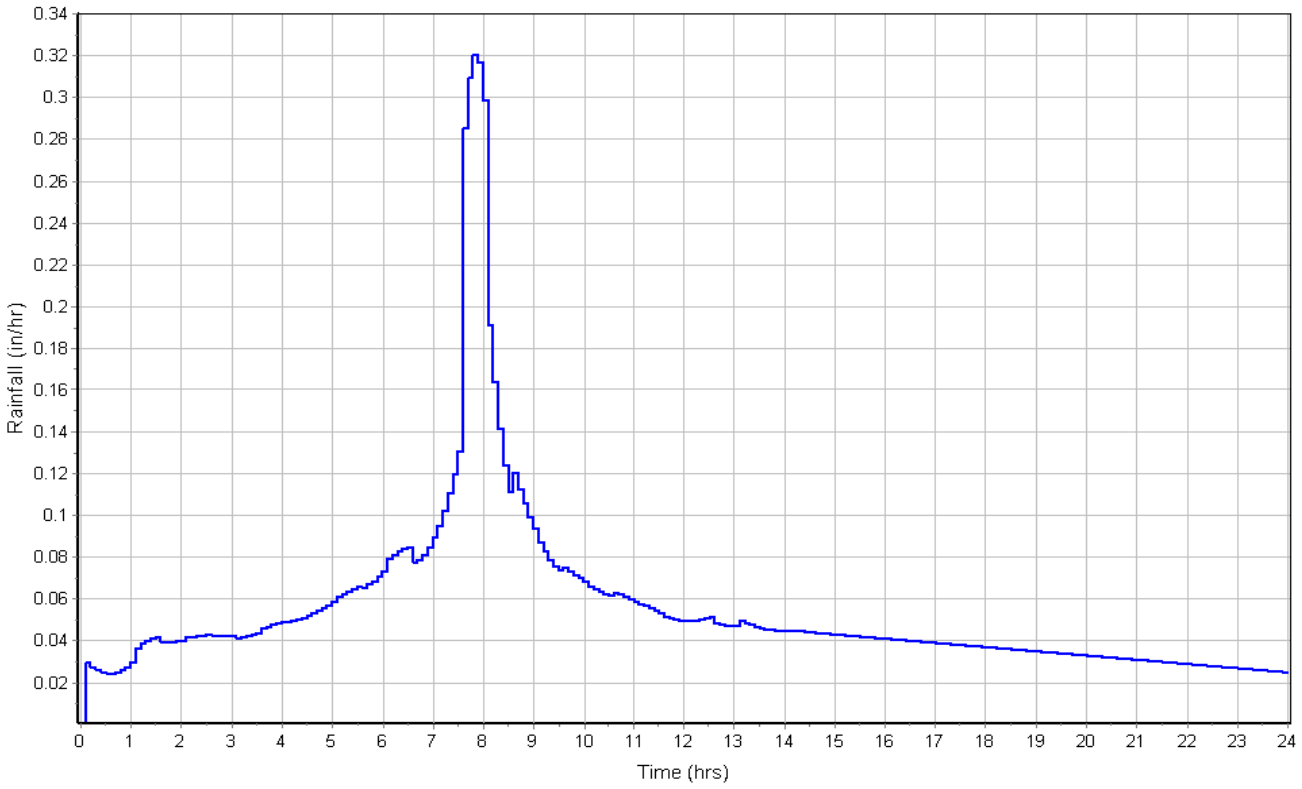
User-Defined TOC override (minutes): 10

Subbasin Runoff Results

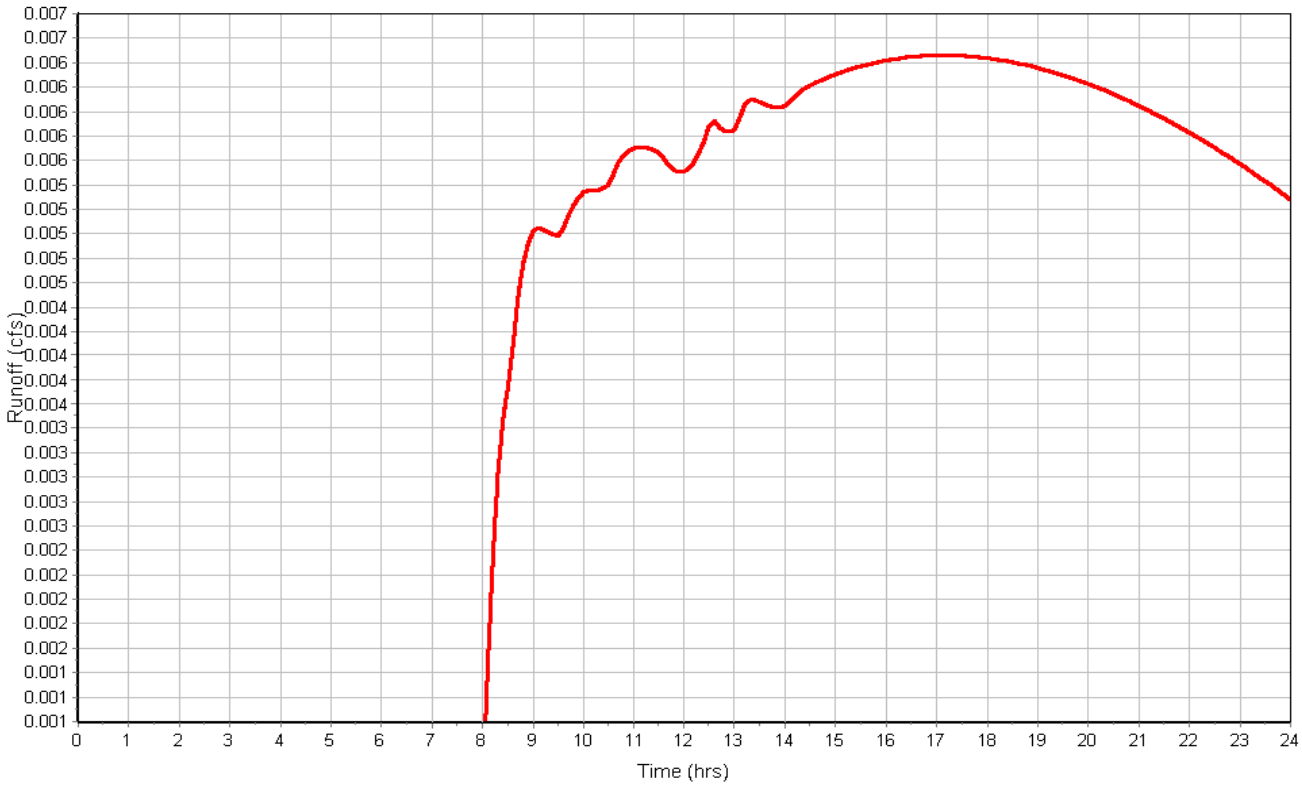
Total Rainfall (in)	1.33
Total Runoff (in)	0.18
Peak Runoff (cfs)	0.01
Weighted Curve Number	79.00
Time of Concentration (days hh:mm:ss)	0 00:10:00

Subbasin : BASIN-H

Rainfall Intensity Graph



Runoff Hydrograph



Subbasin : BASIN-I

Input Data

Area (ft²)	101140.00
Impervious Area (%)	0.00
Impervious Area Curve Number	98.00
Pervious Area Curve Number	79.00
Rain Gage ID	Rain Gage-01

Composite Curve Number

Soil/Surface Description	Area (ft²)	Soil Group	Curve Number
Composite Area & Weighted CN	101140.00		79

Time of Concentration

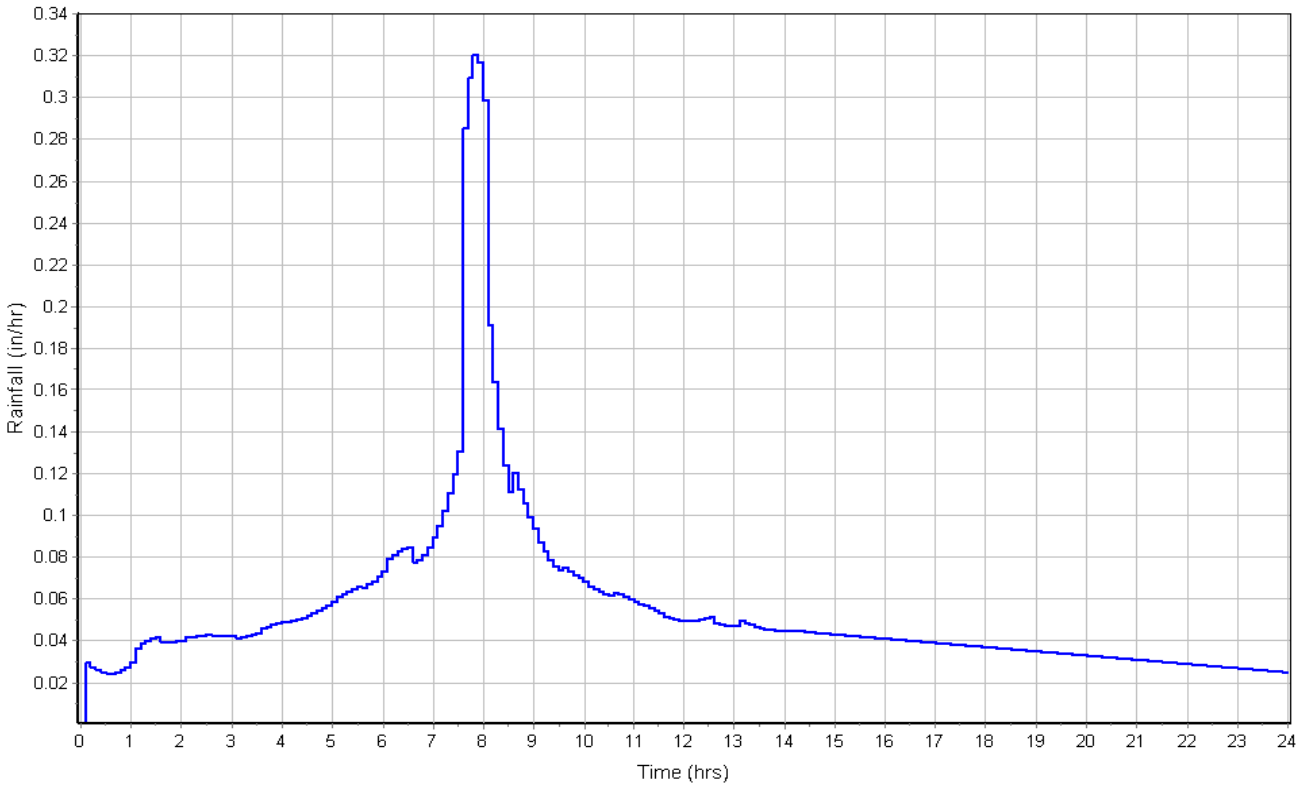
User-Defined TOC override (minutes): 10

Subbasin Runoff Results

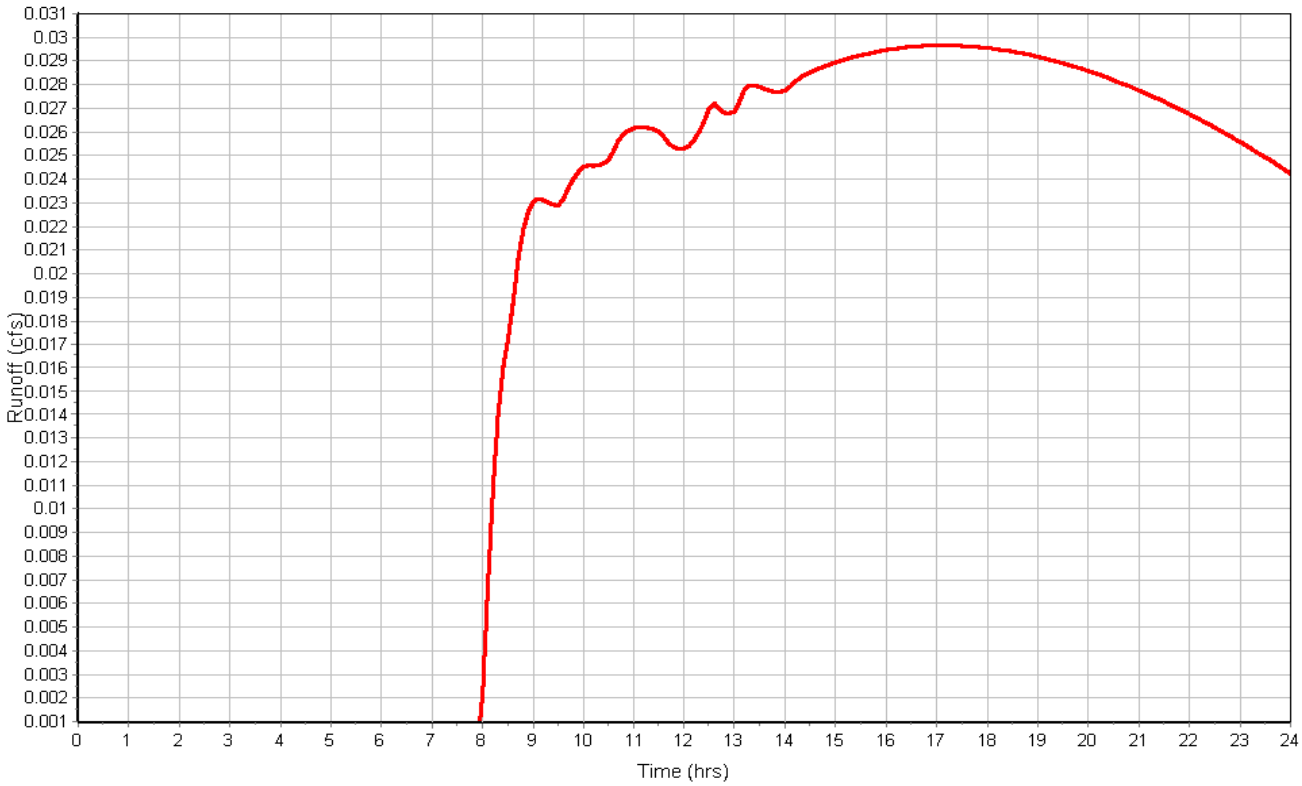
Total Rainfall (in)	1.33
Total Runoff (in)	0.18
Peak Runoff (cfs)	0.03
Weighted Curve Number	79.00
Time of Concentration (days hh:mm:ss)	0 00:10:00

Subbasin : BASIN-I

Rainfall Intensity Graph



Runoff Hydrograph



Subbasin : BASIN-J

Input Data

Area (ft²)	49599.99
Impervious Area (%)	0.00
Impervious Area Curve Number	98.00
Pervious Area Curve Number	79.00
Rain Gage ID	Rain Gage-01

Composite Curve Number

Soil/Surface Description	Area (ft²)	Soil Group	Curve Number
Composite Area & Weighted CN	49599.99		79

Time of Concentration

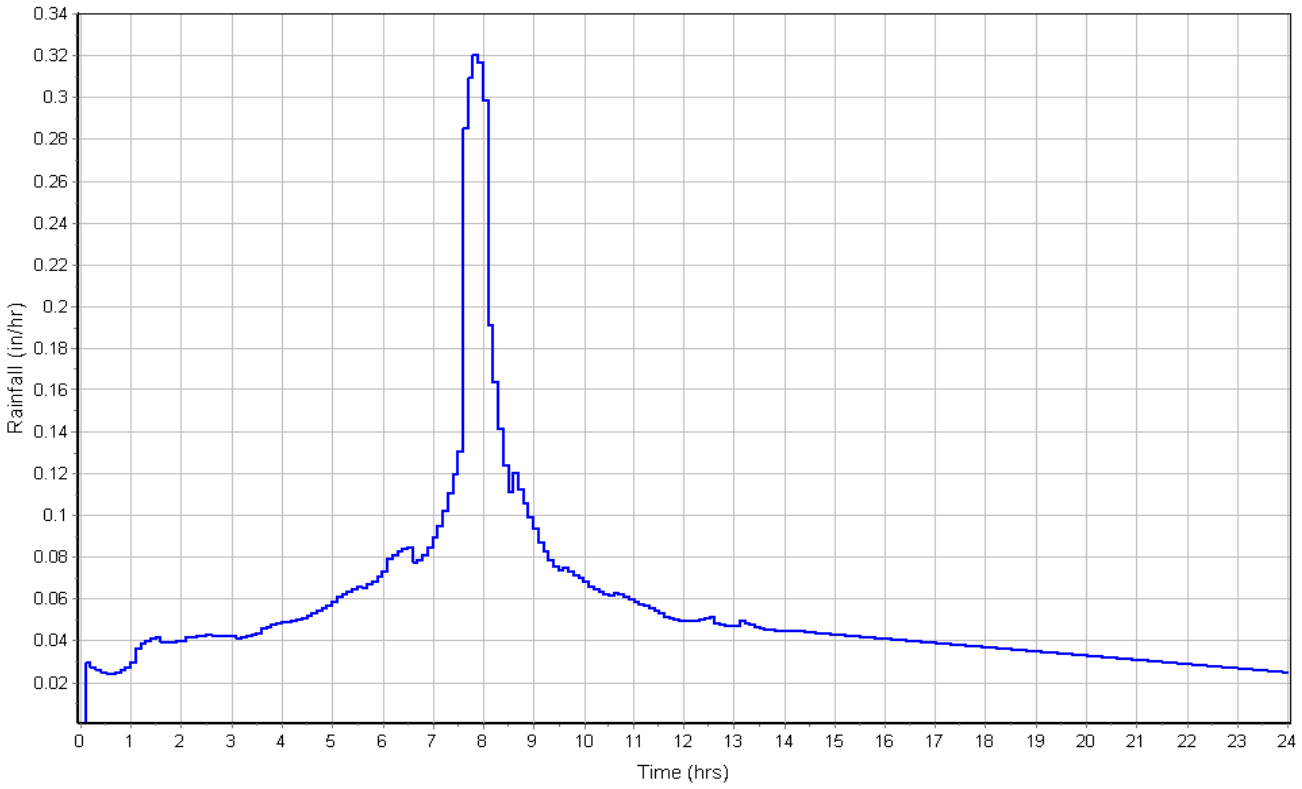
User-Defined TOC override (minutes): 10

Subbasin Runoff Results

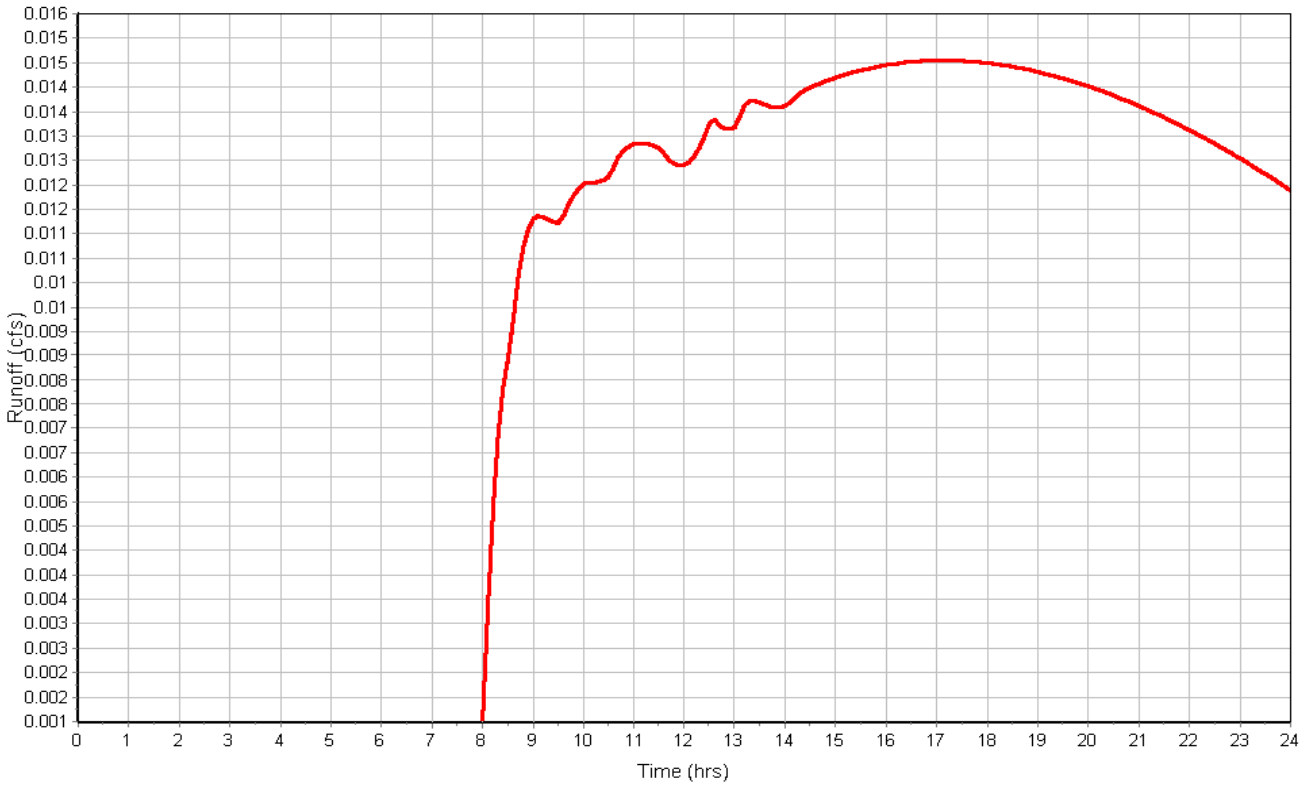
Total Rainfall (in)	1.33
Total Runoff (in)	0.18
Peak Runoff (cfs)	0.02
Weighted Curve Number	79.00
Time of Concentration (days hh:mm:ss)	0 00:10:00

Subbasin : BASIN-J

Rainfall Intensity Graph



Runoff Hydrograph



Subbasin : BASIN-K

Input Data

Area (ft²)	5122.00
Impervious Area (%)	0.00
Impervious Area Curve Number	98.00
Pervious Area Curve Number	79.00
Rain Gage ID	Rain Gage-01

Composite Curve Number

Soil/Surface Description	Area (ft²)	Soil Group	Curve Number
Composite Area & Weighted CN	5122.00		79

