Updated 1/11/2019 all previous version of this form are obsolete

WILSONVILLE OREGON

29799 SW Town Center Loop E, Wilsonville, OR 97070
Phone: 503.682.4960 Fax: 503.682.7025
Web: www.ci.wilsonville.or.us

Planning Division
Development Permit Application

Final action on development application or zone change is required within 120 days per ORS 227.175 or as otherwise required by state or federal law for specific application types.

A pre application conference may be required.

The City will not accept applications for wireless communication facilities or similar facilities without a completed copy of a Wireless Facility Review Worksheet.

The City will not schedule incomplete applications for public hearing or send administrative public notice until all of the required materials are submitted.

Applicant:

Name: Remo Douglas

Company: West Linn-Wilsonville School District

Mailing Address: 22210 SW Stafford Road

City, State, Zip: Tualatin, OR 97062

Phone: 503.673.7988 Fax:

E-mail: douglasr@wlwv.k12.or.us

Authorized Representative:

Name: Keith Liden

Company: Keith Liden, Planning Consultant

Mailing Address: 4021 SW 36th Place

City, State, Zip: Portland, OR 97221

Phone: 503.757.5501 Fax:

E-mail: keith.liden@gmail.com

Property Owner:

Name: Same as applicant

Company:

Mailing Address:

City, State, Zip:

Phone: Fax:

E-mail:

Property Owner's Signature:

Printed Name: REMO DOUGLAS Date: 11-17-22

Applicant's Signature: (if different from Property Owner)

Printed Name: Date:

Site Location and Description:

Project Address if Available: 7151 SW Boeckman Road Suite/Unit

Project Location:

Tax Map #(s): 12DC and 12DD Tax Lot #(s): TL 4500 and 400 County: ☐ Washington ☒ Clackamas

Request:

Master Plan, Lot Line Adjustment, Site Design Review, Tree Removal, and Sign Waiver to construct a new primary school (Phase 1: 350 enrollment and future Phase 2: 550 enrollment).

Project Type: Class I ☐ Class II ☐ Class III ☐

☐ Residential ☐ Commercial ☐ Industrial ☒ Other: Public Facility

Application Type(s):

☐ Annexation	☐ Appeal	☐ Comp Plan Map Amend	☐ Parks Plan Review
☐ Final Plat	☐ Major Partition	☐ Minor Partition	☐ Request to Modify Conditions
☐ Plan Amendment	☐ Planned Development	☐ Preliminary Plat	
☐ Request for Special Meeting	☐ Request for Time Extension	☒ Signs	☒ Site Design Review
☐ SROZ/SRIR Review	☐ Staff Interpretation	☒ Stage I Master Plan	☒ Stage II Final Plan
☒ Type C Tree Removal Plan	☐ Tree Permit (B or C)	☐ Temporary Use	☐ Variance
☐ Villebois SAP	☐ Villebois PDP	☐ Villebois FDP	☐ Other (describe)
☐ Zone Map Amendment	☒ Waiver(s)	☐ Conditional Use	

Chicago Title Insurance Company of Oregon

POLICY OF TITLE INSURANCE

CHICAGO TITLE INSURANCE COMPANY OF OREGON

SUBJECT TO THE EXCLUSIONS FROM COVERAGE, THE EXCEPTIONS FROM COVERAGE CONTAINED IN SCHEDULE B AND THE CONDITIONS AND STIPULATIONS, CHICAGO TITLE INSURANCE COMPANY OF OREGON, an Oregon corporation, herein called the Company, insures, as of Date of Policy shown in Schedule A, against loss or damage, not exceeding the Amount of Insurance stated in Schedule A, sustained or incurred by the insured by reason of:

1. Title to the estate or interest described in Schedule A being vested other than as stated therein;
2. Any defect in or lien or encumbrance on the title;
3. Unmarketability of the title;
4. Lack of a right of access to and from the land.

The Company will also pay the costs, attorneys' fees and expenses incurred in defense of the title, as insured, but only to the extent provided in the Conditions and Stipulations.

CHICAGO TITLE INSURANCE COMPANY OF OREGON

By: Bradley J London
President

CHICAGO TITLE INSURANCE COMPANY OF OREGON
CORPORATE SEAL

By: Thomas J Adams
Secretary

Issued by:
CHICAGO TITLE INSURANCE COMPANY
OF OREGON
10001 S.E. SUNNYSIDE ROAD
CLACKAMAS, OR 97015
(503) 653-7300

Norman Lee
Authorized Signature

ALTA OWNER'S POLICY (10-17-92)

Reorder Form No. 9452

SCHEDULE A

Date of Policy: May 24, 1999 at 1:52 p.m. Policy No.: 201430

Amount of Insurance: $1,225,000.00 Premium: $2,437.50

1. Name of Insured:

   CLACKAMAS COUNTY SCHOOL DISTRICT 3, WEST LINN-WILSONVILLE SCHOOL DISTRICT 3JT

2. The estate or interest in the land which is covered by this policy is:

   FEE SIMPLE

3. Title to the estate or interest in the land is vested in:

   CLACKAMAS COUNTY SCHOOL DISTRICT 3, WEST LINN-WILSONVILLE SCHOOL DISTRICT 3JT

4. The land referred to in this policy is described as follows:

   (Continued)

Policy No. 201430

LEGAL DESCRIPTION

PARCEL I:

A tract of land situated in the Southeast one-quarter of Section 12, Township 3 South, Range 1 West of the Willamette Meridian, in the County of Clackamas and State of Oregon, more particularly described as follows:

Commencing at a stone in a monument box at the Southeast corner of said Section 12; thence tracing the South line of said Section 12 and the centerline of Boeckman Road South 89°46'58" West 1,519.10 feet; thence North 0°02'40" East 30.00 feet to a 5/8" iron rod on the North right-of-way line of Boeckman Road and the true point of beginning of this description; thence continuing North 0°02'40" East 828.00 feet to a 5/8" iron rod; thence South 89°46'58" West 511.16 feet; thence South 0°02'40" West 828.00 feet to the North right-of-way line of said Boeckman Road; thence along said North right-of-way line North 89°46'58" East 511.16 feet to the true point of beginning.

Bearings in this description are based on 'LP 064' (Clackamas County Restoration Survey).

PARCEL II:

A tract of land situated in the Southeast one-quarter of Section 12, Township 3 South, Range 1 West of the Willamette Meridian, in the County of Clackamas and State of Oregon, described as follows:

BEGINNING at stone in monument box at the Southeast corner of said Section 12; thence tracing the South line of said Section 12 and the center line of Boeckman Road South 89°46'58" West 925.63 feet to the Southwest corner of a tract of land conveyed by Theodore C. Hopper to Walter O. and Doris A. Wehler recorded as Recorder's Fee No. 73-35929, Clackamas County Records (found 5/8-inch iron rod bears North 00°02'40" East 30.21 feet); thence continuing South 89°46'58" West 33.00 feet; thence North 00°02'40" East (parallel to the East line of the Southeast one-quarter of said Section 12) 30.00 feet to a point on the North right-of-way line of Boeckman Road (5/8-inch iron rod set by L. S. 475 bears South 63° East 0.13 feet); thence continuing North 00°02'40" East along the West line of a tract of land described in Warranty Deed from James A. Hathaway to Dale I. Kreilkamp, recorded as Recorder's Fee No. 86-01354, Clackamas County Records, North 00°02'40" East 422.00 feet to the true point of beginning of this description; thence South 89°46'58" West 540.47 feet; thence South 00°20'40" West 422.00 feet to a point on the North right-of-way line of said Boeckman Road (30.00 feet North of center line); thence tracing said North line South 89°46'58" West 20.00 feet; thence North 00°02'40" East 828.00 feet to a point on the South line of a tract of land described in Warranty Deed from Hubert Hutchcroft and Gladys B. Hutchcroft to Robert Coats, recorded in Book 641, Page 199, June 9, 1964, Clackamas County Deed Records; thence along said South line and also the South line of a tract of land conveyed by Berry K. Fuller and Stanley Kruse, co-executors of the estate of Mary W. Kruse to Ernest R. and Pauline V. Russel, recorded as Recorder's Fee No. 74-5153, Clackamas County Records, North

(Continued)

Policy No. 201430

LEGAL DESCRIPTION

89°46'58" East 560.47 feet to the Northwest corner of the Kreilkamp Tract described in said Recorder's Fee No. 86-01354, Clackamas County Records; thence along the West line of said Kreilkamp Tract South 00°02'40" West 406.00 feet to the true point of beginning of this description. Bearings in this description are based on 'LP 064' (Clackamas County Restoration Survey).

EXCEPTING THEREFROM that portion thereof contained in Deed to Louie M. Pike, et ux, recorded February 9, 1989, Recorder's Fee No. 89 06039, Clackamas County Records.

Policy No. 201430

SCHEDULE B

This policy does not insure against loss or damage (and the Company will not pay costs, attorneys' fees or expenses) which arise by reason of:

GENERAL EXCEPTIONS

1. a. Taxes or assessments which are not shown as existing liens by the records of any taxing authority that levies taxes or assessments on real property or by the public records.

   b. Proceedings by a public agency which may result in taxes or assessments, or notices of such proceedings, whether or not shown by the records of such agency or by the public records.

2. a. Easements, liens, encumbrances, interests or claims thereof which are not shown by the public records.

   b. Any facts, rights, interests or claims which are not shown by the public records but which could be ascertained by an inspection of the land or by making inquiry of persons in possession thereof.

3. Discrepancies, conflicts in boundary lines, shortage in area, encroachments, or any other facts which a correct survey would disclose, and which are not shown by the public records.

4. a. Unpatented mining claims;

   b. Reservations or exceptions in patents or in Acts authorizing the issuance thereof;

   c. Water rights, claims or title to water;

   whether or not the matters excepted under (a), (b), or (c) are shown by the public records.

5. Any lien or right to a lien, for services, labor or material heretofore or hereafter furnished, imposed by law and not shown by the public records.

Policy No. 201430

SCHEDULE B - continued

SPECIAL EXCEPTIONS:

6. Rights of the public and of governmental bodies in and to that portion of the premises herein described lying below the high water mark of an unnamed creek. (Affects Parcel II)

7. An easement created by instrument, including terms and provisions thereof;

Dated:	July 6, 1907
Recorded:	July 8, 1907
Book:	99
Page:	520
In Favor Of:	Portland Railway, Light and Power Company
For:	Transmission lines
Affects:	The Southerly portion

8. An easement created by instrument, including terms and provisions thereof;

Dated:	July 6, 1907
Recorded:	July 8, 1907
Book:	99
Page:	520
In Favor Of:	Portland Railway, Light and Power Company
For:	Tree trimming and removal
Affects:	The Southerly portion

9. An easement created by instrument, including terms and provisions thereof;

Dated:	July 23, 1913
Recorded:	October 1, 1913
Book:	5
Page:	455, Miscellaneous Records
In Favor Of:	The Pacific Telephone and Telegraph Company
For:	Poles and wires
Affects:	Exact location not disclosed

10. Lease, including the terms and provisions thereof.

Dated:	January 4, 1999
A memorandum of which was:	
Recorded:	January 26, 1999
Recorder's Fee No.:	99-007773
Lessor:	Thomas C. Scott
Lessee:	T. C. Scott Machining, Ltd.

(Affects Parcel I)

(Continued)

Policy No: 201430

The present ownership of said leasehold and other matters affecting the interest of the lessee are not shown herein.

End of Policy

4200-27182-SB
06/15/99
cjg

OWNER'S INFLATION PROTECTION ENDORSEMENT

Attached to Policy No. 201430
Issued by

CHICAGO TITLE INSURANCE COMPANY OF OREGON

Dated: May 24, 1999 at 1:52 p.m. Premium: No Charge

The Company, recognizing the current effect of inflation on real property valuation and intending to provide additional monetary protection to the insured owner named in the policy, hereby modifies the policy, as follows:

1. notwithstanding anything contained in the policy to the contrary, the amount of insurance provided by the policy, as stated in Schedule A thereof, is subject to cumulative annual upward adjustments in the manner and to the extent hereinafter specified;

2. 'adjustment date' is defined, for the purpose of this endorsement, to be 12:01 a.m. on the first January 1 which occurs more than six months after the Date of Policy, as shown in Schedule A of the policy to which this endorsement is attached and on each succeeding January 1;

3. an upward adjustment will be made on each of the adjustment dates, as defined above, by increasing the maximum of insurance provided by the policy by 10% (ten percent) per year for 5 (five) years; provided, however, that the maximum amount of insurance in force shall never exceed 150% of the amount of insurance stated in Schedule A of the policy, less the amount of any claim paid under the policy which, under the terms of the conditions and stipulations, reduces the amount of insurance in force;

4. in the settlement of any claim against the Company under the policy, the amount of insurance in force shall be deemed to be the amount which is in force as of the date on which the insured claimant first learned of the assertion or possible assertion of such claim, or as the date of receipt by the Company of the first notice of the claim, whichever shall first occur.

This endorsement is made a part of the policy and is subject to all the terms and provisions thereof and of any prior endorsements thereto. Except to the extent expressly stated, it neither modifies any of the terms and provisions of the policy and any prior endorsements, nor does it extend the effective date of the policy and any prior endorsements, nor does it increase the face amount thereof.

CHICAGO TITLE INSURANCE COMPANY
OF OREGON

BY: Norman Lee
Authorized Signature

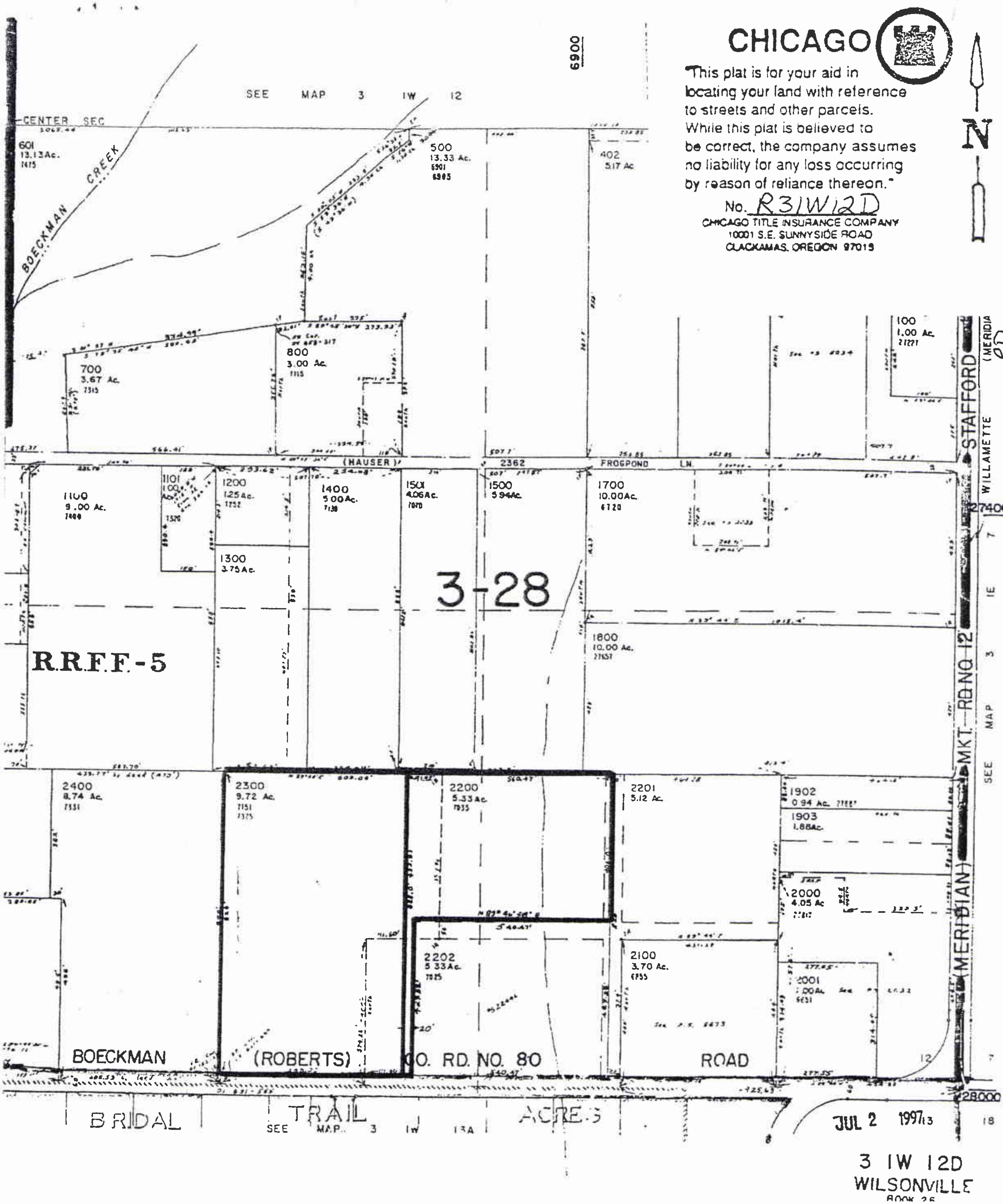
Endorsement No. 78

CHICAGO

"This plat is for your aid in locating your land with reference to streets and other parcels. While this plat is believed to be correct, the company assumes no liability for any loss occurring by reason of reliance thereon."

No. R31W12D

CHICAGO TITLE INSURANCE COMPANY
10001 S.E. SUNNYSIDE ROAD
CLACKAMAS, OREGON 97015



NEW WILSONVILLE PRIMARY SCHOOL
Master Plan, Site Design Review, Tree Removal and Sign Waiver

TABLE OF CONTENTS

APPLICATION SUMMARY

For Stage I Master Plan, Stage II Final Plan, Site Design Review, Type C Tree Removal Permit, and Sign Waiver to construct a new primary school, parking, playground, and related improvements.

GENERAL INFORMATION

Location

7151 Boeckman Road (3S 1W, Section 12DC, Tax Lot 4500 and 3S 1W, Section 12 DD, tax Lot 400.) Its location is shown in Figure 1.

Comprehensive Plan and Zoning Designation

The plan designation is Public, and the zoning is PF - Public Facilities.

Applicant and Owner

Remo Douglas
Capital Construction Program Manager
West Linn-Wilsonville School District
2755 SW Borland Road
Tualatin, OR 97062
Phone: 503.673.7988
douglasr@wlwv.K12.or.us

Applicant's Representative

Keith Liden, AICP
4021 SW 36th Place
Portland, OR 97221
503.757.5501
keith.liden@gmail.com

Design Team

Rebecca Grant
IBI Group
907 SW Harvey Milk Street
Portland, OR 97205
503.419.1606
Rebecca.grant@ibigroup.com

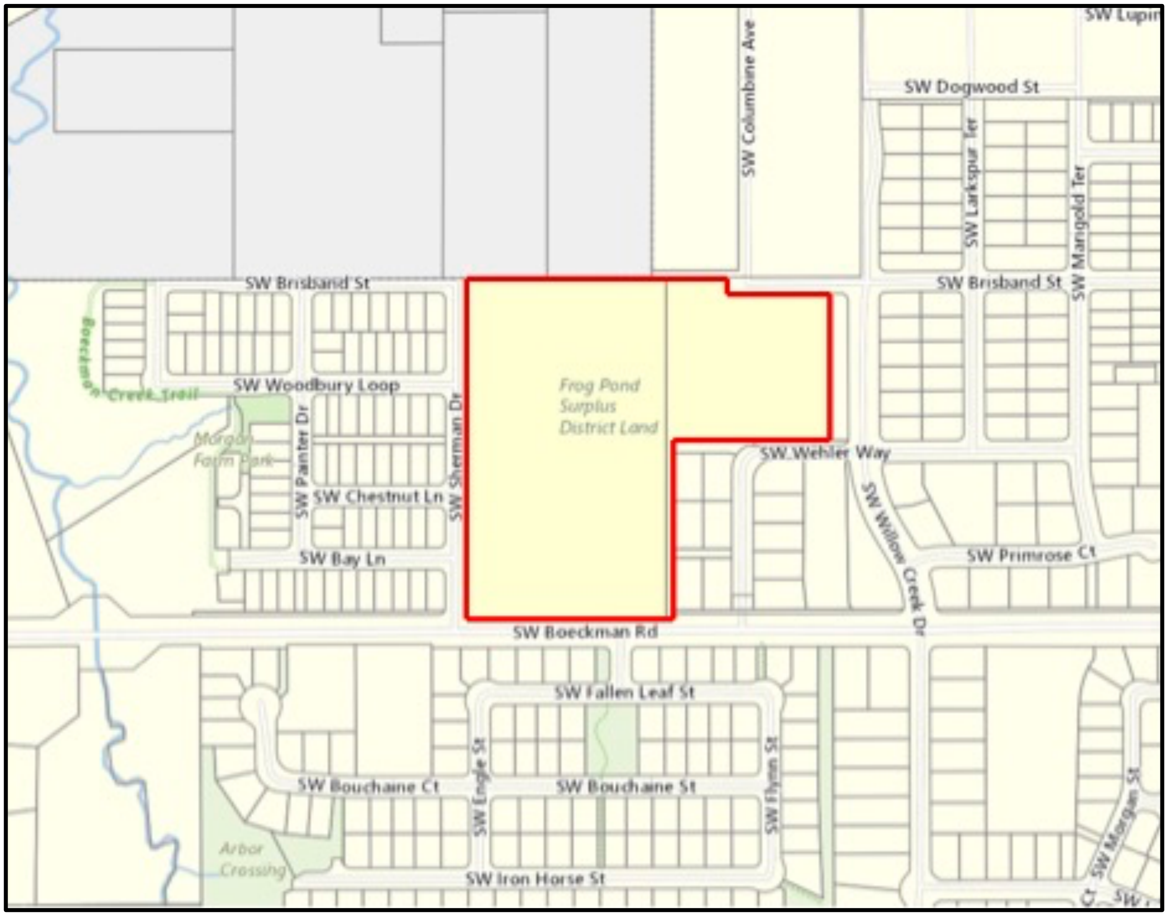
Joseph McAllister, PLS
Compass Land Surveyors
4107 SE International Way, Suite 705
Milwaukie, OR 97222
503.496.1489
joem@compass-landsurveyors.com

John Howorth, PE
3J Consulting
9600 SW Nimbus Avenue, Suite 100
Beaverton, OR 97008
503.946.9365, x201
john.howorth@3j-consulting.com

Jeramie Shane
Mayer/Reed
319 SW Washington Street, Suite 820
Portland, OR 97204
503.223.5953
jeramie.@mayerreed.com

William Driscoll
Glumac
900 SW 5th Avenue, Suite 1600
Portland, OR 97204
503.227.5280
wdriscoll@glumac.com

Figure 1: Vicinity Map



Source: Metro

BACKGROUND INFORMATION

Site Description

The New Wilsonville Primary School site is located on a 12.6-acre property that consists of two parcels (TL 4500 and TL 400). The property was recently annexed into the city and zoned PF – Public Facilities. A residence, pole barn, and two small accessory structures occupy the central portion of Tax Lot 4500. Tax Lot 400 is vacant. The trees on the site are generally clustered near the existing house and along the boundary between Tax Lots 4500 and 400 (Exhibit A – LU 100 and LU 110).

The property has over 511 feet of frontage along Boeckman Road to the south, which is classified as a minor arterial with a three-lane cross section, bike lane, and curb but no sidewalk. The western side of the property has 827 feet of frontage along SW Sherman Drive, which is classified as a local street, lacks full improvements along the subject property frontage. Tract A "Frog Pond Meadows No. 2" separates the eastern property boundary from SW Willow Creek Drive, a collector street. A portion of the property to the southeast fronts on SW Wehler Way, a local street, and the remainder abuts residential properties (Exhibit B).

SW Brisband Street, another local street, is planned to traverse across the northern property boundary. A portion of SW Brisband Street right-of-way has been recently dedicated to the city, and the remainder is assumed to be dedicated in conjunction with the development of the new school.

Surrounding Area Description

The plan and zoning designations and current land use of the surrounding area are summarized in Table 1.

Table 1
Land Use Summary

PROPERTIES IN THE VICINITY	WITHIN CITY	PLAN DESIGNATION	ZONE DESIGNATION	LAND USE
Subject Property 3S 1W 12, TL 4500 and 400	Yes	Public	PF – Public Facility	Acreage residence and vacant
Surrounding Properties North 3S 1W 12D	Yes	Residential	Residential	Acreage residence
TL 1501 and 1300	Yes	Residential	Residential	Acreage residence
TL 1400	No	Residential		Acreage residence
East	Yes	Residential	RN – Residential Neighborhood	Single family residences
South	Yes	Residential	PDR – Planned Development Residential	Single family residences
West	Yes	Residential	RN – Residential Neighborhood	Single family residences

PRIMARY SCHOOL BUILDING AND RELATED IMPROVEMENTS

Improvement Summary

The new Wilsonville Primary School is proposed as envisioned in the Frog Pond Master Plan. The 12.6-acre property (12.78-acres less the right-of-way dedication deed 2022-047267) is owned by the school district, and the northeastern portion is proposed to be sold to the city for use as a neighborhood park.

The proposed primary school is planned to be constructed in two phases. The proposed first phase will accommodate an enrollment of 350 students and 35 staff. A second phase would include additional instruction space to raise the enrollment to 550 students, plus an additional 10 staff. The core facilities, such as the library, gymnasium, auditorium, and administrative offices will be built in the first phase to accommodate full enrollment (Exhibit A – LU 120 and LU 300).

The hours of operation for all primary schools in the district at the time of this application are 7:50am-2:10pm. On early release days (1 or 2 Wed. per month) school ends at 12:10 pm. Each primary school has an after school childcare program that occupies the multi-purpose room, cafeteria, or wellness center until 6 pm Monday-Friday. Gyms are used for either volleyball or basketball by the youth sports programs and community members from 4pm-10pm. Gym use depends upon seasons. Primary gyms are not utilized as often during spring or summer. School events take place in gyms/multi-purpose rooms on average 1-2 times per month.

Lot Line Adjustment

A lot line adjustment <u>will follow</u> this application to create the desired property configuration for both the school and park uses. The plan sheets show the proposed configuration of the school and park properties as tentatively agreed by the district and city (Exhibit B). The proposed lot line adjustment would result in an approximately 9.68-acre (421,512 sf) western parcel for the school and a 2.93-acre (127,449 sf) site for a future city park. Following the anticipated dedications for SW Brisband Street (41.8-ft dedication), SW Sherman Drive (6.0-ft dedication), and Boeckman Road (10.5-ft dedication) the net site area will be 9.11 acres (396,812 sf).

Primary School Building

Program Elements

The Phase 1 development will include core facilities, such as the commons/gym, library, and food service designed to support the ultimate enrollment of 550 students. This phase will result in an approximately 58,130 square-foot, one-story building including:

- 16 classrooms
- Wellness/Commons/Gym
- Music classroom
- Library
- Makerspace
- Administrative offices
- Kitchen
- Main parking lot near Sherman Drive

A future Phase 2 addition of approximately 11,500 square feet (69,630 total) is proposed to include one additional wing of six classrooms and a two-classroom addition to a four-classroom wing from the first phase (Exhibit A – LU 120 and LU 321). In addition, a second parking lot is proposed in the northeastern portion of the school site to support the additional 200-student enrollment and staff.

The building setbacks for the first and second phases following anticipated street right-of-way dedications and the lot line adjustment will be:

- SW Sherman Drive: 114 feet (Phase 1 building corner).
- SW Brisband Street: 139 feet, 11 inches (Phase 2 building corner).
- Tax Lot 400 to the East: 82 feet, 7 inches (Phase 2 building corner).
- Boeckman Road: 206 feet, 7 inches (Phase 1 building corner).

Site and Architectural Design

The school design was guided by three basic principles: 1) being a good neighbor; 2) providing safe and efficient access; and 3) enabling community use (Exhibit A – LU 300 - LU 331 and LU 200 - LU 212).

Being a good neighbor will primarily be accomplished by:

- A single-story structure, with a maximum height of 32.5 feet, which is an appropriate scale to neighborhood.
- Centering the building on the site to maximize its distance from surrounding residences.
- Building finish materials and landscaping to provide a high-quality aesthetic.
- Screening of rooftop mechanical equipment and the trash/recycling area (Exhibit C). The screening for the rooftop equipment is shown in Exhibit A – LU 310-313 and LU 330-340). The gates will be Metalco Grigliato SC-100 panels, and a cut sheet is included in Exhibit C. The dimensions of the gates are included on the site plan that was approved with the Republic Services.

Providing safe and efficient access by providing:

- A separated bus loop from parent drop-off and pick-up.
- Sufficient on-site queueing for drop-off and pick-up to minimize the impact to local streets.
- On-site parking that meets city requirements.
- Safe and convenient pedestrian and bicycle access to and within the school site.
- Vehicular access to the trash/recycling area approved by Republic Services.

Enabling community use including:

- Wellness commons (gym) with kitchenette, space for spectators and activities.
- Multipurpose room with raised platform.
- Walking paths that will be available for public use outside of school hours.
- Playground with accessible surfacing / activities available for public use outside of school hours.

Architectural Form, Materials and Character

The building is designed to have a scale and appearance that is complementary to the residential character of the neighborhood. In addition to a low-profile building scale, this will be accomplished by exterior finish materials that will have a residential aesthetic including:

- Brick.
- Wood-like siding.
- Windows for natural daylight and views.

- Residential scale with single story structures and pitched roofs at the learning neighborhoods.

These materials are shown in Exhibit A – LU 310-313 and LU 330-331, and physical samples are also provided with the application. Photographic representations of the primary exterior finishes are shown in Exhibit A – LU 340 and Exhibit C.

Parking, Circulation, and Loading

Circulation

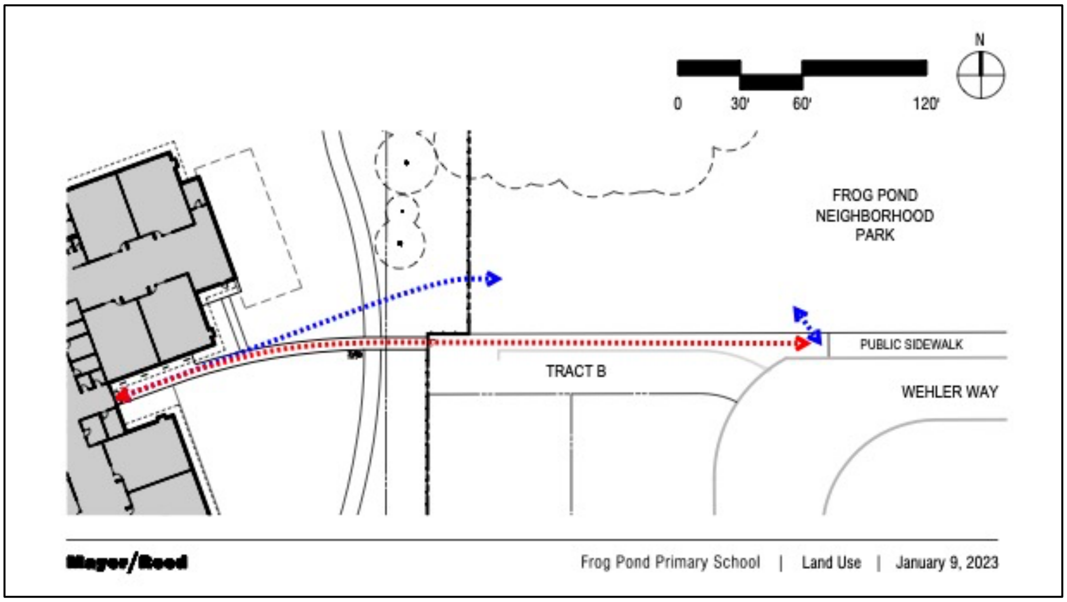
The driveway and overall circulation design is intended to enhance safety for everyone entering and leaving the site by keeping different modes separate. The primary driveway for visitors, parent drop-off/pick-up, and staff is proposed on SW Sherman Drive in alignment with SW Woodbury Loop. A secondary driveway is proposed on SW Brisband Street to another parking lot proposed in Phase 2. A driveway for school buses and authorized vehicles is proposed on Boeckman Road across from SW Laurel Glen Street. This will allow for separation of buses from other traffic along with reducing any potential congestion on SW Sherman Drive (Exhibit A – LU 120).

Once on-site, the parking lot will provide a one-way circulation for parent drop-off and pick-up at the front of the school and the main entrance. Students riding the bus will have similarly convenient access to the school building from the bus drop-off and pick-up loop. This restricted driveway will be clearly signed as Bus and Authorized School District Use Only. The Phase 2 parking lot will provide additional capacity when the school is enlarged to support an enrollment of 550 students. The design of this lot may change, and it could be influenced in a coordination with the city and the future park design.

Direct pedestrian and bicycle access will be provided from all directions to maximize connectivity to the surrounding neighborhoods before and after school, including:

- Sidewalk along the entire property street frontage for Boeckman Road, SW Sherman Drive, and SW Brisband Street.
- Crosswalks at the following intersections along SW Sherman Drive on the west side of the site as approved by the City Engineer.
  - SW Brisband Street: South leg only (No other receiving ADA ramp available).
  - SW Woodbury Loop: North and south legs at the driveway to the school.
  - SW Chestnut Lane: North leg only.
  - SW Bay Lane: North leg only.
  - Boeckman Road: North leg only.
- A street crossing on Boeckman featuring a Rectangular Rapid Flashing Beacon (RRFB) as recommended in the DKS transportation impact analysis (Exhibit D). The DKS study recommends that the district and city develop a map of the preferred Safe Routes to School and to install the RRFB on the east leg of the Sherman/Boeckman intersection.
- Pathway connections to SW Wehler Way and SW Brisband Street. Phase 1 will include a pathway alignment to SW Brisband Street with a modified pathway alignment in Phase 2 to accommodate the Phase 2 layout. The pathways are proposed to be ¼-inch minus to provide ADA accessibility. An option to connect through the future city park property has

been discussed with the city and is the preferred option. Either a direct connection to SW Wehler Way will be made through the private Tract B (as shown on the plans), or just north of Tract B through the public park to SW Wehler Way (shown below).



- A perimeter security fence will enclose the areas occupied during the school day including the playground, field and around the classroom wings. The gates will be locked during school hours but opened at other times to facilitate community access.
- In addition to the main building entrance facing SW Sherman Drive, other building entrances will be accessible for student arrival and dismissal.
- A pedestrian connection from Boeckman Road to SW Brisband Street is shown in the Frog Pond Master Plan along the property's east boundary. The district has accommodated the intent of this pedestrian connection by providing a pathway from Boeckman Road sidewalk north along the bus lane to a path that will meander north along the eastern side of the school building to SW Brisband Street. This path will be gated during school hours but opened to the public at other times to facilitate access. During school hours the pedestrian route would continue along the bus lane to the front of the building and then onto the northwest corner of the site along SW Sherman Drive which then connects to SW Brisband Street completing the intent of the master plan while addressing school security.

In addition to the RRFB recommendation noted above, the transportation impact analysis in Exhibit D contains the following important conclusions:

- Existing traffic operations for the intersections near the site meet the city's operating standards (Table 3).
- With full buildout of the school (550 enrollment) and anticipated Frog Pond development, the nearby intersections will continue to operate acceptably except for the Boeckman Road/Canyon Creek Road intersection (Table 7). However, the report acknowledges that with the planned signal at this intersection, it will also operate at an acceptable level.
- Although the proposed restricted bus driveway does not meet the minimum desired spacing of 600 feet along Boeckman Road, it does not pose a problem because it will align

with the existing SW Laurel Glen Street intersection, and the number of buses is quite low.

- The proposed 119 parking spaces will satisfy city requirements for a range between 119 and 179 spaces to support an enrollment of 550 students and 45 staff.
- A total of 97 bicycle parking spaces are required with the completion of Phase 2 (100 spaces are proposed with the completion of Phase 2).
- Once the school walking boundary is confirmed, the city and district will develop a Safe Routes to School map.

Parking

A 77-space lot is proposed along the SW Sherman Drive frontage as part of Phase 1. Six of the 77 spaces will be accessible. Phase 2 of the development will provide 4 additional spaces to the SW Sherman Drive lot, and a second 38-space lot is proposed in the northeastern corner of the site for a total of 119 spaces to support the increase enrollment from 350 to 550 students.

A total of 52 bicycle parking spaces are proposed with Phase 1. Twenty-six spaces will be long-term, covered spaces located in the front (west side) of the building. An additional 26 spaces are proposed within 30 feet of building entrances on the west and east sides of the building (see Table 2 and Exhibit A - LU 120).

Table 2
Parking Summary

	Phase 1	Phase 2	Total
Vehicle			
Standard	71	42	113
ADA	6	0	6
Total	**77**	**42**	**119**
Bike			
Within 30’ of entry	26	24	50
Covered (long-term)	26	24	50
Total	**52**	**48**	**100**

Loading and Emergency Access

Loading area for deliveries will be in front of the utility yard on the west side of the building. The solid waste and recycling areas will also be located in this area behind a wall and gate enclosure. Access for both functions will be provided by the SW Sherman Drive driveway (Exhibit A – LU 300, LU 311, and LU 320). Republic Services has reviewed and approved the design of the trash and recycling facilities (Exhibit E). A service provider approval has also been received from Tualatin Valley Fire and Rescue (Exhibit F).

Landscape

Tree Removal and Protection

Forty-seven trees are proposed to be removed in Phase 1, (Exhibit A – LU 201), 41 of which are 6-inch dbh and larger. Additional trees may be required to be removed for the Phase 2 parking lot, though that quantity is unknown at this time. A Type C Tree Removal Permit is requested to remove the 47 trees affected by Phase 1 construction. The Austrian pine near SW Boeckman Road and the remaining trees along the northeast side of the site will be protected as shown (Exhibit A – LU 201) and described by the consulting arborist in Exhibit J. Forty-one new trees will be planted in Phase 1 as mitigation for the removed trees 6-inch and larger. Additional trees will be planted with Phase 2 to cover mitigation requirements for additional tree removals.

Landscaping and Plantings

The site design includes an entry courtyard, playgrounds, open play lawn area, gardening planters, and a connecting pedestrian circulation system. Included in the circulation system is the Community Connector path, as directed in the Frog Pond West Master Plan, situated along the east side of the property.

Various types of landscaping have been chosen to create a naturalized campus supportive of hands-on learning and ecological rehabilitation of the site. Hardy, drought-tolerant, low ornamental shrubs and groundcovers will be used adjacent to the building and around the parking lots. Irrigated mown lawn is proposed in programmed high use areas such as the open play area to the north and in the entry courtyard. Several stormwater facilities are distributed throughout the site. The remaining areas of the site are proposed to be planted in either native meadow or native woodland species to improve the ecological health of the site and enhance its resilience (Exhibit A – LU 206 - LU 214).

Street Frontage Landscaping

Boeckman Road is currently being designed by the City of Wilsonville and may change depending on that project. Currently, the street frontage along the new primary school will consist of a 9-foot wide planter strip, a 7-foot wide separated bike lane connected directly to a 6-foot sidewalk with a 10-foot wide planted area that will also be a 10-foot PUE, and finally SW Brisband Street will have a standard planter strip that accommodates both LIDA facilities and street trees as required. Street trees that would otherwise conflict with the LIDA facilities will be planted at the back of the public sidewalk. The Frog Pond Master Plan calls for a brick wall with a black metal fence atop the wall along the Boeckman Road frontage (with the exception described herein). This wall and fence will be constructed as an extension of the existing wall and fence to the east.

This extension of the wall and fence along Boeckman Road at the southeast corner of the site will be buffered to the south with low ornamental planting. The wall is proposed to stop at the east edge of the bus entry driveway. The gap in the wall will improve visibility to and from the school site, benefiting security as well as navigation to the school. This will also serve to emphasize the native plantings and stormwater features along the southern edge of the property. The ornamental planting in the "landscape buffer" will continue west along the street frontage between the bus access drive and the street corner to provide an attractive edge and continuous aesthetic in keeping with the Frog Pond West Master Plan.

SW Sherman Drive and SW Brisband Street will have a standard planter strip that accommodates both LIDA facilities and street trees as required. The planting along SW Sherman Drive and SW Brisband Street will be low shrubs, groundcovers and trees extending seamlessly from the on-site planting plan. Trees will be spaced per city standard spacing, considering required offsets from adjacent improvements such as utilities and vision clearances.

Hardscape and Plaza Spaces

The main outdoor gathering and use space is the Entry Courtyard between the building and the main parking lot. This area will accommodate student pick-up and drop-off, bike parking, general circulation to several building entries, a gathering space for before and after school and community events, two areas showcasing stormwater, and several sub-areas for smaller gatherings. Boulders will be installed throughout the space as informal seating and serve as wayfinding elements to enhance the story of water. Low, wide concrete walls and backed benches increase the options for seating. Details for the concrete walls and boulders are provided in Exhibit A – LU 216, and cutsheets of the benches are in Exhibit H. A stamped concrete finish, to look like a boardwalk, will be used on a portion of the concrete paving to further enhance and delineate the space.

Playground and Field

The main playground and play area are located to the north of the school building. The playground will consist of a large “pond” of asphalt paving with interspersed “lily pads” of synthetic turf surrounding play equipment pieces. The pieces have been chosen specifically to meet the goals of universal and inclusive play, with an emphasis on wheelchair accessibility. A natural lawn play area is located to the east of the playground and is delineated by sloped edges along the northern and eastern edges. Additional site furnishing of low concrete walls (see Exhibit A - LU 216) and picnic tables (Exhibit H) complete the space. Finally, the stamped concrete finish, used in the entry courtyard will be used in a portion of the paving to create a “boardwalk” and “dock” extending into the playground “pond”. Other play elements will be created using paving paint.

Utilities

Stormwater

Stormwater runoff coming from the new impervious areas including the building and paved areas will be conveyed and treated using multiple stormwater facilities within the original drainage basins and be metered and discharged according to the original basins.

Specifically, runoff from the proposed and future impervious areas will be conveyed to Low Impact Development (LID) facilities that have been designed using the BMP Sizing Tool. The areas currently draining to the east and west will be respected and continue to follow the same drainage patterns as closely as possible. Due to the surrounding developments and topography, offsite runoff is not expected to reach the site.

As part of the Stafford Meadows Subdivision, OTAK performed a downstream analysis that included the future build-out of the school site draining east. The analysis showed that the downstream conveyance system has capacity for the development of the school site. Additionally, the subdivision installed a 36-inch box culvert in SW Wehler Way to convey Willow Creek draining north to south. The new culvert was sized to convey future flows from the school site.

The post-developed western portion of the site will discharge treated and detained runoff to the existing storm system installed in Phase 1 and 2 of the Morgan Farm Subdivision. The downstream analysis based on as-built plans and reports indicates the existing systems will not have capacity issues.

Stormwater management for the project area will be provided using the *2015 City of Wilsonville Stormwater & Surface Design & Construction Standards* as described in the Preliminary Drainage Report – New Wilsonville Primary School (Exhibit I).

Water

A private domestic water line will be installed from an existing public water line located in SW Sherman Drive to the west of the site.

A public fire service line will be installed from an existing public water line located in SW Sherman Drive to the west of the site. The fire service line onsite will be within a public water line easement per the city requirements.

An irrigation water service line will be installed from an existing public water line located in SW Sherman Drive to the west of the site.

As part of the extension of SW Brisband Street a public water line will be constructed between the two existing water lines installed as part of previous developments. A reimbursement district will be entered into for this improvement per city standards.

Sanitary Sewer

Sanitary sewer will be collected and discharged via gravity to the west into an existing sanitary sewer system within SW Sherman Drive.

As part of the extension of SW Brisband Street a public sanitary sewer line will be constructed to serve the adjacent properties. A reimbursement district will be entered into for this improvement per city standards.

Power

Power will be extended to the site from SW Sherman Drive and extended to the north side of the building. The transformer will be located within the service area and screened from view.

Site Lighting

Site lighting will be provided for the school grounds (Exhibit A – LU 401 - LU 403). Pole area lights are located throughout the parking lots and driveways while smaller pole area lights are located at pathways and play areas. For pole area lights that are adjacent to the property line, a house side shield will be included with each of these fixtures.

For some building exits with canopies, recessed linear fixtures will be utilized. Most other building exits will utilize architectural wall packs. The main plaza area will include surface mounted downlights at the canopy walkway in addition to light poles. These light poles will have a higher lumen output compared to the light poles at the pathways.

Three flagpoles displaying the US, Oregon, and POW/MIA flags will be illuminated with a luminaire mounted at the top of the flagpole that is directed downward only (Exhibit A – LU 202, LU 203, LU 216, and LU 402). Note that lighting illuminating the American flag is exempt from the general lighting requirements per 4.199.20(.02)L.

An ornamental downspout between the music room and the multi-purpose room will also be illuminated with a fixture specification yet to be determined. It is subject to the general lighting requirements and will comply with all standards set forth per 4.199.10 and 4.199.40.

Cut sheet information for exterior lighting fixtures is provided in Exhibit A – LU 401, and energy compliance forms are provided in Exhibit J.

Signs

The district proposes to have a sign with the school name mounted on the front canopy of the building near the main entrance along with a monument sign with an electronic reader board. Descriptions of the proposed signs are summarized in Table 3 below and illustrated in Exhibit A – LU 350.

The monument sign is proposed to be located on SW Sherman Drive on the south side of the driveway. The material palette corresponds to the materials used on the school's building façade.

The electronic reader board sign is proposed to have the following operating characteristics:

- The sign will allow for real-time updates to the signage outside the school, an example of how this may be helpful would be notice to school visitors of upcoming events, or in the event of inclement weather or cancellation of scheduled events.
- Designed for text only and will not display graphics or animations. Text is displayed in one color of red and has a maximum brightness of 4,000 nits or 4,000 candela per square meter (for comparison, a TV brightness is up to 1,500 nits or 1,500 candela per square meter), which is within the standard recommendation for brightness levels of outdoor displays. The display has a sensor and auto dimming capabilities to provide appropriate light levels during the daytime and early evening, and the message will not change more frequently than every 15 minutes.
- The sign will be located along SW Sherman Drive on the south side of the driveway. The sign will be oriented to be seen along SW Sherman Drive. The recommended minimum

- viewing distance by the manufacturer is 45 feet, and this should not present any visual disturbance for motorists or nearby properties. The sign will be a minimum approximate distance of 60 feet east of the nearest homes on the west side of the street and the reader board will be oriented to be viewed by persons traveling along SW Sherman Drive.
- The sign is essentially the same as the monument sign for Meridian Creek Middle School.

In addition to the monument sign, three flagpoles are proposed in the front of the building (Exhibit A – LU 216). Consistent with The State of Oregon policy: 107-011-160 established that effective January 1, 2018, all new construction of new construction of all county, municipal, school district and special district buildings, upon which or near which it is customary and suitable to display the United States flag, must include sufficient infrastructure to properly display all three flags simultaneously: United States flag, Oregon State flag, and National League of Families' POW/MIA flag. At a maximum 30-foot height, as required by the city, three flagpoles are necessary to properly display these flags when half-mast protocol is in effect.

The reader board and flagpoles are subject to a Class 3 Sign Permit and a sign waiver.

Table 3
Proposed Signs

SIGN LOCATION AND TYPE	NO.	DIMENSIONS AND AREA	MATERIAL AND INSTALLATION	ILLUMINATION
North Courtyard Façade/Main Entrance				
Building Signage "New Wilsonville Primary School" (Placeholder text for school name)	1	27'-1" X 1'-6" = 41 SF 8'-8" X 1'-6" = 13 SF	18" high by 1" thick cast aluminum letters	No illumination
Site Entrance				
Monument Sign "School Name & Address TBD" with an electronic reader board	1	Letters 3'-6" X 2'-4" = 8 SF Reader board 6'-0" x 4'-0" = 24 SF	4" high by ¼" thick cast aluminum letters	Spotlights will illuminate the School Name & Address from the ground Internal illumination

Community Engagement

Voters approved Measure 3-554, commonly referred to as the 2019 Capital Bond Program after a lengthy public engagement process. This project was prominently referenced in information made available prior to the election. Subsequent to the election, the district created an email distribution list of 242 addresses to provide updates regarding the project. Two community open house meetings were held, one on May 3rd during the schematic design phase, and one on August 22nd during the design development phase, and were accompanied by an online survey to provide feedback regarding the project. District staff have also responded to various email inquiries and met with neighbors at the site upon request. A question and answer page on the district website has been used to publicly post answers to questions received and address concerns expressed by the community.

Further stakeholder outreach has included students, teachers, maintenance staff, district administrators, and city staff.

COMPLIANCE WITH THE WILSONVILLE DEVELOPMENT CODE

The city planning staff determined that the proposal is subject to a Master Plan, Lot Line Adjustment and Site Design Review process before the Development Review Board (DRB). In addition, a waiver is requested to allow a reader board message sign, and a Type C Tree Removal Permit is necessary to remove 46 trees, of which 6 are less than 6 inches dbh. The relevant criteria of the Wilsonville Development Code (WDC) must be addressed as part of this review. These criteria are listed followed by findings, which demonstrate that the application is consistent with the code.

4.136 PF – Public Facility Zone

(.02) K. Uses Permitted Outright. Public schools are listed as a permitted use in the PF Zone.

(.04) Dimensional Standards. The proposed school meets the applicable standards in this section because:

- At 9.68 acres, the property exceeds the minimum 1-acre lot size.
- The proposed front, rear, and side yard setbacks for Phases 1 and 2 greatly exceed the city's minimum standards (front and rear of 30 feet / side of 10 feet). The following building setbacks are illustrated in Exhibit A – LU 120):
  - SW Sherman Drive: 114 feet (Phase 1 building corner).
  - SW Brisband Street: 139 feet, 11 inches (Phase 2 building corner).
  - Tax Lot 400 to the East: 82 feet, 7 inches (Phase 2 building corner).
  - Boeckman Road: 206 feet, 7 inches (Phase 1 building corner).
- The street frontage is over 820 feet along SW Sherman Drive and 500 feet along Boeckman Road and SW Brisband Street, exceeding the 75-foot minimum standard.
- The maximum building height for the school gymnasium will have a height of 32.5 feet, which is under the 35-foot maximum (Exhibit A – LU 330 and LU 331).

Requirements pertaining to off-street parking, signs, landscaping, corner vision, and special regulations for site design review are addressed later in this section of the application narrative.

4.118 Standards Applying to All Planned Development Zones

(.03) A. Waiver of development standards. This section allows the DRB to grant waivers to typical development standards such as building height. No waivers under this section are sought to any development standards.

4.140 Planned Development Regulations

(.01) A. Overall purpose of planned development regulations. The proposed primary school has long been planned to be a significant community asset in the Frog Pond West Master Plan. As demonstrated in this application, great care has been given to create a building design that is consistent with the master plan, complements the character of the surrounding neighborhood, and maximizes the functionality of the new school.

(.01) B. A number of specific purpose statements are made in this section. These are addressed below:

1. ***Functional design.*** The design of the site is highly functional including vehicular, bicycle and pedestrian accommodation. Another strength of the proposed design is efficient and effective layout of the building, internally and with respect to other improvements on the site. The proposed building is single story to maintain scale with adjacent homes, centered on the site, and uses simple sloped rooflines and quality materials. The proposed pedestrian pathways, playground, play field and building will be available for community use outside school hours, while the perimeter fence provides security for staff and students during the school day.

2. ***Population density, distribution and circulation.*** Circulation is addressed through the following proposed improvements and as described beginning on Page 7 of this narrative:
   - A separated bus loop from parent drop-off and pick-up.
   - Sufficient on-site queueing for drop-off and pick-up to not impact local streets.
   - On-site parking that meets city requirements.
   - Safe and convenient pedestrian and bicycle access to and within the school site.

3. ***Development that is equal or better.*** Given the scale of the proposed primary school and its significant distance from surrounding properties the proposed design is a quality addition to the Frog Pond community. The proposed development is significantly better than the existing development which includes an irregular combination of pole barns, aging residence, and outbuildings.

4. ***Permit design flexibility for efficient site utilization.*** The proposed design makes efficient and effective use of the site through thoughtful placement of improvements to meet all functional criteria for the school, while being a good neighbor, providing safe and efficient access, and enabling community use.

5. ***Building height flexibility that enables appropriate open space and buffering.*** As noted above, the proposed primary school is single story, and uses simple sloped rooflines to minimize the visual impact to neighboring properties. Large open areas surround the proposed building, with trees and shrubs in excess of code requirements as added buffering. The proposed building is centered on the site to attain setbacks that exceed code requirements.

6. ***Adequate facilities and services are available.*** The school was contemplated in the Frog Pond West Master Plan. Adequate facilities and services are currently available for the proposed school site, including utilities (Exhibit A – LU 150).

7. ***Mix of uses.*** As intended in the Frog Pond West Master Plan, the new Wilsonville Primary School will serve the surrounding community. The school will maintain the district's ability to provide a high-quality education to its students.

8. ***Allow flexibility and innovation.*** The proposed design provides the district with the flexibility to respond to future enrollment growth through the Phase II expansion and accommodates several school and community related activities as described in this narrative. The proposed design includes innovations in response to stakeholder feedback from students, community members, teachers, administrators, and maintenance staff. These innovations will serve to maximize the learning experience for students while honoring the community and stewardship responsibilities of the district.

(.03) A. Ownership. Proposed planned development must be under single ownership, and as the sole owner, the district satisfies this criterion.

(.04) Professional Design. As demonstrated in this application package, the district has engaged a professional design team as required by this section.

(.09) J. 2 b. Essential government service. As an essential government service (defined in Section 4.001(256)), schools are exempt from meeting the Level of Service D requirement. In addition, the transportation impact analysis (Exhibit C) concluded that the proposed improvements will have a modest and acceptable impact on traffic operations in the general vicinity.

4.154 General Regulations – On-site Pedestrian Access and Circulation

(.01) On-site Pedestrian Access and Circulation. This section contains several standards in Subsection B, which are satisfied by the proposed school facility because:

1. The pedestrian pathway system will provide direct connectivity between the building entrances, other facilities on the site, and the surrounding neighborhoods.
2. The connections are designed to be as safe and direct as possible.
3. Vehicles and pedestrians will be separated.
4. The district proposes to provide vehicular separation to enhance safety.
5. In coordination with the city, crosswalks will be provided to allow safe and convenient locations for pedestrians to cross the internal driveway system.
6. The walkways will have ADA compliant surfacing.
7. Wayfinding will be clear and obvious primarily through the site design, which will make navigating on the site intuitive and obvious.

4.155 General Regulations – Parking, Loading and Bicycle Parking

(.02) General provisions. This section contains several provisions, which are satisfied by the proposed school facility as noted:

A. Parking will be maintained for the school use, and the proposal will provide the number of on-site parking spaces in a manner that will not compromise the provision of an attractive and safe pedestrian environment.

B. The number of spaces and the basic parking layout will provide appropriate access and circulation entering, within, and exiting the site. All the parking spaces shown are accessible with appropriate maneuvering area as mandated in the parking lot dimensional standards.

C. Each phase for the school's development is proposed to have the required parking per the code.

D. Not applicable, only one use.

E. Not applicable, only one owner.

F. Existing parking spaces will be maintained, throughout the existing subdivision, specifically on SW Sherman Drive to the west. As this development is new, there are no existing parking spaces to preserve/maintain.

G. Not applicable, no off-site parking is proposed.

H. Parking spaces shall not be used for other activities.

I. All parking areas will be buffered with landscaped areas in a manner that meets or exceeds WDC requirements.

J. Curbs will be utilized to keep cars out of landscaping and walkways.

K. Parking and driveway areas will all be paved.

L. Lighting will be provided, and it will be directed in a manner that will not shine onto adjoining properties as demonstrated in Exhibit A – LU 401-LU 403.

M. Not applicable because the code does have specific parking requirements for schools, and these standards will be satisfied.

N. Not applicable, only standard parking spaces are proposed.

O. The new parking spaces will have curb stops to ensure that the 8-foot wide landscaped areas and pedestrian walkway will not be encroached upon by parked vehicles.

(.03) Minimum and Maximum Off-Street Parking Requirements. This code section contains several standards, which apply to the application. These requirements are met as described below:

A. A loading and waste/recycling area will be provided. As described above and illustrated in the plans, vehicles and pedestrians will be kept separate on distinct routes. In addition, republic Services has reviewed and approved the design of the waste/recycling facilities.

B. All disturbed areas will be landscaped in accordance with city standards as shown. The entire parking lot along SW Sherman Drive will be screened as illustrated in Exhibit A – LU203-LU205. At the time Phase 2 is developed, the second lot on SW Brisband Street will be designed to the same standard. The trees will be spaced and within landscaped areas of sufficient size to satisfy code standards. Additional trees are proposed between Sherman Drive and the main parking lot in response to conversations with residents living in the neighborhood west of the site.

C. The parking and circulation facilities were designed to satisfy ADA and other applicable standards. The proposed 6 ADA parking spaces exceeds the requirement for a minimum of 1 ADA space per 50 spaces.

D. This criterion calls for connecting parking areas on adjacent sites, which is not applicable to the school.

E. Not applicable, applies only to multi-family development.

F. Not applicable, no on-street parking is proposed to be applied to meet the minimum parking requirements.

G. As indicated above, the required number of 119 parking spaces has been determined in the traffic study and by the district.

H. No electrical charging stations are on the site or proposed as part of this project.

I. Motorcycle parking is not proposed on the site.

(.04) Bicycle Parking. This code section contains several standards for bicycle parking.

A. The traffic analysis concluded that 97 bicycle parking spaces were necessary for the full Phase 1 and 2 buildout. A total of 100 bicycle parking spaces are proposed for Phases 1 and 2.

B. Each bicycle parking space will be 2 x 6 feet in dimension and each bicycle rack will accommodate two bike spaces. Clear aisles, where needed, will be a minimum of 5 feet wide. All bike parking, not including covered spaces, will be located within 30 feet of one of the four main entrances.

C. In Phase 1, 50% of the bike parking will be covered and located near the southwest corner of the building. It will be monitored due to its location in public view along the public drop-off and pick-up lane and the bus loop and within view of building classrooms. Phase 2 covered bike parking will be located along the west façade of the Commons part of the school and will be monitored due to its location in public view along the public drop-off and pick-up lane.

(.05) Minimum Off-Street Loading. This code section contains several standards for off-street loading. The applicable standards for the school are satisfied because:

- The required minimum of 1 loading space of at least 12 by 35 feet and minimum clearance 14 feet of is provided.
- Off-street parking will not be used for loading.

4.156 Sign Regulations

The proposed monument sign, canopy signs, and flagpoles are subject to a Class III sign permit including DRB review. As described in this application, two signs are proposed – a monument sign with electronic reader board and a school identification sign on the walkway canopy near the main entrance (see Table 3 and Exhibit A – LU 350). In addition, the flagpoles are illustrated in Exhibit A – LU 216). As explained below, the proposed signs satisfy the applicable code criteria except for the reader board and third flagpole, which require a waiver.

4.156.02(.06) Class III Sign Permits

Section 4.156.02(.06) Class III Sign Permit applies to this application. There are three criteria that must be satisfied in Section 4.156.02(.05) F:

1. ***The proposed signage is compatible with developments or uses permitted in the zone in terms of design, materials used, color schemes, proportionality, and location, so that it does not interfere with or detract from the visual appearance of surrounding development.*** The monument sign will enhance daytime identification of the school in a manner that is complementary to the building's architecture and exterior finish materials. The materials and colors proposed will coincide with the school building façade, resulting in a cohesive design and pleasing appearance. The canopy sign, with its simple and clean cast aluminum lettering will fit well with the building architecture and not be oversized or obtrusive. Each sign is typical of other signs at schools throughout the city and facilitate community information as well as navigation to these public facilities.

   Flagpoles are customarily found with public buildings. The proposed flagpoles will comply with the maximum 30-foot height and will only be used to display the US, state, and POW/MIA flags are required by state policy.

2. ***The proposed signage will not create a nuisance or result in a significant reduction in the value or usefulness of surrounding development.*** The monument sign will complement the materials and colors of the school building façade. Because the monument sign will be a significant distance from any nearby residences, it will have no detrimental impact on surrounding properties (the reader board is addressed under the waiver criteria below). The canopy sign is designed to blend in with the building architecture with the primary purpose of welcoming students and visitors to the school.

   Flagpoles are customarily found with public buildings, and they will be illuminated with up lights. They will not produce any nuisance for the surrounding neighborhood.

3. ***Special attention is paid to the interface between signs and other site elements including building architecture and landscaping, including trees.*** The new Wilsonville Primary School, site landscaping, and signs were carefully designed by the school district to be compatible with the neighborhood and satisfy city code requirements. The proposed monument and canopy signs have been designed to complement the site layout, building architecture, and the school's surroundings.
The flagpoles will be located together in the front of the school building near the main entry, in a location that is integrated with the building and landscape design at a significant distance from surrounding properties.

4.156.02(.08) A. Waivers

A waiver is requested to allow an electronic reader board with changeable copy along with a third flagpole. This section addresses four criteria that must be satisfied to receive a waiver:

1. ***The waiver will result in improved sign design, with regard to both aesthetics and functionality.*** The sign design and location will be very similar to other approved monument signs currently used at other schools including Meridian Creek Middle School and Wood Middle School. The electronic display offers significant advantages by allowing easy message changes and regulation of the sign's operation. Except for the electronic reader board, the proposed monument sign complies with all other dimensional and design requirements.

   The three flagpoles will be arranged in a cohesive grouping near the main building entry as is customary for public buildings. The flagpoles will comply with the city's 30-foot maximum standard, and the flags will not be overly large.

2. ***The waiver will result in a sign or signs more compatible with and complementary to the overall design and architecture of a site, along with adjoining properties, surrounding areas, and the zoning district than signs allowed without the waiver.*** The sign design and location were selected to allow for providing school announcements to the public traveling along SW Sherman Drive. The sign is oriented to not direct messages toward the homes on the west side of the street. The brick and finish of the address lettering are consistent with the finish materials and canopy sign for the school building. The electronic reader board display will have a similar visual appearance to a manual reader board backlit display, which is allowed by the code. It will not have graphics or flashing displays of any kind.

   Official federal and state flags are commonly associated with public buildings, and as noted in this application, the district is obligated to properly display three flags. At a 30-foot maximum flagpole height, it is not possible to properly display them at half-staff.

3. ***The waiver will result in a sign or signs that improve, or at least do not negatively impact, public safety, especially traffic safety.*** The sign location will allow for proper visibility near the intersection of the parking lot driveway and SW Sherman Drive. As noted above, the electronic display will not be overly bright, animated, or distracting in any way that could compromise traffic safety.

The flags will be located a significant distance from the property boundaries and nearby streets, and they will not be distracting or have any impact on traffic safety.

4. ***Sign content is not being considered when determining whether to grant a waiver.*** The sign content will obviously change with each school announcement. The primary consideration should be the proposed absence of any graphics or animation, which could become detrimental to surrounding properties or traffic safety.

   The district shall only display federal and state flags, and no type of advertisement will occur.

4.156.08 Sign Regulation in the PDC, TC, PDI, and PF Zones

Section 4.156.05(.01) C. allows for up to two flags/flagpoles with a maximum height of 30 feet as being exempt from the sign code. The proposed three flagpoles comply with the maximum 30-foot height maximum, and a sign waiver for the third flagpole is submitted as part of this application.

Section 4.156.08(.01) C. allows for a freestanding sign with a maximum of 32 square feet with a maximum height of 20 feet. The proposed sign complies with these dimensional standards with a maximum sign area of 32 square feet, including school name/address and the reader board, and a height of less than 7 feet.

Sections 4.156.08(.01) E, F, G, J, and K provide location standards that are applicable to the proposed monument sign. The proposed sign complies with these standards by:

- Not extending into or above public right-of-way, parking areas, or vehicle maneuvering areas.
- Satisfying applicable sight distance requirements near the driveway.
- Using brick and other materials that match and complement the exterior materials for the school building.
- Locating the sign within 15 feet of the street right-of-way and more than 2 feet from the sidewalk.
- Providing a street address.

Sections 4.156.08(.02) A, B, D, and E include the applicable standards for the proposed building sign. The proposed sign complies with these standards as follows:

- The sign is proposed to be located on the walkway canopy near the main front entrance, and it will wrap around the west corner of the canopy. The northwest facing portion of the sign (41 SF, see Table 3 and LU 350) will be on a building façade in excess of 140 feet, and the west facing portion of the sign (13 SF) will have a façade length over 370 feet. The code allows a sign area of 36 square feet for building facades lengths greater than 72 feet with an allowance to 12 additional square feet of sign area for every additional 24 feet of façade length. Each portion of the sign easily satisfies this standard.
- The proposed uniform lettering will appear as a definable sign band with the taller portions of the building as a backdrop.
- The sign type is allowed as being functionally similar to marquee and awning signs, which are allowed.

4.171 Protection of Natural Features

This section provides approval criteria for a variety of situations including steep slopes, soil hazard areas, earth movement, and flooding. Only the three following subsections are relevant to this application.

(.02) General Terrain Preparation. The site is relatively flat with very modest grades. As a result, only minimal site grading is proposed, and all site work will comply with city and Uniform Building Code requirements.

(.04) Trees and Wooded Areas. As described in this application, existing trees will need to be removed. The existing trees around the existing buildings and southwards will need to be removed as they are in the footprint of the proposed building and bus turnaround. The line of trees along the northern half of the east property line will remain to the extent feasible as shown on Sheet LU 201 (Exhibit A). The northern half of this tree line will need to be removed to accommodate the proposed fire lane off of Brisband.

(.09) Historic Protection. This subsection is intended to "preserve structures, sites, objects, and areas … having historic, cultural, or archaeological significance." There are no historic resources on the site.

4.175 Public Safety and Crime Prevention

The provisions of this section call for appropriate design and lighting to deter crime. The primary school is designed in a manner consistent with these criteria. The proposed site layout offers safe outdoor public spaces that are easily viewed from a variety of vantage points. All access routes on the site will be visible and easily viewed. This will primarily be accomplished by:

- Building design that does not create hidden corners.
- Windows that provide views out and supervision.
- Illumination of building entrances, walkways, and parking areas.
- Plant species that are either low (3 ft maximum), limbed up to 6 feet, or relatively transparent so as to maintain clear sight lines throughout the campus.
- A 6-foot high chain link fence surrounding the north and east portions of the site to protect building entries and students and staff during school time exterior activities.

4.176 Landscaping, Screening and Buffering

(.02) Landscaping and Screening Standards. Because the improvements are well within the site with significant building setbacks on all sides, the general landscaping standards are required except for the parking lot along SW Sherman that requires satisfaction of the low screen standard. The landscape plan meets the code standards, including the requirements in the Frog Pond West Master Plan because:

- ***C. General Landscaping Standard.*** Landscaped areas are 30 feet deep and greater so the planting standards of one tree is required for every 800 square feet and two high shrubs or three low shrubs are required for every 400 square feet. The planting design proposes to meet these requirements throughout the site.

- ***D. Low Screen Landscaping Standard.*** This standard applies along 10% of the west and south edges of the Phase 1 parking lot. The proposed landscaping will exceed this requirement. 3-foot tall evergreen shrubs and groundcover are proposed along the entire western perimeter of the lot and various height and opacity shrubs will be planted along the entire southern perimeter of the lot. In addition, 9 trees will be planted around the perimeter. As illustrated in Exhibit A – LU 207 and LU 208 this will provide a continuous visual buffer between the parking lot and SW Sherman Drive and with the addition of distance and stormwater plantings between the lot and Boeckman Road. The shrubs will screen the cars and headlights. In combination with the layers of trees and other landscaping between the street right-of-way and the building will provide an appropriate and pleasing buffer between the school use and the residences to the west.
- ***Frog Pond West Master Plan.*** Foundation landscaping will be installed along the Boeckman Road frontage between the sidewalk and the wall/fence per the Frog Pond West Master Plan.

(.03) Landscaped Area. 54% of the school site will be landscaped; well over the required minimum of 15%.

(.04) Buffering and screening. The school will be well screened from surrounding properties by virtue of distance, and:

- Phase 1 parking lot with a low screen along the west and south edges.
- Phase 2 parking lot with a low screen along the north edge and a buffering future park along the east edge.
- Significant naturalized buffer to the south of the school including stormwater plantings, ornamental plantings, meadow, and reforestation.

(.05) Sight-Obscuring Fence or Planting. This section requires the installation of required sight-obscuring fencing and planting prior to occupancy. The district fully intends to comply and have all required landscaping and buffering in place prior to opening the school.

(.06) Plant Materials. This section specifies the minimum sizes and coverage for new landscaping. These standards will be met or exceeded as shown on the landscaping plan sheets.

(.07) Installation and Maintenance. The installation requirements will be followed, and an irrigation system is proposed.

(.08) Landscaping on Corner Lots. The landscaping plan demonstrates that vision clearance will be maintained at street and driveway intersections.

(.09 Landscape Plans. This section requires landscape plans. The landscape plan sheets provided in this application comply with the requirements of this section.

(.10) Completion of Landscaping. The district shall install and maintain landscaping as required by this section.

(.11) Street Trees Not Typically Part of Site Landscaping. This section segregates street trees from other landscaping requirements. The landscaping plan is consistent with the Frog Pond West Master Plan by proposing street trees and landscaping as described in the plan.

(.12) Mitigation and restoration plantings. As shown in the tree planting plans (Exhibit A – LU 206), the 40 qualifying (6" dbh and larger) removed trees will be mitigated by more than 40 new trees. All new landscaping shall be properly maintained as described in this code section.

4.177 Street Improvement Standards

This section provides the requirements for street, sidewalk, bicycle, and other public transportation facility improvements. The district's engineering consultant has coordinated closely with the city's engineering department, and the improvements shown are consistent with city requirements.

(.02) Street Design Standards.

- ***A. Improvements and intersections.*** The proposed street improvements are consistent with the Frog Pond West Master Plan and requirements from the City Engineer, and the provide the necessary connections with existing and future development.

- ***B. City Engineer determination.*** The right-of-way widths and street elements have been designed in coordination with the City Engineer.

- ***C. Rights-of-way.*** As noted in the application, the appropriate street right-of-way dedications will be made in conjunction with the proposed primary school.

- ***D. Dead-end streets.*** No dead-end streets are proposed.

- ***E. Corner or clear vision area.*** Appropriate vision clearance will be provided along the entire street frontage by planting street trees and other landscaping that will comply with the standards in this section.

- ***F. Vertical clearance.*** Nothing proposed in this application will include vegetation or structures over pavement surfaces. As street trees mature, they will extend over the pavement, but will be able to meet the minimum 15-foot clearance requirement.

- ***G. Interim improvement standard.*** SW Brisband Street will be extended from the development to the east to the existing SW Sherman Drive intersection. The applicant will provide the minimum required half-street improvement which will require at least 22-ft of pavement to accommodate a minimum of two traffic lanes. The south side of SW Brisband Street will include a 5.0-ft sidewalk, 6.5-ft planter or LIDA facility, and the 22-ft of paving in the interim as coordinated with city engineering staff.

(.03) Sidewalks. Sidewalks, which comply with city standards, are proposed along all street frontage.

(.04) Bicycle facilities. Bicycle facilities are only required along the SW Boeckman Road frontage, and the existing bike lane will remain along this frontage as designed and constructed by the city.

(.05) Multiuse pathways. Such pathways are not proposed by the applicant. The site will include several pathway connections, to allow for safe and convenient pedestrian and bicycle access throughout the site and with the surrounding neighborhood.

(.06) Transit improvements. Such improvements are not required or proposed.

(.07) Residential private access drives. Not applicable.

(.08) Access drive and driveway approach development standards.

- ***A. Access drives and clear travel lane.*** The proposed access drives on the site are designed to satisfy city standards for pavement widths and clearances.

- ***B. Access drive construction.*** The access driveways are proposed to support the required 23-ton minimum.

- ***C. Emergency vehicle access.*** Emergency vehicle access has been reviewed and approved by TVF&R.

- ***D. Secondary emergency access.*** Emergency vehicle access has been reviewed and approved by TVF&R.

- ***E. Access commensurate with the use.*** The proposed access to the school building, parking lots, and bus circulation have been reviewed with city staff and found to be appropriate for the school use.

- ***F. Minimize approaches on higher classification streets.*** The primary access to the school will be provided by the driveways on SW Brisband Street and SW Sherman Drive, which are local streets. The bus access on Boeckman Road has received the endorsement of the City Engineer and consulting traffic engineer.

- ***G. Access limitations.*** *As noted, the access to the site have been held to a minimum while providing suitable accessibility to the site*.

- ***H. Common access drives.*** This is not applicable because there is no current potential to share driveways with adjoining properties.

- ***I. No obstruction in the public right-of-way.*** The circulation system for the three proposed driveway entrances provides sufficient space to avoid traffic backing out onto adjoining public streets.

- ***J. Drive-through and storage facilities.*** This is not applicable because no drive-through or storage facilities are proposed

- ***K. Driveway approaches no wider than necessary.*** The driveway entrances are properly sized for the anticipate traffic loads and types of vehicles. This has been reviewed by the consulting traffic engineer with no recommended amendments.

- ***L. Traffic calming.*** No specific traffic calming techniques are currently proposed by the city or the district.

- ***M. Safe maneuvering near loading areas.*** The site plan provides sufficient space in the vicinity of the trash/recycling and loading area for the school. This arrangement has been approved by Republic Services.

- ***N. Driveway culvert crossing.*** Not applicable.

- ***O. Temporary construction access.*** The district will work with the City Engineer and building department to provide appropriate construction access that will prevent mud being tracked out onto the street.

- ***P. Residential and mixed use driveways.*** Not applicable.

(.09) Minimum intersection spacing standards. Streets and driveways shall be aligned appropriately as demonstrated in the plans for the school.

(.10) Exceptions and adjustments. Not applicable because none are requested.

4.179 Mixed Solid Waste and Recycling

The design of the existing solid waste and recycling facilities on the site were designed to satisfy city and Republic Services requirements. An approval letter was submitted by Republic Services (Exhibit D).

4.199 Outdoor Lighting

The property is within Lighting Overlay Zone 2. The exterior lighting plan complies with the performance standards in 4.199.40(.01)C by:

- Showing a weighted average percentage of direct uplight lumens less than 5% per Table 9.
- Showing that the maximum light level at the property line or adjacent public right-of-way is less than the values in Table 9, by including a photometric summary of:
  - Horizontal illuminance of 0.2 footcandles maximum.
  - Vertical illuminance on the plane facing the site up to the mounting height of the luminaire mounted highest above grade of 0.4 footcandles maximum.

The exterior lighting plan complies with the curfew requirements in 4.199.40(.01)D by controlling the exterior lighting with an astronomical timeclock that turns lighting on at dusk and turns lighting off at or before 10:00 pm.

4.300 – 4.320 Underground Utilities

These code sections generally require underground utilities. The site will be developed with underground utilities, to the extent allowed by PGE, satisfying this requirement.

4.400 Purpose – Site Design Review

(.01) Discourage excessive uniformity and poor design. School properties have proven to be significant community assets. The design of the building and site improvements are consistent with the Frog Pond West Master Plan. The one-story scale and residential character of the building design are complementary to the surrounding residential neighborhood. The exterior finish materials are residential in character, including:

- Brick.
- Wood-like siding.
- Windows for natural daylight and views.
- Pitched roofs for much of the school building.

(.02) A number of objectives are noted in the purpose section. These are addressed below:

A. Proper function. The proposed improvements stress functionality relating to school operations, safe and convenient accessibility to and from the site for all modes, low-maintenance landscaping, and appealing and durable exterior finishes.

B. Encourage originality, flexibility, and innovation. The design of the school and supporting facilities demonstrate the district's commitment to innovation, continuing to improve school design, and value to its students by facilitating opportunities for high-quality education.

C. Discourage drab, inharmonious developments. The district and it design team have devoted a great deal of effort in creating a building and site design that will be visually appealing and functional. The primary design philosophy is to be a good neighbor by:

- Designing a single-story structure to be a consistent scale to neighborhood.
- Centering the building and activity areas on the site and maximizing setbacks.
- Building rotated from cardinal directions to create more interesting viewing angles (both from outside and inside), outdoor adjacencies and outdoor spaces.
- Providing walking paths available outside of school hours.
- Providing a playground with accessible surfacing / activities available outside school hours.

D. Conserve the city's beauty. The architectural integrity of this new facility will retain much of the open feeling of site by the residential scale of the building, sufficient building setbacks in all directions, and a landscape that exceeds city standards.

E. Promote businesses and industry. A quality education program is the cornerstone for attracting business and industry to a community. This new school demonstrates the district's continued commitment to a well-rounded education.

F. Property values. The proposed improvements will be well within the property and should not have any negative impact on surrounding properties or their value. In fact, having a new primary school serving the neighborhood may enhance values.

- ***G. Adequate public facilities.*** Facilities are currently available or will be provided. Most important, the primary school, along with the public facilities to support it, were contemplated in the Frog Pond master planning process.

- ***H. Pleasant environments.*** As noted above, the school design and proposed landscaping will be visually and functionally harmonious with the surrounding neighborhood.

- ***I. Foster civic pride.*** In addition to education, the school serves as a community center, fostering civic pride. In particular, this new school will provide improved educational and cultural opportunities for the community.

- ***J. Sustain comfort, health, tranquility and contentment of residents.*** Quality educational facilities are certainly a contributing factor to achieving this objective.

4.421 Criteria and Application of Design Standards

(.01) Evaluation Standards. The standards of this section are addressed below:

- ***A. Preservation of landscape.*** Although the site will be significantly changed from a small acreage tract to a school, the general appearance of the landscape will be retained by providing significant open space around the new school building.

- ***B. Relation of proposed building to the environment.*** This site does not include any environmentally sensitive areas. In addition, the amount of landscaping and open space is maximized with complementary facilities to mitigate potential stormwater impacts.

- ***C. Drives, parking and circulation.*** Pedestrian, bicycle, vehicle, bus, and emergency access will be successfully accommodated by establishing separate and convenient routes for pedestrians and bicyclists on site. In addition, circulation to and from the site have been designed to operate safely as confirmed in the DKS traffic analysis.

- ***D. Surface water drainage.*** This criterion is satisfied as described above. The storm drainage system is designed to accommodate the new impervious surface of the building addition, driveways, parking, and other improvements. New LID facilities, such as vegetated storm water planters, have been integrated into the design meet the stormwater management requirements for water quality treatment and flow control.

- ***E. Utility service.*** All on-site utilities will be placed underground.

- ***F. Advertising features.*** No advertising features are proposed that would be visible along the perimeter of the site.

- ***G. Special features.*** Storage, loading, and solid waste/recycling area will be set back and visually buffered from surrounding residences.

(.03) Guidance by the purpose statement. The purpose statement in Section 4.400 is also used to evaluate development proposals. The purpose statement and related objectives are addressed above.

4.430 Mixed Solid Waste and Recycling Areas

(.02) Location Standards:

- ***A. Co-locate recyclables with mixed solid waste.*** The recycling and solid water facilities will be in the same location.

- ***B. Compliance with Uniform Building and Fire Code requirements.*** The trash/recycling enclosure has been designed to satisfy building and fire code requirements.

- ***C. Storage area space in single or multiple locations may use interior and exterior locations.*** The trash/recycling area will be enclosed within a wall and sight-obscuring gate.

- ***D. Exterior storage areas can be located within interior side yard or rear yard areas.*** The storage area will be enclosed, and it will not be within a required yard area.

- ***E. Exterior storage areas located to enhance security for users.*** The proposed arrangement for trash/recycling is typical of the district's schools to provide suitable security for staff.

- ***F. Exterior storage areas can be located in a parking areas.*** Not applicable.

- ***G. Access for collection vehicles***. Appropriate access will be provided for vehicles. Republic Services has reviewed and approved the proposed plan. In addition, adequate space is provided to allow vehicles to access this area without impeding pedestrian or vehicle circulation on the site.

(.03) Design Standards:

- ***A. Storage area dimensions.*** The storage area dimensions are appropriate and have been reviewed and approved by Republic Services.

- ***B. Storage container design and materials.*** Will meet applicable code requirements, and they have been reviewed and approved by Republic Services.

- ***C. Exterior storage areas shall be enclosed by a sight obscuring fence, wall or hedge at least six feet in height, with minimum 10-foot wide gate openings, and compliance with vision clearance requirements.*** The storage area will be surrounded by a wall of approximately 13 feet, with a gate opening of greater than 10 feet, and a location outside of any vision clearance area.

- ***D. Storage area(s) and containers shall be clearly labeled.*** The containers will be labeled to avoid any confusion about where to deposit trash and recyclable materials.

(.04) Access Standards:

A. ***Access to storage areas accessibility to users.*** The storage will only be accessible to district personnel and other authorized persons.

B. ***Storage areas shall be designed to be easily accessible to collection trucks and equipment.*** The trash/recycling area will be easily accessible, and the proposed access has been reviewed and approved by Republic Services.

C. ***Storage areas shall be accessible to collection vehicles without requiring backing out of a driveway onto a public street.*** Access is proposed from the front driveway.

4.600 Tree Preservation and Protection (through 4.640.2)

Section 4.610.10(.01) contains the standards for tree removal. The proposed removal of 40 trees satisfies the applicable criteria in this section because:

A. ***SROZ.*** Not applicable because the proposed improvements do not include any work or tree removal in an SROZ.

B. ***Preservation and Conservation.*** This section indicates that no application shall be denied due to tree removal. In this case, the proposed location of the building, driveways, parking lot and fire lane necessitated removal and replacement of 40 trees 6-inch dbh and greater.

C. ***Developmental Alternatives.*** The necessary location of the school building, and other improvements necessitate the removal of many of the existing trees located near the existing residence and accessory buildings. The location of the fire lane in the northeast corner of the site necessitates removal of trees along the east property line. Other trees along the boundary between the school parcel and future city park may be retained, although some more may need to be removed to make way for Phase 2 improvements. The Phase 1 tree removal will be mitigated by the planting of more than 40 new trees throughout the site.

D. ***Land Clearing.*** Because of the scale of the project, most of the site will need to be cleared. However, it will be restored with new landscaping that is integrated with the site design and the character of the emerging neighborhood, which surrounds the site.

E. ***Residential Development.*** Not applicable.

F. ***Compliance with Statutes and Ordinances.*** The proposed tree removal and replacement meets city requirements and is not in conflict with any other regulations.

G. ***Relocation or Replacement.*** Relocating the trees will not be feasible, but they will be replaced at a ratio greater than 1:1. The trees to remain will be protected as shown in the landscaping plans. Section 4.620.10 contains the city requirements for tree protection during construction. As indicated on the landscaping plans, appropriate protection will be provided for trees and other landscaping that is to be retained.

H. Limitation. The removal and replacement of existing trees is necessary to accommodate construction, as noted above.

CONCLUSION

The proposed improvements satisfy all the relevant criteria for Master Plan, Site Design Review, Type C Tree Removal, and sign waiver approval as demonstrated above.

SURVEYOR'S CERTIFICATE

I, JOSEPH C McALLISTER, A REGISTERED PROFESSIONAL LAND SURVEYOR IN THE STATE OF OREGON, HEREBY CERTIFY THAT I HAVE CORRECTLY SURVEYED AND MARKED WITH PROPER MONUMENTS THE LAND SHOWN AND REPRESENTED ON THE ATTACHED PARTITION PLAT, THE BOUNDARY OF WHICH BEING DESCRIBED AS FOLLOWS:

A TRACT OF LAND LOCATED IN THE SOUTHEAST ONE-QUARTER OF SECTION 12, TOWNSHIP 3 SOUTH, RANGE 1 WEST, WILLAMETTE MERIDIAN, CLACKAMAS COUNTY, OREGON, BEING PARCEL 1 OF PARTITION PLAT NO. 2019-047, CLACKAMAS COUNTY PLAT RECORDS AND THAT TRACT OF LAND DESCRIBED IN DOCUMENT NO. 99-052396, CLACKAMAS COUNTY DEED RECORDS, THE OUTBOUNDS THEREOF BEING MORE PARTICULARLY DESCRIBED AS FOLLOWS:

BEGINNING AT A FOUND 5/8 INCH DIAMETER IRON ROD WITH A YELLOW PLASTIC CAP STAMPED "OTAK INC" ON THE NORTH RIGHT OF WAY LINE OF BROECKMAN ROAD (COUNTY ROAD NO. 80, 30.00 FEET FROM CENTERLINE), BEING THE SOUTHWEST CORNER OF "STAFFORD MEADOWS", PLAT NO. 4558, CLACKAMAS COUNTY PLAT RECORDS; THENCE ALONG SAID NORTH RIGHT OF WAY LINE, S.89°48'27"W., 503.17 FEET TO A 5/8 INCH DIAMETER IRON ROD WITH A YELLOW PLASTIC CAP STAMPED "COMPASS LAND SURVEYORS" AT THE SOUTHEAST CORNER OF DEDICATION DOCUMENT 2019-010342, CLACKAMAS DEED RECORDS; THENCE ALONG THE EAST LINE OF SAID DOCUMENT NO. 2019-010342, BEING 28.00 FEET EAST OF AND PARALLEL WITH THE EAST LINE OF "MORGAN FARM", PLAT NO. 4566, CLACKAMAS COUNTY PLAT RECORDS, N.00°03'30"E., 827.88 FEET TO A 5/8 INCH DIAMETER IRON ROD WITH A YELLOW PLASTIC CAP STAMPED "COMPASS LAND SURVEYORS" ON THE NORTH LINE OF AFORESAID DOCUMENT NO. 99-052396; THENCE, ALONG SAID NORTH LINE OF SAID DOCUMENT, N.89°47'54"E., 449.02 FEET TO A 5/8 INCH DIAMETER IRON ROD WITH A YELLOW PLASTIC CAP STAMPED "COMPASS LAND SURVEYORS" AT THE NORTHWEST CORNER OF DEDICATION DOCUMENT NO. 2022-047267, CLACKAMAS COUNTY DEED RECORDS; THENCE, ALONG THE WEST LINE OF SAID DOCUMENT, S.00°21'07"E., 41.77 FEET TO A 5/8 INCH DIAMETER IRON ROD WITH A YELLOW PLASTIC CAP STAMPED "COMPASS LAND SURVEYORS" AT THE SOUTHWEST CORNER THEREOF; THENCE ALONG THE SOUTH LINE THEREOF AND ITS EASTERLY EXTENSION, BEING THE SOUTH LINE OF DEDICATION DOCUMENT NO. 2020-064209, CLACKAMAS COUNTY DEED RECORDS, N.89°38'53"E., 430.33 FEET TO A 5/8 INCH DIAMETER IRON ROD WITH A YELLOW PLASTIC CAP STAMPED "COMPASS LAND SURVEYORS" AT THE SOUTHEAST CORNER OF SAID DOCUMENT NO. 2020-064209, BEING ON THE EAST LINE OF PARCEL 1 OF SAID PARTITION PLAT NO. 2019-047; THENCE, ALONG THE EAST LINE OF SAID PARCEL 1, S.00°04'03"W., 358.13 FEET, TO THE SOUTHEAST CORNER THEREOF; THENCE, ALONG THE SOUTH LINE OF SAID PARCEL 1, S.89°48'47"W., 376.31 FEET TO THE SOUTHERLY REENTRANT CORNER OF SAID PARCEL 1; THENCE ALONG THE EAST LINE OF THE FLAG PORTION OF SAID PARCEL 1, S.00°04'23"W., 429.29 FEET TO TO THE POINT OF BEGINNING, CONTAINING 548,961 SQUARE FEET (12.60 ACRES), MORE OR LESS.

NARRATIVE

1. CLIENT: WEST LINN WILSONVILLE SCHOOL DISTRICT

2. PURPOSE: THE PURPOSE OF THIS SURVEYI IS TO LOCATE AND MONUMENT A PROPERTY LINE ADJUSTMENT BY PARTITION PLAT, BETWEEN THAT TRACT OF LAND DESCRIBED IN DEED NO. 99-052396, CLACKAMAS COUNTY DEED RECORDS AND PARCEL 1, PARTITION PLAT NO. 2019-047, CLACKAMAS COUNTY PLAT RECORDS PER CLACKAMAS COUNTY PLANNING FILE XX-XXX-XX.

3. BASIS OF BEARINGS: THE EAST LINE OF "MORGAN FARM", PLAT NO. 4566, CLACKAMAS COUNTY PLAT RECORDS, BETWEEN THE FOUND 5/8 INCH DIAMETER IRON ROD WITH A YELLOW PLASTIC CAP STAMPED "PIONEER DESIGN" AT THE NORTHEAST CORNER AND THE FOUND 5/8 INCH DIAMETER IRON ROD WITH A YELLOW PLASTIC CAP STAMPED "PIONEER DESIGN" AT THE SOUTHEAST CORNER THEREOF, WAS HELD TO BE S.00°03'30"W., AS DETERMINED BY GPS OBSERVATIONS TIED TO THE OREGON REAL-TIME GNSS NETWORK (ORGN) (OREGON COORDINATE REFERENCE SYSTEM NAD 83 (2011), PORTLAND ZONE EPOCH 2010). THE WEST LINE OF DOCUMENT NO. 99-052396 BEING ESTABLISHED 28.00 FEET EAST OF AND PARALLEL WITH SAID LINE PER DEDICATION DOCUMENT 2019-010342, CLACAKMAS COUNTY DEED RECORDS.

4. THE EASTERLY SUBJECT TRACT, BEING PARCEL 1, OF AFORESAID PARTITION PLAT NO. 2019-047, WAS HELD TO THE MONUMENTS THEREOF, BEING FOUND AND HELD AS SHOWN. THE WEST LINE OF SAID PARCEL 1 BEING THE EAST LINE OF AFORESAID DOCUMENT NO. 99-052396.

5. THE NORTH LINE OF THE DOCUMENT NO. 99-052396, WAS HELD TO THE LINE BETWEEN THE FOUND MONUMENT AT THE NORTHEAST CORNER OF "MORGAN FARMS" TO THE FOUND MONUMENT AT THE NORTHWEST CORNER OF PARCEL 1 OF SAID PARTITION PLAT 2019-047.

6. THE SOUTH LINE OF DOUMENT NO. 99-052396, BEING THE NORTH RIGHT OF WAY LINE OF SW BROECKMAN ROAD (COUNTY ROAD NO. 80. 30.00 FEET FROM CENTERELINE), WAS HELD TO THE LINE BETWEEN THE FOUND MONUMENT AT THE SOUTHEAST CORNER OF "MORGAN FARMS" TO THE MONUMENT FOUND AT THE SOUTHWEST CORNER OF PARCEL 1, PARTITION PLAT NO. 2019-047.

7. THE PROPERTY LINE WAS ADJUSTED AND THE PROPERTIES PARTITIONED AT THE CLIENTS DIRECTION IN ACCORDANCE WITH CLACKAMAS COUNTY PLANNING FILE NO. XX-XXX-XXX.

PRELIMINARY PARTITION PLAT NO. 2022-________

LOCATED IN SOUTHEAST 1/4 SECTION 12, T.3S., R.1W., W.M.
CLACKAMAS COUNTY, OREGON

CLACKAMAS COUNTY PLANNING AND ZONING CASE FILE NO.