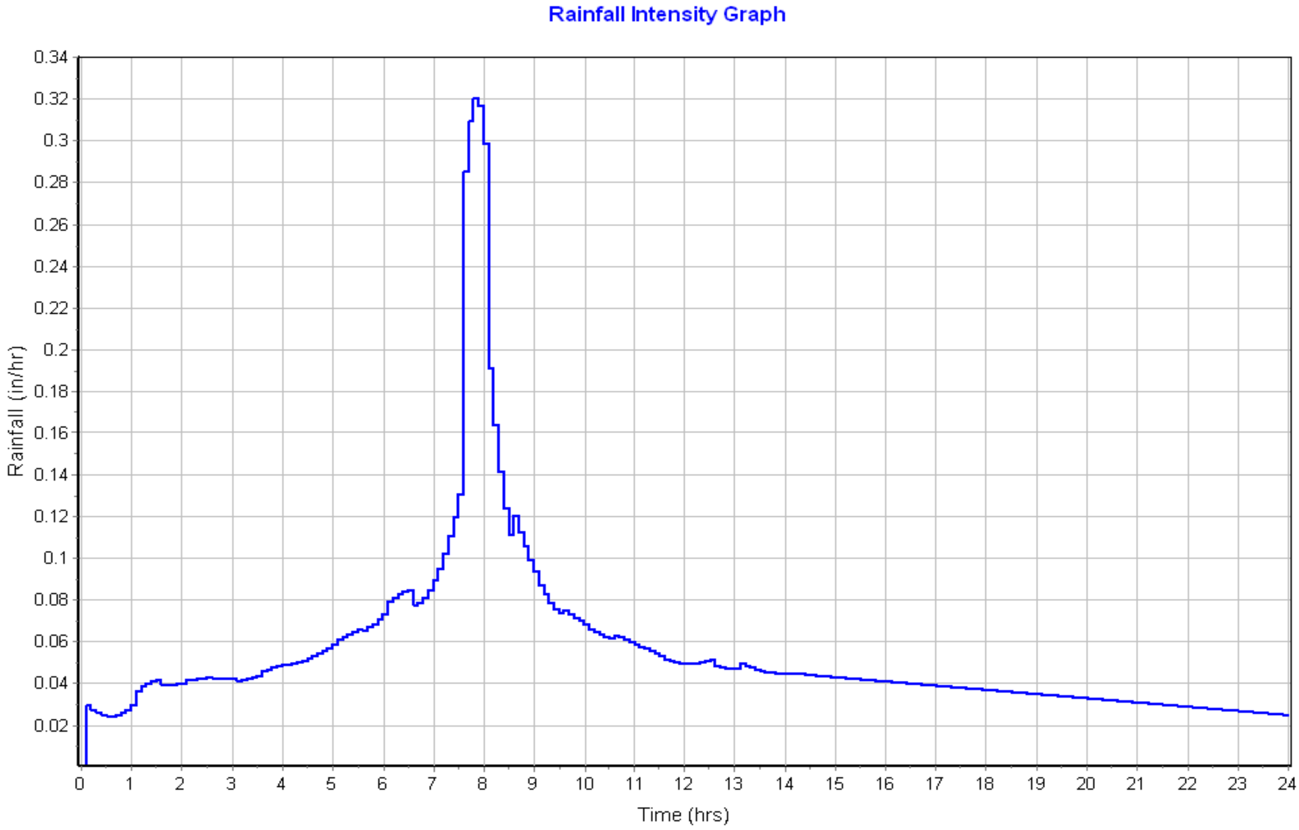
Time of Concentration

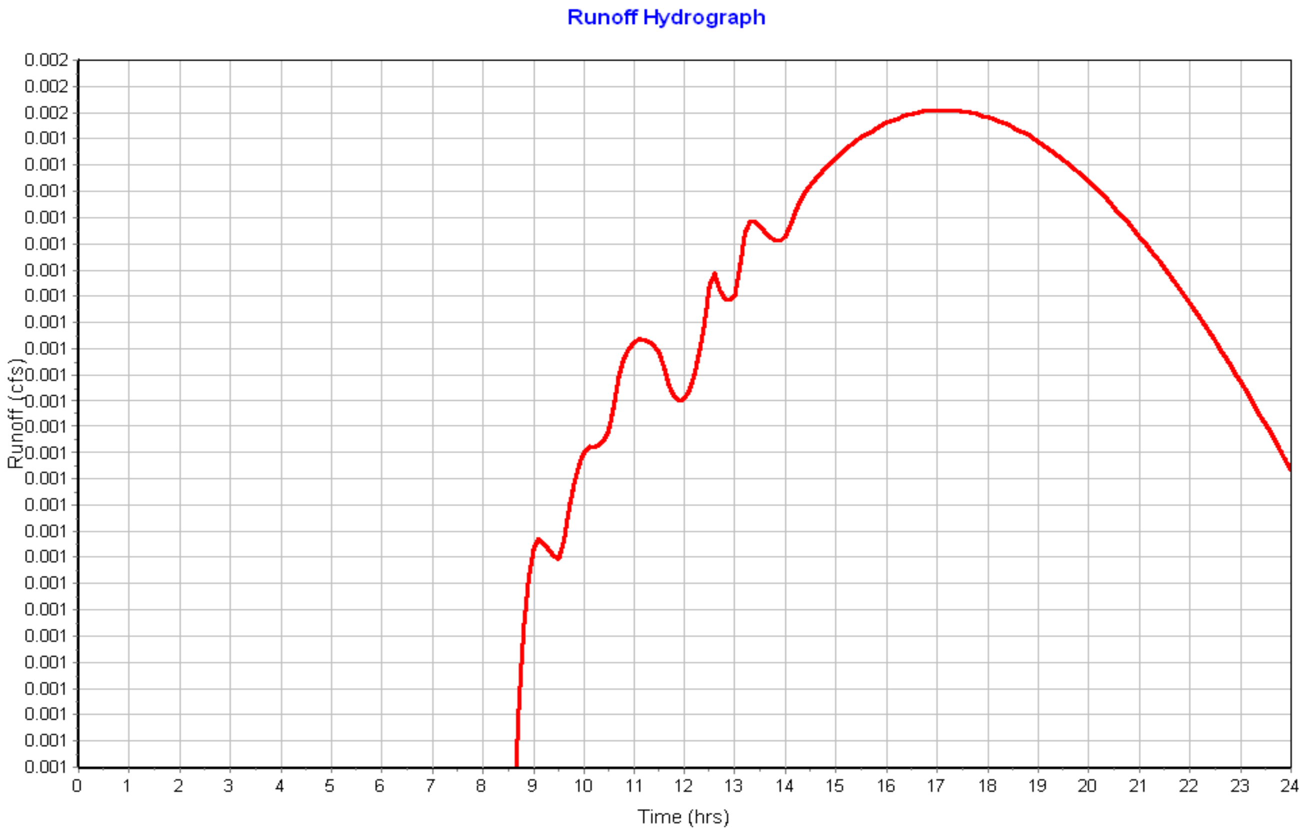
User-Defined TOC override (minutes): 10

Subbasin Runoff Results

Total Rainfall (in)	1.33
Total Runoff (in)	0.18
Peak Runoff (cfs)	0.00
Weighted Curve Number	79.00
Time of Concentration (days hh:mm:ss)	0 00:10:00

Subbasin : BASIN-K





Appendix D

Supplemental Documents and Information

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Search

Properties and Qualities Ratings

Open All | Close All

Soil Chemical Properties
- Calcium Carbonate (CaCO3)
- Cation-Exchange Capacity (CEC-7)
- Effective Cation-Exchange Capacity (ECEC)
- Electrical Conductivity (EC)
- Gypsum
- pH (1 to 1 Water)
- Sodium Adsorption Ratio (SAR)

Soil Erosion Factors
- K Factor, Rock Free
- K Factor, Whole Soil
- T Factor
- Wind Erodibility Group
- Wind Erodibility Index

Soil Health Properties
- Soil Health - Available Water Capacity
- Soil Health - Bulk Density, One-Third Bar
- Soil Health - Organic Matter
- Soil Health - Sodium Adsorption Ratio (SAR)
- Soil Health - Soil Reaction (pH)
- Soil Health - Surface Texture

Soil Physical Properties
- Available Water Capacity
- Available Water Storage
- Available Water Supply, 0 to 100 cm
- Available Water Supply, 0 to 150 cm
- Available Water Supply, 0 to 25 cm
- Available Water Supply, 0 to 50 cm
- Bulk Density, One-Third Bar
- Linear Extensibility
- Liquid Limit
- Organic Matter
- Percent Clay
- Percent Sand
- Percent Silt
- Plasticity Index
- Saturated Hydraulic Conductivity (Ksat)
- Saturated Hydraulic Conductivity (Ksat), Standard Classes
- Surface Texture
- Water Content, 15 Bar
- Water Content, One-Third Bar

Soil Qualities and Features
- AASHTO Group Classification (Surface)
- AASHTO Group Index
- Depth to a Selected Soil Restrictive Layer
- Depth to Any Soil Restrictive Layer
- Drainage Class
- Frost Action
- Frost-Free Days
- **Hydrologic Soil Group**

View Description | View Rating

View Options

Map ☑
Table ☑
Description of Rating ☑
Rating Options ☑
Detailed Description ☐

Advanced Options

Aggregation Method: Dominant Condition
Component Percent Cutoff:
Tie-break Rule: ○ Lower ◉ Higher

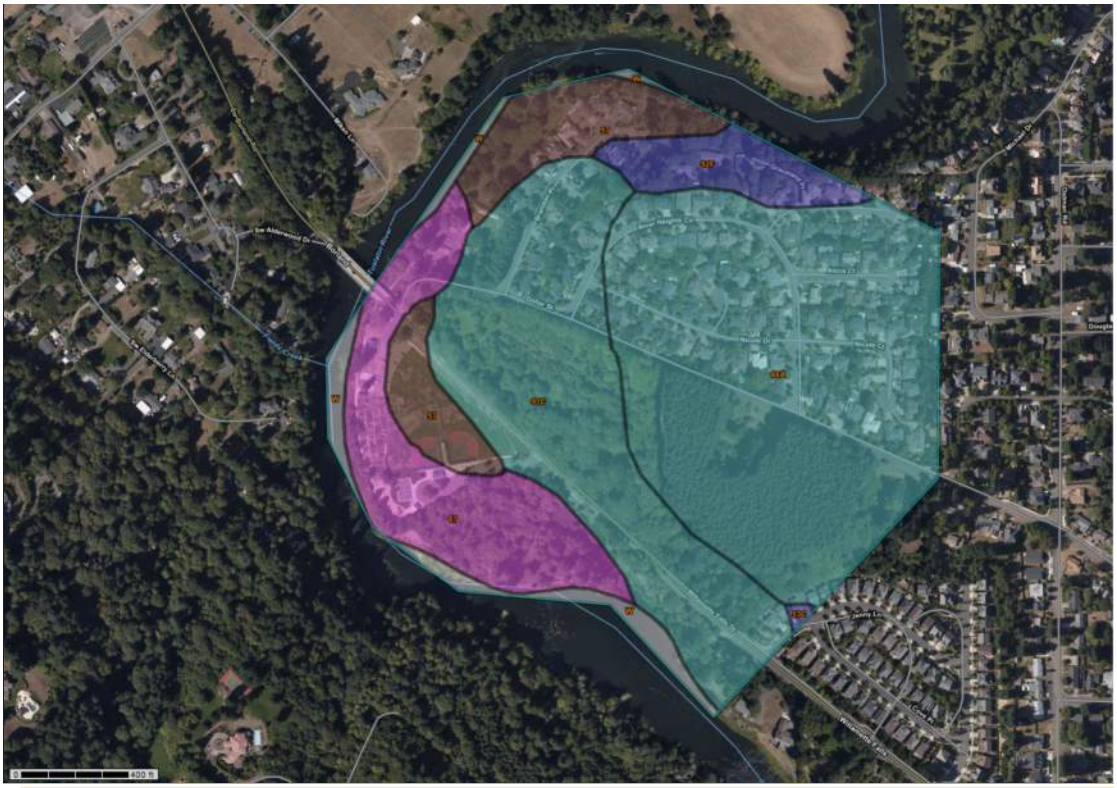
View Description | View Rating

- Map Unit Name
- Parent Material Name
- Representative Slope
- Soil Slippage Potential
- Unified Soil Classification (Surface)

Water Features
- Depth to Water Table
- Flooding Frequency Class
- Ponding Frequency Class

Map — Hydrologic Soil Group

Scale (not to scale)



Warning: Soil Ratings Map may not be valid at this scale.

You have zoomed in beyond the scale at which the soil map for this area is intended to be used. Mapping of soils is done at a particular scale. The soil surveys that comprise your AOI were ma design of map units and the level of detail shown in the resulting soil map are dependent on that map 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 contrast been shown at a more detailed scale.

Tables — Hydrologic Soil Group — Summary By Map Unit

Summary by Map Unit — Clackamas County Area, Oregon (OR610)

Summary by Map Unit — Clackamas County Area, Oregon (OR610)

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
53C	Latourell loam, 8 to 15 percent slopes	B	0.1	0.2%
57	McBee variant loam	B/D	8.2	9.6%
67	Newberg fine sandy loam	A	11.8	13.9%
88A	Willamette silt loam, wet, 0 to 3 percent slopes	C	35.2	41.5%
91C	Woodburn silt loam, 8 to 15 percent slopes	C	22.6	26.6%
92F	Xerochrepts and Haploxerolls, very steep	B	4.1	4.8%
W	Water		2.9	3.4%
Totals for Area of Interest			**84.8**	**100.0%**

Description — 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.

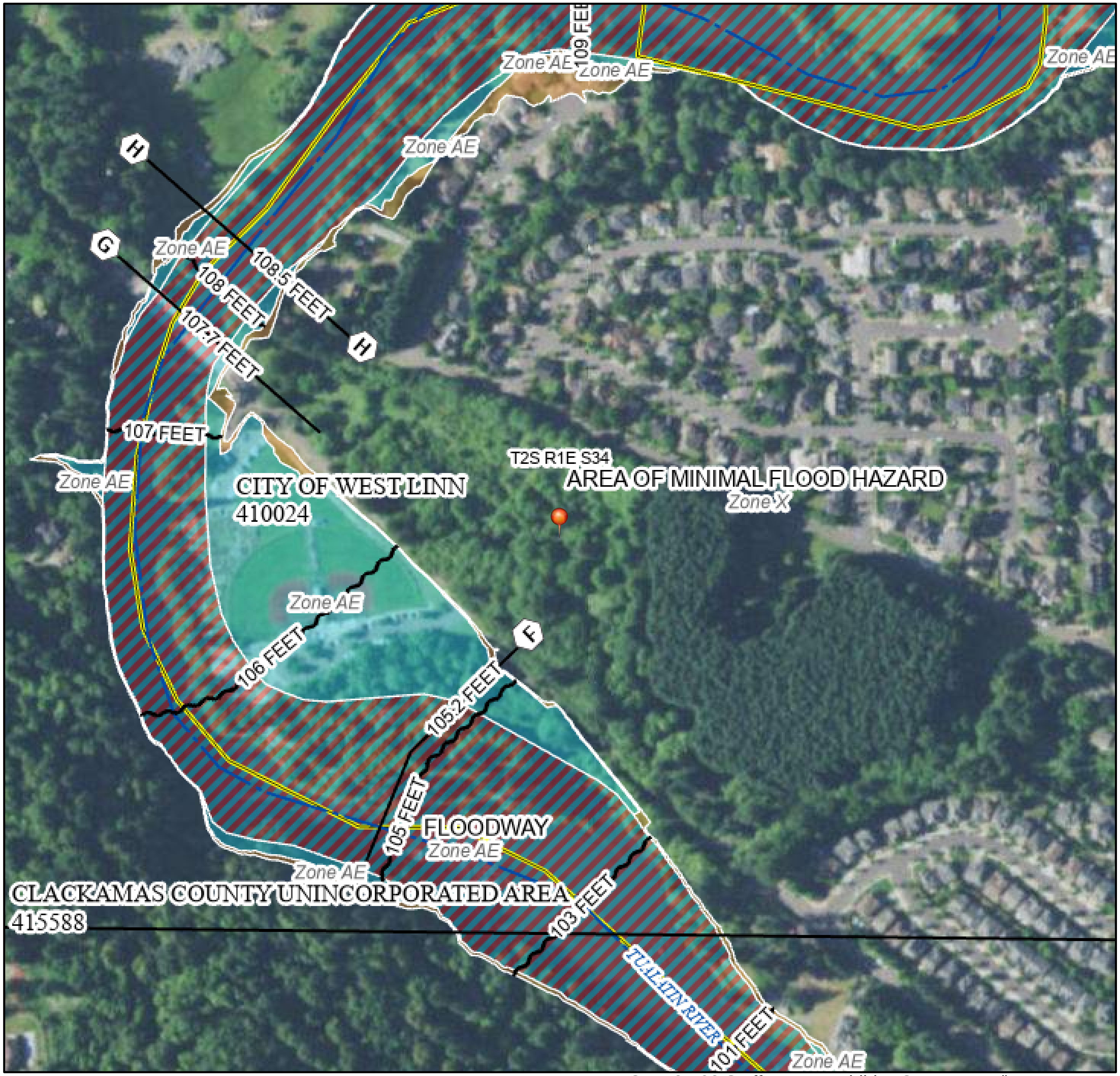
Group C. Soils having a slow infiltration rate when thoroughly wet. These consist chiefly of soils having a layer that impedes the downward movement of water or soils of moderately fine texture or fine texture. These soils have a slow rate of water transmission.

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.

Rating Options — Hydrologic Soil Group

Aggregation Method: Dominant Condition
Component Percent Cutoff: *None Specified*
Tie-break Rule: Higher



Zone AE
109 FEET
Zone AE
108.5 FEET
108 FEET
107.7 FEET
107 FEET
T2S R1E S34
AREA OF MINIMAL FLOOD HAZARD
Zone X
CITY OF WEST LINN
410024
106 FEET
105.2 FEET
105 FEET
FLOODWAY
CLACKAMAS COUNTY UNINCORPORATED AREA
415588
103 FEET
TUALATIN RIVER
101 FEET

Table 4. Results of Global Stability Analyses (continued)

Cross Section	Condition	FOS
Section D-D'	Existing Slope Conditions – Static	1.6
	Existing Slope Conditions – Seismic	1.1
	Proposed Slope Conditions – Static	1.6
	Proposed Slope Conditions – Seismic	1.2

Our analyses indicate the computed FOS's for existing and proposed slope conditions under static and seismic analyses satisfy the minimum FOS's for global stability. The FOS's for slope stability are greater than 1.5 and 1.1 for static and seismic conditions, respectively. However, localized areas of potential shallow instability (e.g., FOS less than 1.5 or 1.1 for static and seismic conditions, respectively) are present on the steep slopes located immediately above Willamette Falls Drive.

6.0 CONCLUSIONS AND RECOMMENDATIONS

Based on the results of our subsurface explorations and engineering analyses, it is our opinion that the site can be developed as proposed. The primary geotechnical considerations for the project are summarized in the "Executive Summary." Our specific recommendations are provided in the following sections.

7.0 DESIGN

7.1 PERMANENT SLOPES

Permanent cut or fill slopes on the site should not exceed a gradient of 2H:1V, unless specifically evaluated for stability. Slopes that will be maintained by mowing should not be constructed steeper than 3H:1V. Footings, buildings, access rods, and pavement should be located at least 5 feet horizontally from the face of slopes. Slopes should be planted with appropriate vegetation to provide protection against erosion as soon as possible after grading. Surface water runoff should be collected and directed away from slopes to prevent water from running down the face of the slope.

7.2 DRAINAGE

7.2.1 Temporary Drainage

During grading at the site, the contractor should be made responsible for temporary drainage of surface water as necessary to prevent standing water and/or erosion at the working surface and drainage onto slopes. During rough and finished grading of the building site, the contractor should keep all footing excavations and building pads free of water.

7.2.2 Surface Drainage

We recommend connecting all roof drains to a tightline leading to storm drain facilities. Pavement surfaces and open space areas should be sloped such that surface water runoff is collected and routed to suitable discharge points. We also recommend sloping ground surfaces adjacent to the building away to facilitate drainage away from the building.

7.2.3 Keyway Drains

We recommend installing a subsurface drain to collect any perched water at the inside of the keyway cut for the fill slopes above Willamette Falls Drive. The drain should consist of a perforated drainpipe covered with a minimum 2-foot-wide and 2-foot-tall zone of drain rock wrapped in a drainage geotextile. Collected water should be routed in non-perforated line(s) to the stormwater system or to a suitable discharge at the base of the slope.

7.2.4 Cement-Amended Slope Drainage

We recommend installing drainage at the contact of relatively impervious cement-amended fill slopes and overlying topsoil to limit runoff onto the slopes below. Drainage should consist of angled strip drains pinned to the cement-amended slope on maximum spacings of 30 feet on-center and connected to minimum 2-foot-wide and 2-foot-deep zones of drain rock with perforated collector pipes. The surface of the cement-amended slopes should be roughened prior to placing the overlying topsoil. Water collected from the top of the cement-amended slopes should be routed in non-perforated line(s) to the stormwater system or a suitable discharge at the base of the slope. The collected water should not be connected to the perforated pipe for the subsurface keyway drain at the base of the fill.

7.2.5 Stormwater Infiltration Systems

We recommend locating any infiltration facilities below a 5H:1V projection from the base of any slopes and/or walls to limit the potential influence of groundwater on the stability of the slopes and walls. Any stormwater detention facilities within the 5H:1V projection from the base of slopes and/or walls should be lined to prevent infiltration near walls and slopes.

Infiltration testing was completed in explorations to evaluate the feasibility of shallow infiltration systems. The infiltration rate will depend on the fines content and consistency of the soil. Tested rates ranged from negligible to 1.5 inches per hour. The unfactored field rates in Table 1 can be used for design. It is the responsibility of the designer to include the appropriate FOS's for the systems.

We recommend that GeoDesign observe the soil conditions and complete confirmation testing during construction to verify the field rates meet the design rates. Due to the presence of variable fines content, it may be necessary to enlarge or deepen systems during construction. Furthermore, we recommend including a contingency to deepen infiltration systems or add additional infiltration systems in other portions of the site during construction if tested rates at the time of construction are unsuitable.

7.2.6 Foundation Drains

Where drains are not already required for embedded building walls, we recommend installing a perimeter foundation drain around the planned new building. The foundation drains should be constructed at a minimum slope of approximately ½ percent and drained by gravity to a suitable discharge. The perforated drainpipe should not be tied to a stormwater drainage system without backflow provisions. The foundation drains should consist of 4-inch-diameter, perforated drainpipe embedded in a minimum 2-foot-wide zone of crushed drain rock that extends up to 6 inches BGS and is wrapped in a drainage geotextile. The invert elevation of the drainpipe

should be installed below the base of imported granular fill and base rock for the building and at least 18 inches below the finish floor elevation. The drain rock and drainage geotextile should meet the requirements specified in the "Materials" section.

7.3 SEISMIC DESIGN CRITERIA

7.3.1 ASCE 7-16 Seismic Design Parameters

Since the school is classified as a special occupancy structure, SOSSC requires a site-specific seismic evaluation. Seismic design criteria for this project will be based on the 2019 SOSSC and ASCE 7-16. A site-specific seismic evaluation was completed, the results of which are presented in Appendix F.

7.3.2 Liquefaction and Lateral Spreading

Liquefaction is caused by a rapid increase in pore water pressure that reduces the effective stress between soil particles to near zero. Granular soil, which relies on interparticle friction for strength, is susceptible to liquefaction until the excess pore pressures can dissipate. In general, loose, saturated sand soil with low silt and clay content is the most susceptible to liquefaction. Saturated silty soil with low plasticity is moderately susceptible to liquefaction or cyclic failure under relatively higher levels of ground shaking. We did not encounter any significant amount of soil considered to be susceptible to liquefaction or cyclic failure at the site. Since the site is not near an open face with saturated conditions and has low susceptibility to liquefaction, lateral spreading is expected to be negligible at this site.

7.4 SHALLOW FOUNDATION RECOMMENDATIONS

7.4.1 General

Based on the results of our explorations and analysis, the proposed school building and other associated structures can be supported by conventional spread footings bearing on a minimum 3-inch-thick layer of crushed rock underlain by undisturbed native soil or structural fill overlying firm native soil. Foundations should not be established on undocumented fill, soft soil, or soil containing deleterious material. If present, this material should be removed and replaced with granular pads.

We recommend placing a minimum 3-inch-thick granular pad over the footing subgrades to protect from disturbance since the silt and silty subgrades will be prone to disturbance during wet weather and the sand or sandy subgrades will be prone to disturbance when dry. If granular pads greater than 6 inches thick are required for the removal of unsuitable materials below footings, the granular pads should extend 6 inches beyond the margins of the footings for every foot excavated below the base grade of the footing. The granular pads should consist of imported granular material, as defined in the "Structural Fill" section. The imported granular material for granular pads 1 foot thick or greater should be compacted to not less than 95 percent of the maximum dry density, as determined by ASTM D1557, or until well-keyed, as determined by one of our geotechnical staff. We recommend that a member of our geotechnical staff observe prepared footing subgrades and granular pads.