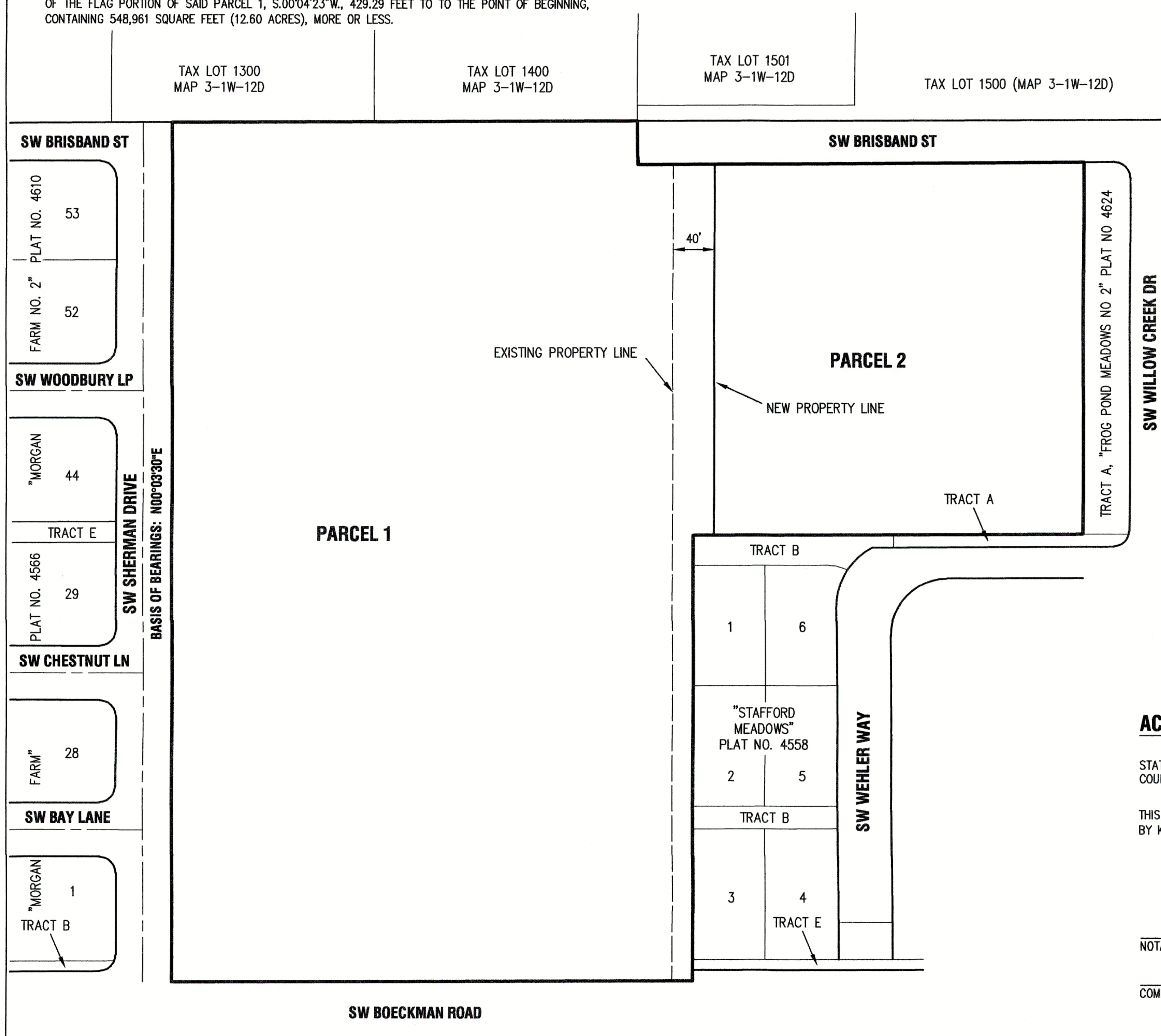
SEPTEMBER 2022 SHEET 1 OF 3

SCALE: 1" = 100'

N

W E

S



PLAT RESTRICTIONS

1. THIS PARTITION IS SUBJECT TO CONDITIONS OF APPROVAL PER CLACKAMAS COUNTY PLANNING AND ZONING CASE FILE NO. ______________ .

DECLARATION

KNOW ALL PEOPLE BY THESE PRESENT THAT WEST LINN-WILSONVILLE SCHOOL DISTRICT NO. 3, OWNER OF THE LAND REPRESENTED ON THE ANNEXED MAP, AND MORE PARTICULARLY DESCRIBED IN THE ACCOMPANYING SURVEYOR'S CERTIFICATE, DOES HEREBY DECLARE THE ANNEXED MAP TO BE A CORRECT MAP OF THE PARTITION PLAT OF SAID PROPERTY AND THAT IT HAS CAUSED THIS PARTITION PLAT TO BE PREPARED AND THE PROPERTY PARTITIONED INTO PARCELS WITH EASEMENTS AS SHOWN, IN ACCORDANCE WITH THE PROVISIONS OF CHAPTER 92 OF OREGON REVISED STATUTES. THE PLATTED PROPERTY HEREON IS SUBJECT TO RESTRICTIONS AS NOTED HEREON. THE DECLARANT MAKES NO CLAIM TO LAND BEYOND THE BOUNDARY AS PLATTED AND DESCRIBED IN THE SURVEYOR'S CERTIFICATE.

____
KATHLEEN LUDWIG, SUPERINTENDENT
WEST LINN-WILSONVILLE SCHOOL DISTRICT NO. 3

ACKNOWLEDGMENT

STATE OF OREGON
COUNTY OF CLACKAMAS } SS

THIS DECLARATION WAS ACKNOWLEDGED BEFORE ME ON ______________________________ , 2022
BY KATHLEEN LUDWIG, SUPERINTENDENT, WEST LINN-WILSONVILLE SCHOOL DISTRICT NO. 3.

NOTARY SIGNATURE ______________ NOTARY PUBLIC - OREGON

COMMISSION NO. ______________ MY COMMISSION EXPIRES

APPROVALS

APPROVED THIS ______ DAY OF ______________________ , 2022

____
CLACKAMAS COUNTY PLANNING DIRECTOR

APPROVED THIS ______ DAY OF ______________________ , 2022

____
CLACKAMAS COUNTY SURVEYOR; AND
CLACKAMAS COUNTY BOARD OF COMMISSIONERS DELEGATE
PER COUNTY CODE CHAPTER 11.02

ALL TAXES, FEES, ASSESSMENTS AND OTHER CHARGES AS PROVIDED BY ORS 92.095 HAVE BEEN PAID THRU JUNE 30, ______________

APPROVED THIS ______ DAY OF ______________________ , 2022
CLACKAMAS COUNTY ASSESSOR & TAX COLLECTOR

BY: ______________________________
DEPUTY

STATE OF OREGON
COUNTY OF CLACKAMAS } SS

I DO HEREBY CERTIFY THAT THE ATTACHED PARTITION PLAT WAS RECEIVED

FOR RECORD ON THE ________ DAY OF __________________, 2022

AT _______O'CLOCK _____ M.

AS PARTITION PLAT NO. ______________________

DOCUMENT NO. ______________________

SHERRY HALL, CLACKAMAS COUNTY CLERK

BY ______________________________
DEPUTY

SURVEYED BY:

COMPASS LAND SURVEYORS
4107 INTERNATIONAL WAY, SUITE 705
MILWAUKIE, OREGON 97222
PHONE: (503) 653-9093
8334 Part.dwg

REGISTERED
PROFESSIONAL
LAND SURVEYOR

OREGON
FEBRUARY 8, 2000
JOSEPH C. McALLISTER
49695

DATE OF SIGNATURE: 10/13/22
EXPIRES: 12/31/2022

PAC-CLAD®
PETERSEN
A CARLISLE COMPANY

Architectural Metal

Custom Fabrication, Curtainwall, Storefront and Wall Applications

FLUSH AND REVEAL WALL PANELS

Flush and Reveal panels are designed for wall, fascia and soffit applications where a flat appearance is desired. A rounded interlock leg and concealed fastening system improves the flush appearance while providing additional strength. Panels are factory-formed to length to minimize field cutting. Maximum panel length is 25′ and minimum panel length is 4′.

Flush panels are available in on-center dimensions designed to complement Petersen's roofing panel product line. Flush and Reveal joint configurations are available.

PENCIL RIBS

The Flush and Reveal panels are available with optional pencil ribs. Pencil ribs are recommended for longer panel lengths. One or two ribs are available.

INSTALLATION

Flush and Reveal panels shall be installed over a solid substrate with appropriate ice and water shield, or in limited applications over framing sections. When used in a windscreen application, panels must be fastened (stitched) through side joints. Consult a local architect/engineer for requirements of local codes and conditions.

OPTIONAL CLIP

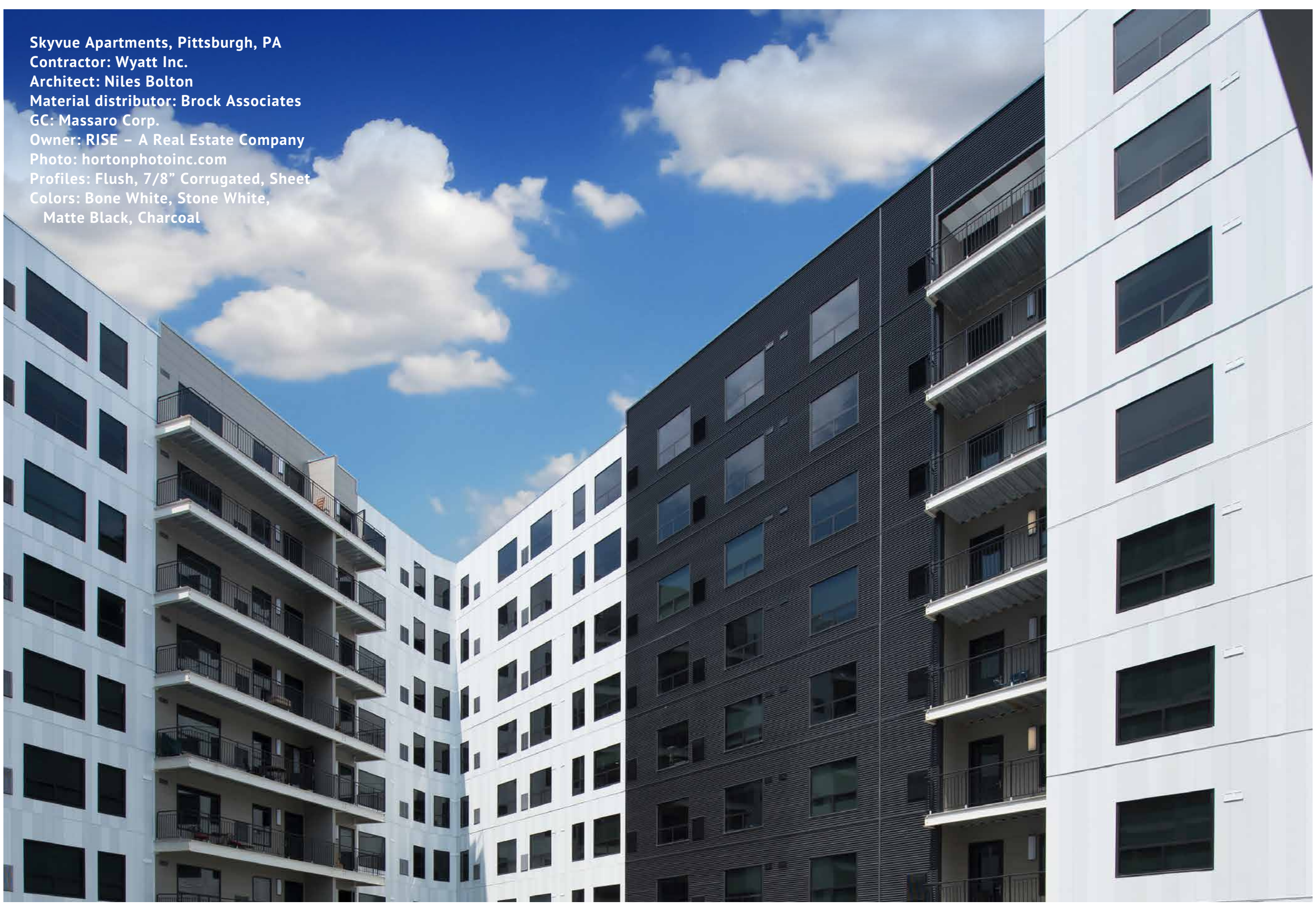
An optional patented concealed fastening clip is available to raise a panel assembly's wind resistance performance level. The optional clip has been designed and tested to resist disengagement during high-wind events.

TRIM

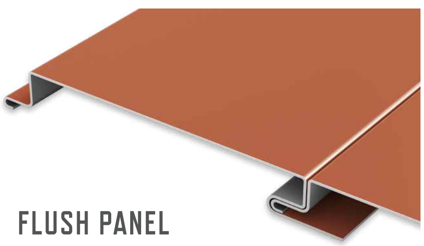
All flashing and trim shall be fabricated by Petersen or qualified fabricator. Flashing shall be PAC-CLAD aluminum (.032 - .063 gauge as specified) or PAC-CLAD steel (24 gauge or 22 gauge as specified). A 30-year non-prorated finish warranty can be supplied covering finish performance. Minimum bending radius is 2T; consult rep for details. Vinyl masking is recommended on all fabrication applications where extra handling is expected. NOTE: The strippable vinyl film must be removed immediately after installation.

HORIZONTAL APPLICATIONS

When installing Flush and Reveal panels horizontally, install first panel at top of wall and proceed to bottom.



Skyvue Apartments, Pittsburgh, PA
Contractor: Wyatt Inc.
Architect: Niles Bolton
Material distributor: Brock Associates
GC: Massaro Corp.
Owner: RISE – A Real Estate Company
Photo: hortonphotoinc.com
Profiles: Flush, 7/8" Corrugated, Sheet
Colors: Bone White, Stone White, Matte Black, Charcoal



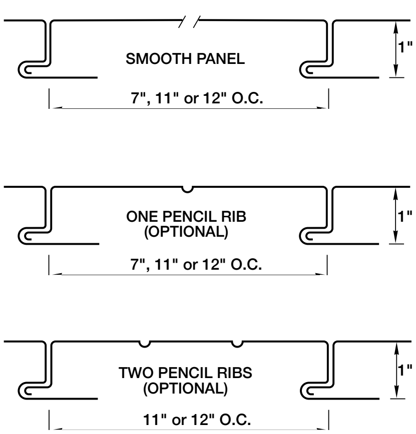
FLUSH PANEL

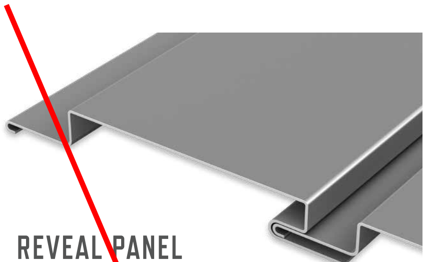
MATERIALS

.032 aluminum	24 gauge steel
.040 aluminum*	22 gauge steel*

SPECS

7", 11", or 12" O.C.	1" High





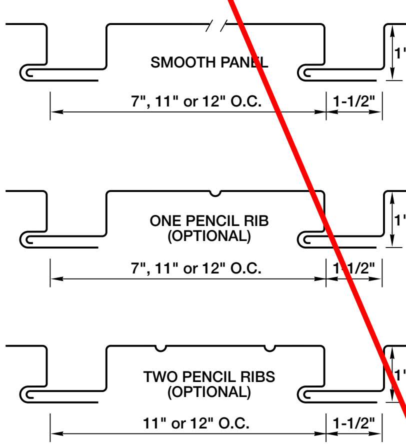
REVEAL PANEL

MATERIALS

.032 aluminum	24 gauge steel
.040 aluminum*	22 gauge steel*

SPECS

7", 11", or 12" O.C.	1" High



PRODUCT FEATURES

- Available with up to two pencil ribs
- Rounded interlock leg provides improved flush fit
- Optional clips available for Miami-Dade wind resistance requirements
- 30-year non-prorated finish warranty
- Panel lengths from 4' to 25'

MATERIAL

- 43 stocked colors (24 gauge steel)
- 16 stocked colors (22 gauge steel)
- 36 stocked colors (.032 aluminum)
- 22 stocked colors (.040 aluminum)
- Galvalume Plus available

ASTM TESTS - FLUSH

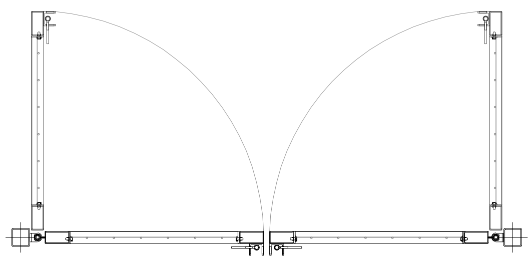
- ASTM E330 tested - 12" only
- ASTM 1592
- ASTM E283
- ASTM E331
- AAMA 501.1-05

FLORIDA BUILDING PRODUCT APPROVALS

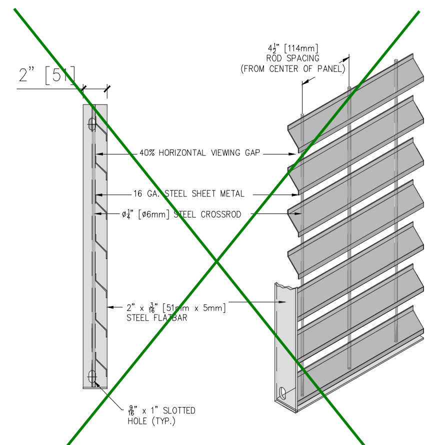
Please refer to pac-clad.com or your local factory for specific product approval numbers for Flush panels.

*Limited color availability.

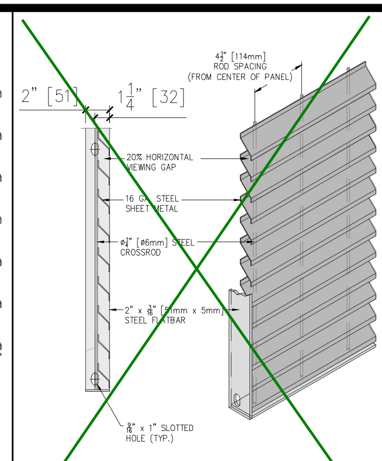
12" O.C. has reduced fastener flange. Clip not shown in drawings above.
A complete specification is available online at pac-clad.com.



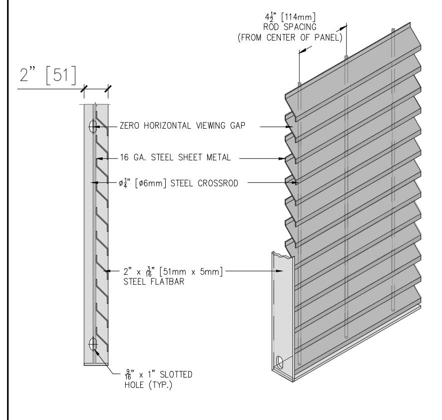
hardware: as shown.



2 DSG GRIGLIATO "SC-60" LOUVER DETAIL
SCALE: 3/4"=1'-0"

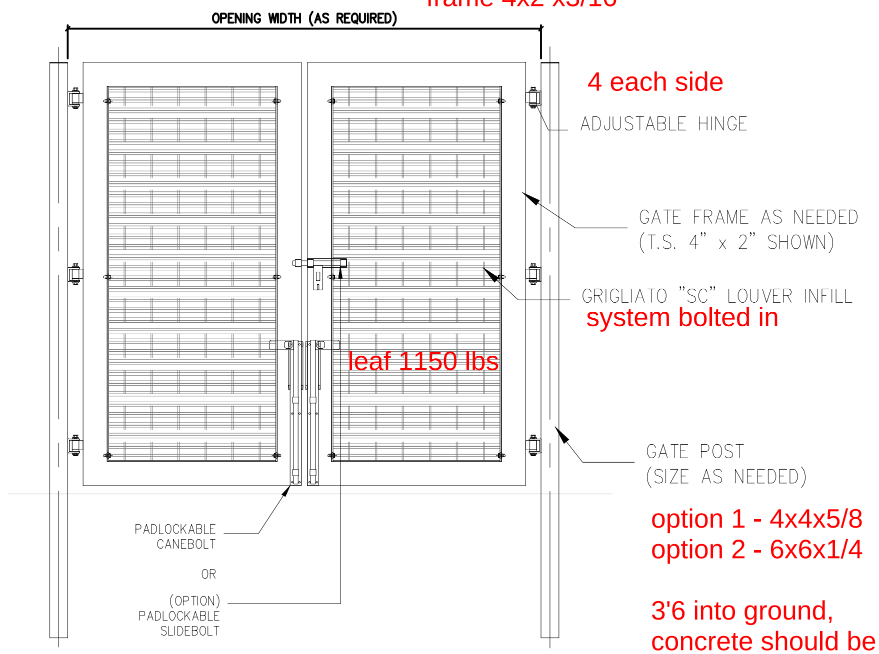


3 DSG GRIGLIATO "SC-80" LOUVER DETAIL
SCALE: 3/4"=1'-0"



4 DSG GRIGLIATO "SC-100" LOUVER DETAIL
SCALE: 3/4"=1'-0"

frame 4x2 x3/16



4 each side

system bolted in

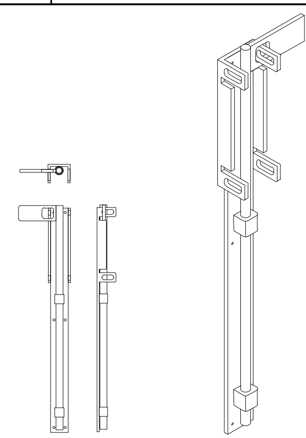
leaf 1150 lbs

option 1 - 4x4x5/8
option 2 - 6x6x1/4

3'6 into ground,
concrete should be 4'
down

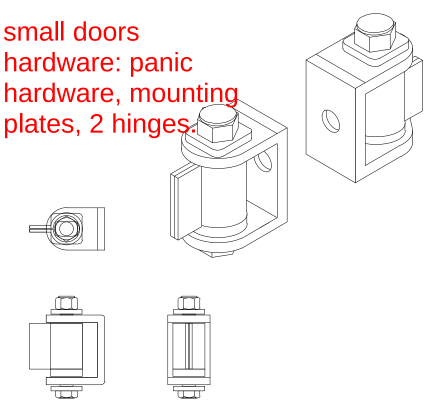
smaller gates will be
4'4x3/16 same footer
- 165lb each door -
frame 4x2x1/8
(headers)

1 DSG TYPICAL DOUBLE-SWING GATE W/GRIGLIATO "SC
SCALE: 3/8"=1'-0"



5 DSG METALCO CB-1 PADLOCKABLE CANEBOLT
SCALE: N.T.S.

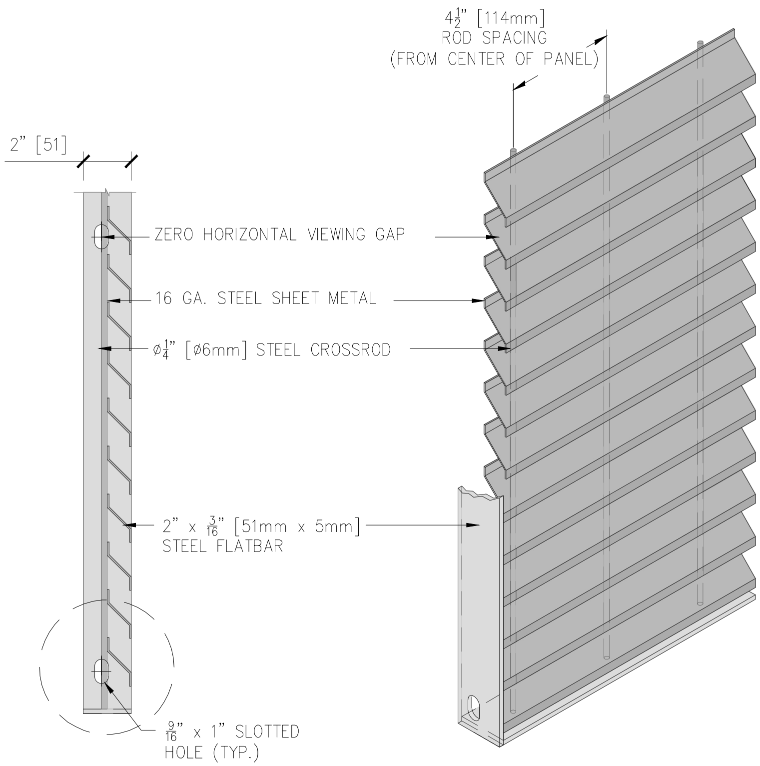
small doors
hardware: panic
hardware, mounting
plates, 2 hinges.



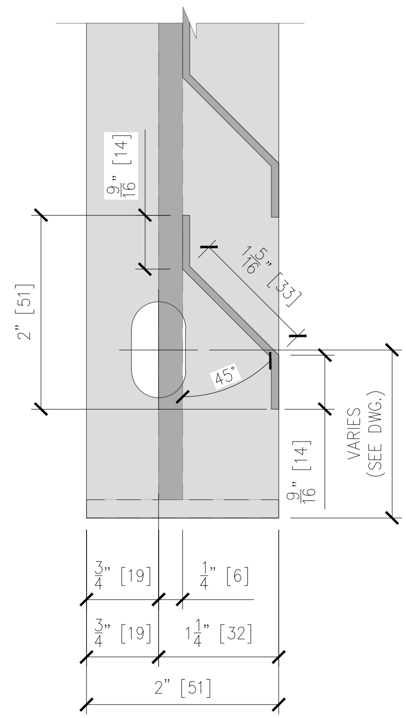
6 DSG METALCO GH-1 ADJUSTABLE GATE HINGE
SCALE: N.T.S.

finish: zinc rich
primer on louver.
'plascoat'

DRAWN BY: KM	METALCO MFR MANUFACTURING CORP. 1065 SILL AVE, AURORA IL 60506 • (815) 552-3333 • WWW.MFRCORP.COM
CHECKED BY: GM	
SCALE: N.T.S.	TITLE: DOUBLE SWING GATE W/ GRIGLIATO "SC" LOUVER INFILL
DATE: 1/18/23	SHEET NO: D-DSG-SC

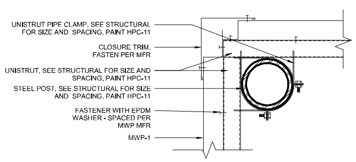


1
SC100
GRIGLIATO SC-100 DETAIL
SCALE: 1-1/2"=1'-0"

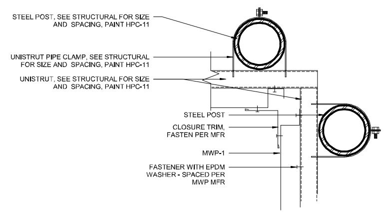


2
SC100
ENLARGED VIEW
SCALE: 6"=1'-0"

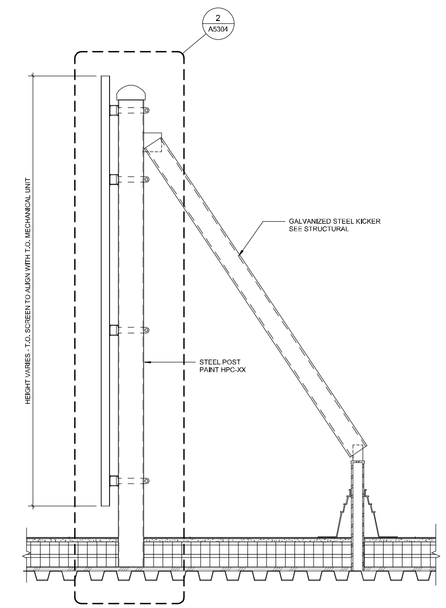
DRAWN BY: GM	METALCO MFR MANUFACTURING CORP.
CHECKED BY: KM	1065 SILL AVE, AURORA IL 60506 • (815) 552-3333 • WWW.MFRCORP.COM
SCALE: AS NOTED	TITLE: GRIGLIATO SC-100 PANEL DETAIL
DATE: 3/17/21	SHEET NO: SC-100



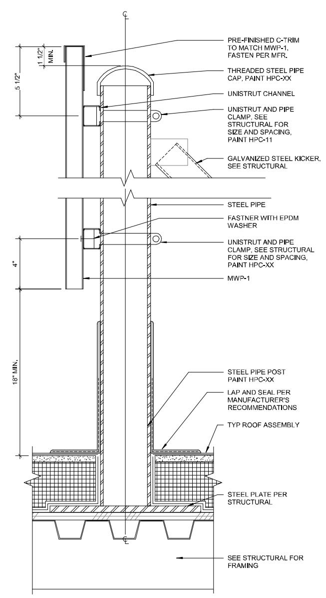
5 **MECHANICAL SCREEN OUTSIDE CORNER**
SCALE: 3" = 1'-0"



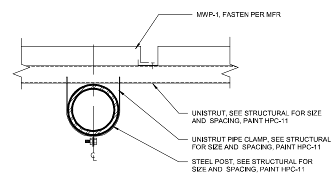
6 **MECHANICAL SCREEN INSIDE CORNER**
SCALE: 3" = 1'-0"



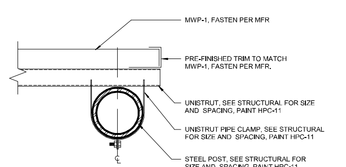
1 **MECHANICAL SCREEN SECTION**
SCALE: 1 1/2" = 1'-0"



2 **MECHANICAL SCREEN ROOF PENETRATION**
SCALE: 3" = 1'-0"



4 **MECHANICAL SCREEN PLAN**
SCALE: 3" = 1'-0"



3 **MECHANICAL SCREEN END**
SCALE: 3" = 1'-0"

CLIENT
West Linn-Wilsonville School District
2755 SW Borland Road, Tualatin, OR 97062

ISSUES

No.	DESCRIPTION	DATE
	CD CHECK SET #1	2022-11-04
	60% CONSTRUCTION DOCUMENTS	2022-12-16

NOT FOR CONSTRUCTION

CONSULTANTS

SEAL

PRIME CONSULTANT
IBI GROUP
907 SW Harvey Milk Street
Portland, OR 97205, USA
tel 503 226 6950 fax 503 273 9192
ibigroup-cdpnw.com

PROJECT
New Wilsonville Primary School
7151 Boeckman Road
Wilsonville, OR 97070

PROJECT NO:
137469

SHEET TITLE
ROOF DETAILS - MECHANICAL SCREEN

SHEET NUMBER
A5304

2023-01-13 3:40:37 PM

WILSONVILLE FROG POND PRIMARY SCHOOL

TRANSPORTATION IMPACT ANALYSIS

OCTOBER 2022

PREPARED FOR CITY OF WILSONVILLE

WILSONVILLE
OREGON

REGISTERED PROFESSIONAL
ENGINEER
56,267
OREGON
JULY 9, 2002
SCOTT M. MANSUR
EXPIRES: DEC. 31, 2022

PREPARED BY DKS ASSOCIATES

Scott Mansur, PE, PTOE
Jenna Bogert, PE
Travis Larson, EI

DKS

117 COMMERCIAL STREET NE, SUITE 310, SALEM, OR 97301 • 503.391.8773 • DKSASSOCIATES.COM

TABLE OF CONTENTS

INTRODUCTION

This study evaluates the transportation impacts associated with the proposed Frog Pond Primary School to be located on Sherman Drive just off Boeckman Road in Wilsonville, Oregon. The West Linn-Wilsonville School District desires to construct a primary school with a future estimated capacity of 550 students that is consistent with the Frog Pond West Master Plan.[1] The school will be constructed in two phases, with Phase 1 accommodating 350 students (with 35 staff) and Phase 2 accommodating another 200 students (with another 10 staff) for the full buildout of 550 students (and 45 staff). For the purposes of evaluating worst case transportation impacts of the proposed primary school, the following transportation analysis assumes traffic associated with full buildout or 550 students.

The purpose of this transportation impact analysis is to identify potential mitigation measures needed to offset transportation impacts that the proposed development may have on the nearby transportation network. The impact analysis is focused on the study intersections, which were selected for evaluation in coordination with City staff. The intersections are listed below and shown on Figure 1. Table 1 lists important characteristics of the study area and proposed project.

- Boeckman Road/Stafford Road/Advance Road/Wilsonville Road
- Boeckman Road/Willow Creek Drive
- Boeckman Road/Laurel Glen Street
- Boeckman Road/Sherman Drive
- Boeckman Road/Canyon Creek Road

[1] Frog Pond West Master Plan, City of Wilsonville, Adopted July 17, 2017.

TABLE 1: STUDY AREA AND PROPOSED PROJECT CHARACTERISTICS

STUDY AREA	
NUMBER OF STUDY INTERSECTIONS	Five
ANALYSIS PERIODS	Weekday AM Peak Hour (highest hour between 7am – 9am) Weekday Afternoon Peak Hour (highest hour between 2pm – 4pm) Weekday PM Peak Hour (highest hour between 4pm – 6pm)
PROPOSED DEVELOPMENT	
SIZE AND LAND USE	Primary school accommodating 550 students (12.8-acre site)
NET PROJECT TRIPS	406 total AM peak hour trips (220 in, 186 out) 247 total Afternoon peak hour trips (114 in, 133 out) 87 total PM peak hour trips (39 in, 48 out)
VEHICLE ACCESS POINTS	The Main Entrance to the site, for parents and employees, will be provided on Sherman Drive via a new eastern fourth leg of the Woodbury Loop intersection. Bus Access will be provided on Boeckman Road via a new fourth northern leg to the Laurel Glen Street intersection.

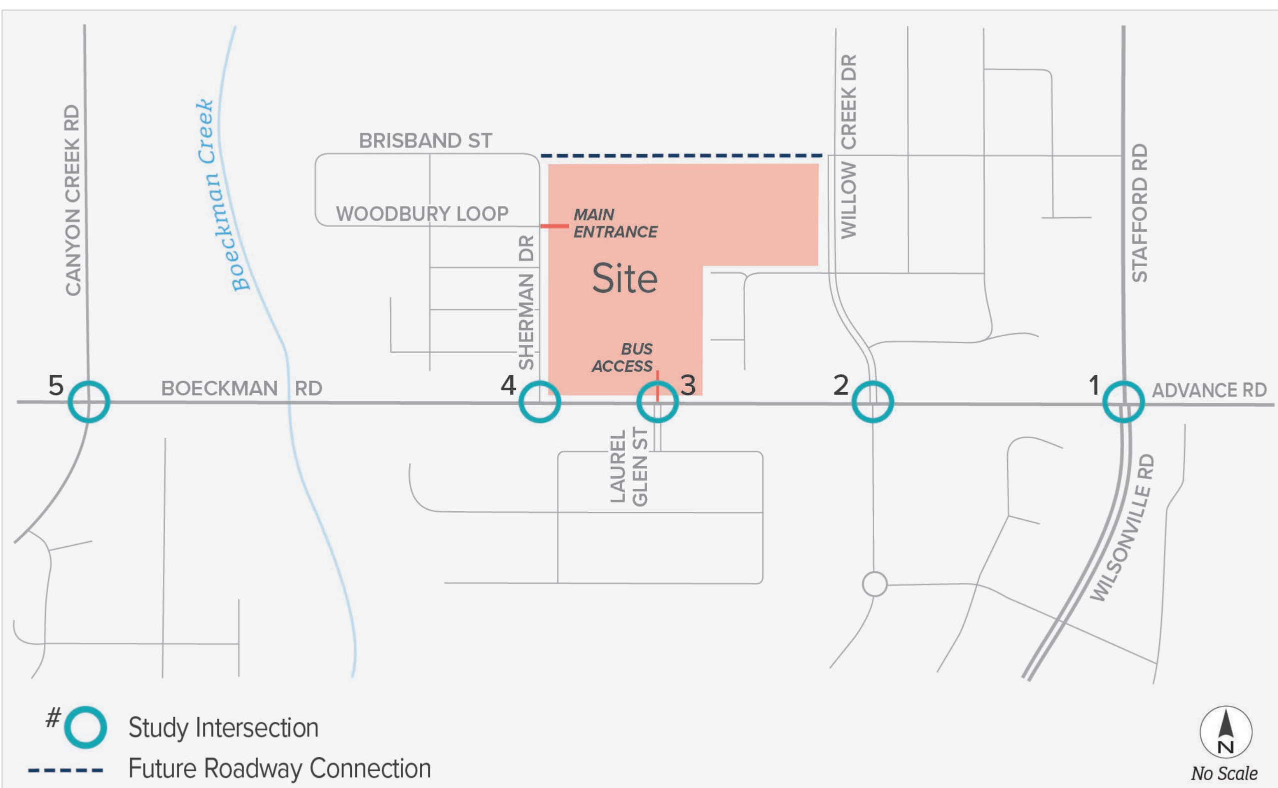


FIGURE 1: STUDY AREA

EXISTING CONDITIONS

This chapter provides documentation of existing study area conditions, including the study area roadway network, pedestrian and bicycle facilities, and existing traffic volumes and operations.

STUDY AREA ROADWAY NETWORK

Key roadways and their existing characteristics in the study area are summarized in Table 2. The functional classifications for the streets are provided in the City of Wilsonville Transportation System Plan (TSP)[2] and the Frog Pond West Master Plan.[3]

TABLE 2: STUDY AREA ROADWAY CHARACTERISTICS

ROADWAY	FUNCTIONAL CLASSIFICATION	ROADWAY OWNERSHIP	POSTED SPEED	SIDEWALKS	BIKE FACILITIES	ON-STREET PARKING
BOECKMAN ROAD	Minor Arterial	City of Wilsonville	40 mph [a]	Partial [b]	Partial [b]	No
ADVANCE ROAD	Collector	City/County [c]	35 mph [d]	Partial [e]	Partial [e]	No
STAFFORD ROAD	Major Arterial	Split City/County [f]	45 mph [g]	No	No	No
WILSONVILLE ROAD	Minor Arterial	City of Wilsonville	35 mph	Yes	Yes	No
WILLOW CREEK DRIVE	Collector	City of Wilsonville	N/A	Yes	Partial [h]	Partial [h]
LAUREL GLEN STREET	Local	City of Wilsonville	25 mph	Yes	No	No
SHERMAN DRIVE	Local	City of Wilsonville	N/A	Partial [i]	No	Yes
CANYON CREEK ROAD	Minor Arterial	City of Wilsonville	35 mph [j]	Yes	Yes	No

[a] Speed limits drops to 35 mph between Willow Creek Drive and Wilsonville Road.
[b] Sidewalk primarily exists on south side of Boeckman Road. Bicycle lanes are intermittent.
[c] City of Wilsonville jurisdiction west of 60th Avenue; Clackamas County jurisdiction east of 60th Avenue.
[d] Speed limit increases from 35 mph to 45 mph west of 60th Avenue outside of the city.
[e] Sidewalk and bike lane present on the south side of Advance Road between Stafford Road and 63rd Avenue.
[f] City of Wilsonville jurisdiction south of Frog Pond Lane; Clackamas County jurisdiction north of Frog Pond Lane.
[g] Speed limit decreases to 35 mph just north of the Boeckman Road intersection.
[h] Bike lanes exist south of Brisband Street; on-street parking exists north of Brisband Street.
[i] Sidewalks currently exist on the west side of Sherman Drive. Sidewalks will exist on both sides at full subdivision buildout.
[j] Speed limit is 35 mph north of Boeckman Road and 30 mph south of Boeckman Road.

[2] Figure 3-2, Wilsonville Transportation System Plan, City of Wilsonville, Amended November 16, 2020.

[3] Figure 19, Frog Pond West Master Plan, City of Wilsonville, Adopted July 17, 2017.

NEARBY BICYCLE AND PEDESTRIAN FACILITIES

The Frog Pond West neighborhood is continually developing and constructing new pedestrian and bicycle infrastructure and connectivity. Willow Creek Drive, a partially constructed collector road, will have sidewalks and bicycle lanes on both sides of the street. Sherman Drive and Brisband Street, partially constructed local streets, will have sidewalks on both sides of the street and bicycles will share the travel way with vehicles.

Within the greater transportation network, Boeckman Road has existing sidewalks on the south side and intermittent bicycle lanes on both sides of the road. There is a push-button activated Rectangular Rapid Flashing Beacon (RRFB) on the west leg of the Boeckman Road and Sherman Drive intersection. Advance Road has a bicycle lane and sidewalk on the south side of the street. Stafford Road has no bicycle or pedestrian facilities currently. Wilsonville Road has bicycle lanes and sidewalks on both sides of the street.

NEARBY PUBLIC TRANSIT SERVICE

South Metro Area Regional Transit (SMART) provides public transportation services within Wilsonville and the outlying areas. There are no bus stops currently adjacent to the Frog Pond West neighborhood, but Route 4 covers Advance Road and Wilsonville Road with the closest stop to the project site approximately 0.15 mile south of the Wilsonville Road/ Advance Road intersection at Landover Road. After the completion of the Boeckman Dip Improvement project (UU-01), transit service is expected to be expanded to the Frog Pond West area.

PLANNED PROJECTS

The City of Wilsonville Transportation System Plan (TSP) has a list of Higher Priority projects which includes the recommended projects reasonably expected to be funded through 2035. These are the highest priority solutions to meet the City’s most important needs. The list includes the following projects that impact the key roadways near the proposed project site.[4]

- *RE-12A – Frog Pond West Neighborhood Collector Roads*: Construction of collector roadways within the Frog Pond West neighborhood per the West Master Plan.
- *UU-01 – Boeckman Road Dip Improvements*: Installation of bridge along Boeckman Road at the vertical curve and a new traffic signal or roundabout or at the Boeckman Road/Canyon Creek Road intersection.
- *UU-06 – Stafford Road Urban Upgrade*: Upgrade of Stafford Road from Kahle Road to Boeckman Road to applicable roadway cross-section standards.
- *UU-10 – Advance Road Urban Upgrade:* Upgrade Advance Road to collector standards starting at Stafford Road to the proposed 63rd Avenue (entrance to proposed Meridian Creek Middle School).
- *RT-01A – Boeckman Creek Trail (North):* Construct north-south trail through east Wilsonville following Boeckman Creek, with connections to neighborhoods, parks, and intersecting roads.
- *RT-07 – Revised Frog Pond Regional Trail:* Construct the regional trail identified in the Frog Pond Area Plan.

---

[4] Table 5-3/Figure 5-4, Wilsonville Transportation System Plan, City of Wilsonville, Amended November 16, 2020.

EXISTING TRAFFIC VOLUMES

A combination of sources were used to determine the existing 2022 traffic volumes. New AM and Afternoon peak period turning movement count data was collected on Thursday, May 19th, 2022 at the five study intersections for the AM and Afternoon volumes. These traffic counts were collected when school was still in session capturing existing school and bus trips. No adjustment factors were applied to the new AM and Afternoon traffic counts.

Historical PM peak period turning movement count data was gathered for three of the study intersections from previous traffic studies that were collected on Thursday, September 30th, 2021. The PM volumes for the two remaining intersections, Boeckman Road/Sherman Drive and Boeckman Road/Laurel Glen Street, were estimated using the turning movement volumes from adjacent intersections and the Institute of Transportation Engineers (ITE) trip generation rates for Single-Family Detached Housing (210).[5] As both Sherman Drive and Laurel Glen Street are currently the only access points for their respective housing developments, turning movements were based on the number of currently constructed homes in each development. A conservative estimate of 60 completed homes was used for development off Sherman Drive and 104 homes was used for the development off Laurel Glen Street. The PM 2021 volumes were then factored up to 2022 conditions by assuming a yearly growth rate of 2%. This yearly growth rate is a typical growth rate used in Wilsonville traffic impact analyses and has been calculated using the Wilsonville Travel Demand model. Figure 2 shows the 2022 Existing AM, Afternoon, and PM peak hour traffic volumes for the study intersections, along with the lane configurations and traffic control.

INTERSECTION PERFORMANCE MEASURES

Agency mobility standards often require intersections to meet level of service (LOS) or volume-to-capacity (v/c) intersection operation thresholds.

- The intersection LOS is similar to a “report card” rating based upon average vehicle delay. Level of service A, B, and C indicate conditions where traffic moves without significant delays over periods of peak hour travel demand. Level of service D and E are progressively worse operating conditions. Level of service 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.
- The volume-to-capacity (v/c) ratio represents the level of saturation of the intersection or individual movement. It is determined by dividing the peak hour traffic volume by the maximum hourly capacity of an intersection or turn movement. When the V/C ratio approaches 0.95, operations become unstable and small disruptions can cause the traffic flow to break down, resulting in the formation of excessive queues.

The City of Wilsonville requires study intersections on public streets to meet its minimum acceptable level of service (LOS) standard of LOS D for the overall intersection for the PM peak period.[6]

---

[5] Trip Generation Manual, 11th Edition, Institute of Transportation Engineers, 2021.

[6] Policy 5, Wilsonville Transportation System Plan, City of Wilsonville, Amended November 16, 2020.

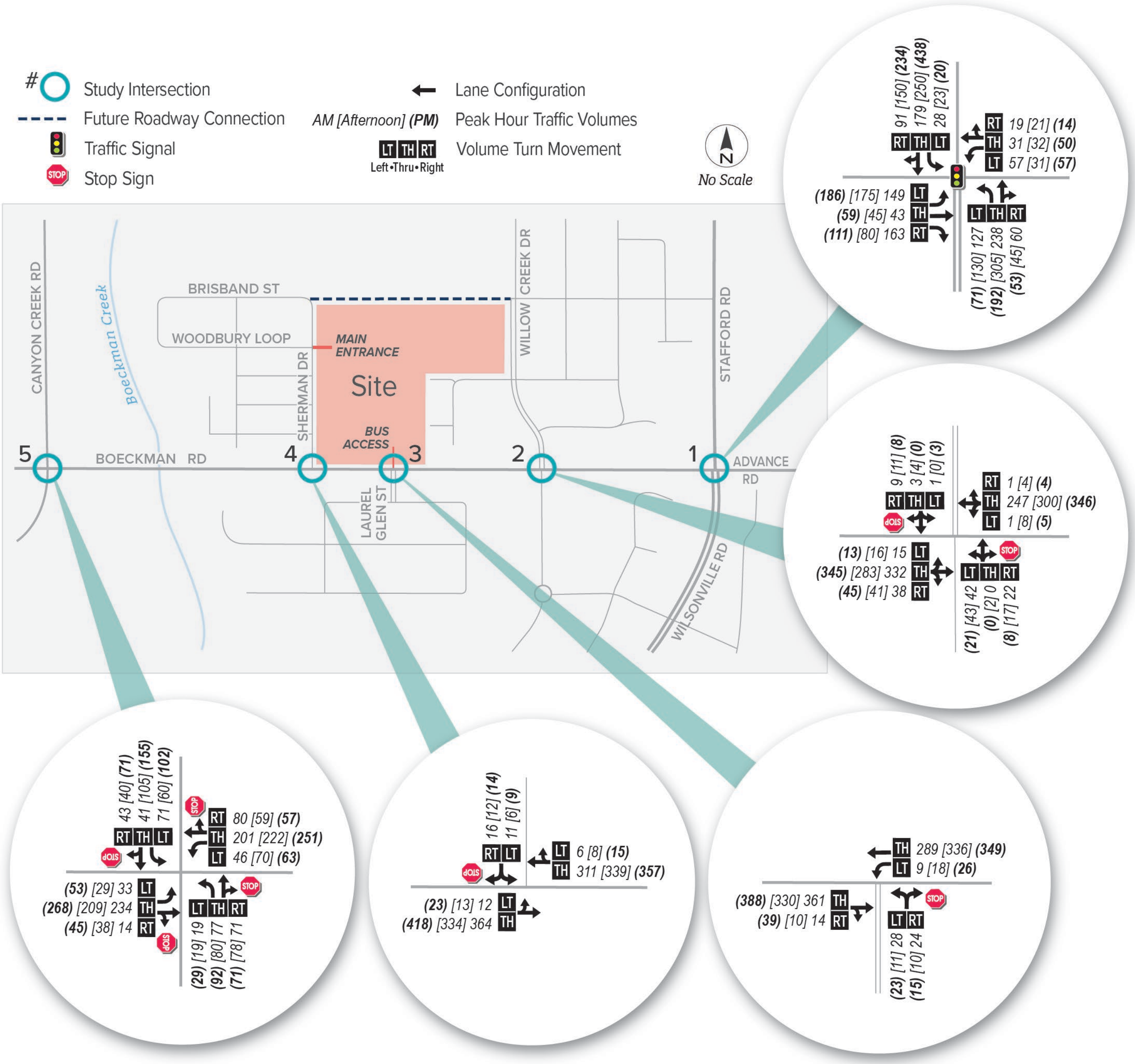


FIGURE 2: 2022 EXISTING TRAFFIC VOLUMES (AM, AFTERNOON, PM)

EXISTING INTERSECTION OPERATIONS

An analysis of the 2022 existing intersection operations was performed at the study intersections to determine the current operating conditions of the study area. Intersection operations were analyzed for the AM, Afternoon, and PM peak hours using Highway Capacity Manual (HCM) 6th Edition methodology.[7] The volume to capacity (v/c) ratio, delay, and level of service (LOS) of each study intersection are listed in Table 3.

TABLE 3: EXISTING 2022 INTERSECTION OPERATIONS

INTERSECTION	OPERATING STANDARD	AM PEAK HOUR			AFTERNOON PEAK HOUR			PM PEAK HOUR		
		V/C	DELAY	LOS	V/C	DELAY	LOS	V/C	DELAY	LOS
SIGNALIZED CONTROL										
BOECKMAN RD-ADVANCE RD/ STAFFORD RD-WILSONVILLE RD	LOS D	0.46	12.4	B	0.67	14.6	B	0.68	19.0	B
TWO-WAY STOP-CONTROLLED										
BOECKMAN RD/ WILLOW CREEK DR	LOS D	0.18	15.7	A/C	0.29	22.2	A/C	0.10	17.4	A/C
BOECKMAN RD/ LAUREL GLEN ST	LOS D	0.13	14.1	A/B	0.08	15.9	A/C	0.11	15.8	A/C
BOECKMAN RD/ SHERMAN DR	LOS D	0.06	12.3	A/B	0.06	13.7	A/B	0.06	13.7	A/B
ALL-WAY STOP-CONTROLLED										
BOECKMAN RD/ CANYON CREEK RD	LOS D	0.52	13.3	B	0.64	16.8	C	0.72	21.1	C

SIGNALIZED INTERSECTION:
Delay = Average Intersection Delay (secs)
v/c = Total Volume-to-Capacity Ratio
LOS = Total Level of Service

TWO-WAY STOP CONTROLLED INTERSECTION:
Delay = Critical Movement Delay (secs)
v/c = Critical Movement Volume-to-Capacity Ratio
LOS = Critical Levels of Service (Major/Minor Road)

ALL-WAY STOP CONTROLLED INTERSECTION:
Delay = Average Intersection Delay (secs)
v/c = Critical Movement Volume-to-Capacity Ratio
LOS = Total Level of Service

Bold/Highlighted = Does not meet the operating standard/mobility target

As shown, all study intersections meet the City of Wilsonville's operating standards for the existing conditions.

[7] Highway Capacity Manual, 6th Edition, Transportation Research Board, 2017.

PROJECT IMPACTS

This chapter reviews the impacts that the proposed development may have on the study area transportation system. This analysis includes site plan evaluation, trip generation, trip distribution, and future year traffic volumes and operating conditions for the study intersections.

PROPOSED DEVELOPMENT

The proposed development includes a primary school with a full buildout capacity of 550 students (350 students during Phase 1 and another 200 students during Phase 2). The location of the proposed development is shown on all analysis figures and is part of the Frog Pond West Master Plan.[8] The parcel is currently used primarily for agricultural purposes with one single-family home on it.

FUTURE ANALYSIS SCENARIOS

Operating conditions were analyzed at the study intersections for the following traffic scenarios. The comparison of the following scenarios enables the assessment of project impacts:

- Existing + Project (AM, Afternoon, PM)
- Existing + Stage II (PM only)
- Existing + Project + Stage II (PM only)

All future analysis scenarios assume the same traffic control as existing conditions.

Stage II represents traffic from other developments that have Stage II approval or are under construction in Wilsonville, for which there is only data available for the PM peak hour. The list of these developments was provided by City staff and is included in the appendix.[9] For this analysis, while the Frog Pond Overlook, Terrace, and Matteoni developments have not been fully approved, they were included in the Stage II list as they are part of the greater Frog Pond Master Plan.

An update of the Wilsonville Stage II Model was recently completed which sought to provide more accurate trip assignment data in a trusted platform to better serve the City. With the update, more accuracy was provided in the model which provided greater clarity to specific trip assignment for developments approved but not yet constructed. This led to some changes in intersection volumes compared to transportation studies using the previous Stage II model.

TRIP GENERATION

Trip generation is the method used to estimate the number of vehicles added to site driveways and the adjacent roadway network by a development during a specified period (e.g., the PM peak hour). For this study, the Institute of Transportation Engineers (ITE) trip generation rates for Elementary School (520) and Single-Family Detached Housing (210) were used to estimate the

[8] Frog Pond West Master Plan, City of Wilsonville, Adopted July 17, 2017.

[9] Email from Daniel Pauly, City of Wilsonville, July 22, 2022.

site's trip generation, which is based on the maximum number of students at the school and the number of lots being removed due to the development.[10] As one home will be removed from the site during construction, the trips from that home have been subtracted from the total trips.

The trip generation for the proposed development is shown in Table 4. As shown, the proposed development is expected to generate a net total 406 AM peak hour trips (220 in, 186 out), 247 Afternoon peak hour trips (114 in, 133 out), and 87 PM peak hour trips (39 in, 48 out).

TABLE 4: VEHICLE TRIP GENERATION

LAND USE	ITE DESCRIPTION (CODE)	UNITS	AM PEAK TRIPS			AFTERNOON PEAK TRIPS			PM PEAK TRIPS			WEEK DAY
			IN	OUT	TOTAL	IN	OUT	TOTAL	IN	OUT	TOTAL	
NEW PRIMARY SCHOOL	ELEMENTARY SCHOOL (520)	550 Students	220	187	407	114	134	248	40	48	88	1,249
EXISTING HOME REMOVED	SINGLE-FAMILY HOUSING (210)	1 Lot	0	1	1	0	1	1	1	0	1	15
		Total Net New Trips	**220**	**186**	**406**	**114**	**133**	**247**	**39**	**48**	**87**	**1,234**

In addition to the vehicular trips generated, eight school buses were included in the analysis of the transportation system and distributed based on conceptual school boundary estimates for the primary school.[11] The eight buses consisted of eight inbound and eight outbound trips for the AM and Afternoon peak hours which utilized the Bus Access. These school buses are denoted as one vehicle per the volume figures but were analyzed as two vehicles per HCM methodology for operations analysis. Table 5 shows the trip generation for these school buses.

TABLE 5: SCHOOL BUS TRIP GENERATION

LAND USE	TYPE OF ADDITIONAL TRIPS	UNITS	AM PEAK TRIPS			AFTERNOON PEAK TRIPS			PM PEAK TRIPS			WEEK DAY
			IN	OUT	TOTAL	IN	OUT	TOTAL	IN	OUT	TOTAL	
NEW PRIMARY SCHOOL	SCHOOL BUSES	Number of Buses	8	8	16	8	8	16	0	0	0	32
		Operations Analysis Volumes	**16**	**16**	**31**	**16**	**16**	**32**	**0**	**0**	**0**	**64**

[10] Trip Generation Manual, 11th Edition, Institute of Transportation Engineers, 2021.

[11] Email from Brooke Besheone, CBRE (West Linn Wilsonville School District Representative), July 27, 2022.

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. The trip distribution was based on coordination with the West Linn-Wilsonville School District and conceptual future school boundary assumptions. [12] It is estimated that 10% of the trips are internal Frog Pond trips, 30% of trips utilize Stafford Road to/from the north, 20% of trips utilize Boeckman Road to/from the west, 5% of trips utilize Wilsonville Road to/from the south, 25% of trips utilize Advance Road to/from the east, and 10% of trips cross into the neighborhood directly south of Boeckman Road. Figure 3 shows the trip distribution for the proposed site.

PROJECT TRIPS THROUGH CITY OF WILSONVILLE INTERCHANGE AREAS

The project trips through the two City of Wilsonville I-5 interchange areas were estimated based on the trip generation and distribution assumptions. It is estimated that 5% of the project trips are expected to travel through the I-5/Wilsonville Road interchange area and 5% are expected to travel through the I-5/Elligsen Road interchange area. Therefore, the proposed development is expected to generate one net new PM peak hour trip through the I-5/Wilsonville Road interchange area and one net new PM peak hour trip through the I-5/Elligsen Road interchange area.

FUTURE TRAFFIC VOLUMES

Traffic volumes were estimated at the study intersections for all the traffic analysis scenarios. Figure 4 provides the Existing + Project traffic volumes, Figure 5 provides the Existing + Stage II traffic volumes, Figure 6 and provides the Existing + Project + Stage II traffic volumes.

[12] Email from Remo Douglas, West Linn Wilsonville School District, July 21, 2022.

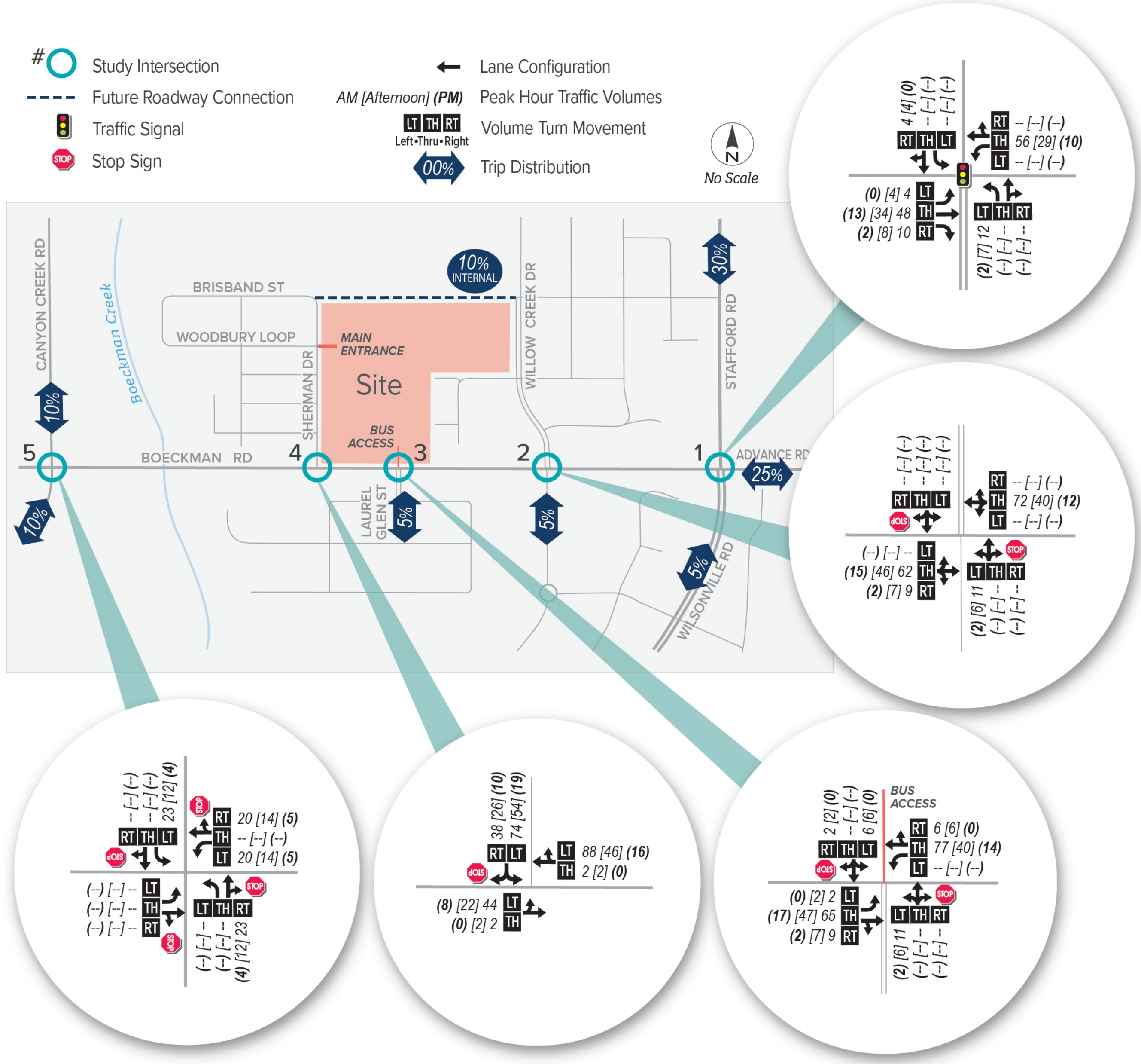


FIGURE 3: PROJECT TRIPS AND DISTRIBUTION (AM, AFTERNOON, PM)

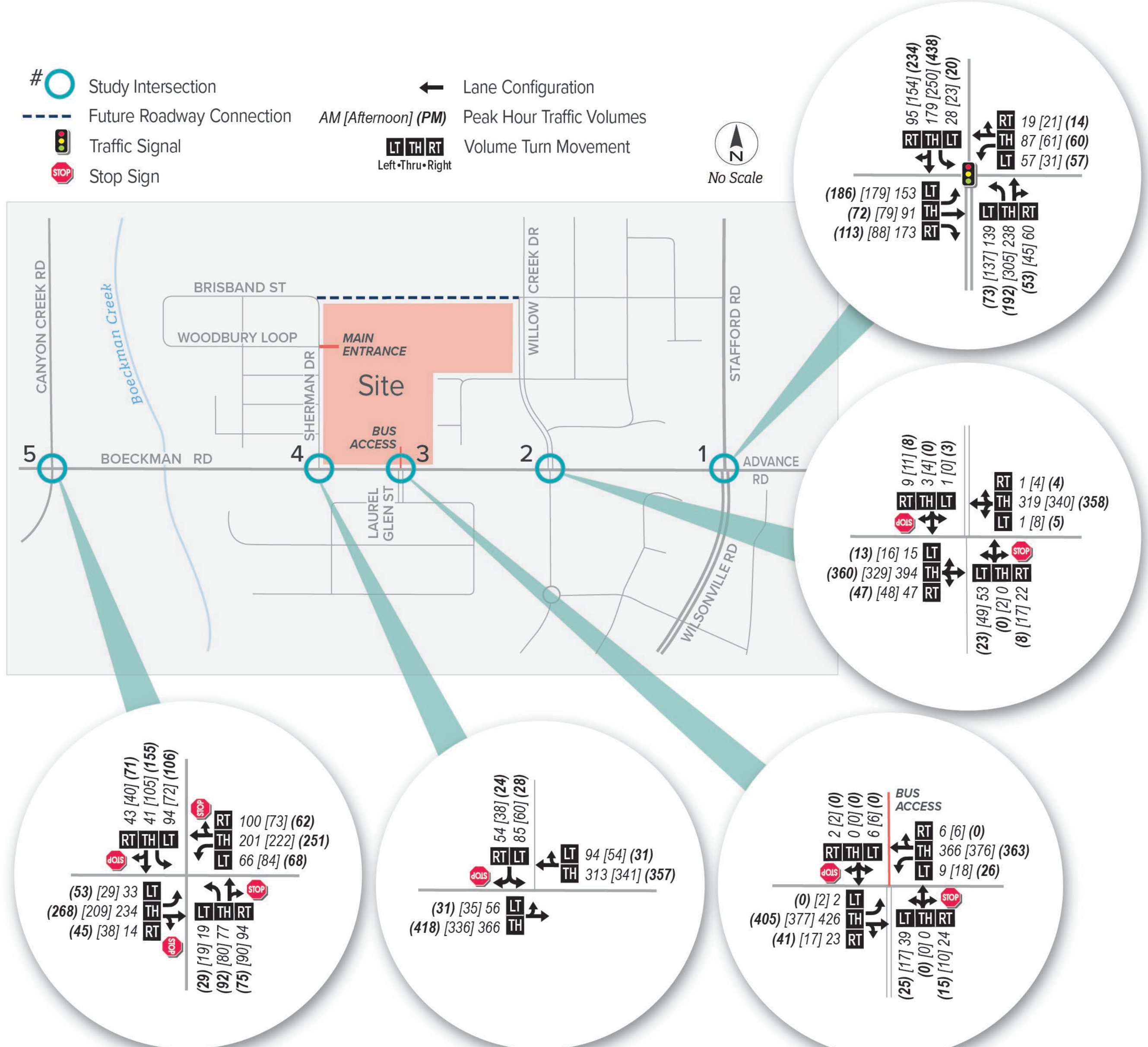


FIGURE 4: 2022 EXISTING + PROJECT TRAFFIC VOLUMES (AM, AFTERNOON, PM)

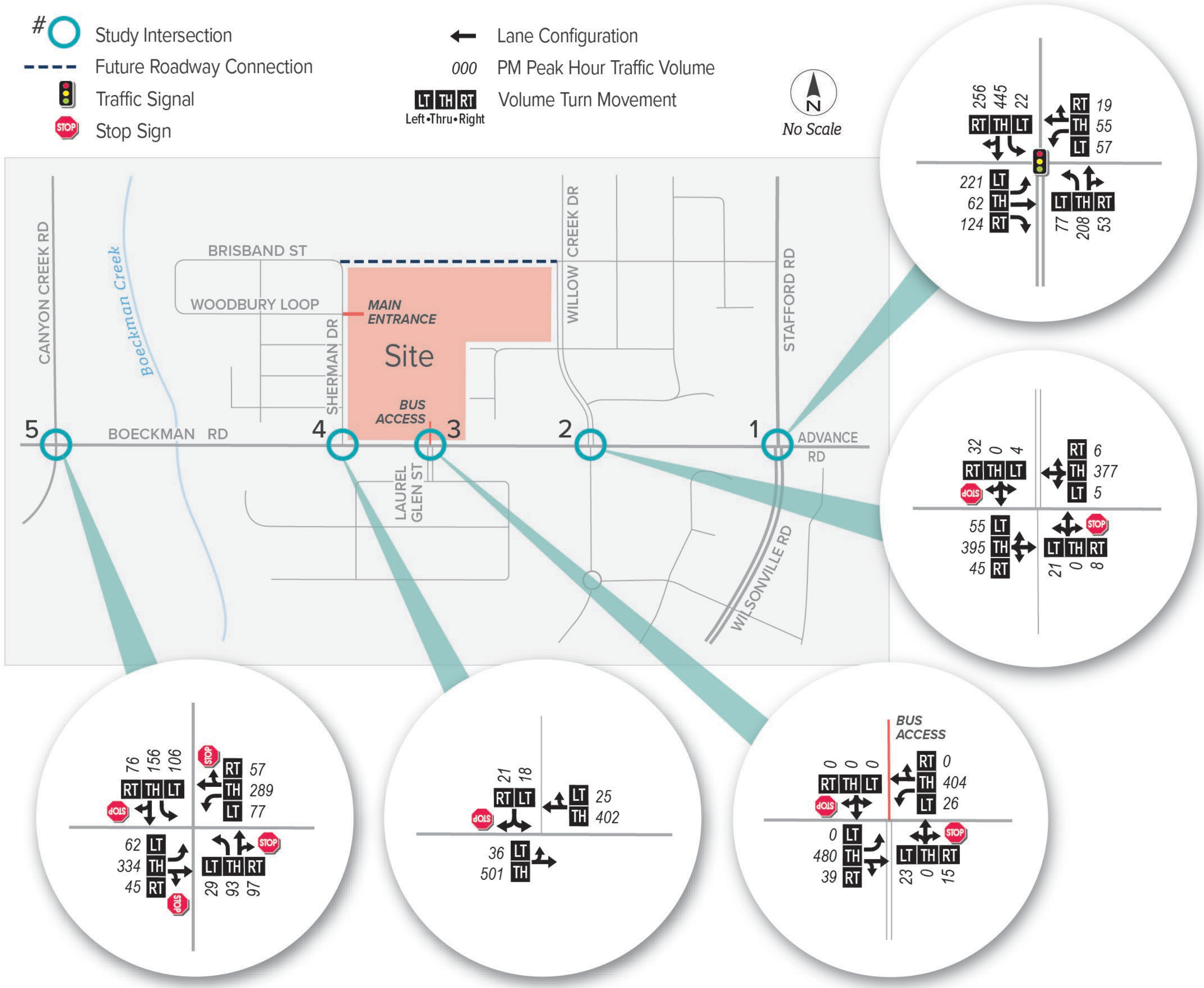


FIGURE 5: 2022 EXISTING + STAGE II TRAFFIC VOLUMES (PM ONLY)

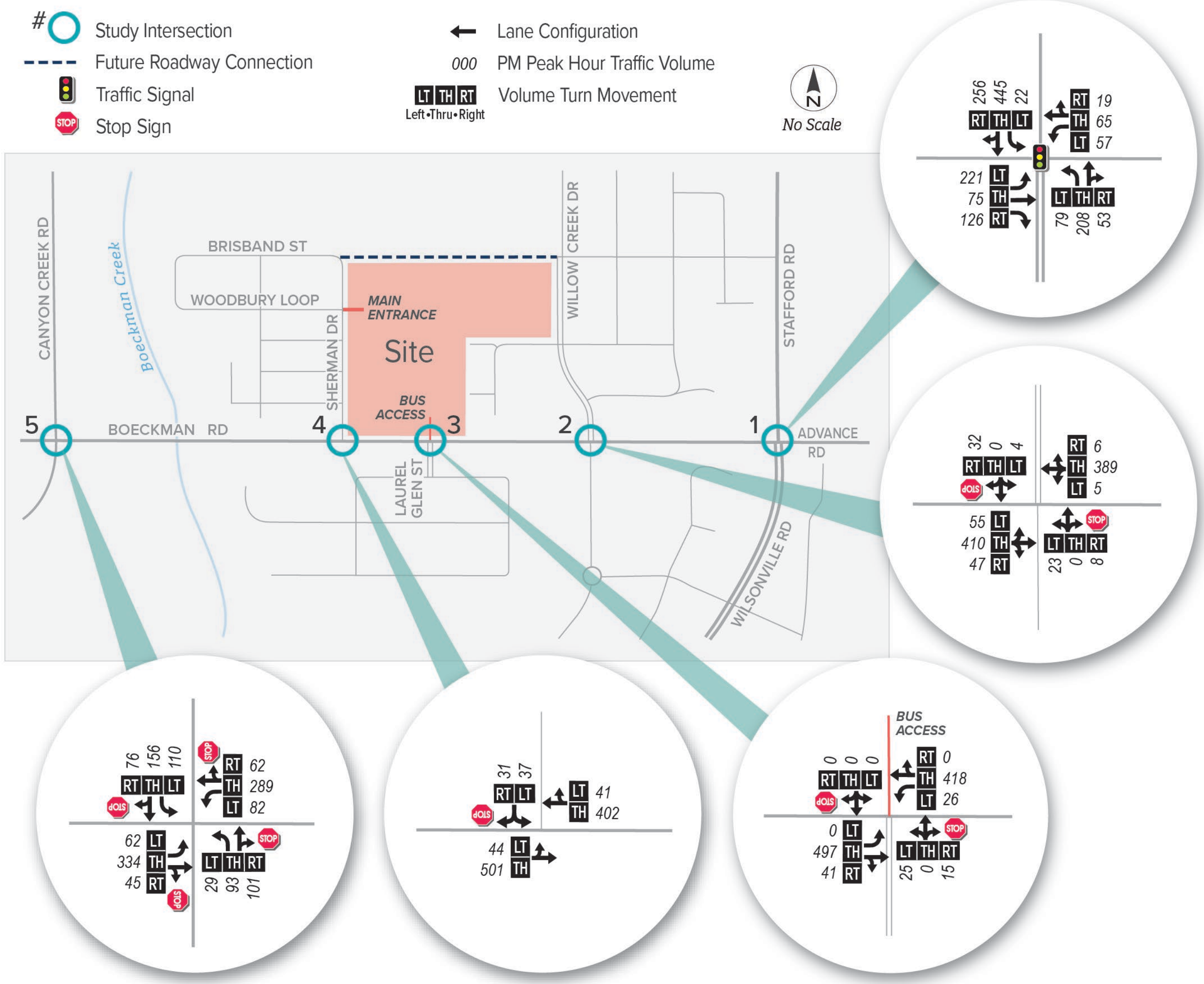


FIGURE 6: 2022 EXISTING + PROJECT + STAGE II TRAFFIC VOLUMES (PM ONLY)

FUTURE INTERSECTION OPERATIONS

Intersection operations were analyzed for all traffic analysis scenarios at all study intersections using Highway Capacity Manual (HCM) 6th Edition methodology.[13] The volume to capacity (v/c) ratio, delay, and level of service (LOS) of each study intersection are listed in Table 6 and Table 7.

As shown, all study intersections except the intersection of Boeckman Road/Canyon Creek Road meet the City of Wilsonville's operating standard.

TABLE 6: INTERSECTION OPERATIONS – EXISTING + PROJECT (AM, AFTERNOON, PM)

INTERSECTION	OPERATING STANDARD	AM PEAK HOUR			AFTERNOON PEAK HOUR			PM PEAK HOUR		
		V/C	DELAY	LOS	V/C	DELAY	LOS	V/C	DELAY	LOS
SIGNALIZED CONTROL										
BOECKMAN RD-ADVANCE RD/ STAFFORD RD-WILSONVILLE RD	LOS D	0.53	14.7	B	0.73	18.4	B	0.69	21.4	C
TWO-WAY STOP-CONTROLLED										
BOECKMAN RD/ WILLOW CREEK DR	LOS D	0.27	20.7	A/C	0.40	30.4	A/D	0.11	18.3	A/C
BOECKMAN RD/ LAUREL GLEN ST	LOS D	0.24	20.6	A/C	0.11	24.4	A/C	0.14	18.6	A/C
BOECKMAN RD/ SHERMAN DR	LOS D	0.41	21.4	A/C	0.43	25.2	A/D	0.15	16.2	A/C
ALL-WAY STOP-CONTROLLED										
BOECKMAN RD/ CANYON CREEK RD	LOS D	0.59	14.8	B	0.69	18.2	C	0.73	21.7	C

SIGNALIZED INTERSECTION:
Delay = Average Intersection Delay (secs)
v/c = Total Volume-to-Capacity Ratio
LOS = Total Level of Service

TWO-WAY STOP CONTROLLED INTERSECTION:
Delay = Critical Movement Delay (secs)
v/c = Critical Movement Volume-to-Capacity Ratio
LOS = Critical Levels of Service (Major/Minor Road)

ALL-WAY STOP CONTROLLED INTERSECTION:
Delay = Average Intersection Delay (secs)
v/c = Critical Movement Volume-to-Capacity Ratio
LOS = Total Level of Service

Bold/Highlighted = Does not meet the operating standard/mobility target

[13] Highway Capacity Manual, 6th Edition, Transportation Research Board, 2017.

TABLE 7: INTERSECTION OPERATIONS – PM PEAK HOUR

INTERSECTION	OPERATING STANDARD	EXISTING + PROJECT			EXISTING + STAGE II			EXISTING + PROJECT + STAGE II		
		V/C	DELAY	LOS	V/C	DELAY	LOS	V/C	DELAY	LOS
SIGNALIZED CONTROL										
BOECKMAN RD-ADVANCE RD/ STAFFORD RD-WILSONVILLE RD	LOS D	0.69	21.4	C	0.73	22.8	C	0.74	23.1	C
TWO-WAY STOP-CONTROLLED										
BOECKMAN RD/ WILLOW CREEK DR	LOS D	0.11	18.3	A/C	0.14	23.9	A/C	0.17	25.6	A/D
BOECKMAN RD/ LAUREL GLEN ST	LOS D	0.14	18.6	A/C	0.16	21.4	A/C	0.18	22.9	A/C
BOECKMAN RD/ SHERMAN DR	LOS D	0.15	16.2	A/C	0.13	17.2	A/C	0.25	20.8	A/C
ALL-WAY STOP-CONTROLLED										
BOECKMAN RD/ CANYON CREEK RD	LOS D	0.73	21.7	C	0.94	36.5	**E**	0.95	38.0	**E**

SIGNALIZED INTERSECTION:
Delay = Average Intersection Delay (secs)
v/c = Total Volume-to-Capacity Ratio
LOS = Total Level of Service

TWO-WAY STOP CONTROLLED INTERSECTION:
Delay = Critical Movement Delay (secs)
v/c = Critical Movement Volume-to-Capacity Ratio
LOS = Critical Levels of Service (Major/Minor Road)

ALL-WAY STOP CONTROLLED INTERSECTION:
Delay = Average Intersection Delay (secs)
v/c = Critical Movement Volume-to-Capacity Ratio
LOS = Total Level of Service

Bold/Highlighted = Does not meet the operating standard/mobility target

MITIGATION

The Boeckman Road/Canyon Creek Road intersection operates at an overall LOS E in the *Existing + Stage II* and *Existing + Stage II + Project* scenarios. The Wilsonville Transportation System Plan already specifies a traffic signal as a high priority project at the intersection as part of project UU-01.[14] As such, the developer's Transportation System Development Charge (SDC) will contribute to the City's fund to implement the traffic signal and no additional off-site mitigations or conditions of approval are necessary. The construction of the new traffic signal will be coordinated with the other tasks in the project UU-01 Boeckman Road Dip Improvements, with design work currently in the process and construction estimated to begin in 2023. While a traffic signal was specified in the TSP, both a traffic signal and roundabout are being considered and evaluated by the City and project team. As such, mitigation results are shown for both a traffic signal and a roundabout in Table 8. The traffic signal includes dedicated left turn lanes for all approaches and protected-permitted phasing. The roundabout is a single-lane roundabout with single entry and exist points at all approaches.

TABLE 8: MITIGATION INTERSECTION OPERATIONS – PM PEAK HOUR

INTERSECTION	MITIGATION TRAFFIC CONTROL	OPERATING STANDARD	EXISTING + PROJECT + STAGE II		
			V/C	DELAY	LOS
BOECKMAN RD/ CANYON CREEK RD	Traffic Signal (with left turn lanes)	LOS D	0.59	14.8	B
BOECKMAN RD/ CANYON CREEK RD	Roundabout (Single-Lane)	LOS D	0.54	9.5	A

SIGNALIZED INTERSECTION:
Delay = Average Intersection Delay (secs)
v/c = Total Volume-to-Capacity Ratio
LOS = Total Level of Service

ROUNDABOUT INTERSECTION:
Delay = Average Intersection Delay (secs)
v/c = Critical Movement Volume-to-Capacity Ratio
LOS = Total Level of Service

Bold/Highlighted = Does not meet the operating standard/mobility target

[14] Table 5-3/Figure 5-4, Wilsonville Transportation System Plan, City of Wilsonville, Amended November 16, 2020.

SITE REVIEW

This chapter reviews the most recently provided site plan (dated 08/17/2022) to determine consistency with the Frog Pond West Master Plan and alignment with the Wilsonville Transportation system Plan (TSP), Development Code, and Construction Standards. The site plan is included in the appendix.

FROG PONG WEST MASTER PLAN CONSISTENCY

The proposed street layout generally matches the framework plan as laid out in the Frog Pond West Master Plan[15] with the proposed site generally being bordered by Sherman Drive, Brisband Street, Willow Creek Drive, and Boeckman Road. The Public Facilities zoning and land use in the site plan also appear to be consistent with the Master Plan.[16]

ACCESS SPACING

The proposed project is required to comply with access spacing requirements as laid out in the City Transportation System Plan.[17] The main entrance access point is located on a local street (Sherman Drive), for which the City has no spacing requirements. The Bus Access is located on the proposed northern fourth leg of the pre-existing Laurel Glen Street minor stop-controlled intersection which located on a Minor Arterial (Boeckman Road), for which the City has a Desired spacing of 1,000 ft and a Minimum spacing of 600 ft. While the Bus Access/Laurel Street intersection is less than 600 ft from Sherman Drive (approximately 400 ft), it is a pre-existing intersection with the existing subdivision to the south. Sherman Drive is also a tee-intersection with no southern approach so there will be no westbound left turn lane at this intersection that would conflict with the eastbound left turn movement at Laurel Glen Street. Additionally, left turn lanes are provided at this Laurel Glen Street intersection and with the access being limited use (school buses only), operations are not expected to impact adjacent intersections or through traffic. Therefore, the access points are consistent with the Frog Pond Master Plan and no new significant access points will be created. It should also be noted that allowing this bus access will improve on site safety by separating bus loading from parent loading and it will also keep buses from having to travel on neighborhood streets to enter and exit the school.

PARKING

The proposed project is required to comply with the Wilsonville Code for the number of vehicular parking and bicycle parking spaces that are provided on site.[18] Table 9 lists the vehicular parking requirements for the project site, which are based primarily on the estimated number of students and staff.[19]

---

[15] Figure 19, Frog Pond West Master Plan, City of Wilsonville, July 17, 2017.

[16] Figure 6 & Table 1, Frog Pond West Master Plan, City of Wilsonville, July 17, 2017.

[17] Table 3-2, Wilsonville Transportation System Plan, Amended November 16, 2020.

[18] Section 4.155, Table 5, Wilsonville Development Code, Updated March 2022.

[19] Email from Brooke Besheone, CBRE (West Linn Wilsonville School District Representative), August 15, 2022.

As shown below, 119 to 179 vehicular parking spaces are needed to meet the Code requirements for the project when estimating 45 staff with the 550 students. 119 parking spaces are proposed on the current site plan reviewed for this study[20], including the auxiliary lot located off of Brisband Street, which meets the code requirements. The Code also dictates that one ADA-accessible parking space is to be constructed for every 50 standard parking spaces, of which there are six currently shown.

TABLE 9: VEHICLE PARKING REQUIREMENTS

LAND USE	SIZE	MINIMUM RATE	MAXIMUM RATE	SPACES REQUIRED	
				VEHICLE MINIMUM	VEHICLE MAXIMUM
ELEMENTARY OR MIDDLE SCHOOL	595 Total Students/Staff	0.2 stalls/ person	0.3 stalls/ person	119	179
		PROPOSED NUMBER OF STALLS		**119**	

Bicycle parking requirements for primary schools are associated with the size of the school building and the number of classrooms. For K-2nd grade classes, 1 space is required per 3,500 square feet of building area. For classes above 2nd grade, 8 spaces are required per class. There will be an estimated 22 classrooms in the new school with a total building square footage of approximately 60,000 square feet at full buildout. Allocating half of the building area to K-2nd grade (30,000 square feet) and allocating half of the classrooms to above 2nd grade (11 classrooms), a total of 97 bicycle parking stalls are needed to meet the minimum code requirements.

No bicycle parking stalls are currently shown on the site plan. As the site plan is further refined, the number should be recalculated accordingly and stalls added to the site plan. See Table 10 for a breakdown of the bicycle parking.

TABLE 10: BICYCLE PARKING REQUIREMENTS

LAND USE	SIZE	K-2ND GRADE CLASSES	ABOVE 2ND GRADE CLASSES	SPACES REQUIRED
ELEMENTARY OR MIDDLE SCHOOL	60,000 SF Building 22 Classrooms	9 Stalls	88 Stalls	97
		PROPOSED NUMBER OF STALLS		**0**

SITE CIRCULATION AND QUEUING

The proposed project provides adequate internal and external site circulation when considering the entirety of the Frog Pond West Master Plan. The proposed site will have access to Boeckman Road via Sherman Drive and Stafford Road via Brisband Street.

[20] Site Plan dated August 17, 2022.

The Main Entrance and parking lot provides a drive aisle loop with a student drop-off and pick-up curb that is striped as approximately 300 ft long, which has the potential to accommodate up to 12 vehicles at a time for student loading when considering 25 ft of space per vehicle. Queuing of vehicles for student drop-off and pick-up can be very variable, depending on the site layout, efficiency of parking aide staff, and length of queuing area vs. length of actual curbside loading area. With the long curbside loading area and availability of additional queuing space through the parking lot (totaling over 750 ft), this should prevent vehicle queues from spilling out of the site onto Sherman Drive.

The Bus Access provides queuing and loading areas for school buses and separates parent pick-up and drop-off from the school buses. There is approximately 275 ft of curb space for buses, which has the potential to accommodate up to five buses at a time when considering 50 ft of space per bus. The school has estimated that a maximum of eight school buses will be needed for the school. Therefore, it is recommended that bus arrival and departure times be coordinated so that all buses are not parked at one time or that additional curb space be provided to accommodate all eight buses at once.

PEDESTRIAN AND BICYCLE FACILITIES

The proposed site plan shows many paths and pedestrian connectivity options throughout the site, with multiple path options from the bus and parent areas. Pedestrian connections are made between each bordering street, including from the back of the school (east side of building) to Wehler Way, allowing for a more direct pedestrian/bicycle route to that area of the Frog Pond neighborhood.

Once the school walking boundary is confirmed, it is recommended that the School District work with the City to provide a map of the preferred Safe Routes to School for the new primary school to residential uses within the school walking boundary. As part of the Safe Route to School plan, a pedestrian/student crossing on the east leg of the Sherman Drive/Boeckman Road intersection should be installed with a median island and Rectangular Rapid Flashing Beacon (RRFB) to serve the students that will need to cross Boeckman Road. The existing RRFB on the west leg should be removed so that a westbound left turn lane can be installed on Boeckman Road into Sherman Drive and not conflict with the RRFB and crosswalk.

Based on discussions with the City of Wilsonville, consistent with the Boeckman Road construction project, left turn lanes will be installed on Boeckman Road at the Laurel Glen/Bus Driveway intersection. The eastbound left turn lane should provide sufficient length to accommodate the estimated number of school buses for the site and will facilitate safe turning movements for the buses.

Additionally, a 20-mph school speed zone should be installed along Boeckman Road, with endpoints approximately 200 feet east and west of the school property.

STREETS

The Frog Pond West Master Plan provides the street classifications and required cross sections for all streets in the Frog Pond West development, including Boeckman Road fronting the Frog Pond

Area.[21] Boeckman Road is a Minor Arterial that is to have two travel lanes, a turn lane/median, buffered bike lanes, planter strips, sidewalks, and an additional landscape buffer on the north side. Sherman Drive and Brisband Drive are Local streets that are to have two travel lanes with on-street parking (with bikes using the travel lanes), planter strips, and sidewalks. The developer will be responsible building half street improvements along the property frontages that meet the required cross section standards.

SIGHT DISTANCE

Adequate sight distance should be provided at the proposed access points. Objects (e.g., fences, walls, or vegetation) located near the intersections may inhibit sight distance for drivers attempting to turn out of a minor street onto the major street. Prior to occupancy, sight distance at any proposed access point will need to be verified, documented, and stamped by a registered professional Civil or Traffic Engineer licensed in the State of Oregon to assure that buildings, signs, or landscaping does not restrict sight distance.

[21] Figure 19 & 20 & 21, Frog Pond West Master Plan, City of Wilsonville, July 17, 2017.

PROJECT IMPACT SUMMARY

The key findings of the transportation impact analysis for the Frog Pond Primary School development are discussed below.

- The project consists of the proposed Frog Pond Primary School development to be located on Sherman Drive which will be part of the West Linn-Wilsonville School District and will have a future capacity of 550 students with 45 total staff. Phase 1 will accommodate 350 students and full buildout at Phase 2 will accommodate another 200 students.
- The proposed full buildout of the 550-student school is expected to generate a net total of 406 AM peak hour trips (220 in, 186 out), 247 Afternoon peak hour trips (114 in, 133 out), 87 PM peak hour trips (39 in, 48 out), and 1,234 Weekday trips.
- Of the net project trips during the PM peak hour, one trip is expected to travel through the I-5/Wilsonville Road interchange area and one trip is expected to travel through the I-5/Elligsen Road interchange area.
- All study intersections, except the intersection of Boeckman Road/Canyon Creek Road, meet the City of Wilsonville's operating standard. However, the Wilsonville Transportation System Plan shows a traffic signal as a high priority project at the intersection of Boeckman Road/Canyon Creek Road as part of project UU-01 and the developer's Transportation System Development Charge (SDC) will contribute to the City's fund to implement the traffic signal. Intersection improvements are currently in the design phase.
- The site plan is generally consistent with the Frog Pond West Master Plan and applicable City of Wilsonville planning documents and standards. See the following findings regarding the site plan.
    - It is recommended that bicycle parking be added to the site to meet City parking standards.
    - Once the school walking boundary is confirmed, it is recommended that the School District work with the City to provide a map of the preferred Safe Routes to School and install a pedestrian/student crossing on the east leg of the Sherman Drive/Boeckman Road intersections with a median island and RRFB.
    - Eastbound and westbound left turn lanes should be installed on Boeckman Road at the Laurel Glen/Bus Driveway intersection to facilitate safe turning movements, especially for the school buses.
    - A 20-mph school speed zone should be installed along Boeckman Road (including flashers), with endpoints approximately 200 feet east and west of the school property.
    - Prior to occupancy, sight distance at any proposed access point will need to be verified, documented, and stamped by a registered professional Civil or Traffic Engineer licensed in the State of Oregon to assure that buildings, signs, or landscaping does not restrict sight distance.

APPENDIX

CONTENTS

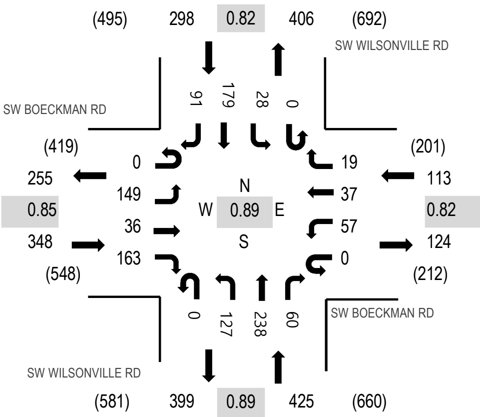
A. TRAFFIC COUNT DATA

ALL TRAFFIC DATA SERVICES
(303) 216-2439
www.alltrafficdata.net

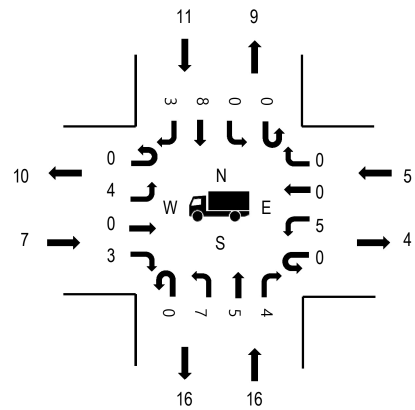
Location: 1 SW WILSONVILLE RD & SW BOECKMAN RD AM
Date: Thursday, May 19, 2022
Peak Hour: 07:40 AM - 08:40 AM
Peak 15-Minutes: 07:50 AM - 08:05 AM

Peak Hour

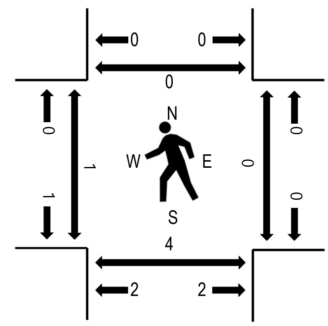
Motorized Vehicles



Heavy Vehicles



Pedestrians



Note: Total study counts contained in parentheses.

	HV%	PHF
EB	2.0%	0.85
WB	4.4%	0.82
NB	3.8%	0.89
SB	3.7%	0.82
All	3.3%	0.89

Traffic Counts - Motorized Vehicles

Interval Start Time	SW BOECKMAN RD Eastbound				SW BOECKMAN RD Westbound				SW WILSONVILLE RD Northbound				SW WILSONVILLE RD Southbound				Total	Rolling Hour
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right		
7:00 AM	0	4	3	1	0	0	1	0	0	2	4	1	0	1	3	2	22	858
7:05 AM	0	6	0	1	0	0	2	2	0	0	12	0	0	1	3	6	33	934
7:10 AM	0	8	0	1	0	2	2	0	0	2	7	0	0	2	6	10	40	1,002
7:15 AM	0	8	0	1	0	2	3	1	0	6	22	0	0	2	8	4	57	1,062
7:20 AM	0	6	3	7	0	3	2	3	0	2	9	1	0	0	7	9	52	1,108
7:25 AM	0	9	3	11	0	1	3	2	0	6	22	3	0	1	19	10	90	1,160
7:30 AM	0	13	2	15	0	2	1	2	0	3	18	2	0	2	7	6	73	1,166
7:35 AM	0	18	1	9	0	5	2	2	0	6	15	2	0	2	10	4	76	1,178
7:40 AM	0	20	1	18	0	4	2	0	0	7	27	2	0	0	16	14	111	1,184
7:45 AM	0	10	3	8	0	5	3	1	0	11	13	3	0	1	11	2	71	1,133
7:50 AM	0	20	6	12	0	6	0	2	0	13	28	9	0	1	18	10	125	1,136
7:55 AM	0	14	3	11	0	7	6	2	0	13	14	11	0	4	12	11	108	1,080
8:00 AM	0	15	0	9	0	4	7	4	0	10	17	4	0	4	15	9	98	1,046
8:05 AM	0	8	4	15	0	4	4	0	0	9	18	6	0	5	21	7	101	
8:10 AM	0	12	5	25	0	6	2	2	0	8	17	1	0	1	16	5	100	
8:15 AM	0	6	4	20	0	5	0	0	0	11	19	1	0	6	25	6	103	
8:20 AM	0	12	2	21	0	6	3	1	0	10	21	6	0	0	14	8	104	
8:25 AM	0	11	2	10	0	7	5	1	0	14	19	2	0	3	17	5	96	
8:30 AM	0	10	4	8	0	2	1	2	0	8	26	6	0	3	6	9	85	
8:35 AM	0	11	2	6	0	1	4	4	0	13	19	9	0	0	8	5	82	
8:40 AM	0	8	5	2	0	2	5	1	0	3	14	1	0	3	10	6	60	
8:45 AM	0	10	4	3	0	1	6	3	0	4	12	7	0	1	11	12	74	
8:50 AM	0	15	4	4	0	7	8	1	0	3	8	7	0	2	3	7	69	
8:55 AM	0	6	7	2	0	5	3	3	0	7	12	12	0	3	8	6	74	
Count Total	0	260	68	220	0	87	75	39	0	171	393	96	0	48	274	173	1,904	
Peak Hour	0	149	36	163	0	57	37	19	0	127	238	60	0	28	179	91	1,184	

Traffic Counts - Heavy Vehicles, Bicycles on Road, and Pedestrians/Bicycles on Crosswalk

Interval Start Time	Heavy Vehicles				
	EB	NB	WB	SB	Total
7:00 AM	2	0	0	0	2
7:05 AM	0	0	1	1	2
7:10 AM	0	1	0	0	1
7:15 AM	0	0	0	0	0
7:20 AM	0	0	2	2	4
7:25 AM	0	1	0	1	2
7:30 AM	1	1	0	1	3
7:35 AM	0	1	1	1	3
7:40 AM	0	0	0	2	2
7:45 AM	1	0	0	1	2
7:50 AM	1	2	0	1	4
7:55 AM	1	1	1	0	3
8:00 AM	0	0	1	1	2
8:05 AM	0	3	0	0	3
8:10 AM	2	0	1	1	4
8:15 AM	1	1	0	1	3
8:20 AM	1	1	1	1	4
8:25 AM	0	1	0	2	3
8:30 AM	0	3	1	0	4
8:35 AM	0	4	0	1	5
8:40 AM	1	3	0	2	6
8:45 AM	0	5	0	1	6
8:50 AM	0	2	3	0	5
8:55 AM	0	0	0	2	2
Count Total	11	30	12	22	75
Peak Hour	7	16	5	11	39

Interval Start Time	Bicycles on Roadway				
	EB	NB	WB	SB	Total
7:00 AM	0	0	0	0	0
7:05 AM	0	0	0	0	0
7:10 AM	0	0	0	0	0
7:15 AM	0	0	0	0	0
7:20 AM	0	0	0	0	0
7:25 AM	0	0	0	0	0
7:30 AM	0	0	0	0	0
7:35 AM	0	0	0	0	0
7:40 AM	0	0	0	0	0
7:45 AM	0	0	0	0	0
7:50 AM	0	0	0	0	0
7:55 AM	0	0	0	0	0
8:00 AM	0	0	0	0	0
8:05 AM	0	0	0	0	0
8:10 AM	0	0	0	0	0
8:15 AM	0	0	0	0	0
8:20 AM	0	0	0	0	0
8:25 AM	0	0	0	0	0
8:30 AM	0	0	0	0	0
8:35 AM	0	0	0	0	0
8:40 AM	0	0	0	0	0
8:45 AM	0	0	0	0	0
8:50 AM	0	0	0	0	0
8:55 AM	0	0	0	0	0
Count Total	0	0	0	0	0
Peak Hour	0	0	0	0	0

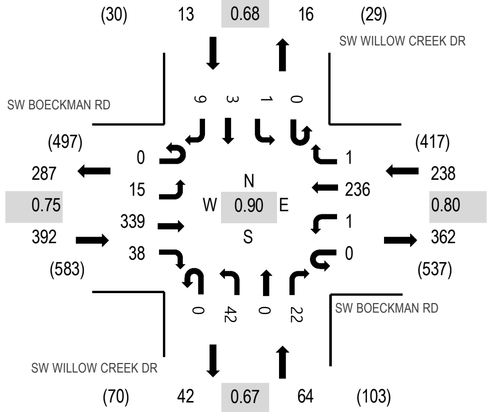
Interval Start Time	Pedestrians/Bicycles on Crosswalk				
	EB	NB	WB	SB	Total
7:00 AM	0	0	0	0	0
7:05 AM	0	0	0	0	0
7:10 AM	0	0	0	0	0
7:15 AM	1	1	0	0	2
7:20 AM	0	1	0	0	1
7:25 AM	0	1	0	0	1
7:30 AM	0	0	0	0	0
7:35 AM	0	1	0	0	1
7:40 AM	0	0	0	0	0
7:45 AM	0	0	0	0	0
7:50 AM	0	3	0	0	3
7:55 AM	0	2	0	0	2
8:00 AM	0	0	0	0	0
8:05 AM	0	0	0	0	0
8:10 AM	0	0	0	0	0
8:15 AM	0	0	0	0	0
8:20 AM	1	0	0	0	1
8:25 AM	0	0	0	0	0
8:30 AM	0	0	0	0	0
8:35 AM	0	1	0	0	1
8:40 AM	0	1	0	0	1
8:45 AM	0	1	0	0	1
8:50 AM	0	1	0	0	1
8:55 AM	0	2	0	0	2
Count Total	2	15	0	0	17
Peak Hour	1	6	0	0	7

Location: 2 SW WILLOW CREEK DR & SW BOECKMAN RD AM
Date: Thursday, May 19, 2022
Peak Hour: 07:30 AM - 08:30 AM
Peak 15-Minutes: 08:10 AM - 08:25 AM

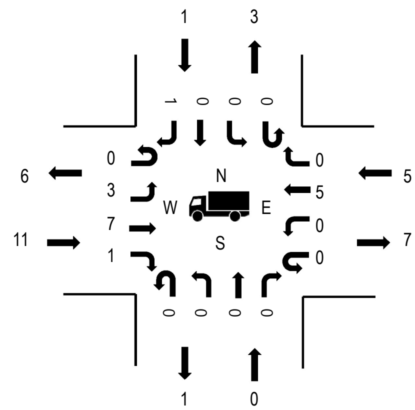
ALL TRAFFIC DATA SERVICES
(303) 216-2439
www.alltrafficdata.net

Peak Hour

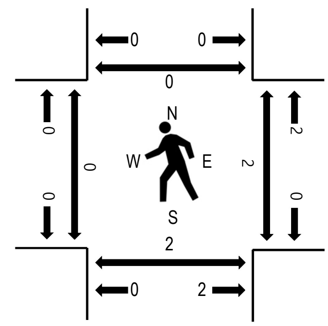
Motorized Vehicles



Heavy Vehicles



Pedestrians



Note: Total study counts contained in parentheses.

	HV%	PHF
EB	2.8%	0.75
WB	2.1%	0.80
NB	0.0%	0.67
SB	7.7%	0.68
All	2.4%	0.90

Traffic Counts - Motorized Vehicles

Interval Start Time	SW BOECKMAN RD Eastbound				SW BOECKMAN RD Westbound				SW WILLOW CREEK DR Northbound				SW WILLOW CREEK DR Southbound				Total	Rolling Hour
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right		
7:00 AM	0	1	7	0	0	0	5	0	0	2	0	1	0	0	0	0	16	507
7:05 AM	0	1	7	1	0	0	8	0	0	2	0	0	0	0	0	0	19	543
7:10 AM	0	0	7	1	0	0	14	0	0	1	0	1	0	0	0	0	24	584
7:15 AM	0	1	8	0	0	0	13	1	0	2	0	0	0	1	0	1	27	620
7:20 AM	0	0	17	0	0	0	12	0	0	3	0	1	0	0	0	1	34	660
7:25 AM	0	1	22	1	0	2	16	0	0	0	0	0	0	0	0	1	43	695
7:30 AM	0	2	28	0	0	0	10	0	0	5	0	1	0	0	1	1	48	707
7:35 AM	0	2	28	1	0	0	14	0	0	3	0	2	0	0	1	1	52	707
7:40 AM	0	1	38	1	0	0	22	0	0	3	0	2	0	0	0	0	67	701
7:45 AM	0	1	17	2	0	0	14	0	0	5	0	2	0	1	0	0	42	666
7:50 AM	0	1	33	1	0	0	23	0	0	2	0	3	0	0	0	0	63	671
7:55 AM	0	1	21	3	0	1	31	1	0	8	0	4	0	0	0	2	72	652
8:00 AM	0	1	24	0	0	0	24	0	0	1	0	0	0	0	0	2	52	626
8:05 AM	0	0	27	4	0	0	22	0	0	4	0	3	0	0	0	0	60	
8:10 AM	0	0	39	2	0	0	14	0	0	3	0	0	0	0	1	1	60	
8:15 AM	0	1	34	12	0	0	16	0	0	2	0	0	0	0	0	2	67	
8:20 AM	0	3	31	9	0	0	21	0	0	4	0	1	0	0	0	0	69	
8:25 AM	0	2	19	3	0	0	25	0	0	2	0	4	0	0	0	0	55	
8:30 AM	0	1	15	4	0	0	19	0	0	4	0	2	0	0	1	2	48	
8:35 AM	0	0	18	2	0	0	21	1	0	1	0	2	0	0	0	1	46	
8:40 AM	0	3	11	2	0	1	11	0	0	2	0	0	0	1	0	1	32	
8:45 AM	0	0	19	2	0	1	21	0	0	1	0	1	0	0	1	1	47	
8:50 AM	0	1	16	2	0	1	16	1	0	4	0	1	0	0	1	1	44	
8:55 AM	0	1	15	4	0	0	15	0	0	6	0	2	0	0	1	2	46	
Count Total	0	25	501	57	0	6	407	4	0	70	0	33	0	3	7	20	1,133	
Peak Hour	0	15	339	38	0	1	236	1	0	42	0	22	0	1	3	9	707	

Traffic Counts - Heavy Vehicles, Bicycles on Road, and Pedestrians/Bicycles on Crosswalk

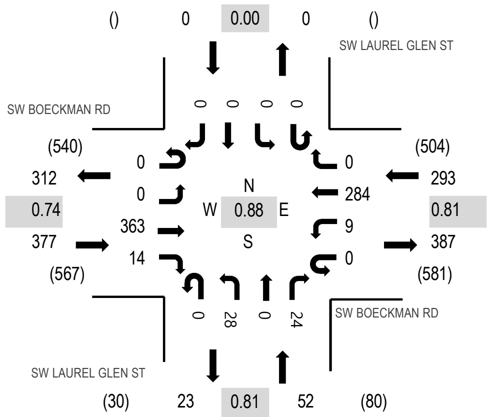
Interval Start Time	Heavy Vehicles					Interval Start Time	Bicycles on Roadway					Interval Start Time	Pedestrians/Bicycles on Crosswalk				
	EB	NB	WB	SB	Total		EB	NB	WB	SB	Total		EB	NB	WB	SB	Total
7:00 AM	2	0	0	0	2	7:00 AM	0	0	0	0	0	7:00 AM	0	0	0	0	0
7:05 AM	1	0	1	0	2	7:05 AM	0	0	0	0	0	7:05 AM	0	0	0	0	0
7:10 AM	0	0	1	0	1	7:10 AM	0	0	0	0	0	7:10 AM	0	1	0	0	1
7:15 AM	0	0	0	0	0	7:15 AM	0	0	0	0	0	7:15 AM	1	0	0	0	1
7:20 AM	0	0	2	0	2	7:20 AM	0	0	0	0	0	7:20 AM	0	0	0	0	0
7:25 AM	0	0	0	0	0	7:25 AM	0	0	0	0	0	7:25 AM	0	1	0	0	1
7:30 AM	1	0	0	0	1	7:30 AM	0	0	0	0	0	7:30 AM	0	0	1	0	1
7:35 AM	1	0	0	0	1	7:35 AM	0	0	0	0	0	7:35 AM	0	0	0	0	0
7:40 AM	0	0	0	0	0	7:40 AM	0	0	0	0	0	7:40 AM	0	0	0	0	0
7:45 AM	3	0	0	0	3	7:45 AM	0	0	0	0	0	7:45 AM	0	1	1	0	2
7:50 AM	0	0	0	0	0	7:50 AM	0	0	0	0	0	7:50 AM	0	0	0	0	0
7:55 AM	1	0	0	0	1	7:55 AM	0	0	0	0	0	7:55 AM	0	0	0	0	0
8:00 AM	0	0	1	1	2	8:00 AM	0	0	0	0	0	8:00 AM	0	0	0	0	0
8:05 AM	0	0	0	0	0	8:05 AM	0	0	0	0	0	8:05 AM	0	1	0	0	1
8:10 AM	2	0	0	0	2	8:10 AM	0	0	0	0	0	8:10 AM	0	0	0	0	0
8:15 AM	2	0	0	0	2	8:15 AM	0	0	0	0	0	8:15 AM	0	0	0	0	0
8:20 AM	1	0	2	0	3	8:20 AM	0	0	0	0	0	8:20 AM	0	0	0	0	0
8:25 AM	0	0	2	0	2	8:25 AM	0	0	0	0	0	8:25 AM	0	0	0	0	0
8:30 AM	0	0	3	0	3	8:30 AM	0	0	0	0	0	8:30 AM	0	1	0	0	1
8:35 AM	0	0	2	0	2	8:35 AM	0	0	0	0	0	8:35 AM	0	1	0	0	1
8:40 AM	2	0	1	0	3	8:40 AM	0	0	0	0	0	8:40 AM	0	0	0	0	0
8:45 AM	0	0	3	0	3	8:45 AM	0	0	0	0	0	8:45 AM	0	0	0	0	0
8:50 AM	0	0	2	0	2	8:50 AM	0	0	0	0	0	8:50 AM	0	0	0	0	0
8:55 AM	0	0	0	1	1	8:55 AM	0	0	0	0	0	8:55 AM	0	1	0	0	1
Count Total	16	0	20	2	38	Count Total	0	0	0	0	0	Count Total	1	7	2	0	10
Peak Hour	11	0	5	1	17	Peak Hour	0	0	0	0	0	Peak Hour	0	2	2	0	4

ALL TRAFFIC DATA SERVICES
(303) 216-2439
www.alltrafficdata.net

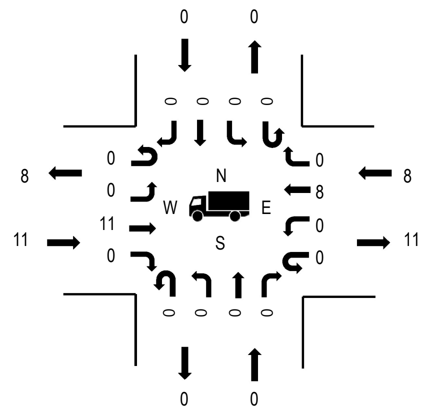
Location: 3 SW LAUREL GLEN ST & SW BOECKMAN RD AM
Date: Thursday, May 19, 2022
Peak Hour: 07:30 AM - 08:30 AM
Peak 15-Minutes: 08:10 AM - 08:25 AM

Peak Hour

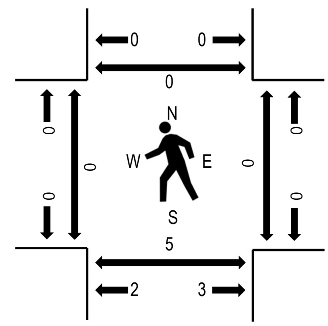
Motorized Vehicles



Heavy Vehicles



Pedestrians



Note: Total study counts contained in parentheses.

	HV%	PHF
EB	2.9%	0.74
WB	2.7%	0.81
NB	0.0%	0.81
SB	0.0%	0.00
All	2.6%	0.88

Traffic Counts - Motorized Vehicles

Interval Start Time	SW BOECKMAN RD Eastbound				SW BOECKMAN RD Westbound				SW LAUREL GLEN ST Northbound				SW LAUREL GLEN ST Southbound				Total	Rolling Hour
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right		
7:00 AM	0	0	4	1	0	0	7	0	0	1	0	0	0	0	0	0	13	516
7:05 AM	0	0	8	0	0	0	10	0	0	3	0	2	0	0	0	0	23	560
7:10 AM	0	0	8	0	0	0	15	0	0	4	0	0	0	0	0	0	27	600
7:15 AM	0	0	9	0	0	0	16	0	0	2	0	0	0	0	0	0	27	638
7:20 AM	0	0	18	1	0	1	14	0	0	1	0	1	0	0	0	0	36	680
7:25 AM	0	0	25	2	0	0	18	0	0	1	0	1	0	0	0	0	47	715
7:30 AM	0	0	24	0	0	0	16	0	0	1	0	4	0	0	0	0	45	722
7:35 AM	0	0	31	1	0	0	18	0	0	5	0	0	0	0	0	0	55	722
7:40 AM	0	0	33	0	0	0	25	0	0	6	0	0	0	0	0	0	64	712
7:45 AM	0	0	24	1	0	2	18	0	0	2	0	1	0	0	0	0	48	680
7:50 AM	0	0	27	1	0	2	25	0	0	2	0	2	0	0	0	0	59	673
7:55 AM	0	0	26	2	0	0	41	0	0	2	0	1	0	0	0	0	72	657
8:00 AM	0	0	22	2	0	1	26	0	0	4	0	2	0	0	0	0	57	635
8:05 AM	0	0	29	1	0	1	25	0	0	4	0	3	0	0	0	0	63	
8:10 AM	0	0	44	2	0	1	16	0	0	1	0	1	0	0	0	0	65	
8:15 AM	0	0	43	2	0	0	21	0	0	0	0	3	0	0	0	0	69	
8:20 AM	0	0	35	2	0	2	26	0	0	0	0	6	0	0	0	0	71	
8:25 AM	0	0	25	0	0	0	27	0	0	1	0	1	0	0	0	0	54	
8:30 AM	0	0	17	0	0	0	25	0	0	3	0	0	0	0	0	0	45	
8:35 AM	0	0	22	0	0	0	23	0	0	0	0	0	0	0	0	0	45	
8:40 AM	0	0	17	0	0	0	14	0	0	0	0	1	0	0	0	0	32	
8:45 AM	0	0	16	0	0	0	23	0	0	0	0	2	0	0	0	0	41	
8:50 AM	0	0	19	2	0	0	22	0	0	0	0	0	0	0	0	0	43	
8:55 AM	0	0	21	0	0	0	23	0	0	3	0	3	0	0	0	0	50	
Count Total	0	0	547	20	0	10	494	0	0	46	0	34	0	0	0	0	1,151	
Peak Hour	0	0	363	14	0	9	284	0	0	28	0	24	0	0	0	0	722	

Traffic Counts - Heavy Vehicles, Bicycles on Road, and Pedestrians/Bicycles on Crosswalk

Interval Start Time	Heavy Vehicles EB	NB	WB	SB	Total
7:00 AM	1	0	0	0	1
7:05 AM	1	0	1	0	2
7:10 AM	0	0	2	0	2
7:15 AM	0	0	0	0	0
7:20 AM	0	0	2	0	2
7:25 AM	0	0	0	0	0
7:30 AM	1	0	1	0	2
7:35 AM	1	0	1	0	2
7:40 AM	0	0	0	0	0
7:45 AM	3	0	0	0	3
7:50 AM	0	0	0	0	0
7:55 AM	1	0	0	0	1
8:00 AM	0	0	2	0	2
8:05 AM	0	0	0	0	0
8:10 AM	2	0	0	0	2
8:15 AM	2	0	0	0	2
8:20 AM	1	0	2	0	3
8:25 AM	0	0	2	0	2
8:30 AM	0	0	3	0	3
8:35 AM	1	0	2	0	3
8:40 AM	2	0	1	0	3
8:45 AM	0	0	3	0	3
8:50 AM	0	0	2	0	2
8:55 AM	0	0	1	0	1
Count Total	16	0	25	0	41
Peak Hour	11	0	8	0	19

Interval Start Time	Bicycles on Roadway EB	NB	WB	SB	Total
7:00 AM	0	0	0	0	0
7:05 AM	0	0	0	0	0
7:10 AM	0	0	0	0	0
7:15 AM	0	0	0	0	0
7:20 AM	0	0	0	0	0
7:25 AM	0	0	0	0	0
7:30 AM	0	0	0	0	0
7:35 AM	0	0	0	0	0
7:40 AM	0	0	0	0	0
7:45 AM	0	0	0	0	0
7:50 AM	0	0	0	0	0
7:55 AM	0	0	0	0	0
8:00 AM	0	0	0	0	0
8:05 AM	0	0	0	0	0
8:10 AM	0	0	0	0	0
8:15 AM	0	0	0	0	0
8:20 AM	0	0	0	0	0
8:25 AM	0	0	0	0	0
8:30 AM	0	0	0	0	0
8:35 AM	0	0	0	0	0
8:40 AM	0	0	0	0	0
8:45 AM	0	0	0	0	0
8:50 AM	0	0	0	0	0
8:55 AM	0	0	0	0	0
Count Total	0	0	0	0	0
Peak Hour	0	0	0	0	0

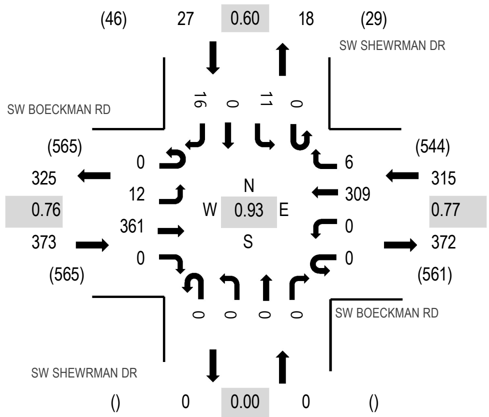
Interval Start Time	Pedestrians/Bicycles on Crosswalk EB	NB	WB	SB	Total
7:00 AM	0	0	0	0	0
7:05 AM	0	0	0	0	0
7:10 AM	0	1	0	0	1
7:15 AM	0	0	0	0	0
7:20 AM	0	1	0	0	1
7:25 AM	0	1	0	0	1
7:30 AM	0	0	0	0	0
7:35 AM	0	0	0	0	0
7:40 AM	0	0	0	0	0
7:45 AM	0	1	0	0	1
7:50 AM	0	0	0	0	0
7:55 AM	0	0	0	0	0
8:00 AM	0	0	0	0	0
8:05 AM	0	0	0	0	0
8:10 AM	0	3	0	0	3
8:15 AM	0	1	0	0	1
8:20 AM	0	0	0	0	0
8:25 AM	0	0	0	0	0
8:30 AM	0	0	0	0	0
8:35 AM	0	1	0	0	1
8:40 AM	0	1	0	0	1
8:45 AM	0	0	0	0	0
8:50 AM	0	0	0	0	0
8:55 AM	0	0	0	0	0
Count Total	0	10	0	0	10
Peak Hour	0	5	0	0	5

ALL TRAFFIC DATA SERVICES
(303) 216-2439
www.alltrafficdata.net

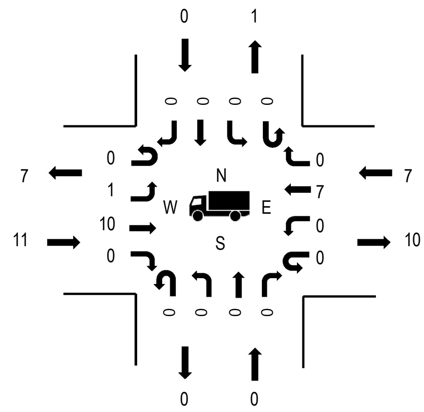
Location: 4 SW SHEWRMAN DR & SW BOECKMAN RD AM
Date: Thursday, May 19, 2022
Peak Hour: 07:30 AM - 08:30 AM
Peak 15-Minutes: 07:50 AM - 08:05 AM

Peak Hour

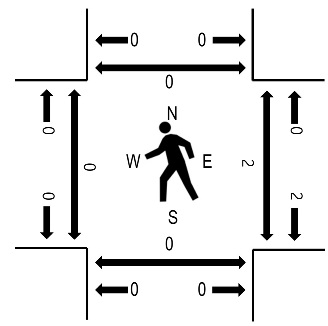
Motorized Vehicles



Heavy Vehicles



Pedestrians



Note: Total study counts contained in parentheses.

	HV%	PHF
EB	2.9%	0.76
WB	2.2%	0.77
NB	0.0%	0.00
SB	0.0%	0.60
All	2.5%	0.93

Traffic Counts - Motorized Vehicles

Interval Start Time	SW BOECKMAN RD Eastbound				SW BOECKMAN RD Westbound				SW SHEWRMAN DR Northbound				SW SHEWRMAN DR Southbound				Total	Rolling Hour
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right		
7:00 AM	0	0	5	0	0	0	9	0	0	0	0	0	0	0	0	3	17	530
7:05 AM	0	0	8	0	0	0	12	0	0	0	0	0	0	0	0	1	21	575
7:10 AM	0	0	9	0	0	0	24	0	0	0	0	0	0	1	0	0	34	615
7:15 AM	0	1	10	0	0	0	14	0	0	0	0	0	0	0	0	2	27	642
7:20 AM	0	0	20	0	0	0	16	0	0	0	0	0	0	1	0	1	38	683
7:25 AM	0	0	27	0	0	0	20	0	0	0	0	0	0	1	0	1	49	706
7:30 AM	0	2	22	0	0	0	19	0	0	0	0	0	0	1	0	3	47	715
7:35 AM	0	0	31	0	0	0	22	1	0	0	0	0	0	2	0	2	58	714
7:40 AM	0	0	29	0	0	0	29	0	0	0	0	0	0	3	0	1	62	697
7:45 AM	0	1	24	0	0	0	17	2	0	0	0	0	0	0	0	2	46	666
7:50 AM	0	1	30	0	0	0	31	1	0	0	0	0	0	0	0	2	65	667
7:55 AM	0	0	22	0	0	0	43	0	0	0	0	0	0	1	0	0	66	649
8:00 AM	0	0	29	0	0	0	30	0	0	0	0	0	0	2	0	1	62	625
8:05 AM	0	4	28	0	0	0	27	0	0	0	0	0	0	0	0	2	61	
8:10 AM	0	0	44	0	0	0	17	0	0	0	0	0	0	0	0	0	61	
8:15 AM	0	0	46	0	0	0	20	1	0	0	0	0	0	0	0	1	68	
8:20 AM	0	2	30	0	0	0	26	0	0	0	0	0	0	1	0	2	61	
8:25 AM	0	2	26	0	0	0	28	1	0	0	0	0	0	1	0	0	58	
8:30 AM	0	1	14	0	0	0	28	0	0	0	0	0	0	2	0	1	46	
8:35 AM	0	2	18	0	0	0	21	0	0	0	0	0	0	0	0	0	41	
8:40 AM	0	1	16	0	0	0	12	0	0	0	0	0	0	1	0	1	31	
8:45 AM	0	2	20	0	0	0	25	0	0	0	0	0	0	0	0	0	47	
8:50 AM	0	1	20	0	0	0	24	0	0	0	0	0	0	1	0	1	47	
8:55 AM	0	3	14	0	0	0	24	0	0	0	0	0	0	1	0	0	42	
Count Total	0	23	542	0	0	0	538	6	0	0	0	0	0	19	0	27	1,155	
Peak Hour	0	12	361	0	0	0	309	6	0	0	0	0	0	11	0	16	715	

Traffic Counts - Heavy Vehicles, Bicycles on Road, and Pedestrians/Bicycles on Crosswalk

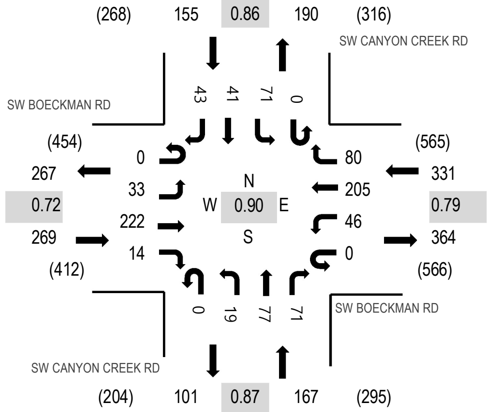
Interval	Heavy Vehicles					Interval	Bicycles on Roadway					Interval	Pedestrians/Bicycles on Crosswalk				
Start Time	EB	NB	WB	SB	Total	Start Time	EB	NB	WB	SB	Total	Start Time	EB	NB	WB	SB	Total
7:00 AM	1	0	0	0	1	7:00 AM	0	0	0	0	0	7:00 AM	0	0	0	0	0
7:05 AM	1	0	1	0	2	7:05 AM	0	0	0	0	0	7:05 AM	0	0	0	0	0
7:10 AM	0	0	1	0	1	7:10 AM	0	0	0	0	0	7:10 AM	0	0	1	1	2
7:15 AM	0	0	1	0	1	7:15 AM	0	0	0	0	0	7:15 AM	0	0	0	0	0
7:20 AM	0	0	0	0	0	7:20 AM	0	0	0	0	0	7:20 AM	0	0	0	0	0
7:25 AM	0	0	0	0	0	7:25 AM	0	0	0	0	0	7:25 AM	0	0	0	0	0
7:30 AM	0	0	0	0	0	7:30 AM	0	0	0	0	0	7:30 AM	0	0	0	0	0
7:35 AM	1	0	0	0	1	7:35 AM	0	0	0	0	0	7:35 AM	0	0	0	0	0
7:40 AM	2	0	0	0	2	7:40 AM	0	0	0	0	0	7:40 AM	0	0	0	0	0
7:45 AM	2	0	0	0	2	7:45 AM	0	0	0	0	0	7:45 AM	0	0	0	0	0
7:50 AM	1	0	0	0	1	7:50 AM	0	0	0	0	0	7:50 AM	0	0	0	0	0
7:55 AM	0	0	0	0	0	7:55 AM	0	0	0	0	0	7:55 AM	0	0	2	0	2
8:00 AM	0	0	2	0	2	8:00 AM	0	0	0	0	0	8:00 AM	0	0	0	0	0
8:05 AM	1	0	0	0	1	8:05 AM	0	0	0	0	0	8:05 AM	0	0	0	0	0
8:10 AM	1	0	0	0	1	8:10 AM	0	0	0	0	0	8:10 AM	0	0	0	0	0
8:15 AM	3	0	0	0	3	8:15 AM	0	0	0	0	0	8:15 AM	0	0	0	0	0
8:20 AM	0	0	2	0	2	8:20 AM	0	0	0	0	0	8:20 AM	0	0	0	0	0
8:25 AM	0	0	3	0	3	8:25 AM	0	0	0	0	0	8:25 AM	0	0	0	0	0
8:30 AM	0	0	3	0	3	8:30 AM	0	0	0	0	0	8:30 AM	0	0	0	0	0
8:35 AM	2	0	1	0	3	8:35 AM	0	0	0	0	0	8:35 AM	0	0	0	0	0
8:40 AM	0	0	1	0	1	8:40 AM	0	0	0	0	0	8:40 AM	0	0	0	0	0
8:45 AM	0	0	5	0	5	8:45 AM	0	0	0	0	0	8:45 AM	0	0	0	0	0
8:50 AM	0	0	1	0	1	8:50 AM	0	0	0	0	0	8:50 AM	0	0	0	0	0
8:55 AM	0	0	0	0	0	8:55 AM	0	0	0	0	0	8:55 AM	0	0	0	0	0
Count Total	15	0	21	0	36	Count Total	0	0	0	0	0	Count Total	0	0	3	1	4
Peak Hour	11	0	7	0	18	Peak Hour	0	0	0	0	0	Peak Hour	0	0	2	0	2

ALL TRAFFIC DATA SERVICES
(303) 216-2439
www.alltrafficdata.net

Location: 5 SW CANYON CREEK RD & SW BOECKMAN RD AM
Date: Thursday, May 19, 2022
Peak Hour: 07:35 AM - 08:35 AM
Peak 15-Minutes: 08:00 AM - 08:15 AM

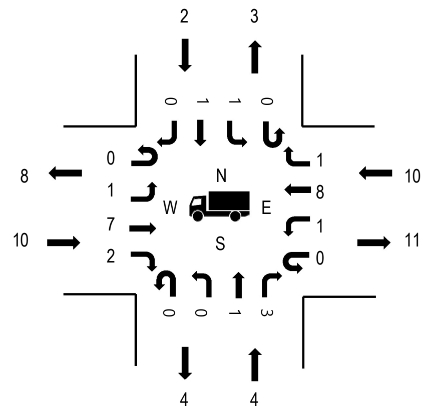
Peak Hour

Motorized Vehicles

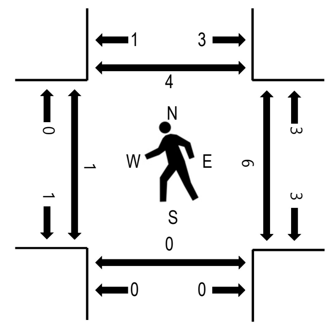


Note: Total study counts contained in parentheses.

Heavy Vehicles



Pedestrians



	HV%	PHF
EB	3.7%	0.72
WB	3.0%	0.79
NB	2.4%	0.87
SB	1.3%	0.86
All	2.8%	0.90

Traffic Counts - Motorized Vehicles

Interval Start Time	SW BOECKMAN RD Eastbound				SW BOECKMAN RD Westbound				SW CANYON CREEK RD Northbound				SW CANYON CREEK RD Southbound				Total	Rolling Hour
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right		
7:00 AM	0	2	6	0	0	4	3	5	0	4	6	0	0	0	1	0	31	708
7:05 AM	0	1	6	0	0	1	8	5	0	0	8	3	0	0	3	2	37	761
7:10 AM	0	0	5	2	0	4	10	6	0	2	2	1	0	2	3	6	43	807
7:15 AM	0	0	8	0	0	4	14	1	0	4	7	1	0	2	0	3	44	853
7:20 AM	0	4	10	1	0	4	11	4	0	3	6	6	0	2	3	1	55	884
7:25 AM	0	1	18	1	0	3	10	6	0	3	8	3	0	8	5	2	68	915
7:30 AM	0	1	5	2	0	2	10	5	0	1	3	7	0	9	2	4	51	921
7:35 AM	0	1	13	2	0	1	12	11	0	3	10	9	0	5	1	5	73	922
7:40 AM	0	1	24	0	0	6	14	10	0	3	5	8	0	4	2	3	80	903
7:45 AM	0	3	15	2	0	7	14	5	0	0	5	4	0	6	5	2	68	877
7:50 AM	0	5	16	2	0	3	16	6	0	1	8	10	0	4	3	4	78	867
7:55 AM	0	6	9	0	0	5	28	7	0	1	4	4	0	7	3	6	80	845
8:00 AM	0	0	23	1	0	7	18	9	0	2	9	5	0	2	4	4	84	832
8:05 AM	0	5	14	2	0	4	20	7	0	1	5	6	0	9	7	3	83	
8:10 AM	0	3	36	1	0	1	17	3	0	1	3	6	0	6	6	6	89	
8:15 AM	0	0	30	1	0	0	12	6	0	1	8	6	0	7	3	1	75	
8:20 AM	0	3	18	2	0	3	20	6	0	2	8	7	0	9	5	3	86	
8:25 AM	0	4	14	1	0	6	15	7	0	1	8	5	0	8	1	4	74	
8:30 AM	0	2	10	0	0	3	19	3	0	3	4	1	0	4	1	2	52	
8:35 AM	0	1	13	1	0	3	13	8	0	0	2	9	0	1	2	1	54	
8:40 AM	0	2	8	3	0	4	13	2	0	2	5	3	0	3	4	5	54	
8:45 AM	0	0	16	0	0	4	12	4	0	2	4	4	0	4	5	3	58	
8:50 AM	0	3	9	1	0	12	10	1	0	0	4	6	0	3	4	3	56	
8:55 AM	0	1	10	2	0	5	18	5	0	1	3	5	0	6	8	3	67	
Count Total	0	49	336	27	0	96	337	132	0	41	135	119	0	111	81	76	1,540	
Peak Hour	0	33	222	14	0	46	205	80	0	19	77	71	0	71	41	43	922	

Traffic Counts - Heavy Vehicles, Bicycles on Road, and Pedestrians/Bicycles on Crosswalk

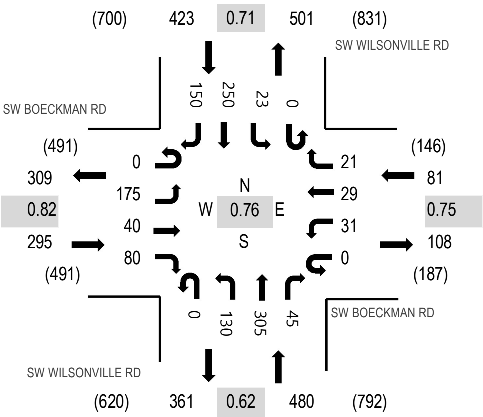
Interval Start Time	Heavy Vehicles EB	NB	WB	SB	Total	Interval Start Time	Bicycles on Roadway EB	NB	WB	SB	Total	Interval Start Time	Pedestrians/Bicycles on Crosswalk EB	NB	WB	SB	Total
7:00 AM	1	1	0	0	2	7:00 AM	0	0	0	0	0	7:00 AM	0	0	1	0	1
7:05 AM	1	0	0	0	1	7:05 AM	0	0	0	0	0	7:05 AM	0	0	0	0	0
7:10 AM	1	0	2	0	3	7:10 AM	0	0	0	0	0	7:10 AM	0	0	0	0	0
7:15 AM	0	0	0	0	0	7:15 AM	0	0	0	0	0	7:15 AM	0	0	0	0	0
7:20 AM	1	0	1	0	2	7:20 AM	0	0	0	0	0	7:20 AM	0	0	0	0	0
7:25 AM	0	2	0	1	3	7:25 AM	0	0	0	0	0	7:25 AM	0	0	0	0	0
7:30 AM	1	0	0	0	1	7:30 AM	0	0	0	0	0	7:30 AM	1	0	0	0	1
7:35 AM	1	1	0	0	2	7:35 AM	0	0	0	0	0	7:35 AM	0	0	0	0	0
7:40 AM	1	1	0	0	2	7:40 AM	0	0	0	0	0	7:40 AM	0	0	1	1	2
7:45 AM	2	0	1	0	3	7:45 AM	0	0	0	0	0	7:45 AM	0	0	1	1	2
7:50 AM	1	0	0	0	1	7:50 AM	0	0	0	0	0	7:50 AM	0	0	0	0	0
7:55 AM	1	0	0	0	1	7:55 AM	0	0	0	0	0	7:55 AM	0	0	1	1	2
8:00 AM	0	0	2	0	2	8:00 AM	0	0	0	0	0	8:00 AM	0	0	0	0	0
8:05 AM	1	0	0	1	2	8:05 AM	0	0	0	0	0	8:05 AM	0	0	0	1	1
8:10 AM	0	0	0	0	0	8:10 AM	0	0	0	0	0	8:10 AM	1	0	0	0	1
8:15 AM	2	1	0	1	4	8:15 AM	0	0	0	0	0	8:15 AM	0	0	1	0	1
8:20 AM	0	0	2	0	2	8:20 AM	0	0	0	0	0	8:20 AM	0	0	2	0	2
8:25 AM	1	1	2	0	4	8:25 AM	0	0	0	0	0	8:25 AM	0	0	0	0	0
8:30 AM	0	0	3	0	3	8:30 AM	0	0	0	0	0	8:30 AM	0	0	0	0	0
8:35 AM	1	0	2	0	3	8:35 AM	0	0	0	0	0	8:35 AM	0	0	0	0	0
8:40 AM	0	0	1	0	1	8:40 AM	0	0	0	0	0	8:40 AM	0	0	0	0	0
8:45 AM	0	1	2	0	3	8:45 AM	0	0	0	0	0	8:45 AM	0	0	1	0	1
8:50 AM	0	0	2	1	3	8:50 AM	0	0	0	0	0	8:50 AM	0	0	0	0	0
8:55 AM	0	0	1	1	2	8:55 AM	0	0	0	0	0	8:55 AM	0	0	0	1	1
Count Total	16	8	21	5	50	Count Total	0	0	0	0	0	Count Total	2	0	8	5	15
Peak Hour	10	4	10	2	26	Peak Hour	0	0	0	0	0	Peak Hour	1	0	6	4	11

ALL TRAFFIC DATA SERVICES
(303) 216-2439
www.alltrafficdata.net

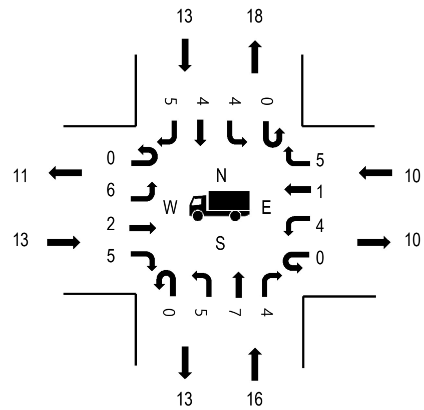
Location: 1 SW WILSONVILLE RD & SW BOECKMAN RD Noon
Date: Thursday, May 19, 2022
Peak Hour: 02:25 PM - 03:25 PM
Peak 15-Minutes: 03:05 PM - 03:20 PM

Peak Hour

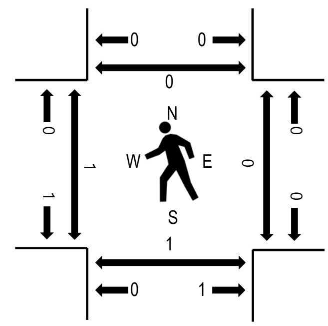
Motorized Vehicles



Heavy Vehicles



Pedestrians



Note: Total study counts contained in parentheses.

	HV%	PHF
EB	4.4%	0.82
WB	12.3%	0.75
NB	3.3%	0.62
SB	3.1%	0.71
All	4.1%	0.76

Traffic Counts - Motorized Vehicles

Interval Start Time	SW BOECKMAN RD Eastbound U-Turn	Left	Thru	Right	SW BOECKMAN RD Westbound U-Turn	Left	Thru	Right	SW WILSONVILLE RD Northbound U-Turn	Left	Thru	Right	SW WILSONVILLE RD Southbound U-Turn	Left	Thru	Right	Total	Rolling Hour
1:30 PM	0	7	2	5	0	3	1	2	0	6	20	3	0	0	6	4	59	825
1:35 PM	0	12	0	9	0	4	1	1	0	13	23	4	0	0	7	4	78	852
1:40 PM	0	8	3	6	0	2	0	1	0	4	19	0	0	1	12	6	62	855
1:45 PM	0	8	2	6	0	1	4	3	0	2	20	4	0	0	7	4	61	881
1:50 PM	0	8	1	8	0	3	0	2	0	0	14	2	0	2	14	5	59	907
1:55 PM	0	6	2	8	0	2	0	0	0	5	10	2	0	0	15	8	58	939
2:00 PM	0	7	1	2	0	4	5	0	0	1	20	2	0	1	17	5	65	969
2:05 PM	0	7	0	3	0	2	3	0	0	2	14	7	0	3	10	12	63	1,032
2:10 PM	0	6	2	3	0	3	2	2	0	7	19	1	0	0	13	14	72	1,100
2:15 PM	0	12	3	7	0	5	1	2	0	8	9	5	0	1	17	8	78	1,174
2:20 PM	0	7	2	5	0	0	0	1	0	13	27	1	0	2	13	12	83	1,238
2:25 PM	0	12	3	4	0	1	2	2	0	11	28	3	0	0	12	9	87	1,279
2:30 PM	0	23	4	3	0	0	2	2	0	6	21	4	0	2	10	9	86	
2:35 PM	0	12	0	4	0	3	4	2	0	6	26	2	0	1	16	5	81	
2:40 PM	0	19	1	4	0	2	2	3	0	1	18	4	0	2	16	16	88	
2:45 PM	0	16	1	7	0	2	3	2	0	4	24	0	0	3	17	8	87	
2:50 PM	0	12	2	11	0	4	2	0	0	6	21	2	0	0	24	7	91	
2:55 PM	0	18	5	8	0	3	3	1	0	3	17	4	0	1	16	9	88	
3:00 PM	0	17	3	10	0	5	2	1	0	5	33	3	0	4	31	14	128	
3:05 PM	0	13	7	12	0	3	6	3	0	25	26	5	0	3	15	13	131	
3:10 PM	0	9	2	5	0	1	1	1	0	29	37	6	0	3	34	18	146	
3:15 PM	0	12	5	7	0	5	2	4	0	30	34	4	0	2	20	17	142	
3:20 PM	0	12	7	5	0	2	0	0	0	4	20	8	0	2	39	25	124	
3:25 PM	0	20	6	2	0	1	4	0	0	2	13	10	0	4	34	16	112	
Count Total	0	283	64	144	0	61	50	35	0	193	513	86	0	37	415	248	2,129	
Peak Hour	0	175	40	80	0	31	29	21	0	130	305	45	0	23	250	150	1,279	

Traffic Counts - Heavy Vehicles, Bicycles on Road, and Pedestrians/Bicycles on Crosswalk

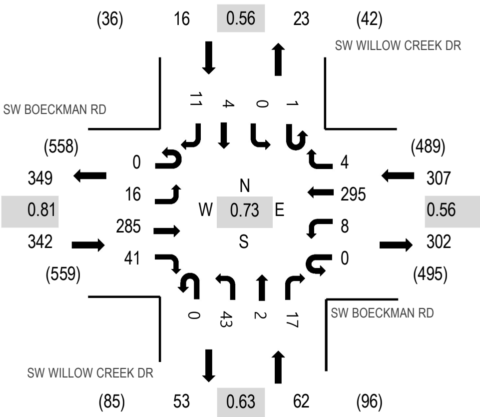
Interval Start Time	Heavy Vehicles					Interval Start Time	Bicycles on Roadway					Interval Start Time	Pedestrians/Bicycles on Crosswalk				
	EB	NB	WB	SB	Total		EB	NB	WB	SB	Total		EB	NB	WB	SB	Total
1:30 PM	1	1	0	0	2	1:30 PM	0	0	0	0	0	1:30 PM	0	0	0	0	0
1:35 PM	3	0	2	0	5	1:35 PM	0	0	0	0	0	1:35 PM	0	0	0	0	0
1:40 PM	1	1	1	0	3	1:40 PM	0	0	0	0	0	1:40 PM	0	0	0	0	0
1:45 PM	1	1	0	0	2	1:45 PM	0	0	0	0	0	1:45 PM	0	0	0	0	0
1:50 PM	1	0	0	0	1	1:50 PM	0	0	0	0	0	1:50 PM	0	0	1	0	1
1:55 PM	0	2	0	0	2	1:55 PM	0	0	0	0	0	1:55 PM	0	0	4	0	4
2:00 PM	0	0	0	1	1	2:00 PM	0	0	0	0	0	2:00 PM	0	0	0	0	0
2:05 PM	2	0	0	2	4	2:05 PM	0	0	0	0	0	2:05 PM	0	0	0	0	0
2:10 PM	0	1	0	3	4	2:10 PM	0	0	0	0	0	2:10 PM	0	0	0	0	0
2:15 PM	1	2	3	0	6	2:15 PM	0	0	0	0	0	2:15 PM	0	0	0	0	0
2:20 PM	0	3	0	2	5	2:20 PM	0	0	0	0	0	2:20 PM	0	0	0	0	0
2:25 PM	1	1	1	0	3	2:25 PM	0	0	0	0	0	2:25 PM	1	0	0	0	1
2:30 PM	3	0	0	0	3	2:30 PM	0	0	0	0	0	2:30 PM	0	0	0	0	0
2:35 PM	2	1	0	0	3	2:35 PM	0	0	0	0	0	2:35 PM	0	0	0	0	0
2:40 PM	1	0	2	6	9	2:40 PM	0	0	0	0	0	2:40 PM	0	0	0	0	0
2:45 PM	0	1	0	1	2	2:45 PM	0	0	0	0	0	2:45 PM	0	0	0	0	0
2:50 PM	0	1	1	0	2	2:50 PM	0	0	0	0	0	2:50 PM	0	0	0	0	0
2:55 PM	2	3	0	1	6	2:55 PM	0	0	0	0	0	2:55 PM	0	1	0	0	1
3:00 PM	0	0	2	2	4	3:00 PM	0	0	0	0	0	3:00 PM	0	0	0	0	0
3:05 PM	1	1	2	0	4	3:05 PM	0	0	0	0	0	3:05 PM	0	0	0	0	0
3:10 PM	2	3	1	1	7	3:10 PM	0	0	0	0	0	3:10 PM	0	0	0	0	0
3:15 PM	0	4	1	1	6	3:15 PM	0	0	0	0	0	3:15 PM	0	0	0	0	0
3:20 PM	1	1	0	1	3	3:20 PM	0	0	0	0	0	3:20 PM	0	0	0	0	0
3:25 PM	1	1	0	0	2	3:25 PM	0	0	0	0	0	3:25 PM	0	0	0	0	0
Count Total	24	28	16	21	89	Count Total	0	0	0	0	0	Count Total	1	1	5	0	7
Peak Hour	13	16	10	13	52	Peak Hour	0	0	0	0	0	Peak Hour	1	1	0	0	2

(303) 216-2439
www.alltrafficdata.net

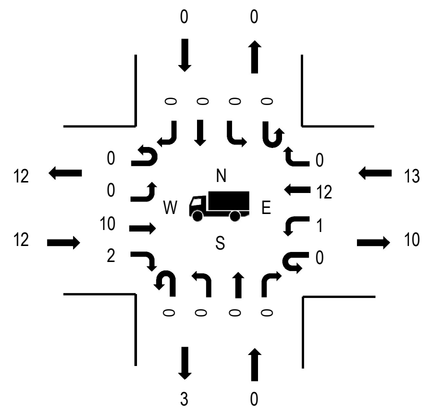
Location: 2 SW WILLOW CREEK DR & SW BOECKMAN RD Noon
Date: Thursday, May 19, 2022
Peak Hour: 02:25 PM - 03:25 PM
Peak 15-Minutes: 03:05 PM - 03:20 PM

Peak Hour

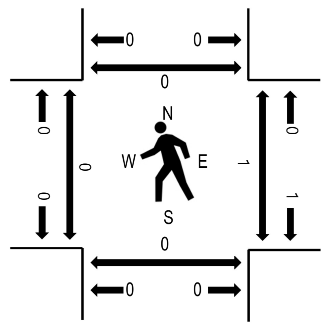
Motorized Vehicles



Heavy Vehicles



Pedestrians



Note: Total study counts contained in parentheses.

	HV%	PHF
EB	3.5%	0.81
WB	4.2%	0.56
NB	0.0%	0.63
SB	0.0%	0.56
All	3.4%	0.73

Traffic Counts - Motorized Vehicles

Interval Start Time	SW BOECKMAN RD Eastbound				SW BOECKMAN RD Westbound				SW WILLOW CREEK DR Northbound				SW WILLOW CREEK DR Southbound				Total	Rolling Hour
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right		
1:30 PM	0	1	8	5	0	1	11	0	0	1	1	4	0	0	0	0	32	443
1:35 PM	0	1	20	1	0	1	18	1	0	1	0	2	0	1	0	1	47	461
1:40 PM	0	0	13	2	0	0	7	1	0	1	0	0	0	0	0	2	26	455
1:45 PM	0	1	19	1	0	0	11	0	0	1	1	1	0	0	1	1	37	476
1:50 PM	0	0	12	1	0	0	9	0	0	2	0	1	0	0	0	1	26	495
1:55 PM	0	1	18	2	0	0	8	0	0	1	0	0	0	0	0	1	31	519
2:00 PM	0	0	9	1	0	0	9	1	0	3	0	0	0	0	0	1	24	542
2:05 PM	0	1	5	4	0	0	20	0	0	1	0	1	0	2	0	1	35	584
2:10 PM	0	4	15	2	0	0	22	0	0	1	0	0	0	0	0	1	45	631
2:15 PM	0	0	21	1	0	0	17	0	0	1	0	1	0	0	0	3	44	668
2:20 PM	0	2	14	2	0	0	22	1	0	3	0	1	0	0	0	1	46	710
2:25 PM	0	1	19	2	0	1	22	0	0	4	0	0	0	0	1	0	50	727
2:30 PM	0	3	23	1	0	0	16	0	0	4	0	3	0	0	0	0	50	
2:35 PM	0	2	20	2	0	0	13	1	0	2	0	0	0	0	0	1	41	
2:40 PM	0	2	20	3	0	1	18	0	0	0	0	1	0	0	1	1	47	
2:45 PM	0	1	29	2	0	1	14	0	0	5	0	2	0	0	1	1	56	
2:50 PM	0	1	23	5	0	0	17	0	0	3	0	1	0	0	0	0	50	
2:55 PM	0	1	28	6	0	2	13	0	0	2	0	0	1	0	1	0	54	
3:00 PM	0	3	29	5	0	0	20	2	0	4	1	1	0	0	0	1	66	
3:05 PM	0	2	31	3	0	2	37	1	0	4	1	0	0	0	0	1	82	
3:10 PM	0	0	14	3	0	1	49	0	0	10	0	4	0	0	0	1	82	
3:15 PM	0	0	24	7	0	0	48	0	0	1	0	5	0	0	0	1	86	
3:20 PM	0	0	25	2	0	0	28	0	0	4	0	0	0	0	0	4	63	
3:25 PM	0	1	22	7	0	0	22	0	0	3	0	2	1	1	0	1	60	
Count Total	0	28	461	70	0	10	471	8	0	62	4	30	2	4	5	25	1,180	
Peak Hour	0	16	285	41	0	8	295	4	0	43	2	17	1	0	4	11	727	

Traffic Counts - Heavy Vehicles, Bicycles on Road, and Pedestrians/Bicycles on Crosswalk

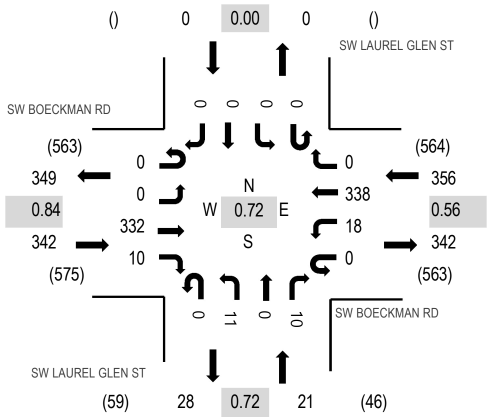
Interval Start Time	Heavy Vehicles EB	NB	WB	SB	Total	Interval Start Time	Bicycles on Roadway EB	NB	WB	SB	Total	Interval Start Time	Pedestrians/Bicycles on Crosswalk EB	NB	WB	SB	Total
1:30 PM	0	0	1	0	1	1:30 PM	0	0	0	0	0	1:30 PM	0	0	0	0	0
1:35 PM	2	0	1	1	4	1:35 PM	0	0	0	0	0	1:35 PM	0	0	0	0	0
1:40 PM	1	0	0	0	1	1:40 PM	0	0	0	0	0	1:40 PM	0	0	0	0	0
1:45 PM	2	0	0	0	2	1:45 PM	0	0	0	0	0	1:45 PM	0	0	0	0	0
1:50 PM	0	0	0	0	0	1:50 PM	0	0	0	0	0	1:50 PM	0	0	0	0	0
1:55 PM	1	0	0	0	1	1:55 PM	0	0	0	0	0	1:55 PM	0	0	0	0	0
2:00 PM	1	0	0	0	1	2:00 PM	0	0	0	0	0	2:00 PM	0	3	0	0	3
2:05 PM	0	0	1	0	1	2:05 PM	0	0	0	0	0	2:05 PM	0	1	0	0	1
2:10 PM	1	0	1	0	2	2:10 PM	0	0	0	0	0	2:10 PM	0	0	0	0	0
2:15 PM	1	0	1	1	3	2:15 PM	0	0	0	0	0	2:15 PM	0	0	0	0	0
2:20 PM	0	0	3	0	3	2:20 PM	0	0	0	0	0	2:20 PM	0	0	0	0	0
2:25 PM	2	0	0	0	2	2:25 PM	0	0	0	0	0	2:25 PM	0	0	0	0	0
2:30 PM	1	0	0	0	1	2:30 PM	0	0	0	0	0	2:30 PM	0	0	0	0	0
2:35 PM	1	0	0	0	1	2:35 PM	0	0	0	0	0	2:35 PM	0	0	0	0	0
2:40 PM	1	0	2	0	3	2:40 PM	0	0	0	0	0	2:40 PM	0	0	0	0	0
2:45 PM	1	0	0	0	1	2:45 PM	0	0	0	0	0	2:45 PM	0	0	0	0	0
2:50 PM	0	0	2	0	2	2:50 PM	0	0	0	0	0	2:50 PM	0	0	0	0	0
2:55 PM	1	0	0	0	1	2:55 PM	0	0	0	0	0	2:55 PM	0	0	0	0	0
3:00 PM	1	0	0	0	1	3:00 PM	0	0	0	0	0	3:00 PM	0	0	0	0	0
3:05 PM	1	0	0	0	1	3:05 PM	0	0	0	0	0	3:05 PM	0	0	0	0	0
3:10 PM	1	0	4	0	5	3:10 PM	0	0	0	0	0	3:10 PM	0	0	0	0	0
3:15 PM	1	0	5	0	6	3:15 PM	0	0	0	0	0	3:15 PM	0	0	0	0	0
3:20 PM	1	0	0	0	1	3:20 PM	0	0	0	0	0	3:20 PM	0	0	1	0	1
3:25 PM	0	0	0	0	0	3:25 PM	0	0	0	0	0	3:25 PM	0	0	0	0	0
Count Total	21	0	21	2	44	Count Total	0	0	0	0	0	Count Total	0	4	1	0	5
Peak Hour	12	0	13	0	25	Peak Hour	0	0	0	0	0	Peak Hour	0	0	1	0	1

ALL TRAFFIC DATA SERVICES
(303) 216-2439
www.alltrafficdata.net

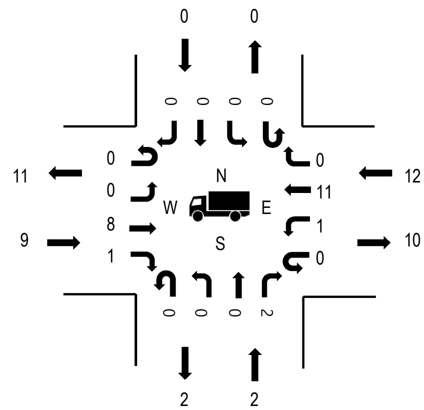
Location: 3 SW LAUREL GLEN ST & SW BOECKMAN RD Noon
Date: Thursday, May 19, 2022
Peak Hour: 02:25 PM - 03:25 PM
Peak 15-Minutes: 03:05 PM - 03:20 PM

Peak Hour

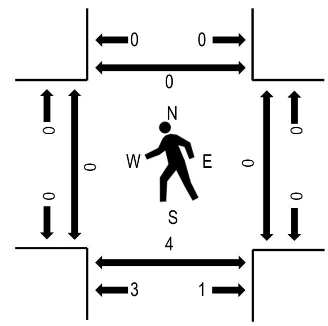
Motorized Vehicles



Heavy Vehicles



Pedestrians



Note: Total study counts contained in parentheses.

	HV%	PHF
EB	2.6%	0.84
WB	3.4%	0.56
NB	9.5%	0.72
SB	0.0%	0.00
All	3.2%	0.72

Traffic Counts - Motorized Vehicles

Interval	SW BOECKMAN RD Eastbound				SW BOECKMAN RD Westbound				SW LAUREL GLEN ST Northbound				SW LAUREL GLEN ST Southbound					Rolling
Start Time	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	Total	Hour
1:30 PM	0	0	16	1	0	0	13	0	0	3	0	0	0	0	0	0	33	455
1:35 PM	0	0	21	3	0	4	16	0	0	2	0	0	0	0	0	0	46	469
1:40 PM	0	0	15	3	0	0	10	0	0	0	0	0	0	0	0	0	28	465
1:45 PM	0	0	21	3	0	0	13	0	0	0	0	1	0	0	0	0	38	479
1:50 PM	0	0	12	0	0	0	12	0	0	2	0	0	0	0	0	0	26	498
1:55 PM	0	0	16	1	0	0	10	0	0	1	0	3	0	0	0	0	31	526
2:00 PM	0	0	12	3	0	2	10	0	0	2	0	0	0	0	0	0	29	546
2:05 PM	0	0	8	1	0	1	23	0	0	0	0	0	0	0	0	0	33	582
2:10 PM	0	0	20	1	0	1	22	0	0	1	0	2	0	0	0	0	47	626
2:15 PM	0	0	22	1	0	0	19	0	0	2	0	0	0	0	0	0	44	664
2:20 PM	0	0	20	0	0	2	25	0	0	4	0	0	0	0	0	0	51	707
2:25 PM	0	0	19	0	0	2	25	0	0	1	0	2	0	0	0	0	49	719
2:30 PM	0	0	27	1	0	0	19	0	0	0	0	0	0	0	0	0	47	
2:35 PM	0	0	25	0	0	0	16	0	0	0	0	1	0	0	0	0	42	
2:40 PM	0	0	21	0	0	1	18	0	0	0	0	2	0	0	0	0	42	
2:45 PM	0	0	34	2	0	2	18	0	0	1	0	0	0	0	0	0	57	
2:50 PM	0	0	29	1	0	0	21	0	0	2	0	1	0	0	0	0	54	
2:55 PM	0	0	33	1	0	0	16	0	0	1	0	0	0	0	0	0	51	
3:00 PM	0	0	37	2	0	0	25	0	0	0	0	1	0	0	0	0	65	
3:05 PM	0	0	33	0	0	3	40	0	0	1	0	0	0	0	0	0	77	
3:10 PM	0	0	21	1	0	2	59	0	0	2	0	0	0	0	0	0	85	
3:15 PM	0	0	26	2	0	5	50	0	0	2	0	2	0	0	0	0	87	
3:20 PM	0	0	27	0	0	3	31	0	0	1	0	1	0	0	0	0	63	
3:25 PM	0	0	31	2	0	2	23	0	0	1	0	1	0	0	0	0	60	
Count Total	0	0	546	29	0	30	534	0	0	29	0	17	0	0	0	0	1,185	
Peak Hour	0	0	332	10	0	18	338	0	0	11	0	10	0	0	0	0	719	

Traffic Counts - Heavy Vehicles, Bicycles on Road, and Pedestrians/Bicycles on Crosswalk

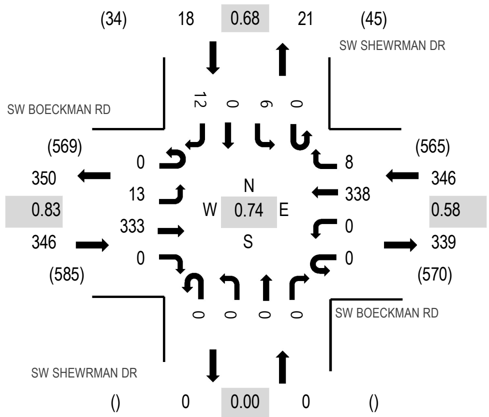
Interval Start Time	Heavy Vehicles EB	NB	WB	SB	Total	Interval Start Time	Bicycles on Roadway EB	NB	WB	SB	Total	Interval Start Time	Pedestrians/Bicycles on Crosswalk EB	NB	WB	SB	Total
1:30 PM	0	0	0	0	0	1:30 PM	0	0	0	0	0	1:30 PM	0	0	0	0	0
1:35 PM	2	0	1	0	3	1:35 PM	0	0	0	0	0	1:35 PM	0	0	0	0	0
1:40 PM	1	0	0	0	1	1:40 PM	0	0	0	0	0	1:40 PM	0	0	0	0	0
1:45 PM	2	0	0	0	2	1:45 PM	0	0	0	0	0	1:45 PM	0	0	0	0	0
1:50 PM	0	0	0	0	0	1:50 PM	0	0	0	0	0	1:50 PM	0	0	0	0	0
1:55 PM	1	0	0	0	1	1:55 PM	0	0	0	0	0	1:55 PM	0	1	0	0	1
2:00 PM	1	0	0	0	1	2:00 PM	0	0	0	0	0	2:00 PM	0	1	0	0	1
2:05 PM	0	0	1	0	1	2:05 PM	0	0	0	0	0	2:05 PM	0	1	0	0	1
2:10 PM	0	2	1	0	3	2:10 PM	0	0	0	0	0	2:10 PM	0	0	0	0	0
2:15 PM	0	0	1	0	1	2:15 PM	0	0	0	0	0	2:15 PM	0	0	0	0	0
2:20 PM	0	0	3	0	3	2:20 PM	0	0	0	0	0	2:20 PM	0	0	0	0	0
2:25 PM	1	1	0	0	2	2:25 PM	0	0	0	0	0	2:25 PM	0	0	0	0	0
2:30 PM	1	0	0	0	1	2:30 PM	0	0	0	0	0	2:30 PM	0	0	0	0	0
2:35 PM	1	0	0	0	1	2:35 PM	0	0	0	0	0	2:35 PM	0	0	0	0	0
2:40 PM	1	0	1	0	2	2:40 PM	0	0	0	0	0	2:40 PM	0	1	0	0	1
2:45 PM	1	0	0	0	1	2:45 PM	0	0	0	0	0	2:45 PM	0	0	0	0	0
2:50 PM	1	0	2	0	3	2:50 PM	0	0	0	0	0	2:50 PM	0	1	0	0	1
2:55 PM	1	0	0	0	1	2:55 PM	0	0	0	0	0	2:55 PM	0	0	0	0	0
3:00 PM	0	1	0	0	1	3:00 PM	0	0	0	0	0	3:00 PM	0	0	0	0	0
3:05 PM	1	0	0	0	1	3:05 PM	0	0	0	0	0	3:05 PM	0	0	0	0	0
3:10 PM	1	0	4	0	5	3:10 PM	0	0	0	0	0	3:10 PM	0	0	0	0	0
3:15 PM	0	0	5	0	5	3:15 PM	0	0	0	0	0	3:15 PM	0	2	0	0	2
3:20 PM	0	0	0	0	0	3:20 PM	0	0	0	0	0	3:20 PM	0	0	0	0	0
3:25 PM	1	0	0	0	1	3:25 PM	0	0	0	0	0	3:25 PM	0	2	0	0	2
Count Total	17	4	19	0	40	Count Total	0	0	0	0	0	Count Total	0	9	0	0	9
Peak Hour	9	2	12	0	23	Peak Hour	0	0	0	0	0	Peak Hour	0	4	0	0	4

ALL TRAFFIC DATA SERVICES
(303) 216-2439
www.alltrafficdata.net

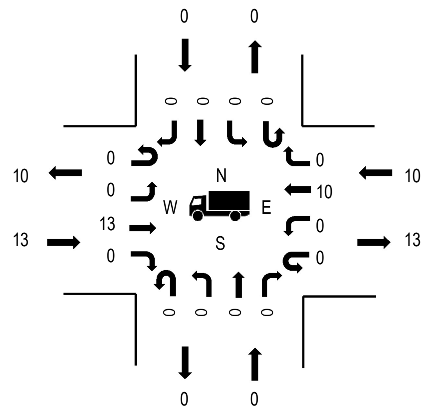
Location: 4 SW SHEWRMAN DR & SW BOECKMAN RD Noon
Date: Thursday, May 19, 2022
Peak Hour: 02:25 PM - 03:25 PM
Peak 15-Minutes: 03:05 PM - 03:20 PM

Peak Hour

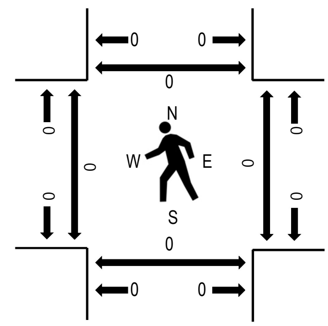
Motorized Vehicles



Heavy Vehicles



Pedestrians



Note: Total study counts contained in parentheses.

	HV%	PHF
EB	3.8%	0.83
WB	2.9%	0.58
NB	0.0%	0.00
SB	0.0%	0.68
All	3.2%	0.74

Traffic Counts - Motorized Vehicles

Interval Start Time	SW BOECKMAN RD Eastbound U-Turn	Left	Thru	Right	SW BOECKMAN RD Westbound U-Turn	Left	Thru	Right	SW SHEWRMAN DR Northbound U-Turn	Left	Thru	Right	SW SHEWRMAN DR Southbound U-Turn	Left	Thru	Right	Total	Rolling Hour
1:30 PM	0	1	12	0	0	0	19	1	0	0	0	0	0	1	0	0	34	460
1:35 PM	0	0	27	0	0	0	14	1	0	0	0	0	0	0	0	3	45	475
1:40 PM	0	1	18	0	0	0	9	1	0	0	0	0	0	0	0	2	31	472
1:45 PM	0	0	19	0	0	0	15	1	0	0	0	0	0	0	0	1	36	484
1:50 PM	0	0	18	0	0	0	12	0	0	0	0	0	0	0	0	3	33	498
1:55 PM	0	0	15	0	0	0	10	1	0	0	0	0	0	0	0	1	27	527
2:00 PM	0	4	17	0	0	0	12	0	0	0	0	0	0	0	0	0	33	561
2:05 PM	0	1	8	0	0	0	22	2	0	0	0	0	0	0	0	0	33	592
2:10 PM	0	3	24	0	0	0	22	3	0	0	0	0	0	1	0	0	53	625
2:15 PM	0	0	18	0	0	0	19	1	0	0	0	0	0	1	0	1	40	661
2:20 PM	0	0	21	0	0	0	31	2	0	0	0	0	0	0	0	1	55	705
2:25 PM	0	0	18	0	0	0	22	0	0	0	0	0	0	0	0	0	40	710
2:30 PM	0	1	26	0	0	0	18	0	0	0	0	0	0	1	0	3	49	
2:35 PM	0	0	24	0	0	0	17	0	0	0	0	0	0	0	0	1	42	
2:40 PM	0	4	20	0	0	0	17	0	0	0	0	0	0	1	0	1	43	
2:45 PM	0	0	31	0	0	0	19	0	0	0	0	0	0	0	0	0	50	
2:50 PM	0	0	33	0	0	0	25	1	0	0	0	0	0	0	0	3	62	
2:55 PM	0	0	42	0	0	0	13	3	0	0	0	0	0	2	0	1	61	
3:00 PM	0	1	33	0	0	0	30	0	0	0	0	0	0	0	0	0	64	
3:05 PM	0	1	24	0	0	0	39	0	0	0	0	0	0	1	0	1	66	
3:10 PM	0	2	27	0	0	0	57	2	0	0	0	0	0	0	0	1	89	
3:15 PM	0	2	29	0	0	0	50	1	0	0	0	0	0	1	0	1	84	
3:20 PM	0	2	26	0	0	0	31	1	0	0	0	0	0	0	0	0	60	
3:25 PM	0	1	31	0	0	0	21	0	0	0	0	0	0	0	0	1	54	
Count Total	0	24	561	0	0	0	544	21	0	0	0	0	0	9	0	25	1,184	
Peak Hour	0	13	333	0	0	0	338	8	0	0	0	0	0	6	0	12	710	

Traffic Counts - Heavy Vehicles, Bicycles on Road, and Pedestrians/Bicycles on Crosswalk

Interval Start Time	Heavy Vehicles				
	EB	NB	WB	SB	Total
1:30 PM	0	0	1	0	1
1:35 PM	3	0	0	0	3
1:40 PM	1	0	0	0	1
1:45 PM	1	0	0	0	1
1:50 PM	0	0	0	0	0
1:55 PM	1	0	0	0	1
2:00 PM	1	0	0	0	1
2:05 PM	0	0	0	0	0
2:10 PM	0	0	1	0	1
2:15 PM	0	0	1	0	1
2:20 PM	0	0	2	0	2
2:25 PM	1	0	0	0	1
2:30 PM	3	0	0	0	3
2:35 PM	0	0	0	0	0
2:40 PM	1	0	1	0	2
2:45 PM	1	0	0	0	1
2:50 PM	3	0	2	0	5
2:55 PM	1	0	0	0	1
3:00 PM	0	0	0	0	0
3:05 PM	1	0	0	0	1
3:10 PM	1	0	4	0	5
3:15 PM	0	0	3	0	3
3:20 PM	1	0	0	0	1
3:25 PM	0	0	0	0	0
Count Total	20	0	15	0	35
Peak Hour	13	0	10	0	23

Interval Start Time	Bicycles on Roadway				
	EB	NB	WB	SB	Total
1:30 PM	0	0	0	0	0
1:35 PM	0	0	0	0	0
1:40 PM	0	0	0	0	0
1:45 PM	0	0	0	0	0
1:50 PM	0	0	0	0	0
1:55 PM	0	0	0	0	0
2:00 PM	0	0	0	0	0
2:05 PM	0	0	0	0	0
2:10 PM	0	0	0	0	0
2:15 PM	0	0	0	0	0
2:20 PM	0	0	0	0	0
2:25 PM	0	0	0	0	0
2:30 PM	0	0	0	0	0
2:35 PM	0	0	0	0	0
2:40 PM	0	0	0	0	0
2:45 PM	0	0	0	0	0
2:50 PM	0	0	0	0	0
2:55 PM	0	0	0	0	0
3:00 PM	0	0	0	0	0
3:05 PM	0	0	0	0	0
3:10 PM	0	0	0	0	0
3:15 PM	0	0	0	0	0
3:20 PM	0	0	0	0	0
3:25 PM	0	0	0	0	0
Count Total	0	0	0	0	0
Peak Hour	0	0	0	0	0

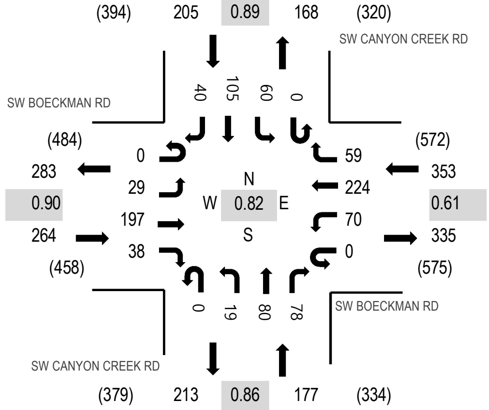
Interval Start Time	Pedestrians/Bicycles on Crosswalk				
	EB	NB	WB	SB	Total
1:30 PM	0	0	0	0	0
1:35 PM	0	0	0	0	0
1:40 PM	0	0	0	0	0
1:45 PM	0	0	0	0	0
1:50 PM	0	0	0	0	0
1:55 PM	0	0	0	0	0
2:00 PM	0	0	0	0	0
2:05 PM	0	0	0	0	0
2:10 PM	0	0	0	0	0
2:15 PM	0	0	0	0	0
2:20 PM	0	0	0	0	0
2:25 PM	0	0	0	0	0
2:30 PM	0	0	0	0	0
2:35 PM	0	0	0	0	0
2:40 PM	0	0	0	0	0
2:45 PM	0	0	0	0	0
2:50 PM	0	0	0	0	0
2:55 PM	0	0	0	0	0
3:00 PM	0	0	0	0	0
3:05 PM	0	0	0	0	0
3:10 PM	0	0	0	0	0
3:15 PM	0	0	0	0	0
3:20 PM	0	0	0	0	0
3:25 PM	0	0	0	0	0
Count Total	0	0	0	0	0
Peak Hour	0	0	0	0	0

ALL TRAFFIC DATA SERVICES
(303) 216-2439
www.alltrafficdata.net

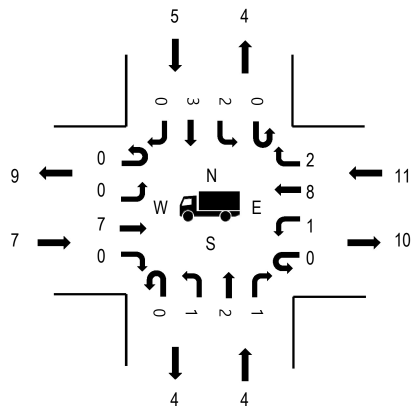
Location: 5 SW CANYON CREEK RD & SW BOECKMAN RD Noon
Date: Thursday, May 19, 2022
Peak Hour: 02:25 PM - 03:25 PM
Peak 15-Minutes: 03:05 PM - 03:20 PM

Peak Hour

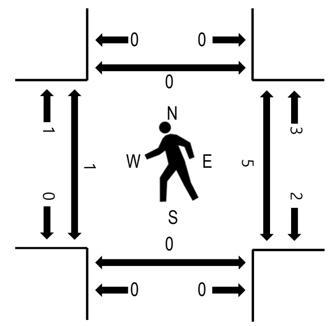
Motorized Vehicles



Heavy Vehicles



Pedestrians



Note: Total study counts contained in parentheses.

	HV%	PHF
EB	2.7%	0.90
WB	3.1%	0.61
NB	2.3%	0.86
SB	2.4%	0.89
All	2.7%	0.82

Traffic Counts - Motorized Vehicles

Interval Start Time	SW BOECKMAN RD Eastbound				SW BOECKMAN RD Westbound				SW CANYON CREEK RD Northbound				SW CANYON CREEK RD Southbound				Total	Rolling Hour
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right		
1:30 PM	0	1	13	2	0	3	8	5	0	2	3	1	0	2	7	4	51	739
1:35 PM	0	3	9	5	0	4	9	6	0	2	8	7	0	10	9	3	75	757
1:40 PM	0	3	11	1	0	2	8	2	0	2	5	6	0	3	6	1	50	762
1:45 PM	0	1	11	0	0	2	11	3	0	2	4	4	0	4	9	2	53	770
1:50 PM	0	6	11	2	0	4	5	2	0	2	3	0	0	6	7	4	52	788
1:55 PM	0	1	9	0	0	3	13	4	0	4	15	3	0	5	6	7	70	820
2:00 PM	0	2	9	4	0	2	4	2	0	2	5	3	0	5	2	2	42	828
2:05 PM	0	4	8	2	0	8	7	5	0	5	7	1	0	4	13	3	67	873
2:10 PM	0	1	5	2	0	6	15	1	0	3	4	7	0	3	6	6	59	901
2:15 PM	0	1	15	4	0	4	18	2	0	0	9	4	0	6	7	4	74	940
2:20 PM	0	3	11	3	0	3	15	6	0	1	9	5	0	3	11	3	73	977
2:25 PM	0	4	11	4	0	5	18	5	0	0	7	3	0	3	9	4	73	999
2:30 PM	0	2	14	2	0	4	13	5	0	0	8	7	0	3	6	5	69	
2:35 PM	0	1	18	7	0	4	12	4	0	2	5	7	0	2	14	4	80	
2:40 PM	0	2	18	3	0	2	9	1	0	2	5	5	0	4	4	3	58	
2:45 PM	0	1	13	5	0	5	12	2	0	2	5	4	0	4	13	5	71	
2:50 PM	0	2	23	3	0	8	13	5	0	3	5	3	0	8	10	1	84	
2:55 PM	0	3	20	1	0	1	16	2	0	1	4	12	0	5	8	5	78	
3:00 PM	0	4	18	3	0	6	13	3	0	1	10	10	0	7	8	4	87	
3:05 PM	0	4	17	2	0	11	25	5	0	2	7	3	0	9	8	2	95	
3:10 PM	0	1	11	3	0	5	32	10	0	1	9	9	0	5	10	2	98	
3:15 PM	0	3	17	2	0	6	38	8	0	3	8	9	0	5	10	2	111	
3:20 PM	0	2	17	3	0	13	23	9	0	2	7	6	0	5	5	3	95	
3:25 PM	0	4	22	5	0	5	18	4	0	2	8	9	0	5	7	4	93	
Count Total	0	59	331	68	0	116	355	101	0	46	160	128	0	116	195	83	1,758	
Peak Hour	0	29	197	38	0	70	224	59	0	19	80	78	0	60	105	40	999	

Traffic Counts - Heavy Vehicles, Bicycles on Road, and Pedestrians/Bicycles on Crosswalk

Interval	Heavy Vehicles					Interval	Bicycles on Roadway					Interval	Pedestrians/Bicycles on Crosswalk				
Start Time	EB	NB	WB	SB	Total	Start Time	EB	NB	WB	SB	Total	Start Time	EB	NB	WB	SB	Total
1:30 PM	0	0	0	0	0	1:30 PM	0	0	0	0	0	1:30 PM	0	0	0	0	0
1:35 PM	3	0	1	0	4	1:35 PM	0	0	0	0	0	1:35 PM	0	0	0	0	0
1:40 PM	1	0	0	0	1	1:40 PM	0	0	0	0	0	1:40 PM	0	0	0	0	0
1:45 PM	2	0	0	0	2	1:45 PM	0	0	0	0	0	1:45 PM	0	0	0	0	0
1:50 PM	0	0	0	0	0	1:50 PM	0	0	0	0	0	1:50 PM	0	0	0	0	0
1:55 PM	1	0	0	0	1	1:55 PM	0	0	0	0	0	1:55 PM	0	0	0	0	0
2:00 PM	1	0	0	0	1	2:00 PM	0	0	0	0	0	2:00 PM	0	0	0	0	0
2:05 PM	1	0	0	1	2	2:05 PM	0	0	0	0	0	2:05 PM	0	0	0	0	0
2:10 PM	0	0	0	0	0	2:10 PM	0	0	0	0	0	2:10 PM	0	0	0	0	0
2:15 PM	0	2	2	0	4	2:15 PM	0	0	0	0	0	2:15 PM	1	0	0	0	1
2:20 PM	0	0	1	0	1	2:20 PM	0	0	0	0	0	2:20 PM	0	0	0	0	0
2:25 PM	0	0	1	0	1	2:25 PM	0	0	0	0	0	2:25 PM	0	0	0	0	0
2:30 PM	1	1	0	0	2	2:30 PM	0	0	0	0	0	2:30 PM	0	0	0	0	0
2:35 PM	2	2	0	0	4	2:35 PM	0	0	0	0	0	2:35 PM	0	0	2	0	2
2:40 PM	0	0	1	0	1	2:40 PM	0	0	0	0	0	2:40 PM	0	0	0	0	0
2:45 PM	1	0	0	0	1	2:45 PM	0	0	0	0	0	2:45 PM	1	0	0	0	1
2:50 PM	1	0	1	4	6	2:50 PM	0	0	0	0	0	2:50 PM	0	0	0	0	0
2:55 PM	0	0	1	0	1	2:55 PM	0	0	0	0	0	2:55 PM	0	0	2	0	2
3:00 PM	0	0	0	0	0	3:00 PM	0	0	0	0	0	3:00 PM	0	0	1	0	1
3:05 PM	0	0	0	0	0	3:05 PM	0	0	0	0	0	3:05 PM	1	0	0	0	1
3:10 PM	1	0	2	1	4	3:10 PM	0	0	0	0	0	3:10 PM	0	0	2	0	2
3:15 PM	0	1	2	0	3	3:15 PM	0	0	0	0	0	3:15 PM	0	0	0	0	0
3:20 PM	1	0	3	0	4	3:20 PM	0	0	0	0	0	3:20 PM	0	0	0	0	0
3:25 PM	0	1	0	0	1	3:25 PM	0	0	0	0	0	3:25 PM	0	0	0	0	0
Count Total	16	7	15	6	44	Count Total	0	0	0	0	0	Count Total	3	0	7	0	10
Peak Hour	7	4	11	5	27	Peak Hour	0	0	0	0	0	Peak Hour	2	0	7	0	9

(303) 216-2439
www.alltrafficdata.net

Location: 4 SW Wilsonville Rd & SW Advance Rd PM

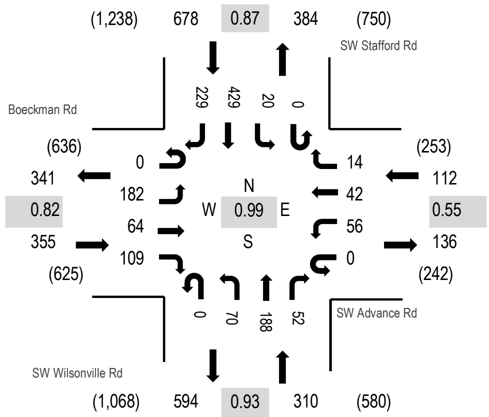
Date: Thursday, September 30, 2021

Peak Hour: 04:45 PM - 05:45 PM

Peak 15-Minutes: 05:00 PM - 05:15 PM

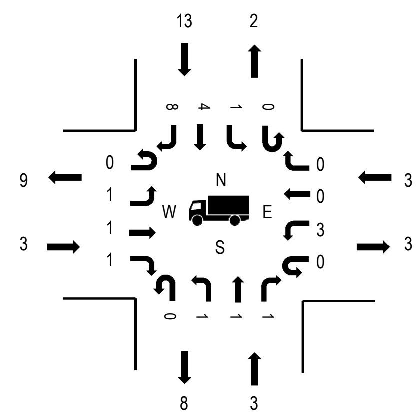
Peak Hour

Motorized Vehicles

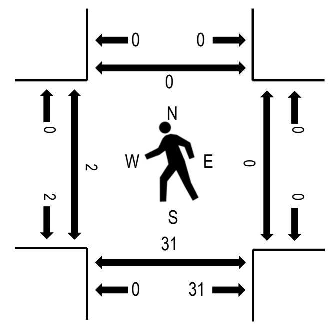


Note: Total study counts contained in parentheses.