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Appendix E

Operations and Maintenance Plan

The operations and maintenance plan will be included in the final version of this document.

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111 SW 5th Avenue, Suite 2600, Portland, OR 97204
503-542-3860 | **www.kpff.com**

GeoDesign Inc
An NV5 Company

REPORT OF GEOTECHNICAL ENGINEERING SERVICES

Athey Creek Middle School – Office Addition and Renovations
2900 SW Borland Road
Tualatin, Oregon

For
West Linn-Wilsonville School District
June 24, 2020

GeoDesign Project: WLWSchDist-5-01

GeoDesign Inc
AN NV5 COMPANY

June 24, 2020

West Linn-Wilsonville School District
22210 SW Stafford Road
Tualatin, OR 97062

Attention: Ryan Hendricks

Report of Geotechnical Engineering Services
Athey Creek Middle School – Office Addition and Renovations
2900 SW Borland Road
Tualatin, Oregon
GeoDesign Project: WLWSchDist-5-01

GeoDesign, Inc. is pleased to submit this report of geotechnical engineering services for the planned new office addition and renovations to Athey Creek Middle School located at 2900 SW Borland Road in Tualatin, Oregon. Our services for this project were conducted in accordance with our proposal dated May 21, 2020.

We appreciate the opportunity to be of service to you. Please call if you have questions regarding this report.

Sincerely,

GeoDesign, Inc.

Shawn M. Dimke, P.E., G.E.
Principal Engineer

cc: Peder Goldberg, JG Pierson, Inc. (via email only)

SMD:kt
Attachments
One copy submitted (via email only)
Document ID: WLWSchDist-5-01-062420-geor.docx

EXECUTIVE SUMMARY

The following is a summary of our findings and recommendations for design and construction of the proposed school improvements. This executive summary is limited to an overview of the project. We recommend that the report be referenced for a more thorough description of the subsurface conditions and geotechnical recommendations for the project.

- Based on the assumed foundation loads, the proposed structure can be supported on shallow foundations bearing on granular pads constructed on firm native soil or soil compacted as structural fill as presented in the "Shallow Foundations" section.

- The on-site soil will generally provide poor support for construction equipment during the wet construction season or when wet of optimum, such as after the demolition of overlying pavement. Subgrade protection during construction will be important. Granular haul roads and working pads should be employed if earthwork will occur during the wet season or when subgrade is wet of optimum moisture content. The existing AC and aggregate base sections can be used as part of haul roads and staging areas.

- Based on the results of our shallow infiltration tests, the native soil has low infiltration rates, which generally increase slightly with depth. Unfactored infiltration results are provided in the "Infiltration Testing" section.

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ACRONYMS AND ABBREVIATIONS

AASHTO	American Association of State Highway and Transportation Officials
AC	asphalt concrete
ACP	asphalt concrete pavement
ASCE	American Society of Civil Engineers
ASTM	American Society for Testing and Materials
BGS	below ground surface
BSE	Basic Safety Earthquake
CPT	cone penetration test
CRBG	Columbia River Basalt Group
CSZ	Cascadia Subduction Zone
ESAL	equivalent single-axle load
fps	feet per second
g	gravitational acceleration (32.2 feet/second^2)
H:V	horizontal to vertical
IBC	International Building Code
km	kilometers
MCE	maximum considered earthquake
MCE_R	risk-targeted maximum considered earthquake
NA	not applicable
OSHA	Occupational Safety and Health Administration
OSSC	Oregon Standard Specifications for Construction (2018)
pcf	pounds per cubic foot
pci	pounds per cubic inch
PG	performance grade
psf	pounds per square foot
psi	pounds per square inch
SOSSC	State of Oregon Structural Specialty Code
SPT	standard penetration test
USGS	U.S. Geological Survey
Vs_{30}	shear wave velocity for the upper 100 feet (30 meters)

1.0 INTRODUCTION

GeoDesign, Inc. is pleased to submit this geotechnical engineering report for the planned new office addition and renovations to Athey Creek Middle School located in Tualatin, Oregon. Figure 1 shows the site relative to existing topographic and physical features. Figure 2 shows the existing site layout and our approximate exploration locations. Acronyms and abbreviations used herein are defined above, immediately following the Table of Contents.

Based on a preliminary site plan provided by you, we understand a new office building expansion will be constructed on the south side of the building at the location shown on Figure 2. We understand associated improvements for the new addition and renovations will include a new section of bus route through the existing parking lot and a new driveway to access renovated Career Technical Education spaces on the north side of the building.

Stormwater management plans were not known at the time of our report and explorations. Our scope of services included obtaining field-measured infiltration rates to evaluate the feasibility of shallow stormwater disposal on site. We conducted infiltration testing at three boring locations.

We understand the new office building expansion is anticipated to have a seismic gap between it and the existing building. Structural loading information was not available at the time of this report; however, column and wall loads are expected to be less than approximately 40 kips (dead plus live) and 4 kips per foot (dead plus live), respectively. The project area is relatively flat, so cuts and fills are expected to be less than a few feet each.

2.0 SCOPE OF SERVICES

The purpose of our geotechnical engineering services was to characterize site subsurface conditions and provide geotechnical engineering recommendations for use in design and construction of the proposed development. We completed the following scope of services:

- Reviewed readily available geotechnical reports, geologic mapping, aerial photographs, and topographic data for the site and vicinity.
- Coordinated utility locates, site access, and subconsultant services for the subsurface explorations.
- Completed a subsurface exploration program that included the following:
  - Drilled one boring (B-3) to a depth of up to 26.5 feet BGS within the planned office addition area.
  - Drilled five borings (B-1, B-2, B-3, B-4, and C-1) to depths between 6.5 and 11.5 feet BGS to evaluate the existing pavement section and subgrade conditions in the planned new bus route area and facilitate infiltration testing. The exploration logs are presented in Appendix A.
  - Advanced one CPT probe within the planned office addition area to a depth of 73.2 feet BGS. Performed shear wave velocity testing at 1- to 2-meter intervals to assist in estimating the seismic site class and to provide shear wave velocities for the site-specific ground motion analysis. Pore-water dissipation testing was also conducted to help evaluate the static groundwater depth. The CPT log is presented in Appendix B.

- Classified the material encountered, collected soil samples for laboratory testing, and maintained a log of soil and groundwater conditions encountered in each boring.
- Completed laboratory analyses on disturbed and undisturbed soil samples collected from the borings as follows:
  - Fifteen moisture content determinations in general accordance with ASTM D2216
  - Six percent fines determinations in general accordance with ASTM D1140
  - One consolidation test in general accordance with ASTM D2435
- Provided recommendations for site preparation and grading, including demolition, temporary and permanent slopes, fill placement criteria, suitability of on-site soil for fill, subgrade preparation, and wet weather construction.
- Provided shallow foundation support recommendations, including allowable bearing capacity, settlement estimates, and lateral resistance parameters.
- Provided recommendations for preparation of floor slab subgrades.
- Evaluated groundwater conditions at the site and provided general recommendations for dewatering during construction and subsurface drainage, if required.
- Evaluated seismic hazards, including liquefaction, lateral spreading, and ground rupture.
- Provided recommendations for on-site pavement sections, including subbase, base course, and AC paving thickness.
- Prepared a site-specific seismic hazard study in accordance with ASCE 7-16 and the 2019 SOSSC as required for essential occupancy classified buildings.
- Provided BSE-1N and BSE-2N seismic design parameters in accordance with ASCE 41-13 for the seismic evaluation of existing building areas.
- Prepared this geotechnical report summarizing our explorations, laboratory testing, and recommendations.

3.0 SITE CONDITIONS

3.1 REGIONAL GEOLOGY

The site is located in a drainage valley of the Tualatin River where the river flows from the Tualatin Basin to the northwest to the Willamette River, located southeast of the site. The drainage valley is located in the southeast portion of Tualatin Basin physiographic province, which is a northwest- to southwest-trending, pull-apart sub-basin of the Willamette Valley (Wilson, 1998). The Tualatin Basin is separated from adjacent sub-basins of the Willamette Valley by slightly folded and faulted Columbia River Basalt bedrock, which forms topographic divides between adjacent basins (Popowski, 1997). The Coast Range and Chehalem Mountains bound the Tualatin Basin to the west, and the Tualatin Mountains (Portland Hills) bound the Tualatin Basin to the east.

The region has undergone large-scale and localized tectonic activity that has formed the geologic structure in the northern Willamette Valley (Burns et al., 1997). The bedrock and older basin fill sediments in the area have been faulted generally in a northwest- and northeast-trending pattern. A majority of these faults are considered to be inactive (Personius, 2002). A detailed discussion of Quaternary Age (less than 12,000 years old) faulting is presented in Appendix C.

The generalized geologic subsurface profile at the site consists of surficial catastrophic Missoula flood deposits, basin fill sedimentary deposits, and basalt bedrock belonging to the CRBG. The

late Pleistocene (15,500 to 13,000 years before present) Missoula flood deposits are generally composed of unconsolidated sand to silt deposited as backwater flood sediments. Near the site vicinity the surficial deposits are reported to be approximately 100 feet thick (Madin, 1990).

The flood deposits are underlain by the Pliocene Age (5 million to 2 million years before present) Sandy River Mudstone equivalent, which represents the majority of the basin fill deposits in the Tualatin Valley (Madin, 1990). The unit is described as moderately to poorly consolidated siltstone, sandstone, mudstone, and claystone. Near the site vicinity the basin fill deposits extend to approximately 300 feet BGS (Madin, 1990).

The basin fill deposits are underlain by the Miocene Age (20 million to 10 million years before present) CRBG, which represent a series of basalt flows that originated from southeast Washington and northeast Oregon and filled the pre-Willamette Valley lowlands. The CRBG is considered the geologic basement unit for this report (Madin, 1990).

3.2 SURFACE CONDITIONS

The Athey Creek Middle School site is accessed by an approximately 800-foot-long, paved access driveway extending to the north from SW Borland Road. A main parking lot is located on the south side of the school, and a smaller parking lot on the north side of the school is accessed by a paved driveway that circles the perimeter of the school. Sports field are located to the north, west, and south of the school and parking lots. The West-Linn Wilsonville School District operations center borders the east side of the site, beyond which is Stafford Elementary School. To the north of the school property there is an agricultural field, beyond which is the south bank of the Tualatin River. Vegetation on site consists of maintained grass turf, landscaped vegetation in the vicinity of the school, and periodically maintained shrubs and mature trees. The site is generally flat with elevations around the school and adjacent parking lots ranging between approximately 181 and 187 feet above mean sea level based on Google Earth.

3.3 SUBSURFACE CONDITIONS

3.3.1 General

Our subsurface exploration program consisted of drilling five borings (B-1 through B-4 and C-1) to depths between 6.5 and 26.5 feet BGS and advancing one CPT probe (CPT-1) to a depth of 73.2 feet BGS. We conducted infiltration testing in three borings (B-1, B-2, and B-4). The approximate locations of the explorations are shown on Figure 2. The boring logs and laboratory test results are presented in Appendix A. The CPT log is presented in Appendix B.

The soil at the site generally consists of medium stiff to stiff, sandy silt and loose to dense, silty sand.

3.3.2 Root Zone and AC Section

A 4-inch-thick root zone was observed in boring B-4. A pavement section consisting of 3.0 to 4.0 inches of AC underlain by 12.0 to 26.5 inches of aggregate base was encountered in all the other borings.

3.3.3 Native Soil

Native soil below the pavement section or directly beneath the ground surface generally consists of silt with variable sand and silty sand. The silt is medium stiff to very stiff and the sand is loose to dense. The sand content generally increases with depth and the deeper CPT probe indicates the density of the sand generally increases with depth. The tested moisture contents of the silt and sand ranged from 14 to 31 percent at the time of our explorations.

3.3.4 Groundwater

We did not observe groundwater in any of our boring explorations, and pore water pressure dissipation tests from the CPT probe indicate the static groundwater level is at a depth of 68 feet BGS. Depth to groundwater may fluctuate in response to prolonged rainfall, seasonal changes, changes in surface topography, and other factors not observed during this study.

3.4 INFILTRATION TESTING

Infiltration testing was completed to assist in the evaluation of potential stormwater infiltration facilities for the project. We conducted infiltration testing at shallow depths in borings B-1, B-2, and B-4. Infiltration testing was performed using the encased falling head method using a 6-inch-inside diameter casing and approximately 12 to 24 inches of water head.

Laboratory testing was performed on select soil samples to determine the percent fines content at the infiltration test depths. Table 1 summarizes the unfactored infiltration test results and the amount of fines present at the depth of the infiltration tests.

Table 1. Unfactored Infiltration Rates

Location	Depth (feet BGS)	Material	Infiltration Rate (inches per hour)	Fines Content[1] (percent)
B-1	2	Sandy SILT	1.2	63
B-1	5	Sandy SILT	6	56
B-2	5	Silty SAND	5	44
B-4	2	SILT, minor sand	1	91
B-4	5	Sandy SILT	0.5	70

1. Fines content: material passing a U.S. Standard No. 200 sieve

Correction factors should be applied to the measured infiltration rates to account for soil variations and the potential for long-term clogging due to siltation and buildup of organic material. The infiltration rates shown in Table 1 are short-term field rates and factors of safety have not been applied. We recommend a minimum factor of safety of at least 2 be applied to the field infiltration values presented above.

If built, we recommend that installation of infiltration facilities be observed by a qualified geotechnical engineer to confirm that the soil conditions are consistent with our observations during our explorations and that verification testing be completed.

4.0 CONCLUSIONS

Based on the results of our subsurface explorations and engineering analyses, it is our opinion that the site can be developed as proposed. The primary geotechnical considerations for the project are summarized in the "Executive Summary." Our specific recommendations are provided in the following sections.

5.0 DESIGN

5.1 GENERAL

The following sections provide our design recommendations for the project. All site preparation and structural fill should be prepared as recommended in the "Construction" section.

5.2 SHALLOW FOUNDATIONS

5.2.1 General

Based on the results of our explorations and analysis, new structural loads for the building expansion and improvements can be supported by conventional spread footings bearing on granular pads underlain by firm, undisturbed soil. Foundations should not be established on undocumented fill, soft soil, or soil containing deleterious material. If present, this material should be removed and replaced with granular pads.

The granular pads should be a minimum of 6 inches thick and should consist of imported granular material, as defined in the "Structural Fill" section. The imported granular material should be compacted to not less than 95 percent of the maximum dry density, as determined by ASTM D1557, or until well-keyed, as determined by one of our geotechnical staff. We recommend a member of our geotechnical staff observe the prepared footing subgrade and the prepared granular pad.

5.2.2 Dimensions and Capacities

Continuous wall and isolated spread footings should be at least 18 and 24 inches wide, respectively. The bottom of exterior footings should be at least 18 inches below the lowest adjacent exterior grade. The bottom of interior footings should be established at least 12 inches below the base of the slab.

Footings bearing on subgrade prepared as recommended above should be sized based on an allowable bearing pressure of 2,500 psf. This is a net bearing pressure; the weight of the footing and overlying backfill can be ignored in calculating footing sizes. The recommended allowable bearing pressure applies to the total of dead plus long-term live loads and may be doubled for short-term loads such as those resulting from wind or seismic forces.

5.2.3 Resistance to Sliding

Lateral loads on footings can be resisted by passive earth pressure on the sides of the structure and by friction on the base of the footings. Our analysis indicates the available passive earth pressure for footings confined by native soil and structural fill is 300 pcf, modeled as an equivalent fluid pressure. Typically, the movement required to develop the available passive resistance may be relatively large; therefore, we recommend using a reduced passive pressure of

250 pcf equivalent fluid pressure. Adjacent floor slabs, pavement, or the upper 12-inch depth of adjacent, unpaved areas should not be considered when calculating passive resistance.

For footings bearing on granular pads, a coefficient of friction equal to 0.40 may be used when calculating resistance to sliding.

5.2.4 Settlement

Based on the anticipated foundation loads, post-construction settlement of footings and floor slabs founded as recommended is anticipated to be less than 1 inch. Differential settlement between similarly loaded, newly constructed foundation elements should be approximately one-half of the total settlement. Differential settlement between structurally isolated new and existing foundation elements may range up to the total estimated settlement. Differential settlement between abutting existing and new foundation elements can be reduced by structurally tying the new and existing foundation elements together.

5.2.5 Subgrade Observation

All footing and floor subgrades should be evaluated by a representative of GeoDesign to evaluate bearing conditions. Observations should also confirm that all loose or soft material, organic material, unsuitable fill, prior topsoil zones, and softened subgrades (if present) have been removed. Localized deepening of footing excavations may be required to penetrate deleterious material.

5.3 FLOOR SLABS

Satisfactory subgrade support for building floor slabs supporting up to 100 psf areal loading can be obtained on the existing undisturbed native silt or on structural fill. To help reduce moisture transmission and slab shifting, we recommend a minimum 6-inch-thick layer of floor slab base rock be placed and compacted over a subgrade that has been prepared in conformance with the "Site Preparation" section. The floor slab base rock should meet the requirements in the "Structural Fill" section and compacted to at least 95 percent of ASTM D1557. A modulus of reaction of 150 pci can be used for slabs on grade constructed on subgrade prepared as recommended in the "Site Preparation" section.

Flooring manufacturers often require vapor barriers to protect flooring and flooring adhesives. Many flooring manufacturers will warrant their product only if a vapor barrier is installed according to their recommendations. Selection and design of an appropriate vapor barrier, if needed, should be based on discussions among members of the design team. We can provide additional information to assist you with your decision.

All slab subgrades should be evaluated by the geotechnical engineer to confirm suitable bearing conditions. Observations should also confirm that loose or soft material, organic material, unsuitable fill, prior topsoil zones, and softened subgrades have been removed and replaced with structural fill. In addition, contaminated base rock for the slabs should be removed and replaced prior to pouring the slab.

5.4 SEISMIC DESIGN CONSIDERATIONS

Since the school is classified as a special occupancy structure, a site-specific seismic hazard evaluation is required by the 2019 SOSSC. Our evaluation is presented in Appendix C.

5.4.1 IBC Parameters

Based on our site-specific seismic hazard evaluation, it is our opinion that amplification factors prescribed by ASCE-7-16 for a seismic Site Class D provided in Table 2 are appropriate for design of the seismically isolated new building addition. The site class is based on the results of the shear wave velocity testing in the CPT probe.

Table 2. IBC Seismic Design Parameters*

Seismic Design Parameter	Short Period (T_s = 0.2 second)	1 Second Period (T_1 = 1.0 second)
MCE Spectral Acceleration, S	S_s = 0.851 g	S_1 = 0.386 g
Site Class	D	
Site Coefficient, F	F_a = 1.2	F_v = 1.924
Adjusted Spectral Acceleration, S_M	S_{MS} = 1.021 g	S_{M1} = 0.743 g
Design Spectral Response Acceleration Parameters, S_D	S_{DS} = 0.681 g	S_{D1} = 0.495 g

* The above parameters can be used provided the seismic response coefficient, C_s, is determined according to the exception in ASCE 7-16 Section 11.4.8 or else a site-specific response analysis will be required.

5.4.2 Seismic Evaluation and Retrofit Parameters

Tables 3 and 4 present seismic design parameters prescribed by ASCE 41-13 based on a selected Site Class D for evaluation and retrofit of the existing building.

Table 3. ASCE 41-13 BSE-2N Seismic Design Parameters

Parameter	Short Period (T_s = 0.2 second)	1 Second Period (T_1 = 1.0 second)
MCE Spectral Acceleration, S	S_s = 0.963 g	S_1 = 0.416 g
Site Class	D	
Site Coefficient, F	F_a = 1.115	F_v = 1.584
Adjusted Spectral Acceleration, S_X	S_{XS} = 1.074 g	S_{X1} = 0.659 g

Table 4. ASCE 41-13 BSE-1N Seismic Design Parameters

Parameter	Short Period (T_s = 0.2 second)	1 Second Period (T_1 = 1.0 second)
MCE Spectral Acceleration, S	S_s = 0.963 g	S_1 = 0.416 g
Site Class	D	
Site Coefficient, F	F_a = 1.115	F_v = 1.584
Adjusted Spectral Acceleration, S_X	S_{XS} = 1.074 g	S_{X1} = 0.659 g
Design Spectral Acceleration, S_X	S_{XS} = 0.716 g	S_{X1} = 0.439 g

5.5 PAVEMENTS

5.5.1 Design Assumptions and Parameters

At the time this report was prepared we had not been provided with anticipated traffic volumes and distribution. Based on the school facility proposed, we assume traffic will consist primarily of passenger cars and busses. We anticipate that AC pavement will be used for passenger car drive aisles and parking areas. Pavement should be installed on undisturbed native subgrade, scarified and re-compacted soil, or new engineered fills as described in the "Site Preparation" and "Structural Fill" sections.

Our pavement recommendations are based on the following assumptions:

- A design life of 20 years for AC.
- A resilient modulus of 20,000 psi was estimated for aggregate base.
- Initial and terminal serviceability indices of 4.2 and 2.0 for AC.
- Reliability of 85 percent and standard deviation of 0.45 for AC.
- Structural coefficients of 0.42 and 0.10 for the AC and aggregate base, respectively.
- The number of buses and trucks indicated below, plus trucks are assumed to be 50 percent two-axle and 50 percent three-axle trucks. We have not included a growth factor. Analysis of alternative traffic assumptions can be completed if requested.
- A resilient modulus of 4,500 psi for subgrade prepared in accordance with the "Site Preparation" section.

If any of these assumptions are incorrect, our office should be contacted with the appropriate information so that the pavement designs can be revised.

5.5.2 Flexible AC Pavement Recommendations

Based on the traffic assumptions provided above, we recommend the AC pavement sections in Table 5.

Table 5. Recommended Standard Pavement Sections

Pavement Use	Busses per Day	Trucks per Day[1]	ESALs	AC Thickness (inches)	Aggregate Base Thickness (inches)
Automobile Parking	0	0	10,000	2.5	9.0
Automobile-Only Drive Aisles	0	0	50,000	3.0	10.0
Bus Areas	10	10	103,000	4.0	12.0
	20	10	161,000	4.5	12.0
	30	10	219,000	4.5	13.0

1. Trucks assumed to be 50 percent two-axle and 50 percent three-axle trucks.

If the subgrade is cement amended to the thicknesses indicated below and the amended soil achieves a seven-day unconfined compressive strength of at least 100 psi, the pavement can be constructed as recommended in Table 6.

Table 6. Recommended Pavement Sections Using Cement Amendment

Pavement Use	Busses per Day	Trucks per Day[1]	ESALs	AC Thickness (inches)	Aggregate Base Thickness (inches)	Cement Amendment[2] (inches)
Automobile Parking	0	0	10,000	2.5	4.0	12.0
Automobile-Only Drive Aisles	0	0	50,000	3.0	4.0	12.0
Bus Areas	10	10	103,000	4.0	5.0	12.0
	20	10	161,000	4.5	5.0	12.0
	30	10	219,000	4.5	6.0	12.0

1. Trucks assumed to be 50 percent two-axle and 50 percent three-axle trucks.
2. Assumes a minimum seven-day unconfined compressive strength of 100 psi.

All thicknesses are intended to be the minimum acceptable. The design of the recommended pavement section is based on the assumption that construction will be completed during an extended period of dry weather. Wet weather construction could require an increased thickness of aggregate base. In addition, to prevent strength loss during curing, cement-amended soil should be allowed to cure for at least four days prior to construction traffic or placing the base rock. Lastly, the amended subgrade should be protected with a minimum of 4 inches of base rock prior to construction traffic access.

Construction traffic should be limited to non-building, unpaved portions of the site or haul roads. Construction traffic should not be allowed on new pavement. If construction traffic is to be allowed on newly constructed road sections, an allowance for this additional traffic will need to be made in the design pavement section.