Heavy Vehicles



Pedestrians



	HV%	PHF
EB	0.8%	0.82
WB	2.7%	0.55
NB	1.0%	0.93
SB	1.9%	0.87
All	1.5%	0.99

Traffic Counts - Motorized Vehicles

Interval Start Time	Boeckman Rd Eastbound U-Turn	Left	Thru	Right	SW Advance Rd Westbound U-Turn	Left	Thru	Right	SW Wilsonville Rd Northbound U-Turn	Left	Thru	Right	SW Stafford Rd Southbound U-Turn	Left	Thru	Right	Total	Rolling Hour
4:00 PM	0	11	4	8	0	16	19	12	0	4	14	1	0	5	26	16	136	1,289
4:05 PM	0	16	1	0	0	3	2	3	0	4	20	1	0	2	22	19	93	1,263
4:10 PM	0	17	6	3	0	4	2	6	0	4	16	3	0	0	31	14	106	1,294
4:15 PM	0	10	2	0	0	4	1	3	0	7	14	4	0	0	23	15	83	1,323
4:20 PM	0	20	7	6	0	9	2	5	0	5	13	1	0	0	30	12	110	1,350
4:25 PM	0	12	3	7	0	5	5	3	0	1	18	7	0	3	25	27	116	1,363
4:30 PM	0	11	5	8	0	3	2	0	0	2	10	3	0	1	24	23	92	1,376
4:35 PM	0	18	2	6	0	2	3	2	0	2	14	3	0	3	29	14	98	1,399
4:40 PM	0	11	3	8	0	3	1	4	0	3	14	5	0	1	31	13	97	1,424
4:45 PM	0	15	4	12	0	8	2	0	0	5	17	7	0	0	25	23	118	1,455
4:50 PM	0	15	6	1	0	2	6	2	0	8	15	7	0	2	35	21	120	1,435
4:55 PM	0	16	13	9	0	0	1	2	0	3	9	4	0	1	41	21	120	1,424
5:00 PM	0	19	10	6	0	6	1	0	0	6	16	6	0	2	21	17	110	1,407
5:05 PM	0	12	6	15	0	8	8	5	0	6	15	5	0	1	28	15	124	
5:10 PM	0	23	3	14	0	11	12	2	0	8	15	4	0	2	28	13	135	
5:15 PM	0	14	2	9	0	4	3	1	0	6	14	2	0	3	30	22	110	
5:20 PM	0	7	2	15	0	2	1	0	0	6	22	3	0	1	42	22	123	
5:25 PM	0	13	3	8	0	4	2	0	0	5	19	4	0	2	54	15	129	
5:30 PM	0	15	5	5	0	6	0	0	0	8	16	1	0	2	41	16	115	
5:35 PM	0	16	4	7	0	2	3	2	0	3	16	3	0	2	45	20	123	
5:40 PM	0	17	6	8	0	3	3	0	0	6	14	6	0	2	39	24	128	
5:45 PM	0	7	4	4	0	5	2	2	0	2	13	6	0	0	35	18	98	
5:50 PM	0	13	2	11	0	3	3	0	0	14	11	2	0	3	31	16	109	
5:55 PM	0	8	4	12	0	1	1	0	0	6	15	8	0	1	36	11	103	
Count Total	0	336	107	182	0	114	85	54	0	124	360	96	0	39	772	427	2,696	
Peak Hour	0	182	64	109	0	56	42	14	0	70	188	52	0	20	429	229	1,455	

Traffic Counts - Heavy Vehicles, Bicycles on Road, and Pedestrians/Bicycles on Crosswalk

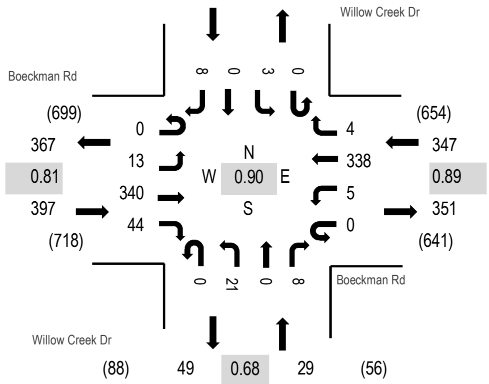
Interval Start Time	Heavy Vehicles					Interval Start Time	Bicycles on Roadway					Interval Start Time	Pedestrians/Bicycles on Crosswalk				
	EB	NB	WB	SB	Total		EB	NB	WB	SB	Total		EB	NB	WB	SB	Total
4:00 PM	0	0	4	1	5	4:00 PM	0	0	0	0	0	4:00 PM	0	8	0	0	8
4:05 PM	0	0	1	0	1	4:05 PM	0	0	0	0	0	4:05 PM	0	0	0	0	0
4:10 PM	1	2	1	0	4	4:10 PM	0	0	0	0	0	4:10 PM	0	0	0	0	0
4:15 PM	1	1	0	0	2	4:15 PM	0	0	0	0	0	4:15 PM	0	1	0	0	1
4:20 PM	0	4	0	1	5	4:20 PM	0	0	0	0	0	4:20 PM	0	1	0	0	1
4:25 PM	0	1	0	1	2	4:25 PM	0	0	0	0	0	4:25 PM	0	44	0	0	44
4:30 PM	0	0	1	3	4	4:30 PM	0	0	0	0	0	4:30 PM	0	0	0	0	0
4:35 PM	0	0	0	0	0	4:35 PM	0	0	0	0	0	4:35 PM	0	0	0	0	0
4:40 PM	0	0	0	1	1	4:40 PM	0	0	0	0	0	4:40 PM	0	11	0	0	11
4:45 PM	0	0	0	1	1	4:45 PM	0	0	0	0	0	4:45 PM	0	9	0	0	9
4:50 PM	0	0	0	2	2	4:50 PM	0	0	0	0	0	4:50 PM	0	22	0	0	22
4:55 PM	0	1	0	1	2	4:55 PM	0	0	0	0	0	4:55 PM	0	0	0	0	0
5:00 PM	0	0	1	0	1	5:00 PM	0	0	0	0	0	5:00 PM	0	1	0	0	1
5:05 PM	0	0	0	1	1	5:05 PM	0	0	0	0	0	5:05 PM	0	0	0	0	0
5:10 PM	2	0	0	1	3	5:10 PM	0	0	0	0	0	5:10 PM	1	0	0	0	1
5:15 PM	0	0	1	2	3	5:15 PM	0	0	0	0	0	5:15 PM	0	3	0	0	3
5:20 PM	0	0	0	1	1	5:20 PM	0	0	0	0	0	5:20 PM	0	0	0	0	0
5:25 PM	1	0	0	0	1	5:25 PM	0	0	0	0	0	5:25 PM	0	0	0	0	0
5:30 PM	0	2	1	0	3	5:30 PM	0	0	0	0	0	5:30 PM	0	0	0	0	0
5:35 PM	0	0	0	3	3	5:35 PM	0	0	0	0	0	5:35 PM	0	0	0	0	0
5:40 PM	0	0	0	1	1	5:40 PM	0	0	0	0	0	5:40 PM	2	0	0	0	2
5:45 PM	0	0	1	0	1	5:45 PM	0	0	0	0	0	5:45 PM	2	0	0	0	2
5:50 PM	0	0	0	0	0	5:50 PM	0	0	0	0	0	5:50 PM	0	0	0	0	0
5:55 PM	0	0	0	0	0	5:55 PM	0	0	0	0	0	5:55 PM	0	0	0	0	0
Count Total	5	11	11	20	47	Count Total	0	0	0	0	0	Count Total	5	100	0	0	105
Peak Hour	3	3	3	13	22	Peak Hour	0	0	0	0	0	Peak Hour	3	35	0	0	38

ALL TRAFFIC DATA SERVICES
(303) 216-2439
www.alltrafficdata.net

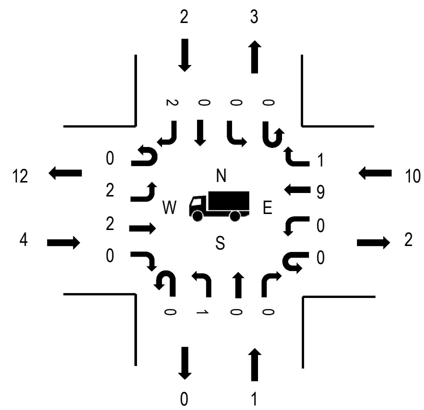
Location: 3 Willow Creek Dr & Boeckman Rd PM
Date: Thursday, September 30, 2021
Peak Hour: 04:45 PM - 05:45 PM
Peak 15-Minutes: 05:00 PM - 05:15 PM

Peak Hour

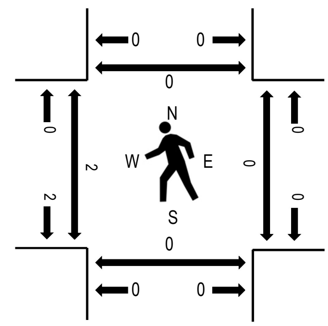
Motorized Vehicles



Heavy Vehicles



Pedestrians



Note: Total study counts contained in parentheses.

	HV%	PHF
EB	1.0%	0.81
WB	2.9%	0.89
NB	3.4%	0.68
SB	18.2%	0.50
All	2.2%	0.90

Traffic Counts - Motorized Vehicles

Interval Start Time	Boeckman Rd Eastbound U-Turn	Left	Thru	Right	Boeckman Rd Westbound U-Turn	Left	Thru	Right	Willow Creek Dr Northbound U-Turn	Left	Thru	Right	Willow Creek Dr Southbound U-Turn	Left	Thru	Right	Total	Rolling Hour
4:00 PM	0	2	19	2	0	0	45	0	0	3	0	0	0	1	0	0	72	700
4:05 PM	0	0	16	2	0	1	23	0	0	3	0	1	0	0	0	0	46	697
4:10 PM	0	0	28	4	0	0	23	0	0	2	0	1	0	0	0	1	59	723
4:15 PM	0	1	24	2	0	0	18	3	0	1	0	0	0	0	0	2	51	741
4:20 PM	0	1	30	2	0	0	18	0	0	2	0	1	0	1	0	2	57	749
4:25 PM	0	1	22	5	0	1	33	0	0	0	0	0	0	1	0	1	64	754
4:30 PM	0	0	23	2	0	0	30	0	0	1	0	0	0	1	0	2	59	736
4:35 PM	0	0	27	1	0	1	18	0	0	1	0	0	0	0	0	1	49	744
4:40 PM	0	0	23	3	0	1	16	0	0	2	0	0	0	0	0	0	45	756
4:45 PM	0	0	29	1	0	1	27	1	0	1	0	1	0	0	0	1	62	784
4:50 PM	0	1	22	3	0	1	33	0	0	3	0	2	0	0	0	2	67	773
4:55 PM	0	1	35	6	0	0	25	0	0	0	0	2	0	0	0	0	69	773
5:00 PM	0	2	36	9	0	0	20	0	0	2	0	0	0	0	0	0	69	754
5:05 PM	0	1	30	2	0	0	36	0	0	2	0	0	0	1	0	0	72	
5:10 PM	0	1	33	7	0	0	34	0	0	2	0	0	0	0	0	0	77	
5:15 PM	0	1	24	3	0	0	27	1	0	2	0	1	0	0	0	0	59	
5:20 PM	0	2	25	0	0	1	31	0	0	1	0	0	0	0	0	2	62	
5:25 PM	0	0	22	0	0	0	20	1	0	1	0	0	0	1	0	1	46	
5:30 PM	0	0	28	8	0	0	28	0	0	1	0	1	0	0	0	1	67	
5:35 PM	0	3	25	2	0	2	25	1	0	3	0	0	0	0	0	0	61	
5:40 PM	0	1	31	3	0	0	32	0	0	3	0	1	0	1	0	1	73	
5:45 PM	0	1	23	2	0	1	20	0	0	3	0	0	0	1	0	0	51	
5:50 PM	0	0	22	4	0	1	35	0	0	4	0	0	0	0	0	1	67	
5:55 PM	0	0	25	4	0	0	19	0	0	2	0	0	0	0	0	0	50	
Count Total	0	19	622	77	0	11	636	7	0	45	0	11	0	8	0	18	1,454	
Peak Hour	0	13	340	44	0	5	338	4	0	21	0	8	0	3	0	8	784	

Traffic Counts - Heavy Vehicles, Bicycles on Road, and Pedestrians/Bicycles on Crosswalk

Interval Start Time	Heavy Vehicles					Interval Start Time	Bicycles on Roadway					Interval Start Time	Pedestrians/Bicycles on Crosswalk				
	EB	NB	WB	SB	Total		EB	NB	WB	SB	Total		EB	NB	WB	SB	Total
4:00 PM	0	0	1	0	1	4:00 PM	0	0	0	0	0	4:00 PM	0	9	0	0	9
4:05 PM	0	0	2	0	2	4:05 PM	0	0	0	0	0	4:05 PM	0	10	0	0	10
4:10 PM	0	0	1	0	1	4:10 PM	0	0	0	0	0	4:10 PM	0	1	0	0	1
4:15 PM	1	0	0	0	1	4:15 PM	0	0	0	0	0	4:15 PM	0	10	0	0	10
4:20 PM	0	0	2	0	2	4:20 PM	0	0	0	0	0	4:20 PM	0	1	0	0	1
4:25 PM	1	0	2	0	3	4:25 PM	0	0	0	0	0	4:25 PM	0	5	0	0	5
4:30 PM	0	0	1	0	1	4:30 PM	0	0	0	0	0	4:30 PM	0	0	0	0	0
4:35 PM	0	0	0	0	0	4:35 PM	0	0	0	0	0	4:35 PM	0	3	0	0	3
4:40 PM	0	0	0	0	0	4:40 PM	0	0	0	0	0	4:40 PM	0	0	0	0	0
4:45 PM	0	0	1	0	1	4:45 PM	0	0	0	0	0	4:45 PM	0	0	0	0	0
4:50 PM	0	0	1	1	2	4:50 PM	0	0	0	0	0	4:50 PM	0	0	0	0	0
4:55 PM	0	0	0	0	0	4:55 PM	0	0	0	0	0	4:55 PM	0	0	0	0	0
5:00 PM	1	0	0	0	1	5:00 PM	0	0	0	0	0	5:00 PM	0	0	0	0	0
5:05 PM	0	0	1	0	1	5:05 PM	0	0	0	0	0	5:05 PM	0	0	0	0	0
5:10 PM	2	1	1	0	4	5:10 PM	0	0	0	0	0	5:10 PM	0	0	0	0	0
5:15 PM	0	0	1	0	1	5:15 PM	0	0	0	0	0	5:15 PM	0	0	0	0	0
5:20 PM	1	0	1	0	2	5:20 PM	0	0	0	0	0	5:20 PM	0	0	0	0	0
5:25 PM	0	0	0	0	0	5:25 PM	0	0	0	0	0	5:25 PM	0	0	0	0	0
5:30 PM	0	0	1	1	2	5:30 PM	0	0	0	0	0	5:30 PM	0	0	0	0	0
5:35 PM	0	0	3	0	3	5:35 PM	0	0	0	0	0	5:35 PM	0	0	0	0	0
5:40 PM	0	0	0	0	0	5:40 PM	0	0	0	0	0	5:40 PM	2	0	0	0	2
5:45 PM	0	0	0	0	0	5:45 PM	0	0	0	0	0	5:45 PM	2	0	0	0	2
5:50 PM	0	0	0	1	1	5:50 PM	0	0	0	0	0	5:50 PM	0	1	0	0	1
5:55 PM	0	0	0	0	0	5:55 PM	0	0	0	0	0	5:55 PM	0	0	0	0	0
Count Total	6	1	19	3	29	Count Total	0	0	0	0	0	Count Total	4	40	0	0	44
Peak Hour	4	1	10	2	17	Peak Hour	0	0	0	0	0	Peak Hour	2	0	0	0	2

ALL TRAFFIC DATA SERVICES

(303) 216-2439
www.alltrafficdata.net

Location: 2 SW Canyon Creek Rd & Boeckman Rd PM

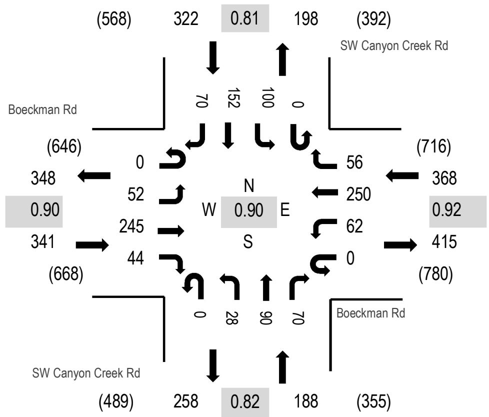
Date: Thursday, September 30, 2021

Peak Hour: 04:45 PM - 05:45 PM

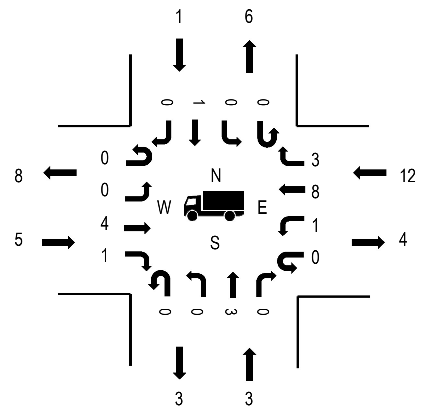
Peak 15-Minutes: 04:50 PM - 05:05 PM

Peak Hour

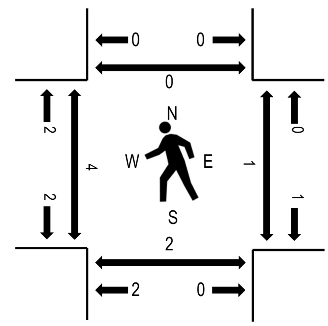
Motorized Vehicles



Heavy Vehicles



Pedestrians



Note: Total study counts contained in parentheses.

	HV%	PHF
EB	1.5%	0.90
WB	3.3%	0.92
NB	1.6%	0.82
SB	0.3%	0.81
All	1.7%	0.90

Traffic Counts - Motorized Vehicles

Interval Start Time	Boeckman Rd Eastbound U-Turn	Left	Thru	Right	Boeckman Rd Westbound U-Turn	Left	Thru	Right	SW Canyon Creek Rd Northbound U-Turn	Left	Thru	Right	SW Canyon Creek Rd Southbound U-Turn	Left	Thru	Right	Total	Rolling Hour
4:00 PM	0	6	17	8	0	11	31	4	0	4	5	2	0	5	9	4	106	1,142
4:05 PM	0	4	22	2	0	4	18	7	0	0	8	6	0	2	9	1	83	1,148
4:10 PM	0	5	21	3	0	3	20	4	0	1	5	5	0	3	15	7	92	1,172
4:15 PM	0	5	14	3	0	2	15	5	0	2	15	6	0	8	7	3	85	1,184
4:20 PM	0	2	28	2	0	4	14	6	0	2	11	4	0	5	15	3	96	1,201
4:25 PM	0	3	19	7	0	7	22	4	0	3	7	4	0	7	9	2	94	1,201
4:30 PM	0	3	23	3	0	8	21	4	0	2	4	5	0	7	5	9	94	1,202
4:35 PM	0	4	22	5	0	2	19	5	0	3	10	1	0	3	13	3	90	1,214
4:40 PM	0	3	19	2	0	6	12	3	0	3	8	4	0	11	14	7	92	1,215
4:45 PM	0	3	18	4	0	1	20	3	0	3	5	3	0	9	9	7	85	1,219
4:50 PM	0	8	12	4	0	5	31	6	0	2	9	5	0	12	16	3	113	1,214
4:55 PM	0	7	25	2	0	6	19	3	0	3	7	8	0	9	13	10	112	1,190
5:00 PM	0	5	22	0	0	2	12	6	0	5	9	11	0	16	15	9	112	1,165
5:05 PM	0	2	27	7	0	8	24	6	0	1	7	3	0	9	10	3	107	
5:10 PM	0	3	21	6	0	8	20	5	0	1	11	4	0	6	12	7	104	
5:15 PM	0	7	19	3	0	4	20	6	0	3	10	7	0	6	14	3	102	
5:20 PM	0	5	14	5	0	7	23	7	0	3	4	5	0	6	11	6	96	
5:25 PM	0	4	19	6	0	7	18	5	0	2	3	3	0	7	16	5	95	
5:30 PM	0	2	25	5	0	3	20	3	0	1	10	7	0	10	11	9	106	
5:35 PM	0	3	21	1	0	6	17	5	0	3	8	5	0	4	17	1	91	
5:40 PM	0	3	22	1	0	5	26	1	0	1	7	9	0	6	8	7	96	
5:45 PM	0	1	21	3	0	7	20	2	0	2	8	6	0	6	2	2	80	
5:50 PM	0	2	16	4	0	5	20	6	0	0	11	2	0	10	10	3	89	
5:55 PM	0	4	19	2	0	6	16	5	0	0	5	3	0	9	14	4	87	
Count Total	0	94	486	88	0	127	478	111	0	50	187	118	0	176	274	118	2,307	
Peak Hour	0	52	245	44	0	62	250	56	0	28	90	70	0	100	152	70	1,219	

Traffic Counts - Heavy Vehicles, Bicycles on Road, and Pedestrians/Bicycles on Crosswalk

Interval Start Time	Heavy Vehicles					Interval Start Time	Bicycles on Roadway					Interval Start Time	Pedestrians/Bicycles on Crosswalk				
	EB	NB	WB	SB	Total		EB	NB	WB	SB	Total		EB	NB	WB	SB	Total
4:00 PM	0	0	3	0	3	4:00 PM	0	0	0	0	0	4:00 PM	0	0	0	0	0
4:05 PM	0	2	2	0	4	4:05 PM	0	0	0	0	0	4:05 PM	0	0	0	0	0
4:10 PM	1	0	1	0	2	4:10 PM	0	0	0	0	0	4:10 PM	0	2	0	0	2
4:15 PM	1	1	0	1	3	4:15 PM	0	0	0	0	0	4:15 PM	1	2	2	0	5
4:20 PM	0	1	1	0	2	4:20 PM	0	0	0	0	0	4:20 PM	0	0	0	0	0
4:25 PM	1	0	2	0	3	4:25 PM	0	0	0	0	0	4:25 PM	0	0	0	0	0
4:30 PM	1	0	2	0	3	4:30 PM	0	0	0	0	0	4:30 PM	0	2	0	0	2
4:35 PM	0	0	0	0	0	4:35 PM	0	0	0	0	0	4:35 PM	0	0	2	0	2
4:40 PM	0	0	0	0	0	4:40 PM	0	0	0	1	1	4:40 PM	0	0	0	0	0
4:45 PM	0	0	1	0	1	4:45 PM	0	0	0	0	0	4:45 PM	0	0	0	0	0
4:50 PM	0	0	1	0	1	4:50 PM	0	0	0	1	1	4:50 PM	0	0	0	0	0
4:55 PM	0	0	0	0	0	4:55 PM	0	0	0	0	0	4:55 PM	0	0	0	0	0
5:00 PM	1	0	0	0	1	5:00 PM	0	0	0	0	0	5:00 PM	0	1	0	0	1
5:05 PM	1	0	0	0	1	5:05 PM	0	0	0	0	0	5:05 PM	1	0	0	0	1
5:10 PM	1	0	1	0	2	5:10 PM	0	0	0	0	0	5:10 PM	0	0	0	0	0
5:15 PM	0	0	1	1	2	5:15 PM	0	0	0	0	0	5:15 PM	1	0	0	0	1
5:20 PM	2	0	2	0	4	5:20 PM	0	0	0	0	0	5:20 PM	0	1	0	0	1
5:25 PM	0	0	1	0	1	5:25 PM	0	0	0	0	0	5:25 PM	0	0	0	0	0
5:30 PM	0	1	2	0	3	5:30 PM	0	0	0	0	0	5:30 PM	0	0	0	0	0
5:35 PM	0	2	3	0	5	5:35 PM	0	0	0	0	0	5:35 PM	0	0	1	0	1
5:40 PM	0	0	0	0	0	5:40 PM	0	0	0	0	0	5:40 PM	2	0	0	0	2
5:45 PM	0	0	0	0	0	5:45 PM	0	0	0	0	0	5:45 PM	2	0	0	0	2
5:50 PM	0	0	0	0	0	5:50 PM	0	0	0	0	0	5:50 PM	0	1	0	0	1
5:55 PM	0	0	0	0	0	5:55 PM	0	0	0	0	0	5:55 PM	0	0	0	0	0
Count Total	9	7	23	2	41	Count Total	0	0	0	2	2	Count Total	7	9	5	0	21
Peak Hour	5	3	12	1	21	Peak Hour	0	0	0	1	1	Peak Hour	4	2	1	0	7

B. HCM REPORTS – EXISTING

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	149	43	163	57	31	19	127	238	60	28	179	91
Future Volume (veh/h)	149	43	163	57	31	19	127	238	60	28	179	91
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	0.98		0.99	0.98		1.00	1.00		0.98	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1900	1870	1767	1900	1900	1811	1870	1796	1900	1841	1856
Adj Flow Rate, veh/h	167	48	5	64	35	0	143	267	55	31	201	76
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
Percent Heavy Veh, %	3	0	2	9	0	0	6	2	7	0	4	3
Cap, veh/h	534	304	250	439	192	0	442	447	92	396	304	115
Arrive On Green	0.13	0.16	0.16	0.07	0.10	0.00	0.09	0.30	0.28	0.03	0.24	0.22
Sat Flow, veh/h	1767	1900	1565	1682	1900	0	1725	1497	308	1810	1272	481
Grp Volume(v), veh/h	167	48	5	64	35	0	143	0	322	31	0	277
Grp Sat Flow(s),veh/h/ln	1767	1900	1565	1682	1900	0	1725	0	1806	1810	0	1753
Q Serve(g_s), s	2.9	0.8	0.1	1.2	0.6	0.0	2.2	0.0	5.5	0.5	0.0	5.1
Cycle Q Clear(g_c), s	2.9	0.8	0.1	1.2	0.6	0.0	2.2	0.0	5.5	0.5	0.0	5.1
Prop In Lane	1.00		1.00	1.00		0.00	1.00		0.17	1.00		0.27
Lane Grp Cap(c), veh/h	534	304	250	439	192	0	442	0	540	396	0	419
V/C Ratio(X)	0.31	0.16	0.02	0.15	0.18	0.00	0.32	0.00	0.60	0.08	0.00	0.66
Avail Cap(c_a), veh/h	633	1243	1024	537	1137	0	528	0	1106	544	0	1025
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	0.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	11.8	13.0	12.7	12.9	14.8	0.0	9.5	0.0	10.8	10.3	0.0	12.4
Incr Delay (d2), s/veh	0.2	0.2	0.0	0.1	0.3	0.0	0.3	0.0	1.1	0.1	0.0	1.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.9	0.3	0.0	0.4	0.2	0.0	0.6	0.0	1.7	0.1	0.0	1.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	12.0	13.2	12.7	13.1	15.1	0.0	9.8	0.0	11.8	10.4	0.0	14.2
LnGrp LOS	B	B	B	B	B	A	A	A	B	B	A	B
Approach Vol, veh/h		220			99			465			308	
Approach Delay, s/veh		12.3			13.8			11.2			13.8	
Approach LOS		B			B			B			B	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	7.2	12.6	8.5	7.6	5.1	14.7	6.4	9.7
Change Period (Y+Rc), s	4.0	4.5	4.5	4.5	4.0	4.5	4.5	4.5
Max Green Setting (Gmax), s	5.0	20.5	6.0	21.0	4.0	21.5	4.0	23.0
Max Q Clear Time (g_c+I1), s	4.2	7.1	4.9	2.6	2.5	7.5	3.2	2.8
Green Ext Time (p_c), s	0.0	0.9	0.0	0.0	0.0	1.1	0.0	0.1

Intersection Summary	
HCM 6th Ctrl Delay	12.4
HCM 6th LOS	B

Intersection	
Int Delay, s/veh	1.8

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	15	332	38	1	247	1	42	0	22	1	3	9
Future Vol, veh/h	15	332	38	1	247	1	42	0	22	1	3	9
Conflicting Peds, #/hr	0	0	2	2	0	0	0	0	2	2	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	20	2	3	0	2	0	0	0	0	0	0	11
Mvmt Flow	17	369	42	1	274	1	47	0	24	1	3	10

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	275	0	0	413	0	0	709	703	394	715	724	275
Stage 1	-	-	-	-	-	-	426	426	-	277	277	-
Stage 2	-	-	-	-	-	-	283	277	-	438	447	-
Critical Hdwy	4.3	-	-	4.1	-	-	7.1	6.5	6.2	7.1	6.5	6.31
Critical Hdwy Stg 1	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Follow-up Hdwy	2.38	-	-	2.2	-	-	3.5	4	3.3	3.5	4	3.399
Pot Cap-1 Maneuver	1191	-	-	1157	-	-	352	364	659	348	354	743
Stage 1	-	-	-	-	-	-	610	589	-	734	685	-
Stage 2	-	-	-	-	-	-	728	685	-	601	577	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1191	-	-	1155	-	-	339	356	657	330	346	743
Mov Cap-2 Maneuver	-	-	-	-	-	-	339	356	-	330	346	-
Stage 1	-	-	-	-	-	-	597	577	-	720	684	-
Stage 2	-	-	-	-	-	-	714	684	-	567	565	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.3	0	15.7	11.8
HCM LOS			C	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	407	1191	-	-	1155	-	-	546
HCM Lane V/C Ratio	0.175	0.014	-	-	0.001	-	-	0.026
HCM Control Delay (s)	15.7	8.1	0	-	8.1	0	-	11.8
HCM Lane LOS	C	A	A	-	A	A	-	B
HCM 95th %tile Q(veh)	0.6	0	-	-	0	-	-	0.1

Intersection	
Int Delay, s/veh	1.1

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	361	14	9	289	28	24
Future Vol, veh/h	361	14	9	289	28	24
Conflicting Peds, #/hr	0	5	5	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	100	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	88	88	88	88	88	88
Heavy Vehicles, %	3	0	0	3	0	0
Mvmt Flow	410	16	10	328	32	27

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	431	0	771	423
Stage 1	-	-	-	-	423	-
Stage 2	-	-	-	-	348	-
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	-	-	1139	-	371	635
Stage 1	-	-	-	-	665	-
Stage 2	-	-	-	-	719	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1134	-	366	632
Mov Cap-2 Maneuver	-	-	-	-	366	-
Stage 1	-	-	-	-	662	-
Stage 2	-	-	-	-	713	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.2	14.1
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	454	-	-	1134	-
HCM Lane V/C Ratio	0.13	-	-	0.009	-
HCM Control Delay (s)	14.1	-	-	8.2	-
HCM Lane LOS	B	-	-	A	-
HCM 95th %tile Q(veh)	0.4	-	-	0	-

Intersection	
Int Delay, s/veh	0.6

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	12	364	311	6	11	16
Future Vol, veh/h	12	364	311	6	11	16
Conflicting Peds, #/hr	0	0	0	0	2	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	93	93	93	93	93	93
Heavy Vehicles, %	8	3	2	0	0	0
Mvmt Flow	13	391	334	6	12	17

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	340	0	-	0	756	337
Stage 1	-	-	-	-	337	-
Stage 2	-	-	-	-	419	-
Critical Hdwy	4.18	-	-	-	6.4	6.2
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	2.272	-	-	-	3.5	3.3
Pot Cap-1 Maneuver	1186	-	-	-	379	710
Stage 1	-	-	-	-	728	-
Stage 2	-	-	-	-	668	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1186	-	-	-	374	710
Mov Cap-2 Maneuver	-	-	-	-	374	-
Stage 1	-	-	-	-	718	-
Stage 2	-	-	-	-	668	-

Approach	EB	WB	SB
HCM Control Delay, s	0.3	0	12.3
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1186	-	-	-	520
HCM Lane V/C Ratio	0.011	-	-	-	0.056
HCM Control Delay (s)	8.1	0	-	-	12.3
HCM Lane LOS	A	A	-	-	B
HCM 95th %tile Q(veh)	0	-	-	-	0.2

Intersection	
Intersection Delay, s/veh	13.3
Intersection LOS	B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	33	234	14	46	201	80	19	77	71	71	41	43
Future Vol, veh/h	33	234	14	46	201	80	19	77	71	71	41	43
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles, %	3	3	14	2	4	1	0	1	4	1	2	0
Mvmt Flow	37	260	16	51	223	89	21	86	79	79	46	48
Number of Lanes	1	1	0	1	1	0	1	1	0	1	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	2	2	2	2
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	2	2	2	2
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	2	2	2	2
HCM Control Delay	14.1	14.5	11.7	11
HCM LOS	B	B	B	B

Lane	NBLn1	NBLn2	EBLn1	EBLn2	WBLn1	WBLn2	SBLn1	SBLn2
Vol Left, %	100%	0%	100%	0%	100%	0%	100%	0%
Vol Thru, %	0%	52%	0%	94%	0%	72%	0%	49%
Vol Right, %	0%	48%	0%	6%	0%	28%	0%	51%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	19	148	33	248	46	281	71	84
LT Vol	19	0	33	0	46	0	71	0
Through Vol	0	77	0	234	0	201	0	41
RT Vol	0	71	0	14	0	80	0	43
Lane Flow Rate	21	164	37	276	51	312	79	93
Geometry Grp	7	7	7	7	7	7	7	7
Degree of Util (X)	0.043	0.295	0.069	0.476	0.095	0.521	0.161	0.168
Departure Headway (Hd)	7.29	6.455	6.763	6.215	6.682	6.007	7.332	6.474
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	489	553	527	576	534	596	487	551
Service Time	5.071	4.236	4.533	3.985	4.45	3.774	5.115	4.256
HCM Lane V/C Ratio	0.043	0.297	0.07	0.479	0.096	0.523	0.162	0.169
HCM Control Delay	10.4	11.9	10	14.6	10.2	15.2	11.5	10.6
HCM Lane LOS	B	B	A	B	B	C	B	B
HCM 95th-tile Q	0.1	1.2	0.2	2.6	0.3	3	0.6	0.6

ID	Software/Method	Intersection	Control Type	LOS	Delay	V/C Ratio
1	Synchro HCM 6th Signal	Wilsonville Rd/Stafford Rd & Boeckman Rd/Ac	Signal	B	12	0.46

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	175	45	80	31	32	21	130	305	45	23	250	150
Future Volume (veh/h)	175	45	80	31	32	21	130	305	45	23	250	150
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	0.99		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1826	1811	1707	1856	1544	1841	1870	1767	1648	1870	1856
Adj Flow Rate, veh/h	230	59	0	41	42	0	171	401	51	30	329	161
Peak Hour Factor	0.76	0.76	0.76	0.76	0.76	0.76	0.76	0.76	0.76	0.76	0.76	0.76
Percent Heavy Veh, %	3	5	6	13	3	24	4	2	9	17	2	3
Cap, veh/h	508	351	295	325	151	0	369	649	83	353	406	199
Arrive On Green	0.16	0.19	0.00	0.05	0.08	0.00	0.08	0.40	0.39	0.03	0.34	0.33
Sat Flow, veh/h	1767	1826	1535	1626	1856	0	1753	1626	207	1570	1185	580
Grp Volume(v), veh/h	230	59	0	41	42	0	171	0	452	30	0	490
Grp Sat Flow(s),veh/h/ln	1767	1826	1535	1626	1856	0	1753	0	1833	1570	0	1765
Q Serve(g_s), s	5.1	1.3	0.0	1.1	1.0	0.0	2.9	0.0	9.4	0.6	0.0	12.1
Cycle Q Clear(g_c), s	5.1	1.3	0.0	1.1	1.0	0.0	2.9	0.0	9.4	0.6	0.0	12.1
Prop In Lane	1.00		1.00	1.00		0.00	1.00		0.11	1.00		0.33
Lane Grp Cap(c), veh/h	508	351	295	325	151	0	369	0	732	353	0	605
V/C Ratio(X)	0.45	0.17	0.00	0.13	0.28	0.00	0.46	0.00	0.62	0.09	0.00	0.81
Avail Cap(c_a), veh/h	596	900	757	404	709	0	369	0	1038	441	0	1000
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	0.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	14.3	16.1	0.0	18.6	20.6	0.0	10.7	0.0	11.4	10.4	0.0	14.3
Incr Delay (d2), s/veh	0.5	0.2	0.0	0.1	0.7	0.0	0.7	0.0	0.9	0.1	0.0	2.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.8	0.5	0.0	0.4	0.4	0.0	0.9	0.0	3.1	0.2	0.0	4.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	14.8	16.2	0.0	18.7	21.3	0.0	11.3	0.0	12.3	10.5	0.0	17.0
LnGrp LOS	B	B	A	B	C	A	B	A	B	B	A	B
Approach Vol, veh/h		289			83			623			520	
Approach Delay, s/veh		15.1			20.0			12.0			16.6	
Approach LOS		B			C			B			B	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	8.0	20.3	11.4	7.9	5.3	23.0	6.2	13.1
Change Period (Y+Rc), s	4.0	4.5	4.5	4.5	4.0	4.5	4.5	4.5
Max Green Setting (Gmax), s	4.0	26.5	9.3	17.7	4.0	26.5	4.0	23.0
Max Q Clear Time (g_c+I1), s	4.9	14.1	7.1	3.0	2.6	11.4	3.1	3.3
Green Ext Time (p_c), s	0.0	1.7	0.1	0.0	0.0	1.6	0.0	0.1

Intersection Summary		
HCM 6th Ctrl Delay		14.6
HCM 6th LOS		B

Intersection	
Int Delay, s/veh	2.4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	16	283	41	8	300	4	43	2	17	0	4	11
Future Vol, veh/h	16	283	41	8	300	4	43	2	17	0	4	11
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	1	1	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	73	73	73	73	73	73	73	73	73	73	73	73
Heavy Vehicles, %	0	4	5	12	4	0	0	0	0	0	0	0
Mvmt Flow	22	388	56	11	411	5	59	3	23	0	5	15

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	416	0	0	444	0	0	906	898	417	910	924	414
Stage 1	-	-	-	-	-	-	460	460	-	436	436	-
Stage 2	-	-	-	-	-	-	446	438	-	474	488	-
Critical Hdwy	4.1	-	-	4.22	-	-	7.1	6.5	6.2	7.1	6.5	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Follow-up Hdwy	2.2	-	-	2.308	-	-	3.5	4	3.3	3.5	4	3.3
Pot Cap-1 Maneuver	1154	-	-	1065	-	-	259	281	640	258	271	643
Stage 1	-	-	-	-	-	-	585	569	-	603	583	-
Stage 2	-	-	-	-	-	-	595	582	-	575	553	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1154	-	-	1065	-	-	242	270	639	239	260	643
Mov Cap-2 Maneuver	-	-	-	-	-	-	242	270	-	239	260	-
Stage 1	-	-	-	-	-	-	570	554	-	587	575	-
Stage 2	-	-	-	-	-	-	568	574	-	537	539	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.4	0.2	22.2	13.2
HCM LOS			C	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	293	1154	-	-	1065	-	-	462
HCM Lane V/C Ratio	0.29	0.019	-	-	0.01	-	-	0.044
HCM Control Delay (s)	22.2	8.2	0	-	8.4	0	-	13.2
HCM Lane LOS	C	A	A	-	A	A	-	B
HCM 95th %tile Q(veh)	1.2	0.1	-	-	0	-	-	0.1

Intersection	
Int Delay, s/veh	0.7

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	330	10	18	336	11	10
Future Vol, veh/h	330	10	18	336	11	10
Conflicting Peds, #/hr	0	4	4	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	100	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	72	72	72	72	72	72
Heavy Vehicles, %	2	10	6	3	0	20
Mvmt Flow	458	14	25	467	15	14

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	476	0	986	469
Stage 1	-	-	-	-	469	-
Stage 2	-	-	-	-	517	-
Critical Hdwy	-	-	4.16	-	6.4	6.4
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	-	-	2.254	-	3.5	3.48
Pot Cap-1 Maneuver	-	-	1066	-	277	559
Stage 1	-	-	-	-	634	-
Stage 2	-	-	-	-	603	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1062	-	270	557
Mov Cap-2 Maneuver	-	-	-	-	270	-
Stage 1	-	-	-	-	632	-
Stage 2	-	-	-	-	589	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.4	15.9
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	358	-	-	1062	-
HCM Lane V/C Ratio	0.081	-	-	0.024	-
HCM Control Delay (s)	15.9	-	-	8.5	-
HCM Lane LOS	C	-	-	A	-
HCM 95th %tile Q(veh)	0.3	-	-	0.1	-

Intersection	
Int Delay, s/veh	0.5

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	13	334	339	8	6	12
Future Vol, veh/h	13	334	339	8	6	12
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	74	74	74	74	74	74
Heavy Vehicles, %	0	4	3	0	0	0
Mvmt Flow	18	451	458	11	8	16

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	469	0	-	0	951	464
Stage 1	-	-	-	-	464	-
Stage 2	-	-	-	-	487	-
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	1103	-	-	-	291	602
Stage 1	-	-	-	-	637	-
Stage 2	-	-	-	-	622	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1103	-	-	-	285	602
Mov Cap-2 Maneuver	-	-	-	-	285	-
Stage 1	-	-	-	-	623	-
Stage 2	-	-	-	-	622	-

Approach	EB	WB	SB
HCM Control Delay, s	0.3	0	13.7
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1103	-	-	-	439
HCM Lane V/C Ratio	0.016	-	-	-	0.055
HCM Control Delay (s)	8.3	0	-	-	13.7
HCM Lane LOS	A	A	-	-	B
HCM 95th %tile Q(veh)	0	-	-	-	0.2

Intersection	
Intersection Delay, s/veh	16.8
Intersection LOS	C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	29	209	38	70	222	59	19	80	78	60	105	40
Future Vol, veh/h	29	209	38	70	222	59	19	80	78	60	105	40
Peak Hour Factor	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82
Heavy Vehicles, %	0	4	0	1	4	3	5	2	1	3	3	0
Mvmt Flow	35	255	46	85	271	72	23	98	95	73	128	49
Number of Lanes	1	1	0	1	1	0	1	1	0	1	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	2	2	2	2
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	2	2	2	2
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	2	2	2	2
HCM Control Delay	18	19.1	14.1	13.6
HCM LOS	C	C	B	B

Lane	NBLn1	NBLn2	EBLn1	EBLn2	WBLn1	WBLn2	SBLn1	SBLn2
Vol Left, %	100%	0%	100%	0%	100%	0%	100%	0%
Vol Thru, %	0%	51%	0%	85%	0%	79%	0%	72%
Vol Right, %	0%	49%	0%	15%	0%	21%	0%	28%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	19	158	29	247	70	281	60	145
LT Vol	19	0	29	0	70	0	60	0
Through Vol	0	80	0	209	0	222	0	105
RT Vol	0	78	0	38	0	59	0	40
Lane Flow Rate	23	193	35	301	85	343	73	177
Geometry Grp	7	7	7	7	7	7	7	7
Degree of Util (X)	0.052	0.385	0.073	0.58	0.174	0.642	0.163	0.358
Departure Headway (Hd)	8.113	7.192	7.481	6.929	7.351	6.742	7.995	7.284
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	441	499	479	521	487	535	449	493
Service Time	5.868	4.946	5.232	4.679	5.099	4.49	5.75	5.038
HCM Lane V/C Ratio	0.052	0.387	0.073	0.578	0.175	0.641	0.163	0.359
HCM Control Delay	11.3	14.4	10.8	18.9	11.7	20.9	12.3	14.1
HCM Lane LOS	B	B	B	C	B	C	B	B
HCM 95th-tile Q	0.2	1.8	0.2	3.7	0.6	4.5	0.6	1.6

ID	Software/Method	Intersection	Control Type	LOS	Delay	V/C Ratio
1	Synchro HCM 6th Signal	Wilsonville Rd/Stafford Rd & Boeckman Rd/Ac	Signal	B	15	0.67

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	186	59	111	57	50	14	71	192	53	20	438	234
Future Volume (veh/h)	186	59	111	57	50	14	71	192	53	20	438	234
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	0.93		0.91	0.90		0.88	1.00		0.97	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1885	1870	1885	1826	1900	1900	1885	1885	1870	1826	1885	1856
Adj Flow Rate, veh/h	188	60	17	58	51	1	72	194	44	20	442	217
Peak Hour Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Percent Heavy Veh, %	1	2	1	5	0	0	1	1	2	5	1	3
Cap, veh/h	482	388	300	368	252	5	264	666	151	555	503	247
Arrive On Green	0.12	0.21	0.21	0.05	0.14	0.13	0.05	0.45	0.44	0.02	0.42	0.41
Sat Flow, veh/h	1795	1870	1446	1739	1851	36	1795	1479	335	1739	1193	586
Grp Volume(v), veh/h	188	60	17	58	0	52	72	0	238	20	0	659
Grp Sat Flow(s),veh/h/ln	1795	1870	1446	1739	0	1888	1795	0	1814	1739	0	1778
Q Serve(g_s), s	4.8	1.5	0.6	1.6	0.0	1.4	1.3	0.0	4.9	0.4	0.0	19.9
Cycle Q Clear(g_c), s	4.8	1.5	0.6	1.6	0.0	1.4	1.3	0.0	4.9	0.4	0.0	19.9
Prop In Lane	1.00		1.00	1.00		0.02	1.00		0.18	1.00		0.33
Lane Grp Cap(c), veh/h	482	388	300	368	0	257	264	0	817	555	0	750
V/C Ratio(X)	0.39	0.15	0.06	0.16	0.00	0.20	0.27	0.00	0.29	0.04	0.00	0.88
Avail Cap(c_a), veh/h	535	751	581	418	0	623	303	0	990	641	0	970
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	16.5	19.0	18.6	20.0	0.0	22.4	12.6	0.0	10.2	9.6	0.0	15.6
Incr Delay (d2), s/veh	0.4	0.1	0.1	0.1	0.0	0.3	0.4	0.0	0.2	0.0	0.0	7.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.8	0.6	0.2	0.6	0.0	0.6	0.5	0.0	1.6	0.1	0.0	8.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	16.9	19.1	18.7	20.2	0.0	22.7	13.0	0.0	10.4	9.6	0.0	23.2
LnGrp LOS	B	B	B	C	A	C	B	A	B	A	A	C
Approach Vol, veh/h		265			110			310			679	
Approach Delay, s/veh		17.5			21.4			11.0			22.8	
Approach LOS		B			C			B			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	6.8	28.7	11.1	12.0	5.1	30.3	6.9	16.1
Change Period (Y+Rc), s	4.0	4.5	4.5	4.5	4.0	4.5	4.5	4.5
Max Green Setting (Gmax), s	4.0	31.4	8.3	18.8	4.0	31.4	4.1	23.0
Max Q Clear Time (g_c+I1), s	3.3	21.9	6.8	3.4	2.4	6.9	3.6	3.5
Green Ext Time (p_c), s	0.0	2.2	0.1	0.1	0.0	0.9	0.0	0.2

Intersection Summary	
HCM 6th Ctrl Delay	19.0
HCM 6th LOS	B

Intersection	
Int Delay, s/veh	1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	13	345	45	5	346	4	21	0	8	3	0	8
Future Vol, veh/h	13	345	45	5	346	4	21	0	8	3	0	8
Conflicting Peds, #/hr	0	0	0	0	0	0	2	0	0	0	0	2
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	15	1	0	0	3	25	5	0	0	0	0	25
Mvmt Flow	14	383	50	6	384	4	23	0	9	3	0	9

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	388	0	0	433	0	0	841	836	408	839	859	388
Stage 1	-	-	-	-	-	-	436	436	-	398	398	-
Stage 2	-	-	-	-	-	-	405	400	-	441	461	-
Critical Hdwy	4.25	-	-	4.1	-	-	7.15	6.5	6.2	7.1	6.5	6.45
Critical Hdwy Stg 1	-	-	-	-	-	-	6.15	5.5	-	6.1	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.15	5.5	-	6.1	5.5	-
Follow-up Hdwy	2.335	-	-	2.2	-	-	3.545	4	3.3	3.5	4	3.525
Pot Cap-1 Maneuver	1103	-	-	1137	-	-	281	305	648	288	296	613
Stage 1	-	-	-	-	-	-	593	583	-	632	606	-
Stage 2	-	-	-	-	-	-	617	605	-	599	569	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1103	-	-	1137	-	-	271	298	648	279	289	612
Mov Cap-2 Maneuver	-	-	-	-	-	-	271	298	-	279	289	-
Stage 1	-	-	-	-	-	-	583	573	-	621	602	-
Stage 2	-	-	-	-	-	-	603	601	-	581	559	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.3	0.1	17.4	13
HCM LOS			C	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	323	1103	-	-	1137	-	-	462
HCM Lane V/C Ratio	0.1	0.013	-	-	0.005	-	-	0.026
HCM Control Delay (s)	17.4	8.3	0	-	8.2	0	-	13
HCM Lane LOS	C	A	A	-	A	A	-	B
HCM 95th %tile Q(veh)	0.3	0	-	-	0	-	-	0.1

Intersection						
Int Delay, s/veh	1					

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	388	39	26	349	23	15
Future Vol, veh/h	388	39	26	349	23	15
Conflicting Peds, #/hr	0	5	5	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	100	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	3	0	0	3	0	0
Mvmt Flow	431	43	29	388	26	17

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	479	0	904	458
Stage 1	-	-	-	-	458	-
Stage 2	-	-	-	-	446	-
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	-	-	1094	-	310	607
Stage 1	-	-	-	-	641	-
Stage 2	-	-	-	-	649	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1089	-	300	604
Mov Cap-2 Maneuver	-	-	-	-	300	-
Stage 1	-	-	-	-	638	-
Stage 2	-	-	-	-	631	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.6	15.8
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	374	-	-	1089	-
HCM Lane V/C Ratio	0.113	-	-	0.027	-
HCM Control Delay (s)	15.8	-	-	8.4	-
HCM Lane LOS	C	-	-	A	-
HCM 95th %tile Q(veh)	0.4	-	-	0.1	-

Intersection						
Int Delay, s/veh	0.6					

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	23	418	357	15	9	14
Future Vol, veh/h	23	418	357	15	9	14
Conflicting Peds, #/hr	0	0	0	0	1	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, %	0	3	3	0	0	0
Mvmt Flow	26	464	397	17	10	16

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	414	0	-	0	923	406
Stage 1	-	-	-	-	406	-
Stage 2	-	-	-	-	517	-
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	1156	-	-	-	302	649
Stage 1	-	-	-	-	677	-
Stage 2	-	-	-	-	603	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1156	-	-	-	293	649
Mov Cap-2 Maneuver	-	-	-	-	293	-
Stage 1	-	-	-	-	657	-
Stage 2	-	-	-	-	603	-

Approach	EB	WB	SB
HCM Control Delay, s	0.4	0	13.7
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1156	-	-	-	440
HCM Lane V/C Ratio	0.022	-	-	-	0.058
HCM Control Delay (s)	8.2	0	-	-	13.7
HCM Lane LOS	A	A	-	-	B
HCM 95th %tile Q(veh)	0.1	-	-	-	0.2

Intersection	
Intersection Delay, s/veh	21.1
Intersection LOS	C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	53	268	45	63	251	57	29	92	71	102	155	71
Future Vol, veh/h	53	268	45	63	251	57	29	92	71	102	155	71
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles, %	0	2	2	2	3	5	0	3	0	0	1	0
Mvmt Flow	59	298	50	70	279	63	32	102	79	113	172	79
Number of Lanes	1	1	0	1	1	0	1	1	0	1	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	2	2	2	2
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	2	2	2	2
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	2	2	2	2
HCM Control Delay	24.9	23.8	15.3	17.3
HCM LOS	C	C	C	C

Lane	NBLn1	NBLn2	EBLn1	EBLn2	WBLn1	WBLn2	SBLn1	SBLn2
Vol Left, %	100%	0%	100%	0%	100%	0%	100%	0%
Vol Thru, %	0%	56%	0%	86%	0%	81%	0%	69%
Vol Right, %	0%	44%	0%	14%	0%	19%	0%	31%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	29	163	53	313	63	308	102	226
LT Vol	29	0	53	0	63	0	102	0
Through Vol	0	92	0	268	0	251	0	155
RT Vol	0	71	0	45	0	57	0	71
Lane Flow Rate	32	181	59	348	70	342	113	251
Geometry Grp	7	7	7	7	7	7	7	7
Degree of Util (X)	0.078	0.398	0.131	0.718	0.157	0.705	0.262	0.53
Departure Headway (Hd)	8.699	7.918	8.017	7.434	8.049	7.419	8.324	7.599
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	410	453	445	483	444	486	430	472
Service Time	6.493	5.712	5.798	5.215	5.83	5.2	6.109	5.384
HCM Lane V/C Ratio	0.078	0.4	0.133	0.72	0.158	0.704	0.263	0.532
HCM Control Delay	12.2	15.9	12	27.1	12.3	26.2	14.1	18.7
HCM Lane LOS	B	C	B	D	B	D	B	C
HCM 95th-tile Q	0.3	1.9	0.4	5.7	0.6	5.5	1	3

ID	Software/Method	Intersection	Control Type	LOS	Delay	V/C Ratio
1	Synchro HCM 6th Signal	Wilsonville Rd/Stafford Rd & Boeckman Rd/Ac	Signal	B	19	0.68

C. STAGE II LIST

Updated by D. Pauly 07.22.2022

Stage II Approved

Project	Land Use	Status	Size	Total PM Peak Trips	Trip Allocation Percentage		Net New (Primary + Diverted) PM Peak Hour Trips not yet active		
					Internal	Pass-By	In	Out	Total
Hydro-Temp: Recent agreement with the City, the project is vested and so are the traffic trips	Office/Flex-Space	Not built	60.8 KSF				44	46	90
Mercedes Benz (Phase 2)	Auto Dealership	Not built					20	26	46
Shredding Systems (SQFT does not including paint canopy and another canopy)	Industrial/Commercial	Under construction	66.8 KSF				20	46	66
Town Center Ph III *and trip dedication to Miller Paint store Uses marked with "*" have not been built and PM peak hr trip sum exceeds remaining vested trip level by 2 trips. It has yet to be determined how to allocate trips between remaining buildings.*	*High Turnover Restaurant (Pad 1)	Not built	7.5 KSF				24	17	47*
	Remaining Approved Total								47
Wilsonville Road Business Park Phase II	Phase 2 - office (2-story building on west parcel)	Partially Built	21.7 KSF				15	71	86
Frog Pond-Stafford Meadows (Phase 2 and 3a of 10/18 study)	Residential	Partially Built, 34 homes built and occupied	44 units				6	4	10
Frog Pond-Frog Pond Meadows (Phase 3B, 4A, 4B of 10/18 Study)	Residential	Partially Built, 52 homes built and occupied	74 units				13	9	22
Frog Pond Ridge	Residential	Under construction, n	71 units				43	28	71
Frog Pond-Morgan Farm	Residential	Partially Built, 69 homes built and occupied	78 units				5	4	9
Frog Pond Crossing	Residential	Approved	29 units				19	9	28
Frog Pond Estates	Residential	Approved	17 units				11	7	18
Frog Pond Oaks	Residential	Approved	41 units				27	14	41
Frog Pond Vista	Residential	Approved	38 units				27	17	44
Magnolia Townhomes	Residential	Under construction	6 units				3	2	5
Canyon Creek III	Residential	Approved	5 units (traffic study was for 11)				2	3	5
Coffee Creek Logistics	Industrial/Commercial	Complete	115K				16	41	57
PW Complex on Boberg	Public	Approved	15,800 office, 17,900 warehouse				11	39	50
DAS North Valley Complex	Public/Industria	Under Construction	174,700 sf				5	15	20
Black Creek Group-Garden Acres	Industrial	Approved	148,500 sf warehouse	178			69	109	178

Stage II Approved – Villebois

Project	Phase	Status	Land Use					Total PM Peak Trips	Trip Allocation Percentage		Net New (Primary + Diverted) PM Peak Hour Trips not yet active		
			SF	Town.	Apt.	Retail	School		Internal	Pass-By	In	Out	Total
North (Entirety)	Residential	Partially built, 364 homes sold and occupied	451								53	34	87
Central	Residential	Partially Built, 991 homes (102 single family, 319 condo/row homes, 365 apartments) occupied	102	391	510						60	30	90

Pending Projects for Which Traffic Analysis has been completed

Project	Land Use	Status	Size	Total PM Peak T	Trip Allocation Percentage			Net New (Primary) PM Peak Hour Trips		
					Internal	Pass-By	Diverted	In	Out	Total
Boones Ferry Gas Station/Conve	Commercail	under review	3,460 sf store, 12 g	240		134		53	53	106
Delta Logistics	Industrial	under review	56,100 sf whareho	33				9	24	33
Building W5 Boeckman and Kins	Industrial	under review	80,000 sf manufac	54				17	37	54
Frog Pond Overlook	Residential	under review	12 lots	13				8	5	13
Frog Pond Terrace	Residential	under review	19 lots	20				12	8	20
Boones Ferry Construction Stora	Industrial	under review	1.25 acres	5				1	4	5

D. HCM REPORTS – EXISTING + PROJECT

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	157	92	174	57	88	19	140	238	60	28	179	99
Future Volume (veh/h)	157	92	174	57	88	19	140	238	60	28	179	99
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	0.99		0.99	0.98		0.98	1.00		0.98	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1900	1870	1767	1900	1900	1811	1870	1796	1900	1841	1856
Adj Flow Rate, veh/h	176	103	17	64	99	6	157	267	55	31	201	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
Percent Heavy Veh, %	3	0	2	9	0	0	6	2	7	0	4	3
Cap, veh/h	425	308	254	359	164	10	432	422	87	387	267	109
Arrive On Green	0.11	0.16	0.16	0.04	0.09	0.11	0.10	0.28	0.29	0.03	0.21	0.23
Sat Flow, veh/h	1767	1900	1565	1682	1771	107	1725	1497	308	1810	1242	507
Grp Volume(v), veh/h	176	103	17	64	0	105	157	0	322	31	0	283
Grp Sat Flow(s),veh/h/ln	1767	1900	1565	1682	0	1878	1725	0	1806	1810	0	1748
Q Serve(g_s), s	3.4	1.9	0.4	1.3	0.0	2.1	2.6	0.0	6.1	0.5	0.0	5.9
Cycle Q Clear(g_c), s	3.4	1.9	0.4	1.3	0.0	2.1	2.6	0.0	6.1	0.5	0.0	5.9
Prop In Lane	1.00		1.00	1.00		0.06	1.00		0.17	1.00		0.29
Lane Grp Cap(c), veh/h	425	308	254	359	0	174	432	0	509	387	0	376
V/C Ratio(X)	0.41	0.33	0.07	0.18	0.00	0.60	0.36	0.00	0.63	0.08	0.00	0.75
Avail Cap(c_a), veh/h	552	1099	906	446	0	917	443	0	975	520	0	944
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	13.9	14.4	13.8	15.3	0.0	17.0	10.0	0.0	12.2	11.1	0.0	14.2
Incr Delay (d2), s/veh	0.5	0.5	0.1	0.2	0.0	2.5	0.4	0.0	1.3	0.1	0.0	3.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.1	0.7	0.1	0.4	0.0	0.9	0.7	0.0	2.0	0.2	0.0	2.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	14.3	14.9	13.9	15.4	0.0	19.5	10.4	0.0	13.5	11.1	0.0	17.3
LnGrp LOS	B	B	B	B	A	B	B	A	B	B	A	B
Approach Vol, veh/h		296			169			479			314	
Approach Delay, s/veh		14.5			17.9			12.5			16.7	
Approach LOS		B			B			B			B	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	7.7	13.4	9.2	8.6	5.1	16.0	6.5	11.3
Change Period (Y+Rc), s	4.0	4.5	4.5	4.5	4.0	4.5	4.5	4.5
Max Green Setting (Gmax), s	4.0	21.5	7.5	19.5	4.0	21.5	4.0	23.0
Max Q Clear Time (g_c+I1), s	4.6	7.9	5.4	4.1	2.5	8.1	3.3	3.9
Green Ext Time (p_c), s	0.0	0.9	0.1	0.2	0.0	1.0	0.0	0.3

Intersection Summary		
HCM 6th Ctrl Delay		14.7
HCM 6th LOS		B

Intersection	
Int Delay, s/veh	2.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	15	400	47	1	325	1	53	0	22	1	3	9
Future Vol, veh/h	15	400	47	1	325	1	53	0	22	1	3	9
Conflicting Peds, #/hr	0	0	2	2	0	0	0	0	2	2	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	20	2	3	0	2	0	0	0	0	0	0	11
Mvmt Flow	17	444	52	1	361	1	59	0	24	1	3	10

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	362	0	0	498	0	0	876	870	474	882	896	362
Stage 1	-	-	-	-	-	-	506	506	-	364	364	-
Stage 2	-	-	-	-	-	-	370	364	-	518	532	-
Critical Hdwy	4.3	-	-	4.1	-	-	7.1	6.5	6.2	7.1	6.5	6.31
Critical Hdwy Stg 1	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Follow-up Hdwy	2.38	-	-	2.2	-	-	3.5	4	3.3	3.5	4	3.399
Pot Cap-1 Maneuver	1104	-	-	1076	-	-	272	292	595	269	282	663
Stage 1	-	-	-	-	-	-	552	543	-	659	627	-
Stage 2	-	-	-	-	-	-	654	627	-	544	529	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1104	-	-	1074	-	-	261	285	593	253	275	663
Mov Cap-2 Maneuver	-	-	-	-	-	-	261	285	-	253	275	-
Stage 1	-	-	-	-	-	-	539	531	-	645	626	-
Stage 2	-	-	-	-	-	-	640	626	-	510	517	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.3	0	20.7	13.1
HCM LOS			C	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	312	1104	-	-	1074	-	-	457
HCM Lane V/C Ratio	0.267	0.015	-	-	0.001	-	-	0.032
HCM Control Delay (s)	20.7	8.3	0	-	8.4	0	-	13.1
HCM Lane LOS	C	A	A	-	A	A	-	B
HCM 95th %tile Q(veh)	1.1	0	-	-	0	-	-	0.1

Intersection	
Int Delay, s/veh	1.9

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	4	426	23	9	366	12	39	0	24	12	0	4
Future Vol, veh/h	4	426	23	9	366	12	39	0	24	12	0	4
Conflicting Peds, #/hr	0	0	5	5	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	100	-	-	100	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	88	88	88	88	88	88	88	88	88	88	88	88
Heavy Vehicles, %	0	3	0	0	3	0	0	0	0	0	0	0
Mvmt Flow	5	484	26	10	416	14	44	0	27	14	0	5

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	430	0	0	515	0	0	958	962	502	964	968	423
Stage 1	-	-	-	-	-	-	512	512	-	443	443	-
Stage 2	-	-	-	-	-	-	446	450	-	521	525	-
Critical Hdwy	4.1	-	-	4.1	-	-	7.1	6.5	6.2	7.1	6.5	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Follow-up Hdwy	2.2	-	-	2.2	-	-	3.5	4	3.3	3.5	4	3.3
Pot Cap-1 Maneuver	1140	-	-	1061	-	-	239	258	573	237	256	635
Stage 1	-	-	-	-	-	-	548	540	-	598	579	-
Stage 2	-	-	-	-	-	-	595	575	-	542	533	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1140	-	-	1057	-	-	234	254	571	223	252	635
Mov Cap-2 Maneuver	-	-	-	-	-	-	234	254	-	223	252	-
Stage 1	-	-	-	-	-	-	543	536	-	596	574	-
Stage 2	-	-	-	-	-	-	585	570	-	514	529	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.1	0.2	20.6	19.5
HCM LOS			C	C

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	302	1140	-	-	1057	-	-	266
HCM Lane V/C Ratio	0.237	0.004	-	-	0.01	-	-	0.068
HCM Control Delay (s)	20.6	8.2	-	-	8.4	-	-	19.5
HCM Lane LOS	C	A	-	-	A	-	-	C
HCM 95th %tile Q(veh)	0.9	0	-	-	0	-	-	0.2

Intersection						
Int Delay, s/veh	3.5					

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	56	368	315	94	85	54
Future Vol, veh/h	56	368	315	94	85	54
Conflicting Peds, #/hr	0	0	0	0	2	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	93	93	93	93	93	93
Heavy Vehicles, %	8	3	2	0	0	0
Mvmt Flow	60	396	339	101	91	58

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	440	0	-	0	908	390
Stage 1	-	-	-	-	390	-
Stage 2	-	-	-	-	518	-
Critical Hdwy	4.18	-	-	-	6.4	6.2
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	2.272	-	-	-	3.5	3.3
Pot Cap-1 Maneuver	1089	-	-	-	308	663
Stage 1	-	-	-	-	689	-
Stage 2	-	-	-	-	602	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1089	-	-	-	286	663
Mov Cap-2 Maneuver	-	-	-	-	286	-
Stage 1	-	-	-	-	640	-
Stage 2	-	-	-	-	602	-

Approach	EB	WB	SB
HCM Control Delay, s	1.1	0	21.4
HCM LOS			C

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1089	-	-	-	367
HCM Lane V/C Ratio	0.055	-	-	-	0.407
HCM Control Delay (s)	8.5	0	-	-	21.4
HCM Lane LOS	A	A	-	-	C
HCM 95th %tile Q(veh)	0.2	-	-	-	1.9

Intersection	
Intersection Delay, s/veh	14.8
Intersection LOS	B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	33	234	14	67	201	101	19	77	95	95	41	43
Future Vol, veh/h	33	234	14	67	201	101	19	77	95	95	41	43
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles, %	3	3	14	2	4	1	0	1	4	1	2	0
Mvmt Flow	37	260	16	74	223	112	21	86	106	106	46	48
Number of Lanes	1	1	0	1	1	0	1	1	0	1	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	2	2	2	2
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	2	2	2	2
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	2	2	2	2
HCM Control Delay	15.4	16.6	13.1	11.9
HCM LOS	C	C	B	B

Lane	NBLn1	NBLn2	EBLn1	EBLn2	WBLn1	WBLn2	SBLn1	SBLn2
Vol Left, %	100%	0%	100%	0%	100%	0%	100%	0%
Vol Thru, %	0%	45%	0%	94%	0%	67%	0%	49%
Vol Right, %	0%	55%	0%	6%	0%	33%	0%	51%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	19	172	33	248	67	302	95	84
LT Vol	19	0	33	0	67	0	95	0
Through Vol	0	77	0	234	0	201	0	41
RT Vol	0	95	0	14	0	101	0	43
Lane Flow Rate	21	191	37	276	74	336	106	93
Geometry Grp	7	7	7	7	7	7	7	7
Degree of Util (X)	0.045	0.359	0.073	0.509	0.146	0.59	0.225	0.177
Departure Headway (Hd)	7.646	6.756	7.203	6.653	7.043	6.331	7.689	6.828
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	468	533	499	543	511	574	467	525
Service Time	5.391	4.5	4.917	4.367	4.754	4.041	5.437	4.575
HCM Lane V/C Ratio	0.045	0.358	0.074	0.508	0.145	0.585	0.227	0.177
HCM Control Delay	10.8	13.3	10.5	16.1	11	17.8	12.7	11
HCM Lane LOS	B	B	B	C	B	C	B	B
HCM 95th-tile Q	0.1	1.6	0.2	2.9	0.5	3.8	0.9	0.6

ID	Software/Method	Intersection	Control Type	LOS	Delay	V/C Ratio
1	Synchro HCM 6th Signal	Wilsonville Rd/Stafford Rd & Boeckman Rd/A	Signal	B	14.7	0.53

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	183	80	89	31	62	21	138	305	45	23	250	158
Future Volume (veh/h)	183	80	89	31	62	21	138	305	45	23	250	158
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	0.99		0.99	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1826	1811	1707	1856	1544	1841	1870	1767	1648	1870	1856
Adj Flow Rate, veh/h	241	105	1	41	82	4	182	401	51	30	329	171
Peak Hour Factor	0.76	0.76	0.76	0.76	0.76	0.76	0.76	0.76	0.76	0.76	0.76	0.76
Percent Heavy Veh, %	3	5	6	13	3	24	4	2	9	17	2	3
Cap, veh/h	432	356	298	263	128	6	361	638	81	347	377	196
Arrive On Green	0.15	0.19	0.19	0.02	0.07	0.08	0.09	0.39	0.40	0.03	0.33	0.34
Sat Flow, veh/h	1767	1826	1531	1626	1754	86	1753	1626	207	1570	1159	602
Grp Volume(v), veh/h	241	105	1	41	0	86	182	0	452	30	0	500
Grp Sat Flow(s),veh/h/ln	1767	1826	1531	1626	0	1840	1753	0	1833	1570	0	1761
Q Serve(g_s), s	6.2	2.6	0.0	1.2	0.0	2.4	3.3	0.0	10.5	0.7	0.0	14.1
Cycle Q Clear(g_c), s	6.2	2.6	0.0	1.2	0.0	2.4	3.3	0.0	10.5	0.7	0.0	14.1
Prop In Lane	1.00		1.00	1.00		0.05	1.00		0.11	1.00		0.34
Lane Grp Cap(c), veh/h	432	356	298	263	0	135	361	0	719	347	0	573
V/C Ratio(X)	0.56	0.30	0.00	0.16	0.00	0.64	0.50	0.00	0.63	0.09	0.00	0.87
Avail Cap(c_a), veh/h	582	780	654	334	0	486	363	0	902	424	0	833
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	17.0	18.1	17.1	22.0	0.0	23.7	11.5	0.0	12.9	11.4	0.0	16.6
Incr Delay (d2), s/veh	0.8	0.3	0.0	0.2	0.0	3.7	0.8	0.0	0.9	0.1	0.0	7.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.2	1.0	0.0	0.4	0.0	1.1	1.1	0.0	3.6	0.2	0.0	5.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	17.9	18.4	17.1	22.2	0.0	27.4	12.3	0.0	13.8	11.5	0.0	23.7
LnGrp LOS	B	B	B	C	A	C	B	A	B	B	A	C
Approach Vol, veh/h		347			127			634			530	
Approach Delay, s/veh		18.0			25.7			13.4			23.0	
Approach LOS		B			C			B			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	8.9	22.1	12.7	8.9	5.4	25.7	6.3	15.3
Change Period (Y+Rc), s	4.0	4.5	4.5	4.5	4.0	4.5	4.5	4.5
Max Green Setting (Gmax), s	5.0	25.4	12.7	14.4	4.0	26.4	4.1	23.0
Max Q Clear Time (g_c+I1), s	5.3	16.1	8.2	4.4	2.7	12.5	3.2	4.6
Green Ext Time (p_c), s	0.0	1.6	0.3	0.1	0.0	1.6	0.0	0.2

Intersection Summary	
HCM 6th Ctrl Delay	18.4
HCM 6th LOS	B

Intersection	
Int Delay, s/veh	2.9

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	16	335	48	8	346	4	49	2	17	0	4	11
Future Vol, veh/h	16	335	48	8	346	4	49	2	17	0	4	11
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	1	1	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	73	73	73	73	73	73	73	73	73	73	73	73
Heavy Vehicles, %	0	4	5	12	4	0	0	0	0	0	0	0
Mvmt Flow	22	459	66	11	474	5	67	3	23	0	5	15

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	479	0	0	525	0	0	1045	1037	493	1049	1068	477
Stage 1	-	-	-	-	-	-	536	536	-	499	499	-
Stage 2	-	-	-	-	-	-	509	501	-	550	569	-
Critical Hdwy	4.1	-	-	4.22	-	-	7.1	6.5	6.2	7.1	6.5	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Follow-up Hdwy	2.2	-	-	2.308	-	-	3.5	4	3.3	3.5	4	3.3
Pot Cap-1 Maneuver	1094	-	-	993	-	-	209	233	580	207	223	592
Stage 1	-	-	-	-	-	-	532	527	-	557	547	-
Stage 2	-	-	-	-	-	-	550	546	-	523	509	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1094	-	-	993	-	-	193	223	580	190	213	592
Mov Cap-2 Maneuver	-	-	-	-	-	-	193	223	-	190	213	-
Stage 1	-	-	-	-	-	-	517	512	-	541	539	-
Stage 2	-	-	-	-	-	-	523	538	-	484	494	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.3	0.2	30.4	14.5
HCM LOS			D	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	233	1094	-	-	993	-	-	401
HCM Lane V/C Ratio	0.4	0.02	-	-	0.011	-	-	0.051
HCM Control Delay (s)	30.4	8.4	0	-	8.7	0	-	14.5
HCM Lane LOS	D	A	A	-	A	A	-	B
HCM 95th %tile Q(veh)	1.8	0.1	-	-	0	-	-	0.2

Intersection	
Int Delay, s/veh	1.5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	4	377	17	18	376	12	17	0	10	12	0	4
Future Vol, veh/h	4	377	17	18	376	12	17	0	10	12	0	4
Conflicting Peds, #/hr	0	0	4	4	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	100	-	-	100	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	72	72	72	72	72	72	72	72	72	72	72	72
Heavy Vehicles, %	0	2	10	6	3	0	0	0	20	0	0	0
Mvmt Flow	6	524	24	25	522	17	24	0	14	17	0	6

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	539	0	0	552	0	0	1136	1141	540	1136	1145	531
Stage 1	-	-	-	-	-	-	552	552	-	581	581	-
Stage 2	-	-	-	-	-	-	584	589	-	555	564	-
Critical Hdwy	4.1	-	-	4.16	-	-	7.1	6.5	6.4	7.1	6.5	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Follow-up Hdwy	2.2	-	-	2.254	-	-	3.5	4	3.48	3.5	4	3.3
Pot Cap-1 Maneuver	1040	-	-	998	-	-	181	202	508	181	201	552
Stage 1	-	-	-	-	-	-	522	518	-	503	503	-
Stage 2	-	-	-	-	-	-	501	499	-	520	512	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1040	-	-	995	-	-	174	195	506	172	194	552
Mov Cap-2 Maneuver	-	-	-	-	-	-	174	195	-	172	194	-
Stage 1	-	-	-	-	-	-	517	513	-	500	490	-
Stage 2	-	-	-	-	-	-	483	487	-	503	507	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.1	0.4	23.7	24.4
HCM LOS			C	C

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	230	1040	-	-	995	-	-	208
HCM Lane V/C Ratio	0.163	0.005	-	-	0.025	-	-	0.107
HCM Control Delay (s)	23.7	8.5	-	-	8.7	-	-	24.4
HCM Lane LOS	C	A	-	-	A	-	-	C
HCM 95th %tile Q(veh)	0.6	0	-	-	0.1	-	-	0.4

Intersection	
Int Delay, s/veh	3.2

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	35	338	343	54	60	38
Future Vol, veh/h	35	338	343	54	60	38
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	74	74	74	74	74	74
Heavy Vehicles, %	0	4	3	0	0	0
Mvmt Flow	47	457	464	73	81	51

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	537	0	-	0	1052	501
Stage 1	-	-	-	-	501	-
Stage 2	-	-	-	-	551	-
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	1041	-	-	-	253	574
Stage 1	-	-	-	-	613	-
Stage 2	-	-	-	-	581	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1041	-	-	-	238	574
Mov Cap-2 Maneuver	-	-	-	-	238	-
Stage 1	-	-	-	-	576	-
Stage 2	-	-	-	-	581	-

Approach	EB	WB	SB
HCM Control Delay, s	0.8	0	25.2
HCM LOS			D

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1041	-	-	-	308
HCM Lane V/C Ratio	0.045	-	-	-	0.43
HCM Control Delay (s)	8.6	0	-	-	25.2
HCM Lane LOS	A	A	-	-	D
HCM 95th %tile Q(veh)	0.1	-	-	-	2.1

Intersection	
Intersection Delay, s/veh	18.2
Intersection LOS	C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	29	209	38	85	222	74	19	80	91	73	105	40
Future Vol, veh/h	29	209	38	85	222	74	19	80	91	73	105	40
Peak Hour Factor	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82
Heavy Vehicles, %	0	4	0	1	4	3	5	2	1	3	3	0
Mvmt Flow	35	255	46	104	271	90	23	98	111	89	128	49
Number of Lanes	1	1	0	1	1	0	1	1	0	1	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	2	2	2	2
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	2	2	2	2
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	2	2	2	2
HCM Control Delay	19.2	21.3	15.1	14.1
HCM LOS	C	C	C	B

Lane	NBLn1	NBLn2	EBLn1	EBLn2	WBLn1	WBLn2	SBLn1	SBLn2
Vol Left, %	100%	0%	100%	0%	100%	0%	100%	0%
Vol Thru, %	0%	47%	0%	85%	0%	75%	0%	72%
Vol Right, %	0%	53%	0%	15%	0%	25%	0%	28%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	19	171	29	247	85	296	73	145
LT Vol	19	0	29	0	85	0	73	0
Through Vol	0	80	0	209	0	222	0	105
RT Vol	0	91	0	38	0	74	0	40
Lane Flow Rate	23	209	35	301	104	361	89	177
Geometry Grp	7	7	7	7	7	7	7	7
Degree of Util (X)	0.053	0.426	0.076	0.6	0.217	0.691	0.203	0.368
Departure Headway (Hd)	8.311	7.361	7.72	7.167	7.528	6.89	8.198	7.485
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	430	488	463	503	476	523	437	479
Service Time	6.079	5.127	5.482	4.928	5.287	4.648	5.964	5.25
HCM Lane V/C Ratio	0.053	0.428	0.076	0.598	0.218	0.69	0.204	0.37
HCM Control Delay	11.5	15.5	11.1	20.2	12.4	23.8	13.1	14.6
HCM Lane LOS	B	C	B	C	B	C	B	B
HCM 95th-tile Q	0.2	2.1	0.2	3.9	0.8	5.3	0.8	1.7

ID	Software/Method	Intersection	Control Type	LOS	Delay	V/C Ratio
1	Synchro HCM 6th Signal	Wilsonville Rd/Stafford Rd & Boeckman Rd/A	Signal	B	18.4	0.73

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	186	72	113	57	60	14	73	192	53	20	438	234
Future Volume (veh/h)	186	72	113	57	60	14	73	192	53	20	438	234
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	0.92		0.90	0.88		0.87	1.00		0.97	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1885	1870	1885	1826	1900	1900	1885	1885	1870	1826	1885	1856
Adj Flow Rate, veh/h	188	73	20	58	61	2	74	194	44	20	442	216
Peak Hour Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Percent Heavy Veh, %	1	2	1	5	0	0	1	1	2	5	1	3
Cap, veh/h	422	356	273	307	208	7	261	647	147	556	488	239
Arrive On Green	0.11	0.19	0.19	0.03	0.11	0.12	0.05	0.44	0.45	0.02	0.41	0.42
Sat Flow, veh/h	1795	1870	1435	1739	1819	60	1795	1479	335	1739	1195	584
Grp Volume(v), veh/h	188	73	20	58	0	63	74	0	238	20	0	658
Grp Sat Flow(s),veh/h/ln	1795	1870	1435	1739	0	1879	1795	0	1814	1739	0	1778
Q Serve(g_s), s	5.2	1.9	0.7	1.7	0.0	1.8	1.4	0.0	5.0	0.4	0.0	20.6
Cycle Q Clear(g_c), s	5.2	1.9	0.7	1.7	0.0	1.8	1.4	0.0	5.0	0.4	0.0	20.6
Prop In Lane	1.00		1.00	1.00		0.03	1.00		0.18	1.00		0.33
Lane Grp Cap(c), veh/h	422	356	273	307	0	215	261	0	793	556	0	727
V/C Ratio(X)	0.45	0.20	0.07	0.19	0.00	0.29	0.28	0.00	0.30	0.04	0.00	0.91
Avail Cap(c_a), veh/h	501	710	545	355	0	539	297	0	945	640	0	927
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	18.8	20.2	19.7	22.3	0.0	24.0	12.8	0.0	10.8	9.6	0.0	16.4
Incr Delay (d2), s/veh	0.5	0.2	0.1	0.2	0.0	0.6	0.4	0.0	0.2	0.0	0.0	10.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.0	0.8	0.2	0.7	0.0	0.8	0.5	0.0	1.7	0.1	0.0	9.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	19.4	20.4	19.8	22.5	0.0	24.6	13.2	0.0	11.0	9.7	0.0	26.8
LnGrp LOS	B	C	B	C	A	C	B	A	B	A	A	C
Approach Vol, veh/h		281			121			312			678	
Approach Delay, s/veh		19.7			23.6			11.5			26.3	
Approach LOS		B			C			B			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	6.8	29.2	11.5	11.8	5.1	30.9	7.0	16.3
Change Period (Y+Rc), s	4.0	4.5	4.5	4.5	4.0	4.5	4.5	4.5
Max Green Setting (Gmax), s	4.0	31.4	9.6	17.5	4.0	31.4	4.1	23.0
Max Q Clear Time (g_c+I1), s	3.4	22.6	7.2	3.8	2.4	7.0	3.7	3.9
Green Ext Time (p_c), s	0.0	2.1	0.1	0.1	0.0	0.9	0.0	0.2

Intersection Summary	
HCM 6th Ctrl Delay	21.4
HCM 6th LOS	C

Intersection												
Int Delay, s/veh	1.1											
Movement	**EBL**	**EBT**	**EBR**	**WBL**	**WBT**	**WBR**	**NBL**	**NBT**	**NBR**	**SBL**	**SBT**	**SBR**
Lane Configurations												
Traffic Vol, veh/h	13	360	47	5	358	4	23	0	8	3	0	8
Future Vol, veh/h	13	360	47	5	358	4	23	0	8	3	0	8
Conflicting Peds, #/hr	0	0	0	0	0	0	2	0	0	0	0	2
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	15	1	0	0	3	25	5	0	0	0	0	25
Mvmt Flow	14	400	52	6	398	4	26	0	9	3	0	9

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	402	0	0	452	0	0	873	868	426	871	892	402
Stage 1	-	-	-	-	-	-	454	454	-	412	412	-
Stage 2	-	-	-	-	-	-	419	414	-	459	480	-
Critical Hdwy	4.25	-	-	4.1	-	-	7.15	6.5	6.2	7.1	6.5	6.45
Critical Hdwy Stg 1	-	-	-	-	-	-	6.15	5.5	-	6.1	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.15	5.5	-	6.1	5.5	-
Follow-up Hdwy	2.335	-	-	2.2	-	-	3.545	4	3.3	3.5	4	3.525
Pot Cap-1 Maneuver	1090	-	-	1119	-	-	267	293	633	274	283	601
Stage 1	-	-	-	-	-	-	580	573	-	621	598	-
Stage 2	-	-	-	-	-	-	606	597	-	586	558	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1090	-	-	1119	-	-	258	286	633	265	276	600
Mov Cap-2 Maneuver	-	-	-	-	-	-	258	286	-	265	276	-
Stage 1	-	-	-	-	-	-	570	563	-	610	594	-
Stage 2	-	-	-	-	-	-	592	593	-	568	549	-
Approach	**EB**			**WB**			**NB**			**SB**		
HCM Control Delay, s	0.3			0.1			18.3			13.3		
HCM LOS							C			B		

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	305	1090	-	-	1119	-	-	446
HCM Lane V/C Ratio	0.113	0.013	-	-	0.005	-	-	0.027
HCM Control Delay (s)	18.3	8.3	0	-	8.2	0	-	13.3
HCM Lane LOS	C	A	A	-	A	A	-	B
HCM 95th %tile Q(veh)	0.4	0	-	-	0	-	-	0.1

Intersection	
Int Delay, s/veh	1.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	405	41	26	363	0	25	0	15	0	0	0
Future Vol, veh/h	0	405	41	26	363	0	25	0	15	0	0	0
Conflicting Peds, #/hr	0	0	5	5	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	100	-	-	100	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	0	3	0	0	3	0	0	0	0	0	0	0
Mvmt Flow	0	450	46	29	403	0	28	0	17	0	0	0

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	403	0	0	501	0	0	939	939	478	943	962	403
Stage 1	-	-	-	-	-	-	478	478	-	461	461	-
Stage 2	-	-	-	-	-	-	461	461	-	482	501	-
Critical Hdwy	4.1	-	-	4.1	-	-	7.1	6.5	6.2	7.1	6.5	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Follow-up Hdwy	2.2	-	-	2.2	-	-	3.5	4	3.3	3.5	4	3.3
Pot Cap-1 Maneuver	1167	-	-	1074	-	-	246	266	591	245	258	652
Stage 1	-	-	-	-	-	-	572	559	-	584	569	-
Stage 2	-	-	-	-	-	-	584	569	-	569	546	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1167	-	-	1070	-	-	240	258	589	233	250	652
Mov Cap-2 Maneuver	-	-	-	-	-	-	240	258	-	233	250	-
Stage 1	-	-	-	-	-	-	570	557	-	584	554	-
Stage 2	-	-	-	-	-	-	568	554	-	553	544	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	0.6	18.6	0
HCM LOS			C	A

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	309	1167	-	-	1070	-	-	-
HCM Lane V/C Ratio	0.144	-	-	-	0.027	-	-	-
HCM Control Delay (s)	18.6	0	-	-	8.5	-	-	0
HCM Lane LOS	C	A	-	-	A	-	-	A
HCM 95th %tile Q(veh)	0.5	0	-	-	0.1	-	-	-

Intersection	
Int Delay, s/veh	1.3

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	31	418	357	31	28	24
Future Vol, veh/h	31	418	357	31	28	24
Conflicting Peds, #/hr	0	0	0	0	1	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, %	0	3	3	0	0	0
Mvmt Flow	34	464	397	34	31	27

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	431	0	-	0	947	414
Stage 1	-	-	-	-	414	-
Stage 2	-	-	-	-	533	-
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	1139	-	-	-	292	643
Stage 1	-	-	-	-	671	-
Stage 2	-	-	-	-	593	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1139	-	-	-	280	643
Mov Cap-2 Maneuver	-	-	-	-	280	-
Stage 1	-	-	-	-	644	-
Stage 2	-	-	-	-	593	-

Approach	EB	WB	SB
HCM Control Delay, s	0.6	0	16.2
HCM LOS			C

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1139	-	-	-	379
HCM Lane V/C Ratio	0.03	-	-	-	0.152
HCM Control Delay (s)	8.3	0	-	-	16.2
HCM Lane LOS	A	A	-	-	C
HCM 95th %tile Q(veh)	0.1	-	-	-	0.5

Intersection	
Intersection Delay, s/veh	21.7
Intersection LOS	C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	53	268	45	68	251	62	29	92	75	106	155	71
Future Vol, veh/h	53	268	45	68	251	62	29	92	75	106	155	71
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles, %	0	2	2	2	3	5	0	3	0	0	1	0
Mvmt Flow	59	298	50	76	279	69	32	102	83	118	172	79
Number of Lanes	1	1	0	1	1	0	1	1	0	1	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	2	2	2	2
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	2	2	2	2
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	2	2	2	2
HCM Control Delay	25.5	24.8	15.7	17.5
HCM LOS	D	C	C	C

Lane	NBLn1	NBLn2	EBLn1	EBLn2	WBLn1	WBLn2	SBLn1	SBLn2
Vol Left, %	100%	0%	100%	0%	100%	0%	100%	0%
Vol Thru, %	0%	55%	0%	86%	0%	80%	0%	69%
Vol Right, %	0%	45%	0%	14%	0%	20%	0%	31%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	29	167	53	313	68	313	106	226
LT Vol	29	0	53	0	68	0	106	0
Through Vol	0	92	0	268	0	251	0	155
RT Vol	0	75	0	45	0	62	0	71
Lane Flow Rate	32	186	59	348	76	348	118	251
Geometry Grp	7	7	7	7	7	7	7	7
Degree of Util (X)	0.078	0.411	0.132	0.725	0.17	0.721	0.274	0.535
Departure Headway (Hd)	8.763	7.972	8.088	7.505	8.102	7.462	8.388	7.663
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	407	449	441	480	440	483	426	467
Service Time	6.561	5.769	5.874	5.291	5.888	5.248	6.176	5.45
HCM Lane V/C Ratio	0.079	0.414	0.134	0.725	0.173	0.72	0.277	0.537
HCM Control Delay	12.3	16.3	12.1	27.8	12.6	27.4	14.3	19
HCM Lane LOS	B	C	B	D	B	D	B	C
HCM 95th-tile Q	0.3	2	0.5	5.8	0.6	5.8	1.1	3.1

ID	Software/Method	Intersection	Control Type	LOS	Delay	V/C Ratio
1	Synchro HCM 6th Signal	Wilsonville Rd/Stafford Rd & Boeckman Rd/A	Signal	C	21.4	0.69

E. HCM REPORTS – EXISTING + STAGE II

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	221	62	124	57	55	19	77	208	53	22	445	256
Future Volume (veh/h)	221	62	124	57	55	19	77	208	53	22	445	256
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	0.91		0.90	0.85		0.84	1.00		0.97	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1885	1870	1885	1826	1900	1900	1885	1885	1870	1826	1885	1856
Adj Flow Rate, veh/h	223	63	23	58	56	2	78	210	44	22	449	237
Peak Hour Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Percent Heavy Veh, %	1	2	1	5	0	0	1	1	2	5	1	3
Cap, veh/h	425	349	267	272	162	6	254	676	142	558	490	258
Arrive On Green	0.13	0.19	0.19	0.03	0.09	0.10	0.05	0.45	0.46	0.02	0.42	0.43
Sat Flow, veh/h	1795	1870	1433	1739	1809	65	1795	1504	315	1739	1161	613
Grp Volume(v), veh/h	223	63	23	58	0	58	78	0	254	22	0	686
Grp Sat Flow(s),veh/h/ln	1795	1870	1433	1739	0	1874	1795	0	1819	1739	0	1773
Q Serve(g_s), s	6.5	1.7	0.8	1.8	0.0	1.8	1.4	0.0	5.4	0.4	0.0	22.3
Cycle Q Clear(g_c), s	6.5	1.7	0.8	1.8	0.0	1.8	1.4	0.0	5.4	0.4	0.0	22.3
Prop In Lane	1.00		1.00	1.00		0.03	1.00		0.17	1.00		0.35
Lane Grp Cap(c), veh/h	425	349	267	272	0	168	254	0	817	558	0	748
V/C Ratio(X)	0.52	0.18	0.09	0.21	0.00	0.35	0.31	0.00	0.31	0.04	0.00	0.92
Avail Cap(c_a), veh/h	487	689	528	317	0	494	285	0	920	636	0	897
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	19.7	20.9	20.6	24.3	0.0	26.1	13.2	0.0	10.7	9.5	0.0	16.6
Incr Delay (d2), s/veh	0.7	0.2	0.1	0.3	0.0	0.9	0.5	0.0	0.2	0.0	0.0	12.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.5	0.7	0.3	0.7	0.0	0.8	0.5	0.0	1.9	0.1	0.0	10.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	20.4	21.1	20.7	24.6	0.0	27.0	13.7	0.0	10.9	9.5	0.0	29.2
LnGrp LOS	C	C	C	C	A	C	B	A	B	A	A	C
Approach Vol, veh/h		309			116			332			708	
Approach Delay, s/veh		20.6			25.8			11.6			28.5	
Approach LOS		C			C			B			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	6.9	30.8	12.9	10.5	5.2	32.5	7.0	16.4
Change Period (Y+Rc), s	4.0	4.5	4.5	4.5	4.0	4.5	4.5	4.5
Max Green Setting (Gmax), s	4.0	31.4	10.5	16.6	4.0	31.4	4.1	23.0
Max Q Clear Time (g_c+I1), s	3.4	24.3	8.5	3.8	2.4	7.4	3.8	3.7
Green Ext Time (p_c), s	0.0	2.0	0.1	0.1	0.0	0.9	0.0	0.2

Intersection Summary			
HCM 6th Ctrl Delay			22.8
HCM 6th LOS			C

Intersection	
Int Delay, s/veh	1.8

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	55	395	45	5	377	6	21	0	8	4	0	32
Future Vol, veh/h	55	395	45	5	377	6	21	0	8	4	0	32
Conflicting Peds, #/hr	0	0	0	0	0	0	2	0	0	0	0	2
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	15	1	0	0	3	25	5	0	0	0	0	25
Mvmt Flow	61	439	50	6	419	7	23	0	9	4	0	36

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	426	0	0	489	0	0	1041	1024	464	1026	1046	425
Stage 1	-	-	-	-	-	-	586	586	-	435	435	-
Stage 2	-	-	-	-	-	-	455	438	-	591	611	-
Critical Hdwy	4.25	-	-	4.1	-	-	7.15	6.5	6.2	7.1	6.5	6.45
Critical Hdwy Stg 1	-	-	-	-	-	-	6.15	5.5	-	6.1	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.15	5.5	-	6.1	5.5	-
Follow-up Hdwy	2.335	-	-	2.2	-	-	3.545	4	3.3	3.5	4	3.525
Pot Cap-1 Maneuver	1067	-	-	1085	-	-	205	237	602	215	230	583
Stage 1	-	-	-	-	-	-	491	500	-	604	584	-
Stage 2	-	-	-	-	-	-	579	582	-	497	487	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1067	-	-	1085	-	-	180	217	602	198	210	582
Mov Cap-2 Maneuver	-	-	-	-	-	-	180	217	-	198	210	-
Stage 1	-	-	-	-	-	-	452	461	-	556	580	-
Stage 2	-	-	-	-	-	-	539	578	-	451	449	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	1	0.1	23.9	13.2
HCM LOS			C	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	223	1067	-	-	1085	-	-	479
HCM Lane V/C Ratio	0.144	0.057	-	-	0.005	-	-	0.084
HCM Control Delay (s)	23.9	8.6	0	-	8.3	0	-	13.2
HCM Lane LOS	C	A	A	-	A	A	-	B
HCM 95th %tile Q(veh)	0.5	0.2	-	-	0	-	-	0.3

Intersection	
Int Delay, s/veh	1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	480	39	26	404	0	23	0	15	0	0	0
Future Vol, veh/h	0	480	39	26	404	0	23	0	15	0	0	0
Conflicting Peds, #/hr	0	0	5	5	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	100	-	-	100	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	0	3	0	0	3	0	0	0	0	0	0	0
Mvmt Flow	0	533	43	29	449	0	26	0	17	0	0	0

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	449	0	0	581	0	0	1067	1067	560	1070	1088	449
Stage 1	-	-	-	-	-	-	560	560	-	507	507	-
Stage 2	-	-	-	-	-	-	507	507	-	563	581	-
Critical Hdwy	4.1	-	-	4.1	-	-	7.1	6.5	6.2	7.1	6.5	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Follow-up Hdwy	2.2	-	-	2.2	-	-	3.5	4	3.3	3.5	4	3.3
Pot Cap-1 Maneuver	1122	-	-	1003	-	-	202	224	532	201	218	614
Stage 1	-	-	-	-	-	-	516	514	-	552	543	-
Stage 2	-	-	-	-	-	-	552	543	-	514	503	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1122	-	-	999	-	-	197	217	530	190	211	614
Mov Cap-2 Maneuver	-	-	-	-	-	-	197	217	-	190	211	-
Stage 1	-	-	-	-	-	-	514	512	-	552	527	-
Stage 2	-	-	-	-	-	-	536	527	-	498	501	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	0.5	21.4	0
HCM LOS			C	A

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	262	1122	-	-	999	-	-	-
HCM Lane V/C Ratio	0.161	-	-	-	0.029	-	-	-
HCM Control Delay (s)	21.4	0	-	-	8.7	-	-	0
HCM Lane LOS	C	A	-	-	A	-	-	A
HCM 95th %tile Q(veh)	0.6	0	-	-	0.1	-	-	-

Intersection						
Int Delay, s/veh	1					

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	36	501	402	25	18	21
Future Vol, veh/h	36	501	402	25	18	21
Conflicting Peds, #/hr	0	0	0	0	1	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, %	0	3	3	0	0	0
Mvmt Flow	40	557	447	28	20	23

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	475	0	-	0	1099	461
Stage 1	-	-	-	-	461	-
Stage 2	-	-	-	-	638	-
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	1098	-	-	-	237	605
Stage 1	-	-	-	-	639	-
Stage 2	-	-	-	-	530	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1098	-	-	-	224	605
Mov Cap-2 Maneuver	-	-	-	-	224	-
Stage 1	-	-	-	-	605	-
Stage 2	-	-	-	-	530	-

Approach	EB	WB	SB
HCM Control Delay, s	0.6	0	17.2
HCM LOS			C

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1098	-	-	-	339
HCM Lane V/C Ratio	0.036	-	-	-	0.128
HCM Control Delay (s)	8.4	0	-	-	17.2
HCM Lane LOS	A	A	-	-	C
HCM 95th %tile Q(veh)	0.1	-	-	-	0.4

Intersection	
Intersection Delay, s/veh	36.5
Intersection LOS	E

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	62	334	45	77	289	57	29	93	97	106	156	76
Future Vol, veh/h	62	334	45	77	289	57	29	93	97	106	156	76
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles, %	0	2	2	2	3	5	0	3	0	0	1	0
Mvmt Flow	69	371	50	86	321	63	32	103	108	118	173	84
Number of Lanes	1	1	0	1	1	0	1	1	0	1	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	2	2	2	2
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	2	2	2	2
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	2	2	2	2
HCM Control Delay	53.2	40.2	19.5	21.2
HCM LOS	F	E	C	C

Lane	NBLn1	NBLn2	EBLn1	EBLn2	WBLn1	WBLn2	SBLn1	SBLn2
Vol Left, %	100%	0%	100%	0%	100%	0%	100%	0%
Vol Thru, %	0%	49%	0%	88%	0%	84%	0%	67%
Vol Right, %	0%	51%	0%	12%	0%	16%	0%	33%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	29	190	62	379	77	346	106	232
LT Vol	29	0	62	0	77	0	106	0
Through Vol	0	93	0	334	0	289	0	156
RT Vol	0	97	0	45	0	57	0	76
Lane Flow Rate	32	211	69	421	86	384	118	258
Geometry Grp	7	7	7	7	7	7	7	7
Degree of Util (X)	0.086	0.512	0.166	0.95	0.209	0.873	0.302	0.607
Departure Headway (Hd)	9.581	8.738	8.686	8.118	8.798	8.178	9.217	8.476
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	374	412	413	446	407	442	390	425
Service Time	7.348	6.505	6.445	5.876	6.559	5.938	6.979	6.237
HCM Lane V/C Ratio	0.086	0.512	0.167	0.944	0.211	0.869	0.303	0.607
HCM Control Delay	13.3	20.4	13.2	59.8	13.9	46	15.9	23.6
HCM Lane LOS	B	C	B	F	B	E	C	C
HCM 95th-tile Q	0.3	2.8	0.6	11.2	0.8	9	1.3	3.9

ID	Software/Method	Intersection	Control Type	LOS	Delay	V/C Ratio
1	Synchro HCM 6th Signal	Wilsonville Rd/Stafford Rd & Boeckman Rd/A	Signal	C	22.8	0.73

F. HCM REPORTS – EXISTING + PROJECT + STAGE II

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	221	75	126	57	65	19	79	208	53	22	445	256
Future Volume (veh/h)	221	75	126	57	65	19	79	208	53	22	445	256
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	0.92		0.90	0.85		0.85	1.00		0.97	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1885	1870	1885	1826	1900	1900	1885	1885	1870	1826	1885	1856
Adj Flow Rate, veh/h	223	76	24	58	66	4	80	210	44	22	449	237
Peak Hour Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Percent Heavy Veh, %	1	2	1	5	0	0	1	1	2	5	1	3
Cap, veh/h	419	353	271	274	162	10	253	676	142	556	489	258
Arrive On Green	0.13	0.19	0.19	0.03	0.09	0.10	0.05	0.45	0.46	0.02	0.42	0.43
Sat Flow, veh/h	1795	1870	1434	1739	1752	106	1795	1504	315	1739	1161	613
Grp Volume(v), veh/h	223	76	24	58	0	70	80	0	254	22	0	686
Grp Sat Flow(s),veh/h/ln	1795	1870	1434	1739	0	1858	1795	0	1819	1739	0	1773
Q Serve(g_s), s	6.5	2.1	0.8	1.9	0.0	2.2	1.5	0.0	5.5	0.4	0.0	22.5
Cycle Q Clear(g_c), s	6.5	2.1	0.8	1.9	0.0	2.2	1.5	0.0	5.5	0.4	0.0	22.5
Prop In Lane	1.00		1.00	1.00		0.06	1.00		0.17	1.00		0.35
Lane Grp Cap(c), veh/h	419	353	271	274	0	172	253	0	817	556	0	747
V/C Ratio(X)	0.53	0.22	0.09	0.21	0.00	0.41	0.32	0.00	0.31	0.04	0.00	0.92
Avail Cap(c_a), veh/h	479	684	524	319	0	486	283	0	913	634	0	890
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	19.7	21.1	20.6	24.4	0.0	26.3	13.4	0.0	10.8	9.6	0.0	16.7
Incr Delay (d2), s/veh	0.8	0.2	0.1	0.3	0.0	1.1	0.5	0.0	0.2	0.0	0.0	12.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.5	0.9	0.3	0.7	0.0	1.0	0.5	0.0	1.9	0.1	0.0	10.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	20.5	21.3	20.7	24.6	0.0	27.5	13.9	0.0	11.0	9.6	0.0	29.6
LnGrp LOS	C	C	C	C	A	C	B	A	B	A	A	C
Approach Vol, veh/h		323			128			334			708	
Approach Delay, s/veh		20.7			26.2			11.7			29.0	
Approach LOS		C			C			B			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	7.0	30.9	12.9	10.7	5.3	32.6	7.0	16.6
Change Period (Y+Rc), s	4.0	4.5	4.5	4.5	4.0	4.5	4.5	4.5
Max Green Setting (Gmax), s	4.0	31.4	10.5	16.6	4.0	31.4	4.1	23.0
Max Q Clear Time (g_c+I1), s	3.5	24.5	8.5	4.2	2.4	7.5	3.9	4.1
Green Ext Time (p_c), s	0.0	2.0	0.1	0.1	0.0	0.9	0.0	0.2

Intersection Summary			
HCM 6th Ctrl Delay			23.1
HCM 6th LOS			C

Intersection	
Int Delay, s/veh	1.8

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	55	410	47	5	389	6	23	0	8	4	0	32
Future Vol, veh/h	55	410	47	5	389	6	23	0	8	4	0	32
Conflicting Peds, #/hr	0	0	0	0	0	0	2	0	0	0	0	2
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	15	1	0	0	3	25	5	0	0	0	0	25
Mvmt Flow	61	456	52	6	432	7	26	0	9	4	0	36

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	439	0	0	508	0	0	1072	1055	482	1057	1078	438
Stage 1	-	-	-	-	-	-	604	604	-	448	448	-
Stage 2	-	-	-	-	-	-	468	451	-	609	630	-
Critical Hdwy	4.25	-	-	4.1	-	-	7.15	6.5	6.2	7.1	6.5	6.45
Critical Hdwy Stg 1	-	-	-	-	-	-	6.15	5.5	-	6.1	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.15	5.5	-	6.1	5.5	-
Follow-up Hdwy	2.335	-	-	2.2	-	-	3.545	4	3.3	3.5	4	3.525
Pot Cap-1 Maneuver	1055	-	-	1067	-	-	196	227	588	205	220	573
Stage 1	-	-	-	-	-	-	480	491	-	594	576	-
Stage 2	-	-	-	-	-	-	570	574	-	486	478	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1055	-	-	1067	-	-	171	207	588	188	201	572
Mov Cap-2 Maneuver	-	-	-	-	-	-	171	207	-	188	201	-
Stage 1	-	-	-	-	-	-	441	451	-	546	572	-
Stage 2	-	-	-	-	-	-	530	570	-	440	439	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.9	0.1	25.6	13.4
HCM LOS			D	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	209	1055	-	-	1067	-	-	466
HCM Lane V/C Ratio	0.165	0.058	-	-	0.005	-	-	0.086
HCM Control Delay (s)	25.6	8.6	0	-	8.4	0	-	13.4
HCM Lane LOS	D	A	A	-	A	A	-	B
HCM 95th %tile Q(veh)	0.6	0.2	-	-	0	-	-	0.3

Intersection	
Int Delay, s/veh	1.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	497	41	26	418	0	25	0	15	0	0	0
Future Vol, veh/h	0	497	41	26	418	0	25	0	15	0	0	0
Conflicting Peds, #/hr	0	0	5	5	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	100	-	-	100	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	0	3	0	0	3	0	0	0	0	0	0	0
Mvmt Flow	0	552	46	29	464	0	28	0	17	0	0	0

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	464	0	0	603	0	0	1102	1102	580	1106	1125	464
Stage 1	-	-	-	-	-	-	580	580	-	522	522	-
Stage 2	-	-	-	-	-	-	522	522	-	584	603	-
Critical Hdwy	4.1	-	-	4.1	-	-	7.1	6.5	6.2	7.1	6.5	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Follow-up Hdwy	2.2	-	-	2.2	-	-	3.5	4	3.3	3.5	4	3.3
Pot Cap-1 Maneuver	1108	-	-	984	-	-	191	213	518	190	207	602
Stage 1	-	-	-	-	-	-	504	503	-	542	534	-
Stage 2	-	-	-	-	-	-	542	534	-	501	492	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1108	-	-	980	-	-	186	206	516	180	200	602
Mov Cap-2 Maneuver	-	-	-	-	-	-	186	206	-	180	200	-
Stage 1	-	-	-	-	-	-	502	501	-	542	518	-
Stage 2	-	-	-	-	-	-	526	518	-	485	490	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	0.5	22.9	0
HCM LOS			C	A

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	245	1108	-	-	980	-	-	-
HCM Lane V/C Ratio	0.181	-	-	-	0.029	-	-	-
HCM Control Delay (s)	22.9	0	-	-	8.8	-	-	0
HCM Lane LOS	C	A	-	-	A	-	-	A
HCM 95th %tile Q(veh)	0.6	0	-	-	0.1	-	-	-

Intersection						
Int Delay, s/veh	1.7					

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	44	501	402	41	37	31
Future Vol, veh/h	44	501	402	41	37	31
Conflicting Peds, #/hr	0	0	0	0	1	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, %	0	3	3	0	0	0
Mvmt Flow	49	557	447	46	41	34

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	493	0	-	0	1126	470
Stage 1	-	-	-	-	470	-
Stage 2	-	-	-	-	656	-
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	1081	-	-	-	229	598
Stage 1	-	-	-	-	633	-
Stage 2	-	-	-	-	520	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1081	-	-	-	214	598
Mov Cap-2 Maneuver	-	-	-	-	214	-
Stage 1	-	-	-	-	591	-
Stage 2	-	-	-	-	520	-

Approach	EB	WB	SB
HCM Control Delay, s	0.7	0	20.8
HCM LOS			C

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1081	-	-	-	303
HCM Lane V/C Ratio	0.045	-	-	-	0.249
HCM Control Delay (s)	8.5	0	-	-	20.8
HCM Lane LOS	A	A	-	-	C
HCM 95th %tile Q(veh)	0.1	-	-	-	1

Intersection	
Intersection Delay, s/veh	38
Intersection LOS	E

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	62	334	45	82	289	62	29	93	101	110	156	76
Future Vol, veh/h	62	334	45	82	289	62	29	93	101	110	156	76
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles, %	0	2	2	2	3	5	0	3	0	0	1	0
Mvmt Flow	69	371	50	91	321	69	32	103	112	122	173	84
Number of Lanes	1	1	0	1	1	0	1	1	0	1	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	2	2	2	2
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	2	2	2	2
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	2	2	2	2
HCM Control Delay	55.2	42.7	20	21.5
HCM LOS	F	E	C	C

Lane	NBLn1	NBLn2	EBLn1	EBLn2	WBLn1	WBLn2	SBLn1	SBLn2
Vol Left, %	100%	0%	100%	0%	100%	0%	100%	0%
Vol Thru, %	0%	48%	0%	88%	0%	82%	0%	67%
Vol Right, %	0%	52%	0%	12%	0%	18%	0%	33%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	29	194	62	379	82	351	110	232
LT Vol	29	0	62	0	82	0	110	0
Through Vol	0	93	0	334	0	289	0	156
RT Vol	0	101	0	45	0	62	0	76
Lane Flow Rate	32	216	69	421	91	390	122	258
Geometry Grp	7	7	7	7	7	7	7	7
Degree of Util (X)	0.086	0.527	0.168	0.959	0.224	0.892	0.315	0.612
Departure Headway (Hd)	9.648	8.797	8.768	8.199	8.86	8.231	9.289	8.547
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	371	410	409	442	405	441	386	423
Service Time	7.418	6.566	6.528	5.959	6.624	5.994	7.055	6.312
HCM Lane V/C Ratio	0.086	0.527	0.169	0.952	0.225	0.884	0.316	0.61
HCM Control Delay	13.3	21	13.3	62.1	14.2	49.3	16.3	24
HCM Lane LOS	B	C	B	F	B	E	C	C
HCM 95th-tile Q	0.3	3	0.6	11.5	0.8	9.5	1.3	4

ID	Software/Method	Intersection	Control Type	LOS	Delay	V/C Ratio
1	Synchro HCM 6th Signal	Wilsonville Rd/Stafford Rd & Boeckman Rd/A(	Signal	C	23.1	0.74

G. HCM REPORTS – MITIGATIONS

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	62	334	45	82	289	62	29	93	101	110	156	76
Future Volume (veh/h)	62	334	45	82	289	62	29	93	101	110	156	76
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	0.99		0.99	0.99		0.97
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1900	1870	1870	1870	1856	1826	1900	1856	1900	1900	1885	1900
Adj Flow Rate, veh/h	69	371	41	91	321	55	32	103	38	122	173	52
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	0	2	2	2	3	5	0	3	0	0	1	0
Cap, veh/h	393	469	52	373	454	78	321	177	65	407	258	78
Arrive On Green	0.05	0.28	0.28	0.06	0.29	0.29	0.03	0.14	0.14	0.08	0.19	0.19
Sat Flow, veh/h	1810	1654	183	1781	1543	264	1810	1287	475	1810	1379	415
Grp Volume(v), veh/h	69	0	412	91	0	376	32	0	141	122	0	225
Grp Sat Flow(s),veh/h/ln	1810	0	1837	1781	0	1807	1810	0	1762	1810	0	1794
Q Serve(g_s), s	1.0	0.0	8.1	1.4	0.0	7.3	0.6	0.0	2.9	2.2	0.0	4.6
Cycle Q Clear(g_c), s	1.0	0.0	8.1	1.4	0.0	7.3	0.6	0.0	2.9	2.2	0.0	4.6
Prop In Lane	1.00		0.10	1.00		0.15	1.00		0.27	1.00		0.23
Lane Grp Cap(c), veh/h	393	0	521	373	0	531	321	0	243	407	0	336
V/C Ratio(X)	0.18	0.00	0.79	0.24	0.00	0.71	0.10	0.00	0.58	0.30	0.00	0.67
Avail Cap(c_a), veh/h	480	0	822	477	0	846	475	0	726	476	0	744
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	9.6	0.0	12.9	9.7	0.0	12.3	13.9	0.0	15.8	13.0	0.0	14.8
Incr Delay (d2), s/veh	0.2	0.0	2.8	0.3	0.0	1.8	0.1	0.0	2.2	0.4	0.0	2.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.3	0.0	2.8	0.4	0.0	2.3	0.2	0.0	1.1	0.7	0.0	1.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	9.8	0.0	15.7	10.0	0.0	14.1	14.0	0.0	18.0	13.4	0.0	17.1
LnGrp LOS	A	A	B	B	A	B	B	A	B	B	A	B
Approach Vol, veh/h		481			467			173			347	
Approach Delay, s/veh		14.8			13.3			17.2			15.8	
Approach LOS		B			B			B			B	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	7.1	9.9	6.5	15.6	5.2	11.8	6.1	16.0				
Change Period (Y+Rc), s	4.0	4.5	4.0	4.5	4.0	4.5	4.0	4.5				
Max Green Setting (Gmax), s	4.6	16.1	4.8	17.5	4.5	16.2	4.0	18.3				
Max Q Clear Time (g_c+I1), s	4.2	4.9	3.4	10.1	2.6	6.6	3.0	9.3				
Green Ext Time (p_c), s	0.0	0.3	0.0	1.0	0.0	0.6	0.0	1.0				
Intersection Summary												
HCM 6th Ctrl Delay			14.8									
HCM 6th LOS			B									

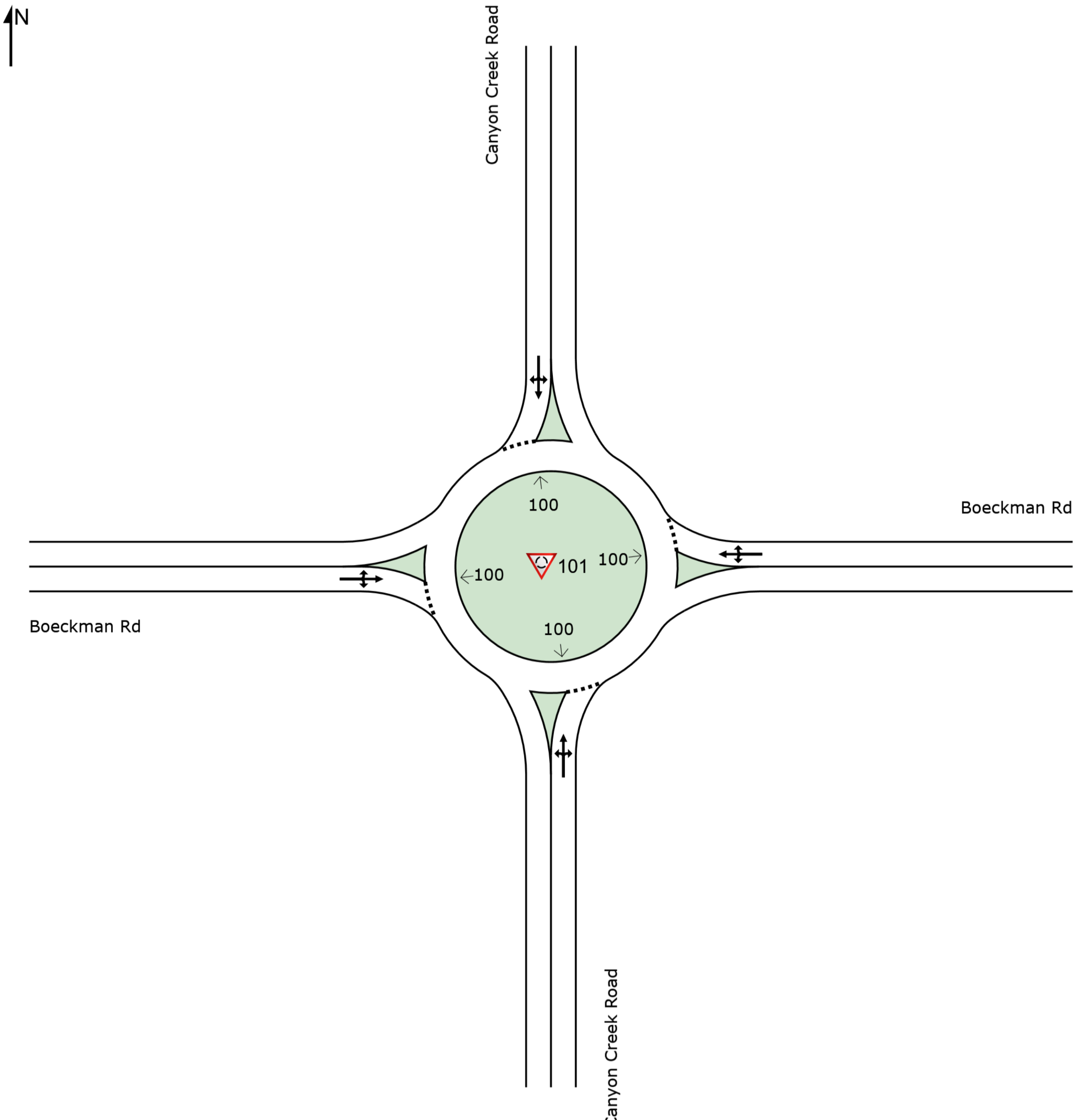
ID	Software/Method	Intersection	Control Type	LOS	Delay	V/C Ratio
5	Synchro HCM 6th Signal	Canyon Creek Rd & Boeckman Rd	Signal	B	14.8	0.59

SITE LAYOUT

Site: 101 [Boeckman Rd/Canyon Creek Rd (Site Folder: Frog Pond Elementary Mitigations)]

New Site
Site Category: (None)
Roundabout

Layout pictures are schematic functional drawings reflecting input data. They are not design drawings.



MOVEMENT SUMMARY

Site: 101 [Boeckman Rd/Canyon Creek Rd (Site Folder: Frog Pond Elementary Mitigations)]

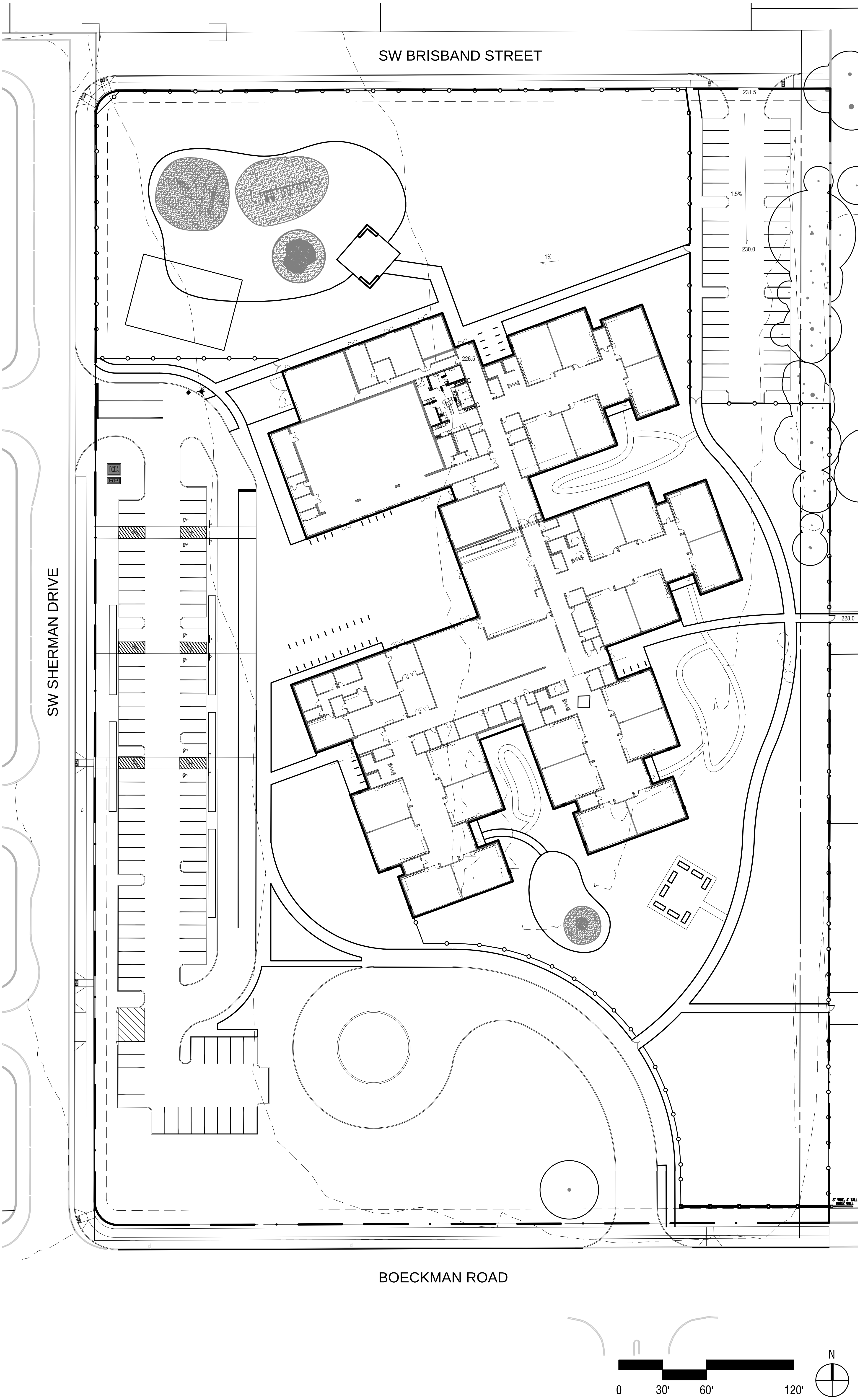
New Site
Site Category: (None)
Roundabout

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] %	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] ft	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed mph
South: Canyon Creek Road														
3	L2	29	0.0	32	0.0	0.325	8.6	LOS A	1.5	37.9	0.64	0.64	0.64	29.8
8	T1	93	3.0	103	3.0	0.325	8.7	LOS A	1.5	37.9	0.64	0.64	0.64	28.5
18	R2	101	0.0	112	0.0	0.325	8.6	LOS A	1.5	37.9	0.64	0.64	0.64	29.0
Approach		223	1.3	248	1.3	0.325	8.6	LOS A	1.5	37.9	0.64	0.64	0.64	28.9
East: Boeckman Rd														
1	L2	82	2.0	91	2.0	0.445	8.1	LOS A	2.7	68.9	0.50	0.36	0.50	30.3
6	T1	289	3.0	321	3.0	0.445	8.2	LOS A	2.7	68.9	0.50	0.36	0.50	33.1
16	R2	62	5.0	69	5.0	0.445	8.2	LOS A	2.7	68.9	0.50	0.36	0.50	30.8
Approach		433	3.1	481	3.1	0.445	8.2	LOS A	2.7	68.9	0.50	0.36	0.50	32.2
North: Canyon Creek Road														
7	L2	110	0.0	122	0.0	0.441	9.6	LOS A	2.7	68.3	0.66	0.68	0.78	30.8
4	T1	156	1.0	173	1.0	0.441	9.6	LOS A	2.7	68.3	0.66	0.68	0.78	27.9
14	R2	76	0.0	84	0.0	0.441	9.6	LOS A	2.7	68.3	0.66	0.68	0.78	29.9
Approach		342	0.5	380	0.5	0.441	9.6	LOS A	2.7	68.3	0.66	0.68	0.78	29.2
West: Boeckman Rd														
5	L2	62	0.0	69	0.0	0.538	11.1	LOS B	4.5	113.0	0.69	0.74	0.94	30.8
2	T1	334	2.0	371	2.0	0.538	11.2	LOS B	4.5	113.0	0.69	0.74	0.94	31.8
12	R2	45	2.0	50	2.0	0.538	11.2	LOS B	4.5	113.0	0.69	0.74	0.94	28.1
Approach		441	1.7	490	1.7	0.538	11.2	LOS B	4.5	113.0	0.69	0.74	0.94	31.2
All Vehicles		1439	1.8	1599	1.8	0.538	9.5	LOS A	4.5	113.0	0.62	0.60	0.72	30.6

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.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 6).
Roundabout Capacity Model: US HCM 6.
Delay Model: HCM Delay Formula (Geometric Delay is not included).
Queue Model: HCM Queue Formula.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

H. SITE PLAN


SW BRISBAND STREET
SW SHERMAN DRIVE
BOECKMAN ROAD
226.5
231.5
1.5%
230.0
1%
228.0
DCDA
RP
0
30'
60'
120'
N

Mayer/Reed

REPUBLIC SERVICES
10295 Southwest Ridder Road Wilsonville, OR 97070
o 503.570.0626 f 503.582.9307 republicservices.com

September 29, 2022

Brooke Besheone

Re: Frog Pond Primary School
7151 SW Boeckman Rd.
Wilsonville, OR 97070

Dear Brooke,

Thank you, for sending us the preliminary site plans for this proposed development in Wilsonville OR.

My Company: Republic Services of Clackamas and Washington Counties has the franchise agreement to service this area with the City of Wilsonville. We will provide complete commercial waste removal and recycling services as needed on a weekly basis for this location

The site access from SW Sherman Dr. onto the property, and the planned traffic pattern and turnaround will allow our trucks to safely maneuver and service the trash and recycle at the designated enclosure.

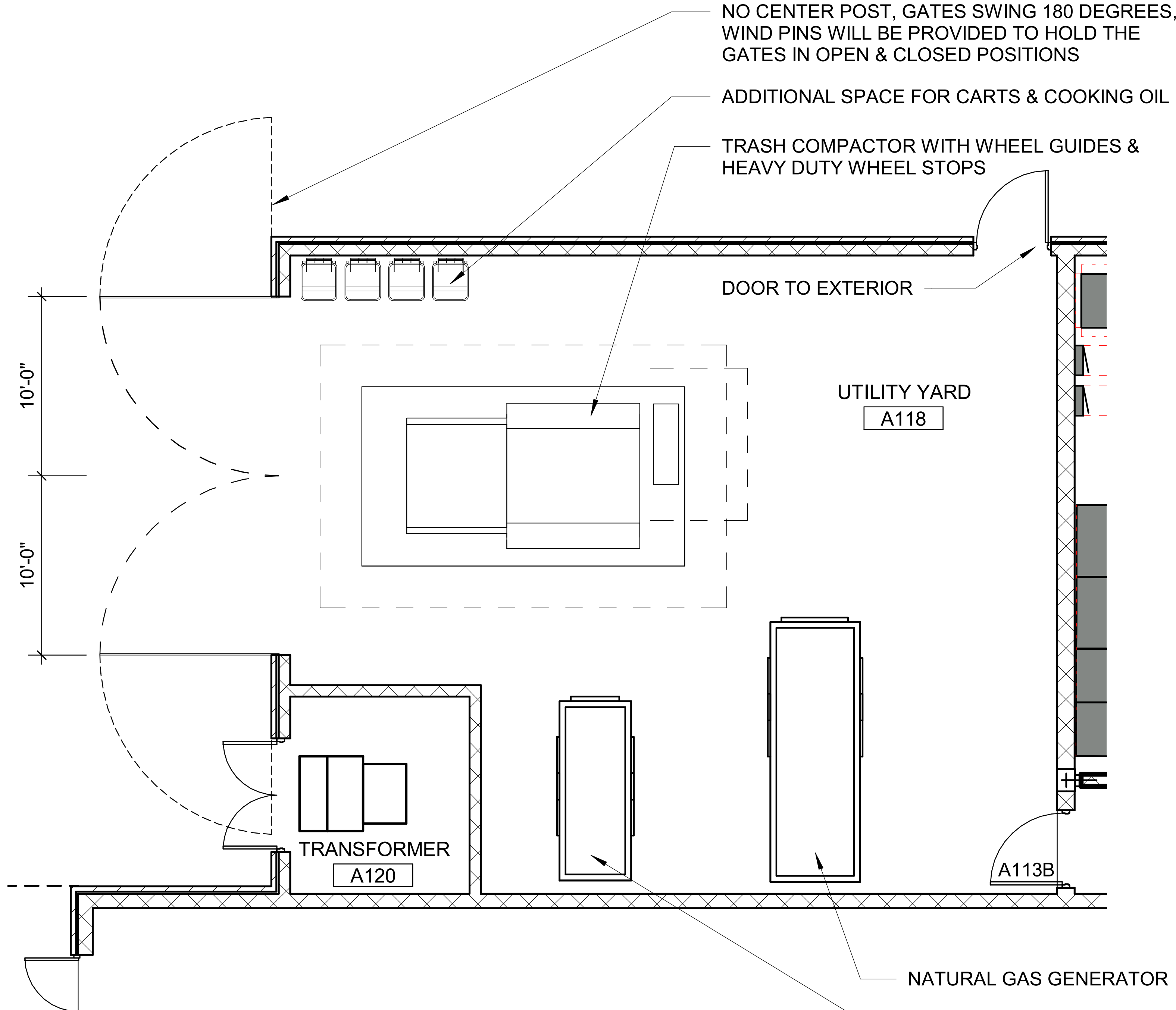
The enclosure design plan including a double gate opening width of 20' Ft. free space, wind pins attached to secure gates in the open and closed position, and gate swing radius of 180 degrees will allow access to the receptacles. The surface transition from the enclosure to driveway will be smooth, level, and free of any obstruction or curbing. The trash compactor placement and recycle equipment storage space will provide versatility for sideload carts and/or frontload container storage to accommodate the anticipated commingle recycling volumes for this facility.

The design plan of the self-contained 12 cubic yard trash compactor, to include wheel guides and wheel stops, accessible HPU hose disconnects and power shut-off is adequate. Our operations team will require confirmation of the compactor compatibility with our trucks superior endless chain roll off system and ground set up at the time of installation.

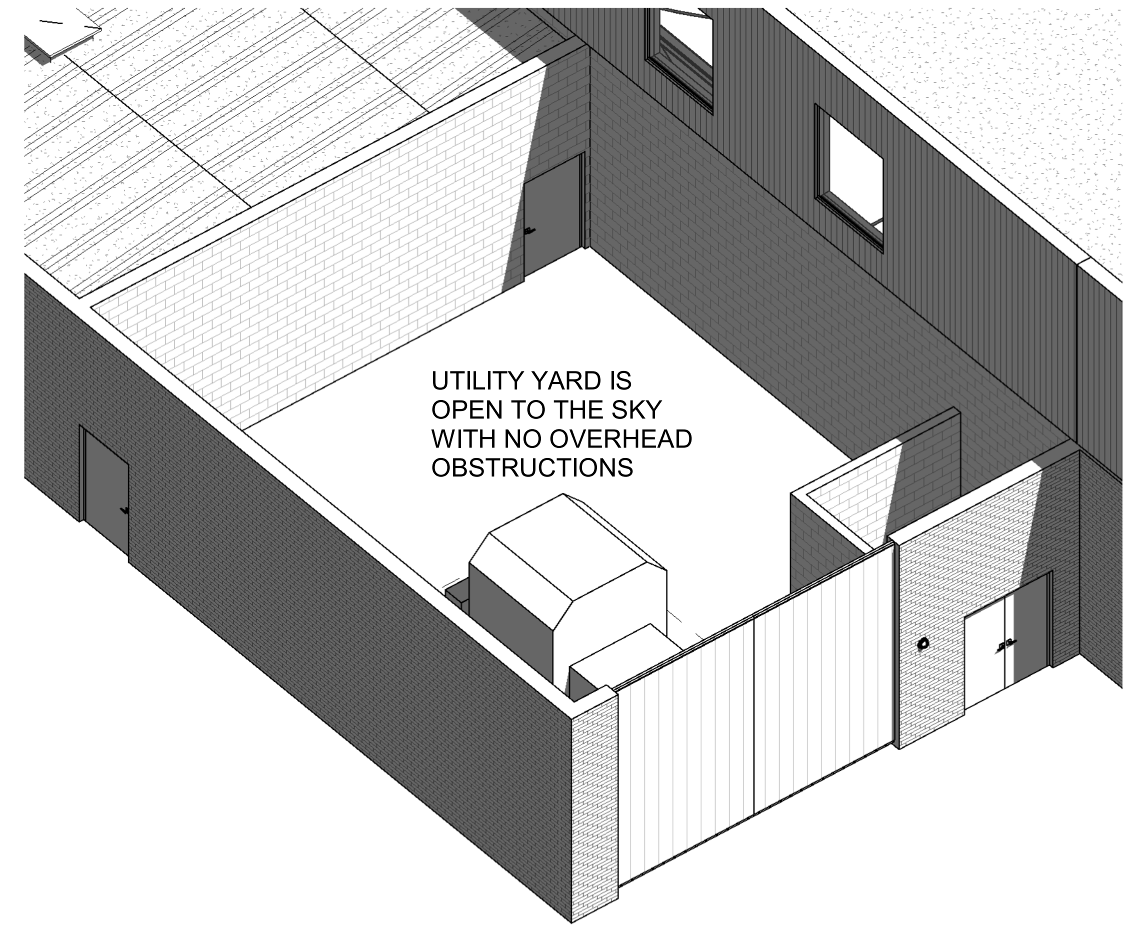
Thanks Brooke, for your help and concerns for our services prior to this project being developed.

Sincerely,

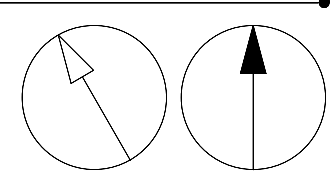
Kelly Herrod
Operations Supervisor
Republic Services Inc.



1 **FLOOR PLAN - UTILITY YARD**
SCALE: 1/8" = 1'-0"



2 **AXONOMETRIC**
SCALE:

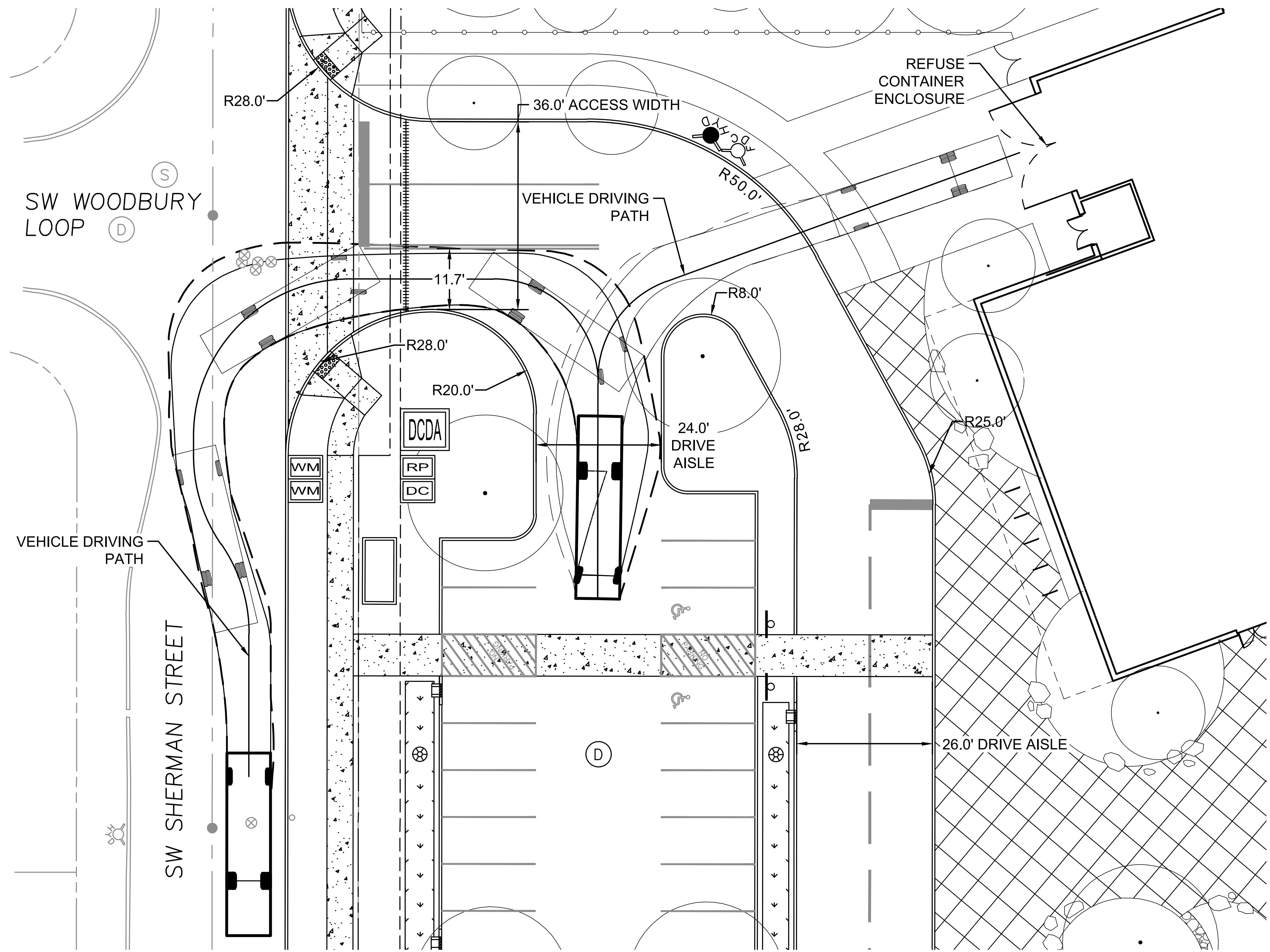


West Linn-Wilsonville School District

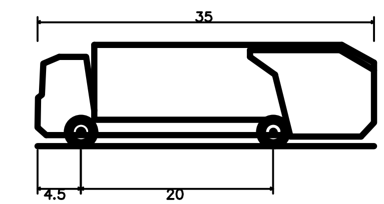
IBI GROUP

Frog Pond Primary School

Date: **2022-09-13** Project No: **137469** **Republic Services** **RS 01**



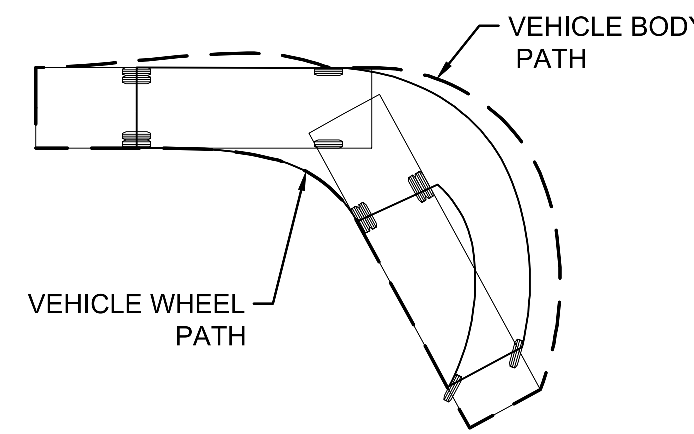
MACK MRU HEIL FRONT LOADER



Rear-Load Garbage Truck	
Overall Length	35.000ft
Overall Width	8.375ft
Overall Body Height	10.546ft
Min Body Ground Clearance	1.000ft
Track Width	8.375ft
Lock-to-lock time	6.00s
Curb to Curb Turning Radius	29.300ft

VEHICLE MOVEMENT SIMULATION CRITERIA

2.5 MPH MIN SIMULATION SPEED



N
W E
S

SCALE: 1" = 20'
0 20 40 FT

09/07/22

FROG POND PRIMARY SCHOOL

WEST LINN / WILSONVILLE SCHOOL DISTRICT

SOLID WASTE VEHICULAR ACCESS PLAN (REPUBLIC SERVICES)

3J CONSULTING
CIVIL ENGINEERING . WATER RESOURCES . COMMUNITY PLANNING

Tree Protection Specifications

It is critical that the following steps be taken to ensure that trees slated for retention are protected.

Before Construction Begins

1. **Tree removals** within the tree protection area.
    a. Prior to construction, allow tree removal within the tree protection area to occur.
        i. The project arborist shall oversee the removal of any trees within the tree protection zone.
    b. Installing tree protection fencing immediately following the removal of trees within the tree protection area (see 3 below). Tree protecting shall be installed after removals to ensure:
        i. Tree removals are performed safely.
        ii. Tree protection fencing is not accidentally or intentionally moved.
2. **Notify all contractors of the tree protection procedures.** For successful tree protection on a construction site, all contractors must know and understand the goals of tree protection. It can only take one mistake with a misplaced trench or other action to destroy the future of a tree.
    a. Hold a Tree Protection meeting with all contractors to fully explain goals of tree protection.
    b. Have all sub-contractors sign memoranda of understanding regarding the goals of tree protection. Memoranda to include penalty for violating tree protection plan. Penalty to equal appraised value of tree(s) within the violated tree protection zone per the current Trunk Formula Method as outline by the Council of Tree & Landscape Appraisers current edition of the ***Guide for Plant Appraisal***. Penalty is to be paid to owner of the property.
3. **Fencing.**
    a. Establish fencing around each tree or grove of trees to be retained. The tree protection fencing should be placed at 6X the diameter of the tree. For example: tree #2442 is a 27" DBH Pine. 27 X 0.5 = 13.5. The fencing should be thirteen-feet-six-inches away from the trunk in circumference of the tree,
    b. The fencing is to be put in place before the ground is cleared in order to protect the trees and the soil around the trees from any disturbance at all.
    c. Fencing is to be placed at the edge of the root protection zone. Root protection zones are to be established by the project arborist based on the needs of the site and the tree to be protected.
    d. Fencing is to consist of a minimum of 4-foot-high metal fencing secured to the ground with metal posts to prevent it from being moved by contractors, sagging, or falling down OR as required by municipal code.
    e. Fencing is to remain in the position that is established by the project arborist and not to be moved without written permission from the project arborist until the end of the project.

4. **Signage**
    a. All tree protection fencing should have signage as follows so that all contractors understand the purpose of the fencing:

VEGETATION/TREE PROTECTION ZONE DO NOT REMOVE OR ADJUST THIS FENCING**.** The fence locations are approved to protect vegetation & trees. NOTE: Moving these fences is a civil violation. Please contact the Code Enforcement Specialist and project arborist, if alterations to the approved location of the protection fencing is requested. Project Arborist: TERAGAN & ASSOCIATES, INC 503-697-1975

    b. Signage should be place as to be visible from all sides of a tree protection area and spaced every 35 feet.

During Construction

1. **Protection guidelines Within the Root Protection Zone**
    a. No traffic shall be allowed within the root protection zone. No vehicle, heavy equipment, or even repeated foot traffic.
    b. No storage of materials including but not limiting to soil, construction material, or waste from the site.
        i. Waste includes but is not limited to concrete wash out, gasoline, diesel, paint, cleaner, thinners, etc.
    c. Construction trailers are not to be parked / placed within the root protection zone without written clearance from project arborist.
    d. No vehicles shall be allowed to park within the root protection areas.
    e. No activity shall be allowed that will cause soil compaction within the root protection zone.
2. **Tree pruning.** The trees shall be protected from any cutting, skinning, or breaking of branches, trunks or roots.
3. **Root pruning.** Any roots that are to be cut from existing trees that are to be retained, the project consulting arborist shall be notified to evaluate and oversee the proper cutting of roots with sharp cutting tools. Cut roots are to be immediately covered with soil or mulch to prevent them from drying out.
4. **Grade changes**. No grade change should be allowed within the root protection zone.
5. **Root protection zone changes.** Any necessary deviation of the root protection zone shall be cleared by the project consulting arborist or project owner.
6. **Watering**. Provide water to trees during the summer months. Tree(s) that will have had root system(s) cut back will need supplemental water to overcome the loss of ability to absorb necessary moisture during the summer months.
7. **Utilities**. Any necessary passage of utilities through the root protection zone shall be by means of tunneling under roots by hand digging or boring.

After Construction

1. **Landscaping.** Carefully landscape in the area of the tree. Do not allow trenching within the root protection zone. Carefully plant new plants within the root protection zone. Avoid cutting the roots of the existing trees.
2. **Irrigation**. Do not plan for irrigation within the root protection zone of existing trees unless it is drip irrigation for a specific planting or cleared by the project arborist.
3. **Drainage**. Provide for adequate drainage of the location around the retained trees.
4. **Tree pruning**. Pruning of the trees should be completed as one of the last steps of the landscaping process before the final placement of trees, shrubs, ground covers, mulch or turf.
5. **Pest and disease inspection.** Provide for inspection and treatment of insect and disease populations that are capable of damaging the retained trees and plants.
6. **Fertilization**. Trees that are retained may need to be fertilized as called for by project arborist after final inspection.

FIRE CODE / LAND USE / BUILDING REVIEW APPLICATION

TVF&R Tualatin Valley Fire & Rescue

North Operating Center
11945 SW 70th Avenue
Tigard, OR 97223
Phone: 503-649-8577

South Operating Center
8445 SW Elligsen Rd
Wilsonville, OR 97070
Phone: 503-649-8577

REV 6-30-20

Project Information

Applicant Name: Rebecca Grant

Address: 907 SW Harvey Milk Street, Portland, Oregon 97205

Phone: (971) 227-5066

Email: rebecca.grant@ibigroup.com

Site Address: 7151 Boeckman Road

City: Wilsonville

Map & Tax Lot #:

Business Name: West Linn-Wilsonville School District

Land Use/Building Jurisdiction: Wilsonville

Land Use/ Building Permit #

Choose from: Beaverton, Tigard, Newberg, Tualatin, North Plains, West Linn, Wilsonville, Sherwood, Rivergrove, Durham, King City, Washington County, Clackamas County, Multnomah County, Yamhill County

Project Description

The new Primary School will be a starter primary school with 350 student capacity for grade levels pre-K-5. A future learning neighborhood addition will increase the capacity to 550 students.

The new facility will be built on a green-field site east of Boeckman Creek and north of Boeckman Road, in the City of Wilsonville. The school must be operational at the beginning of the 2024-2025 school year.

Permit/Review Type (check one):

- ✓ Land Use / Building Review - Service Provider Permit
- ☐ Emergency Radio Responder Coverage Install/Test
- ☐ LPG Tank (Greater than 2,000 gallons)
- ☐ Flammable or Combustible Liquid Tank Installation (Greater than 1,000 gallons)
  - * Exception: Underground Storage Tanks (UST) are deferred to DEQ for regulation.
- ☐ Explosives Blasting (Blasting plan is required)
- ☐ Exterior Toxic, Pyrophoric or Corrosive Gas Installation (in excess of 810 cu.ft.)
- ☐ Tents or Temporary Membrane Structures (in excess of 10,000 square feet)
- ☐ Temporary Haunted House or similar
- ☐ OLCC Cannabis Extraction License Review
- ☐ Ceremonial Fire or Bonfire (For gathering, ceremony or other assembly)

For Fire Marshal's Office Use Only

TVFR Permit #: 2022-0111

Permit Type: SPP

Submittal Date: 9/6/2022

Assigned To: McGladrey

Due Date: 10/4/2022

Fees Due: Ø

Fees Paid: Ø

Approval/Inspection Conditions
(For Fire Marshal's Office Use Only)

This section is for application approval only

McGl— 10/4/2022

Fire Marshal or Designee   Date

Conditions: A Final TVF&R inspection is required.

ERRC system requires approval of Washington County Consolidated Communications Agency

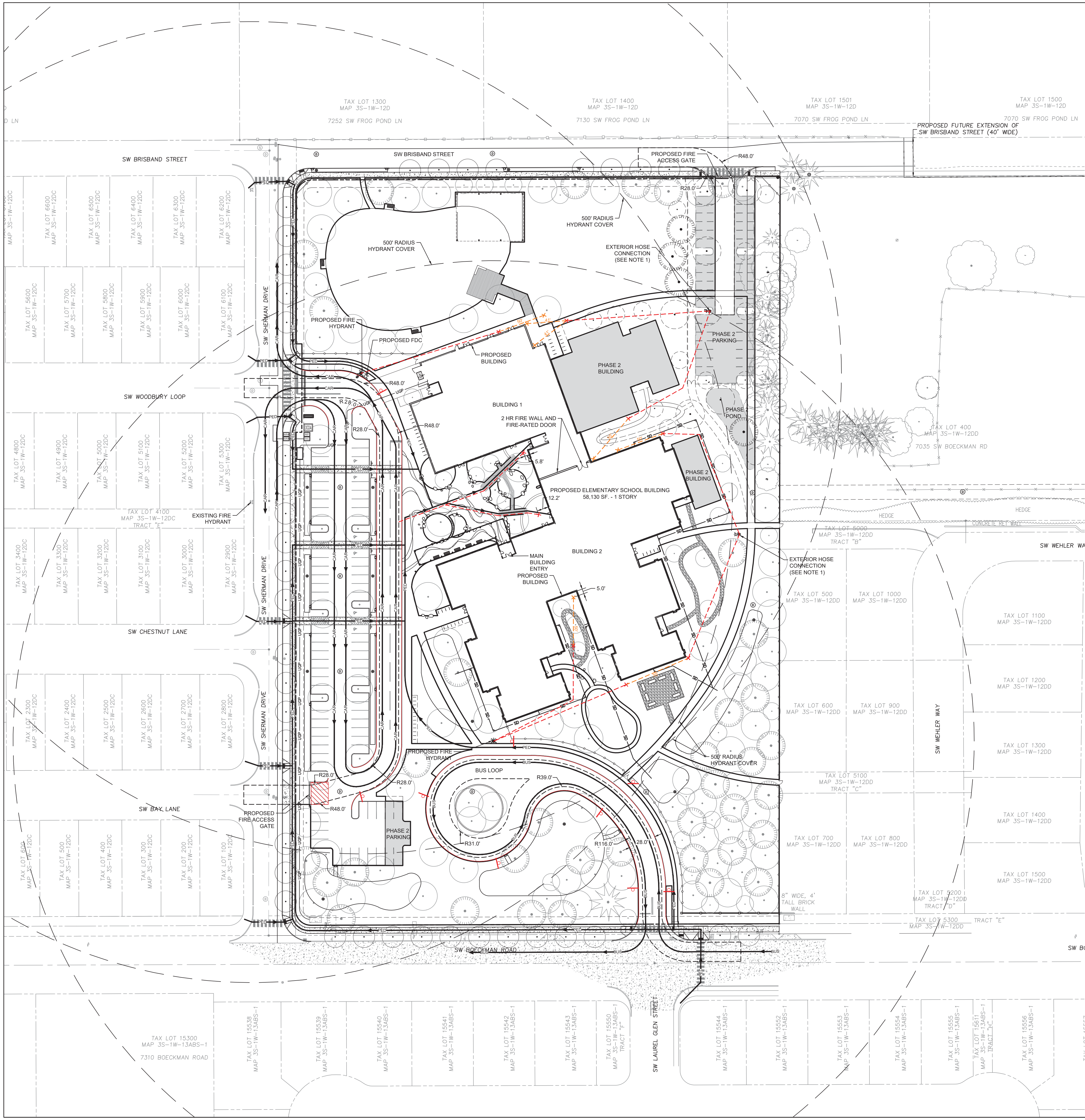
See Attached Conditions: ☐ Yes ☐ No

Site Inspection Required: ☒ Yes ☐ No

This section used when site inspection is required

Inspection Comments:

Final TVFR Approval Signature & Emp ID   Date

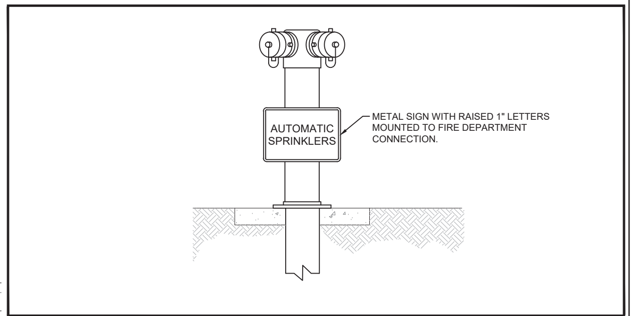


LEGEND

- PROPOSED FIRE HOSE PULL (150')
- PROPOSED FIRE HOSE PULL EXTENTS (EXCEEDS 150')
- PROPOSED 450' HYDRANT COVER RADIUS
- PROPOSED FIRE HYDRANT
- PROPOSED EXTERIOR HOSE CONNECTION WITH POST INDICATOR VALVE
- PROPOSED FDC
- PROPOSED 20' WIDE FIRE ACCESS PATH INSIDE RADIUS 28 FT, OUTSIDE RADIUS 48 FT
- PROPOSED NO PARKING FIRE LANE CURB STRIPING
- PROPOSED NO PARKING FIRE LANE SIGN
- BUS CIRCULATION ROUTE
- CAR CIRCULATION ROUTE
- PEDESTRIAN CIRCULATION ROUTE

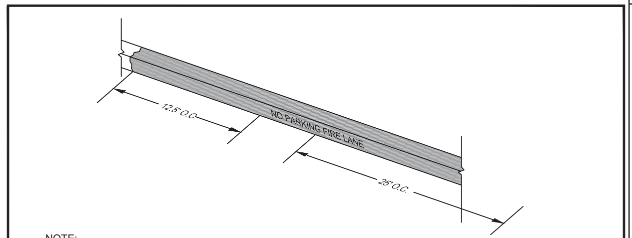
NOTES

1. ALTERNATE METHOD PROPOSED IN LIEU OF FIRE DEPARTMENT ACCESS ON THE NORTH AND EAST SIDES OF THE BUILDING (150-FT FIRE HOSE PULL RULE). ALTERNATE METHOD UTILIZES EXTERNAL HOSE CONNECTIONS IN CONJUNCTION WITH THE INTERNAL PLUMBING AND WET SPRINKLER SYSTEM.
2. BUILDING TO BE FULLY SPRINKLERED.
3. LEVEL 1 BUILDING LAYOUT SHOWN.



DETAIL NUMBER 1

FIRE DEPARTMENT CONNECTION (FDC) SIGNAGE



NOTE:
1. PAINT CURBING BRIGHT RED AND STENCIL WITH 1" WIDE BY 4" HIGH LETTERS 'NO PARKING FIRE LANE' IN WHITE
2. DIMENSIONS PER OFC 503.3

DETAIL NUMBER 2

RED PAINTED FIRE CURB

NO PARKING FIRE LANE LEFT ARROW

NO PARKING FIRE LANE DOUBLE ARROW PER OFC D103.6

NO PARKING FIRE LANE RIGHT ARROW

NOT TO SCALE

DETAIL NUMBER 3

NO PARKING FIRE LANE SIGNAGE

Know what's below. Call before you dig.

CLIENT
West Linn-Wilsonville School District
2755 SW Borland Road,
Tualatin, OR 97062

ISSUES

No.	DESCRIPTION	DATE
1	100% DESIGN DEVELOPMENT	2022-09-01

True North   Project North

CONSULTANTS
3J CONSULTING
CIVIL ENGINEERING
WATER RESOURCES
COMMUNITY PLANNING
9600 SW NIMBUS AVE., SUITE 100; BEAVERTON, OR 97008

SEAL

PRIME CONSULTANT
IBI GROUP
907 SW Harvey Milk Street
Portland, OR 97205, USA
tel 503 226 6950 fax 503 273 9192
ibigroup-edpnw.com

PROJECT
New Wilsonville Primary School
7151 Boeckman Road
Wilsonville, OR 97070

PROJECT NO:
137469

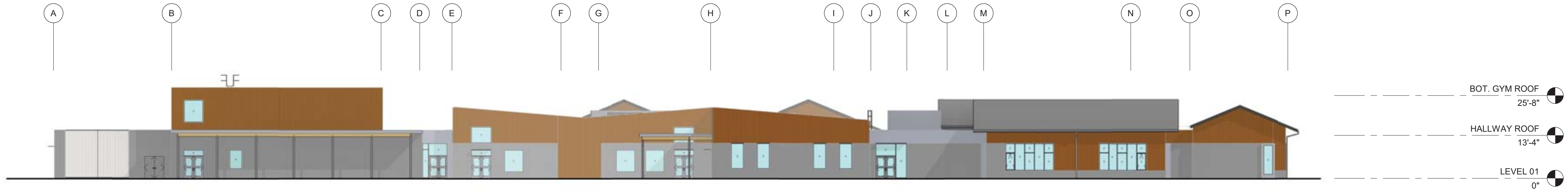
SHEET TITLE
FIRE SITE PLAN

SHEET NUMBER
FS-1

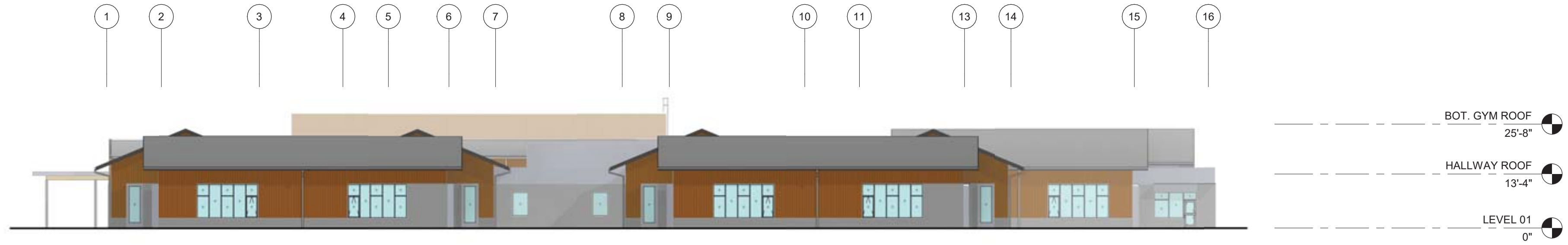
P:\22768-WLWV Frog Pond ES\CAD\Sheets\C1100 EXTG CONDITIONS PLAN.dwg

SCALE CHECK 10mm 1 in

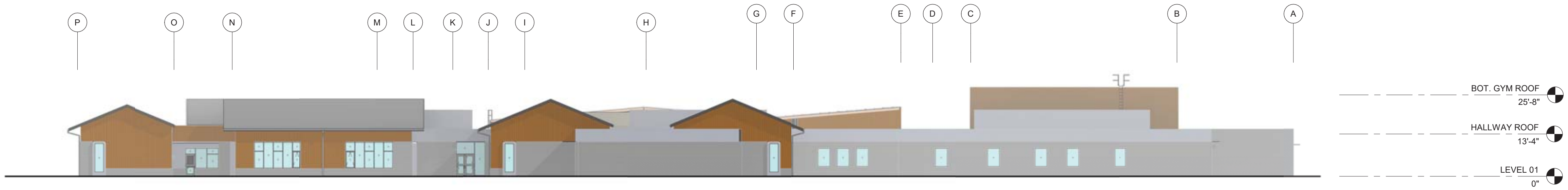
6/28/2022 10:16 PM



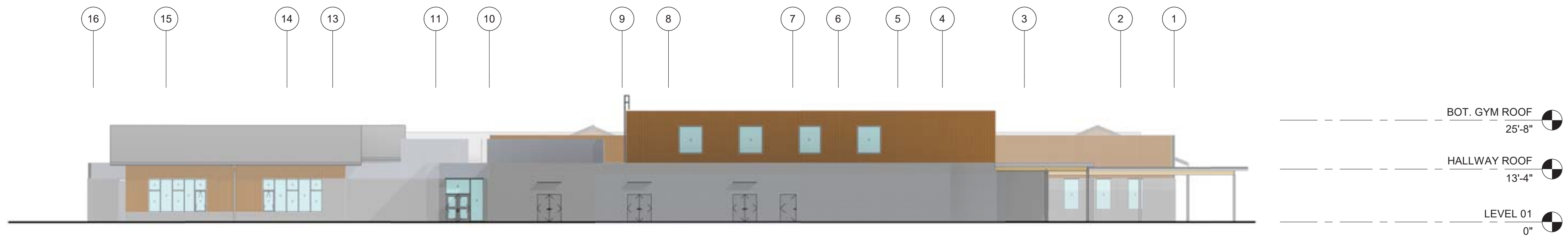
4 WEST ELEVATION - OVERALL
SCALE: 1/16" = 1'-0"



3 SOUTH ELEVATION - OVERALL
SCALE: 1/16" = 1'-0"



2 EAST ELEVATION - OVERALL
SCALE: 1/16" = 1'-0"



1 NORTH ELEVATION - OVERALL
SCALE: 1/16" = 1'-0"

2022-09-02 2:27:04 PM

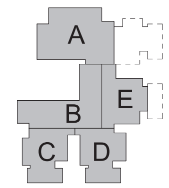
CLIENT
West Linn-Wilsonville School District
2755 SW Borland Road,
Tualatin, OR 97062

ISSUES

No.	DESCRIPTION	DATE
	100% DESIGN DEVELOPMENT	2022-09-01

NOT FOR CONSTRUCTION

KEYPLAN



CONSULTANTS

SEAL

PRIME CONSULTANT
IBI GROUP
907 SW Harvey Milk Street
Portland, OR 97205, USA
tel 503 226 6950 fax 503 273 9192
ibigroup-edpnw.com

PROJECT
Frog Pond Primary School
7151 Boeckman Road
Wilsonville, OR 97070

PROJECT NO:
137469

SHEET TITLE
OVERALL BUILDING ELEVATIONS

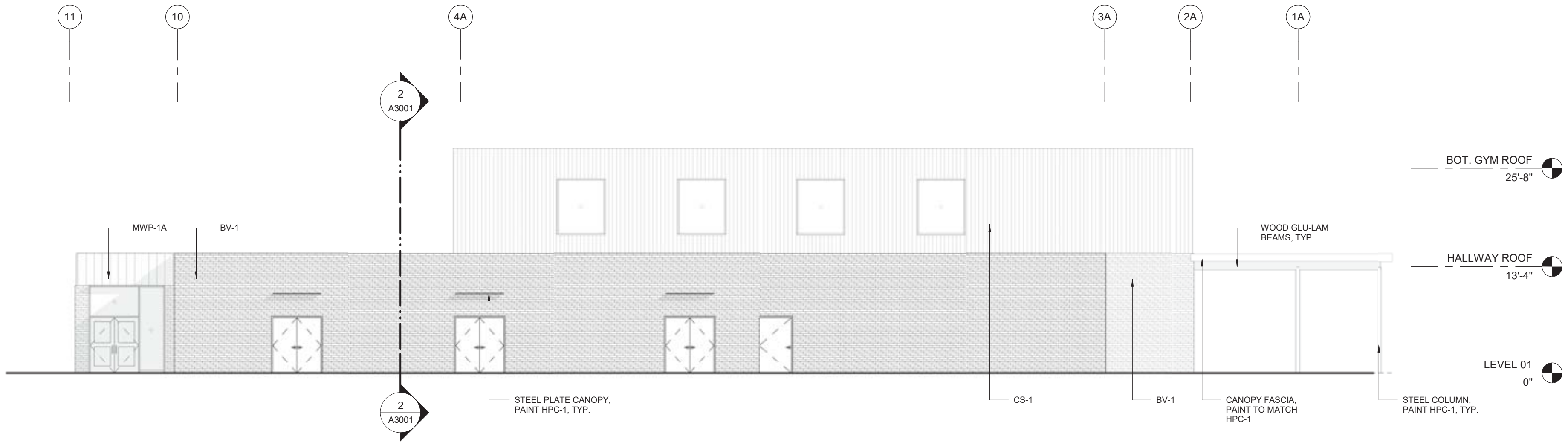
SHEET NUMBER
FS-2

Autodesk Docs://137469-FrogPond_ES R2022/137469_FrogPondES_R22.rvt

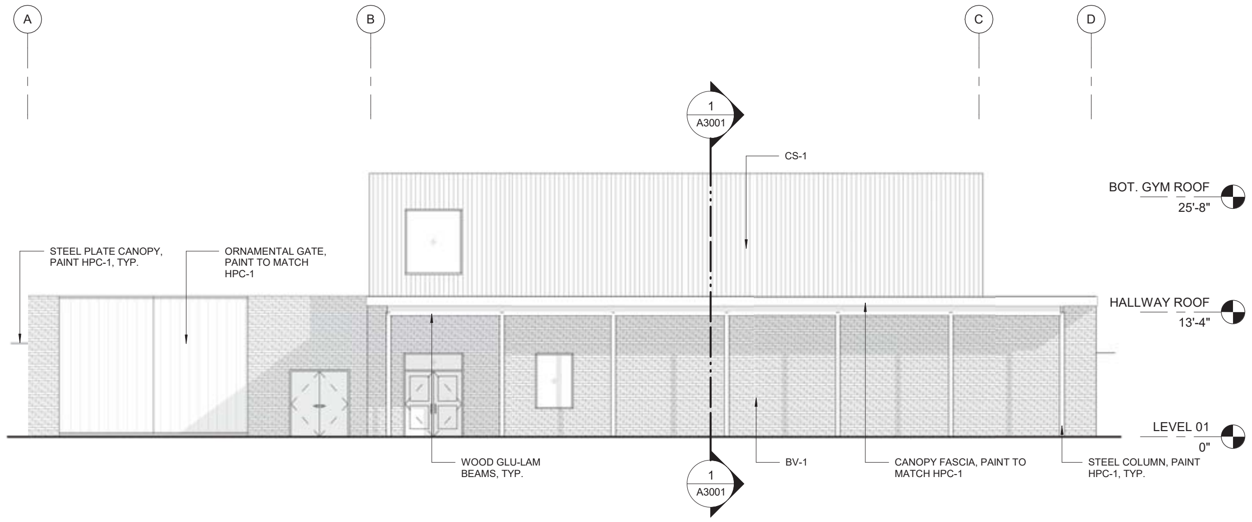
SCALE CHECK
1 in
10mm

EXTERIOR ELEVATIONS NOTES:

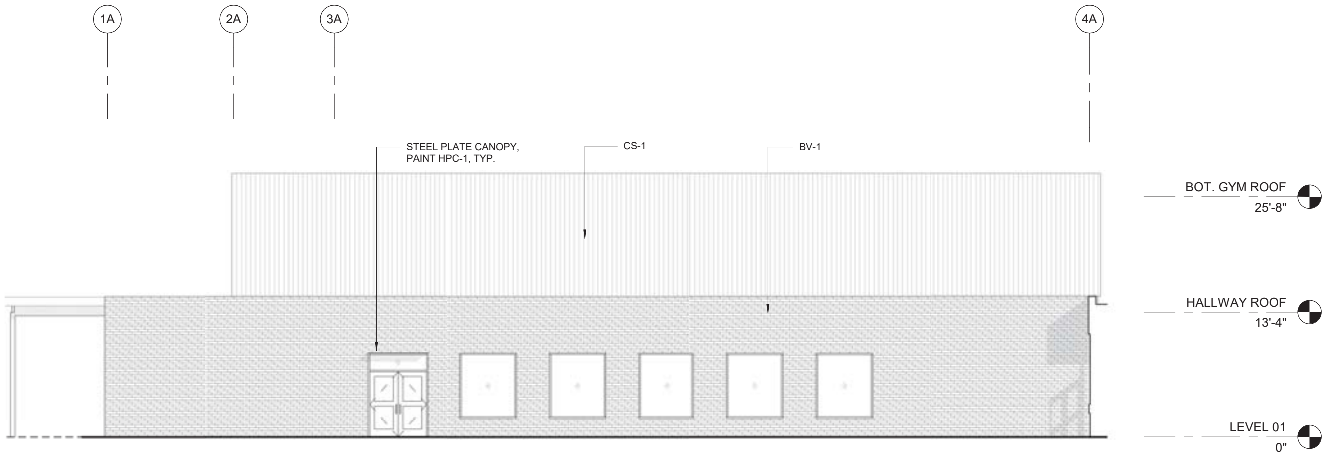
1. HPC - HIGH PERFORMANCE COATING ON ALL EXPOSED STEEL.
2. NOT ALL MECHANICAL, PLUMBING, ELECTRICAL OR TECHNOLOGY FIXTURES AND DEVICES ARE SHOWN. COORDINATE WITH MECHANICAL, PLUMBING, ELECTRICAL, AND TECHNOLOGY DRAWINGS FOR ADDITIONAL FIXTURES AND DEVICES.
3. ALL EXTERIOR WINDOWS ARE STOREFRONT.
4. PREFINISHED METAL FASCIAS, GUTTERS AND COPINGS, TYP.
5. REFERENCE ELEVATIONS FOR GENERAL HEIGHTS AND MATERIALS, SEE FLOOR PLAN FOR LENGTHS.



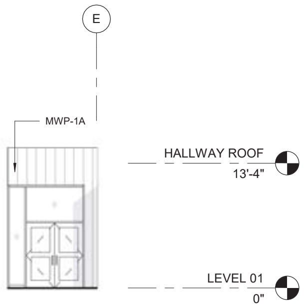
3 NORTH ELEVATION - SECTOR A
SCALE: 1/8" = 1'-0"



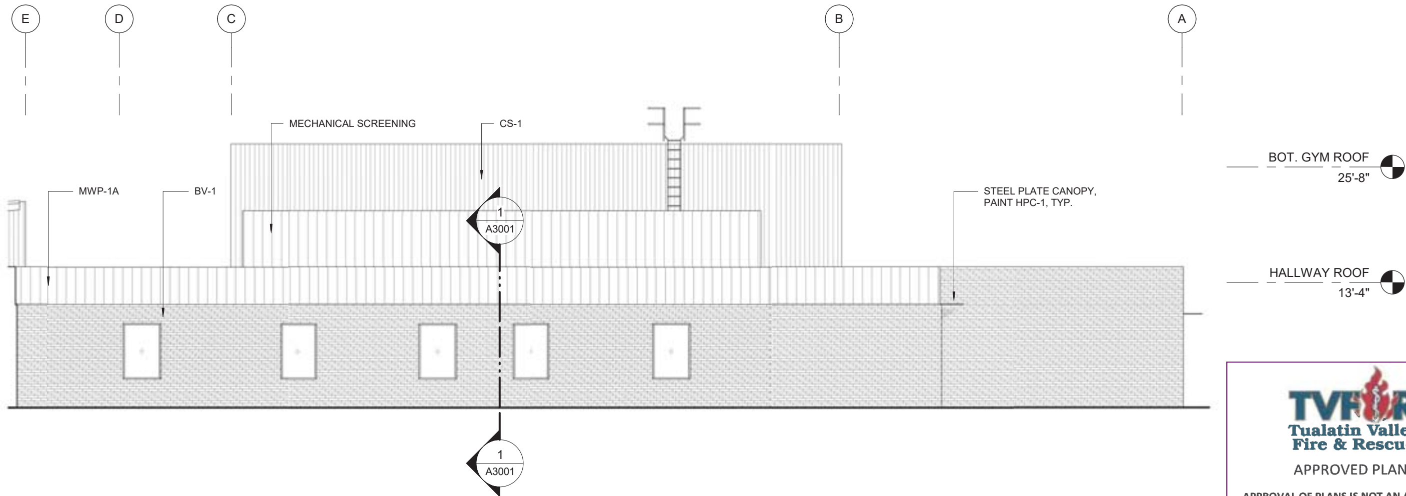
5 WEST ELEVATION - SECTOR A
SCALE: 1/8" = 1'-0"



2 SOUTH ELEVATION - SECTOR A
SCALE: 1/8" = 1'-0"



4 WEST ELEVATION - SECTOR A
SCALE: 1/8" = 1'-0"



1 EAST ELEVATION - SECTOR A
SCALE: 1/8" = 1'-0"

TVF&R
Tualatin Valley Fire & Rescue
APPROVED PLANS
APPROVAL OF PLANS IS NOT AN APPROVAL OF OMISSIONS OR OVERSIGHTS.
Deputy Fire Marshal II

TVF&R Permit #2022-0111

CLIENT
West Linn-Wilsonville School District
2755 SW Borland Road,
Tualatin, OR 97062

ISSUES

No.	DESCRIPTION	DATE
	100% SCHEMATIC DESIGN	2022-06-03
	100% DESIGN DEVELOPMENT	2022-09-01

NOT FOR CONSTRUCTION

KEYPLAN
A
B
E
C
D

CONSULTANTS

SEAL

PRIME CONSULTANT
IBI GROUP
907 SW Harvey Milk Street
Portland, OR 97205, USA
tel 503 226 6950 fax 503 273 9192
ibigroup-edpnw.com

PROJECT
Frog Pond Primary School
7151 Boeckman Road
Wilsonville, OR 97070

PROJECT NO:
137469

SHEET TITLE
BUILDING ELEVATIONS

SHEET NUMBER
FS-3

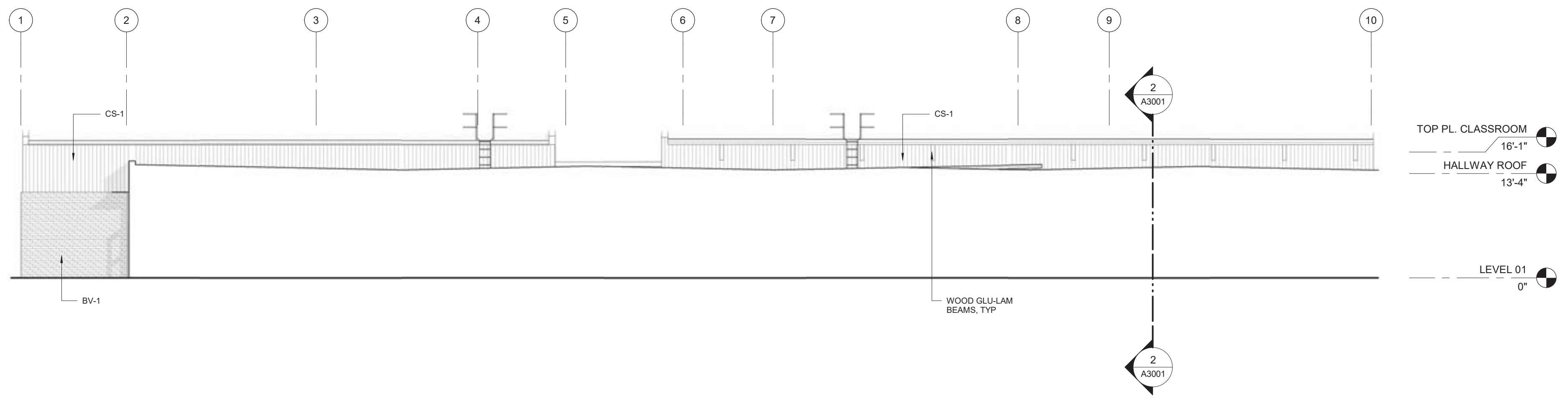
Autodesk Docs://137469-FrogPond_ES R2022/137469_FrogPondES_R22.rvt

SCALE CHECK
10mm
1 in

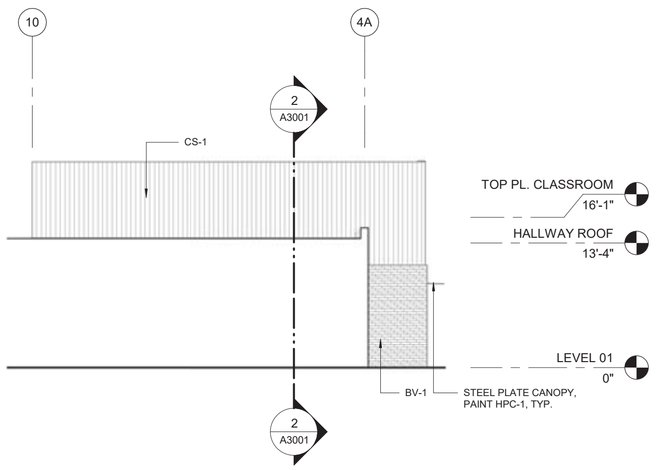
2022-09-02 2:27:09 PM

EXTERIOR ELEVATIONS NOTES:

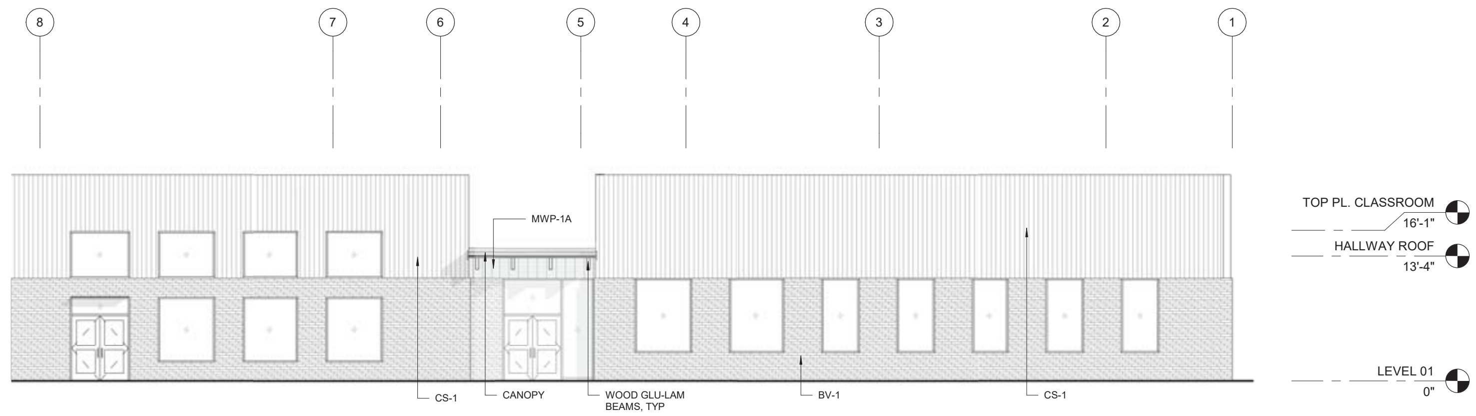
1. HPC - HIGH PERFORMANCE COATING ON ALL EXPOSED STEEL.
2. NOT ALL MECHANICAL, PLUMBING, ELECTRICAL OR TECHNOLOGY FIXTURES AND DEVICES ARE SHOWN. COORDINATE WITH MECHANICAL, PLUMBING, ELECTRICAL, AND TECHNOLOGY DRAWINGS FOR ADDITIONAL FIXTURES AND DEVICES.
3. ALL EXTERIOR WINDOWS ARE STOREFRONT.
4. PREFINISHED METAL FASCIAS, GUTTERS AND COPINGS, TYP.
5. REFERENCE ELEVATIONS FOR GENERAL HEIGHTS AND MATERIALS, SEE FLOOR PLAN FOR LENGTHS.



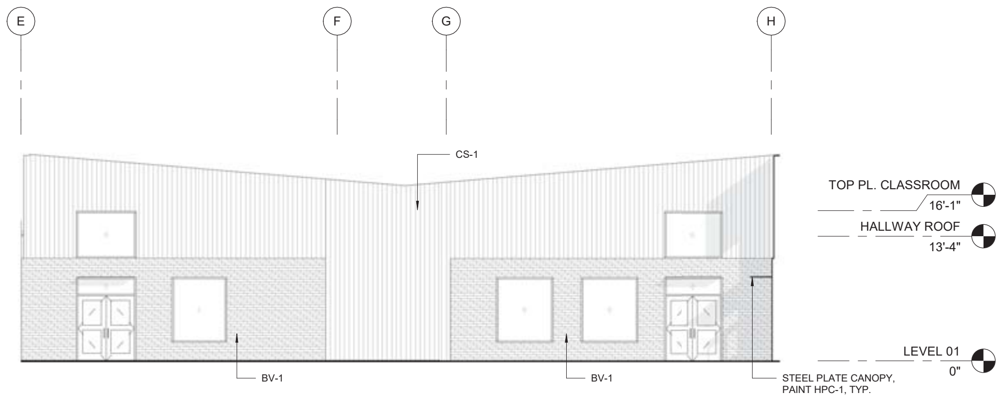
3 **SOUTH ELEVATION - SECTOR B**
SCALE: 1/8" = 1'-0"



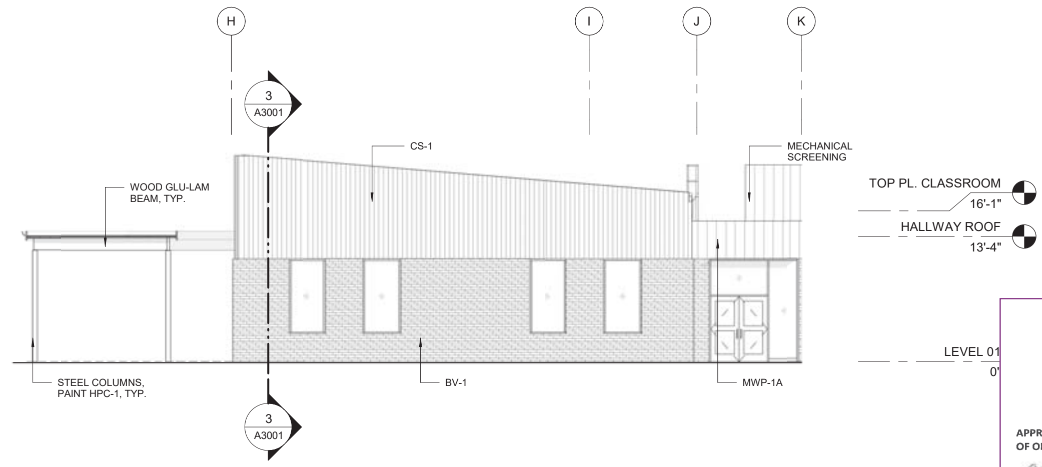
4 **NORTH ELEVATION - SECTOR B**
SCALE: 1/8" = 1'-0"



2 **NORTH ELEVATION - SECTOR B**
SCALE: 1/8" = 1'-0"



5 **WEST ELEVATION - SECTOR B**
SCALE: 1/8" = 1'-0"



1 **WEST ELEVATION - SECTOR B**
SCALE: 1/8" = 1'-0"

TVF&R Tualatin Valley Fire & Rescue
APPROVED PLANS
APPROVAL OF PLANS IS NOT AN APPROVAL OF OMISSIONS OR OVERSIGHTS.
Deputy Fire Marshal II

TVF&R Permit #2022-0111

2022-09-02 2:27:14 PM

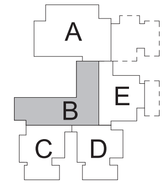
CLIENT
West Linn-Wilsonville School District
2755 SW Borland Road,
Tualatin, OR 97062

ISSUES

No.	DESCRIPTION	DATE
	100% SCHEMATIC DESIGN	2022-06-03
	100% DESIGN DEVELOPMENT	2022-09-01

NOT FOR CONSTRUCTION

KEYPLAN



CONSULTANTS

SEAL

PRIME CONSULTANT
IBI GROUP
907 SW Harvey Milk Street
Portland, OR 97205, USA
tel 503 226 6950 fax 503 273 9192
ibigroup-edpnw.com

PROJECT
Frog Pond Primary School
7151 Boeckman Road
Wilsonville, OR 97070

PROJECT NO:
137469

SHEET TITLE
BUILDING ELEVATIONS

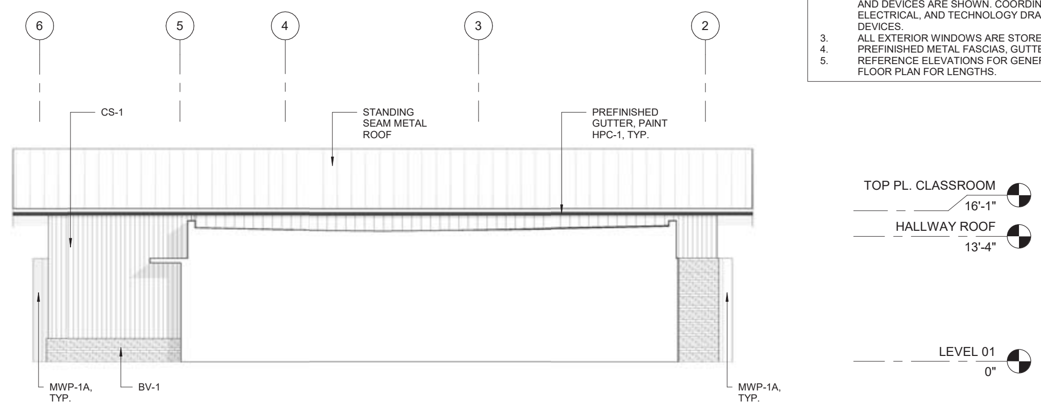
SHEET NUMBER
FS-4

Autodesk Docs://137469-FrogPond_ES R2022/137469_FrogPondES_R22.rvt

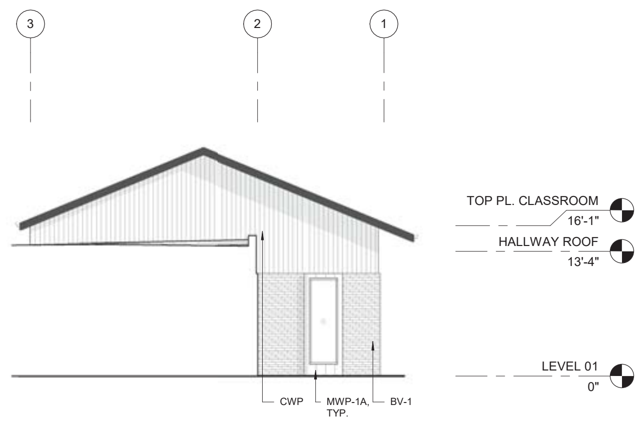
SCALE CHECK
1 in
10mm

EXTERIOR ELEVATIONS NOTES:

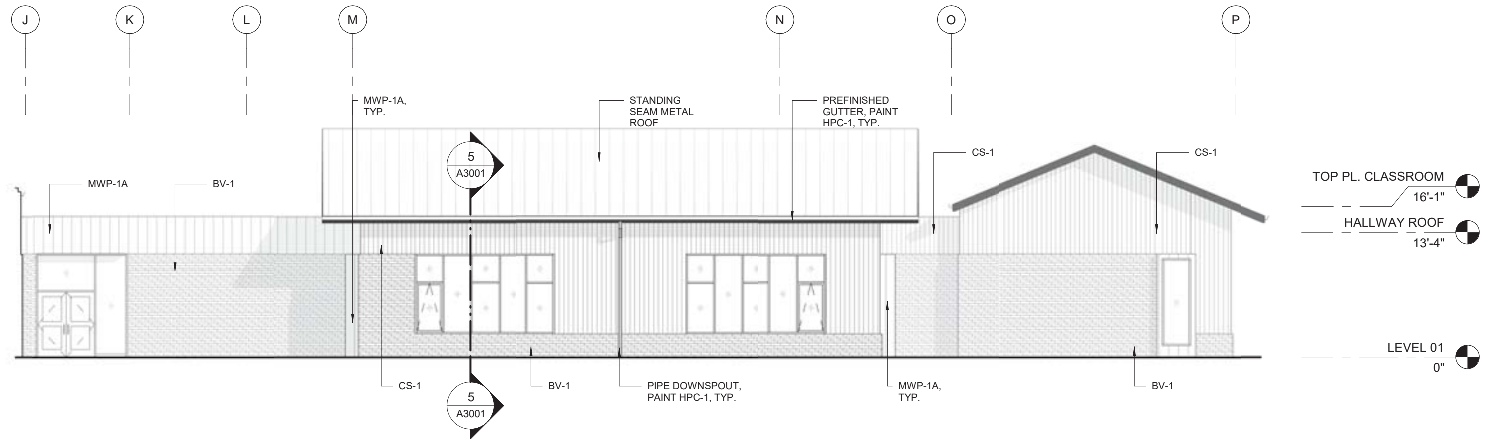
1. HPC - HIGH PERFORMANCE COATING ON ALL EXPOSED STEEL.
2. NOT ALL MECHANICAL, PLUMBING, ELECTRICAL OR TECHNOLOGY FIXTURES AND DEVICES ARE SHOWN. COORDINATE WITH MECHANICAL, PLUMBING, ELECTRICAL, AND TECHNOLOGY DRAWINGS FOR ADDITIONAL FIXTURES AND DEVICES.
3. ALL EXTERIOR WINDOWS ARE STOREFRONT.
4. PREFINISHED METAL FASCIAS, GUTTERS AND COPINGS, TYP.
5. REFERENCE ELEVATIONS FOR GENERAL HEIGHTS AND MATERIALS, SEE FLOOR PLAN FOR LENGTHS.