The AC, aggregate base, and cement amendment should meet the requirements outlined in the "Structural Fill" section.

5.6 DRAINAGE

5.6.1 Temporary

During work at the site, the contractor should be made responsible for temporary drainage of surface water as necessary to prevent standing water and/or erosion at the working surface. During rough and finished grading of the site, the contractor should keep all pads and subgrade free of ponding water.

5.6.2 Surface

The ground surface at finished pads should be sloped away from their edges at a minimum 2 percent gradient for a distance of at least 5 feet. Roof drainage from the buildings should be directed into solid, smooth-walled drainage pipes that carry the collected water to the storm drain system.

5.6.3 Subsurface

In our opinion, perimeter drains are not required for the improvements. If perimeter drains are desired, they should consist of a filter fabric-wrapped, drain rock-filled trench that extends at least 12 inches below the lowest adjacent grade (i.e., slab subgrade elevation). A perforated pipe should be placed at the base to collect water that gathers in the drain rock. The drain rock and filter fabric should meet specifications outlined in the "Materials" section. Discharge for the footing drain should not be tied directly into the stormwater drainage system, unless mechanisms are installed to prevent backflow.

5.6.4 Stormwater Infiltration Systems

Infiltration testing was completed in explorations to evaluate the feasibility of shallow infiltration systems. The infiltration rate will depend on the fines content and consistency of the soil. Tested rates ranged from 0.5 inch to 6 inches per hour and rates generally increased with greater depth. The unfactored field rates in Table 1 can be used for design. It is the responsibility of the designer to include the appropriate factors of safety for the systems.

We recommend that GeoDesign observe the soil conditions and complete confirmation testing during construction to verify the field rates meet the design rates. Due to the presence of variable fines contents, it may be necessary to enlarge or deepen systems during construction. Furthermore, we recommend including a contingency to deepen infiltration systems or add additional infiltration systems in other portions of the site during construction if tested rates at the time of construction are unsuitable.

5.7 PERMANENT SLOPES

Permanent cut or fill slopes on the site should not exceed a gradient of 2H:1V, unless specifically evaluated for stability. Slopes that will be maintained by mowing should not be constructed steeper than 3H:1V. Slopes should be planted with appropriate vegetation to provide protection against erosion as soon as possible after grading. Surface water runoff should be collected and directed away from slopes to prevent water from running down the face of the slope.

6.0 CONSTRUCTION

6.1 SITE PREPARATION

6.1.1 Demolition

Site development will include demolition and removal of existing structures, utilities, or other buried elements that may be present underneath areas to be improved. Demolition includes complete removal of pavement, concrete walkways, curbs, and landscaped areas that will be within the proposed areas to be improved. Utility lines abandoned under new structural components should be completely removed and backfilled with structural fill or grouted full if left in place.

Excavations should be performed as recommended in the "Excavation" section. Excavations left from demolition and removal of existing structures should be backfilled with compacted structural fill in accordance with the recommendations in the "Structural Fill" section.

6.1.2 Stripping and Grubbing

The existing lawn and landscaped areas, including the topsoil zone, should be stripped and removed from all proposed structural fill, pavement, and building areas and for a 5-foot margin around these areas. Based on our observations, the average depth of stripping will be approximately 3 inches, although greater stripping depths may be required to remove localized zones of loose, soft, or organic soil. The actual stripping depth should be based on field observations at the time of construction. Stripped material should be transported off site for disposal or used in landscaped areas.

Trees and shrubs should be removed from fill areas. In addition, root balls should be grubbed out to the depth of the roots, which could exceed 3 feet BGS. Depending on the methods used to remove the root balls, considerable disturbance and loosening of the subgrade could occur during site grubbing. We recommend that soil disturbed during grubbing operations be removed to expose firm, undisturbed subgrade. The resulting excavations should be backfilled with structural fill.

6.1.3 Subgrade Evaluation

Upon completion of stripping and subgrade stabilization, and prior to the placement of fill or pavement improvements, the exposed subgrade should be evaluated by proof rolling. The subgrade should be proof rolled with a fully loaded dump truck or similarly heavy, rubber tire construction equipment to identify soft, loose, or unsuitable areas. A member of our geotechnical staff should observe proof rolling to evaluate yielding of the ground surface. During wet weather or when the surficial soil is more than a couple percentage points above the optimum moisture content for compaction, subgrade evaluation should be performed by

probing with a foundation probe rather than proof rolling. Areas that appear soft or loose should be improved in accordance with subsequent sections of this report.

6.2 SUBGRADE PROTECTION

The fine-grained soil present on this site is easily disturbed. If not carefully executed, site preparation, utility trench work, and excavations can create extensive soft areas and significant repair costs can result. Earthwork planning, regardless of the time of year, should include considerations for minimizing subgrade disturbance.

If construction occurs during or extends into the wet season, or if the moisture content of the surficial soil is more than a couple percentage points above optimum, site stripping and cutting may need to be accomplished using track-mounted equipment. Likewise, the use of granular haul roads and staging areas will be necessary for support of construction traffic during the rainy season or when the moisture content of the surficial soil is more than a few percentage points above optimum. The base rock thickness for pavement areas is intended to support post-construction design traffic loads. This design base rock thickness may not support construction traffic or pavement construction when the subgrade soil is wet. Accordingly, if construction is planned for periods when the subgrade soil is wet, staging and haul roads with increased thicknesses of base rock will be required.

The amount of staging and haul road areas, as well as the required thickness of granular material, will vary with the contractor's sequencing of a project and type/frequency of construction equipment. Based on our experience, between 12 and 18 inches of imported granular material is generally required in staging areas and between 18 and 24 inches in haul roads areas. Stabilization material may be used as a substitute, provided the top 4 inches of material consists of imported granular material. The actual thickness will depend on the contractor's means and methods and, accordingly, should be the contractor's responsibility. In addition, a geotextile fabric should be placed as a barrier between the subgrade and imported granular material in areas of repeated construction traffic. The imported granular material, stabilization material, and geotextile fabric should meet the specifications in the "Materials" section.

As an alternative to thickened crushed rock sections, haul roads and utility work zones may be constructed using cement-amended subgrades overlain by a crushed rock wearing surface. If this approach is used, the thickness of granular material in staging areas and along haul roads can typically be reduced to between 6 and 9 inches. This recommendation is based on an assumed minimum unconfined compressive strength of 100 psi for subgrade amended to a depth of 12 to 16 inches. The actual thickness of the amended material and imported granular material will depend on the contractor's means and methods and, accordingly, should be the contractor's responsibility. Cement amendment is discussed in the "Structural Fill" section.

6.3 EXCAVATION

6.3.1 Excavation and Shoring

Temporary excavation sidewalls should stand vertical to a depth of approximately 4 feet, provided groundwater seepage is not observed in the sidewalls. Open excavation techniques may be used to excavate trenches with depths between 4 and 8 feet, provided the walls of the

excavation are cut at a slope of 1H:1V and groundwater seepage is not present. At this inclination, the slopes may slough and require some ongoing repair. Excavations should be flattened to 1½H:1V if excessive sloughing or raveling occurs. In lieu of large and open cuts, approved temporary shoring may be used for excavation support. A wide variety of shoring and dewatering systems are available. Consequently, we recommend that the contractor be responsible for selecting the appropriate shoring and dewatering systems.

If box shoring is used, it should be understood that box shoring is a safety feature used to protect workers and does not prevent caving. If the excavations are left open for extended periods of time, caving of the sidewalls may occur. The presence of caved material will limit the ability to properly backfill and compact the trenches. The contractor should be prepared to fill voids between the box shoring and the sidewalls of the trenches with sand or gravel before caving occurs.

If shoring is used, we recommend that the type and design of the shoring system be the responsibility of the contractor, who is in the best position to choose a system that fits the overall plan of operation. All excavations should be made in accordance with applicable OSHA and state regulations.

6.3.2 Trench Dewatering

Excavations are not expected to encounter the static groundwater table. However, perched groundwater may be encountered after prolonged wet periods. Dewatering systems are best designed by the contractor. It may be possible to remove groundwater encountered by pumping from a sump in the trenches. More intense use of pumps may be required at certain times of the year and where more intense seepage occurs. Removed water should be routed to a suitable discharge point.

If groundwater is present at the base of utility trench excavations, we recommend placing up to 12 inches of stabilization material at the base of the excavations. Trench stabilization material should meet the requirements provided in the “Structural Fill” section.

We note that these recommendations are for guidance only. Dewatering of excavations is the sole responsibility of the contractor, as the contractor is in the best position to select these systems based on their means and methods.

6.3.3 Safety

All excavations should be made in accordance with applicable OSHA requirements and regulations of the state, county, and local jurisdiction. While this report describes certain approaches to excavation and dewatering, the contract documents should specify that the contractor is responsible for selecting excavation and dewatering methods, monitoring the excavations for safety, and providing shoring (as required) to protect personnel and adjacent structural elements.

6.4 MATERIALS

6.4.1 Structural Fill

6.4.1.1 General

Fill should be placed on subgrade that has been prepared in conformance with the "Site Preparation" section. A variety of material may be used as structural fill at the site. However, all material used as structural fill should be free of organic material or other unsuitable materials and should meet the specifications provided in OSSC 00330 (Earthwork), OSSC 00400 (Drainage and Sewers), and OSSC 02600 (Aggregates), depending on the application. A brief characterization of some of the acceptable materials and our recommendations for their use as structural fill are provided below.

6.4.1.2 On-Site Soil

The material at the site should be suitable for use as general structural fill, provided it is properly moisture conditioned; free of debris, organic material, and particles over 4 inches in diameter; and meets the specifications provided in OSSC 00330.12 (Borrow Material).

Based on laboratory test results, the moisture content of the on-site silt and silty soil is above the optimum moisture content for compaction. We estimate the optimum moisture content for compaction to be approximately 16 to 19 percent for the on-site soil. Moisture conditioning (drying) will be required to use on-site soil for structural fill. Accordingly, extended dry weather will be required to adequately condition and place the soil as structural fill. It will be difficult, if not impossible, to adequately compact on-site soil during the rainy season or during prolonged periods of rainfall.

When used as structural fill, native soil should be placed in lifts with a maximum uncompacted thickness of 6 to 8 inches and compacted to not less than 92 percent of the maximum dry density for fine-grained soil and 95 percent of the maximum dry density for granular soil, as determined by ASTM D1557.

6.4.1.3 Imported Granular Material

Imported granular material used as structural fill should be pit- or quarry-run rock, crushed rock, or crushed gravel and sand and should meet the specifications provided in OSSC 00330.14 (Selected Granular Backfill) or OSSC 00330.15 (Selected Stone Backfill). The imported granular material should also be angular, should be fairly well graded between coarse and fine material, should have less than 5 percent by dry weight passing the U.S. Standard No. 200 sieve, and should have at least two fractured faces.

Imported granular material should be placed in lifts with a maximum uncompacted thickness of 12 inches and compacted to not less than 95 percent of the maximum dry density, as determined by ASTM D1557. During the wet season or when wet subgrade conditions exists, the initial lift should be approximately 18 inches in uncompacted thickness and should be compacted by rolling with a smooth-drum roller without using vibratory action.

6.4.1.4 Stabilization Material

Stabilization material used in staging or haul road areas or in trenches should consist of 4- or 6-inch-minus pit- or quarry-run rock, crushed rock, or crushed gravel and sand and should meet

the specifications provided in OSSC 00330.15 (Selected Stone Backfill). The material should have a maximum particle size of 6 inches, should have less than 5 percent by dry weight passing the U.S. Standard No. 4 sieve, and should have at least two mechanically fractured faces. The material should be free of organic material and other deleterious materials. Stabilization material should be placed in lifts between 12 and 24 inches thick and compacted to a firm condition.

6.4.1.5 Trench Backfill

Trench backfill placed beneath, adjacent to, and for at least 12 inches above utility lines (i.e., the pipe zone) should consist of well-graded granular material with a maximum particle size of 1½ inches and less than 10 percent by dry weight passing the U.S. Standard No. 200 sieve and should meet the specifications provided in OSSC 00405.13 (Pipe Zone Material). The pipe zone backfill should be compacted to at least 90 percent of the maximum dry density, as determined by ASTM D1557, or as required by the pipe manufacturer or local building department.

Within roadway alignments, the remainder of the trench backfill up to the subgrade elevation should consist of well-graded granular material with a maximum particle size of 2½ inches and less than 10 percent by dry weight passing the U.S. Standard No. 200 sieve and should meet the specifications provided in OSSC 00405.14 (Trench Backfill; Class B, C, or D). This material should be compacted to at least 90 percent of the maximum dry density, as determined by ASTM D1557, or as required by the pipe manufacturer or local building department. The upper 3 feet of the trench backfill should be compacted to at least 95 percent of the maximum dry density, as determined by ASTM D1557.

Outside of structural improvement areas (e.g., roadway alignments or building pads) trench backfill placed above the pipe zone may consist of general fill material that is free of organic material and material over 6 inches in diameter and meets the specifications provided in OSSC 00405.14 (Trench Backfill; Class A, B, C, or D). This general trench backfill should be compacted to at least 90 percent of the maximum dry density, as determined by ASTM D1557, or as required by the pipe manufacturer or local building department.

6.4.1.6 Drain Rock

Drain rock should consist of angular, granular material with a maximum particle size of 2 inches and should meet the specifications provided in OSSC 00430.11 (Granular Drain Backfill Material). The material should be free of roots, organic material, and other unsuitable materials; should have less than 2 percent by dry weight passing the U.S. Standard No. 200 sieve (washed analysis); and should have at least two mechanically fractured faces. Drain rock should be compacted to a well-keyed, firm condition.

6.4.1.7 Aggregate Base Rock

Imported granular material used as base rock for building floor slabs and pavement should consist of ¾- or 1½-inch-minus material (depending on the application) and meet the requirements in OSSC 00641 (Aggregate Subbase, Base, and Shoulders). In addition, the aggregate should have less than 5 percent by dry weight passing the U.S. Standard No. 200 sieve. The aggregate base should be compacted to not less than 95 percent of the maximum dry density, as determined by ASTM D1557.

6.4.1.8 Recycled Concrete and Recycled AC

Recycled concrete can be used for structural fill, provided the concrete is broken to a maximum particle size of 3 inches. This material can be used as trench backfill if it meets the requirements for imported granular material, which would require a smaller maximum particle size. The material should be placed in lifts with a maximum uncompacted thickness of 12 inches and compacted to not less than 95 percent of the maximum dry density as determined by ASTM D1557.

Recycled AC can be used for structural fill material below new impervious AC and exterior concrete areas, provided it is broken to a maximum particle size of 3 inches. The material should be placed in lifts with a maximum uncompacted thickness of 12 inches and compacted to not less than 95 percent of the maximum dry density, as determined by ASTM D1557.

6.4.2 Cement Amendment

6.4.2.1 General

Cement amendment can be used to stabilize subgrade and protect it from damage due to repeated construction traffic during wet conditions. Cement amendment can also serve as an alternative to the use of imported granular material for wet weather structural fill. Successful use of soil amendment depends on the use of correct mixing techniques, soil moisture content, and amendment quantities. The amount of cement used during amendment should be based on an assumed soil dry unit weight of 110 pcf.

6.4.2.2 Subbase Stabilization

Specific recommendations based on exposed site conditions for soil amending can be provided if necessary. However, for preliminary design purposes, we recommend a target strength for cement-amended subgrade for building and pavement subbase (below aggregate base) soil of 100 psi. The amount of cement used to achieve this target generally varies with moisture content and soil type. It is difficult to predict field performance of soil to cement amendment due to variability in soil response, and we recommend laboratory testing to confirm expectations. Generally, 5 percent cement by weight of dry soil can be used when the soil moisture content does not exceed approximately 20 percent. If the soil moisture content is in the range of 25 to 35 percent, 6 to 9 percent by weight of dry soil is recommended. The amount of cement added to the soil may need to be adjusted based on field observations and performance. Moreover, depending on the time of year and moisture content levels during amendment, water may need to be applied during tilling to appropriately condition the soil moisture content.

For building and pavement subbase, we recommend assuming a minimum cement ratio of 6 percent (by dry weight). If the soil moistures are in excess of 30 percent, a cement ratio of 7 to 8 percent will likely be needed. Due to the higher organic content and moisture, we recommend using a cement ratio of 8 percent when stabilizing topsoil (tilled) zone material for building and pavement subbase and anticipate that the cement will need to be applied in two 4 percent applications followed by multiple tilling passes with each application.

We recommend cement-spreading equipment be equipped with balloon tires to reduce rutting and disturbance of the fine-grained soil. A static sheepsfoot or segmented pad roller with a minimum static weight of 40,000 pounds should be used for initial compaction of the fine-

grained soil. A smooth-drum roller with a minimum applied linear force of 700 pounds per inch should be used for final compaction. The amended soil should be compacted to at least 92 percent of the achievable dry density at the moisture content of the material, as defined in ASTM D1557.

A minimum curing time of four days is required between amendment and construction traffic access. Construction traffic should not be allowed on unprotected, cement-amended subgrade. To protect the cement-amended surfaces from abrasion or damage, the finished surface should be covered with 4 to 6 inches of imported granular material.

Amendment depths for building/pavement, haul roads, and staging areas are typically on the order of 12, 16, and 12 inches, respectively. The crushed rock typically becomes contaminated with soil during construction. Contaminated base rock should be removed and replaced with clean rock in pavement areas. The actual thickness of the amended material and imported granular material for haul roads and staging areas will depend on the anticipated traffic and the contractor's means and methods and should be the contractor's responsibility.

Cement amending should not be attempted when the air temperature is below 40 degrees Fahrenheit or during moderate to heavy precipitation. Cement should not be placed when the ground surface is saturated or standing water exists.

6.4.2.3 Cement-Amended Structural Fill

On-site soil that is not suitable for structural fill due to high moisture content may be amended and placed as fill over a subgrade prepared in conformance with the "Site Preparation" section. The cement ratio for general cement-amended fill can generally be reduced by 1 percent (by dry weight). Typically, a minimum curing of four days is required between amendment and construction traffic access. Consecutive lifts of fill may be amended immediately after the previous lift has been amended and compacted (e.g., the four-day wait period does not apply). However, where the final lift of fill is a building or roadway subgrade, the four-day wait period is in effect for the final lift of cement-amended soil.

6.4.2.4 Other Considerations

Portland cement-amended soil is hard and has low permeability. This soil does not drain well and it is not suitable for planting. Future planted areas should not be cement amended, if practical, or accommodations should be made for drainage and planting. Moreover, cement amending soil within building areas must be done carefully to avoid trapping water under floor slabs. We should be contacted if this approach is considered. Cement amendment should not be used if runoff during construction cannot be directed away from adjacent wetlands (if any).

6.4.2.5 Specification Recommendations

We recommend that the following comments be included in the specifications for the project:

- In general, cement amending is not recommended during the cold weather (temperatures less than 40 degrees Fahrenheit) or during rainfall.
- Mixing Equipment
  - Use a pulverizer/mixer capable of uniformly mixing the cement into the soil to the design depth. Blade mixing will not be allowed.
  - Pulverize the soil-cement mixture such that 100 percent by dry weight passes a 1-inch sieve and a minimum of 70 percent passes the U.S. Standard No. 4 sieve, exclusive of gravel or stone retained on these sieves. If water is required, the pulverizer should be equipped to inject water to a tolerance of ¼ gallon per square foot of surface area.
  - Use machinery that will not disturb the subgrade, such as using low-pressure "balloon" tires on the pulverizer/mixer vehicle. If subgrade is disturbed, the tilling/amendment depth shall extend the full depth of the disturbance.
  - Multiple "passes" of the tiller will likely be required to adequately blend the cement and soil mixture.
- Spreading Equipment
  - Use a spreader capable of distributing the cement uniformly on the ground to within 5 percent variance of the specified application rate.
  - Use machinery that will not disturb the subgrade, such as using low-pressure "balloon" tires on the spreader vehicle. If subgrade is disturbed, the tilling/amendment depth shall extend the full depth of the disturbance.
- Compaction Equipment
  - Use a static, sheepsfoot or segmented pad roller with a minimum static weight of 40,000 pounds for initial compaction of fine-grained soil (silt and clay) or an alternate approved by the geotechnical engineer.

6.4.3 AC

The AC should be Level 2, ½-inch, dense ACP and compacted to 91 percent of the theoretical maximum density of the mix, as determined by AASHTO T 209. The minimum and maximum lift thickness should be 2.0 and 3.0 inches, respectively, for ½-inch ACP. Asphalt binder should be performance graded and conform to PG 64-22 or better.

6.4.4 Geotextile Fabric

6.4.4.1 Subgrade Geotextile Fabric

The subgrade geotextile should meet the specifications provided in OSSC Table 02320-4 – Geotextile Property Values for Subgrade Geotextile (Separation). The geotextile should be installed in conformance with OSSC 00350 (Geosynthetic Installation). A minimum initial aggregate base lift of 6 inches is required over geotextiles. All drainage aggregate and stabilization material should be underlain by a subgrade geotextile. Geotextile is not required where stabilization material is used at the base of utility trenches.

6.4.4.2 Drainage Geotextile Fabric

Drainage geotextile should meet the specifications provided in OSSC Table 02320-1 – Geotextile Property Values for Drainage Geotextile. The geotextile should be installed in conformance with OSSC 00350 (Geosynthetic Installation). A minimum initial aggregate base lift of 6 inches is required over geotextiles.

6.5 EROSION CONTROL

The site soil is susceptible to erosion; therefore, erosion control measures should be carefully planned and in place before construction begins. Surface water runoff should be collected and directed away from slopes to prevent water from running down the slope face. Erosion control measures (such as straw bales, sediment fences, and temporary detention and settling basins) should be used in accordance with local and state ordinances.

7.0 OBSERVATION OF CONSTRUCTION

Satisfactory foundation and earthwork performance depends to a large degree on quality of construction. Sufficient observation of the contractor's activities is a key part of determining that the work is completed in accordance with the construction drawings and specifications. Subsurface conditions observed during construction should be compared with those encountered during the subsurface exploration. Recognition of changed conditions often requires experience; therefore, qualified personnel should visit the site with sufficient frequency to detect if subsurface conditions change significantly from those anticipated.

We recommend that GeoDesign be retained to observe earthwork activities, including stripping, proof rolling of the subgrade and repair of soft areas, footing subgrade preparation, final proof rolling of the pavement subgrade and base rock, and AC placement and compaction, and performing laboratory compaction and field moisture-density tests.

8.0 LIMITATIONS

We have prepared this report for use by West Linn-Wilsonville School District and members of the design and construction team for the proposed project. The data and report can be used for bidding or estimating purposes, but our report, conclusions, and interpretations should not be construed as warranty of the subsurface conditions and are not applicable to other nearby building sites.

Exploration observations indicate soil conditions only at specific locations and only to the depths penetrated. They do not necessarily reflect soil strata or water level variations that may exist between exploration locations. If subsurface conditions differing from those described are noted during the course of excavation and construction, re-evaluation will be necessary.

The site development plans and design details were preliminary at the time this report was prepared. When the design has been finalized and if there are changes in the site grades or location, configuration, design loads, or type of construction, the conclusions and recommendations presented may not be applicable. If design changes are made, we request that we be retained to review our conclusions and recommendations and to provide a written modification or verification.

The scope does not include services related to construction safety precautions, and our recommendations are not intended to direct the contractor's methods, techniques, sequences, or procedures, except as specifically described in this report for consideration in design.

Within the limitations of scope, schedule, and budget, our services have been executed in accordance with generally accepted practices in this area at the time this report was prepared. No warranty, express or implied, should be understood.