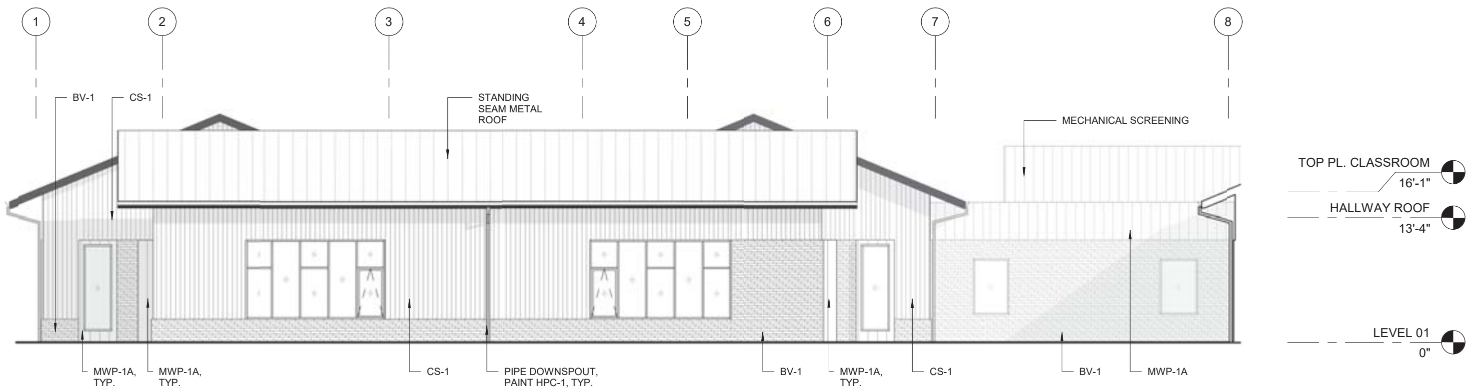
6 NORTH ELEVATION 1 - SECTOR C
SCALE: 1/8" = 1'-0"



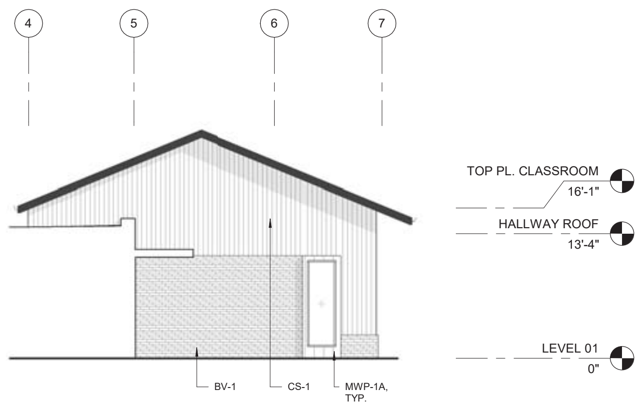
5 NORTH ELEVATION 2 - SECTOR C
SCALE: 1/8" = 1'-0"



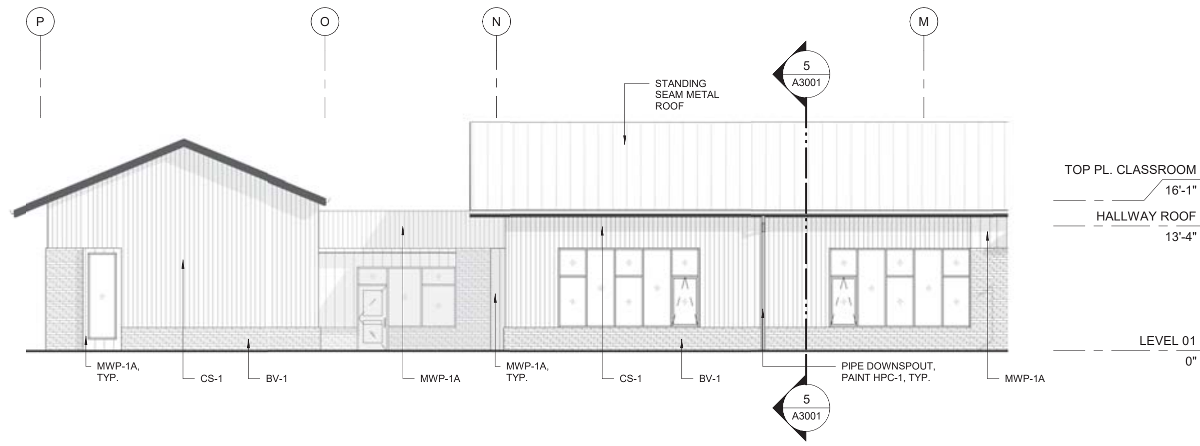
4 WEST ELEVATION - SECTOR C
SCALE: 1/8" = 1'-0"



3 SOUTH ELEVATION - SECTOR C
SCALE: 1/8" = 1'-0"



2 SOUTH ELEVATION 3 - SECTOR C
SCALE: 1/8" = 1'-0"



1 EAST ELEVATION - SECTOR C
SCALE: 1/8" = 1'-0"

TVF&R Tualatin Valley Fire & Rescue
APPROVED PLANS
APPROVAL OF PLANS IS NOT AN APPROVAL OF OMISSIONS OR OVERSIGHTS.
Alex McGh...
Deputy Fire Marshal II

TVF&R Permit #2022-0111

2022-09-02 2:27:19 PM

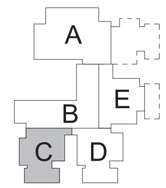
CLIENT
West Linn-Wilsonville School District
2755 SW Borland Road, Tualatin, OR 97062

ISSUES

No.	DESCRIPTION	DATE
	100% SCHEMATIC DESIGN	2022-06-03
	100% DESIGN DEVELOPMENT	2022-09-01

NOT FOR CONSTRUCTION

KEYPLAN



CONSULTANTS

SEAL

PRIME CONSULTANT
IBI GROUP
907 SW Harvey Milk Street
Portland, OR 97205, USA
tel 503 226 6950 fax 503 273 9192
ibigroup-edpnw.com

PROJECT
Frog Pond Primary School
7151 Boeckman Road
Wilsonville, OR 97070

PROJECT NO:
137469

SHEET TITLE
BUILDING ELEVATIONS

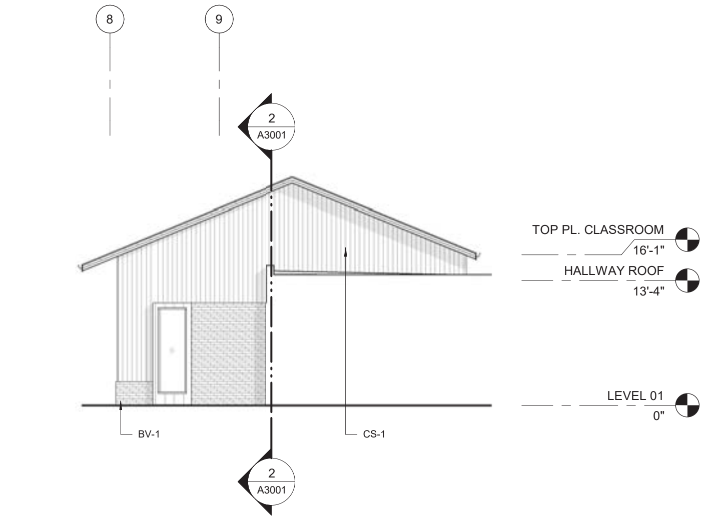
SHEET NUMBER
FS-5

Autodesk Docs://137469-FrogPond_ES R2022/137469_FrogPondES_R22.rvt

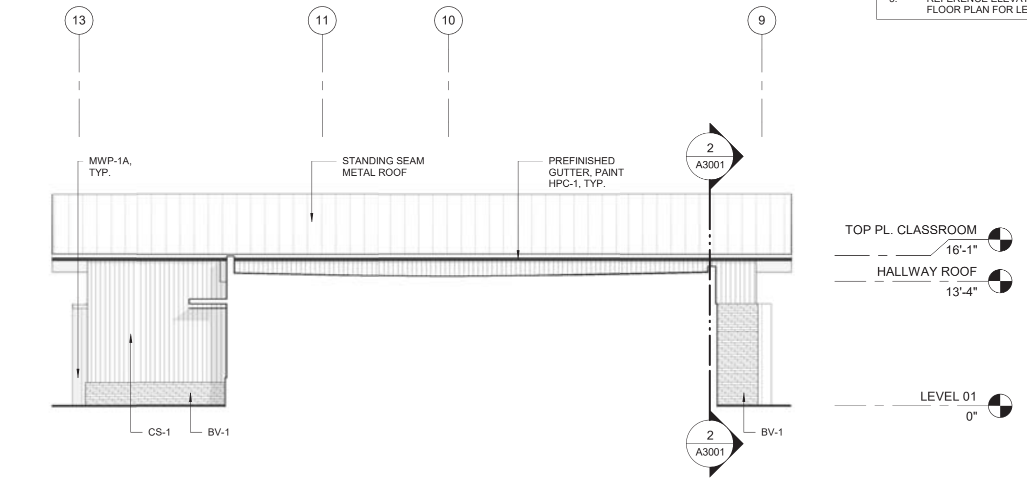
SCALE CHECK
10mm
1 in

EXTERIOR ELEVATIONS NOTES:

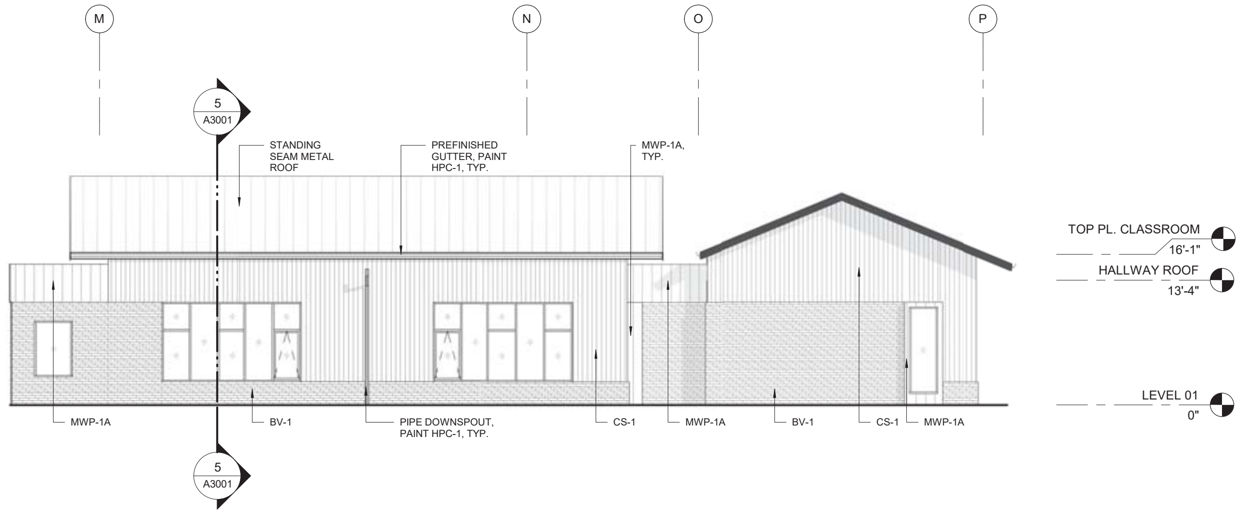
1. HPC - HIGH PERFORMANCE COATING ON ALL EXPOSED STEEL.
2. NOT ALL MECHANICAL, PLUMBING, ELECTRICAL OR TECHNOLOGY FIXTURES AND DEVICES ARE SHOWN. COORDINATE WITH MECHANICAL, PLUMBING, ELECTRICAL, AND TECHNOLOGY DRAWINGS FOR ADDITIONAL FIXTURES AND DEVICES.
3. ALL EXTERIOR WINDOWS ARE STOREFRONT.
4. PREFINISHED METAL FASCIAS, GUTTERS AND COPINGS, TYP.
5. REFERENCE ELEVATIONS FOR GENERAL HEIGHTS AND MATERIALS, SEE FLOOR PLAN FOR LENGTHS.



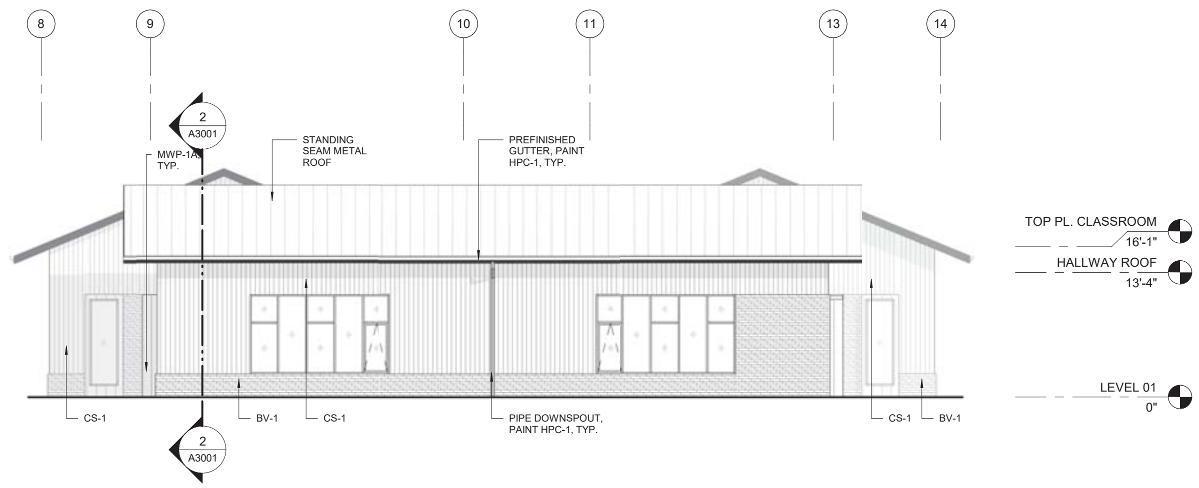
6 **SOUTH ELEVATION 3 - SECTOR D**
SCALE: 1/8" = 1'-0"



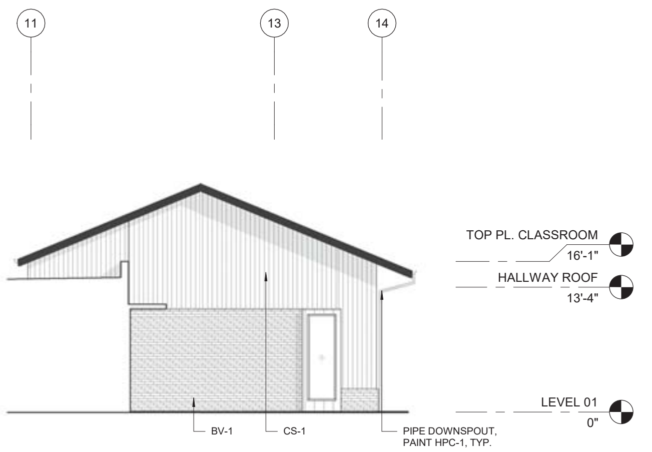
3 **NORTH ELEVATION 1 - SECTOR D**
SCALE: 1/8" = 1'-0"



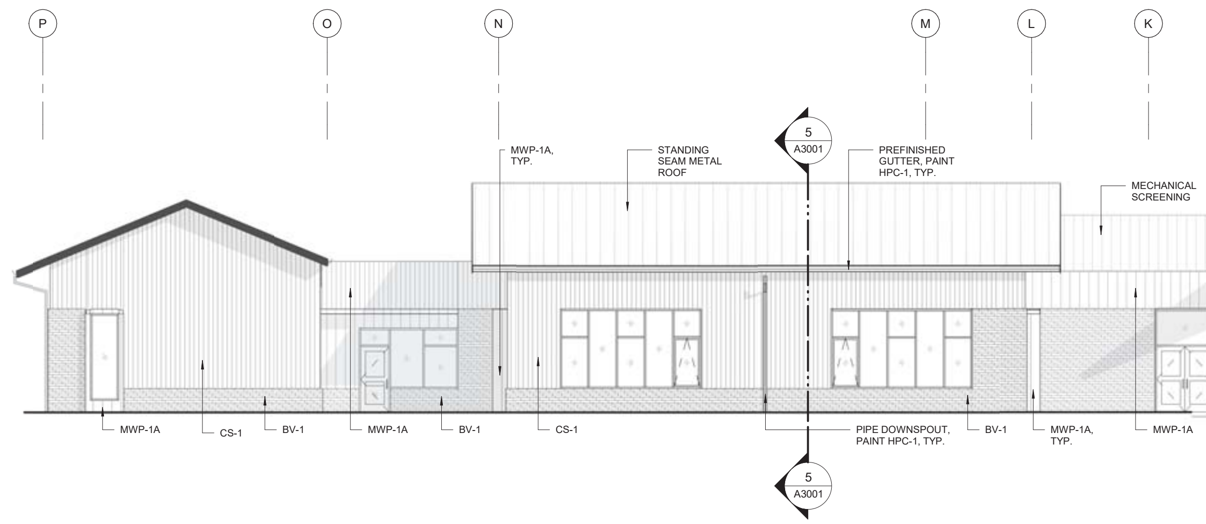
5 **WEST ELEVATION - SECTOR D**
SCALE: 1/8" = 1'-0"



2 **SOUTH ELEVATION 2 - SECTOR D**
SCALE: 1/8" = 1'-0"



4 **SOUTHELEVATION 1 - SECTOR D**
SCALE: 1/8" = 1'-0"



1 **EAST ELEVATION - SECTOR D**
SCALE: 1/8" = 1'-0"

TVF&R
Tualatin Valley Fire & Rescue
APPROVED PLANS
APPROVAL OF PLANS IS NOT AN APPROVAL OF OMISSIONS OR OVERSIGHTS.
Alex McGl—
Deputy Fire Marshal II

TVF&R Permit #2022-0111

2022-09-02 2:27:24 PM

CLIENT
West Linn-Wilsonville School District
2755 SW Borland Road,
Tualatin, OR 97062

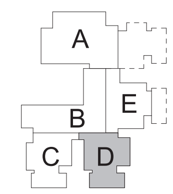
COPYRIGHT

ISSUES

No.	DESCRIPTION	DATE
	100% SCHEMATIC DESIGN	2022-06-03
	100% DESIGN DEVELOPMENT	2022-09-01

NOT FOR CONSTRUCTION

KEYPLAN



CONSULTANTS

SEAL

PRIME CONSULTANT
IBI GROUP
907 SW Harvey Milk Street
Portland, OR 97205, USA
tel 503 226 6950 fax 503 273 9192
ibigroup-edpnw.com

PROJECT
Frog Pond Primary School
7151 Boeckman Road
Wilsonville, OR 97070

PROJECT NO:
137469

SHEET TITLE
BUILDING ELEVATIONS

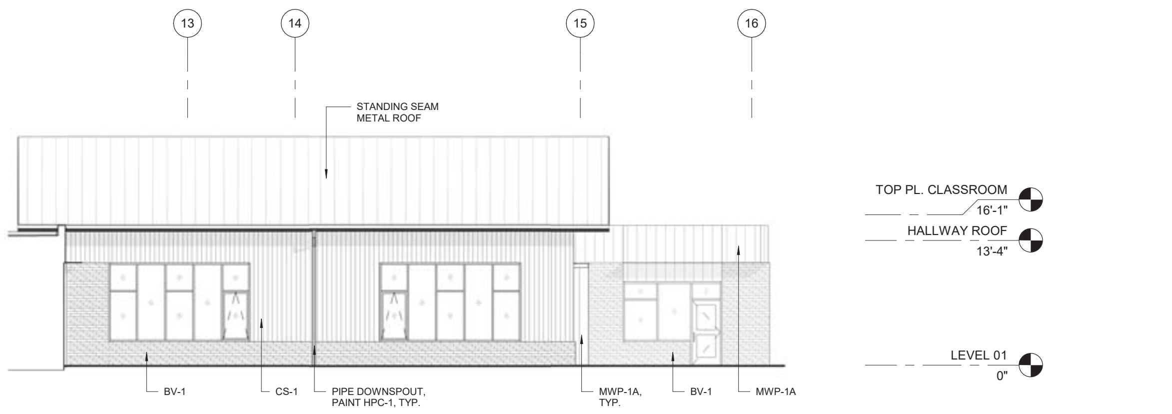
SHEET NUMBER
FS-6

Autodesk Docs://137469-FrogPond_ES R2022/137469_FrogPondES_R22.rvt

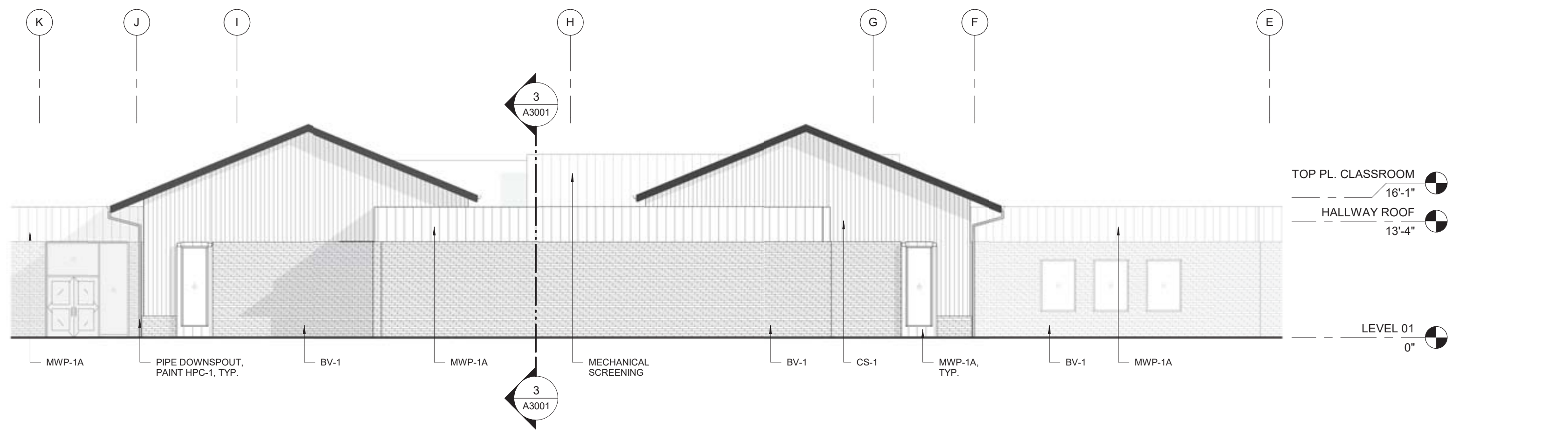
SCALE CHECK
1 in
10mm

EXTERIOR ELEVATIONS NOTES:

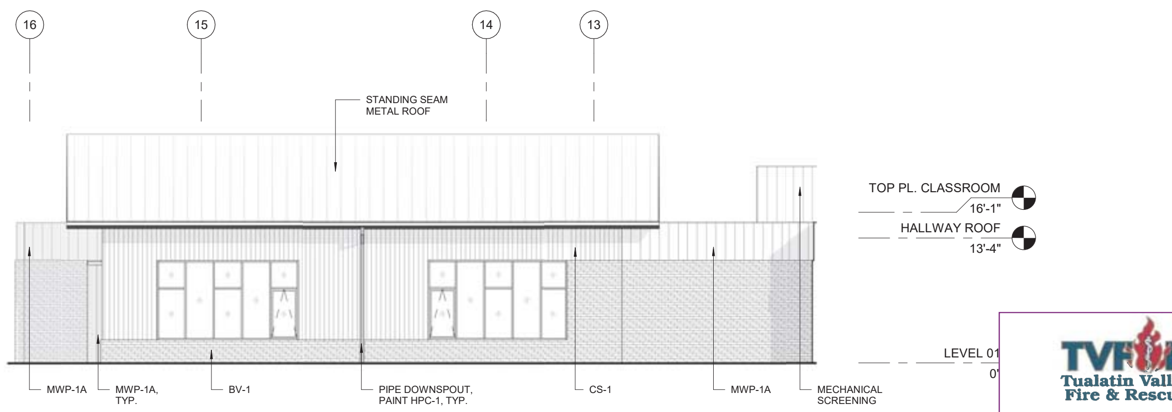
1. HPC - HIGH PERFORMANCE COATING ON ALL EXPOSED STEEL.
2. NOT ALL MECHANICAL, PLUMBING, ELECTRICAL OR TECHNOLOGY FIXTURES AND DEVICES ARE SHOWN. COORDINATE WITH MECHANICAL, PLUMBING, ELECTRICAL, AND TECHNOLOGY DRAWINGS FOR ADDITIONAL FIXTURES AND DEVICES.
3. ALL EXTERIOR WINDOWS ARE STOREFRONT.
4. PREFINISHED METAL FASCIAS, GUTTERS AND COPINGS, TYP.
5. REFERENCE ELEVATIONS FOR GENERAL HEIGHTS AND MATERIALS, SEE FLOOR PLAN FOR LENGTHS.



3 SOUTH ELEVATION - SECTOR E
SCALE: 1/8" = 1'-0"



2 EAST ELEVATION - SECTOR E
SCALE: 1/8" = 1'-0"



1 NORTH ELEVATION - SECTOR E
SCALE: 1/8" = 1'-0"

TVF&R Tualatin Valley Fire & Rescue
APPROVED PLANS
APPROVAL OF PLANS IS NOT AN APPROVAL OF OMISSIONS OR OVERSIGHTS.
Alex McGl...
Deputy Fire Marshal II

TVF&R Permit #2022-0111

2022-09-02 2:27:28 PM

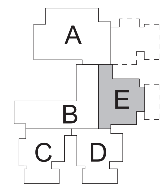
CLIENT
West Linn-Wilsonville School District
2755 SW Borland Road,
Tualatin, OR 97062

ISSUES

No.	DESCRIPTION	DATE
	100% SCHEMATIC DESIGN	2022-06-03
	100% DESIGN DEVELOPMENT	2022-09-01

NOT FOR CONSTRUCTION

KEYPLAN



CONSULTANTS

SEAL

PRIME CONSULTANT
IBI GROUP
907 SW Harvey Milk Street
Portland, OR 97205, USA
tel 503 226 6950 fax 503 273 9192
ibigroup-edpnw.com

PROJECT
Frog Pond Primary School
7151 Boeckman Road
Wilsonville, OR 97070

PROJECT NO:
137469

SHEET TITLE
BUILDING ELEVATIONS

SHEET NUMBER
FS-7

Autodesk Docs://137469-FrogPond_ES R2022/137469_FrogPondES_R22.rvt

SCALE CHECK 1 in 10mm

3J CONSULTING

CIVIL ENGINEERING | WATER RESOURCES | COMMUNITY PLANNING

PRELIMINARY DRAINAGE REPORT

NEW WILSONVILLE PRIMARY SCHOOL
7151 BOECKMAN ROAD
WILSONVILLE, OREGON

Planning DB No. TBD

November 2, 2022

Applicant:

West Linn-Wilsonville School District
22210 SW Stafford Road
Tualatin, Oregon 97062
503-673-7000

REGISTERED PROFESSIONAL ENGINEER
74498PE
PRELIMINARY
OREGON
Jan. 8, 2009
KATHLEEN E. FREEMAN
EXPIRES: 12/31/2023

Prepared By:
3J Consulting, Inc.
9600 SW Nimbus Avenue, Suite 100
Beaverton, Oregon 97008
Project No: 21680
Kathleen Freeman, PE
Water Resources Project Manager

TABLE OF CONTENTS

LIST OF FIGURES

LIST OF TABLES

EXECUTIVE SUMMARY

The proposed project is a new primary school located in Frog Pond Area Plan boundary. The 9.95 acre site is located at 7151 Boeckman Road, in Wilsonville, OR on Tax Lot 4500 on Tax Map 3S-1W-12DC. The property is zoned Public Facility (PF) in the Frog Pond planning area. The project site is within the jurisdiction of the City of Wilsonville. Design and analysis pertaining to stormwater management will be in accordance with the *City of Wilsonville Public Works Standards* (WPWS, 2015).

The existing site is a farm containing a home, outbuilding and grass (majority mowed for hay). The majority of the site slopes west towards the Morgan Farm Subdivision. The remaining area slopes east towards Stafford Meadows Subdivision. There is currently no stormwater management system for the site.

The project proposes the construction of a new primary elementary school for grade levels pre-K-5 and is planned to be constructed in two phases. Infrastructure design will accommodate the future phase of development on the site. Frontage improvements will be constructed along Boeckman Road to the south and SW Sherman Drive to the west. Along the northern boundary, SW Brisband Street will be constructed and finish the street connectivity.

Runoff from the proposed and future impervious areas will be conveyed to Low Impact Development (LID) facilities that have been designed using the BMP Sizing Tool created for Clackamas County. The areas currently draining to the east and west will be respected and continue as closely as possible to follow the same drainage patterns. Due to the surrounding developments and topography, offsite runoff is not expected to reach the site.

As part of the Stafford Meadows Subdivision, OTAK performed a downstream analysis that included the future build-out of the school site draining east. The analysis showed that the downstream conveyance system has capacity for the development of the school site. Additionally, the subdivision installed a 36” box culvert in SW Wehler Way to convey Willow Creek draining north to south. The new culvert was sized to convey future flows from the school site.

The post-developed western portion of the site will discharge treated and detained runoff to the existing storm system installed in Phase 1 and 2 of the Morgan Farm Subdivision. The downstream analysis based on as-built plans and reports indicates the existing systems will not have capacity issues.

A draft Operations & Maintenance Plan (OMP) has been prepared as part of this report and attached herein.

The purpose of this report is to accomplish the following.

- Describe pre- and post-development basins and drainage;
- Describe the design and analysis of the proposed stormwater management facilities; and,
- Demonstrate compliance with the WPWS pertaining to stormwater management.

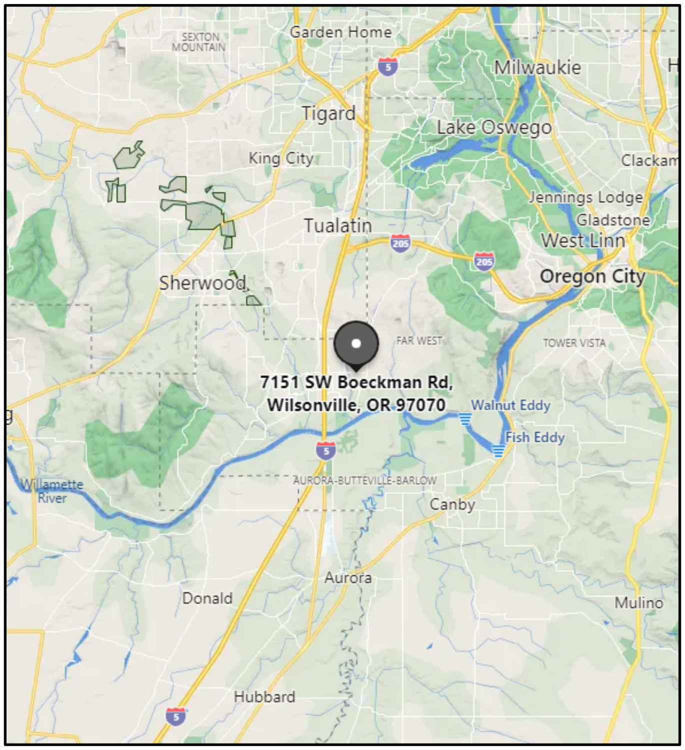


Figure 1 - Vicinity Map

Figure 2 – Location Map

PROJECT DESCRIPTION

The proposed project is a new primary school located in Frog Pond Area Plan boundary. The 9.95 acre site is located at 7151 Boeckman Road, in Wilsonville, OR on Tax Lot 4500 on Tax Map 3S-1W-12DC. The property is zoned Public Facility (PF) in the Frog Pond planning area. The site does not contain jurisdictional wetlands. The project proposes the construction of a new primary school for grade levels pre-K-5. Landscaping, parking lots, playgrounds and utilities, in addition to the building will be constructed. Additionally, infrastructure design will accommodate the future phase of development on the site.

EXISTING CONDITIONS

Site Description

The existing site is a farm containing a home, outbuilding and grass (majority mowed for hay). There is currently no stormwater management system for the site (See Technical Appendix: Exhibits – Existing Drain Basin Plan).

Topography: The initial onsite survey was performed by Compass Land Surveyors in September 2021. Onsite slopes are mild (i.e., 1.5%-3.5%). The majority of the site slopes west towards the Morgan Farm Subdivision. The remaining area slopes east towards Stafford Meadows Subdivision. The site contains no natural or constructed channels, wetlands, creeks, ravines, gullies, steep slopes, springs or any other sensitive areas.

Soils: USDA's Web Soil Survey indicates that the project site is underlain with Aloha and Concord Silt Loam (See Technical Appendix: Exhibits - Hydrologic Soil Group – Clackamas County Area, Oregon). Both soils are associated with hydrologic soil group (HSG) C/D.

Existing Drainage: The West Drainage Basin ultimately discharges into Boeckman Creek on the west side of Morgan Farm Subdivision. The East Drainage Basin ultimately discharges to Willow Creek with the Stafford Meadows Subdivision. Both creeks eventually discharge into the Willamette River.

Offsite Drainage: The area to the east and west of the property is comprised of newly constructed subdivisions. Directly south of the property is Boeckman Road. The properties directly to the north are comprised of homes on large tracks of land which will eventually be developed.

The northern property at 7130 SW Frog Pond Lane currently drains southwest towards Morgan Farm Subdivision and southeast towards Willow Creek and Stafford Meadows Subdivision (See Technical Appendix: Exhibits - City of Wilsonville: GIS 2ft Contours). All other surrounding areas slope away from the school property.

Flood Map: The site is located within Zone X (unshaded) per flood insurance rate map (FIRM) community-panel number 41005C0234D (See Technical Appendix: Exhibits – National Flood Hazard Layer FIRMette). FEMA's definition of Zone X (un-shaded) is an area of minimal flood hazard.

Geotechnical Report & Infiltration Testing

A Geotechnical Report for the site was prepared on June 1, 2022 by NV5 (See Technical Appendix: Geotechnical Report (excerpts only)). Groundwater was encountered at depths between 4 and 10 feet below ground surface (BGS). Additionally, the east side of the site may have shallower groundwater depths than the west side. Infiltration testing was performed at three test pit excavations between 3 and 5 feet BGS. The measured infiltration rates were 0.2, 0.3 and 0.5 in/hr at depths 3, 4 and 5 feet BGS, respectively. Due to the high groundwater and minimal infiltration capacity, infiltration of stormwater runoff is not a feasible option.

Onsite Basin Areas

Table 1 outlines the existing basin areas within the proposed site. Although there is currently impervious area onsite, it is assumed to be 100% pervious covered in grass for predeveloped conditions. The basins include the frontage improvement areas.

Pre-Developed Conditions	**sf**	**ac**
[1]West Drainage Basin	289,543	6.65
East Drainage Basin	143,912	3.30
Total Area	433,455	9.95

[1]Does not include asphalt replacement on Sherman Drive

Table 1 – Basin Area Summary – Predeveloped Conditions

PROPOSED CONDITIONS

Site Description

Impervious areas will be constructed consisting of roof area, asphalt parking, and concrete sidewalks. Additionally, a playground area will be constructed in the northwest corner of the site consisting of an artificial turf surface. Landscaping, open space, and surface stormwater management will comprise the pervious portions of the site. Frontage improvements will be constructed along Boeckman Road to the south and SW Sherman Drive to the west. Along the northern boundary, SW Brisband Street will be constructed. All future build-out conditions have been included in the stormwater management design.

Stormwater Management Strategy

The stormwater management system for the new Wilsonville Primary School was designed using the following methods and standards:

- Water Quality: The City of Wilsonville requires capture and treatment of 80 percent of the average annual runoff. The City of Wilsonville has adopted the BMP Sizing Tool to aid in the design of water quality and detention LID facilities. The BMP Sizing Tool was used to size minimum footprint areas to meet the water quality treatment requirements.
- Flow Control: The City requires flow duration matching whereby the duration of peak flow rates from post development conditions shall be less than or equal to the duration of peak flow rates from pre-development conditions for all peak flows between 42% of the 2-year storm peak flow rate up to the 10-year peak flow rate. The BMP Sizing Tool was used to size minimum footprint areas to meet the flow control requirements.
- Conveyance: Conveyance calculations will be completed in the final design phase of the project to convey the 25-year, 24-hour storm with at least 1 foot of freeboard. The Santa Barbara Urban Hydrograph method using XPSTORM software will be used.

Drainage Changes

Onsite drainage patterns will be maintained as closely as possible. A new road to the north of the property will be constructed to connect to SW Brisband Street in Morgan Farm Subdivision (Phase 2). A new storm system will be constructed in the street to connect to with the existing storm system in SW Brisband Street.

Impervious Area Reduction

The proposed project will not be implementing any impervious area reductions.

Post-Developed Basin Areas

Table 2 show the area breakdown between the west and east basin in proposed conditions (See Technical Appendix: Exhibits – Proposed Drainage Basin Plan).

Proposed Conditions	**sf**	**ac**
West Basin		
[1]Impervious Area	112,305	2.58
Pervious Area	173,186	3.98
Total Area	285,491	6.55
East Basin		
Impervious Area	95,164	2.18
Pervious Area	60,721	1.39
Total Area	155,885	3.59

[1]Includes 7,921 sf of asphalt replacement on Sherman Drive

Table 2 – Basin Area Summary – Post-Developed Drainage Basins

HYDROLOGIC ANALYSIS

Conveyance Modeling

Design Guidelines

To meet the Conveyance Standards and model the downstream system in Morgan Farm Subdivision, the SBUH method will be performed via XPSTORM software. Other than basin area, the SBUH method requires a runoff curve number and time of concentration, which will be discussed in the following subsections.

The method will also be used in conjunction with 24-hr design storm depths organized in the NRCS Type IA rainfall distribution. Conveyance calculations require the 25-year storm event which has a rainfall depth of 3.90 inches.

Runoff Curve Number

The runoff curve number (CN) represents stormwater runoff potential whose major contributing factors include hydrologic soil group, cover type, treatment, hydrologic condition, and antecedent runoff condition.

The project site is completely underlain with C/D soils and proposed cover types include landscaping, concrete, pavement, and roofs. All proposed pervious areas will be modeled with a CN of 80, which corresponds to open space lawn in good condition. Pavement, concrete, and roofs will be modeled with a CN of 98.

Time of Concentration

Proposed Basins were assumed to have Tc's of 5 minutes due to their size and imperviousness.

BMP Sizing Tool

Design Guidelines

The City requires predeveloped conditions for hydrologic modeling, which is historical vegetation prior to human settlement. The predeveloped area conditions within the Frog Pond planning area included Oak Savanah; the City allows Oak Savanah to be modeled as grass for predeveloped conditions. For post-developed conditions, paved conditions were used for all impervious areas including roofs, sidewalks, and asphalt. Disturbed landscape areas were set to Landscape. The BMP Sizing Tool has been used to determine minimum footprint sizes, as well as orifice sizes.

DESIGN FOR WATER QUALITY TREATMENT

Low Impact Development

Per Section 301.1.05 of the WPWS, LID approaches that maximize groundwater recharge through infiltration shall be designed, to the maximum extent practicable. Multiple LID approaches have been designed throughout the site to provide water quality treatment.

Water Quality Facilities

Filtration rain gardens and planters have been designed using the BMP Sizing Tool. The calculation reports are provided in the Technical Appendix.

New impervious areas on Boeckman Road will not be treated, and it's understood that the City will provide treatment once the road is improved in a future project. SW Sherman Drive will be constructed to sheet flow to new road side planters.

DESIGN FOR FLOW CONTROL

Per Section 301.4.04(d) of the WPWS, post-developed release rates shall be less than or equal to the duration of peak flow rates from pre-development conditions for all peak flows between 42% of the 2-year storm up to the 10-year peak flow rate. The BMP Sizing Tool was designed to accommodate these flow requirements (See Technical Appendix: Calculations).

Each proposed filtration rain garden and planter will have flow control structures located immediately downstream of the facilities, per the City's standard detail. Orifices will be installed at the ends of the underdrain pipes. Table 3 summaries the proposed facilities for the site. All facilities are sized for both water quality treatment and flow control.

Contributing Basin	Facility ID	Minimum LID Size (sf)	LID Size Provided (sf)	Orifice Diameter (in)
12	RG1	577	1,337	1.40
10	RG2	1,597	7,455	2.24
8	RG3	501	3,655	1.21
15	RG4	812	3,603	1.50
14,17-19,21	RG5	2,746	3,063	2.66
4,20	RG6 FUTURE	1,986	2,000	2.51
7	PLTR1	334	861	1.22
16C	PLTR2	253	577	1.06
16B	PLTR3	289	300	1.26
16A	PLTR4	236	300	1.12
6	PLTR5	193	330	0.93
5	PLTR6	204	352	0.96
22	PLTR7	131	489	0.75
23	PLTR8	206	750	0.94
24	PLTR9	387	1,311	1.35
25	PLTR10	101	520	0.68
26	PLTR11	125	520	0.77
27	PLTR12	243	520	1.08

Table 3 – LID Approach Summary Table

CONVEYANCE ANALYSIS & DESIGN

Per Section 301.1.13 of the WPWS, conveyance systems shall be designed to convey and contain at least the peak runoff for the 25-year design storm, with a minimum 1 foot of freeboard. Conveyance of the proposed storm system will be provided in the final design phase once final grades have been established.

DOWNSTREAM ANALYSIS

A downstream review has been completed for each basin per section 301.5.01 of the City's Standards, which are as follows:

- Verify the 25-year design storm can be conveyed in the downstream system.
- Extend the review to a point in the drainage system where the proposed development site contributes 10% or less of the total tributary drainage flow or for ¼ mile downstream of the approved point of discharge.

East Basin

As part of the Stafford Meadows Subdivision, OTAK performed a downstream analysis that included the future build-out of the school site draining east. The analysis showed that the downstream conveyance system has capacity for the development of the school site (See Technical Appendix: Downstream Analysis – Stafford Meadows: Appendix C-Downstream Analysis, by OTAK, Dated 01/16/2018). Additionally, the subdivision installed a 36” box culvert in SW Wehler Way to convey Willow Creek draining north to south. The new culvert was sized to convey future flows from the school site. The analysis has been reviewed and concur that the system will have capacity to convey the 25-year flows from the school site.

West Basin

Approximately 5.48 acres of the post-developed western portion of the site will continue discharging runoff to the existing storm system installed in the Morgan Farm Phase 1 Subdivision. Two new connections will be made from the school site to Morgan Farm Subdivision: 1) At SDMH-1A near the intersection of SW Sherman Drive and Boeckman Road, 2) At SDMH-2D near the intersection of SW Bay Lane and SW Sherman Drive. Both manhole labels reflect the labeling in the Morgan Farm Phase 1 Subdivision plans. An XPSTORM model was created for the existing storm system based on the Morgan Farm Phase 1 Record Drawings, dated April 24, 2019, and the Final Storm Drainage Report, dated July 11, 2018. All basin areas, percent impervious, and Curve Numbers from the subdivision utilized the Stormwater Conveyance Calculations from the final storm report (See Technical Appendix: Downstream Analysis – Morgan Farm Phase 1). The conveyance system, including detention pond and flow control structure were modeled utilizing the pertinent storm sheets from the Record Drawings.

The City has expressed concerns that the existing pond does not currently empty which would cause backwater in the existing system; however, the model shows that the system will have the capacity to convey the 25-year storm event from the proposed school site with no out of system flooding and at least 0.69 feet of freeboard. This indicates that the City may want to further investigate this situation to ensure the pond was either constructed per the plans or some blockage exists. The downstream analysis ended at the existing discharge in Boeckman Creek.

Approximately 0.90 acres in the northern portion of the post-developed site will continue discharging runoff to the existing storm system installed in the Morgan Farm Phase 2 Subdivision. One new connection will be made on SW Brisband Street. An XPSTORM model was created for the existing storm system based on the Morgan Farm Phase 2 Record Drawings, dated December 18, 2019, and the Final Storm Drainage Report, dated January 16, 2019. All basin areas, percent impervious and Curve Numbers from the subdivision utilized the Stormwater Conveyance Calculations from the final storm report (See Technical Appendix: Downstream Analysis – Morgan Farm Phase 2). The conveyance system, including swales and flow control structure were modeled utilizing the pertinent storm sheets from the Record Drawings. The Model shows that the system will have the capacity to convey the 25-year storm event from the proposed school site with no out of system flooding and at least 3.49 feet of freeboard.

OPERATION & MAINTENANCE

All vegetated facilities will be maintained by the School District. The Operations and Maintenance requirements have been included in the Technical Appendix.

CONCLUSION

The proposed New Wilsonville Primary School development’s stormwater management systems have been designed to meet the standards of the City of Wilsonville. Currently 4.58 acres of impervious area will be created. Impervious areas will be treated and detained through filtration rain gardens and planters. Approximately 0.24 acres of impervious area will leave the site untreated due to grading constraints.

TECHNICAL APPENDIX

Exhibits

- Existing Drain Basin Plan
- Hydrologic Soil Group – Clackamas County Area, Oregon
- City of Wilsonville: GIS 2ft Contours
- National Flood Hazard Layer FIRMette
- Proposed Drainage Basin Plan & Table
- Table 2-2a Runoff Curve Numbers

Calculations

- WES BMP Sizing Report

Geotechnical Report

- Report of Geotechnical Engineering Services by NV5, dated June 1, 2022

Downstream Analysis

- Stafford Meadows
  - Appendix C-Downstream Analysis, by OTAK, Dated 01/16/2018
- Morgan Farm Phase 1
  - XPSTORM Hydraulic Layout: Morgan Farm Phase 1 Storm System
  - XPSTORM Runoff Data – Morgan Farm Phase 1
  - XPSTORM Conveyance Data – Morgan Farm Phase 1
  - Record Drawings Morgan Farm Phase 1: Sheets C4.3, C5.0-C5.4 and C5.6
  - Stormwater Conveyance Calculations (Excerpt from Final Storm Drainage Report)
- Morgan Farm Phase 2
  - XPSTORM Hydraulic Layout: Morgan Farm Phase 2 Storm System
  - XPSTORM Runoff Data – Morgan Farm Phase 2
  - XPSTORM Conveyance Data – Morgan Farm Phase 2
  - Record Drawings Morgan Farm Phase 2: Sheets C3.0, C4.0, C4.7 C5.1-C5.5
  - Stormwater Conveyance Calculations (Excerpt from Final Storm Drainage Report)

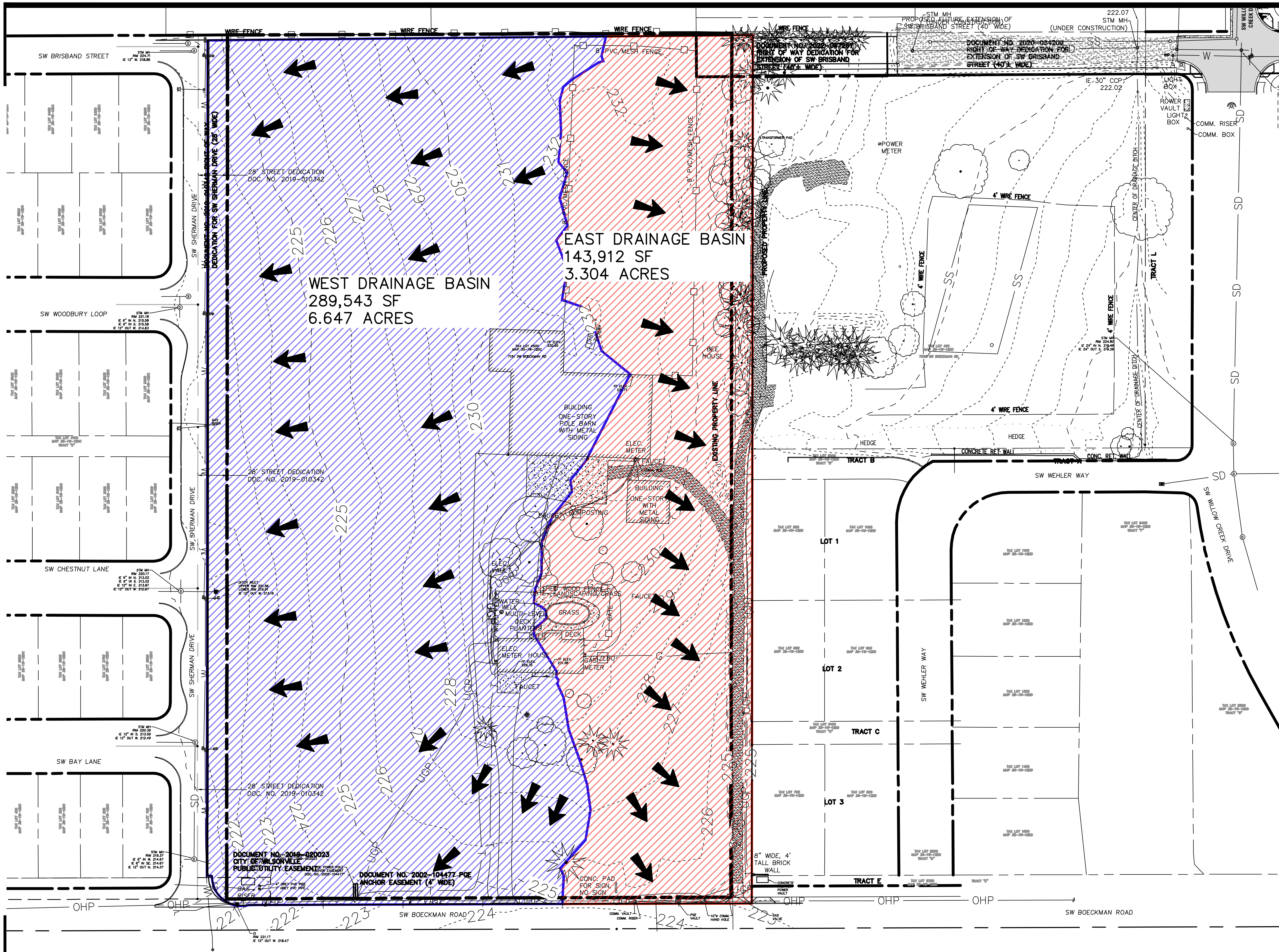
Operations & Maintenance

- O&M Plan

REFERENCES

1. *City of Wilsonville 2015 Stormwater & Surface Water Design & Construction Standards*
2. Morgan Farm Phase 2 Final Storm Drainage Report, dated July 11, 2018, by Pioneer Design Group, Inc
3. Morgan Farm Phase 2 Final Storm Drainage Report, dated January 16, 2019, by Pioneer Design Group, Inc
4. Stafford Meadows Stormwater Management Plan, dated June 22, 2018 by OTAK

EXHIBITS



DRAINAGE BASIN LEGEND

- PROPERTY LINE
- EASEMENT LINE
- SD — STORM LINE
- SS — SEWER LINE
- W — WATER LINE
- G — GAS LINE
- UGP — UNDERGROUND POWER LINE
- OHP — OVERHEAD POWER LINE
- T — COMMUNICATIONS LINE
- FENCE
- XX0 — MAJOR CONTOUR
- XX1 — MINOR CONTOUR
- EAST DRAINAGE BASIN
- WEST DRAINAGE BASIN
- DIRECTION OF FLOW

NOTE:
SW BOEKMAN RD CURRENTLY HAS NO STORM SYSTEM

N
W E
S

SCALE: 1" = 100'

0 100 200 FT

SEPT 2022

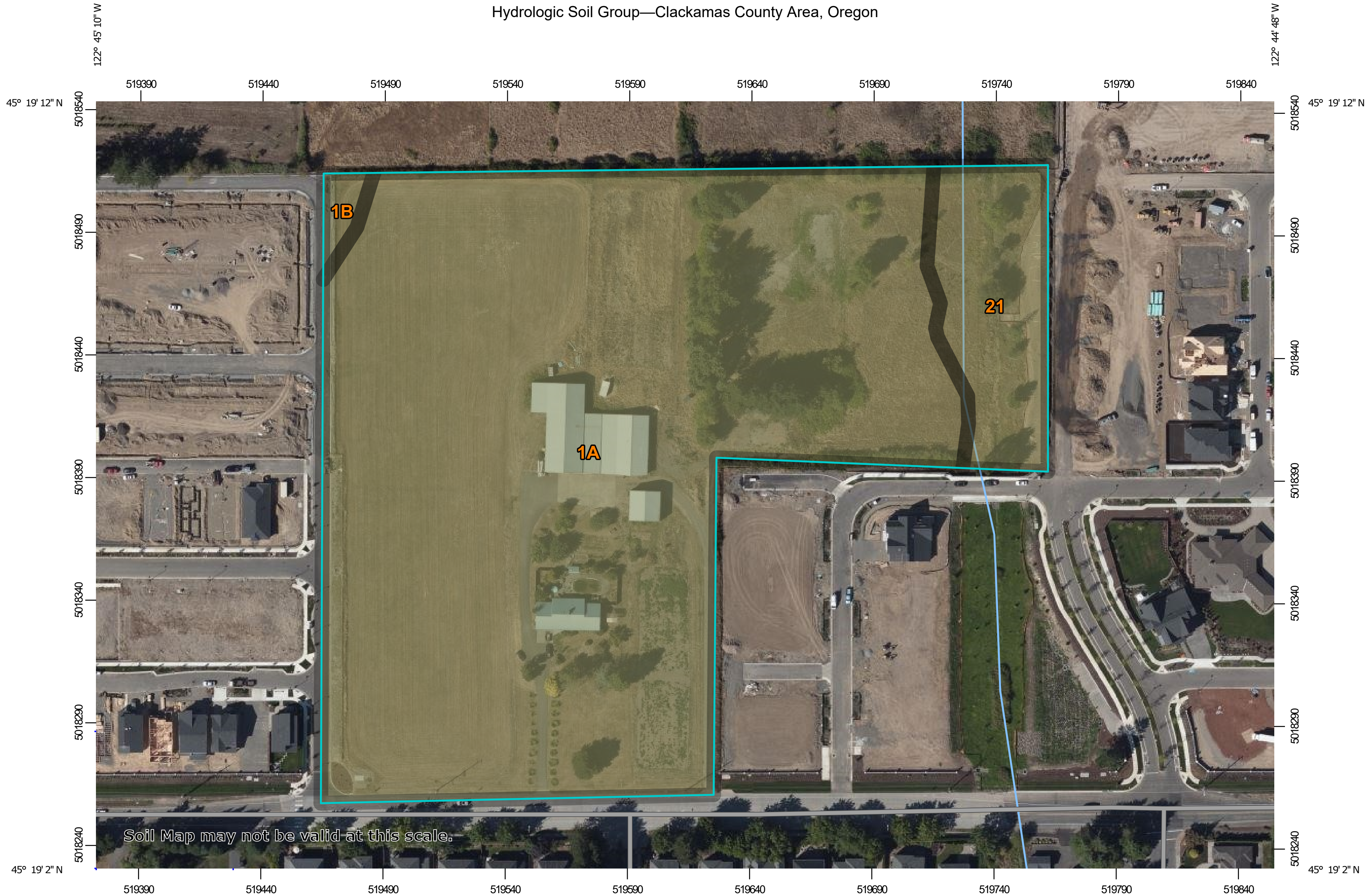
NEW WILSONVILLE PRIMARY SCHOOL

WEST LINN / WILSONVILLE SCHOOL DISTRICT

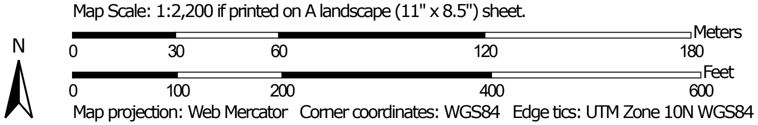
EXISTING DRAIN BASIN PLAN

3J CONSULTING
CIVIL ENGINEERING . WATER RESOURCES . COMMUNITY PLANNING

Hydrologic Soil Group—Clackamas County Area, Oregon



Map Scale: 1:2,200 if printed on A landscape (11" x 8.5") sheet.



Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 10N WGS84

MAP LEGEND

Area of Interest (AOI)

Area of Interest (AOI)

Soils

Soil Rating Polygons

A

A/D

B

B/D

C

C/D

D

Not rated or not available

Soil Rating Lines

A

A/D

B

B/D

C

C/D

D

Not rated or not available

Soil Rating Points

A

A/D

B

B/D

C

C/D

D

Not rated or not available

Water Features

Streams and Canals

Transportation

Rails

Interstate Highways

US Routes

Major Roads

Local Roads

Background

Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:20,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Clackamas County Area, Oregon
Survey Area Data: Version 16, Jun 11, 2020

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Aug 1, 2019—Sep 12, 2019

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Hydrologic Soil Group

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
1A	Aloha silt loam, 0 to 3 percent slopes	C/D	12.9	90.0%
1B	Aloha silt loam, 3 to 6 percent slopes	C/D	0.1	0.9%
21	Concord silt loam	C/D	1.3	9.1%
Totals for Area of Interest			**14.3**	**100.0%**

Description

Hydrologic soil groups are based on estimates of runoff potential. Soils are assigned to one of four groups according to the rate of water infiltration when the soils are not protected by vegetation, are thoroughly wet, and receive precipitation from long-duration storms.

The soils in the United States are assigned to four groups (A, B, C, and D) and three dual classes (A/D, B/D, and C/D). The groups are defined as follows:

Group A. Soils having a high infiltration rate (low runoff potential) when thoroughly wet. These consist mainly of deep, well drained to excessively drained sands or gravelly sands. These soils have a high rate of water transmission.

Group B. Soils having a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep or deep, moderately well drained or well drained soils that have moderately fine texture to moderately coarse texture. These soils have a moderate rate of water transmission.

Group C. Soils having a slow infiltration rate when thoroughly wet. These consist chiefly of soils having a layer that impedes the downward movement of water or soils of moderately fine texture or fine texture. These soils have a slow rate of water transmission.

Group D. Soils having a very slow infiltration rate (high runoff potential) when thoroughly wet. These consist chiefly of clays that have a high shrink-swell potential, soils that have a high water table, soils that have a claypan or clay layer at or near the surface, and soils that are shallow over nearly impervious material. These soils have a very slow rate of water transmission.

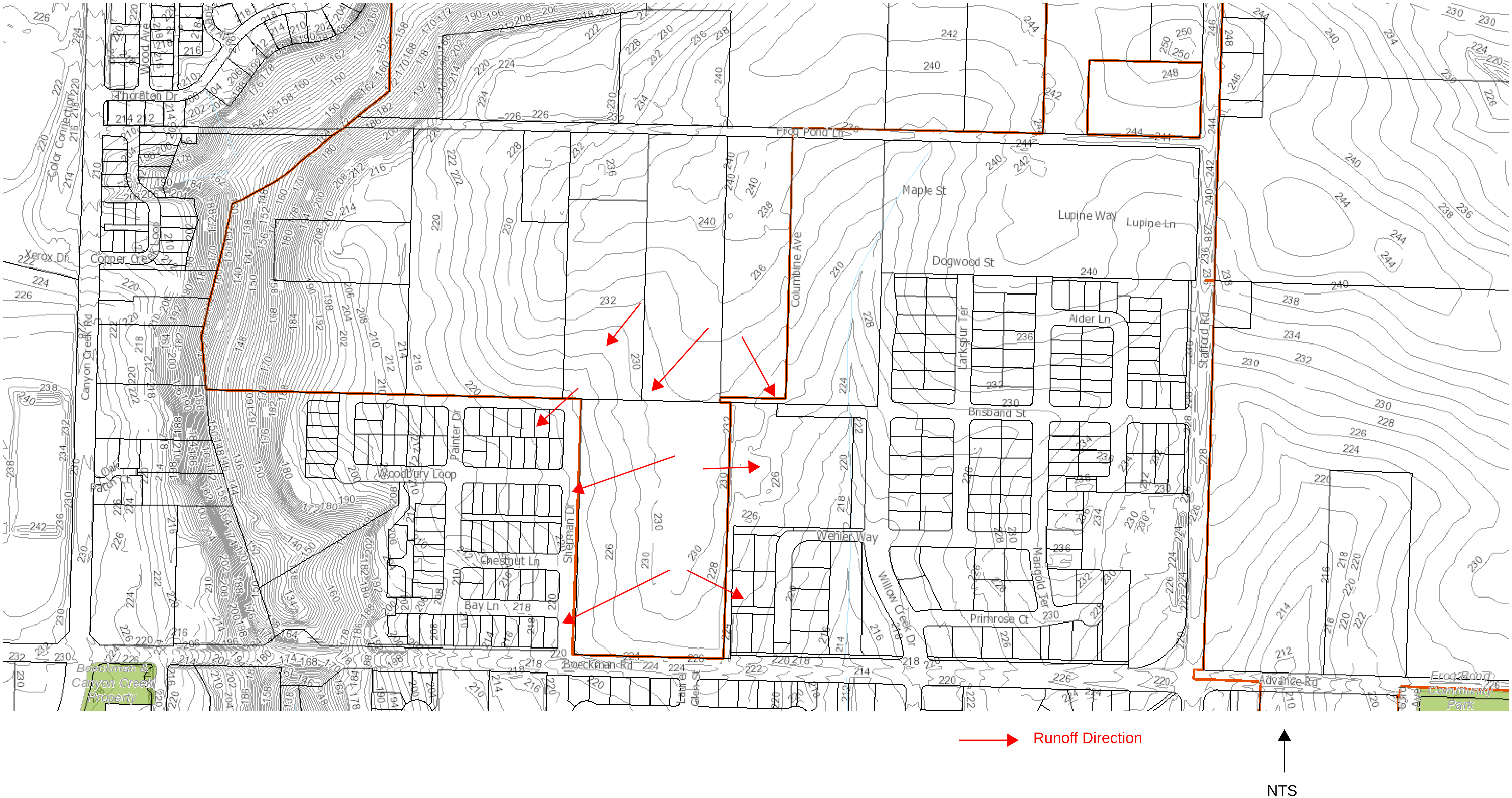
If a soil is assigned to a dual hydrologic group (A/D, B/D, or C/D), the first letter is for drained areas and the second is for undrained areas. Only the soils that in their natural condition are in group D are assigned to dual classes.

Rating Options

Aggregation Method: Dominant Condition

Component Percent Cutoff: None Specified

Tie-break Rule: Higher



CITY OF WILSONVILLE: GIS 2FT CONTOURS

National Flood Hazard Layer FIRMette

FEMA

122°45'21"W 45°19'20"N

122°44'43"W 45°18'55"N

Feet 0 250 500 1,000 1,500 2,000

1:6,000

Basemap: USGS National Map: Orthoimagery: Data refreshed October, 2020

Legend

SEE FIS REPORT FOR DETAILED LEGEND AND INDEX MAP FOR FIRM PANEL LAYOUT

SPECIAL FLOOD HAZARD AREAS
- Without Base Flood Elevation (BFE) *Zone A, V, A99*
- With BFE or Depth *Zone AE, AO, AH, VE, AR*
- Regulatory Floodway

OTHER AREAS OF FLOOD HAZARD
- 0.2% Annual Chance Flood Hazard, Areas of 1% annual chance flood with average depth less than one foot or with drainage areas of less than one square mile *Zone X*
- Future Conditions 1% Annual Chance Flood Hazard *Zone X*
- Area with Reduced Flood Risk due to Levee. See Notes. *Zone X*
- Area with Flood Risk due to Levee *Zone D*

OTHER AREAS
- NO SCREEN Area of Minimal Flood Hazard *Zone X*
- Effective LOMRs
- Area of Undetermined Flood Hazard *Zone D*

GENERAL STRUCTURES
- Channel, Culvert, or Storm Sewer
- Levee, Dike, or Floodwall

OTHER FEATURES
- 20.2 / 17.5 Cross Sections with 1% Annual Chance Water Surface Elevation
- 8 Coastal Transect
- 513 Base Flood Elevation Line (BFE)
- Limit of Study
- Jurisdiction Boundary
- Coastal Transect Baseline
- Profile Baseline
- Hydrographic Feature

MAP PANELS
- Digital Data Available
- No Digital Data Available
- Unmapped

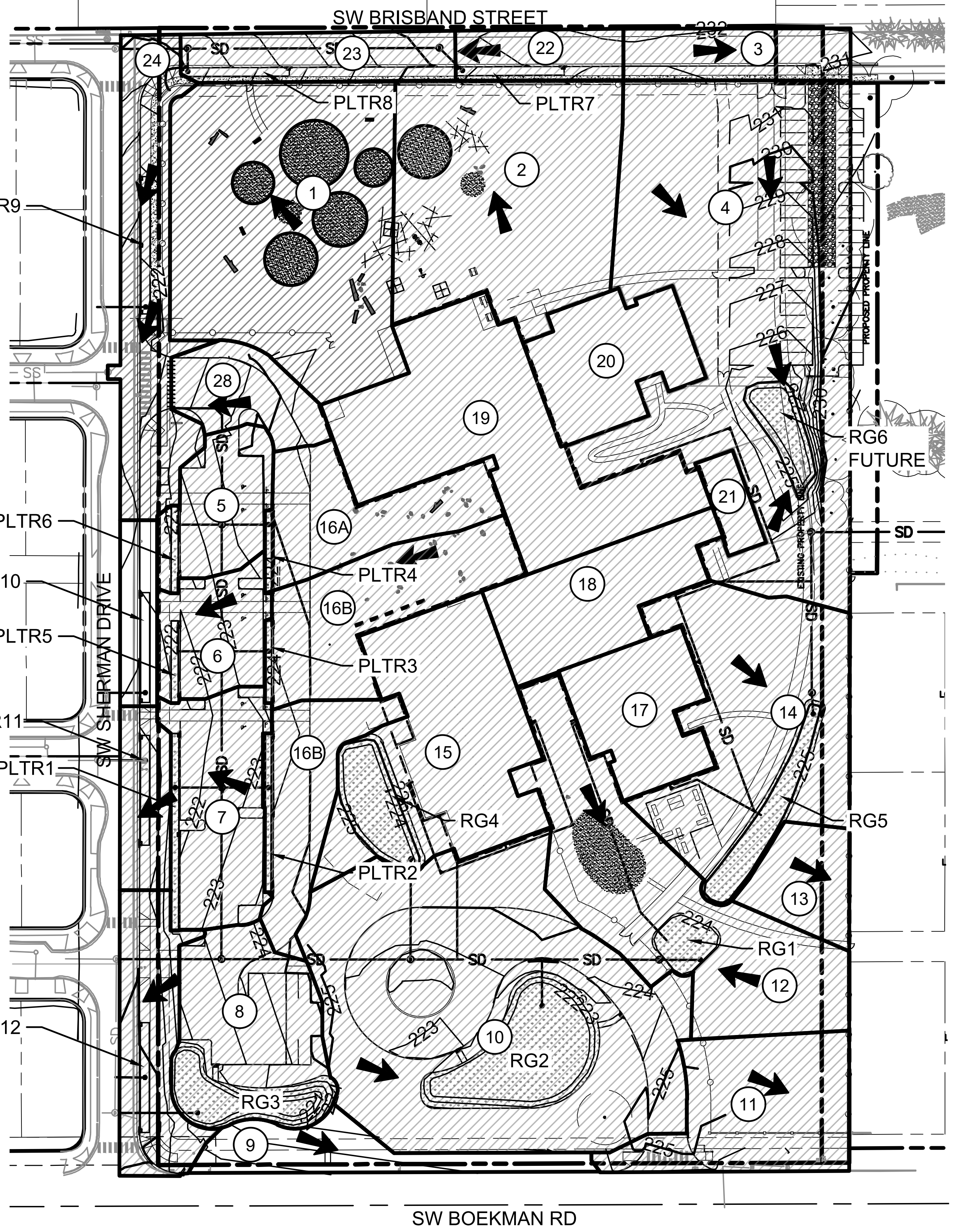
N

The pin displayed on the map is an approximate point selected by the user and does not represent an authoritative property location.

This map complies with FEMA's standards for the use of digital flood maps if it is not void as described below. The basemap shown complies with FEMA's basemap accuracy standards

The flood hazard information is derived directly from the authoritative NFHL web services provided by FEMA. This map was exported on 7/26/2021 at 6:55 PM and does not reflect changes or amendments subsequent to this date and time. The NFHL and effective information may change or become superseded by new data over time.

This map image is void if the one or more of the following map elements do not appear: basemap imagery, flood zone labels, legend, scale bar, map creation date, community identifiers, FIRM panel number, and FIRM effective date. Map images for unmapped and unmodernized areas cannot be used for regulatory purposes.



LEGEND

PROPERTY LINE

EXTG. RIGHT OF WAY

STORM STRUCTURES

MAJOR DESIGN CONTOUR

MINOR DESIGN CONTOUR

DRAINAGE BASIN

DIRECTION OF FLOW

EAST / WEST BASIN TOTALS

EAST	155,885 SF - 3.59 ACRES
WEST	277,571 SF - 6.37 ACRES

NOTE:
SEE PROPOSED DRAINAGE BASIN TABLE
TABLE ABOVE DOES NOT INCLUDE 7,921 SF OF REPAVING ON SHERMAN DRIVE FOR HALF STREET IMPROVEMENTS

N W E S

SCALE: 1" = 100'

0 100 200 FT

NOV 2022

NEW WILSONVILLE PRIMARY SCHOOL

WEST LINN / WILSONVILLE SCHOOL DISTRICT

PROPOSED DRAINAGE BASIN PLAN

3J CONSULTING
CIVIL ENGINEERING . WATER RESOURCES . COMMUNITY PLANNING

DRAINAGE BASIN TABLE

#	IMP AREA (SF)	PERV AREA (SF)	DIRECTION OF DRAINAGE[1]	FACILITY ID	MIN LID SIZE (FT)	ORIFICE SIZE (IN)
1	0	33,544	MF PH1	OFFSITE	N/A	N/A
2	0	27,467	MF PH2	OFFSITE	N/A	N/A
3	5,855	374	EAST	OFFSITE	N/A	N/A
4	11,720	40,771	SM CULVERT	RG6 FUTURE	1,986	2.51
5	5,493	1,856	MF PH1	PLTR6	204	0.96
6	5,323	1,592	MF PH1	PLTR5	194	0.93
7	9,428	2,447	MF PH1	PLTR1	334	1.22
8	8,338	5,983	MF PH1	RG3	501	1.21
9	0	6,876	MF PH1	OFFSITE	N/A	N/A
10	17,937	31,413	MF PH1	RG2	1597	2.24
11	759	12,609	EAST	OFFSITE	N/A	N/A
12	3,464	20,578	MF PH1	RG1	576	1.45
13	0	5,222	EAST	OFFSITE	N/A	N/A
14	22,325	1,745	SM CULVERT	RG5	2746	2.66
15	16,032	6,105	MF PH1	RG4	812	1.50
16A	2,675	7,393	MF PH1	PLTR4	236	1.12
16B	2,749	9,853	MF PH1	PLTR3	290	1.26
16C	7,205	1,755	MF PH1	PLTR2	253	1.06
17	8,633	0	SM CULVERT	RG5	SEE BASIN 14	
18	10,815	0	SM CULVERT	RG5	SEE BASIN 14	
19	23,645	0	SM CULVERT	RG5	SEE BASIN 14	
20	9,398	0	SM CULVERT	RG6 FUTURE	SEE BASIN 4	
21	2,014	0	SM CULVERT	RG5	SEE BASIN 14	
22	4,016	489	MF PH2	PLTR7	131	0.75
23	6,352	750	MF PH2	PLTR8	206	0.94
24	9,127	5,375	MF PH1	PLTR9	289	1.18
25	2,639	1,015	MF PH1	PLTR10	64	0.55
26	2,685	2,119	MF PH1	PLTR11	89	0.67
27	5,017	4,384	MF PH1	PLTR12	176	0.95
28	3,795	2,192	MF PH1	NOT TREATED	N/A	N/A
TOTAL	207,469	233,907				

[1] MF PH1 = MORGAN FARM SUBDIVISION PHASE 1
MF PH1 = MORGAN FARM SUBDIVISION PHASE 2
SM CULVERT = STAFFORD MEADOWS CULVERT
BASINS 24–27 INCLUDE HALF STREET IMPROVEMENTS TO SHERMAN

NEW WILSONVILLE PRIMARY SCHOOL

NOV 2022

WEST LINN / WILSONVILLE SCHOOL DISTRICT

PROPOSED DRAINAGE BASIN TABLE

3J CONSULTING
CIVIL ENGINEERING . WATER RESOURCES . COMMUNITY PLANNING

Table 2-2a Runoff curve numbers for urban areas [1/]

Cover description: Cover type and hydrologic condition	Average percent impervious area [2/]	Curve numbers for hydrologic soil group: A	B	C	D
Fully developed urban areas (vegetation established)					
Open space (lawns, parks, golf courses, cemeteries, etc.) [3/]:					
Poor condition (grass cover < 50%)		68	79	86	89
Fair condition (grass cover 50% to 75%)		49	69	79	84
Good condition (grass cover > 75%)		39	61	74	80
Impervious areas:					
Paved parking lots, roofs, driveways, etc. (excluding right-of-way)		98	98	98	98
Streets and roads:					
Paved; curbs and storm sewers (excluding right-of-way)		98	98	98	98
Paved; open ditches (including right-of-way)		83	89	92	93
Gravel (including right-of-way)		76	85	89	91
Dirt (including right-of-way)		72	82	87	89
Western desert urban areas:					
Natural desert landscaping (pervious areas only) [4/]		63	77	85	88
Artificial desert landscaping (impervious weed barrier, desert shrub with 1- to 2-inch sand or gravel mulch and basin borders)		96	96	96	96
Urban districts:					
Commercial and business	85	89	92	94	95
Industrial	72	81	88	91	93
Residential districts by average lot size:					
1/8 acre or less (town houses)	65	77	85	90	92
1/4 acre	38	61	75	83	87
1/3 acre	30	57	72	81	86
1/2 acre	25	54	70	80	85
1 acre	20	51	68	79	84
2 acres	12	46	65	77	82
Developing urban areas					
Newly graded areas (pervious areas only, no vegetation) [5/]		77	86	91	94
Idle lands (CN's are determined using cover types similar to those in table 2-2c).					

1 Average runoff condition, and $I_a = 0.2S$.

2 The average percent impervious area shown was used to develop the composite CN's. Other assumptions are as follows: impervious areas are directly connected to the drainage system, impervious areas have a CN of 98, and pervious areas are considered equivalent to open space in good hydrologic condition. CN's for other combinations of conditions may be computed using figure 2-3 or 2-4.

3 CN's shown are equivalent to those of pasture. Composite CN's may be computed for other combinations of open space cover type.

4 Composite CN's for natural desert landscaping should be computed using figures 2-3 or 2-4 based on the impervious area percentage (CN = 98) and the pervious area CN. The pervious area CN's are assumed equivalent to desert shrub in poor hydrologic condition.

5 Composite CN's to use for the design of temporary measures during grading and construction should be computed using figure 2-3 or 2-4 based on the degree of development (impervious area percentage) and the CN's for the newly graded pervious areas.

CALCULATIONS

WES BMP Sizing Software Version 1.6.0.2, May 2018

WES BMP Sizing Report

Project Information

Project Name	Frog Pond ES
Project Type	Commercial
Location	7151 Boeckman Rd, Wilsonville, OR
Stormwater Management Area	0
Project Applicant	WLWV School District
Jurisdiction	OutofDistrict

Drainage Management Area

Name	Area (sq-ft)	Pre-Project Cover	Post-Project Cover	DMA Soil Type	BMP
16A PERV	7,393	Grass	LandscapeDsoil	D	PLTR4
16A IMP	2,675	Grass	ConventionalConcrete	D	PLTR4
15 PERV	6,105	Grass	LandscapeDsoil	D	RG4
15 IMP	16,032	Grass	ConventionalConcrete	D	RG4
17-19 & 21 IMP	45,107	Grass	Roofs	D	RG5
14 PERV	1,745	Grass	LandscapeDsoil	D	RG5
14 IMP	22,328	Grass	ConventionalConcrete	D	RG5
12 PERV	20,578	Grass	LandscapeDsoil	D	RG1
12 IMP	0	Grass	ConventionalConcrete	D	RG1
10 PERV	31,413	Grass	LandscapeDsoil	D	RG2
10 IMP	17,937	Grass	ConventionalConcrete	D	RG2
8 PERV	5,983	Grass	LandscapeDsoil	D	RG3
8 IMP	8,338	Grass	ConventionalConcrete	D	RG3
7 PERV	2,447	Grass	LandscapeDsoil	D	PLTR1
7 IMP	9,428	Grass	ConventionalConcrete	D	PLTR1
6 PERV	1,592	Grass	LandscapeDsoil	D	PLTR5
6 IMP	5,323	Grass	ConventionalConcrete	D	PLTR5
5 IMP	5,493	Grass	ConventionalCo	D	PLTR6

			ncrete		
5 PERV	1,856	Grass	LandscapeDsoil	D	PLTR6
16B IMP	2,749	Grass	ConventionalConcrete	D	PLTR3
16B PERV	9,853	Grass	LandscapeDsoil	D	PLTR3
16C IMP	7,205	Grass	ConventionalConcrete	D	PLTR2
16C PERV	1,755	Grass	LandscapeDsoil	D	PLTR2
4 IMP	11,720	Grass	ConventionalConcrete	D	RG6 FUTURE
4 PERV	40,771	Grass	LandscapeDsoil	D	RG6 FUTURE
20 IMP	9,398	Grass	Roofs	D	RG6 FUTURE
22 IMP	4,016	Grass	ConventionalConcrete	D	PLTR7
22 PERV	489	Grass	LandscapeDsoil	D	PLTR7
23 IMP	6,353	Grass	ConventionalConcrete	D	PLTR8
23 PERV	750	Grass	LandscapeDsoil	D	PLTR8
24 IMP	9,127	Grass	ConventionalConcrete	D	PLTR9
24 PERV	5,375	Grass	LandscapeDsoil	D	PLTR9
25 IMP	2,639	Grass	ConventionalConcrete	D	PLTR10
25 PERV	1,015	Grass	LandscapeDsoil	D	PLTR10
26 IMP	2,685	Grass	ConventionalConcrete	D	PLTR11
26 PERV	2,119	Grass	LandscapeDsoil	D	PLTR11
27 IMP	5,017	Grass	ConventionalConcrete	D	PLTR12
27 PERV	4,384	Grass	LandscapeDsoil	D	PLTR12

LID Facility Sizing Details

LID ID	Design Criteria	BMP Type	Facility Soil Type	Minimum Area (sq-ft)	Planned Areas (sq-ft)	Orifice Diameter (in)
RG4	FlowControlAndTreatment	Rain Garden - Filtration	D1	812.2	3,603.0	1.5
RG5	FlowControlAndTreatment	Rain Garden - Filtration	D1	2,746.3	3,063.0	2.7
RG1	FlowControlAndTreatment	Rain Garden - Filtration	D1	576.2	1,337.0	1.4
RG2	FlowControlAndTreatment	Rain Garden - Filtration	D1	1,597.0	7,455.0	2.2
RG3	FlowControlA	Rain Garden	D1	501.0	3,655.0	1.2

	ndTreatment	- Filtration				
RG6 FUTURE	FlowControlAndTreatment	Rain Garden - Filtration	D1	1,986.3	2,000.0	2.5
PLTR4	FlowControlAndTreatment	Stormwater Planter - Filtration	D1	235.5	300.0	1.1
PLTR1	FlowControlAndTreatment	Stormwater Planter - Filtration	D1	334.2	861.0	1.2
PLTR5	FlowControlAndTreatment	Stormwater Planter - Filtration	D1	193.1	330.0	0.9
PLTR6	FlowControlAndTreatment	Stormwater Planter - Filtration	D1	203.8	352.0	1.0
PLTR3	FlowControlAndTreatment	Stormwater Planter - Filtration	D1	289.4	300.0	1.3
PLTR2	FlowControlAndTreatment	Stormwater Planter - Filtration	D1	253.0	577.0	1.1
PLTR7	FlowControlAndTreatment	Stormwater Planter - Filtration	D1	130.7	489.0	0.8
PLTR8	FlowControlAndTreatment	Stormwater Planter - Filtration	D1	206.3	750.0	0.9
PLTR9	FlowControlAndTreatment	Stormwater Planter - Filtration	D1	386.7	1,311.0	1.3
PLTR10	FlowControlAndTreatment	Stormwater Planter - Filtration	D1	100.5	520.0	0.7
PLTR11	FlowControlAndTreatment	Stormwater Planter - Filtration	D1	125.0	520.0	0.8
PLTR12	FlowControlAndTreatment	Stormwater Planter - Filtration	D1	242.6	520.0	1.1

Pond Sizing Details

1. FCWQT = Flow control and water quality treatment, WQT = Water quality treatment only
2. Depth is measured from the bottom of the facility and includes the three feet of media (drain rock, separation layer and growing media).
3. Maximum volume of the facility. Includes the volume occupied by the media at the bottom of the facility.
4. Maximum water storage volume of the facility. Includes water storage in the three feet of soil media assuming a 40 percent porosity.

GEOTECHNICAL REPORT

REPORT OF GEOTECHNICAL ENGINEERING SERVICES

Boeckman Road School
7151 Boeckman Road
Wilsonville, Oregon

For
West Linn-Wilsonville School District
June 1, 2022

Project: WLWSchDist-7-01

NV5

June 1, 2022

West Linn-Wilsonville School District
22210 SW Stafford Road
Tualatin, OR 97062

Attention: Brooke Besheone

Report of Geotechnical Engineering Services
Boeckman Road School
7151 Boeckman Road
Wilsonville, Oregon
Project: WLWSchDist-7-01

NV5 is pleased to submit this report of geotechnical engineering services for the proposed Boeckman Road School located at 7151 Boeckman Road in Wilsonville, Oregon. Our services for this project were conducted in accordance with our proposal dated March 9, 2022.

We appreciate the opportunity to be of service to you. Please contact us if you have questions regarding this report.

Sincerely,

NV5

Shawn M. Dimke, P.E., G.E.
Principal Engineer

cc: Rebecca Grant, IBI Group (via email only)
Aaron Stocek, KPFF Consulting Engineers (via email only)
Angela Caffrey, West Linn-Wilsonville School District (via email only)

SPM:SMD:kt
Attachments
One copy submitted (via email only)
Document ID: WLWSchDist-7-01-060122-geor.docx

Washington and northeastern Oregon. The CRBG is considered the geologic basement unit for this report (Gannett and Caldwell, 1998; Burns et al., 1997; Schlicker and Finlayson, 1979; Hart and Newcomb, 1965).

3.3 SUBSURFACE CONDITIONS

We explored subsurface conditions by excavating nine test pits (TP-1 through TP-9) to depths between 5 and 15.5 feet BGS, conducting DCP testing in three of the test pits, and conducting two CPTs (CPT-1 and CPT-2) to depths of approximately 60.5 and 100.5 feet BGS. A description of the field explorations and laboratory testing program, the test pit logs, and results of laboratory testing are presented in Appendix A. Results of DCP testing are presented in Appendix B. The CPT logs are presented in Appendix C. All exploration locations are shown on Figure 2.

The explorations generally encountered layers of silt and clay to the maximum depth explored. We observed an approximate 2- to 6-inch thick root zone and 8- to 14-inch thick agricultural tilled zone at the ground surface. The following provides a description of the soil unit encountered.

3.3.1 Silt/Clay

Layers of silt and clay were encountered from the ground surface to the maximum depth explored. The silt/clay soil contains trace to minor amounts of fine sand in the upper approximately 40 feet. CPT logs indicate that the sand content generally increases and clay content generally decreases at depths below 40 feet BGS. Hand probing and observation during test pit excavation indicate that the silt/clay is soft in the agricultural tilled zone (upper 8 to 14 inches) and generally medium stiff to very stiff below the tilled zone. CPT logs indicate that the soil strength gradually increases to very stiff to hard at depths of approximately 40 to 60 feet BGS and then strength decreases to medium stiff to stiff at depths of 60 to 100 feet BGS.

Laboratory testing of select samples of the silt/clay indicated moisture content between 31 and 38 percent at the time of exploration and a fines content between 81 and 98 percent by weight. Atterberg limits testing of one select clay sample indicated moderate plasticity.

3.3.2 Groundwater

Groundwater was encountered at depths between 4 and 10 feet BGS in the test pits. Groundwater depths are presented on Figure 2 and indicate that groundwater is shallower on the east side of the site. The depth to groundwater is expected to fluctuate in response to seasonal changes, changes in surface topography, local river levels, and other factors not observed in the site vicinity.

3.4 INFILTRATION TESTING

We performed infiltration testing in three test pit excavations. Testing was performed at depths between 3 and 5 feet BGS in 6-inch-diameter PVC pipes inserted into the test pits. Pipes were pushed into the soil at the bottom of the pits to create a seal and backfill was placed around the pipes. After backfilling, water was injected into the pipes and the soil was allowed to soak for a period of one hour before beginning the test. After the soak period, we measured the drop in water level over a period of at least one hour. The measured average infiltration rates are presented in Table 1.

Table 1. Infiltration Test Results

Location	Depth (feet BGS)	Soil Type at Test Depth	Measured Infiltration Rate (inches per hour)	Fines Content[1] (percent)
TP-2	5	Silt, some clay, trace sand	0.3	98
TP-4	3	Silt, some clay, trace sand	0.2	97
TP-5	4	Silt, some clay, trace sand	0.5	NA

1. particles finer than 75 µm by dry weight

4.0 DESIGN RECOMMENDATIONS

4.1 FOUNDATION SUPPORT

4.1.1 General

Based on the results of the explorations, the planned building loads, and the grading plan (see "Project Understanding" section), the building can be supported by shallow foundations bearing on undisturbed native soil or structural fill overlying undisturbed native soil. Foundations should not be established over the existing agricultural tilled zone. Where identified within foundation subgrade soil, tilled zone material should be removed and replaced with structural fill in accordance with the "Structural Fill" section.

The results of our subsurface explorations, laboratory testing, and geotechnical analysis indicate that total post-construction consolidation-induced settlement under static conditions should be less than 1 inch with differential settlement of less than ½ inch between footings. As discussed in the "Seismic Design" section, shallow foundations could also be subject to 1 inch to 1.5 inches of liquefaction-induced settlement during the design-level earthquake (0.5 to 0.75 inch of differential settlement over a span of 50 feet). While ASCE 7-16 does not require foundation ties for the estimated differential settlement magnitude, the project structural engineer should verify that foundations can tolerate the estimated settlement.

4.1.2 Dimensions and Design Parameters

Continuous wall and isolated spread footings should be at least 16 and 20 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 established on subgrade prepared as recommended above should be sized based on an allowable bearing pressure of 2,500 psf. This value 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 can be increased by one-half for short-term loads, such as those resulting from wind or seismic forces.

4.1.3 Resistance to Sliding

Lateral loads on footings can be resisted by passive earth pressure on the sides of footings and by friction on the base of the footings. Our analysis indicates that the available passive earth pressure for footings confined by on-site soil and structural fill is 250 pcf, modeled as an

LEGEND:

TP-1 TEST PIT

CPT-1 CPT

(9.5) DEPTH TO GROUNDWATER (FEET BGS)

N

0 100 200

(SCALE IN FEET)

NOTES:

1. SITE PLAN BASED ON IMAGE OBTAINED FROM IBI GROUP ON MAY 6, 2022.
2. AERIAL PHOTOGRAPH OBTAINED FROM GOOGLE EARTH PRO MAY 26, 2022.

FIGURE 2

SITE PLAN

BOECKMAN ROAD SCHOOL
WILSONVILLE, OR

WLWSCHDIST-7-01

JUNE 2022

NV5

Printed By: mmiller | Print Date: 6/1/2022 2:23:35 PM
File Name: J:\S-Z\WLWSchDist\WLWSchDist-7\WLWSchDist-7-01\Figures\CAD\WLWSchDist-7-01-SP01.dwg | Layout: FIGURE 2

DEPTH FEET	GRAPHIC LOG	MATERIAL DESCRIPTION	ELEVATION DEPTH	TESTING	SAMPLE	MOISTURE CONTENT % (0 50 100)	COMMENTS
0.0		Soft, pale brown with orange mottled and black speckled SILT (ML), some clay, trace sand and organics (rootlets); moist, sand is fine (10-inch-thick tilled zone, 3-inch-thick root zone). medium stiff to stiff at 0.9 foot		PP			PP = 0.5 tsf
				PP			PP = 1.0 tsf
2.5					X	●	
		wet at 4.0 feet		PP			PP = 4.5 tsf
5.0		Exploration completed at a depth of 5.0 feet.	5.0	P200	X	●	Infiltration test at 5.0 feet. P200 = 98% No groundwater seepage observed to the depth explored. No caving observed to the depth explored. Surface elevation was not measured at the time of exploration.
7.5							
10.0							
12.5							
15.0							
17.5							
20.0							

EXCAVATED BY: Dan J. Fischer Excavating, Inc.

LOGGED BY: S. Freeman

COMPLETED: 03/28/22

EXCAVATION METHOD: backhoe (see document text)

NV5

WLWSCHDIST-7-01

JUNE 2022

TEST PIT TP-2

BOECKMAN ROAD SCHOOL
WILSONVILLE, OR

FIGURE A-2

DEPTH FEET	GRAPHIC LOG	MATERIAL DESCRIPTION	ELEVATION DEPTH	TESTING	SAMPLE	● MOISTURE CONTENT % (0 50 100)	COMMENTS
0.0		Soft, brown with orange and pale brown mottled and black speckled SILT (ML), some clay, trace sand and organics (rootlets); moist, sand is fine (12-inch-thick tilled zone, 6-inch-thick root zone). stiff at 1.0 foot					
2.5				PP	⊠		PP = 3.5 tsf
				PP	⊠	●	Infiltration test at 4.0 feet. PP = 3.0 tsf
5.0					⊠		
		Exploration completed at a depth of 5.5 feet.	5.5				No groundwater seepage observed to the depth explored. No caving observed to the depth explored. Surface elevation was not measured at the time of exploration.
7.5							
10.0							
12.5							
15.0							
17.5							
20.0						0 50 100	

EXCAVATED BY: Dan J. Fischer Excavating, Inc. LOGGED BY: S. Freeman COMPLETED: 03/28/22

EXCAVATION METHOD: backhoe (see document text)

NV5	WLWSCHDIST-7-01	**TEST PIT TP-5**
	JUNE 2022	BOECKMAN ROAD SCHOOL WILSONVILLE, OR — **FIGURE A-5**

TEST PIT LOG - NV5 - 1 PER PAGE WLWSCHDIST-7-01-TP1_9.GPJ GDI_NV5.GDT PRINT DATE: 5/31/22:KT

DOWNSTREAM ANALYSIS

STAFFORD MEADOWS

Appendix C—Downstream Analysis

Otak

Technical Memorandum

To:	Mike Peebles, PE Otak, Inc.
From:	Mojy Rostaminia, PhD Rose Horton, PE
Copies:	File
Date:	1/16/2018
Subject:	Downstream Impact Analysis Stafford Meadows Development
Project No.:	17868

Introduction

Otak has conducted a downstream impact analysis on the downstream storm conveyance system for the proposed Stafford Meadows Development, per City of Wilsonville standards. This proposed development is located north of SW Boeckman Road, as shown on Figure 1.

Figure 1 Vicinity map

The development will meet the City of Wilsonville Public Work Standards Section 301.4.04 which requires flow control from post-development conditions for peak flow rates generated by between 42% of the 2-year storm up to the 10-year storm.

In order to meet the requirements of City of Wilsonville Public Work Standards Section 301.5.01, a downstream analysis shall include:

- verifying that the downstream system has the capacity to convey the 25-year design storm
- extending the analysis downstream to a point in the drainage system where the proposed development site contributes 10% or less of the total tributary drainage flow or for one-quarter mile downstream of the approved point of discharge. The later was applied in this case.

Existing Conveyance System

The existing conveyance system used in this analysis is shown on Figure 2, which also includes drainage basin delineation, time of concentration (Tc) flow paths, and runoff node locations represented in the hydraulic model. Details of the downstream conveyance system used to create the hydraulic model were primarily obtained from City GIS as-built information, and field observation. The proposed Stafford Meadows development will discharge runoff into the existing Willow Creek channel running south through the site. The creek is conveyed south under SW Boeckman Road through a pair of 18” culverts and then runs in a grassed channel through a neighborhood. The channel is collected in a 36” diameter pipe that crosses under SW Willow Creek Drive where it is joined by runoff from the neighborhood. The combined flows then drain to a deep channel which outfalls to the Willamette River approximately one mile downstream of the end of this analysis.

The proposed development for this site is located above the 100-year floodplain delineated in the Flood Insurance Rate Map (FEMA, 2008) and in non-printed unmapped Flood Map Boundary Area. See Appendix B for the FIRMette corresponding to the proposed site.

Field Visit and Assessment

The project site is located in the headwaters of Willow Creek. The headwaters are currently in an agriculture condition. The proposed Stafford Meadows development is one of the first developments added per the Frog *Pond West Master Plan (*Wilsonville, 2017*)*. The basins downstream of SW Boeckman Road are developed single family residential areas and the channel is wide grassed and stable. Flow from the grassed channel is conveyed in a 36” storm pipe through the neighborhood and outfalls through a concrete box energy dissipater into a natural channel. Channel incision persists throughout this reach. Incision is occurring via upstream migration of multiple headcuts, measuring one to two-foot in height, through the fine grained soil. Riparian habitat was observed in sections above the active channel along the creek with high proportions of non-native, invasive plant species dominating the riparian community. In-stream wood is dispersed throughout the reach due to the scattering of riparian trees available for recruiting.
The stretch of channel downstream of the project site was visited on December 1st, 2017 after several days of wet weather. The field assessment started at the onsite drainage channel directly upstream of SW Boeckman Road and extended one quarter mile downstream through the section of channel adjacent to Willow Creek Park.

The purpose of the field visit was to observe and document existing channel conditions, road crossings, outfalls, and contributing waterways. Visual documentation of the drainage system along the channel is included in the Photo Log in Appendix A. The estimated downstream distances (in feet), referred to as Stations in this analysis, are referenced to Node 1 at station 0+00. The following section discusses the observations made through each of the reaches.

Table 1 identifies six nodes where drainage basins contribute to the creek. Existing and potential problems are highlighted. Field observations and references to photos are listed in the last column with the goal of emphasizing the more significant channel modifications caused by the existing flow rates.

Table 1: Downstream Impact Analysis - Drainage System Table					
Station	**Drainage Component**	**Contributing Drainages** (See Figure 2 for referenced basins)	**Existing Problems**	**Potential Problems**	**Observations** (Referenced Photos are in Appendix B)
0+00 to 0+35	Node 1: Existing stream south of development and upstream of outfall.	**.Basin 1 and Site** Agricultural properties with homestead buildings north of Boeckman Road	None	None	Shallow natural channel and wetland located adjacent to Stafford Meadows property. The channel is in good condition without indicators of degradation. (**Photo 1)**
0+35 to 1+25	Existing pair of 18-inch dia, 80-ft long concrete culverts at SW Boeckman Road	—	None	None	Culvert inlets in **Photo 2**. Gravels accumulating at downstream end of culverts in **Photo 3**.
1+25 to 6+65	Grassed channel with brushy sides	**Basin 2** SW Boeckman Road runoff discharged to channel through culvert and rocked swale	None	None	Grassed channel with brushy banks. Channel typically 6-ft wide, 4H:1V side slopes. Banks vary 2-3' height. Blackberry dominates much of the riparian corridor in this reach. (**Photo 4)**
6+65 to 7+75	Grassed channel with maintained sides	—	None	None	Channel widens and vegetated side slopes steepen. 10.5-ft bottom width, banks 4-5-ft high. (**Photo 5)**
7+75 to 7+90	Upstream input from 18-inch, CCP	**Basin 3** Neighborhood west of channel managed with two upstream stormwater facilities	None	None	Accumulation of silt and leaves in culvert bottom reduces capacity. (**Photo 6)**
7+90 to 10+70	36-in dia, 295-ft long concrete culvert at SW Willow creek Drive with angle at manhole halfway	**Basin 4** Residential neighborhood located adjacent of channel	None	None	295-ft long, 36-in dia. CPP culvert under SW Willow Creek Dr (**Photo 7**). Accumulation of debris at upstream grate. Downstream end of culvert drops into grated concrete box (**Photo 8**) with 24-inch concrete outfall onto riprap (**Photo 9**). Approximately 3-ft of drop from culvert to channel.

Table 1: Downstream Impact Analysis - Drainage System Table

10+70 11+15	Natural channel	**Basin 5** Park area and channel	Incision	Incision	Slightly meandering, 8-ft wide fine grained channel (**Photo 10**). Incised vertical banks 2-ft high. Top of slope about 10-ft above channel bottom. Slopes heavily vegetated with blackberry, ferns and trees.
11+15 to 11+30	Natural channel	—	Incision	Incision	Channel narrows to 4-ft. A pair of 10-inch drops over 1-ft to 3-ft dia rocks. (**Photo 11**)
11+30 to 11+45	Natural channel	—	Incision	Incision	Channel narrows to 1-ft wide and 1-ft deep. Vertical right bank 5-ft high. Left bank vertical for 1-ft and then more gradual slope above. (**Photo 12**)
11+45 to 11+90	Natural channel	—	Incision	Incision	Channel widens to 6-ft width, left bank 18-inches high and right 4-ft high vertically. Large rocks in channel and large wood across. (**Photo 13**)
11+90 to 12+70	Natural channel	—	None	None	Channel narrows to 3-ft width, 1-ft drop. Left bank 4-ft high (steep) and right bank 3-ft high. Large rocks in channel with ferns established on banks at 3-ft each side. (**Photo 14**)
12+70 to 13+40	Natural channel	—	None	None	Channel about 2-ft bottom width. 2-ft drops spaced about every 20-ft and wood in channel. Side slopes 1:1. (**Photo 15**)
13+40 to 13+80	24-inch dia. CPP culvert outfall perched 3-ft above channel.	**Basin 6** Residential area west of the channel.			Perched culvert on right side (**Photo 16**).Channel width 4-ft. 2-ft drop in channel. Right bank near vertical for 10-ft and left 5-ft high with 6-ft wide bench with another 5-ft slope to top. (**Photo 17**)

Hydrology

Peak runoff rates from the drainage basins delineated in Figure 2, during existing and proposed conditions were calculated using XPSWMM V14. The Santa Barbara Urban Hydrograph (SBUH) method was used to apply the conveyance design event (25-year recurrence interval, 24-hour duration, NRCS Type 1A rainfall distribution), per Section 301.5.01. Time of Concentration values were calculated for each delineated drainage basin using TR-55 equations. Time of Concentration (Tc) flow paths are shown in Figure 2 and corresponding calculations for each drainage basin are included in Appendix B. A time of concentration of 5 minutes, the minimum allowable, was applied to developed impervious areas.

Most of the study area is comprised of silt loam categorized in the hydrologic soil group (HSG) D. HSG D soils generally exhibit very slow infiltration rates when thoroughly wet. A small upland area is categorized as HSG C with low to moderate infiltration, and a section of the channel is HSG B with moderate infiltration. A Curve Number (CN) of 98 was used for all impervious areas. The pervious areas were open space with good grass cover, thus a CN of 61 (HSG B), 74 (HSG C), or 80 (HSG D) was used as applicable.

The basins downstream of the proposed project site are developed residential areas. Impervious percentages were estimated based on existing impervious surfaces captured in 2007 aerial imagery. Basin 1 and the 15.3-acre proposed Stafford Meadows development are currently agricultural with few homes, outbuildings, and driveways. Per the *Frog Pond West Master Plan* (Wilsonville, 2017), Basin 1 is to be developed into primarily a mix of small, medium, and large lot single family homes. Based on a published Clackamas County Water and Environmental Services (WES) study of impervious surfaces (WES, 2005), impervious percentages for future land uses in Basin 1 were estimate and averaged for the basin (see Appendix B). The impervious percentage for the proposed site was calculated using the proposed site plan. The existing two-lane SW Boeckman Road, included in Basin 2, is anticipated to be widened to include bicycle lanes and sidewalks in the near future and this improvement is included the Basin1 Fully Developed scenario.

Table 2 summarizes the 25-year existing and developed peak flowrates in Willow Creek for proposed project conditions calculated in XP-SWMM. The stationing represents the 1,380 feet measured downstream from the starting point of the downstream impact analysis.

Table 2: Peak 25-Year Flowrates

Node	Station	Contributing Basin Area (ac)	Existing Flow Rate (cfs)	Proposed Flow Rate (cfs)	Basin 1 Fully Developed Flow Rate (cfs)
1	0+00	55.80	20.83	28.06	44.61
2	1+25	5.84	24.91	31.10	47.92
3	7+75	5.89	29.62	35.28	52.56
4	7+90	11.87	40.45	46.89	63.32
5	10+70	1.32	40.59	47.13	63.14
6	13+40	9.80	48.44	55.07	71.07

Downstream Conveyance Modeling Analysis

The stormwater conveyance network was analyzed in XP-SWMM. The conveyance system was modeled to determine whether the existing downstream system has sufficient capacity to support the Stafford Meadows development runoff undetained during the 25-year, 24-hour storm event. The pipe network reflects inverts from GIS As-built data. A Manning's n value of 0.013 was applied to the storm conveyance pipes in the network and a value of 0.035 was applied to the open channel reach of Willow Creek upstream of SW Willow Creek Drive. A value of 0.04 was applied to the channel and 0.08 was applied to the banks of the open channel reach of Willow Creek downstream of SW Willow Creek Drive. A minimum of one-foot of freeboard between the hydraulic grade line (HGL) and the structure rim elevations was confirmed; therefore it is assumed that adequate capacity exists. Appendix C includes output information from the XP-SWMM model, summarizing the pipe network characteristics and results of the hydraulic routing during the design storm. The existing channel on the Stafford Meadows (XPSWMM Link 1) site is only about 1.5-ft in depth. The runoff generated by the Fully Developed Basin 1 will over top the existing channel banks and the downstream SW Boeckman Road.

Directly downstream of the project site a pair of 18-inch diameter culverts convey Willow Creek beneath SW Boeckman Road. These culverts are approximately 80 feet long and invert elevations were obtained through survey. The hydraulic capacity of these culverts, referred to as Culvert West and Culvert East, were modeled using HY-8 software. The peak flow rate entering the culverts is the 26.8 cfs from the upstream channel (XPSWMM Link 1) under proposed conditions. The results of the hydraulic calculations (see Appendix C) show that the existing culverts do not have adequate capacity to convey the 25-year flow rate without overtopping the existing roadway.

Conclusions

The downstream stormwater conveyance system analyzed as part of this downstream analysis extends from the proposed development approximately one quarter of a mile downstream to the open channel adjacent to Willow Creek Park. The system consists of both open channel and piped conveyance components. A site visit along the downstream reach provided a qualitative assessment of the storm conveyance system, and found no evidence of capacity restrictions under existing conditions. The storm sewer was modeled using XP-SWMM software, and shows adequate capacity for the proposed flows and that the onsite channel lacks capacity for Basin 1 Fully Buildout flow rates. The culverts beneath SW Boeckman Road were modeled using HY-8 software, and lack adequate capacity to convey the proposed undetained flows from the Stafford Meadows development.
The proposed development will need to detain high flows on site or increase the capacity at the crossing under SW Boeckman Road to meet City standards.

References

City of Wilsonville. *City of Wilsonville Public Works Standards. Section 3, Stormwater & Surface Water Design and Construction Standards*, City of Wilsonville, Revised December 2015.

FEMA, 2008. *Flood Insurance Rate Map (FIRM) for Clackamas County, Oregon, Incorporated Areas, Panel 243*, Federal Emergency Management Agency, June 17, 2008.

National Resource Conservation Services, United States Department of Agriculture. “Web Soil Survey.” <http://websoilsurvey.nrcs.usda.gov/> Accessed: December 14, 2017.

WES, 2005. *Results of evaluation and analysis of impervious surface and current and future land use types in CCSD#1 and the Damascus UGB expansion area*. Clackamas County Water Environment Services, July 2005

Wilsonville, 2017. *Frog Pond West Master Plan*, City of Wilsonville, July 17, 2017.

Downstream Analysis

F i g u r e s

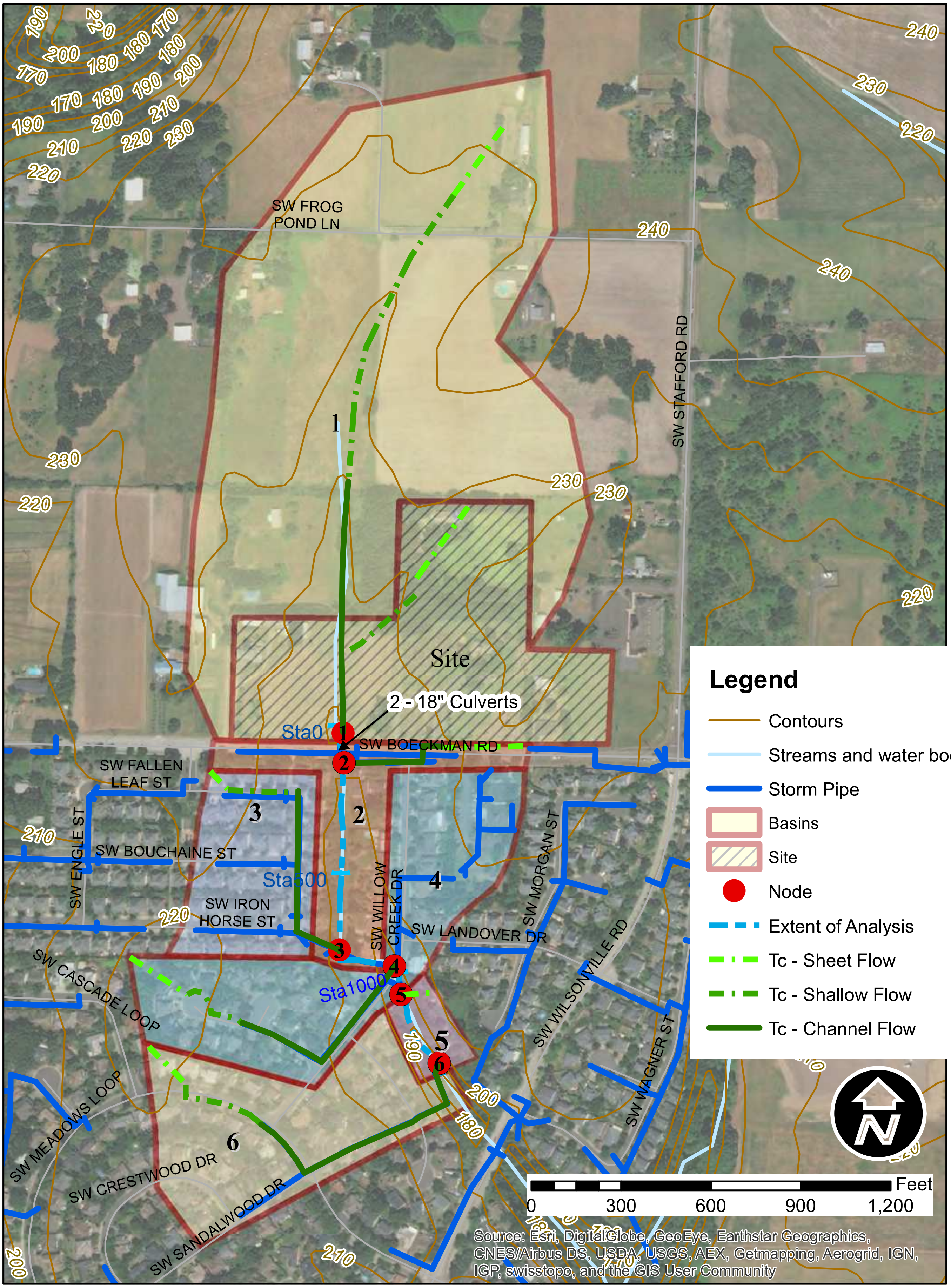

SW FROG POND LN
SW STAFFORD RD
SW BOECKMAN RD
SW FALLEN LEAF ST
SW ENGLE ST
SW BOUCHAINE ST
SW IRON HORSE ST
SW WILLOW CREEK DR
SW LANDOVER DR
SW MORGAN ST
SW WILSONVILLE RD
SW WAGNER ST
SW CASCADE LOOP
SW MEADOWS LOOP
SW CRESTWOOD DR
SW SANDALWOOD DR
Site
2 - 18" Culverts
Sta0
Sta500
Sta1000
1
2
3
4
5
6
Legend
Contours
Streams and water bodies
Storm Pipe
Basins
Site
Node
Extent of Analysis
Tc - Sheet Flow
Tc - Shallow Flow
Tc - Channel Flow
N
0
300
600
900
1,200
Feet
Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community

FIGURE 2

Downstream Analysis

Appendices

Downstream Analysis

Appendix A — Photo Log

Downstream Analysis

Photo 1 Channel in ROW on Frog Property

Photo 2 Upstream Ends of Culverts

Photo 3 Downstream of culvert with gravel accumulation

Photo 4 Vegetated section of channel

Photo 5 Vegetated channel with taller banks and logs channeling flow

Photo 6 Partly submerged 18-inch CCP contributing culvert

Photo 7 36-inch culvert under SW Willow Creek Drive

Photo 8 36-inch Outfall into Concrete Box

Photo 9 24-inch Outfall from energy dissipation Concrete Box at outfall from 36-inch Pipe

Photo 10 Wide Incised Channel

Photo 11 Channel with Drops adjacent to rocks in the channel

Photo 12 Confined channel section

Photo 13 Widened channel with rock and large wood

Photo 14 Channel with steep and eroding banks, and rock in channel

Photo 15 2-ft high drops in Channel

Photo 16 Perched Culvert on Right Bank

Photo 17 Channel at downstream extent of analysis

Downstream Analysis

Appendix B — Hydrology

MAP SCALE 1" = 500'

250 0 500 1000 FEET

NFIP

NATIONAL FLOOD INSURANCE PROGRAM

PANEL 0234D

FIRM
FLOOD INSURANCE RATE MAP
CLACKAMAS COUNTY, OREGON
AND INCORPORATED AREAS

PANEL 234 OF 1175
(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
CLACKAMAS COUNTY	415588	0234	D
WILSONVILLE, CITY OF	410025	0234	D

Notice to User: The **Map Number** shown below should be used when placing map orders; the **Community Number** shown above should be used on insurance applications for the subject community.

MAP NUMBER
41005C0234D

EFFECTIVE DATE
JUNE 17, 2008

Federal Emergency Management Agency

This is an official copy of a portion of the above referenced flood map. It was extracted using F-MIT On-Line. This map does not reflect changes or amendments which may have been made subsequent to the date on the title block. For the latest product information about National Flood Insurance Program flood maps check the FEMA Flood Map Store at www.msc.fema.gov

Basin Areas
17868 Stafford Meadows Downstream Analysis

Existing Conditions											
Basin	**HSG**	**% HSG Type**	**Basin Area (ac)**	**Time of Concentration (Tc)**	**% Impervious**	**Total Impervious Area (ac)**	**Area HSG D (ac)**	**Area HSG C (ac)**	**Area HSG B (ac)**	**Total Pervious Area (ac)**	**Drains To Node**
1	C/D	100	40.30	36.1	10	4.03	36.27	0.00	0.00	36.27	1
Site	C/D	100	15.30	33.4	8	1.17	14.13	0.00	0.00	14.13	1
2	C/D	100	5.84	5.0	45	2.63	3.21	0.00	0.00	3.21	2
3	C/D	100	5.89	12.2	60	3.53	2.36	0.00	0.00	2.36	3
4	C/D	100	11.87	5.0	60	7.12	4.75	0.00	0.00	4.75	4
5	C/D, B	41, 59	1.32	8.0	5	0.07	0.51	0.74	0.00	1.25	5
6	C/D, C, B	94, 3, 3	9.80	34.8	60	5.88	3.69	0.12	0.12	3.92	6

Proposed Conditions											
Basin	**HSG**	**% HSG Type**	**Basin Area (ac)**	**Time of Concentration (Tc)**	**% Impervious**	**Total Impervious Area (ac)**	**Area HSG D (ac)**	**Area HSG C (ac)**	**Area HSG B (ac)**	**Total Pervious Area (ac)**	**Drains To Node**
1	C/D	100	40.30	36.1	10	4.03	36.27	0.00	0.00	36.27	1
Site_developed	C/D	100	15.30	5.0	44	6.70	8.60	0.00	0.00	8.60	1
2	C/D	100	5.84	5.0	45	2.63	3.21	0.00	0.00	3.21	2
3	C/D	100	5.89	12.2	60	3.53	2.36	0.00	0.00	2.36	3
4	C/D	100	11.87	5.0	60	7.12	4.75	0.00	0.00	4.75	4
5	C/D, B	41, 59	1.32	8.0	5	0.07	0.51	0.74	0.00	1.25	5
6	C/D, C, B	94, 3, 3	9.80	34.8	60	5.88	3.69	0.12	0.12	3.92	6

Basins 1 Fully Developed											
Basin	**HSG**	**% HSG Type**	**Basin Area (ac)**	**Time of Concentration (Tc)**	**% Impervious**	**Total Impervious Area (ac)**	**Area HSG D (ac)**	**Area HSG C (ac)**	**Area HSG B (ac)**	**Total Pervious Area (ac)**	**Drains To Node**
1_developed	C/D	100	40.30	28.9	55	22.17	18.14	0.00	0.00	18.14	1
Site_developed	C/D	100	15.30	5.0	44	6.70	8.60	0.00	0.00	8.60	1
2_developed*	C/D	100	5.84	5.0	60	3.50	2.34	0.00	0.00	2.34	2
3	C/D	100	5.89	12.2	60	3.53	2.36	0.00	0.00	2.36	3
4	C/D	100	11.87	5.0	60	7.12	4.75	0.00	0.00	4.75	4
5	C/D, B	41, 59	1.32	8.0	5	0.07	0.51	0.74	0.00	1.25	5
6	C/D, C, B	94, 3, 3	9.80	34.8	60	5.88	3.69	0.12	0.12	3.92	6

*Includes widening of Boeckman Road

WES 2005 Memo Data		
Description	**Density (units/acre)**	**Impervious Area (%)**
Ras-A Small Lot Single Family	10.45	53
Ras-B	9.57	58
school (ID-6)	NA	35
school (ID-29)	NA	16

Summary of Basin 1 Full Buildout Impervous % by Land Use			
Description	**Density (units/acre)**	**Impervious Area (%)**	**% of Basin**
R-10 Large Lot Single Family	4.3	50*	4.9
R-7 Medium Lot Single Family	6.2	60*	57.9
R-5 Small Lot Single Family	8.7	60*	20.2
Public Facilities	NA	35	13.6
Civic	NA	35	0.6
SROZ	NA	0	2.8

*Values reflect an increase of 5% to account for future collector roads.

Time of Concentration Calculations

17868 Stafford Meadows Downstream Analysis

BASINS		1	1 developed	Site	2
SHEET FLOW					
INPUT					
Surface Description (from Table 3-1)		Short grass	Short grass	Short grass	Paved
Manning's Roughness Coefficient		0.15	0.15	0.15	0.011
Flow Length , L (<300 ft)	ft	295	295	300	268
2-Year, 24-Hour Rainfall, P_2	in	2.5	2.5	2.5	2.5
Land Slope, s	ft/ft	0.020	0.020	0.017	0.025
OUTPUT					
Travel Time	hr	0.44	0.44	0.48	0.05
SHALLOW CONCENTRATED FLOW					
INPUT					
Surface Description (paved or unpaved)		Unpaved		Unpaved	
Flow Length, L	ft	1039		491	
Watercourse Slope, s	ft/ft	0.017		0.018	
OUTPUT					
Average Velocity, V	ft/s	2.12		2.16	
Travel Time	hr	0.14		0.06	
CHANNEL FLOW					
INPUT					
Cross Sectional Flow Area, a	ft^2	3.14	3.14	25	4.71
Wetted Perimeter, p_w	ft	0.79	0.79	16.8	1.77
Channel Slope, s	ft/ft	0.006	0.012	0.011	0.017
Manning's Roughness Coefficient		0.035	0.035	0.035	0.035
Flow Length, L	ft	872	1911	325	373
OUTPUT					
Average Velocity, V	ft/s	8.09	11.72	5.84	10.79
Hydraulic Radius, $r = a/p_w$	ft	3.97	3.97	1.49	2.66
Travel Time	hr	0.030	0.045	0.015	0.010
Basin Time of Concentration, T_c	**hrs**	**0.60**	**0.48**	**0.56**	**0.06**
	min	**36.1**	**28.9**	**33.4**	**3.3** *

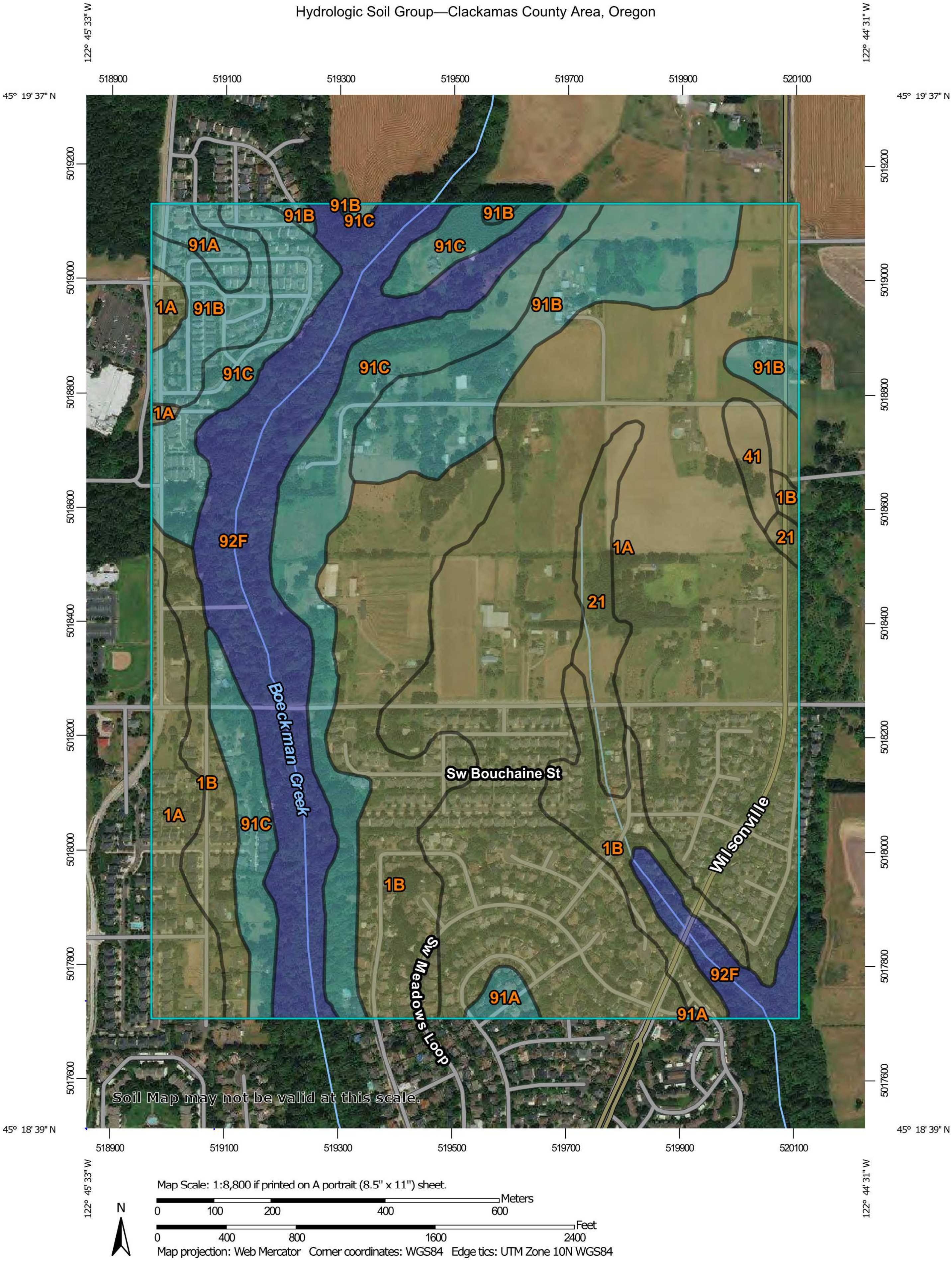
* Minimum Tc of 5 minutes applied to analysis.

Time of Concentration Calculations

17868 Stafford Meadows Downstream Analysis

BASINS		3	4	5	6
SHEET FLOW					
INPUT					
Surface Description (from Table 3-1)		short grass	Short grass	Short grass	Short grass
Manning's Roughness Coefficient		0.15	0.15	0.15	0.15
Flow Length , L (<300 ft)	ft	82	228	125	175
2-Year, 24-Hour Rainfall, P_2	in	2.5	2.5	2.5	2.5
Land Slope, s	ft/ft	0.018	0.010	0.070	0.005
OUTPUT					
Travel Time	hr	0.16	0.48	0.13	0.52
SHALLOW CONCENTRATED FLOW					
INPUT					
Surface Description (paved or unpaved)		paved	paved		paved
Flow Length, L	ft	231	243		312
Watercourse Slope, s	ft/ft	0.011	0.029		0.013
OUTPUT					
Average Velocity, V	ft/s	2.16	3.45		2.33
Travel Time	hr	0.03	0.02		0.04
CHANNEL FLOW					
INPUT					
Cross Sectional Flow Area, a	ft^2	3.14	3.14		6.28
Wetted Perimeter, p_w	ft	0.79	0.79		3.14
Channel Slope, s	ft/ft	0.013	0.012		0.031
Manning's Roughness Coefficient		0.035	0.035		0.035
Flow Length, L	ft	471	700		885
OUTPUT					
Average Velocity, V	ft/s	12.26	11.77		11.85
Hydraulic Radius, $r = a/p_w$	ft	3.97	3.97		2.00
Travel Time	hr	0.011	0.017		0.021
Basin Time of Concentration, T_c	**hrs**	**0.20**	**0.04**	**0.13**	**0.58**
	min	**12.2**	**2.2** *	**8.0**	**34.8**

* Minimum Tc of 5 minutes applied to analysis.


122° 45' 33" W
122° 44' 31" W
45° 19' 37" N
45° 18' 39" N
518900
519100
519300
519500
519700
519900
520100
5019200
5019000
5018800
5018600
5018400
5018200
5018000
5017800
5017600
91A
91B
91C
1A
92F
1B
41
21
Boeckman Creek
Sw Bouchaine St
Sw Meadows Loop
Wilsonville
Soil Map may not be valid at this scale.
Map Scale: 1:8,800 if printed on A portrait (8.5" x 11") sheet.
N
Meters
0 100 200 400 600
Feet
0 400 800 1600 2400
Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 10N WGS84

MAP LEGEND

Area of Interest (AOI)

- Area of Interest (AOI)

Soils

Soil Rating Polygons

- A
- A/D
- B
- B/D
- C
- C/D
- D
- Not rated or not available

Soil Rating Lines

- A
- A/D
- B
- B/D
- C
- C/D
- D
- Not rated or not available

Soil Rating Points

- A
- A/D
- B
- B/D
- C
- C/D
- D
- Not rated or not available

Water Features

- Streams and Canals

Transportation

- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background

- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:20,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Clackamas County Area, Oregon
Survey Area Data: Version 12, Sep 19, 2017

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Aug 19, 2015—Sep 13, 2016

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Hydrologic Soil Group

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
1A	Aloha silt loam, 0 to 3 percent slopes	C/D	169.0	42.0%
1B	Aloha silt loam, 3 to 6 percent slopes	C/D	64.8	16.1%
21	Concord silt loam	C/D	10.5	2.6%
41	Huberly silt loam	C/D	3.0	0.7%
91A	Woodburn silt loam, 0 to 3 percent slopes	C	5.0	1.3%
91B	Woodburn silt loam, 3 to 8 percent slopes	C	38.6	9.6%
91C	Woodburn silt loam, 8 to 15 percent slopes	C	55.0	13.7%
92F	Xerochrepts and Haploxerolls, very steep	B	55.9	13.9%
Totals for Area of Interest			**401.8**	**100.0%**

Description

Hydrologic soil groups are based on estimates of runoff potential. Soils are assigned to one of four groups according to the rate of water infiltration when the soils are not protected by vegetation, are thoroughly wet, and receive precipitation from long-duration storms.

The soils in the United States are assigned to four groups (A, B, C, and D) and three dual classes (A/D, B/D, and C/D). The groups are defined as follows:

Group A. Soils having a high infiltration rate (low runoff potential) when thoroughly wet. These consist mainly of deep, well drained to excessively drained sands or gravelly sands. These soils have a high rate of water transmission.

Group B. Soils having a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep or deep, moderately well drained or well drained soils that have moderately fine texture to moderately coarse texture. These soils have a moderate rate of water transmission.

Group C. Soils having a slow infiltration rate when thoroughly wet. These consist chiefly of soils having a layer that impedes the downward movement of water or soils of moderately fine texture or fine texture. These soils have a slow rate of water transmission.

Group D. Soils having a very slow infiltration rate (high runoff potential) when thoroughly wet. These consist chiefly of clays that have a high shrink-swell potential, soils that have a high water table, soils that have a claypan or clay layer at or near the surface, and soils that are shallow over nearly impervious material. These soils have a very slow rate of water transmission.

If a soil is assigned to a dual hydrologic group (A/D, B/D, or C/D), the first letter is for drained areas and the second is for undrained areas. Only the soils that in their natural condition are in group D are assigned to dual classes.

Rating Options

Aggregation Method: Dominant Condition

Component Percent Cutoff: None Specified

Tie-break Rule: Higher

Table 2-2a Runoff curve numbers for urban areas [1]

Cover description		Curve numbers for hydrologic soil group			
Cover type and hydrologic condition	Average percent impervious area [2]	A	B	C	D
Fully developed urban areas (vegetation established)					
Open space (lawns, parks, golf courses, cemeteries, etc.) [3]:					
Poor condition (grass cover < 50%)		68	79	86	89
Fair condition (grass cover 50% to 75%)		49	69	79	84
Good condition (grass cover > 75%)		39	61	74	80
Impervious areas:					
Paved parking lots, roofs, driveways, etc. (excluding right-of-way)		98	98	98	98
Streets and roads:					
Paved; curbs and storm sewers (excluding right-of-way)		98	98	98	98
Paved; open ditches (including right-of-way)		83	89	92	93
Gravel (including right-of-way)		76	85	89	91
Dirt (including right-of-way)		72	82	87	89
Western desert urban areas:					
Natural desert landscaping (pervious areas only) [4]		63	77	85	88
Artificial desert landscaping (impervious weed barrier, desert shrub with 1- to 2-inch sand or gravel mulch and basin borders)		96	96	96	96
Urban districts:					
Commercial and business	85	89	92	94	95
Industrial	72	81	88	91	93
Residential districts by average lot size:					
1/8 acre or less (town houses)	65	77	85	90	92
1/4 acre	38	61	75	83	87
1/3 acre	30	57	72	81	86
1/2 acre	25	54	70	80	85
1 acre	20	51	68	79	84
2 acres	12	46	65	77	82
Developing urban areas					
Newly graded areas (pervious areas only, no vegetation) [5]		77	86	91	94
Idle lands (CN's are determined using cover types similar to those in table 2-2c).					

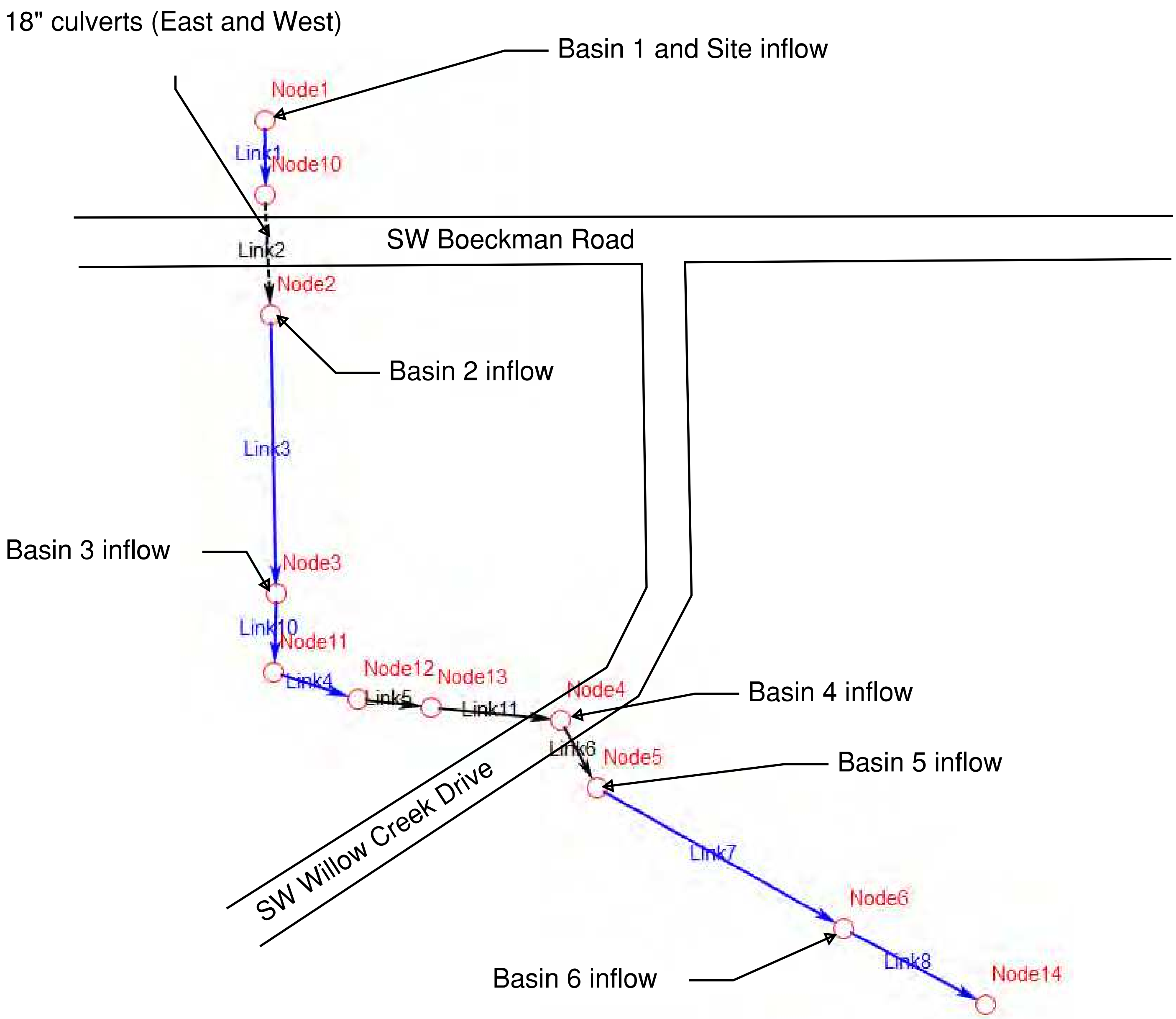
1 Average runoff condition, and $I_a = 0.2S$.
2 The average percent impervious area shown was used to develop the composite CN's. Other assumptions are as follows: impervious areas are directly connected to the drainage system, impervious areas have a CN of 98, and pervious areas are considered equivalent to open space in good hydrologic condition. CN's for other combinations of conditions may be computed using figure 2-3 or 2-4.
3 CN's shown are equivalent to those of pasture. Composite CN's may be computed for other combinations of open space cover type.
4 Composite CN's for natural desert landscaping should be computed using figures 2-3 or 2-4 based on the impervious area percentage (CN = 98) and the pervious area CN. The pervious area CN's are assumed equivalent to desert shrub in poor hydrologic condition.
5 Composite CN's to use for the design of temporary measures during grading and construction should be computed using figure 2-3 or 2-4 based on the degree of development (impervious area percentage) and the CN's for the newly graded pervious areas.

Downstream Analysis

Appendix C — Hydraulics

XP-SWMM Layout

Stafford Meadows Downstream Analysis



XP-SWMM RUNOFF DATA

Stafford Meadows Development

SCS Type 1A 25-Year Storm Event							
Existing Conditions							
XP-SWMM Input Data					XP-SWMM Output Data		
Node Name	Total Area (ac)	Impervious %	Curve Number	Tc (min)	Unit Hydrograph Method	Infiltration Depth (in)	Surface Runoff Flow (cfs)
Node1	4.030	100	98	5.0	Santa Barbara	2.02	4.727
Node1	36.270	0	80	36.1	Santa Barbara	0.00	10.501
Node1	1.170	100	98	5.0	Santa Barbara	0.00	1.372
Node1	14.130	0	80	33.4	Santa Barbara	0.00	4.234
Node2	2.630	100	98	5.0	Santa Barbara	2.02	3.085
Node2	3.210	0	80	5.0	Santa Barbara	0.00	1.855
Node3	3.530	100	98	5.0	Santa Barbara	2.02	4.141
Node3	2.360	0	80	12.2	Santa Barbara	0.00	1.074
Node4	7.120	100	98	5.0	Santa Barbara	2.02	8.352
Node4	4.750	0	80	5.0	Santa Barbara	0.00	2.745
Node5	0.070	100	98	5.0	Santa Barbara	2.44	0.082
Node5	0.510	0	80	8.0	Santa Barbara	0.00	0.265
Node5	0.740	0	74	8.0	Santa Barbara	0.00	0.259
Node6	5.880	100	98	5.0	Santa Barbara	3.18	6.898
Node6	3.690	0	79	34.8	Santa Barbara	0.00	1.086
Node6	0.120	0	79	34.8	Santa Barbara	0.00	0.023
Node6	0.120	0	79	43.8	Santa Barbara	0.00	0.006

XP-SWMM RUNOFF DATA

Stafford Meadows Development

SCS Type 1A 25-Year Storm Event							
Proposed Conditions							
XP-SWMM Input Data					XP-SWMM Output Data		
Node Name	Total Area (ac)	Impervious %	Curve Number	Tc (min)	Unit Hydrograph Method	Infiltration Depth (in)	Surface Runoff Flow (cfs)
Node1	4.030	100	98	5.0	Santa Barbara	2.02	4.727
Node1	36.270	0	79	36.1	Santa Barbara	0.00	10.501
Node1	6.700	100	80	5.0	Santa Barbara	0.00	7.860
Node1	8.600	0	79	5.0	Santa Barbara	0.00	4.971
Node2	2.630	100	80	5.0	Santa Barbara	2.02	3.085
Node2	3.210	0	79	5.0	Santa Barbara	0.00	1.855
Node3	3.530	100	80	5.0	Santa Barbara	2.02	4.141
Node3	2.360	0	79	12.2	Santa Barbara	0.00	1.074
Node4	7.120	100	80	5.0	Santa Barbara	2.02	8.352
Node4	4.750	0	79	5.0	Santa Barbara	0.00	2.745
Node5	0.070	100	80	5.0	Santa Barbara	2.44	0.082
Node5	0.510	0	79	8.0	Santa Barbara	0.00	0.265
Node5	0.740	0	80	8.0	Santa Barbara	0.00	0.259
Node6	5.880	100	74	5.0	Santa Barbara	3.18	6.898
Node6	3.690	0	79	34.8	Santa Barbara	0.00	1.086
Node6	0.120	0	79	34.8	Santa Barbara	0.00	0.023
Node6	0.120	0	79	43.8	Santa Barbara	0.00	0.006

XP-SWMM RUNOFF DATA

Stafford Meadows Development

SCS Type 1A 25-Year Storm Event							
Basin 1 Fully Developed Conditions							
XP-SWMM Input Data					XP-SWMM Output Data		
Node Name	Total Area (ac)	Impervious %	Curve Number	Tc (min)	Unit Hydrograph Method	Infiltration Depth (in)	Surface Runoff Flow (cfs)
Node1	22.170	100	98	5.0	Santa Barbara	2.02	26.007
Node1	18.140	0	79	28.9	Santa Barbara	0.00	5.769
Node1	6.700	100	98	5.0	Santa Barbara	0.00	7.860
Node1	8.600	0	80	5.0	Santa Barbara	0.00	4.971
Node2	3.500	100	98	5.0	Santa Barbara	2.02	4.106
Node2	2.340	0	80	5.0	Santa Barbara	0.00	1.352
Node3	3.530	100	98	5.0	Santa Barbara	2.02	4.141
Node3	2.360	0	80	12.2	Santa Barbara	0.00	1.074
Node4	7.120	100	98	5.0	Santa Barbara	2.02	8.352
Node4	4.750	0	80	5.0	Santa Barbara	0.00	2.745
Node5	0.070	100	98	5.0	Santa Barbara	2.44	0.082
Node5	0.510	0	80	8.0	Santa Barbara	0.00	0.265
Node5	0.740	0	79	8.0	Santa Barbara	0.00	0.259
Node6	5.880	100	80	5.0	Santa Barbara	3.18	6.898
Node6	3.690	0	74	34.8	Santa Barbara	0.00	1.086
Node6	0.120	0	79	34.8	Santa Barbara	0.00	0.023
Node6	0.120	0	79	43.8	Santa Barbara	0.00	0.006

XP-SWMM HYDRAULICS DATA

17868 Stafford Meadows Downstream Analysis

SCS Type 1A 25-Year Storm Event																			
Existing Conditions																			
Location			Conduit Properties				Conduit Profile								Conduit Results				
Link Name	Node Limits		Diameter		Length	Slope	Ground Elevation (ft)		Invert Elevation (ft)		Freeboard (ft)		Max. HGL Elevation (ft)		Design Flow	Max. Flow	Max. Velocity	Max. Depth	y/d0
	From	To	in	ft	ft	%	US	DS	US	DS	US	DS	US	DS	(cfs)	(cfs)	(ft/s)	(ft)	
Link1 +	Node1	Node10	18	1.5	35	0.2	214.70	216.00	212.70	212.63	0.6	2.2	214.1	213.8	17.40	19.99	2.24	1.36	0.90
Link2 *	Node10	Node2	18	1.5	80	2.0	216.00	214.50	212.63	211.00	2.2	2.6	213.8	211.9	14.99	10.06	6.81	1.21	0.81
Link2 **	Node10	Node2	18	1.5	80	2.0	216.00	214.50	212.64	211.06	2.2	2.6	213.8	211.9	14.76	9.91	6.73	1.20	0.80
Link2 ***	Node10	Node2	0	0.0	0	0.0	216.00	214.50	0.00	0.00	2.2	2.6	213.8	211.9	0.00	0.00	0.00	0.00	0.00
Link3 +	Node2	Node3	24	2.0	540	1.2	214.50	209.00	211.00	204.40	2.6	3.9	211.9	205.1	152.09	24.41	3.07	0.87	0.43
Link4 +	Node11	Node12	48	4.0	15	3.3	208.00	207.60	203.10	202.60	4.3	4.0	203.7	203.6	1736.29	29.35	3.66	1.01	0.25
Link5	Node12	Node13	36	3.0	32	3.9	207.60	206.00	202.52	201.27	4.0	3.9	203.6	202.1	131.82	29.36	12.93	1.09	0.36
Link6	Node4	Node5	36	3.0	104	6.4	206.00	200.00	195.11	188.58	9.5	13.5	196.5	186.6	167.13	39.88	12.90	1.39	0.46
Link7 +	Node5	Node6	120	10.0	270	4.3	200.00	184.00	185.50	174.00	13.5	7.8	186.6	176.2	5327.19	40.43	5.29	2.16	0.22
Link8 +	Node6	Node14	120	10.0	40	1.0	184.00	184.00	174.00	173.60	7.8	9.4	176.2	174.6	674.27	48.05	5.65	2.16	0.22
Link10+	Node3	Node11	48	4.0	110	1.2	209.00	208.00	204.40	203.10	3.9	4.3	205.1	203.7	1033.85	29.36	3.43	0.66	0.17
Link11	Node13	Node4	36	3.0	144	3.9	206.00	206.00	200.97	195.31	3.9	9.5	202.1	196.5	132.23	29.35	12.33	1.19	0.40
Proposed Conditions																			
Location			Conduit Properties				Conduit Profile								Conduit Results				
Link Name	Node Limits		Diameter		Length	Slope	Ground Elevation (ft)		Invert Elevation (ft)		Freeboard (ft)		Max. HGL Elevation (ft)		Design Flow	Max. Flow	Max. Velocity	Max. Depth	y/d0
	From	To	in	ft	ft	%	US	DS	US	DS	US	DS	US	DS	(cfs)	(cfs)	(ft/s)	(ft)	
Link1 +	Node1	Node10	18	1.5	35	0.2	214.70	216.00	212.70	212.63	0.1	1.4	214.6	214.6	17.40	26.74	2.25	1.98	1.00
Link2 *	Node10	Node2	18	1.5	80	2.0	216.00	214.50	212.63	211.00	1.4	2.5	214.6	212.0	14.99	13.06	7.61	1.98	1.32
Link2 **	Node10	Node2	18	1.5	80	2.0	216.00	214.50	212.64	211.06	1.4	2.5	214.6	212.0	14.76	13.15	7.59	1.97	1.31
Link2 ***	Node10	Node2	0	0.0	0	0.0	216.00	214.50	0.00	0.00	1.4	2.5	214.6	212.0	0.00	0.00	0.00	0.00	0.00
Link3 +	Node2	Node3	24	2.0	540	1.2	214.50	209.00	211.00	204.40	2.5	3.9	212.0	205.1	152.09	30.64	3.26	0.98	0.49
Link4 +	Node11	Node12	48	4.0	15	3.3	208.00	207.60	203.10	202.60	4.2	3.9	203.8	203.7	1736.29	35.62	3.76	1.14	0.28
Link5	Node12	Node13	36	3.0	32	3.9	207.60	206.00	202.52	201.27	3.9	3.8	203.7	202.2	131.82	35.63	13.49	1.22	0.41
Link6	Node4	Node5	36	3.0	104	6.4	206.00	200.00	195.11	188.58	9.3	13.4	196.7	186.6	167.13	46.41	13.14	1.55	0.52
Link7 +	Node5	Node6	120	10.0	270	4.3	200.00	184.00	185.50	174.00	13.4	7.7	186.6	176.3	5327.19	46.95	5.51	2.34	0.23
Link8 +	Node6	Node14	120	10.0	40	1.0	184.00	184.00	174.00	173.60	7.7	9.2	176.3	174.8	674.27	54.64	5.92	2.34	0.23
Link10 +	Node3	Node11	48	4.0	110	1.2	209.00	208.00	204.40	203.10	3.9	4.2	205.1	203.8	1033.85	35.62	3.68	0.73	0.18
Link11	Node13	Node4	36	3.0	144	3.9	206.00	206.00	200.97	195.31	3.8	9.3	202.2	196.7	132.23	35.63	12.75	1.35	0.45

+ open channel
* 18" culvert west
** 18" culvert east
*** road surface

XP-SWMM HYDRAULICS DATA

17868 Stafford Meadows Downstream Analysis

SCS Type 1A 25-Year Storm Event																				
Basin 1 Fully Developed																				
Location			Conduit Properties				Conduit Profile										Conduit Results			
Link Name	Node Limits		Diameter		Length	Slope	Ground Elevation (ft)		Invert Elevation (ft)		Freeboard (ft)		Max. HGL Elevation (ft)		Design Flow	Max. Flow	Max. Velocity	Max. Depth	y/d0
	From	To	in	ft	ft	%	US	DS	US	DS	US	DS	US	DS	(cfs)	(cfs)	(ft/s)	(ft)	
Link1 +	Node1	Node10	47	3.9	35.0	0.2	216.70	216.83	212.70	212.63	0.3	0.4	216.4	216.4	222.42	43.34	2.25	3.77	0.97
Link2 *	Node10	Node2	18	1.5	80.0	2.0	216.83	214.50	212.63	211.00	0.4	2.3	216.4	212.2	14.99	17.65	10.02	3.77	2.52
Link2 **	Node10	Node2	18	1.5	80.0	2.0	216.83	214.50	212.64	211.06	0.4	2.3	216.4	212.2	14.76	17.26	9.69	3.76	2.51
Link2 ***	Node10	Node2	0	0.0	0.0	0.0	216.83	214.50	0.00	0.00	0.4	2.3	216.4	212.2	0.00	7.55	0.00	0.00	0.00
Link3 +	Node2	Node3	24	2.0	540.0	1.2	214.50	209.00	211.00	204.40	2.3	3.7	212.2	205.3	152.09	47.35	3.65	1.23	0.62
Link4 +	Node11	Node12	48	4.0	15.0	3.3	208.00	207.60	203.10	202.60	4.0	3.6	204.0	204.1	1736.29	52.22	3.82	1.45	0.36
Link5	Node12	Node13	36	3.0	32.0	3.9	207.60	206.00	202.52	201.27	3.6	3.4	204.1	202.6	131.82	52.22	14.66	1.53	0.51
Link6	Node4	Node5	36	3.0	104.0	6.4	206.00	200.00	195.11	188.58	9.0	13.2	197.0	186.8	167.13	62.52	13.57	1.93	0.64
Link7 +	Node5	Node6	120	10.0	270.0	4.3	200.00	184.00	185.50	174.00	13.2	7.2	186.8	176.8	5327.19	63.06	5.93	2.76	0.28
Link8 +	Node6	Node14	120	10.0	40.0	1.0	184.00	184.00	174.00	173.60	7.2	8.9	176.8	175.1	674.27	70.55	6.48	2.76	0.28
Link10+	Node3	Node11	48	4.0	110.0	1.2	209.00	208.00	204.40	203.10	3.7	4.0	205.3	204.0	1033.85	52.24	4.21	0.90	0.23
Link11	Node13	Node4	36	3.0	144.0	3.9	206.00	206.00	200.97	195.31	3.4	9.0	202.6	197.0	132.23	52.22	13.48	1.73	0.58

+ open channel
* 18" culvert west
** 18" culvert east
*** road surface functioning as weir

HY-8 Culvert Analysis Report

Roadway Data for Crossing: SW Boeckman Road

Roadway Profile Shape: Irregular Roadway Shape (coordinates)

Roadway Surface: Paved

Roadway Top Width: 68.00 ft

Tailwater Channel Data - SW Boeckman Road

Tailwater Channel Option: Trapezoidal Channel

Bottom Width: 6.00 ft

Side Slope (H:V): 4.00 (_:1)

Channel Slope: 0.0120

Channel Manning's n: 0.0350

Channel Invert Elevation: 211.00 ft

Crossing Discharge Data

Discharge Selection Method: Specify Minimum, Design, and Maximum Flow

Minimum Flow: 20 cfs

Design Flow: 26.8 cfs

Maximum Flow: 43.3 cfs

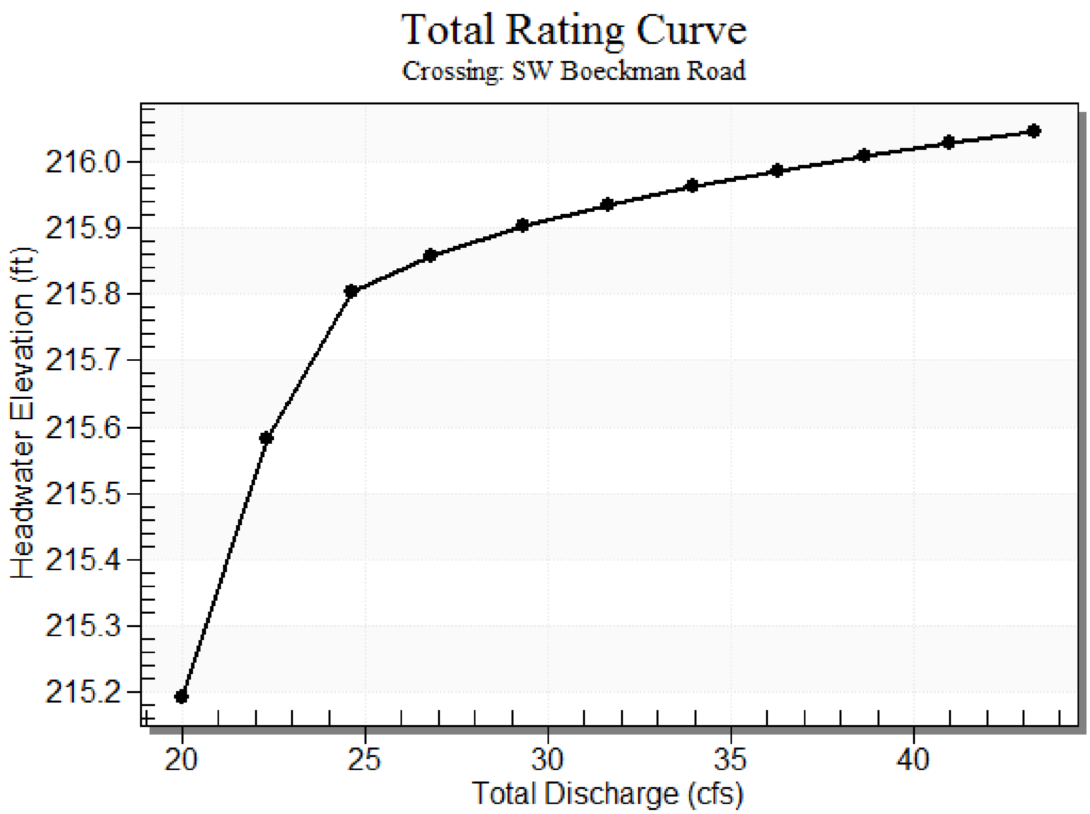
Table 1 - Downstream Channel Rating Curve (Crossing: SW Boeckman Road)

Flow (cfs)	Water Surface Elev (ft)	Depth (ft)	Velocity (ft/s)	Shear (psf)	Froude Number
20.00	211.73	0.73	3.09	0.54	0.73
22.33	211.77	0.77	3.19	0.58	0.74
24.66	211.81	0.81	3.28	0.61	0.75
26.80	211.85	0.85	3.36	0.64	0.75
29.32	211.89	0.89	3.45	0.67	0.75
31.65	211.93	0.93	3.52	0.69	0.76
33.98	211.96	0.96	3.59	0.72	0.76
36.31	211.99	0.99	3.66	0.74	0.77
38.64	212.03	1.03	3.73	0.77	0.77
40.97	212.06	1.06	3.79	0.79	0.77
43.30	212.09	1.09	3.85	0.81	0.77

Table 2 - Summary of Culvert Flows at Crossing: SW Boeckman Road

Headwater Elevation (ft)	Total Discharge (cfs)	Culvert West Discharge (cfs)	Culvert East Discharge (cfs)	Roadway Discharge (cfs)	Iterations
215.19	20.00	10.02	9.99	0.00	6
215.58	22.33	11.14	11.11	0.00	40
215.80	24.66	11.74	11.71	1.12	19
215.86	26.80	11.88	11.86	2.93	8
215.90	29.32	12.00	11.98	5.26	7
215.94	31.65	12.08	12.06	7.37	5
215.96	33.98	12.16	12.13	9.61	5
215.99	36.31	12.22	12.19	11.76	4
216.01	38.64	12.27	12.25	14.01	4
216.03	40.97	12.32	12.30	16.27	4
216.05	43.30	12.37	12.35	18.53	4
215.69	22.84	11.43	11.41	0.00	Overtopping

Rating Curve Plot for Crossing: SW Boeckman Road



Site Data - Culvert West

Site Data Option: Culvert Invert Data

Inlet Station: 0.00 ft

Inlet Elevation: 212.63 ft

Outlet Station: 79.01 ft

Outlet Elevation: 211.00 ft

Number of Barrels: 1

Culvert Data Summary - Culvert West

Barrel Shape: Circular

Barrel Diameter: 1.50 ft

Barrel Material: Concrete

Embedment: 0.00 in

Barrel Manning's n: 0.0130

Culvert Type: Straight

Inlet Configuration: Mitered to Conform to Slope

Inlet Depression: NONE

Table 3 - Culvert Summary Table: Culvert West

Total Discharge (cfs)	Culvert Discharge (cfs)	Headwater Elevation (ft)	Inlet Control Depth (ft)	Outlet Control Depth (ft)	Flow Type	Normal Depth (ft)	Critical Depth (ft)	Outlet Depth (ft)	Tailwater Depth (ft)	Outlet Velocity (ft/s)	Tailwater Velocity (ft/s)
20.00	10.02	215.19	2.563	1.292	5-S2n	0.892	1.218	0.907	0.728	8.973	3.085
22.33	11.14	215.58	2.952	1.691	5-S2n	0.958	1.276	0.974	0.771	9.165	3.186
24.66	11.74	215.80	3.172	1.917	5-S2n	0.995	1.303	1.010	0.813	9.284	3.280
26.80	11.88	215.86	3.228	1.974	5-S2n	1.004	1.309	1.019	0.849	9.310	3.359
29.32	12.00	215.90	3.273	2.021	5-S2n	1.011	1.314	1.026	0.890	9.333	3.447
31.65	12.08	215.94	3.305	2.053	5-S2n	1.016	1.317	1.030	0.926	9.350	3.522
33.98	12.16	215.96	3.333	2.082	5-S2n	1.021	1.320	1.034	0.961	9.366	3.594
36.31	12.22	215.99	3.356	2.106	5-S2n	1.024	1.323	1.039	0.994	9.371	3.662
38.64	12.27	216.01	3.378	2.128	5-S2n	1.028	1.324	1.043	1.026	9.373	3.726
40.97	12.32	216.03	3.398	2.149	5-S2n	1.031	1.326	1.046	1.057	9.379	3.788
43.30	12.37	216.05	3.416	2.168	5-S2n	1.034	1.328	1.049	1.088	9.384	3.847

****

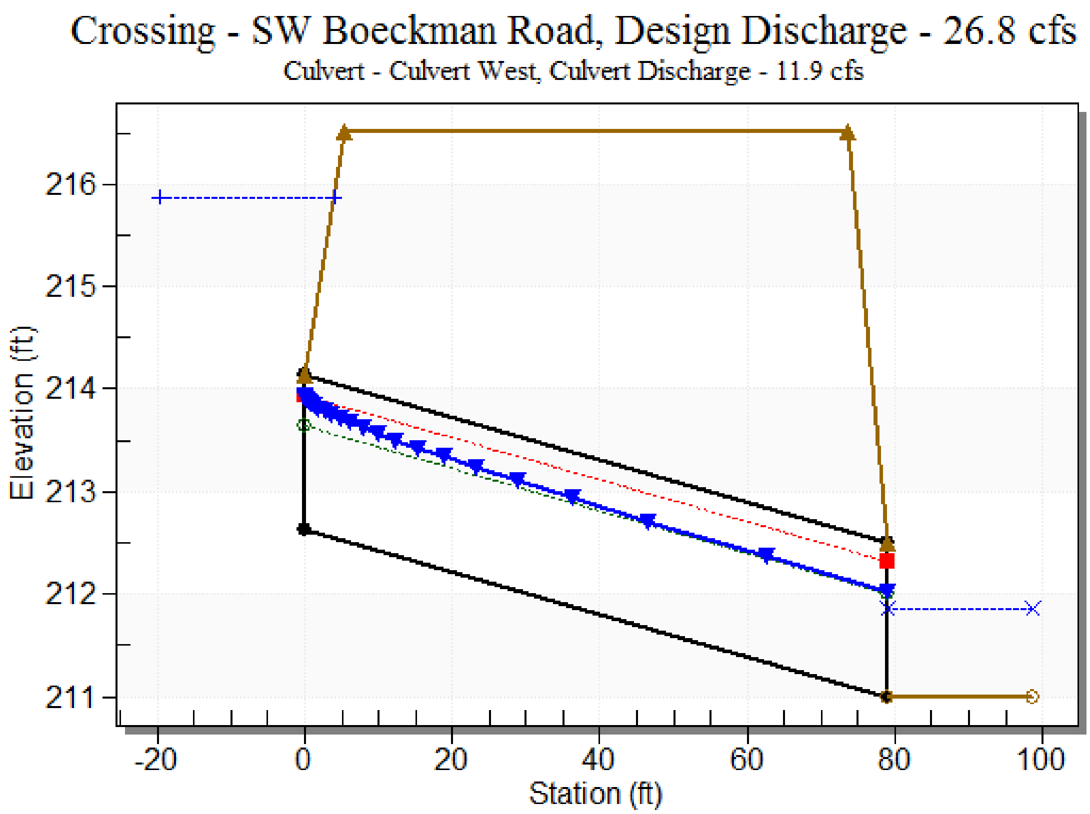
Straight Culvert

Inlet Elevation (invert): 212.63 ft,   Outlet Elevation (invert): 211.00 ft

Culvert Length: 79.03 ft,   Culvert Slope: 0.0206

****

Water Surface Profile Plot for Culvert: Culvert West



Site Data - Culvert East

Site Data Option: Culvert Invert Data

Inlet Station: 0.00 ft

Inlet Elevation: 212.64 ft

Outlet Station: 78.87 ft

Outlet Elevation: 211.06 ft

Number of Barrels: 1

Culvert Data Summary - Culvert East

Barrel Shape: Circular

Barrel Diameter: 1.50 ft

Barrel Material: Concrete

Embedment: 0.00 in

Barrel Manning's n: 0.0130

Culvert Type: Straight

Inlet Configuration: Mitered to Conform to Slope

Inlet Depression: NONE

Table 4 - Culvert Summary Table: Culvert East

Total Discharge (cfs)	Culvert Discharge (cfs)	Headwater Elevation (ft)	Inlet Control Depth (ft)	Outlet Control Depth (ft)	Flow Type	Normal Depth (ft)	Critical Depth (ft)	Outlet Depth (ft)	Tailwater Depth (ft)	Outlet Velocity (ft/s)	Tailwater Velocity (ft/s)
20.00	9.99	215.19	2.553	1.331	5-S2n	0.899	1.217	0.913	0.728	8.872	3.085
22.33	11.11	215.58	2.942	1.730	5-S2n	0.966	1.275	0.982	0.771	9.062	3.186
24.66	11.71	215.80	3.162	1.955	5-S2n	1.004	1.302	1.017	0.813	9.194	3.280
26.80	11.86	215.86	3.218	2.012	5-S2n	1.013	1.308	1.027	0.849	9.208	3.359
29.32	11.98	215.90	3.263	2.059	5-S2n	1.021	1.313	1.035	0.890	9.223	3.447
31.65	12.06	215.94	3.295	2.092	5-S2n	1.026	1.316	1.040	0.926	9.234	3.522
33.98	12.13	215.96	3.323	2.120	5-S2n	1.030	1.319	1.045	0.961	9.244	3.594
36.31	12.19	215.99	3.346	2.144	5-S2n	1.034	1.322	1.049	0.994	9.253	3.662
38.64	12.25	216.01	3.368	2.166	5-S2n	1.038	1.323	1.052	1.026	9.261	3.726
40.97	12.30	216.03	3.388	2.187	5-S2n	1.041	1.325	1.055	1.057	9.268	3.788
43.30	12.35	216.05	3.406	2.206	5-S2n	1.044	1.327	1.058	1.088	9.275	3.847

****

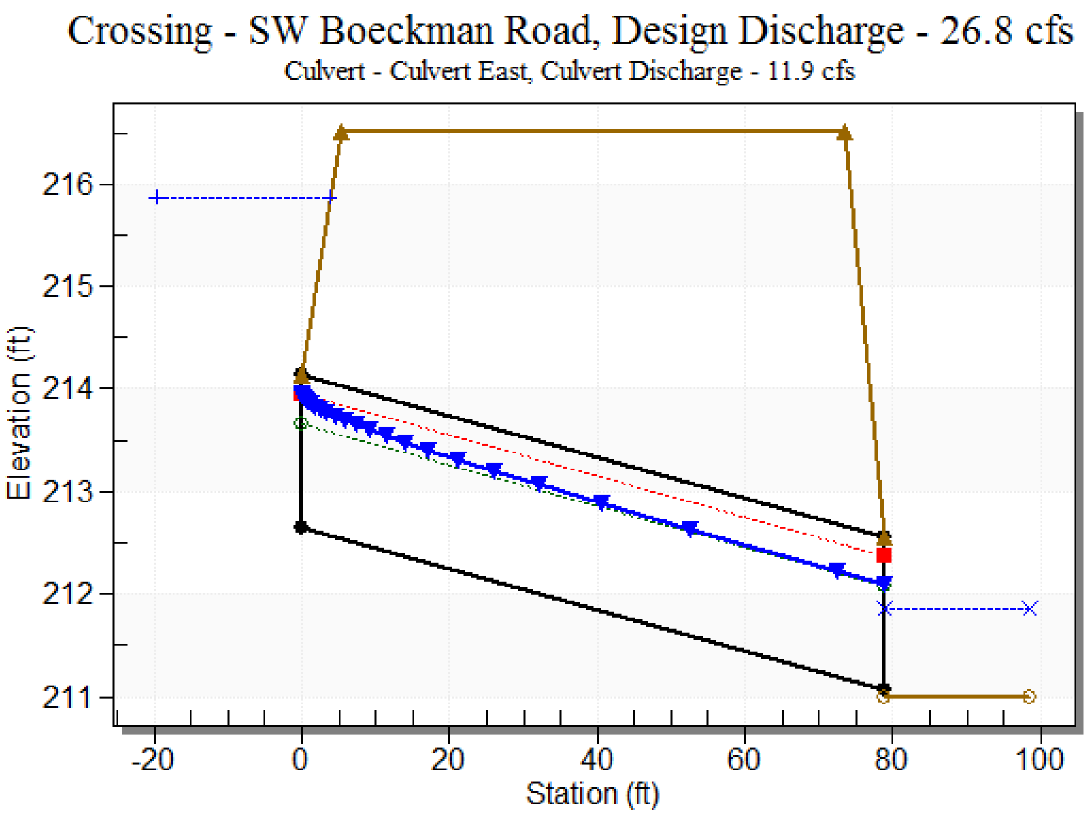
Straight Culvert

Inlet Elevation (invert): 212.64 ft,   Outlet Elevation (invert): 211.06 ft

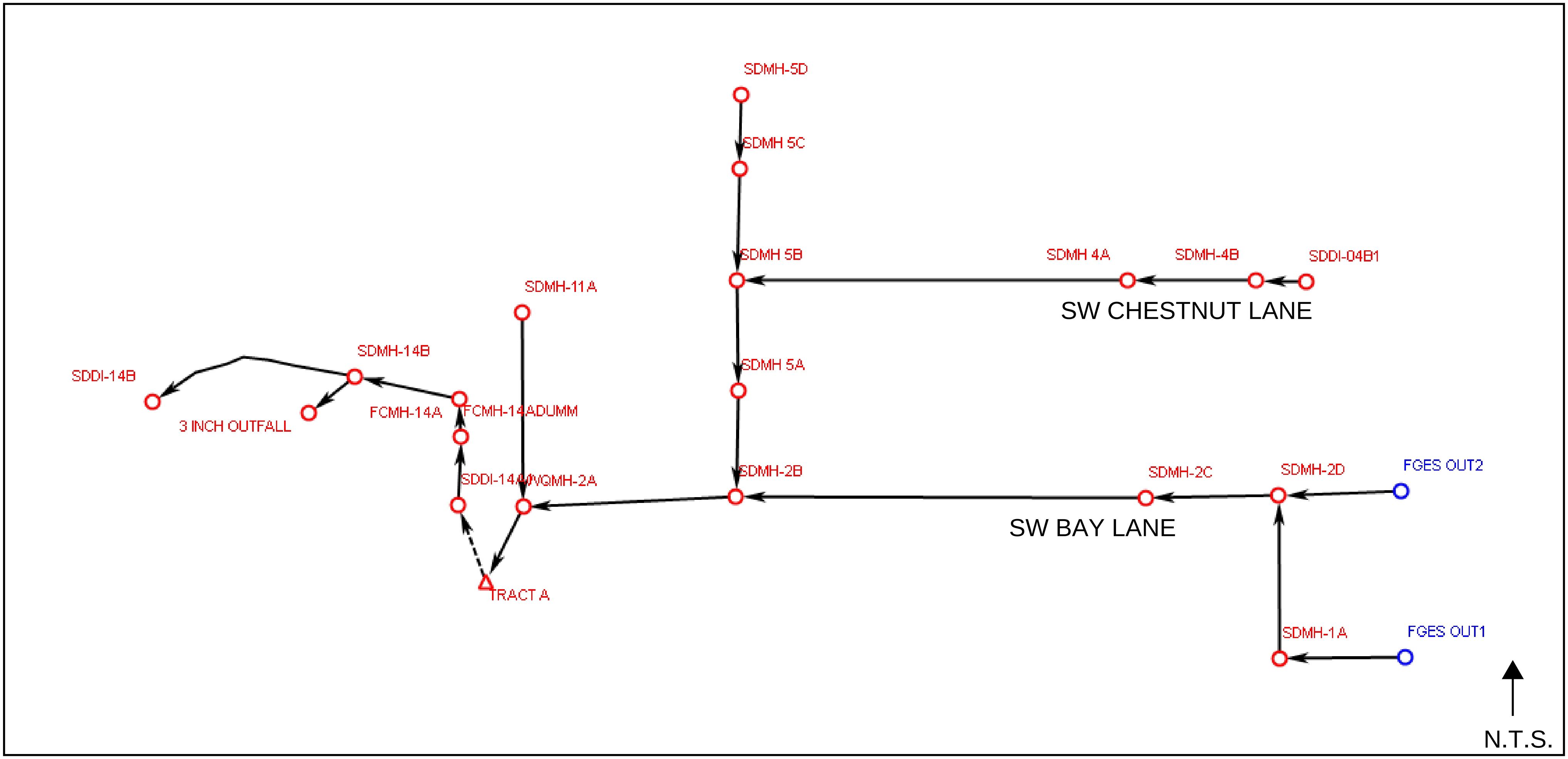
Culvert Length: 78.89 ft,   Culvert Slope: 0.0200

****

Water Surface Profile Plot for Culvert: Culvert East



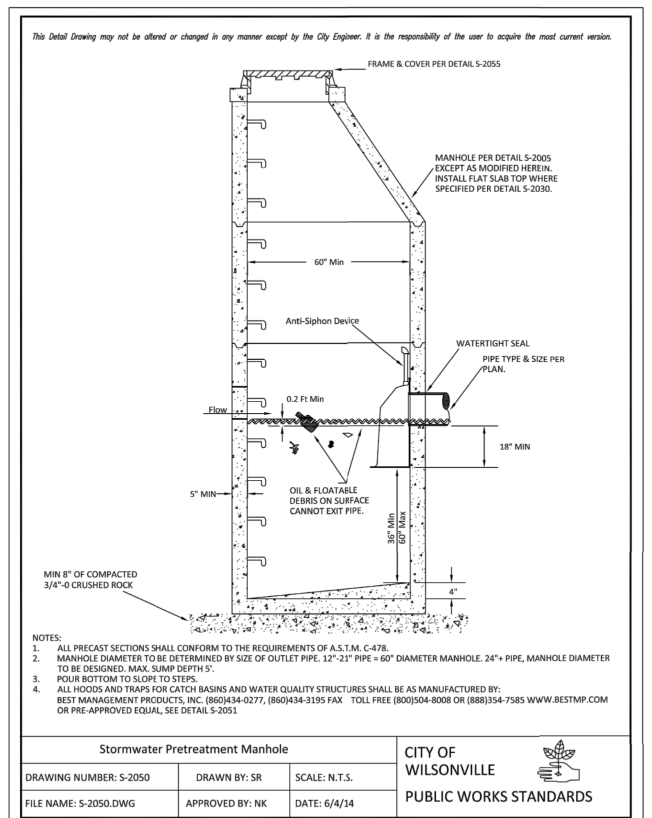
MORGAN FARM PHASE 1

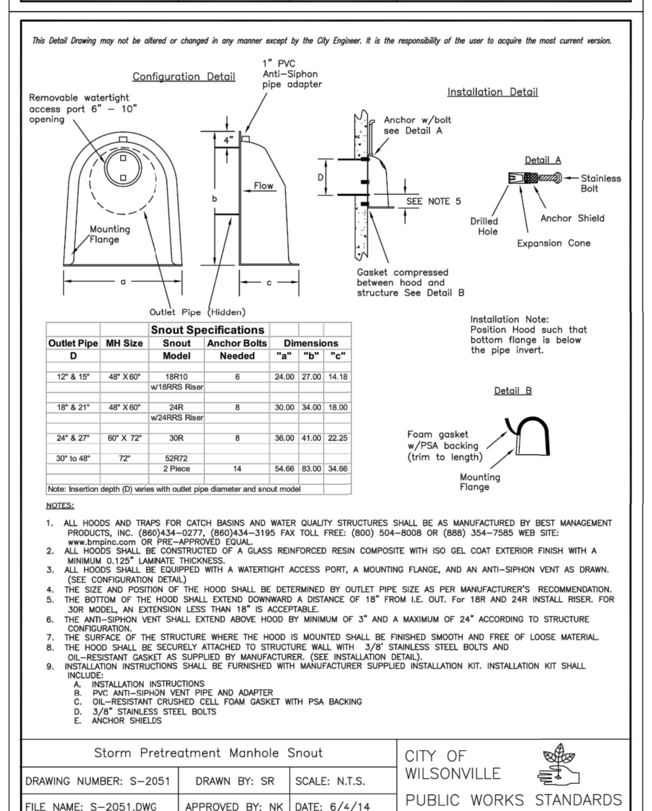


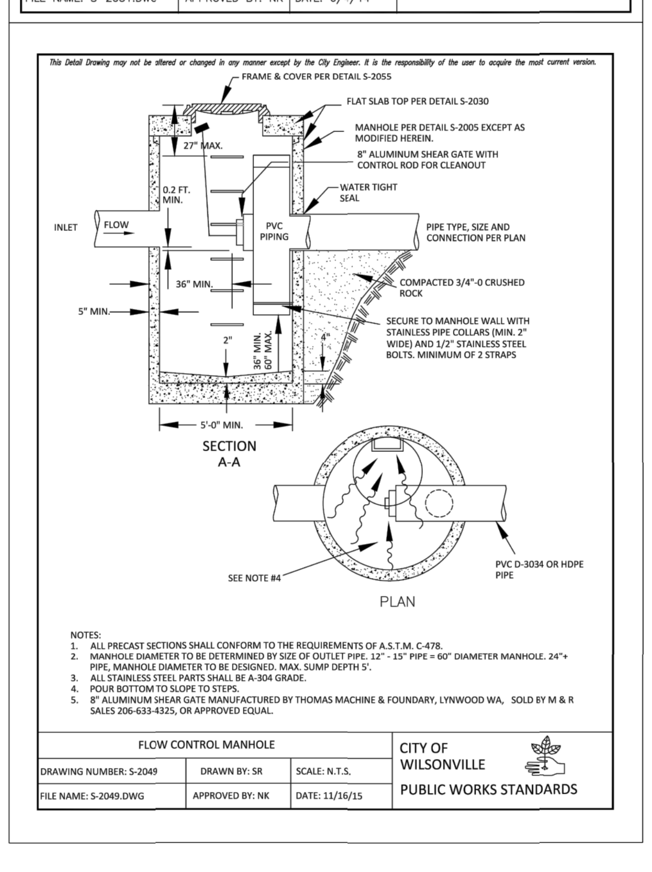
XPSTORM HYDRAULIC LAYOUT: MORGAN FARM PHASE 1 STORM SYSTEM

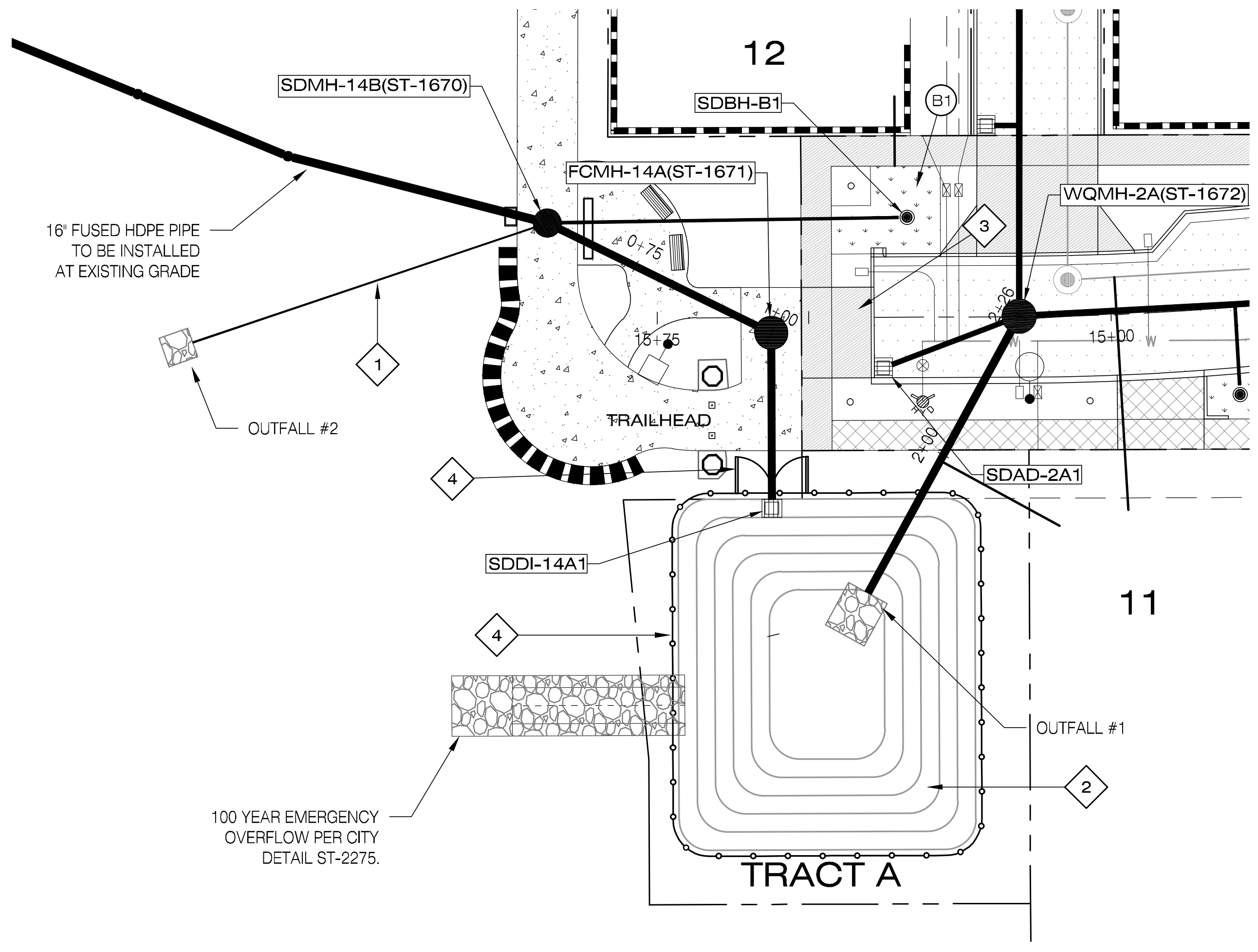
XPSTORM RUNOFF DATA - MORGAN FARM PHASE 1 - HYDRAULIC ANAYLSIS						
DOWNSTREAM STORM ANALYSIS						
Node Name	Runoff Parameters (Input)					Output
	Area	Imp	CN	Tc	Precip	Peak
	ac	%		min.	in	cfs
25-YEAR						
SDMH-1A	0.18	67.4	74	5	3.90	0.13
SDMH-2D	0.20	67.4	74	5	3.90	0.15
SDMH-2B	0.56	67.4	74	5	3.90	0.41
WQMH-2A	0.03	67.4	74	5	3.90	0.02
SDMH-4B	0.26	67.4	74	5	3.90	0.19
SDMH 4A	1.09	67.4	74	5	3.90	0.80
SDMH 5B	0.29	67.4	74	5	3.90	0.21
SDMH 5A	0.34	67.4	74	5	3.90	0.25
SDMH-2C	1.59	67.4	74	5	3.90	1.16
SDMH-11A	0.63	67.4	74	5	3.90	0.46
SDMH 5C	0.43	67.4	74	5	3.90	0.31
SDMH-5D	0.15	67.4	74	5	3.90	0.11
SDMH-14B	0.06	67.4	74	5	3.90	0.04
FGES OUT1	0.62	100	98	10	3.90	0.61
	0.17	0	80	10		
FGES OUT2	2.49	100	98	10	3.90	3.52
	3.15	0	80	10		

XPSTORM CONVEYANCE DATA - MORGAN FARM PHASE 1																			
DOWNSTREAM STORM ANALYSIS - 25 YEAR ANALYSIS																			
Location			Conduit Properties			Conduit Results						Conduit Profile							
	Station																		
Link	From	To	Diameter	Length	Slope	Design Capacity	Qmax/ Qdesign	Max Flow	Max Velocity	Max Flow Depth	y/d0	US Ground Elev.	DS Ground Elev.	US IE	DS IE	US Freeboard	DS Freeboard	US HGL	DS HGL
			ft	ft	%	cfs		cfs	ft/s	ft		ft	ft	ft	ft	ft	ft	ft	ft
Link-110	SDMH-1A	SDMH-2D	1.00	111.21	0.5	2.48	0.31	0.76	1.88	1.17	1.17	219.39	220.42	214.30	213.56	4.42	5.49	214.97	214.93
Link-119	SDMH-2D	SDMH-2C	1.00	89.13	0.9	3.33	1.31	4.38	5.75	1.37	1.37	220.42	218.48	213.56	212.58	5.49	5.18	214.93	213.30
Link-112	SDMH-2B	WQMH-2A	1.00	143.23	3.1	6.32	1.22	7.72	9.57	6.19	6.19	210.03	199.97	199.48	191.88	4.36	0.69	205.67	199.28
Link-113	WQMH-2A	TRACT A	1.25	52.14	1.0	6.57	1.25	8.19	6.57	4.40	3.52	199.97	199.00	191.88	191.93	0.69	0.53	199.28	198.47
Link-124	TRACT A	SDDI-14A1	0.50	10.00	0.0	0.02	158.78	2.82	13.55	6.54	13.07	199.00	197.88	191.93	191.02	0.53	1.45	198.47	196.43
Link-114	SDDI-04B1	SDMH-4B	1.00	28.50	1.0	3.53	0.00	0.00	0.00	0.00	0.00	221.10	220.26	213.28	212.80	7.82	7.32	213.28	212.94
Link-115	SDMH-4B	SDMH 4A	1.00	88.25	1.7	4.66	0.04	0.19	2.90	0.14	0.14	220.26	219.76	212.80	211.09	7.32	8.40	212.94	211.36
Link-116	SDMH 4A	SDMH 5B	1.00	266.75	3.0	6.15	0.16	0.99	5.56	2.84	2.84	219.76	210.55	211.09	202.95	8.40	4.57	211.36	205.99
Link-117	SDMH 5B	SDMH 5A	1.00	73.22	2.1	5.22	0.31	1.61	5.52	4.47	4.47	210.55	208.36	202.95	201.18	4.57	2.51	205.99	205.85
Link-118	SDMH 5A	SDMH-2B	1.00	73.11	2.1	5.10	0.36	1.84	4.40	5.99	5.99	208.36	210.03	201.18	199.48	2.51	4.36	205.85	205.67
Link-120	SDMH-2C	SDMH-2B	1.00	278.87	3.9	7.04	0.78	5.51	9.38	3.97	3.97	218.48	210.03	212.58	199.48	5.18	4.36	213.30	205.67
Link-121	SDMH-11A	WQMH-2A	1.00	167.84	2.6	5.70	0.08	0.46	1.84	4.26	4.26	205.35	199.97	199.31	191.88	5.85	0.69	199.50	199.28
Link-122	SDMH 5C	SDMH 5B	1.00	119.01	4.6	7.60	0.06	0.42	4.95	2.84	2.84	215.27	210.55	208.57	202.95	6.54	4.57	208.73	205.99
Link-123	SDMH-5D	SDMH 5C	1.00	38.49	1.1	3.72	0.03	0.11	2.11	0.12	0.12	215.75	215.27	209.39	208.57	6.24	6.54	209.51	208.73
Link-125	SDDI-14A1	FCMH-14ADUMM	1.25	29.00	0.0	6.00	1.35	8.08	6.45	5.41	4.33	197.88	199.06	191.02	185.46	1.45	3.07	196.43	195.99
Link-127	FCMH-14A	SDMH-14B	1.25	41.24	1.1	6.75	1.20	8.07	6.72	1.27	1.01	199.06	198.78	185.46	189.88	7.13	8.45	191.93	190.33
Link-128	SDMH-14B	3 INCH OUTFALL	0.08	10.00	0.5	0.00	3.06	0.01	1.87	0.45	5.41	198.78	190.33	189.88	189.83	8.45	0.42	190.33	189.91
Link-130	SDMH-14B	SDDI-14B	1.33	290.50	18.5	32.80	0.25	8.10	19.54	0.45	0.34	198.78	139.17	189.88	136.07	8.45	2.65	190.33	136.52
Link-131	FGES OUT1	SDMH-1A	1.00	60.00	1.0	3.56	0.17	0.61	3.36	0.47	0.47	220.00	219.39	215.10	214.30	4.62	4.42	215.38	214.97
Link-132	FGES OUT2	SDMH-2D	1.00	76.42	1.0	3.55	0.99	3.51	5.02	1.17	1.17	219.00	220.42	214.52	213.56	3.39	5.49	215.61	214.93









TRACT A POND - PLAN
SCALE: 1"=20' (H)

PUBLIC CATCH BASIN DATA

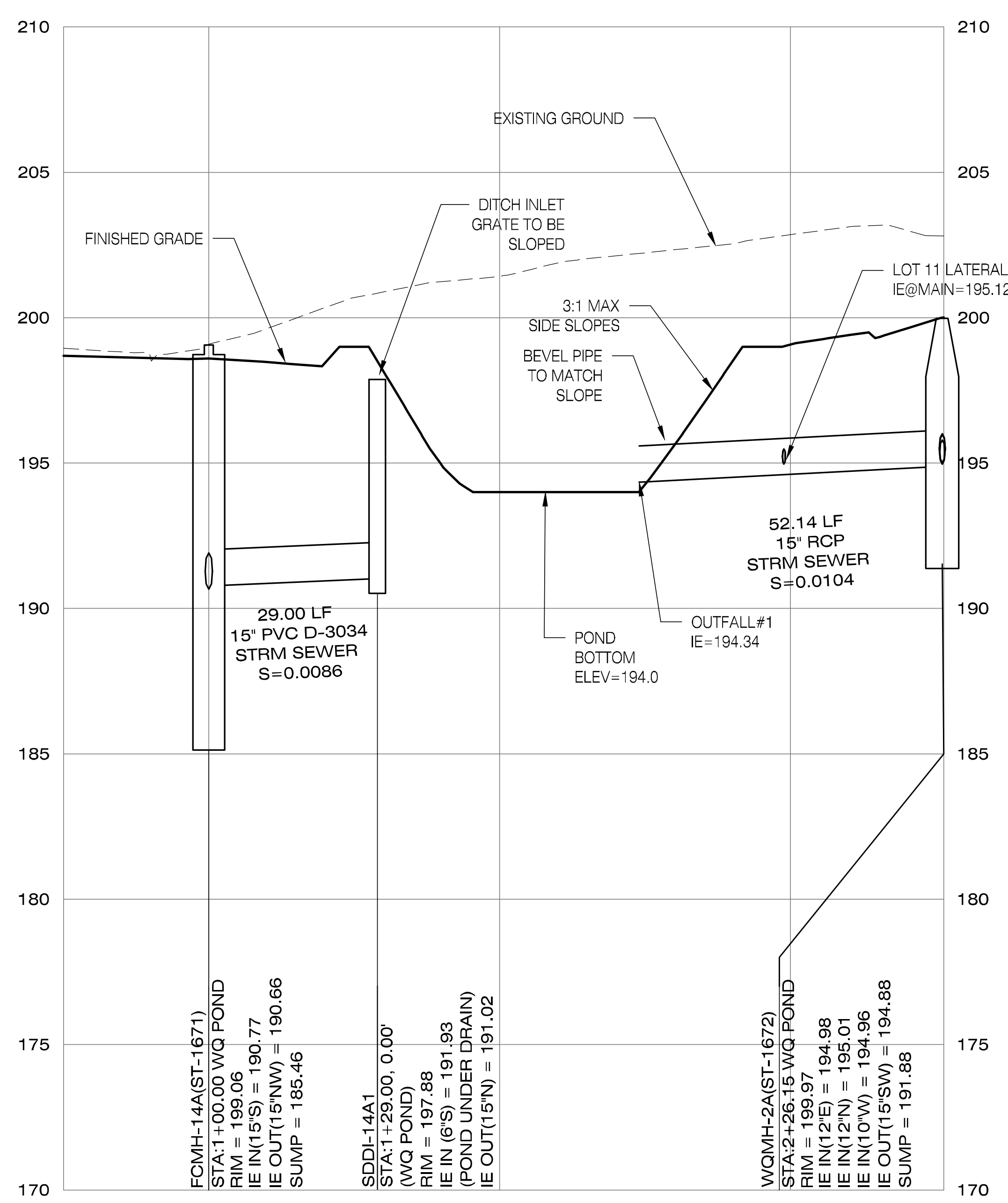
TAG	TYPE	STATION	RIM ELEV	IE IN	IE OUT	SLOPE	PIPE
SDBH-B1	BEEHIVE INLET	15+33.65 16.50' RT SW BAY LN	197.37		193.39	0.0240	59.47 LF 6" PVC D-3034

CONSTRUCTION NOTES

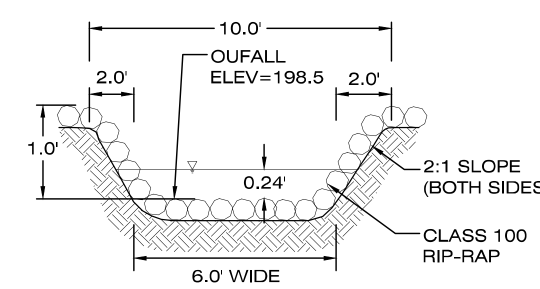
1. 61.86 LF 3' HDPE
   IE IN = 189.90
   IE OUT=188.21
   S = 0.0273
2. CONSTRUCT WATER QUALITY AND DETENTION POND PER CITY DETAIL 6060.
3. INSTALL 15' WIDE DRIVEWAY ACCESS AND CONCRETE PAD TO FLOW-CONTROL MANHOLE.
4. INSTALL 4' HIGH CHAIN-LINK FENCE WITH 12' WIDE ACCESS GATE. SEE LANDSCAPE PLANS FOR FENCING DETAILS.