♦ ♦ ♦

We appreciate the opportunity to be of service to you. Please call if you have questions concerning this report or if we can provide additional services.

Sincerely,

GeoDesign, Inc.

Shawn M. Dimke, P.E., G.E.
Principal Engineer

REFERENCES

ASCE, 2016. Minimum Design Loads for Buildings and Other Structures. ASCE Standard ASCE/SEI 7-016. American Society of Civil Engineers.

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Popowski, Thomas, A., 1997, Geology, Structure, and Tectonic History of the Tualatin Basin, Northwestern Oregon, Unpublished Master of Science Thesis, Oregon State University, 126 p.

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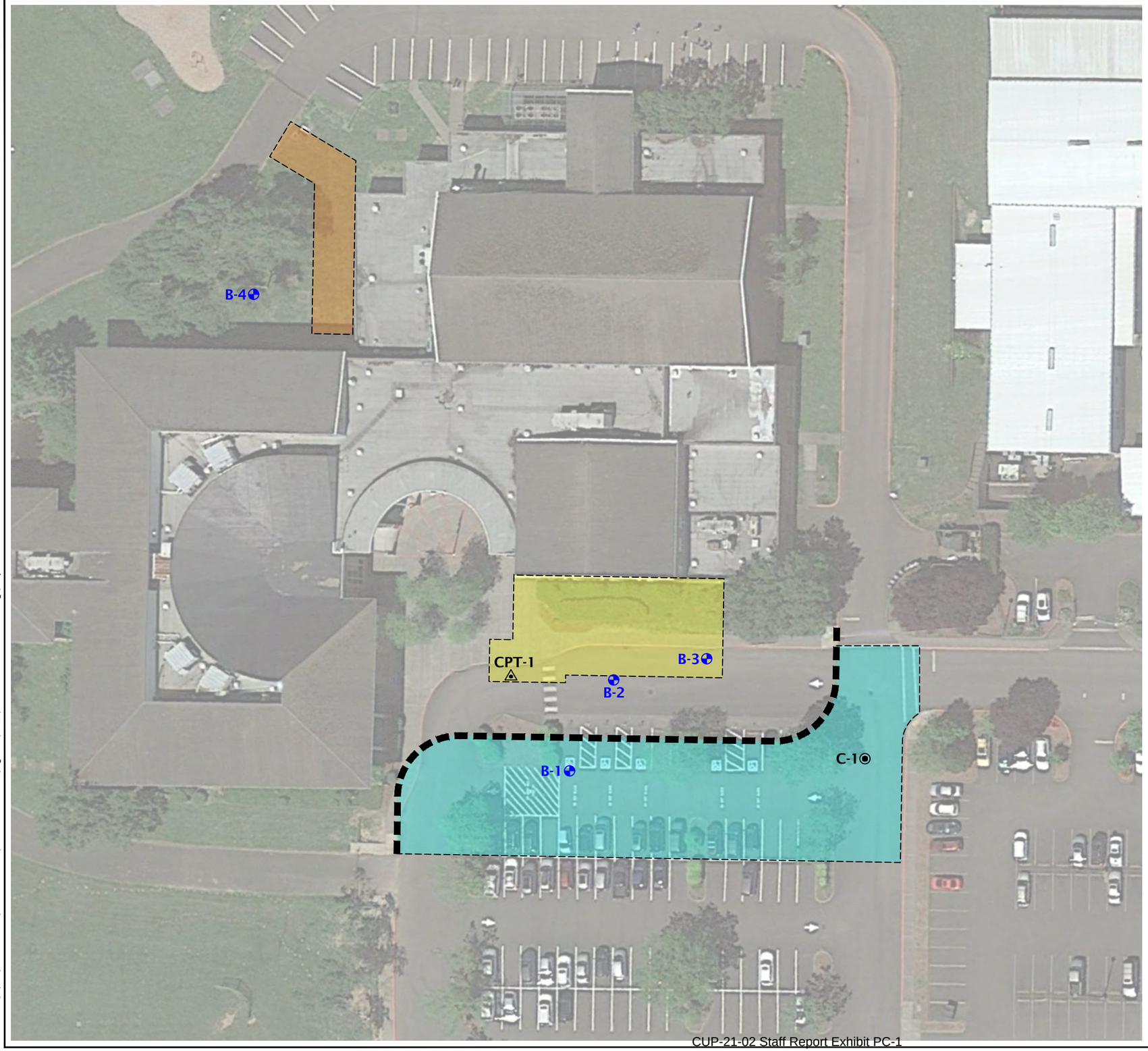
FIGURES

GEODESIGN INC AN NV5 COMPANY	WLWSCHDIST-5-01	**VICINITY MAP**	
	JUNE 2020	ACMS – OFFICE ADDITION AND RENOVATIONS TUALATIN, OR	**FIGURE 1**

Printed By: mmiller | Print Date: 6/24/2020 8:35:51 AM
File Name: J:\S-Z\WLWSchDist\WLWSchDist-5\WLWSchDist-5-01\Figures\CAD\WLWSchDist-5-01-VM01.dwg | Layout: FIGURE 1



LEGEND:

- B-1 — BORING
- C-1 — PAVEMENT CORE BORING
- CPT-1 — CONE PENETRATION TEST
- PROPOSED BUILDING EXPANSION AREA
- PROPOSED NEW VEHICLE ACCESS AREA
- PROPOSED NEW AC AREA
- PROPOSED NEW CURB LINE

N

0 50 100

(SCALE IN FEET)

SITE PLAN BASED ON AERIAL PHOTOGRAPH OBTAINED FROM GOOGLE EARTH PRO®, JUNE 10, 2020

SITE PLAN

ACMS – OFFICE ADDITION AND RENOVATIONS
TUALATIN, OR

FIGURE 2

WLWSCHDIST-5-01

JUNE 2020

GeoDesign NW
AN NV5 COMPANY

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APPENDIX A

APPENDIX A

FIELD EXPLORATIONS

GENERAL

We explored the site by drilling five borings (B-1 through B-4 and C-1) to depths between 6.5 and 26.5 feet BGS and completing one CPT probe (CPT-1) to a depth of 73.2 feet BGS. We performed infiltration testing in three borings: B-1 at 2 and 5 feet BGS, B-2 at 5 feet BGS, and B-4 at 2 and 5 feet BGS. The borings were drilled on June 2, 2020 using solid-stem auger drilling methods, in addition to a core drill used for C-1, by Dan J. Fischer Excavating, Inc. of Forest Grove, Oregon. The exploration logs are presented in this appendix. The CPT is described in Appendix B.

The approximate locations of our explorations are shown on Figure 2. Exploration locations were chosen based on preliminary site plans provided to our office by the project team and correspondence with CBRE Heery. The exploration locations were determined by pacing from existing site features and should be accurate implied by the methods used.

SOIL SAMPLING

The explorations were observed by a member of our geology staff. We collected representative samples of the various soils encountered in the explorations for geotechnical laboratory testing. Soil samples were collected from the borings using SPT sampling methods. SPTs were performed in general conformance with ASTM D1586. The sampler was driven with a 140-pound hammer free-falling 30 inches. The number of blows required to drive the sampler 1 foot, or as otherwise indicated, into the soil is shown adjacent to the sample symbols on the exploration logs. Disturbed samples were collected from the split barrel for subsequent classification and index testing. Higher quality, relatively undisturbed samples were collected using a standard Shelby tube in general accordance with ASTM D1587. Sampling methods and intervals are shown on the exploration logs.

The SPTs completed by Dan J. Fischer Excavating, Inc. were conducted using two wraps around the cathead.

SOIL CLASSIFICATION

The soil samples were classified in accordance with the "Exploration Key" (Table A-1) and "Soil Classification System" (Table A-2), which are presented in this appendix. The exploration logs indicate the depths at which the soils or their characteristics change, although the change could be gradual. If the change occurred between sample locations, the depth was interpreted. Classifications are shown on the exploration logs.

LABORATORY TESTING

CLASSIFICATION

The soil samples were classified in the laboratory to confirm field classifications. The laboratory classifications are shown on the exploration logs if those classifications differed from the field classifications.

MOISTURE CONTENT

We tested the natural moisture content of select soil samples in general accordance with ASTM D2216. The natural moisture content is a ratio of the weight of the water to soil in a test sample and is expressed as a percentage. The test results are presented in this appendix.

PARTICLE-SIZE ANALYSIS

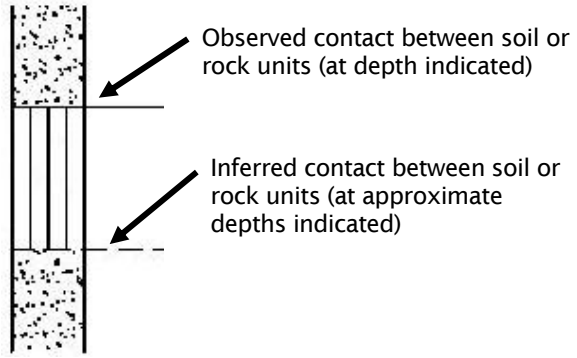
Particle-size analysis was performed on select soil samples to determine the distribution of soil particle sizes. The testing consisted of percent fines determination (percent passing the U.S. Standard No. 200 sieve) analyses completed in general accordance with ASTM D1140. The test results are presented in this appendix.

CONSOLIDATION TESTING

One-dimensional consolidation testing was completed on a select relatively undisturbed soil sample in general accordance with ASTM D2435. The test measures the volume change (consolidation) of a soil sample under predetermined loads. The test results are presented in this appendix.

SYMBOL	SAMPLING DESCRIPTION
	Location of sample collected in general accordance with ASTM D1586 using Standard Penetration Test with recovery
	Location of sample collected using thin-wall Shelby tube or Geoprobe® sampler in general accordance with ASTM D1587 with recovery
	Location of sample collected using Dames & Moore sampler and 300-pound hammer or pushed with recovery
	Location of sample collected using Dames & Moore sampler and 140-pound hammer or pushed with recovery
	Location of sample collected using 3-inch-O.D. California split-spoon sampler and 140-pound hammer with recovery
	Location of grab sample
	Rock coring interval
	Water level during drilling
	Water level taken on date shown

Graphic Log of Soil and Rock Types



GEOTECHNICAL TESTING EXPLANATIONS

ATT	Atterberg Limits	P	Pushed Sample
CBR	California Bearing Ratio	PP	Pocket Penetrometer
CON	Consolidation	P200	Percent Passing U.S. Standard No. 200 Sieve
DD	Dry Density		
DS	Direct Shear	RES	Resilient Modulus
HYD	Hydrometer Gradation	SIEV	Sieve Gradation
MC	Moisture Content	TOR	Torvane
MD	Moisture-Density Relationship	UC	Unconfined Compressive Strength
NP	Non-Plastic	VS	Vane Shear
OC	Organic Content	kPa	Kilopascal

ENVIRONMENTAL TESTING EXPLANATIONS

CA	Sample Submitted for Chemical Analysis	ND	Not Detected
P	Pushed Sample	NS	No Visible Sheen
PID	Photoionization Detector Headspace Analysis	SS	Slight Sheen
		MS	Moderate Sheen
ppm	Parts per Million	HS	Heavy Sheen

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EXPLORATION KEY

TABLE A-1

RELATIVE DENSITY - COARSE-GRAINED SOIL

Relative Density	Standard Penetration Resistance	Dames & Moore Sampler (140-pound hammer)	Dames & Moore Sampler (300-pound hammer)
Very Loose	0 – 4	0 – 11	0 – 4
Loose	4 – 10	11 – 26	4 – 10
Medium Dense	10 – 30	26 – 74	10 – 30
Dense	30 – 50	74 – 120	30 – 47
Very Dense	More than 50	More than 120	More than 47

CONSISTENCY - FINE-GRAINED SOIL

Consistency	Standard Penetration Resistance	Dames & Moore Sampler (140-pound hammer)	Dames & Moore Sampler (300-pound hammer)	Unconfined Compressive Strength (tsf)
Very Soft	Less than 2	Less than 3	Less than 2	Less than 0.25
Soft	2 – 4	3 – 6	2 – 5	0.25 – 0.50
Medium Stiff	4 – 8	6 – 12	5 – 9	0.50 – 1.0
Stiff	8 – 15	12 – 25	9 – 19	1.0 – 2.0
Very Stiff	15 – 30	25 – 65	19 – 31	2.0 – 4.0
Hard	More than 30	More than 65	More than 31	More than 4.0

PRIMARY SOIL DIVISIONS			GROUP SYMBOL	GROUP NAME
COARSE-GRAINED SOIL (more than 50% retained on No. 200 sieve)	GRAVEL (more than 50% of coarse fraction retained on No. 4 sieve)	CLEAN GRAVEL (< 5% fines)	GW or GP	GRAVEL
		GRAVEL WITH FINES (≥ 5% and ≤ 12% fines)	GW-GM or GP-GM	GRAVEL with silt
			GW-GC or GP-GC	GRAVEL with clay
		GRAVEL WITH FINES (> 12% fines)	GM	silty GRAVEL
			GC	clayey GRAVEL
			GC-GM	silty, clayey GRAVEL
	SAND (50% or more of coarse fraction passing No. 4 sieve)	CLEAN SAND (<5% fines)	SW or SP	SAND
		SAND WITH FINES (≥ 5% and ≤ 12% fines)	SW-SM or SP-SM	SAND with silt
			SW-SC or SP-SC	SAND with clay
		SAND WITH FINES (> 12% fines)	SM	silty SAND
			SC	clayey SAND
			SC-SM	silty, clayey SAND
FINE-GRAINED SOIL (50% or more passing No. 200 sieve)	SILT AND CLAY	Liquid limit less than 50	ML	SILT
			CL	CLAY
			CL-ML	silty CLAY
			OL	ORGANIC SILT or ORGANIC CLAY
		Liquid limit 50 or greater	MH	SILT
			CH	CLAY
			OH	ORGANIC SILT or ORGANIC CLAY
HIGHLY ORGANIC SOIL			PT	PEAT

MOISTURE CLASSIFICATION

Term	Field Test
dry	very low moisture, dry to touch
moist	damp, without visible moisture
wet	visible free water, usually saturated

ADDITIONAL CONSTITUENTS

Secondary granular components or other materials such as organics, man-made debris, etc.

Percent	Silt and Clay In: Fine-Grained Soil	Silt and Clay In: Coarse-Grained Soil	Percent	Sand and Gravel In: Fine-Grained Soil	Sand and Gravel In: Coarse-Grained Soil
< 5	trace	trace	< 5	trace	trace
5 – 12	minor	with	5 – 15	minor	minor
> 12	some	silty/clayey	15 – 30	with	with
			> 30	sandy/gravelly	Indicate %

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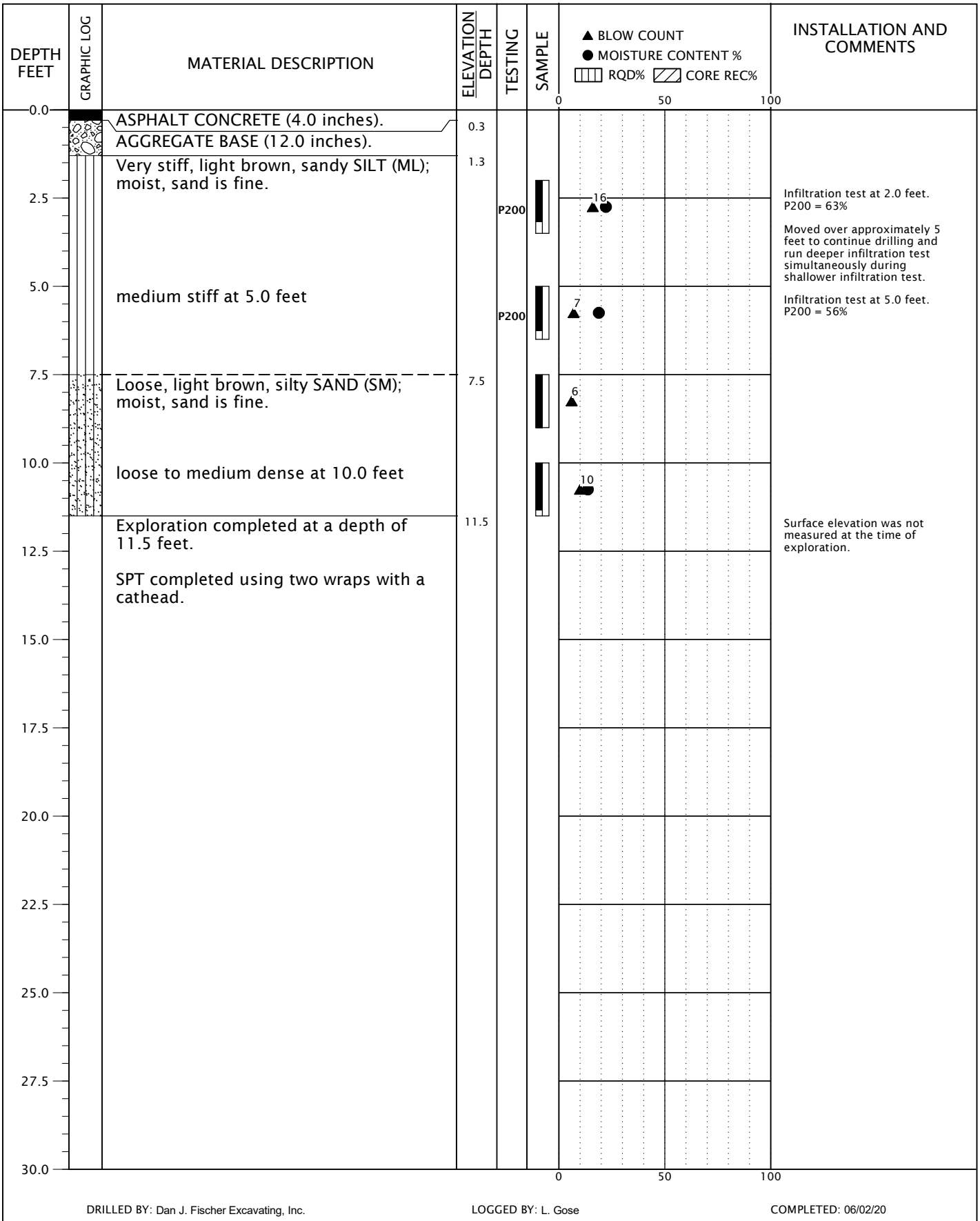
SOIL CLASSIFICATION SYSTEM

TABLE A-2



DRILLED BY: Dan J. Fischer Excavating, Inc.

LOGGED BY: L. Gose

COMPLETED: 06/02/20

BORING METHOD: solid-stem auger (see document text)

BORING BIT DIAMETER: 6 inches

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WLSWSCHDIST-5-01

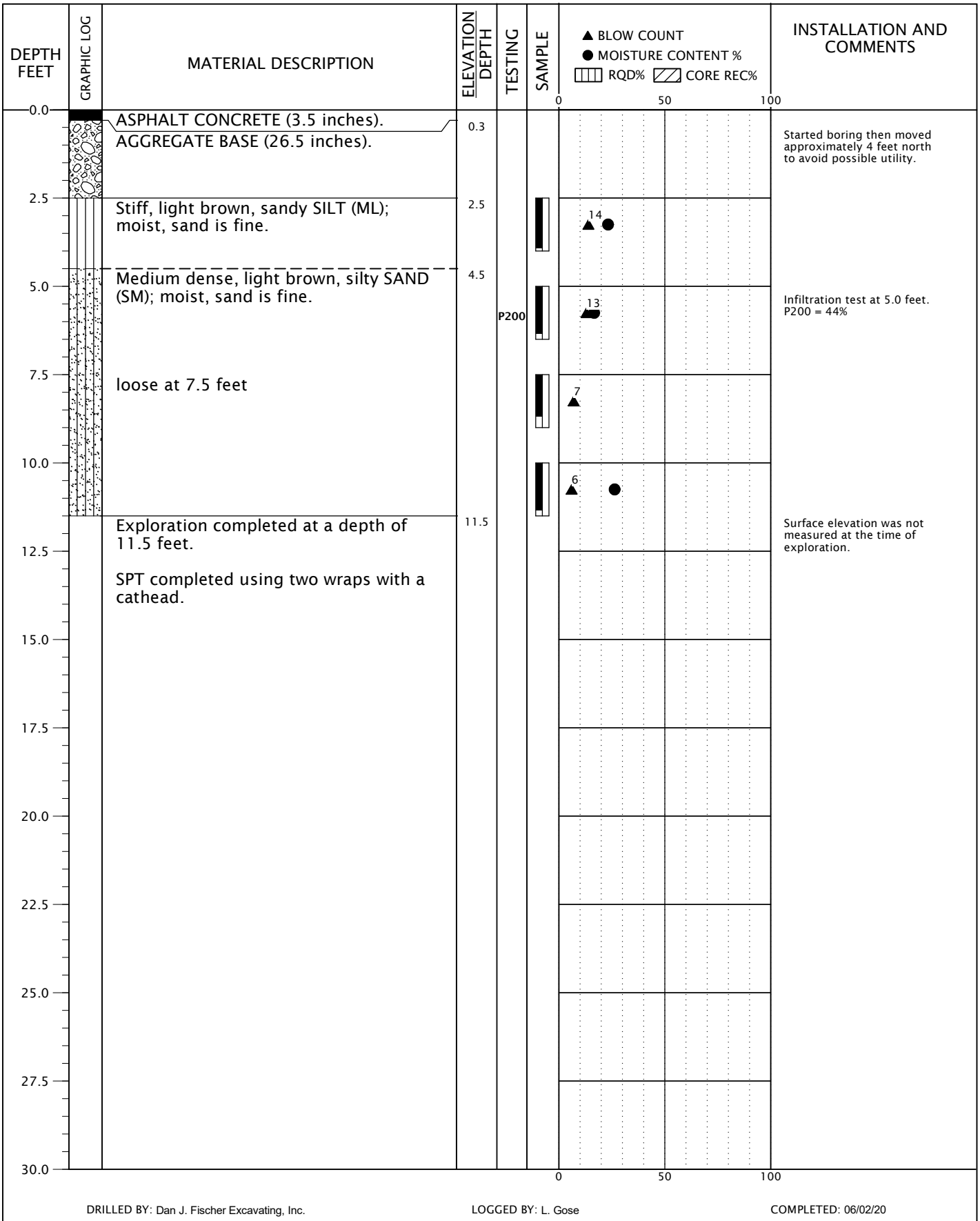
BORING B-1

JUNE 2020

ACMS - OFFICE ADDITION AND RENOVATIONS
TUALATIN, OR

FIGURE A-1

BORING LOG - GDI-NV5 - 1 PER PAGE WLSWSCHDIST-5-01-B1_4-C1.GPJ GDI_NV5.GDT PRINT DATE: 6/24/20:KT



DRILLED BY: Dan J. Fischer Excavating, Inc. LOGGED BY: L. Gose COMPLETED: 06/02/20

BORING METHOD: solid-stem auger (see document text) BORING BIT DIAMETER: 6 inches

GEODESIGN INC AN NV5 COMPANY

WLSWSCHDIST-5-01

BORING B-2

JUNE 2020

ACMS - OFFICE ADDITION AND RENOVATIONS
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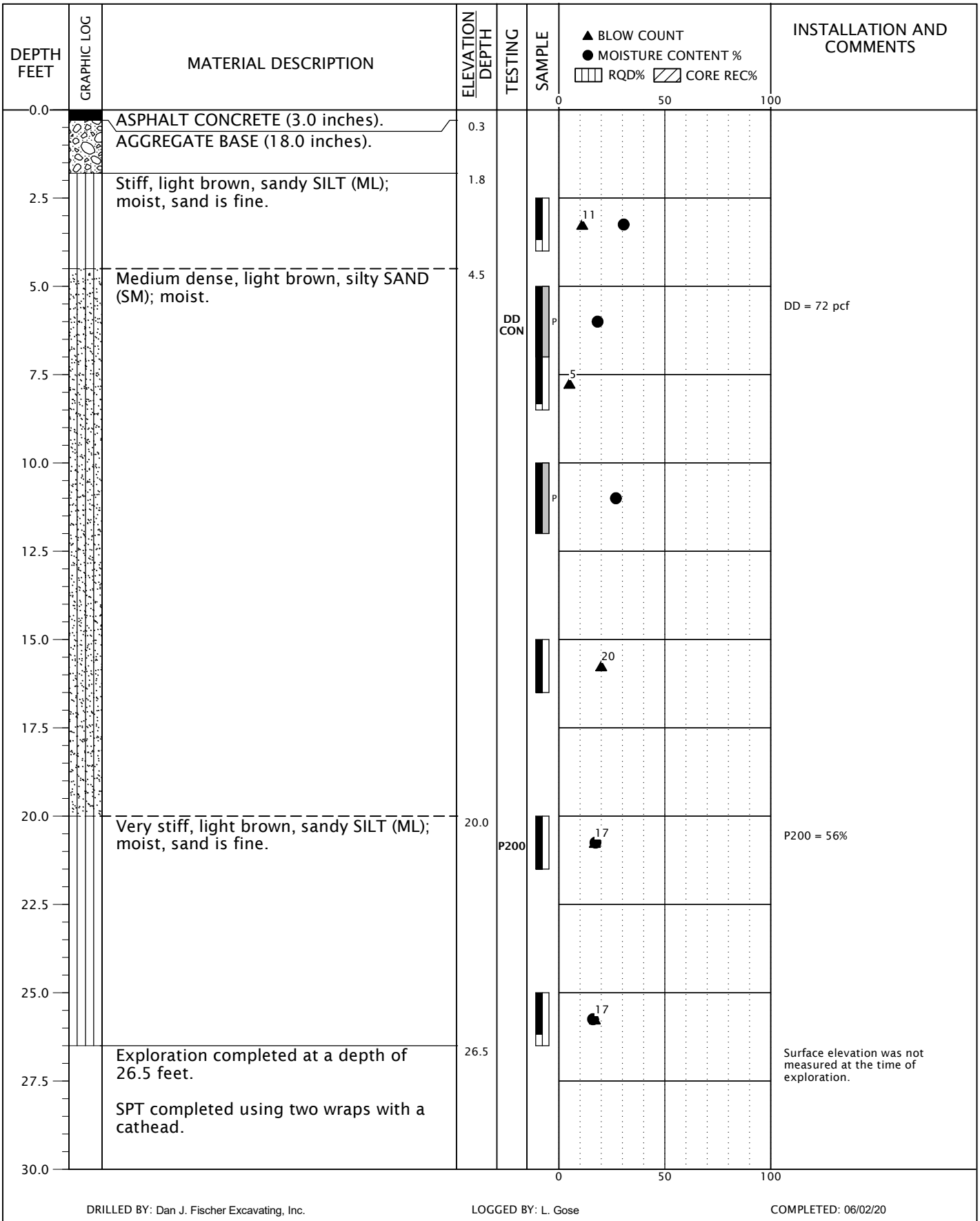
FIGURE A-2

BORING LOG - GDI-NV5 - 1 PER PAGE WLSWSCHDIST-5-01-B1_4-C1.GPJ GDI_NV5.GDT PRINT DATE: 6/24/20:KT



DRILLED BY: Dan J. Fischer Excavating, Inc.

LOGGED BY: L. Gose

COMPLETED: 06/02/20

BORING METHOD: solid-stem auger (see document text)

BORING BIT DIAMETER: 3 inches

GEODESIGN INC
AN NV5 COMPANY

WLSWSCHDIST-5-01

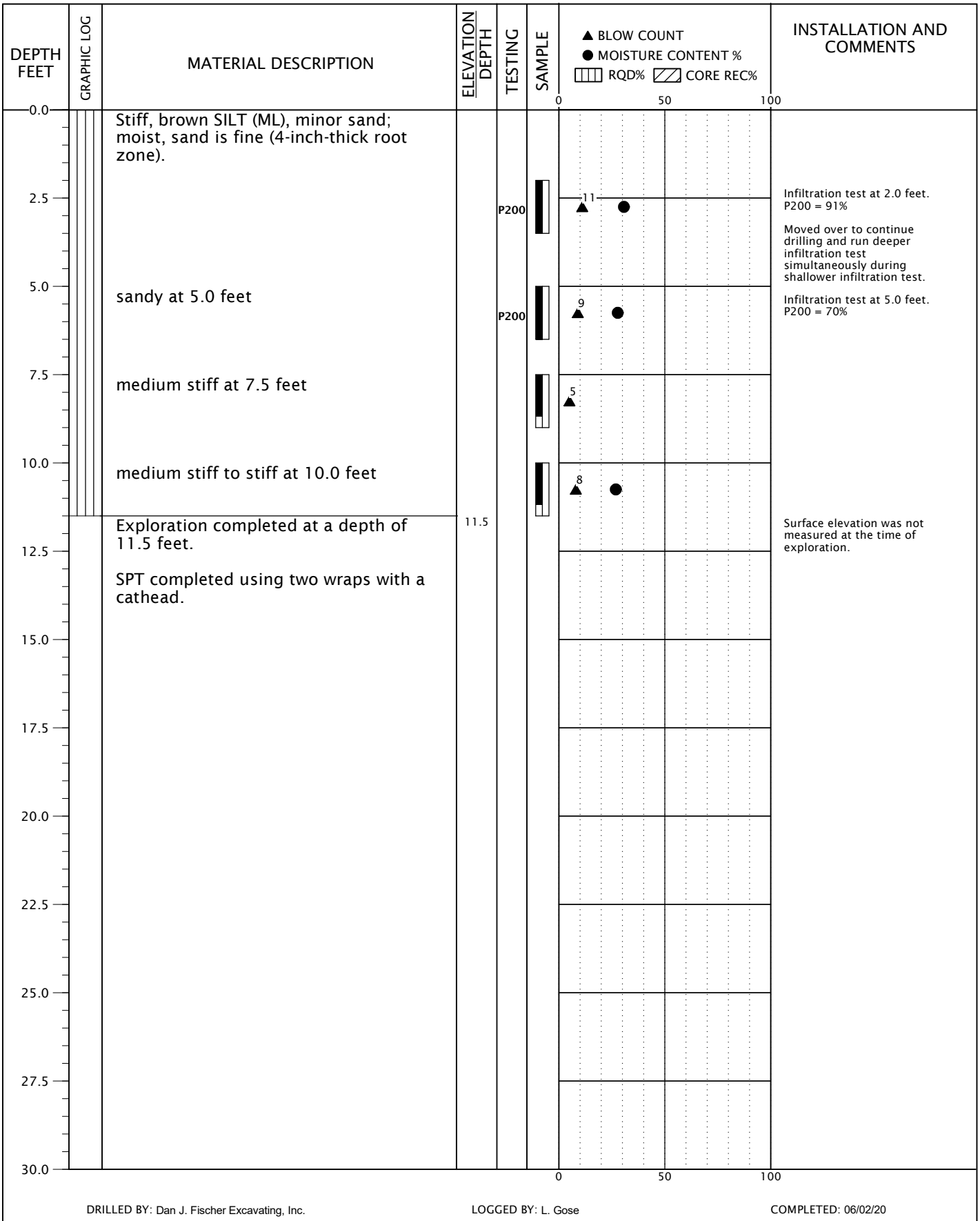
BORING B-3

JUNE 2020

ACMS - OFFICE ADDITION AND RENOVATIONS
TUALATIN, OR

FIGURE A-3

BORING LOG - GDI-NV5 - 1 PER PAGE WLSWSCHDIST-5-01-B1_4-C1.GPJ GDI_NV5.GDT PRINT DATE: 6/24/20:KT


DEPTH FEET
GRAPHIC LOG
MATERIAL DESCRIPTION
ELEVATION DEPTH
TESTING
SAMPLE
▲ BLOW COUNT
● MOISTURE CONTENT %
RQD% CORE REC%
0
50
100
INSTALLATION AND COMMENTS
Stiff, brown SILT (ML), minor sand; moist, sand is fine (4-inch-thick root zone).
sandy at 5.0 feet
medium stiff at 7.5 feet
medium stiff to stiff at 10.0 feet
Exploration completed at a depth of 11.5 feet.
SPT completed using two wraps with a cathead.
11.5
P200
P200
11
9
5
8
Infiltration test at 2.0 feet. P200 = 91%
Moved over to continue drilling and run deeper infiltration test simultaneously during shallower infiltration test.
Infiltration test at 5.0 feet. P200 = 70%
Surface elevation was not measured at the time of exploration.
0.0
2.5
5.0
7.5
10.0
12.5
15.0
17.5
20.0
22.5
25.0
27.5
30.0
DRILLED BY: Dan J. Fischer Excavating, Inc.
LOGGED BY: L. Gose
COMPLETED: 06/02/20
BORING METHOD: solid-stem auger (see document text)
BORING BIT DIAMETER: 6 inches
GEODESIGN INC
AN NV5 COMPANY
WLSWSCHDIST-5-01
BORING B-4
JUNE 2020
ACMS - OFFICE ADDITION AND RENOVATIONS
TUALATIN, OR
FIGURE A-4
BORING LOG - GDI-NV5 - 1 PER PAGE WLSWSCHDIST-5-01-B1_4-C1.GPJ GDI_NV5.GDT PRINT DATE: 6/24/20:KT

DEPTH FEET	GRAPHIC LOG	MATERIAL DESCRIPTION	ELEVATION / DEPTH	TESTING	SAMPLE	▲ BLOW COUNT ● MOISTURE CONTENT % RQD% CORE REC% (0 50 100)	INSTALLATION AND COMMENTS
0.0		ASPHALT CONCRETE (3.0 inches).					
		AGGREGATE BASE (12.0 inches).	0.3				
		Stiff, light brown, sandy SILT (ML); moist, sand is fine.	1.3			▲14 ●	
2.5							
5.0						▲10	
		Exploration completed at a depth of 6.5 feet. SPT completed using two wraps with a cathead.	6.5				CORE DETAILS: No patch observed. No crack at core.
7.5							
10.0						0 50 100	

DRILLED BY: Dan J. Fischer Excavating, Inc. LOGGED BY: L. Gose COMPLETED: 06/02/20

BORING METHOD: core drill/solid-stem auger (see document text) BORING BIT DIAMETER: 5 inches/4 inches

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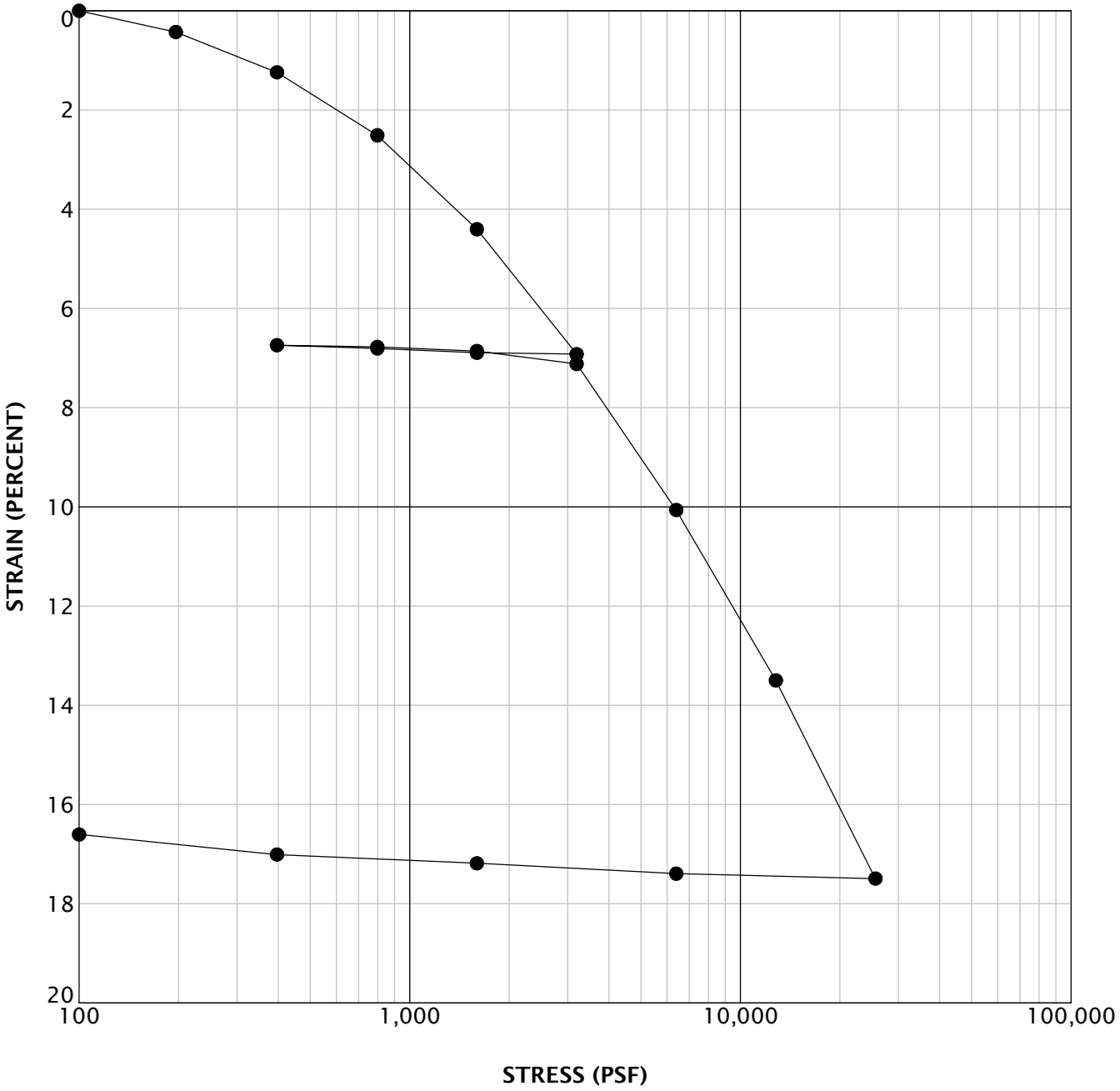
BORING C-1

JUNE 2020

ACMS - OFFICE ADDITION AND RENOVATIONS
TUALATIN, OR

FIGURE A-5

BORING LOG - GDI-NV5 - 1 PER PAGE WLSWSCHDIST-5-01-B1_4-C1.GPJ GDI_NV5.GDT PRINT DATE: 6/24/20:KT



KEY	EXPLORATION NUMBER	SAMPLE DEPTH (FEET)	MOISTURE CONTENT (PERCENT)	DRY DENSITY (PCF)
●	B-3	5.0	18	72

CONSOL_STRAIN_100K WLSWSCHDIST-5-01-B1_4-C1.GPJ GEODESIGN.GDT PRINT DATE: 6/23/20:KT

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CONSOLIDATION TEST RESULTS

JUNE 2020

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FIGURE A-6

SAMPLE INFORMATION			MOISTURE CONTENT (PERCENT)	DRY DENSITY (PCF)	SIEVE			ATTERBERG LIMITS		
EXPLORATION NUMBER	SAMPLE DEPTH (FEET)	ELEVATION (FEET)			GRAVEL (PERCENT)	SAND (PERCENT)	P200 (PERCENT)	LIQUID LIMIT	PLASTIC LIMIT	PLASTICITY INDEX
B-1	2.0		22				63			
B-1	5.0		19				56			
B-1	10.0		14							
B-2	2.5		23							
B-2	5.0		17				44			
B-2	10.0		26							
B-3	2.5		31							
B-3	5.0		18	72						
B-3	10.0		27							
B-3	20.0		17				56			
B-3	25.0		16							
B-4	2.0		31				91			
B-4	5.0		28				70			
B-4	10.0		27							
C-1	1.5		28							

LAB SUMMARY - GDI-NV5 WLSWSCHDIST-5-01-B1_4-C1.GPJ GDI_NV5.GDT PRINT DATE: 6/23/20:KT

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WLSWSCHDIST-5-01

SUMMARY OF LABORATORY DATA

JUNE 2020

ACMS - OFFICE ADDITION AND RENOVATIONS
TUALATIN, OR

FIGURE A-7

APPENDIX B

APPENDIX B

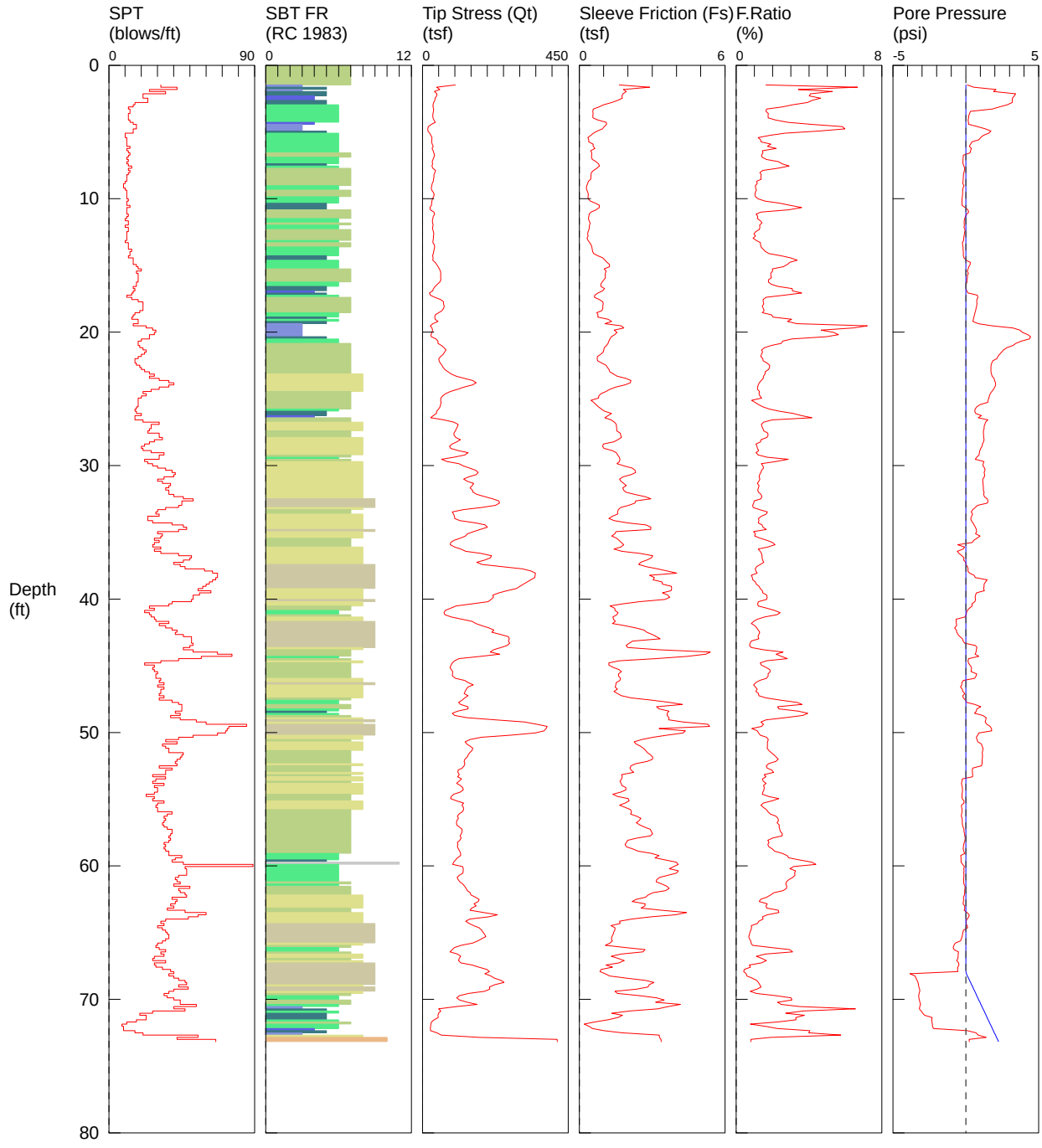
CONE PENETRATION TESTING

Oregon Geotechnical Explorations performed one CPT probe (CPT-1) on June 3, 2020 using a seismic electronic cone penetrometer to a depth of 73.2 feet BGS. Shear wave velocity tests were completed at 1- to 2-meter intervals. The approximate location of the CPT is shown on Figure 2. The CPT log is presented in this appendix.

The CPT is an in situ test that provides characterizes subsurface stratigraphy. The testing includes advancing a 35.6-millimeter-diameter cone equipped with a load cell and a friction sleeve through the soil profile. The cone is advanced at a rate of approximately 2 centimeters per second. Tip resistance, sleeve friction, and pore pressure at are typically recorded at 0.1-meter intervals.

Geo Design / CPT-1 / 2900 SW Borland Rd Tualatin

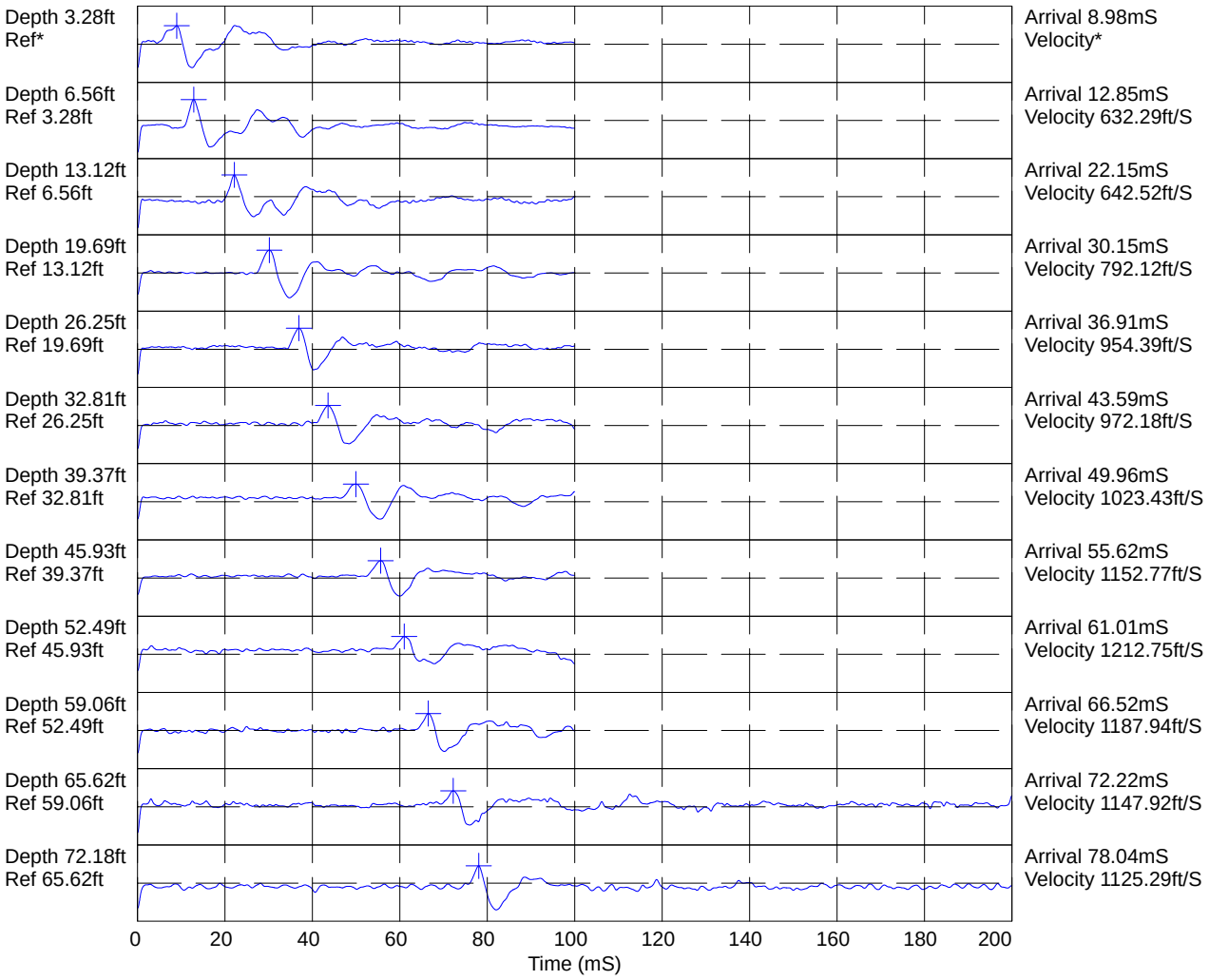
OPERATOR: OGE BAK
CONE ID: DDG1170
HOLE NUMBER: CPT-1
TEST DATE: 6/3/2020 6:34:53 AM
TOTAL DEPTH: 73.163 ft



1 sensitive fine grained
2 organic material
3 clay
4 silty clay to clay
5 clayey silt to silty clay
6 sandy silt to clayey silt
7 silty sand to sandy silt
8 sand to silty sand
9 sand
10 gravelly sand to sand
11 very stiff fine grained (*)
12 sand to clayey sand (*)

*SBT/SPT CORRELATION: UBC-1983

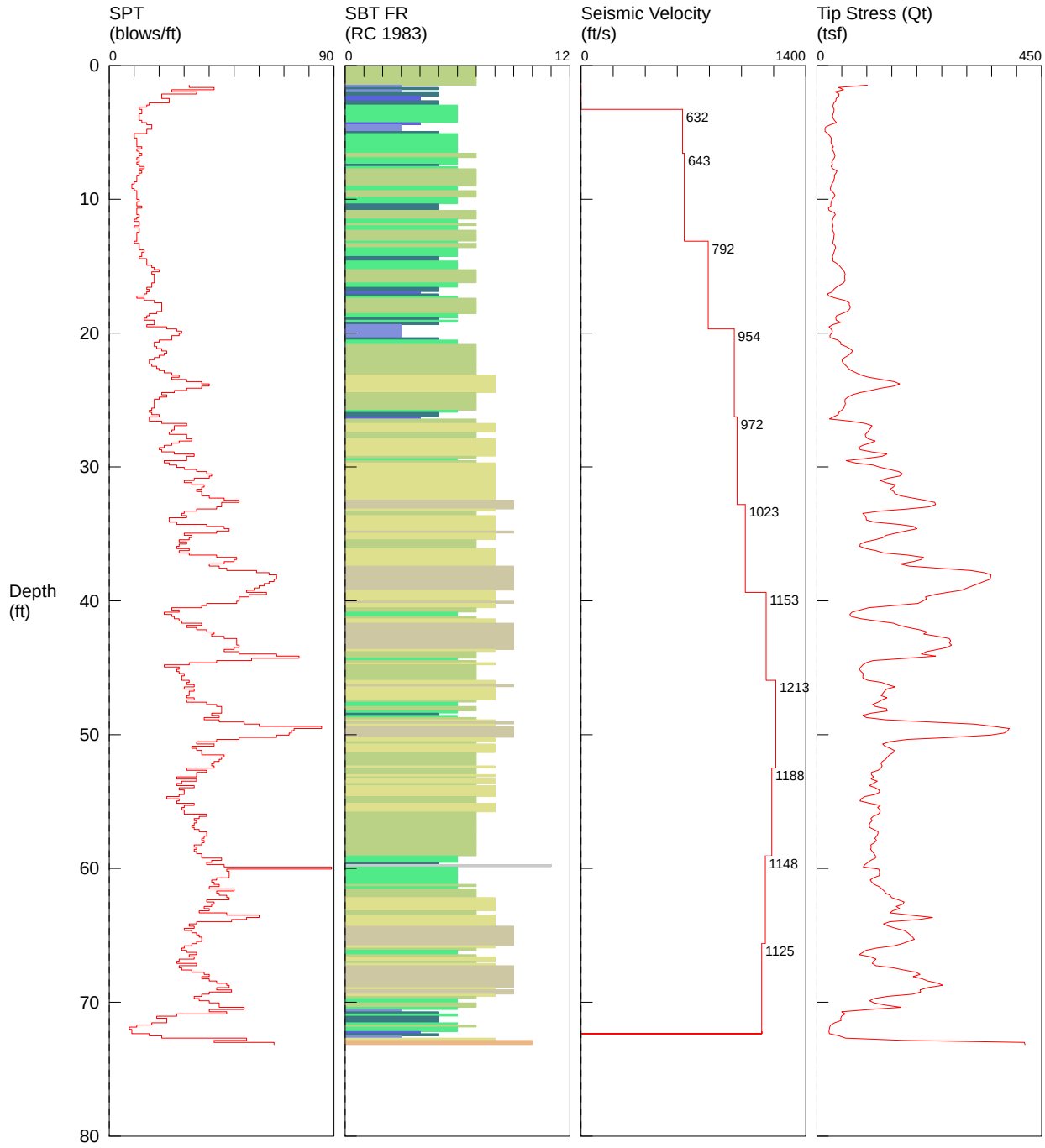
COMMENT: Geo Design / CPT-1 / 2900 SW Borland Rd Tualatin



Hammer to Rod String Distance (ft): 4.27
* = Not Determined

Geo Design / CPT-1 / 2900 SW Borland Rd Tualatin

OPERATOR: OGE BAK
CONE ID: DDG1170
HOLE NUMBER: CPT-1
TEST DATE: 6/3/2020 6:34:53 AM
TOTAL DEPTH: 73.163 ft

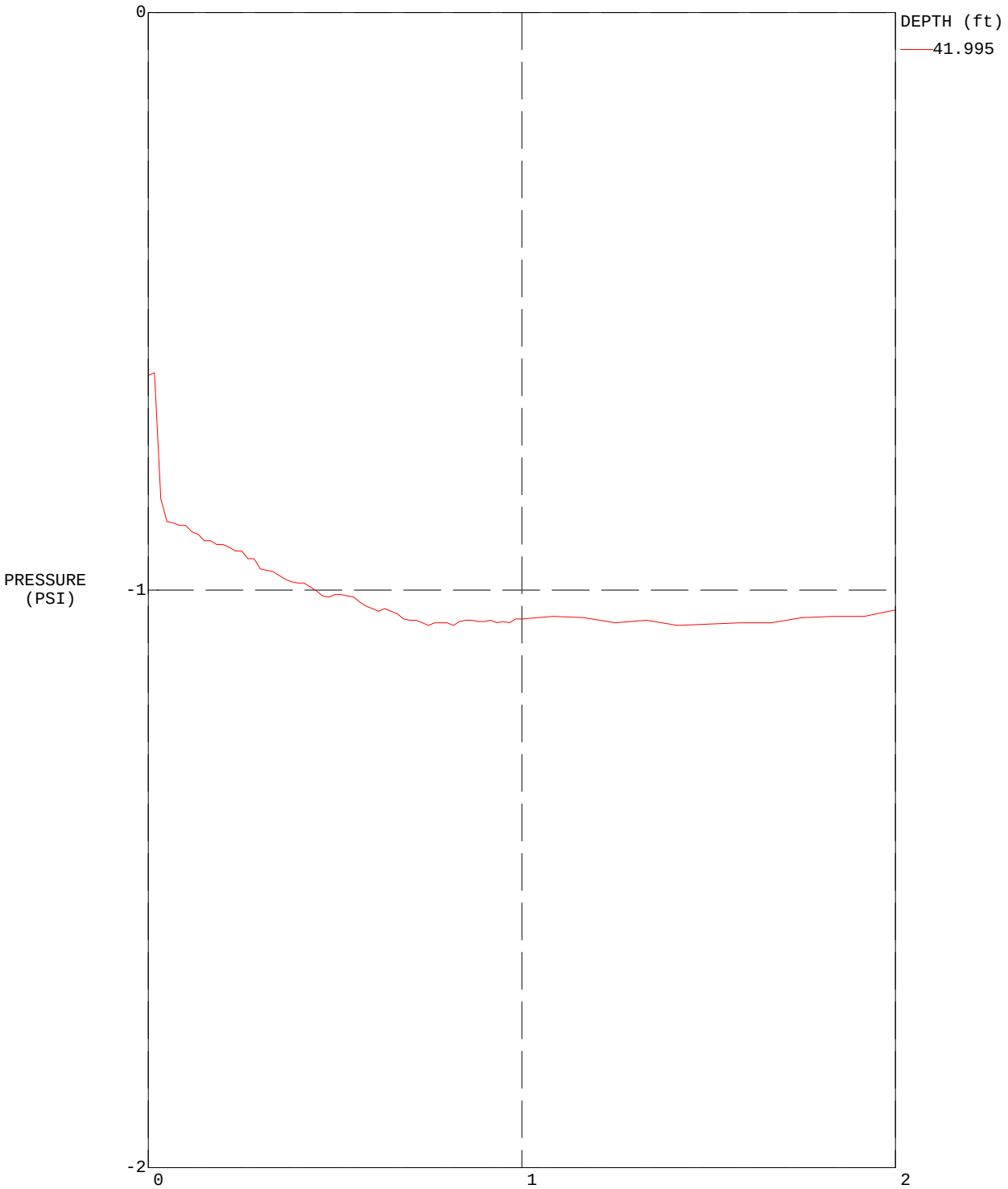


1 sensitive fine grained
2 organic material
3 clay
4 silty clay to clay
5 clayey silt to silty clay
6 sandy silt to clayey silt
7 silty sand to sandy silt
8 sand to silty sand
9 sand
10 gravelly sand to sand
11 very stiff fine grained (*)
12 sand to clayey sand (*)

*SBT/SPT CORRELATION: UBC-1983

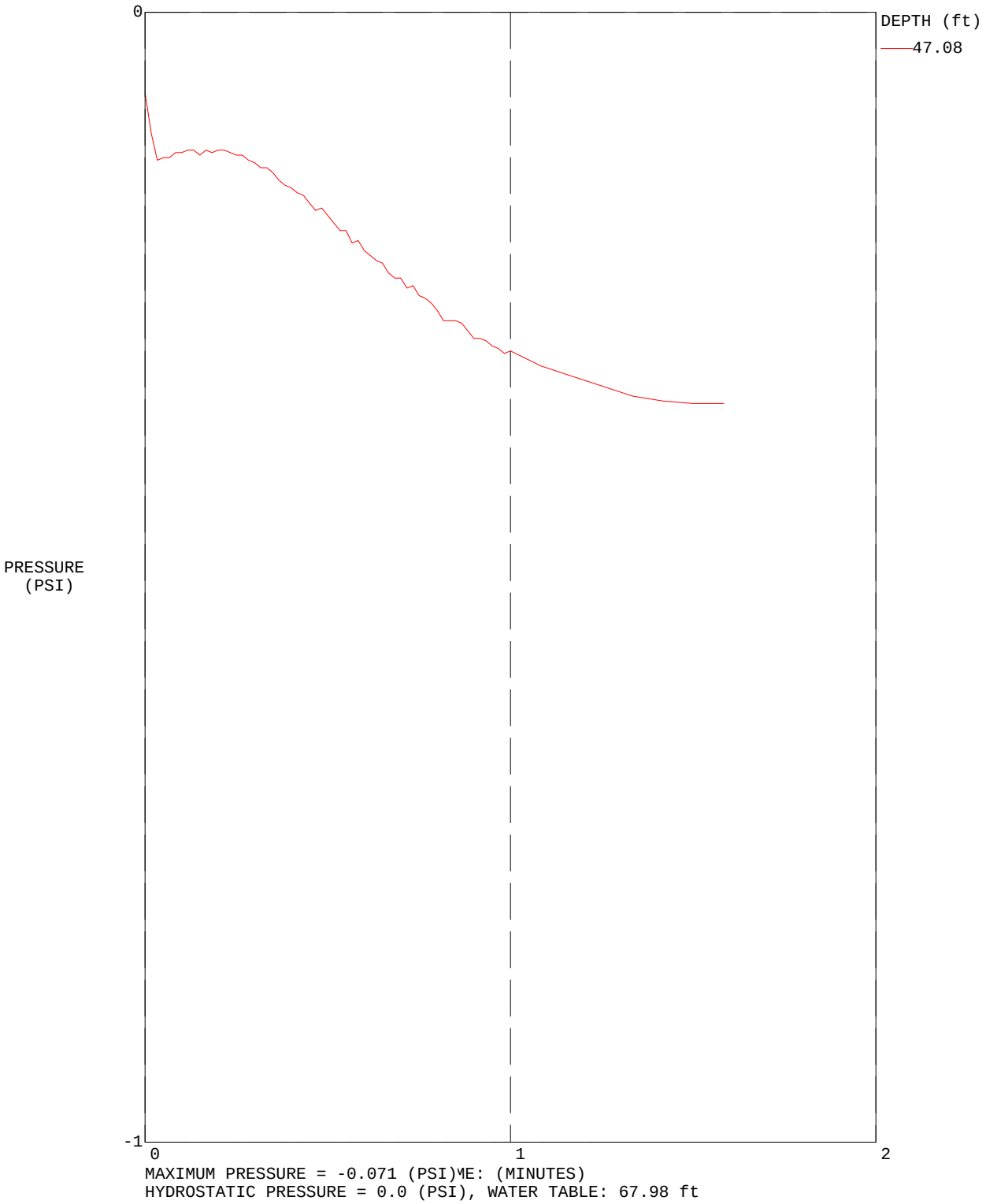
COMMENT: Geo Design / CPT-1 / 2900 Sw Borland Rd Tualatin

TEST DATE: 6/3/2020 6:34:53 AM



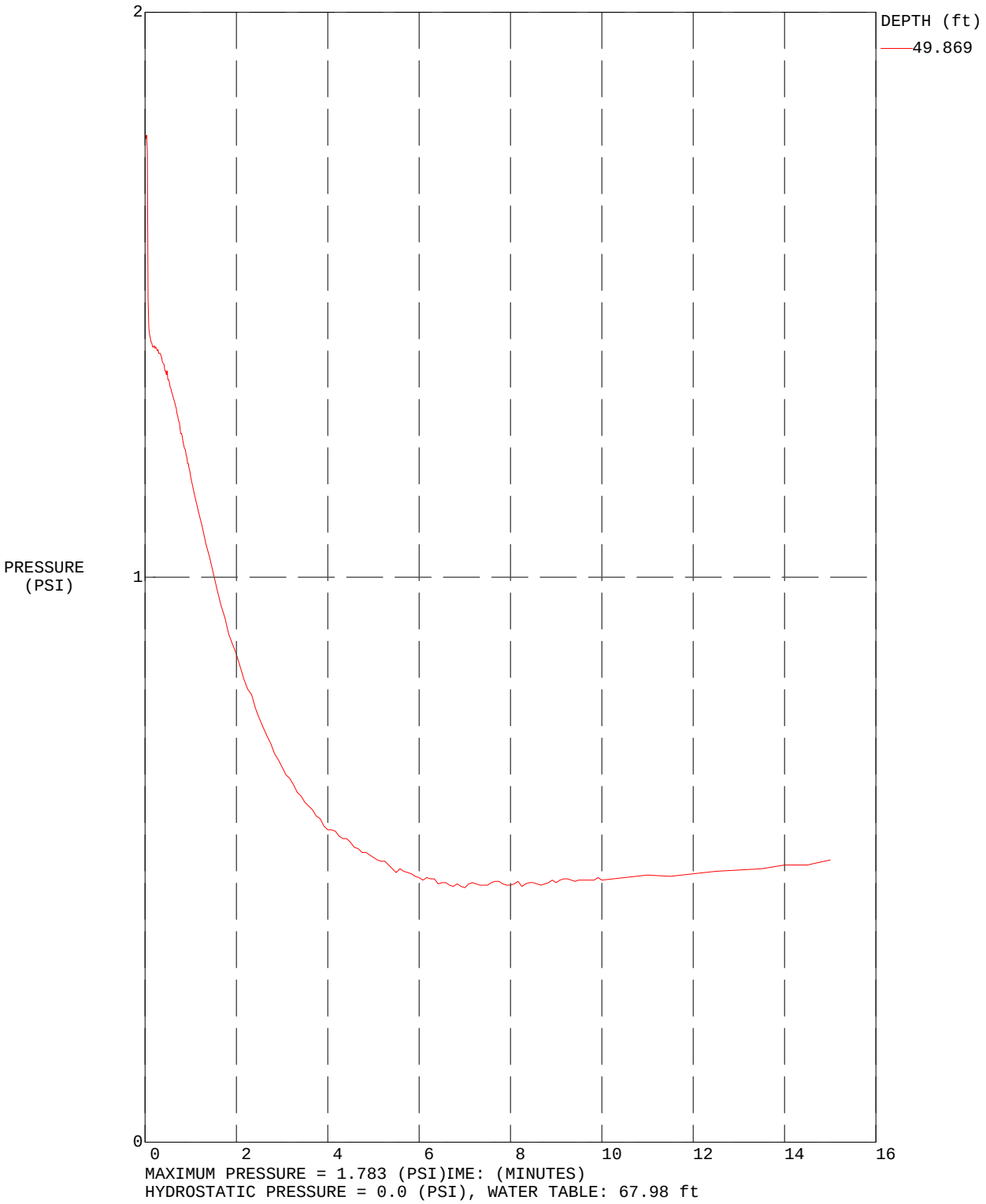
COMMENT: Geo Design / CPT-1 / 2900 Sw Borland Rd Tualatin

TEST DATE: 6/3/2020 6:34:53 AM



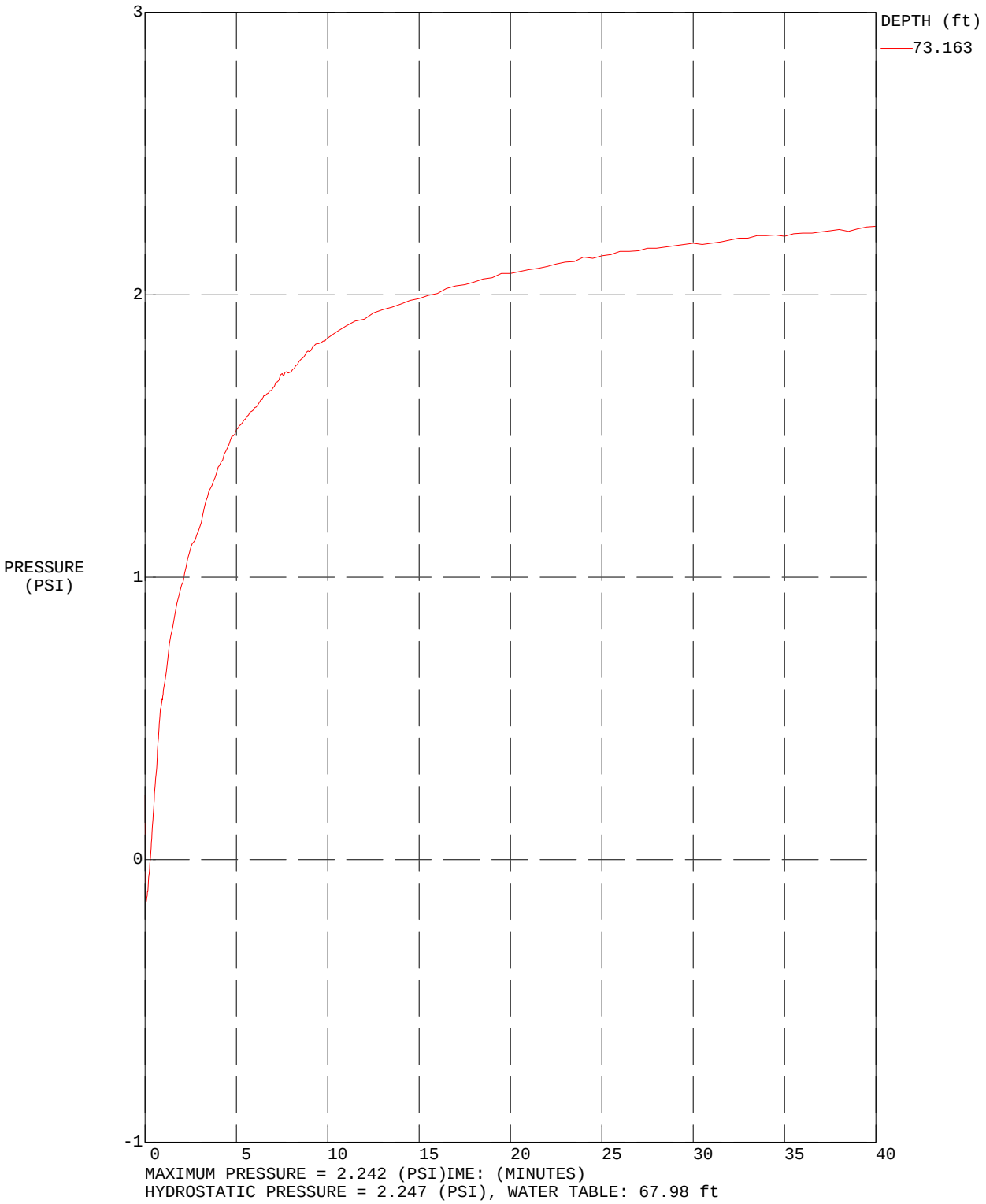
COMMENT: Geo Design / CPT-1 / 2900 Sw Borland Rd Tualatin

TEST DATE: 6/3/2020 6:34:53 AM



COMMENT: Geo Design / CPT-1 / 2900 Sw Borland Rd Tualatin

TEST DATE: 6/3/2020 6:34:53 AM



APPENDIX C

APPENDIX C

SITE-SPECIFIC SEISMIC HAZARD EVALUATION

INTRODUCTION

The information in this appendix summarizes the results of a site-specific seismic hazard evaluation for the proposed improvements at Athey Creek Middle School in Tualatin, Oregon. This seismic hazard evaluation was performed in accordance with the requirements of the 2019 SOSSC and ASCE 7-16.

SITE CONDITIONS

REGIONAL GEOLOGY

A detailed description of the geologic setting is presented in the main report.

SUBSURFACE CONDITIONS

A detailed description of site subsurface conditions is presented in the main report.

SEISMIC SETTING

Earthquake Source Zones

Three scenario earthquakes were considered for this study consistent with the local seismic setting. Two of the possible earthquake sources are associated with the CSZ, and the third event is a shallow, local crustal earthquake that could occur in the North American Plate. The three earthquake scenarios are discussed below.

Regional Events

The CSZ is the region where the Juan de Fuca Plate is being subducted beneath the North American Plate. This subduction is occurring in the coastal region between Vancouver Island and northern California. Evidence has accumulated suggesting that this subduction zone has generated eight great earthquakes in the last 4,000 years, with the most recent event occurring approximately 300 years ago (Weaver and Shedlock, 1991). The fault trace is mapped approximately 50 to 120 km off the Oregon Coast. Two types of subduction zone earthquakes are possible and considered in this study:

1. An interface event earthquake on the seismogenic part of the interface between the Juan de Fuca Plate and the North American Plate on the CSZ. This source is reportedly capable of generating earthquakes with a moment magnitude of between 8.5 and 9.0.
2. A deep intraplate earthquake on the seismogenic part of the subducting Juan de Fuca Plate. These events typically occur at depths of between 30 and 60 km. This source is capable of generating an event with a moment magnitude of up to 7.5.

Local Events

A significant earthquake could occur on a local fault near the site within the design life of the facility. Such an event would cause ground shaking at the site that could be more intense than the CSZ events, although the duration would be shorter. Figure C-1 shows the locations of faults

with potential Quaternary movement within a 40-km radius of the site (USGS, 2019). The most significant faults in the site vicinity are the Canby-Molalla fault, Oatfield fault, Portland Hills fault, and Beaverton fault zone. A discussion of these faults is provided below. Figure C-2 shows the interpreted locations of seismic events that occurred between 1904 and 2020.

Canby-Molalla Fault

The mapped trace of the north-northwest-striking Canby-Molalla fault is based on a linear series of northeast-trending, discontinuous aeromagnetic anomalies that probably represent significant offset of Eocene basement and volcanic rocks of the Miocene CRBG beneath Neogene sediments that fill the northern Willamette River Basin. The fault has little geomorphic expression across the gently sloping floor of the Willamette Valley, but a small, laterally restricted berm associated with the fault may suggest young deformation. Deformation of probable Missoula flood deposits in a high-resolution seismic reflection survey conducted across the aeromagnetic anomaly east of Canby suggests possible Holocene deformation. Sense of displacement of the Canby-Molalla fault is poorly known, but the fault shows apparent right-lateral separation of several transverse magnetic anomalies, and down-west vertical displacement is also apparent in water well logs. The actual sense of displacement of the Canby-Molalla fault is poorly known. The fault shows apparent right-lateral separation of several transverse magnetic anomalies, and down-west vertical displacement is also apparent in water well logs (Blakely et al., 2001). Given the compressional setting of other faults in the area and lack of significant topographic expression (Blakely et al., 2001), the fault probably is a right-lateral, strike-slip fault with lesser amounts of reverse displacement.

Oatfield Fault

The northwest-striking Oatfield fault forms northeast-facing escarpments in volcanic rocks of the Miocene CRBG in the Tualatin Mountains and northern Willamette Valley. The fault may be part of the Portland Hills-Clackamas River structural zone. The Oatfield fault is primarily mapped as a very high-angle, reverse fault with apparent down-to-the-southwest displacement, but a few kilometer-long reach of the fault with down-to-the-northeast displacement is mapped in the vicinity of the Willamette River. This apparent change in displacement direction along strike may reflect a discontinuity in the fault trace or could reflect the right-lateral, strike-slip displacement that characterizes other parts of the Portland Hills-Clackamas River structural zone. The fault has also been modeled as a 70-degree, east-dipping reverse fault. Reverse displacement with a right-lateral, strike-slip component is consistent with the tectonic setting, mapped geologic relations, and microseismicity in the area. Fault scarps on surficial deposits have not been described, but exposures in a light rail tunnel showing offset of approximately 1 M_a Boring Lava across the fault indicate Quaternary displacement (Personius, 2002).

Portland Hills Fault

The Portland Hills fault is mapped approximately 10.2 km east of the site. The northwest-striking Portland Hills fault forms the prominent linear northeast margin of the Tualatin Mountains (Portland Hills) and the southwest margin of the Portland Basin; this basin may be a right-lateral, pull-apart basin in the forearc of the CSZ or a piggyback synclinal basin formed between antiformal uplifts of the Portland fold belt. The fault is part of the Portland Hills-Clackamas River structural zone, which controlled the deposition of Miocene CRBG lavas in the region. The crest of the Portland Hills is defined by the northwest-striking Portland Hills

anticline. Sense of displacement on the Portland Hills fault is poorly known and controversial. The fault was originally mapped as a down-to-the-northeast normal fault. The fault has also been mapped as part of a regional-scale zone of right-lateral oblique slip faults and as a steep escarpment caused by asymmetrical folding above a southwest-dipping blind thrust. Reverse displacement with a right-lateral, strike-slip component may be most consistent with the tectonic setting, mapped geologic relations, aeromagnetic data, and microseismicity in the area. Fault scarps on surficial Quaternary deposits have not been described along the fault trace, but some geomorphic (steep, linear escarpment, triangular facets, over-steepened, and knick-pointed tributaries) and geophysical (aeromagnetic, seismic reflection, and ground penetrating radar) evidence suggest Quaternary displacement (Personius, 2017).

Beaverton Fault Zone

The east-west-striking Beaverton fault zone forms the south margin of the main part of the Tualatin Basin, an isolated extension of the Willamette lowland forearc basin in northwest Oregon. The Beaverton fault zone is not shown on most published geologic maps of the area, but is marked by a linear aeromagnetic anomaly and has been mapped in the subsurface where it offsets Miocene CRBG rocks and overlying Pliocene to Pleistocene sediments. The late Neogene Tualatin Basin may be a pull-apart basin, with subsidence driven by dextral shear on the nearby Gales Creek fault zone. The fault trace is buried by a thick sequence of sediment deposited by the 12.7 to 13.3 ka Missoula Floods, but offsets middle Pleistocene and possibly younger sediments in the subsurface. Seismic and well data clearly indicate down-to-the-north displacement across the Beaverton fault zone, but the subsurface data are not detailed enough to determine fault dip direction. Based on seismic deaggregation the Beaverton fault zone does not significantly contribute to the overall seismic hazard at the site.

Table C-1. Significant Crustal Faults

Source	Closest Mapped Distance[1] (km)	Mapped Length[1] (km)
Canby-Molalla fault	0.9	50
Oatfield fault	6.7	24
Portland Hills fault	9.1	49
Beaverton Fault Zone	13.5	15

1. reported by USGS

DESIGN EARTHQUAKE

Deaggregation at the approximate fundamental building period of 0.1 second using the USGS Unified Hazard tool (https://earthquake.usgs.gov/hazards/interactive/ [latitude = 45.3779, longitude = -122.7058]) indicates the CSZ comprises approximately 35 percent and deep intraplate events comprise approximately 16 percent of the seismic hazard at the site. The remaining 49 percent is comprised local events. The Portland Hills fault is largest contributor to the seismic hazard of the remaining sources (approximately 8 percent) with all others contributing less than 5 percent.

SEISMIC DESIGN PARAMETERS

Seismic site class was determined based on shear wave velocity testing from the CPT probe (CPT-1) at the site. Shear wave velocity test results are presented in Appendix B.

Based on calculations, the site class for the development is C. Calculation of the site class is provided in Table C-2.

Table C-2. Site Class Determination

Soil Type	Depth Below Foundation[1] (feet)	Interval (feet)	Shear Wave Velocity (fps)	Depth/Shear Wave Velocity (second)
Silt and Sand[1]	0 to 18	18	650	0.0277
Alluvial Gravel	18 to 38	20	975	0.0205
Troutdale Formation	38 to 100	62	1,150	0.0539
Sum	NA	100	NA	0.1021
Average shear wave velocity in the upper 100 feet below the foundation, Vs_{30} (fps)	NA			979
Site Class	NA			D

1. assumes base of foundations is 2 feet BGS

Because subsurface conditions consist of a sandy silt transitioning to silt with sand with small impedance contrasts, it is our opinion that amplifications factors prescribed by ASCE 7-16 for a seismic Site Class D are appropriate for design and a site-response analysis is not required. The parameters in Table C-3 can be used for design of the seismically isolated building expansion.

Table C-3. IBC Seismic Design Parameters*

Seismic Design Parameter	Short Period (T_s = 0.2 second)	1 Second Period (T_1 = 1.0 second)
MCE Spectral Acceleration, S	S_s = 0.851 g	S_1 = 0.386 g
Site Class	D	
Site Coefficient, F	F_a = 1.2	F_v = 1.924
Adjusted Spectral Acceleration, S_M	S_{MS} = 1.021 g	S_{M1} = 0.743 g
Design Spectral Response Acceleration Parameters, S_D	S_{DS} = 0.681 g	S_{D1} = 0.495 g

* The above parameters can be used provided the seismic response coefficient, C_s, is determined according to the exception in ASCE 7-16 Section 11.4.8 or else a site-specific response analysis will be required.

GEOLOGIC HAZARDS

In addition to ground shaking, site-specific geologic conditions can influence the potential for earthquake damage. Deep deposits of loose or soft alluvium can amplify ground motions, resulting in increased seismic loads on structures. Other geologic hazards are related to soil failure and permanent ground deformation. Permanent ground deformation could result from liquefaction, lateral spreading, landsliding, and fault rupture. The following sections provide additional discussion regarding potential seismic hazards that could affect the planned development.

FAULT SURFACE RUPTURE

The nearest mapped fault is the Canby-Molalla fault mapped 0.9 km southwest of the site. Consequently, it is our opinion that the probability of surface fault rupture beneath the site is low.

LIQUEFACTION

Liquefaction is caused by a rapid increase in pore water pressure that reduces the effective stress between soil particles to near zero. Granular soil, which relies on interparticle friction for strength, is susceptible to liquefaction until the excess pore pressures can dissipate. In general, loose, saturated sand soil with low silt and clay content is the most susceptible to liquefaction. Silty soil with low plasticity is moderately susceptible to liquefaction under relatively higher levels of ground shaking

Based on the static groundwater depth of 68 feet BGS based on pore pressure testing from the CPT probe, liquefaction is not considered a risk for design levels of ground shaking.

LATERAL SPREADING

Lateral spreading is a liquefaction-related seismic hazard. Development areas subject to lateral spreading are typically gently sloping or flat sites underlain by liquefiable sediments adjacent to an open face, such as riverbanks. Liquefied soil adjacent to open faces may “flow” in that direction, resulting in surface cracking and lateral displacement towards the open face (i.e., riverbank). Since the site is not near an open face and has low susceptibility to liquefaction, lateral spreading is expected to be negligible at this site.

GROUND MOTION AMPLIFICATION

Soil capable of significantly amplifying ground motions beyond the levels determined by our site-specific seismic study were not encountered during the subsurface explorations. The main report provides a detailed description of the subsurface conditions encountered.

LANDSLIDE

Earthquake-induced landsliding generally occurs in steeper slopes comprised of relatively weak soil deposits. The site and surrounding area are relatively flat, and seismically induced landslides are not considered a site hazard.

SETTLEMENT

Settlement due to earthquakes is most prevalent in relatively deep deposits of dry, clean sand. We do not anticipate that seismic-induced settlement in addition to liquefaction-induced settlement will occur during design levels of ground shaking.

SUBSIDENCE/UPLIFT

Subduction zone earthquakes can cause vertical tectonic movements. The movements reflect coseismic strain release accumulation associated with interplate coupling in the subduction zone. Based on our review of the literature, the locked zone of the CSZ is located in excess of 60 miles from the site. Consequently, we do not anticipate that subsidence or uplift is a significant design concern.

LURCHING

Lurching is a phenomenon generally associated with very high levels of ground shaking, which cause localized failures and distortion of the soil. The anticipated ground accelerations are below the threshold required to induce lurching of the site soil.

SEICHE AND TSUNAMI

The site is inland and elevated away from tsunami inundation zones and away from large bodies of water that may develop seiches. Seiches and tsunamis are not considered a hazard in the site vicinity.

REFERENCES

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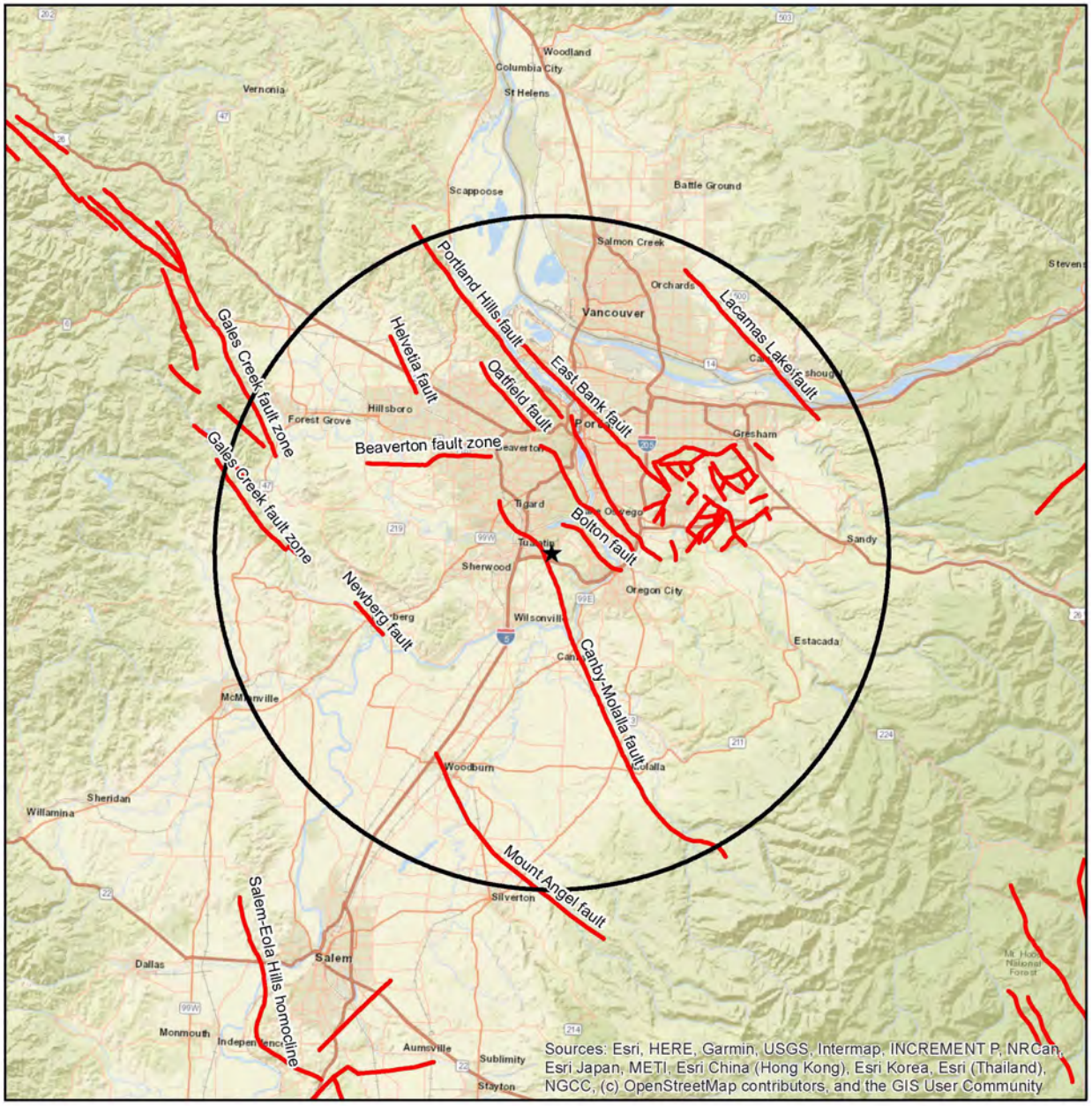


LEGEND

- RADIUS
- ★ SITE LOCATION
- USGS QUATERNARY FAULTS

N

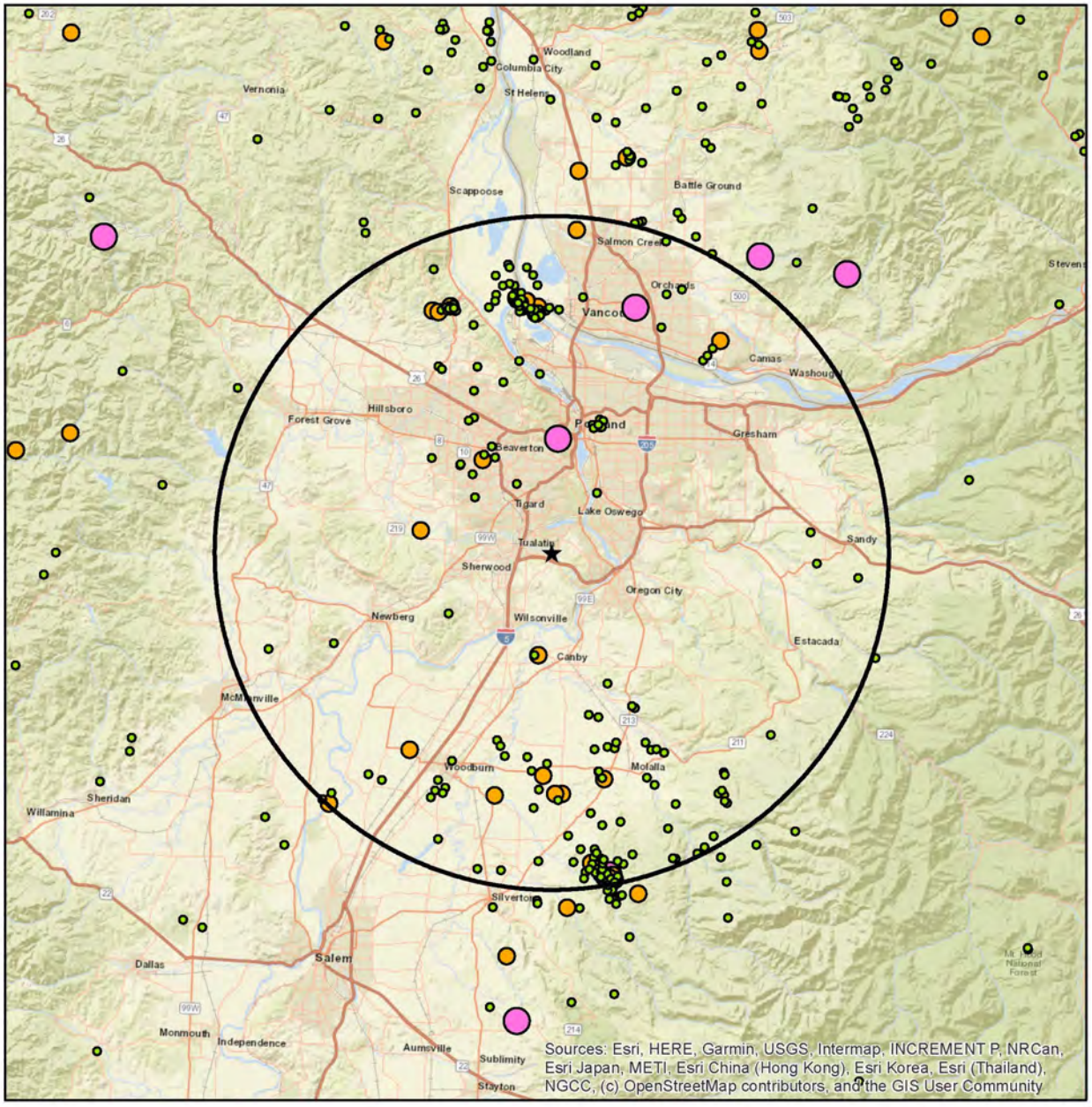
0 20 40

Kilometers

USGS, Quaternary Fault and Fold Database of the United States, U.S. Geological Survey, Available: https://earthquake.usgs.gov/hazards/qfaults

GeoDesign Inc An NV5 Company	WLWSCHDIST-5-01	**QUATERNARY FAULT MAP**	
	JUNE 2020	ACMS – OFFICE ADDITION AND RENOVATIONS TUALATIN, OR	**FIGURE C-1**

WLWSchDist-5-01-FC1_C2.docx Print Date: 6/23/20



LEGEND

- RADIUS
- ★ SITE LOCATION

INSTRUMENTAL EARTHQUAKE MAGNITUDE

- 2.0 - 3.0
- 3.0 - 4.0
- 4.0 - 6.0
- > 6.0

N

0 20 40

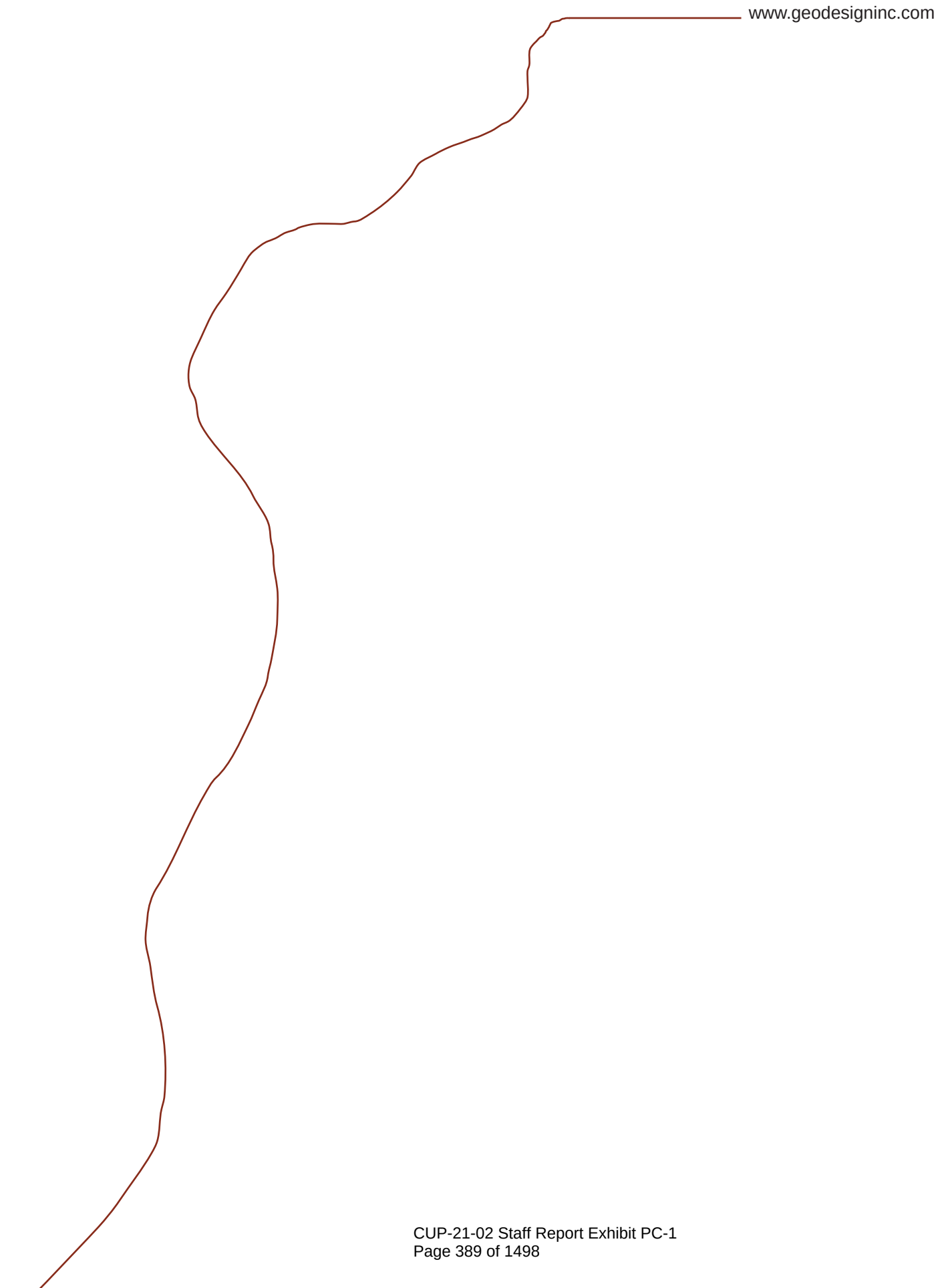
Kilometers

USGS, accessed January 2020, Earthquake Hazards Program, US Earthquake Information by State, U.S. Geological Survey, Available: http://earthquake.usgs.gov/earthquakes/search

Earthquakes in figure are from 1904-2020.

GeoDesign Inc An NV5 Company	WLWSCHDIST-5-01	**HISTORICAL SEISMICITY MAP**	
	JUNE 2020	ACMS – OFFICE ADDITION AND RENOVATIONS TUALATIN, OR	**FIGURE C-2**

WLWSchDist-5-01-FC1_C2.docx Print Date: 6/23/20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