FLOW CONTROL MANHOLE DETAILS

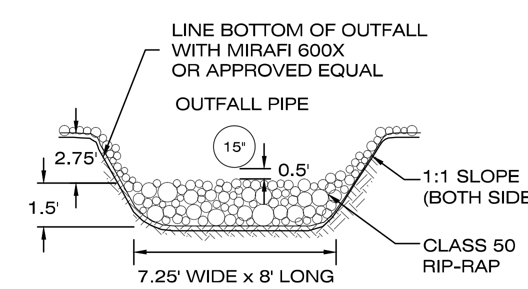
INLET PIPE ELEVATION	190.77
INLET PIPE DIAMETER (IN.)	15 IN.
OUTLET PIPE ELEVATION	190.66
OUTLET PIPE DIAMETER (IN.)	15 IN.
LOWER ORIFICE INVERT ELEVATION	189.51
LOWER ORIFICE DIAMETER (IN.)	2.7 IN.
UPPER ORIFICE ELEVATION	194.21
UPPER ORIFICE DIAMETER (IN.)	6.8 IN.
OVERFLOW WEIR ELEVATION	195.51
OVERFLOW WEIR LENGTH (FT)	6.3 FT. (24" VERTICAL PIPE)



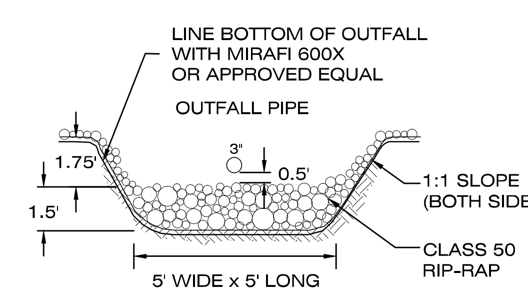
TRACT A POND - PROFILE
SCALE: 1"=20' (H); 1"=4' (V)



EMERGENCY OVERFLOW
N.T.S.



OUTFALL #1 PROTECTION
N.T.S.



OUTFALL #2 PROTECTION
N.T.S.

N

GRAPHIC SCALE
(IN FEET)
1 inch = 20 ft.

WILSONVILLE APP. NO. DB18-0018 - DB18-0021

PDG
PIONEER DESIGN GROUP, INC.
9020 SW WASHINGTON SQUARE RD. SUITE 170 PORTLAND, OREGON 97223 p 503.643.8286 f 844.715.4743 www.pd-grp.com

REGISTERED PROFESSIONAL ENGINEER 54627PE OREGON MAR. 12, 2009 BRENT E. FITCH
VALID THROUGH 12-31-19

WQ AND DETENTION POND - PLAN AND PROFILE

MORGAN FARM - PHASE 1 - AS BUILTS
CITY OF WILSONVILLE, OREGON

Designed by	TCC	Date	04/19
Drawn by	TCC	Date	04/19
Reviewed by	BEF	Date	04/19
Project No.	321-002	REF.	
Horiz. Scale:	N/A		
Vert. Scale:	N/A		

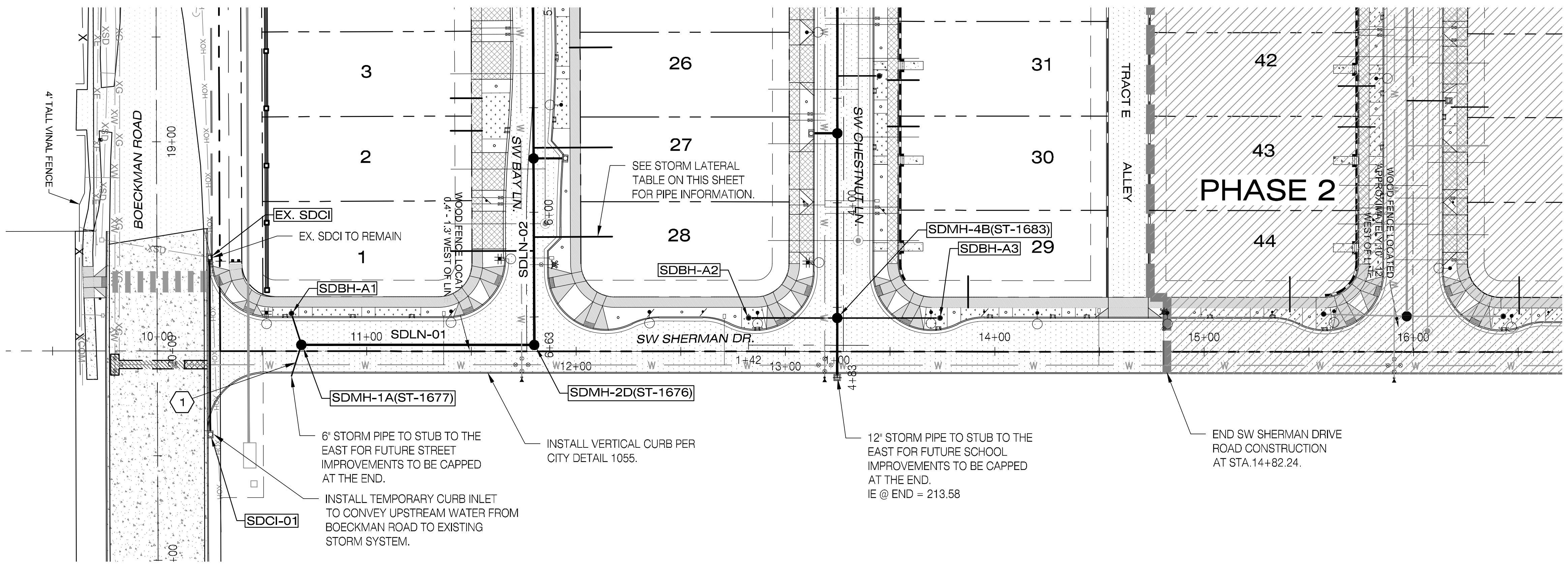
3381_C4-3WQPF.dwg

No. | Date | Revision | By

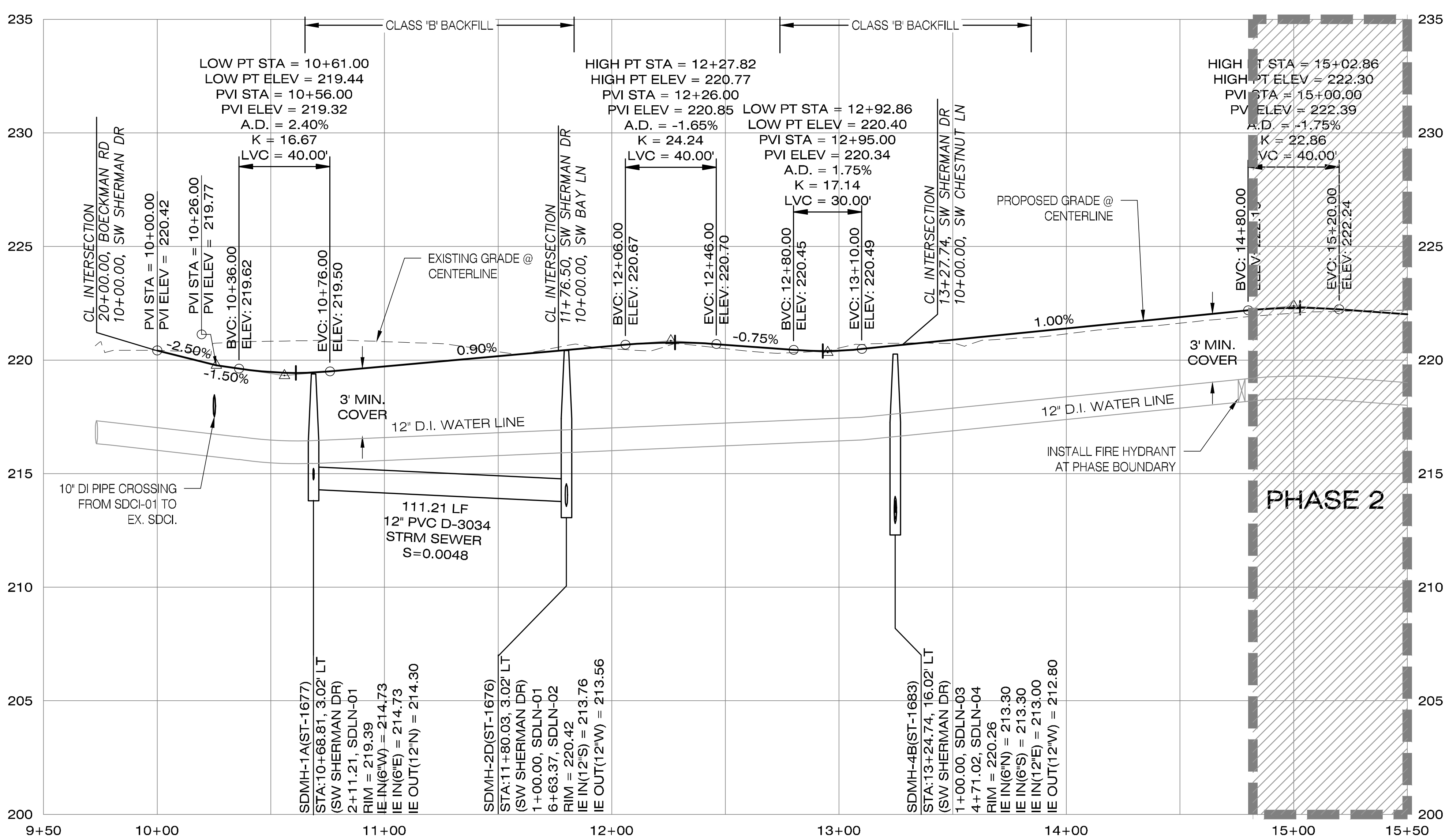
RECORD DRAWINGS
DATE 04/24/2019 THESE RECORD DRAWINGS HAVE BEEN PREPARED BASED ON FIELD OBSERVATION AND SURVEYED INFORMATION.

Project MORGAN FARM - PH.1
No. 321-002
Type AS-BUILTS
Sheet C4.3 of 52

B:\Land Projects 2004\338-001\dwg\engineering\3381_C4-3WQPF.dwg 4/25/2019 11:18:40 AM



SW SHERMAN DR / SDLN-01 / SDLN-04 (PUBLIC) PLAN
SCALE: 1"=40' (H)



SW SHERMAN DR / SDLN-01 / SDLN-04 (PUBLIC) PROFILE
SCALE: 1"=40' (H), 1"=4' (V)

LEGEND

- PROPOSED SIDEWALK WITH FACILITY PERMIT
- PROPOSED SIDEWALK (BY HOMEBUILDER)
- PROPOSED CONCRETE CURB AND GUTTER
- PROPOSED STORM LINE & MANHOLE
- PROPOSED SANITARY LINE & MANHOLE
- PROPOSED WATERLINE & VALVE
- PROPOSED PAVEMENT

CONSTRUCTION NOTES

1. 15.73 LF - 6" D-3034 STORM LINE FOR FUTURE BEEHIVE.
IE @ MH = 214.82
IE @ PLUG = 215.00
S = 0.0114

STORM LATERAL DATA

LOT NO.	D.S. M.H.	DIST. FROM D.S. M.H.	LENGTH	INV. EL. @ MAINLINE	INV. EL. @ PLUG	SLOPE	DEPTH @ PLUG
29	LIDA	--	15.0'	220.74	220.89	0.0100	0.45'

LIDA STRUCTURE DATA

TAG	TYPE	STATION	D.S. M.H.	DIST. FROM D.S. M.H.	RIM ELEV	IE OUT	SLOPE	PIPE
SDBH-A1	Beehive Inlet	10+64.07 18.00' LT SW SHERMAN	1A	0.00	218.97	215.18	0.0286	15.73 LF 6" PVC D-3034
SDBH-A2	Beehive Inlet	12+82.39 18.00' LT SW SHERMAN	4B	0.00	220.04	215.79	0.0588	42.33 LF 6" PVC D-3034
SDBH-A3	Beehive Inlet	13+73.79 18.00' LT SW SHERMAN	4B	0.00	220.68	216.46	0.0644	49.05 LF 6" PVC D-3034

PUBLIC CATCH BASIN DATA

TAG	TYPE	STATION	TC ELEV	IE IN	IE OUT	SLOPE	PIPE
EX. SDCI	Existing Inlet	19+55.45 23.75' LT BOECKMAN	219.81*	217.06	216.96*	--	--
SDCI-01	CG-30	20+39.94 23.75' LT BOECKMAN	221.46	--	218.01	0.0113	84.49 LF 10" DUCTILE IRON PIPE

*EXISTING ELEVATION

CONSTRUCTION NOTES

ALL 6" STORM LATERALS THAT OUTFALL INTO STREET SIDE SWALES WILL BE DUCTILE IRON PIPE AND INSTALLED AT S=0.0100 TO MAXIMIZE COVER AT THE END OF THE PIPE.

STORM SEWER NOTES

UNLESS OTHERWISE NOTED, ALL LATERALS ARE TO BE 6" PVC (ASTM D3034) WITH A MINIMUM SLOPE OF 0.0100. LATERAL CONNECTIONS TO MAIN SEWER LINE TO BE MADE WITH MANUFACTURED TEES.

ALL 2"x 4" STORM SERVICE CONNECTION MARKERS TO BE COLOR CODED WHITE. CONTRACTOR TO NOTE LENGTH OF BOARD USED ON EACH MARKER.

BACKFILL NOTE: PIPES UNDER PAVED SURFACES REQUIRE GRANULAR BACKFILL. FOR PIPES OUTSIDE PAVEMENT, NATIVE BACKFILL IS PERMITTED, UNLESS OTHERWISE NOTED.

THE CONTRACTOR SHALL FIELD VERIFY THE SIZE, LOCATION & DEPTH OF EXISTING UTILITIES PRIOR TO CONSTRUCTION.

N

GRAPHIC SCALE
40 0 20 40 80
(IN FEET)
1 inch = 40 ft.

WILSONVILLE APP. NO. DB18-0018 - DB18-0021

PIONEER DESIGN GROUP, INC.
9020 SW WASHINGTON SQUARE RD. SUITE 170 PORTLAND, OREGON 97223
p 503.643.8286 f 844.715.4743 www.pd-grp.com

REGISTERED PROFESSIONAL ENGINEER 54627PE OREGON MAR. 12, 2002 BRENT E. FITCH
VALID THROUGH 12-31-19

SHERMAN DRIVE- SDLN-01- SDLN-04 PLAN AND PROFILE

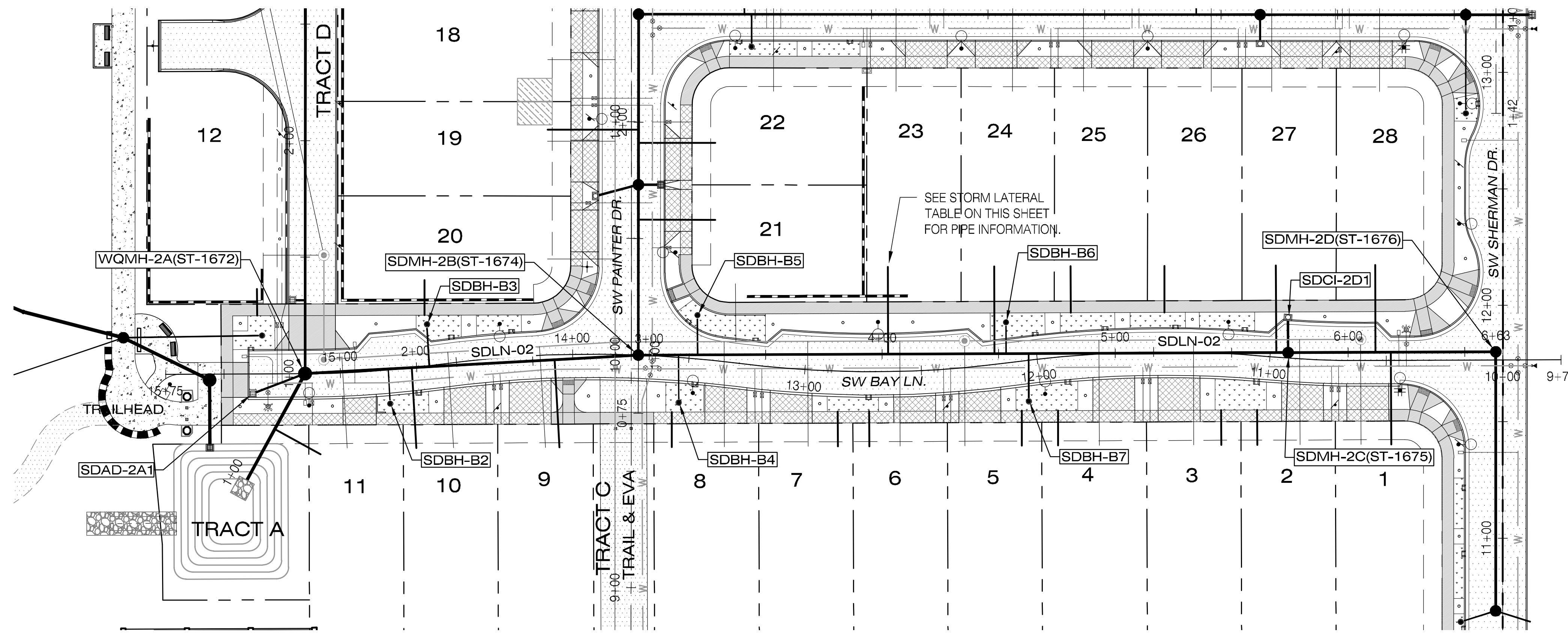
MORGAN FARM - PHASE 1 - AS BUILTS
CITY OF WILSONVILLE, OREGON

Designed by	TCC	Date	04/19
Drawn by	TCC	Date	04/19
Reviewed by	BEF	Date	04/19
Project No.	321-002	REF.	
Horiz. Scale: 1" = 40'			
Vert. Scale: 1" = 4'			
3381_C5-0STRT.dwg			

No. | Date | Revision | By

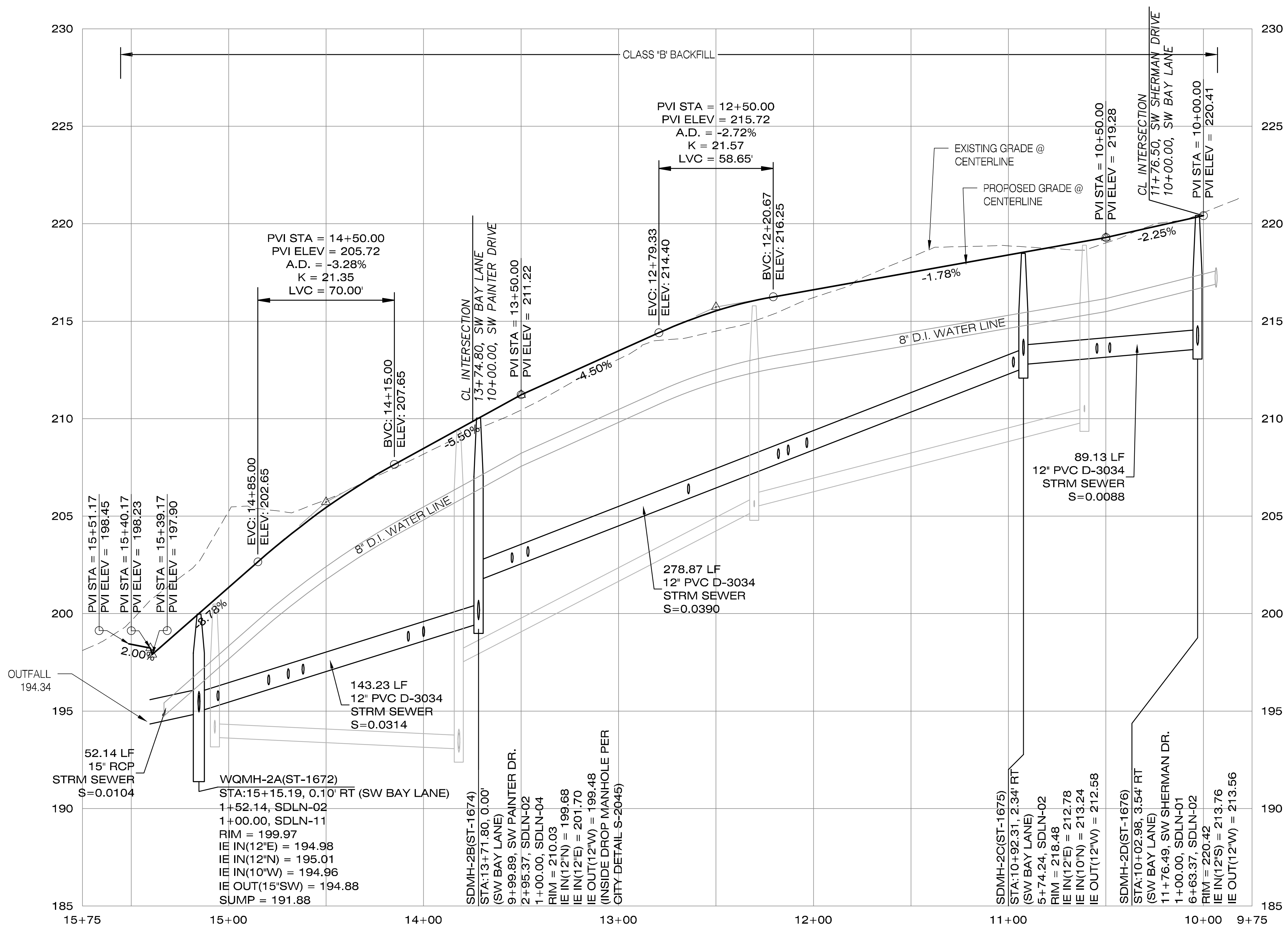
RECORD DRAWINGS
DATE 04/24/2019 THESE RECORD DRAWINGS HAVE BEEN PREPARED BASED ON FIELD OBSERVATION AND SURVEYED INFORMATION.

Project MORGAN FARM - PH.1
No. 321-002
Type AS-BUILTS
Sheet C5.0 of 52



SW BAY LANE / SDLN-02 (PUBLIC) PLAN

SCALE: 1"=40' (H)



SW BAY LANE / SDLN-02 (PUBLIC) PROFILE

SCALE: 1"=40' (H), 1"=4' (V)

STORM SEWER NOTES

UNLESS OTHERWISE NOTED, ALL LATERALS ARE TO BE 6" PVC (ASTM D3034) WITH A MINIMUM SLOPE OF 0.0100. LATERAL CONNECTIONS TO MAIN SEWER LINE TO BE MADE WITH MANUFACTURED TEES.

ALL 2'x 4' STORM SERVICE CONNECTION MARKERS TO BE COLOR CODED WHITE. CONTRACTOR TO NOTE LENGTH OF BOARD USED ON EACH MARKER.

BACKFILL NOTE: PIPES UNDER PAVED SURFACES REQUIRE GRANULAR BACKFILL. FOR PIPES OUTSIDE PAVEMENT, NATIVE BACKFILL IS PERMITTED, UNLESS OTHERWISE NOTED.

THE CONTRACTOR SHALL FIELD VERIFY THE SIZE, LOCATION & DEPTH OF EXISTING UTILITIES PRIOR TO CONSTRUCTION.

LEGEND

PROPOSED SIDEWALK WITH FACILITY PERMIT

PROPOSED SIDEWALK (BY HOMEBUILDER)

PROPOSED CONCRETE CURB AND GUTTER

PROPOSED STORM LINE & MANHOLE

PROPOSED SANITARY LINE & MANHOLE

PROPOSED WATERLINE & VALVE

PROPOSED PAVEMENT

STORM LATERAL DATA

LOT NO.	D.S. M.H.	DIST. FROM D.S. M.H.	LENGTH	INV. EL. @ MAINLINE	INV. EL. @ PLUG	SLOPE	DEPTH @ PLUG
1	2C	44.12'	39.5'	213.42	214.71	0.0327	5.0'
2	LIDA	--	15.0'	217.70	217.85	0.0100	0.6'
3	LIDA	--	15.0'	217.44	217.59	0.0100	0.6'
4	LIDA	--	15.0'	216.15	216.30	0.0100	5.0'
5	LIDA	--	15.0'	215.85	216.00	0.0100	0.6'
6	LIDA	--	15.0'	214.07	214.22	0.0100	0.6'
7	LIDA	--	15.0'	213.50	213.65	0.0100	0.6'
8	LIDA	--	15.0'	210.37	210.52	0.0100	0.6'
9	2A	107.24'	37.7'	198.60	203.42	0.1278	5.0'
10	2A	45.82'	34.5'	196.67	199.89	0.0933	5.0'
11	POND	24.91'	22.4'	194.97	198.50	0.1571	3.0'
20	LIDA	--	15.0'	204.22	204.37	0.0100	3.8'
23	2B	107.25	37.5'	206.13	209.70	0.0952	5.0'
24	2B	152.85'	37.5'	207.91	211.67	0.1003	5.0'
25	LIDA	--	20.0'	216.45	216.65	0.0100	5.0'
26	LIDA	--	20.0'	217.10	217.30	0.0100	0.6'
27	2B	273.75'	37.5'	212.63	213.72	0.0291	5.0'
28	2C	37.53'	37.5'	213.36	214.58	0.0326	5.0'

PUBLIC CATCH BASIN DATA

TAG	TYPE	STATION	TC ELEV	IE IN	IE OUT	SLOPE	PIPE
SDAD-2A1	AREA DRAIN	15+37.66 10.00' LT SW BAY LN	197.62'	--	195.60	0.0267	24.01 LF 10" PVC C900
SDCI-2D1	CG-30	10+92.16 16.00' RT SW BAY LN	218.67'	--	215.04	0.1194	15.08 LF 10" PVC C900

LIDA STRUCTURE DATA

TAG	TYPE	STATION	D.S. M.H.	DIST. FROM D.S. M.H.	RIM ELEV	IE OUT	SLOPE	PIPE
SDBH-B2	Beehive Inlet	14+79.43 14.50' LT SW BAY LN	2A	35.73	202.62	198.37	0.1347	14.98 LF 6" PVC D-3034
SDBH-B3	Beehive Inlet	14+61.80 17.64' RT SW BAY LN	2A	53.38	204.39	200.55	0.2007	18.15 LF 6" PVC D-3034
SDBH-B4	Beehive Inlet	13+54.52 19.46' LT SW BAY LN	2B	17.25	210.68	206.30	0.1790	20.54 LF 6" PVC D-3034
SDBH-B5	Beehive Inlet	13+46.31 20.44' RT SW BAY LN	2B	25.43	210.66	206.00	0.1801	16.98 LF 6" PVC D-3034
SDBH-B6	Beehive Inlet	12+13.48 17.34' RT SW BAY LN	2B	157.85	216.13	212.04	0.2921	13.46 LF 6" PVC D-3034
SDBH-B7	Beehive Inlet	12+03.75 17.59' LT SW BAY LN	2B	167.50	215.98	211.91	0.1668	20.54 LF 6" PVC D-3034

CONSTRUCTION NOTES

ALL 6" STORM LATERALS THAT OUTFALL INTO STREET SIDE SWALES WILL BE DUCTILE IRON PIPE AND INSTALLED AT S=0.0100 TO MAXIMIZE COVER AT THE END OF THE PIPE.

GRAPHIC SCALE

(IN FEET)
1 inch = 40 ft.

WILSONVILLE APP. NO. DB18-0018 - DB18-0021

PIONEER DESIGN GROUP, INC.
9020 SW WASHINGTON SQUARE RD. SUITE 170
PORTLAND, OREGON 97223
p 503.643.8286
f 844.715.4743
www.pd-grp.com

REGISTERED PROFESSIONAL ENGINEER
OREGON
BRENT E. FITCH
VALID THROUGH 12-31-19

BAY LANE - SDLN-02 PLAN AND PROFILE

MORGAN FARM - PHASE 1 - AS BUILTS
CITY OF WILSONVILLE, OREGON

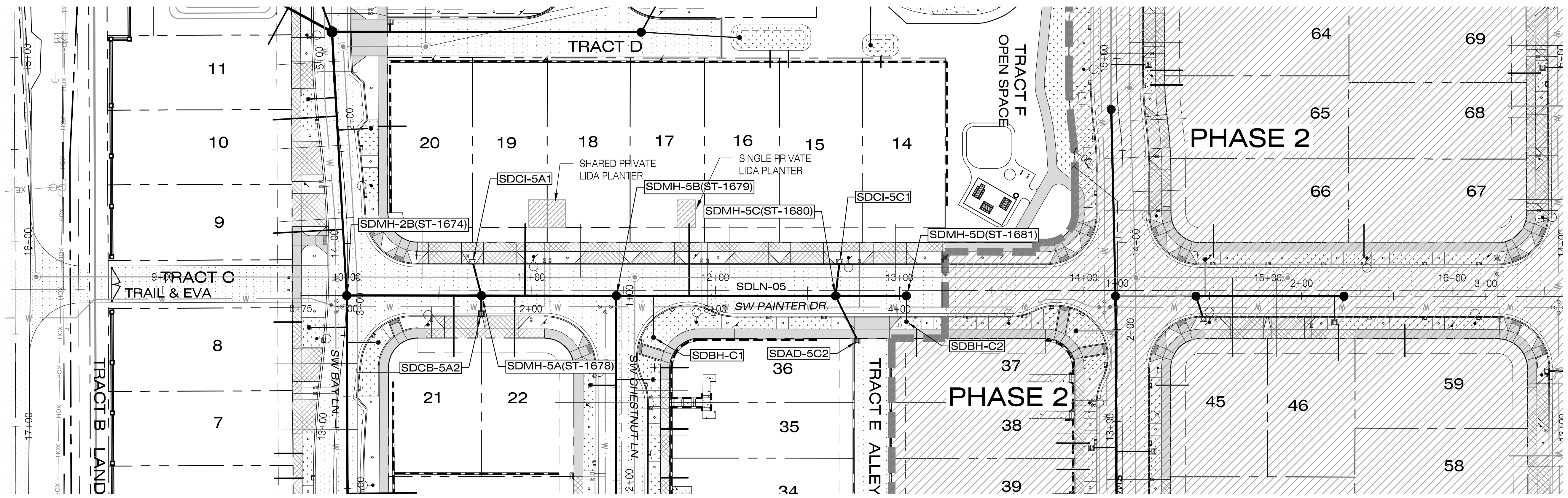
Designed by TCC Date 04/19
Drawn by TCC Date 04/19
Reviewed by BEF Date 04/19
Project No. 321-002 REF.
Horiz. Scale: 1" = 40'
Vert. Scale: 1" = 4'
3381_C5-1STRT.dwg

RECORD DRAWINGS
DATE 04/24/2019 THESE RECORD DRAWINGS HAVE BEEN PREPARED BASED ON FIELD OBSERVATION AND SURVEYED INFORMATION.

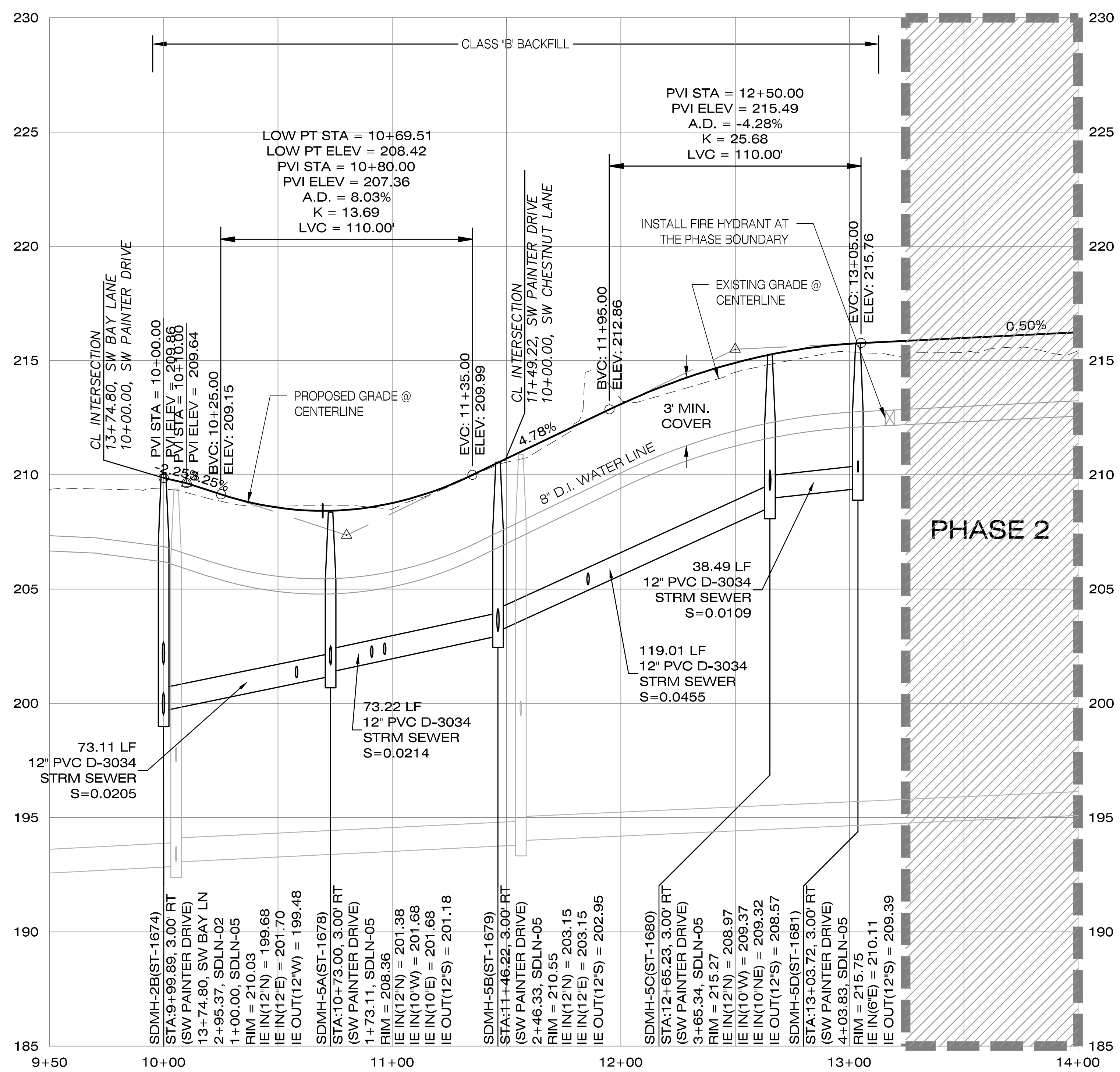
No. | Date | Revision | By

Project MORGAN FARM - PH.1
No. 321-002
Type AS-BUILTS
Sheet C5.1 of 52

B:\Land Projects 2004\338-001\dwg\engineering\3381_C5-1STRT.dwg 4/25/2019 11:20:34 AM



PAINTER DR / SDLN-05 (PUBLIC) PLAN
SCALE: 1"=40' (H)



PAINTER DR / SDLN-05 (PUBLIC) PROFILE
SCALE: 1"=40' (H), 1"=4' (V)

LEGEND

- PROPOSED SIDEWALK WITH FACILITY PERMIT
- PROPOSED SIDEWALK (BY HOMEBUILDER)
- PROPOSED CONCRETE CURB AND GUTTER
- PROPOSED STORM LINE & MANHOLE
- PROPOSED SANITARY LINE & MANHOLE
- PROPOSED WATERLINE & VALVE
- PROPOSED PAVEMENT

STORM LATERAL DATA

LOT NO.	D.S. M.H.	DIST. FROM D.S. M.H.	LENGTH	INV. EL. @ MAINLINE	INV. EL. @ PLUG	SLOPE	DEPTH @ PLUG
17	5B	39.44'	39.0'	205.20	206.69	0.0383	6.0'
19	5A	23.65'	39.0'	202.14	203.39	0.0322	6.0'
21	2B	58.11'	33.0'	201.12	203.99	0.0869	5.0'
22	5A	18.00'	33.0'	202.02	204.13	0.0641	5.0'
37	LIDA	--	15.0'	215.25	215.40	0.0100	0.9'

NOTE: STORMWATER FOR LOTS 18 & 19 TO BE CONVEYED TO A SHARED LATERAL.

PUBLIC CATCH BASIN DATA

TAG	TYPE	STATION	TC ELEV	IE IN	IE OUT	SLOPE	PIPE
SDAD-5C2	AREA DRAIN	12+77.35 26.00' RT PAINTER DR	215.43	--	210.88	0.0571	27.34 LF 10" PVC C900
SDCB-5A2	CG-2	10+73.00 12.75' RT PAINTER DR	208.09*	--	202.64	0.0985	9.75 LF 10" PVC C900
SDCI-5A1	CG-30	10+68.15 14.00' LT PAINTER DR	208.63	--	204.33	0.1395	18.99 LF 10" PVC C900
SDCI-5C1	CG-30	12+65.23 14.00' LT PAINTER DR	215.40	--	210.75	0.0746	18.50 LF 10" PVC C900

*FLOW LINE ELEVATION IN GUTTER.

LIDA STRUCTURE DATA

TAG	TYPE	STATION	D.S. M.H.	DIST. FROM D.S. M.H.	RIM ELEV	IE OUT	SLOPE	PIPE
SDBH-C1	Beehive Inlet	11+66.36 17.00' RT PAINTER DR	5B	20.14	210.02	205.82	0.0663	22.68 LF 6" PVC D-3034
SDBH-C2	Beehive Inlet	13+03.72 13.81' RT PAINTER DR	5D	0.00	215.41	211.14	0.0736	14.00 LF 6" PVC D-3034

CONSTRUCTION NOTES

1. ALL 6" STORM LATERALS THAT OUTFALL INTO STREET SIDE SWALES WILL BE DUCTILE IRON PIPE AND INSTALLED AT S=0.0100 TO MAXIMIZE COVER AT THE END OF THE PIPE.
2. CONTRACTOR TO STEEPEN CROSS SLOPE OF STREET IN FRONT OF SDCB-5A2 TO MAKE THE LOW POINT OF THE GUTTER LINE AT THE CATCH BASIN.

STORM SEWER NOTES

UNLESS OTHERWISE NOTED, ALL LATERALS ARE TO BE 6" PVC (ASTM D3034) WITH A MINIMUM SLOPE OF 0.0100. LATERAL CONNECTIONS TO MAIN SEWER LINE TO BE MADE WITH MANUFACTURED TEES.

ALL 2"x 4" STORM SERVICE CONNECTION MARKERS TO BE COLOR CODED WHITE. CONTRACTOR TO NOTE LENGTH OF BOARD USED ON EACH MARKER.

BACKFILL NOTE: PIPES UNDER PAVED SURFACES REQUIRE GRANULAR BACKFILL. FOR PIPES OUTSIDE PAVEMENT, NATIVE BACKFILL IS PERMITTED, UNLESS OTHERWISE NOTED.

THE CONTRACTOR SHALL FIELD VERIFY THE SIZE, LOCATION & DEPTH OF EXISTING UTILITIES PRIOR TO CONSTRUCTION.

GRAPHIC SCALE
(IN FEET)
1 inch = 40 ft.

WILSONVILLE APP. NO. DB18-0018 - DB18-0021

PIONEER DESIGN GROUP, INC.
9020 SW WASHINGTON SQUARE RD.
SUITE 170
PORTLAND, OREGON 97223
p 503.643.8286
f 844.715.4743
www.pd-grp.com

VALID THROUGH 12-31-19

PAINTER DRIVE - SDLN-05 PLAN AND PROFILE

MORGAN FARM - PHASE 1 - AS BUILTS
CITY OF WILSONVILLE, OREGON

Designed by TCC Date 04/19
Drawn by TCC Date 04/19
Reviewed by BEF Date 04/19
Project No. 321-002 REF.
Horiz. Scale: 1" = 40'
Vert. Scale: 1" = 4'
3381_C5-2STRT.dwg

No.	Date	Revision	By

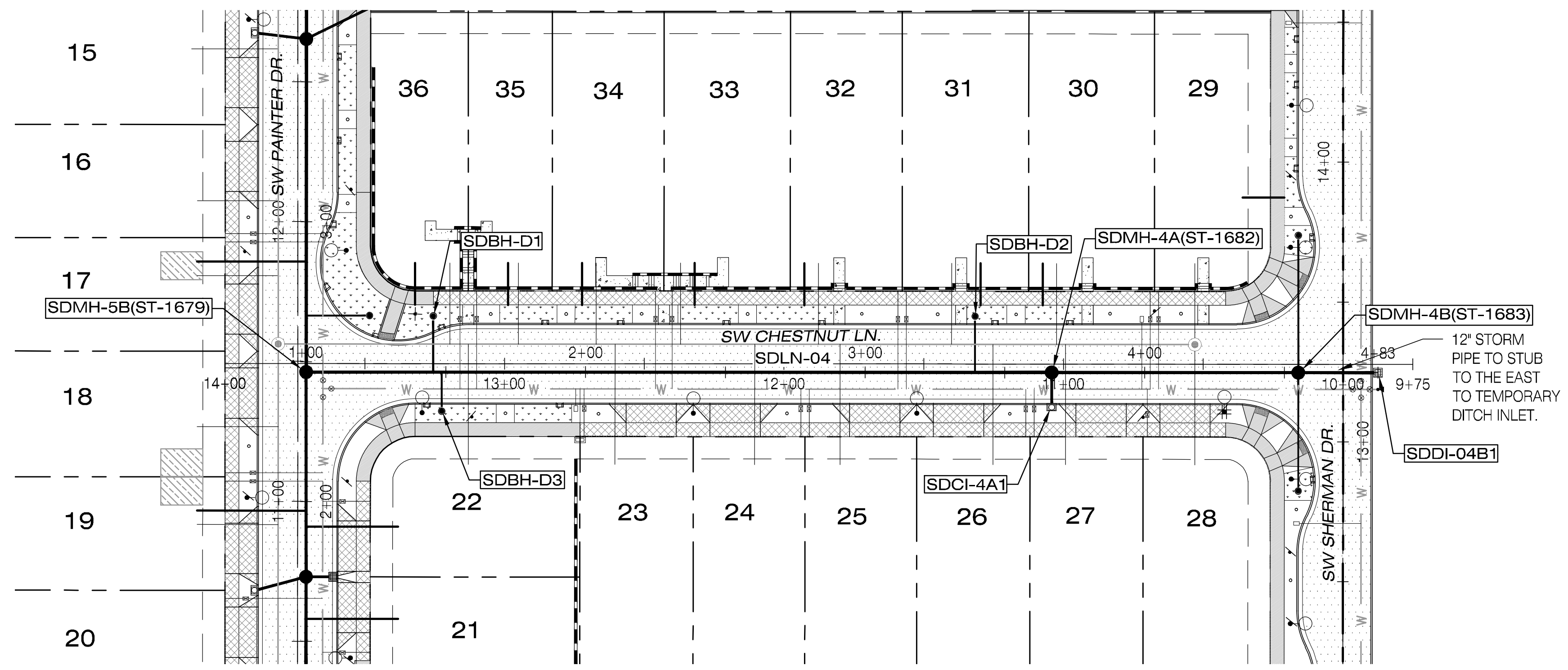
RECORD DRAWINGS
DATE 04/24/2019 THESE RECORD DRAWINGS HAVE BEEN PREPARED BASED ON FIELD OBSERVATION AND SURVEYED INFORMATION.

Project MORGAN FARM - PH.1
No. 321-002
Type AS-BUILTS
Sheet C5.2 of 52

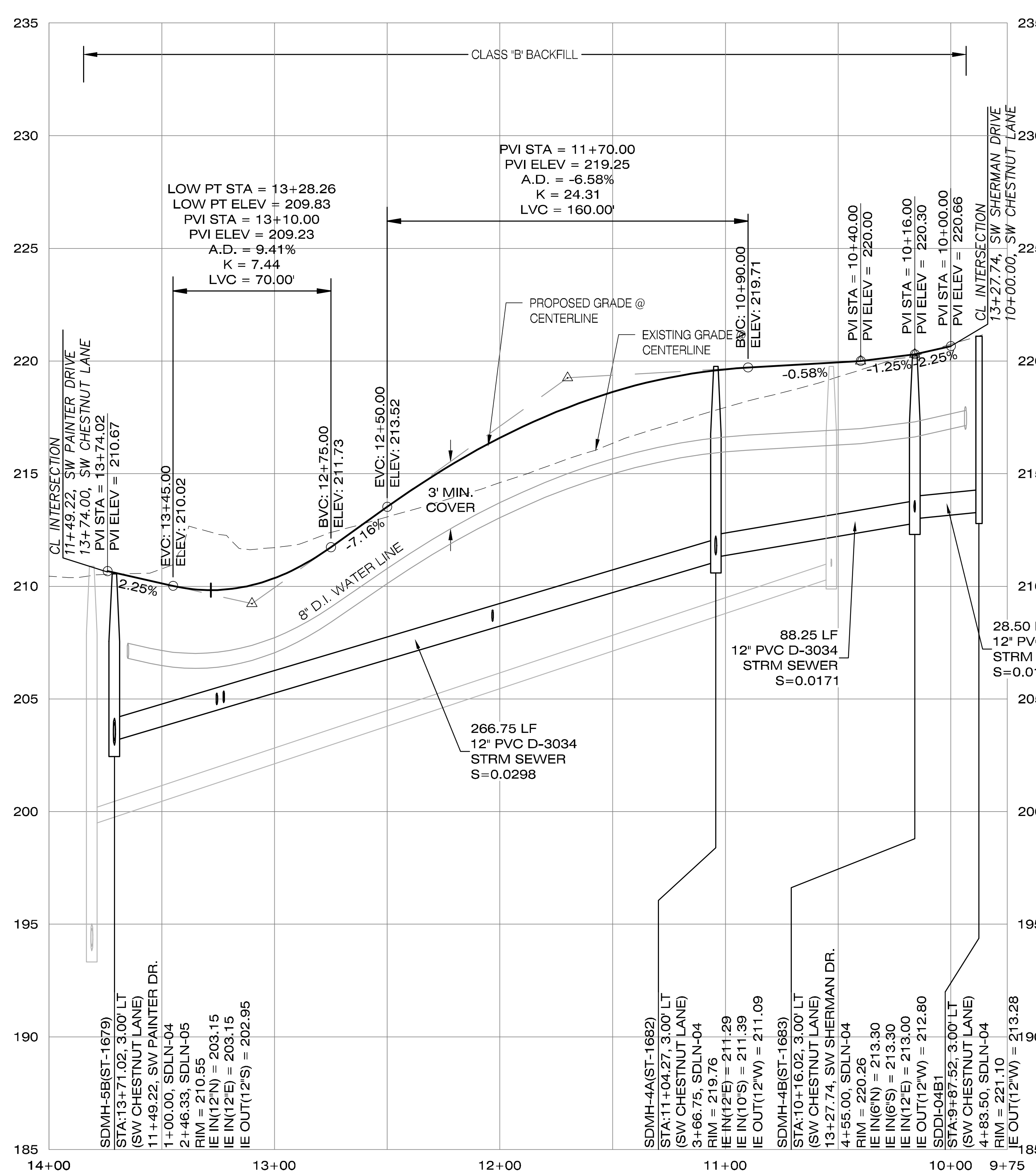
B:\Land Projects 2004\338-001\dwg\engineering\3381_C5-2STRT.dwg 4/25/2019 11:21:10 AM

LEGEND

- PROPOSED SIDEWALK WITH FACILITY PERMIT
- PROPOSED SIDEWALK (BY HOMEBUILDER)
- PROPOSED CONCRETE CURB AND GUTTER
- PROPOSED STORM LINE & MANHOLE
- PROPOSED SANITARY LINE & MANHOLE
- PROPOSED WATERLINE & VALVE
- PROPOSED PAVEMENT



CHESTNUT LANE / SDLN-04 (PUBLIC) PLAN
SCALE: 1"=40' (H)



CHESTNUT LANE / SDLN-04 (PUBLIC) PROFILE
SCALE: 1"=40' (H), 1"=4' (V)

STORM LATERAL DATA

LOT NO.	D.S. M.H.	DIST. FROM D.S. M.H.	LENGTH	INV. EL. @ MAINLINE	INV. EL. @ PLUG	SLOPE	DEPTH @ PLUG
29	LIDA	--	15.0'	220.74	220.89	0.0100	0.5'
30	LIDA	--	15.0'	218.91	219.06	0.0100	1.3'
31	LIDA	--	15.0'	218.49	218.64	0.0100	1.5'
32	LIDA	--	15.0'	216.33	216.48	0.0100	2.5'
33	LIDA	--	15.0'	214.26	214.41	0.0100	3.8'
34	LIDA	--	15.0'	211.58	211.73	0.0100	5.6'
35	LIDA	--	15.0'	209.88	210.03	0.0100	6.8'
36	LIDA	--	15.0'	209.27	209.42	0.0100	6.8'

PUBLIC CATCH BASIN DATA

TAG	TYPE	STATION	TC ELEV	IE IN	IE OUT	SLOPE	PIPE
SDCI-4A1	CG-30	11+04.25 14.00' LT CHESTNUT LN	219.76	--	214.01	0.2116	12.38 LF 10" PVC C900

LIDA STRUCTURE DATA

TAG	TYPE	STATION	D.S. M.H.	DIST. FROM D.S. M.H.	RIM ELEV	IE OUT	SLOPE	PIPE
SDBH-D1	Beehive Inlet	13+25.57 17.00' RT CHESTNUT LN	5B	45.45	209.55	205.12	0.0184	20.00 LF 6" PVC D-3034
SDBH-D2	Beehive Inlet	12+03.25 17.00' RT CHESTNUT LN	5B	239.33	218.88	214.34	0.1908	20.00 LF 6" PVC D-3034
SDBH-D3	Beehive Inlet	13+22.52 17.00' LT CHESTNUT LN	5B	48.50	209.53	205.50	0.0469	14.00 LF 6" PVC D-3034

CONSTRUCTION NOTES

ALL 6" STORM LATERALS THAT OUTFALL INTO STREET SIDE SWALES WILL BE DUCTILE IRON PIPE AND INSTALLED AT S=0.0100 TO MAXIMIZE COVER AT THE END OF THE PIPE.

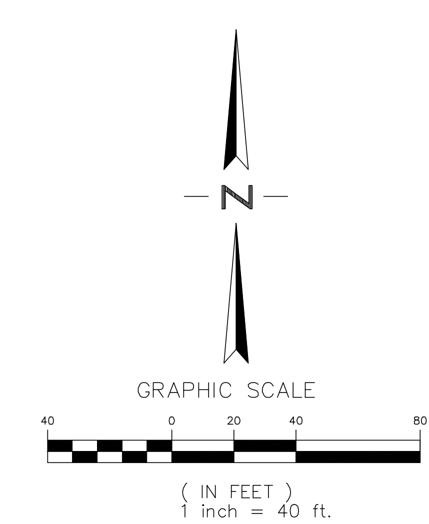
STORM SEWER NOTES

UNLESS OTHERWISE NOTED, ALL LATERALS ARE TO BE 6" PVC (ASTM D3034) WITH A MINIMUM SLOPE OF 0.0100. LATERAL CONNECTIONS TO MAIN SEWER LINE TO BE MADE WITH MANUFACTURED TEES.

ALL 2"x 4" STORM SERVICE CONNECTION MARKERS TO BE COLOR CODED WHITE. CONTRACTOR TO NOTE LENGTH OF BOARD USED ON EACH MARKER.

BACKFILL NOTE: PIPES UNDER PAVED SURFACES REQUIRE GRANULAR BACKFILL. FOR PIPES OUTSIDE PAVEMENT, NATIVE BACKFILL IS PERMITTED, UNLESS OTHERWISE NOTED.

THE CONTRACTOR SHALL FIELD VERIFY THE SIZE, LOCATION & DEPTH OF EXISTING UTILITIES PRIOR TO CONSTRUCTION.



WILSONVILLE APP. NO. DB18-0018 - DB18-0021

PIONEER DESIGN GROUP, INC.
9020 SW WASHINGTON SQUARE RD. SUITE 170 PORTLAND, OREGON 97223 p 503.643.8286 f 844.715.4743 www.pd-grp.com

REGISTERED PROFESSIONAL ENGINEER 54627PE OREGON MAR. 12, 2009 BRENT E. FITCH
VALID THROUGH 12-31-19

CHESTNUT LANE - SDLN-04 PLAN AND PROFILE

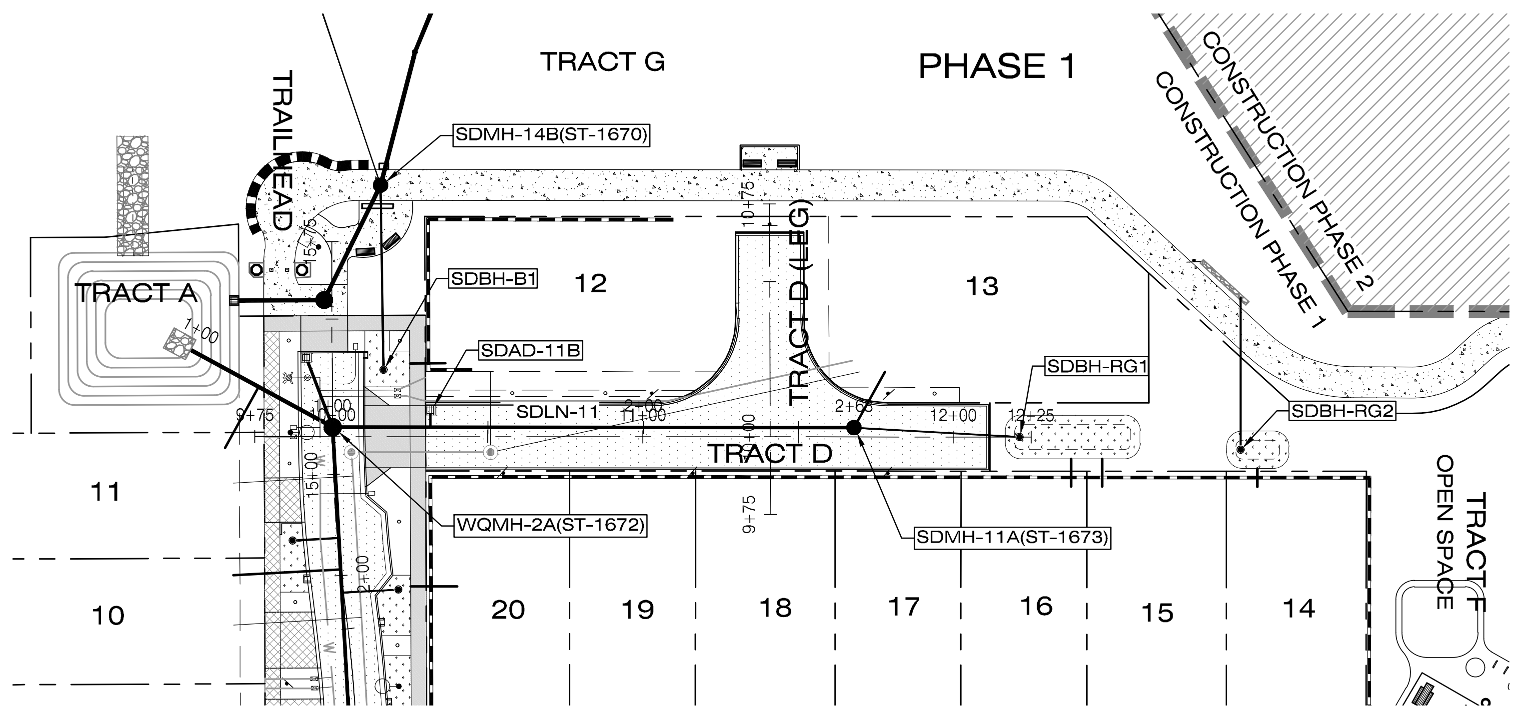
MORGAN FARM - PHASE 1 - AS BUILTS
CITY OF WILSONVILLE, OREGON

Designed by TCC Date 04/19
Drawn by TCC Date 04/19
Reviewed by BEF Date 04/19
Project No. 321-002 REF.
Horiz. Scale: 1" = 40'
Vert. Scale: 1" = 4'
3381_C5-3STRT.dwg

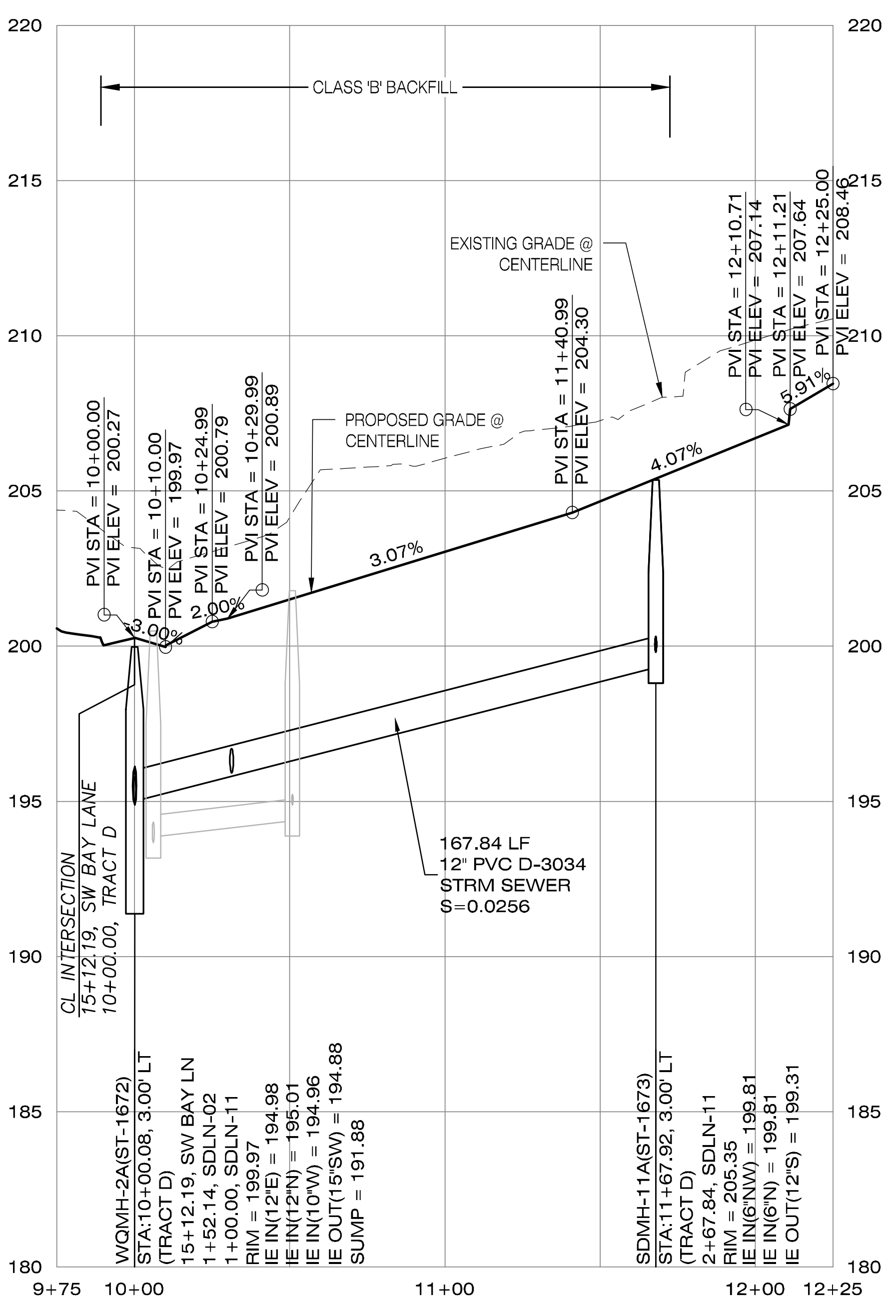
RECORD DRAWINGS
DATE 04/24/2019 THESE RECORD DRAWINGS HAVE BEEN PREPARED BASED ON FIELD OBSERVATION AND SURVEYED INFORMATION.

Project: MORGAN FARM - PH.1
No. 321-002
Type: AS-BUILTS
Sheet C5.3 of 52

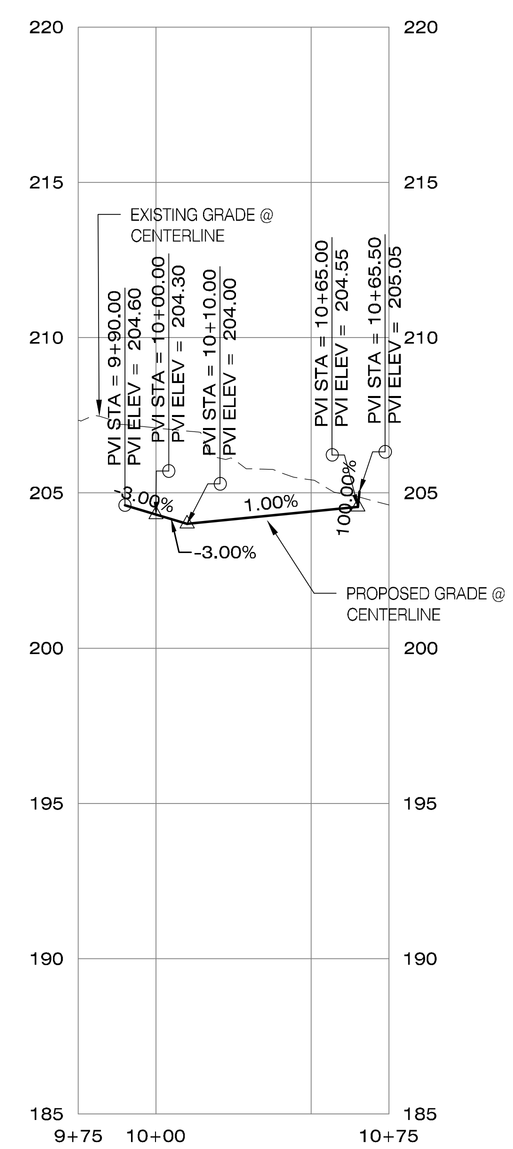
B:\Land Projects 2004\338-001\dwg\engineering\3381_C5-3STRT.dwg 4/25/2019 11:21:56 AM



TRACT D / SDLN-11 (PUBLIC) PLAN
SCALE: 1"=40' (H)



TRACT D / SDLN-11 (PUBLIC) PROFILE
SCALE: 1"=40' (H), 1"=4' (V)



TRACT D LEG (PUBLIC) PROFILE
SCALE: 1"=40' (H), 1"=4' (V)

LEGEND

- PROPOSED SIDEWALK WITH FACILITY PERMIT
- PROPOSED SIDEWALK (BY HOMEBUILDER)
- PROPOSED CONCRETE CURB AND GUTTER
- PROPOSED STORM LINE & MANHOLE
- PROPOSED SANITARY LINE & MANHOLE
- PROPOSED WATERLINE & VALVE
- PROPOSED PAVEMENT

STORM LATERAL DATA

LOT NO.	D.S. M.H.	DIST. FROM D.S. M.H.	LENGTH	INV. EL. @ MAINLINE	INV. EL. @ PLUG	SLOPE	DEPTH @ PLUG
12	LIDA	--	11.5'	197.90	198.01	0.0100	5.8'
13	11A	0.00'	20.6'	199.81	200.89	0.0524	5.0'
14	LIDA	--	6.0'	210.50	210.56	0.0100	5.3'
15	LIDA	--	9.0'	205.50	205.59	0.0100	9.0'
16	LIDA	--	9.0'	205.50	205.59	0.0100	9.3'

PUBLIC CATCH BASIN DATA

TAG	TYPE	STATION	RIM ELEV	IE IN	IE OUT	SLOPE	PIPE
SDAD-11B	AREA DRAIN	10+31.59 10.00' LT TRACT D	200.59		196.69	0.1435	5.50 LF 10" PVC C900

LIDA STRUCTURE DATA

TAG	TYPE	STATION	D.S. M.H.	DIST. FROM D.S. M.H.	RIM ELEV	IE OUT	SLOPE	PIPE
SDBH-RG1	Beehive Inlet	12+21.21 0.02' LT TRACT D	11A	0.00	206.00	202.25	0.0457	53.37 LF 6" PVC D-3034
SDBH-RG2	Beehive Inlet		--	--	210.42	206.92	0.0100	49.11 LF 6" PVC D-3034

CONSTRUCTION NOTES

ALL 6" STORM LATERALS THAT OUTFALL INTO STREET SIDE SWALES WILL BE DUCTILE IRON PIPE AND INSTALLED AT S=0.0100 TO MAXIMIZE COVER AT THE END OF THE PIPE.

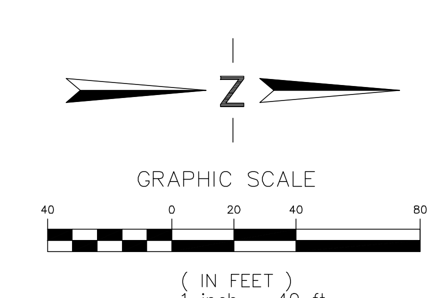
STORM SEWER NOTES

UNLESS OTHERWISE NOTED, ALL LATERALS ARE TO BE 6" PVC (ASTM D3034) WITH A MINIMUM SLOPE OF 0.0100. LATERAL CONNECTIONS TO MAIN SEWER LINE TO BE MADE WITH MANUFACTURED TEES.

ALL 2"x 4" STORM SERVICE CONNECTION MARKERS TO BE COLOR CODED WHITE. CONTRACTOR TO NOTE LENGTH OF BOARD USED ON EACH MARKER.

BACKFILL NOTE: PIPES UNDER PAVED SURFACES REQUIRE GRANULAR BACKFILL. FOR PIPES OUTSIDE PAVEMENT, NATIVE BACKFILL IS PERMITTED, UNLESS OTHERWISE NOTED.

THE CONTRACTOR SHALL FIELD VERIFY THE SIZE, LOCATION & DEPTH OF EXISTING UTILITIES PRIOR TO CONSTRUCTION.



WILSONVILLE APP. NO. DB18-0018 - DB18-0021

PIONEER DESIGN GROUP, INC.
9020 SW WASHINGTON SQUARE RD. SUITE 170 PORTLAND, OREGON 97223
p 503.643.8286 f 844.715.4743 www.pd-grp.com

TRACT D - SDLN-11 - PLAN AND PROFILE

MORGAN FARM - PHASE 1 - AS BUILTS
CITY OF WILSONVILLE, OREGON

Designed by	TCC	Date	04/19
Drawn by	TCC	Date	04/19
Reviewed by	BEF	Date	04/19
Project No.	321-002	REF.	
Horiz. Scale:	1" = 40'		
Vert. Scale:	1" = 4'		

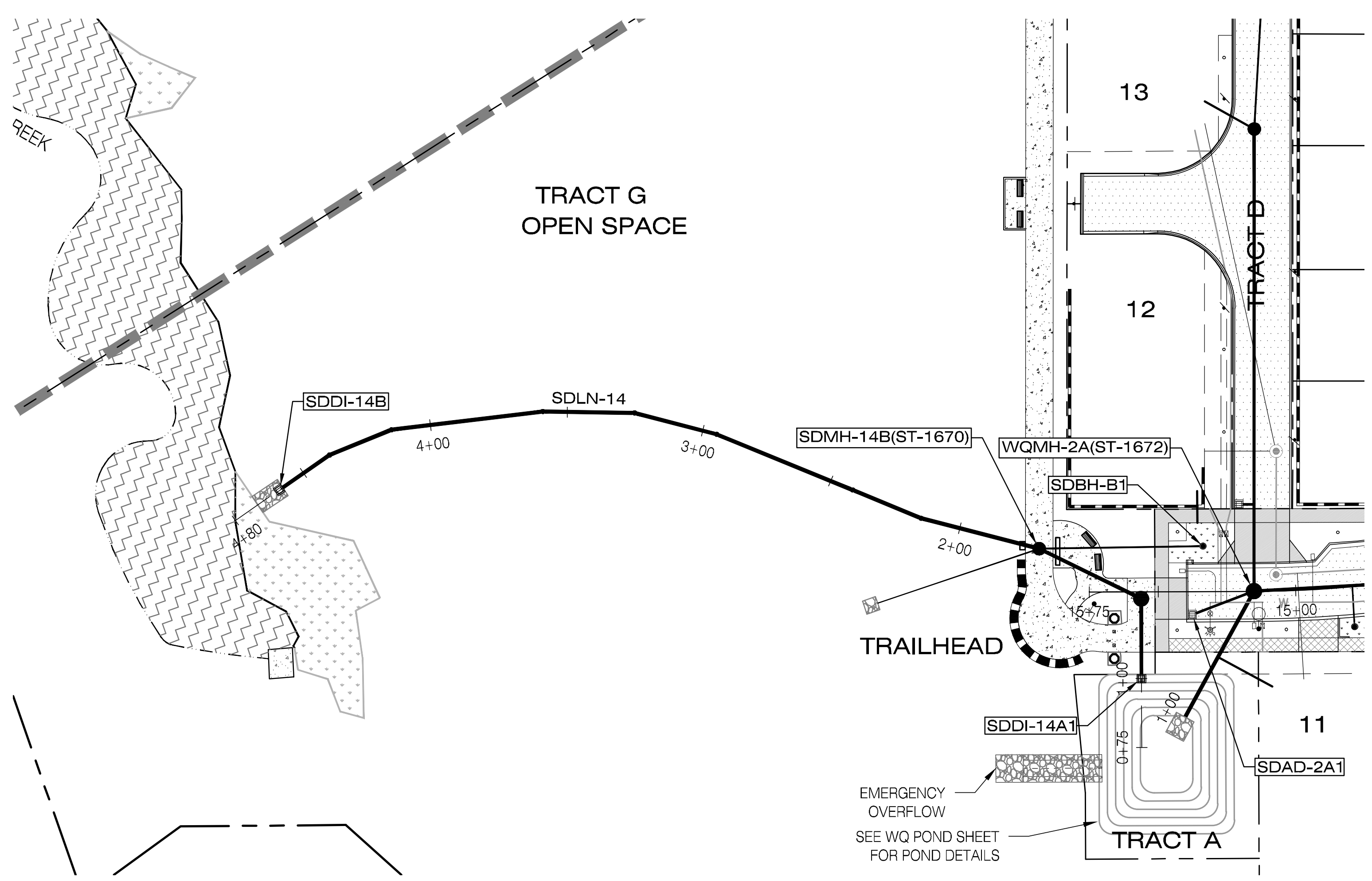
3381_C5-4STRT.dwg

No.	Date	Revision	By

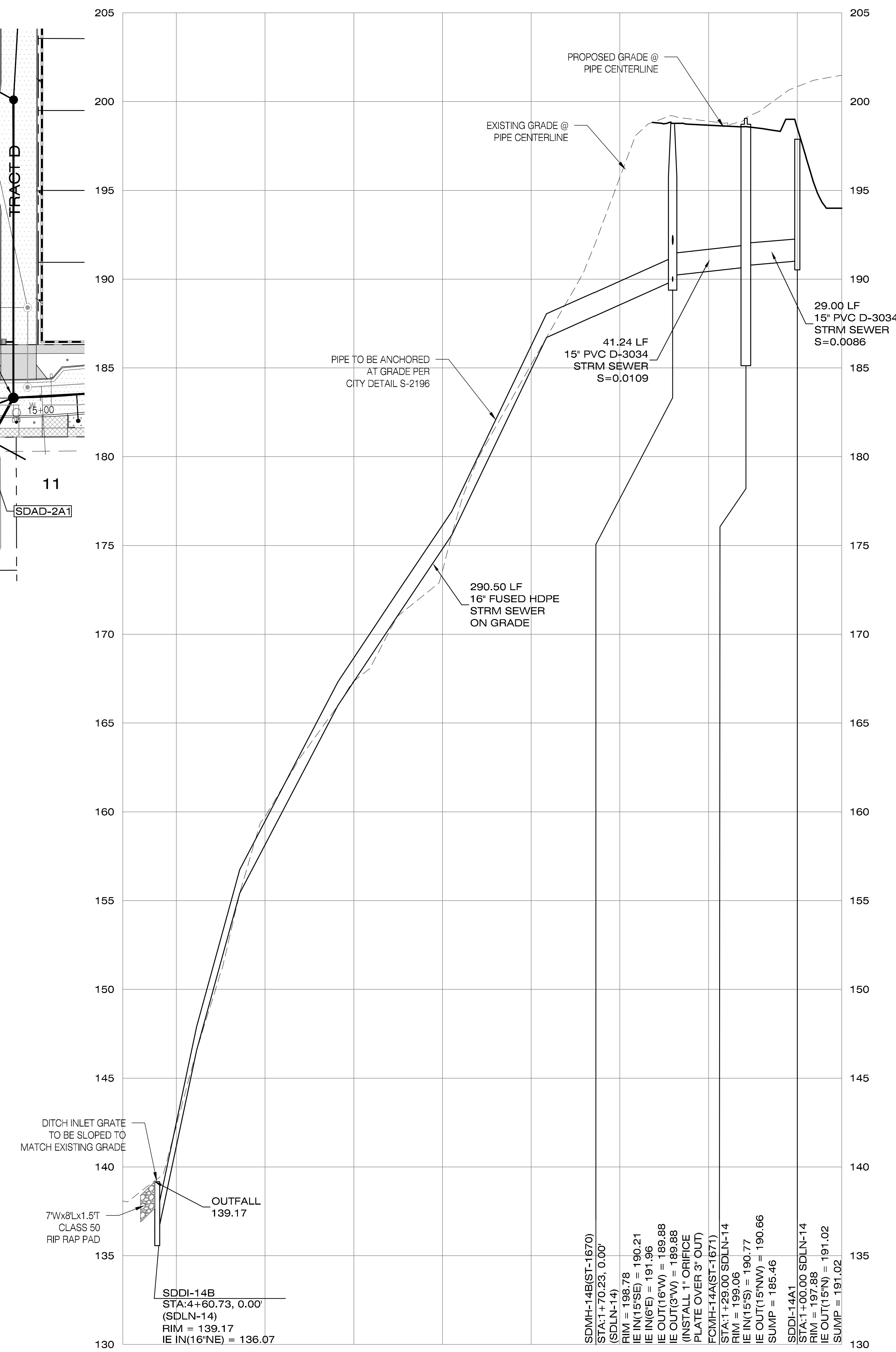
RECORD DRAWINGS
DATE 04/24/2019 THESE RECORD DRAWINGS HAVE BEEN PREPARED BASED ON FIELD OBSERVATION AND SURVEYED INFORMATION.

Project MORGAN FARM - PH.1
No. 321-002
Type AS-BUILTS
Sheet C5.4 of 52

B:\Land Projects 2004\338-001\dwg\engineering\3381_C5-4STRT.dwg 4/25/2019 11:22:28 AM



SDLN-14 (PUBLIC) PLAN
SCALE: 1"=40' (H)



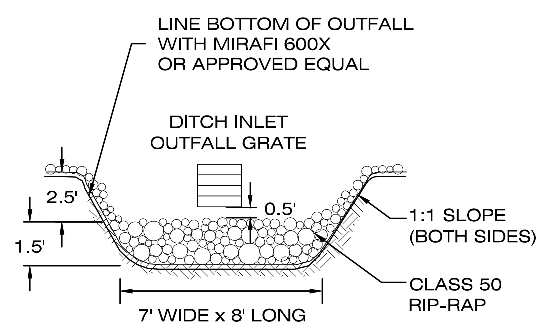
SDLN-14 (PUBLIC) PROFILE
SCALE: 1"=40' (H), 1"=4' (V)

LEGEND

- PROPOSED SIDEWALK WITH FACILITY PERMIT
- PROPOSED SIDEWALK (BY HOMEBUILDER)
- PROPOSED CONCRETE CURB AND GUTTER
- PROPOSED STORM LINE & MANHOLE
- PROPOSED SANITARY LINE & MANHOLE
- PROPOSED WATERLINE & VALVE
- PROPOSED PAVEMENT

LIDA STRUCTURE DATA

TAG	TYPE	STATION	D.S. M.H.	DIST. FROM D.S. M.H.	RIM ELEV	IE OUT	SLOPE	PIPE
SDBH-B1	Beehive Inlet		14B	0.00	197.37	193.39	0.0240	59.47 LF 6" PVC D-3034



DITCH INLET
OUTFALL PROTECTION
N.T.S.

STORM SEWER NOTES

UNLESS OTHERWISE NOTED, ALL LATERALS ARE TO BE 6" PVC (ASTM D3034) WITH A MINIMUM SLOPE OF 0.0100. LATERAL CONNECTIONS TO MAIN SEWER LINE TO BE MADE WITH MANUFACTURED TEES.

ALL 2"x 4" STORM SERVICE CONNECTION MARKERS TO BE COLOR CODED WHITE. CONTRACTOR TO NOTE LENGTH OF BOARD USED ON EACH MARKER.

BACKFILL NOTE: PIPES UNDER PAVED SURFACES REQUIRE GRANULAR BACKFILL. FOR PIPES OUTSIDE PAVEMENT, NATIVE BACKFILL IS PERMITTED, UNLESS OTHERWISE NOTED.

THE CONTRACTOR SHALL FIELD VERIFY THE SIZE, LOCATION & DEPTH OF EXISTING UTILITIES PRIOR TO CONSTRUCTION.

GRAPHIC SCALE
(IN FEET)
1 inch = 40 ft.

WILSONVILLE APP. NO. DB18-0018 - DB18-0021

PIONEER DESIGN GROUP, INC.
9020 SW WASHINGTON SQUARE RD.
SUITE 170
PORTLAND, OREGON 97223
p 503.643.8286
f 844.715.4743
www.pd-grp.com

REGISTERED PROFESSIONAL ENGINEER
OREGON
BRENT E. FITCH
VALID THROUGH 12-31-19

SDLN-14 PLAN AND PROFILE

MORGAN FARM - PHASE 1 - AS BUILTS
CITY OF WILSONVILLE, OREGON

Designed by TCC Date 04/19
Drawn by TCC Date 04/19
Reviewed by BEF Date 04/19
Project No. 321-002 REF.
Horiz. Scale: 1" = 40'
Vert. Scale: 1" = 4'
3381_C5-6STRM.dwg

No. Date Revision By

RECORD DRAWINGS
DATE 04/24/2019 THESE RECORD DRAWINGS HAVE BEEN PREPARED BASED ON FIELD OBSERVATION AND SURVEYED INFORMATION.

Project MORGAN FARM - PH.1
No. 321-002
Type AS-BUILTS
Sheet C5.6 of 52

B:\Land Projects 2004\338-001\dwg\engineering\3381_C5-6STRM.dwg 4/25/2019 11:23:31 AM

PIONEER DESIGN GROUP

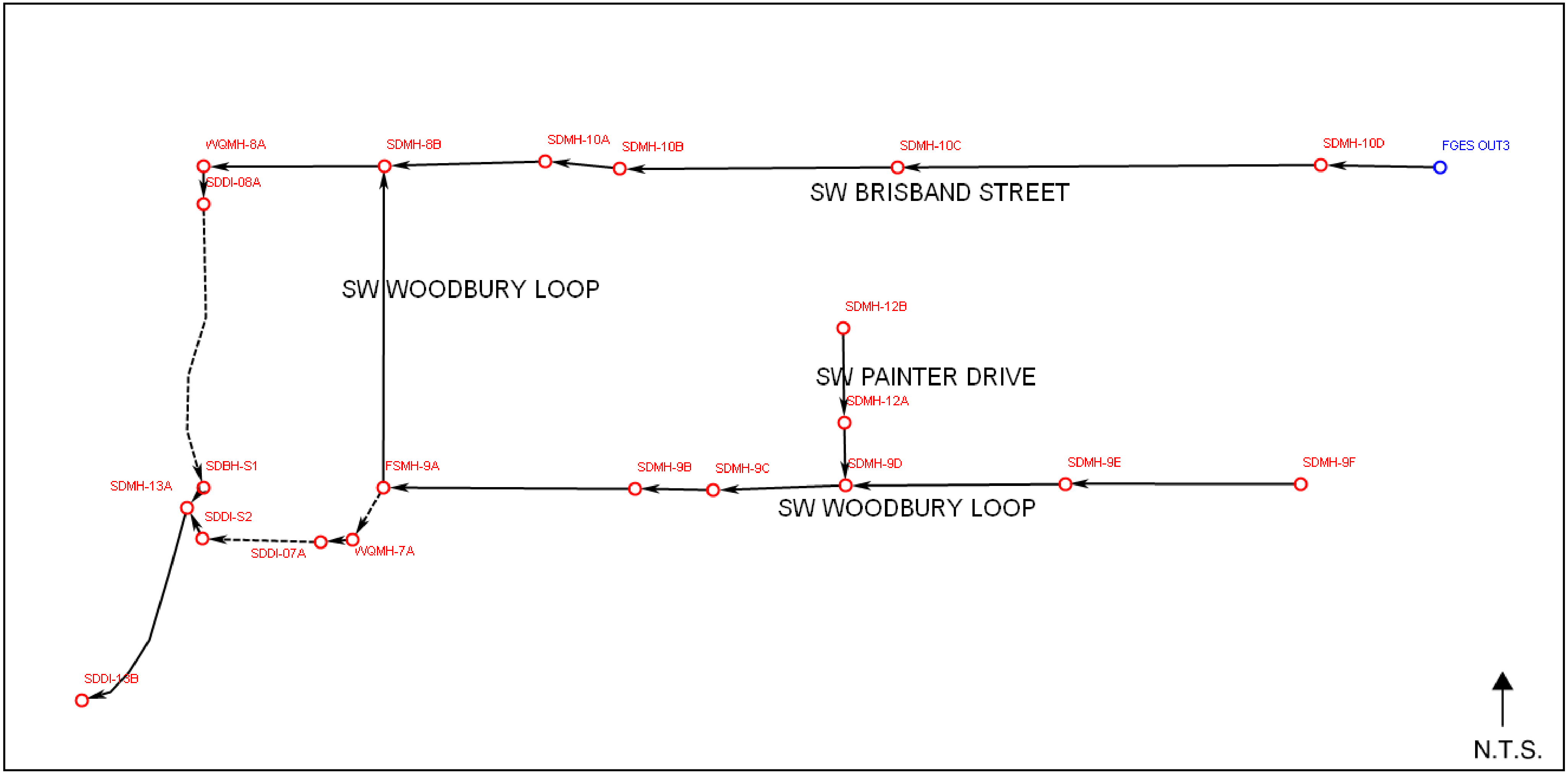
STORMWATER CONVEYANCE CALCULATIONS

JOB NUMBER: 321-002
PROJECT: Morgan Farm - Ph.1

FILE: 3212_FINAL hydro
Design Storm: 25 YR
Storm Duration: 24 HRS
Precipitation: 3.9 IN
Manning's "n" 0.013

LINE	INC. AREA (AC)	AREA TOTAL (AC)	% IMP.	AREA PERV. (AC)	CN PER.	AREA IMP. (AC)	CN IMP.	TIME (MIN)	Q (CFS)	PIPE SIZE (IN)	SLOPE (FT/FT)	Qf (CFS)	Q/Qf (%)	Vf (FPS)	V/Vf (%)	ACTUAL V (FPS)	LENGTH (FT)	INC. TIME (MIN)
SOUTH BASIN																		
SDLN-1																		
SDMH 1A TO 2D	0.18	0.18	67.4	0.06	74	0.12	98	5.00	0.14	12	0.0050	2.53	5.68%	3.22	0.26	0.83	111.21	2.24
SDLN-2																		
SDMH 2D TO 2C	0.20	0.38	67.4	0.12	74	0.26	98	7.24	0.28	12	0.0050	2.53	11.19%	3.22	0.31	1.00	89.13	1.48
SDMH 2C TO 2B	1.59	1.97	67.4	0.64	74	1.33	98	8.72	1.44	12	0.0391	7.06	20.43%	8.99	0.40	3.64	278.87	1.28
SDLN-4																		
SDMH 4B TO 4A	0.26	0.26	67.4	0.08	74	0.18	98	5.00	0.21	12	0.0170	4.66	4.45%	5.93	0.24	1.45	88.25	1.01
SDMH 4A TO 5B	1.09	1.35	67.4	0.44	74	0.91	98	6.01	1.03	12	0.0302	6.21	16.64%	7.90	0.37	2.90	266.75	1.54
SDLN-5																		
SDMH 5D TO 5C	0.15	0.15	67.4	0.05	74	0.10	98	5.00	0.12	12	0.0081	3.22	3.72%	4.09	0.24	0.97	38.49	0.66
SDMH 5C TO 5B	0.43	0.58	67.4	0.19	74	0.39	98	5.66	0.45	12	0.0488	7.89	5.70%	10.05	0.26	2.58	119.01	0.77
SDMH 5B TO 5A	0.29	2.22	67.4	0.72	74	1.50	98	7.55	1.65	12	0.0078	3.15	52.21%	4.02	0.72	2.90	73.22	0.42
SDMH 5A TO 2B	0.34	2.56	67.4	0.83	74	1.73	98	7.97	1.89	12	0.0050	2.53	74.89%	3.22	0.95	3.05	73.11	0.40
SDLN-2 (CONT.)																		
SDMH 2B TO 2A	0.56	5.09	67.4	1.66	74	3.43	98	10.00	3.67	12	0.0459	7.65	47.89%	9.74	0.68	6.62	143.23	0.36
SDLN-11																		
SDMH 11A TO 2A	0.63	0.63	67.4	0.21	74	0.42	98	5.00	0.50	12	0.0244	5.58	9.00%	7.10	0.29	2.06	167.84	1.36
SDLN-2 (CONT.)																		
SDMH 2A TO POND	0.03	5.75	67.4	1.87	74	3.88	98	10.36	4.12	15	0.0100	6.48	63.59%	5.28	0.84	4.41	52.14	0.20
																8.0'L x 7.25'W x 1.5'D CL 50 Riprap Pad		
SDLN-14																		
SDDI-14A1 TO FCMH 14A	0.00	5.75	67.4	1.87	74	3.88	98	5.00	4.59	16	0.0089	7.26	63.19%	5.20	0.83	4.32	38.13	0.15
FCMH 14A TO SDMH 14B	0.00	5.75	67.4	1.87	74	3.88	98	5.15	4.56	16	0.0075	6.66	68.41%	4.77	0.88	4.22	41.24	0.16
SDMH 15A TO SDDI 14B (OUTFALL)	0.06	5.81	67.4	1.89	74	3.92	98	5.31	4.57	16	0.0342	14.23	32.15%	10.19	0.52	5.31	277.55	0.87

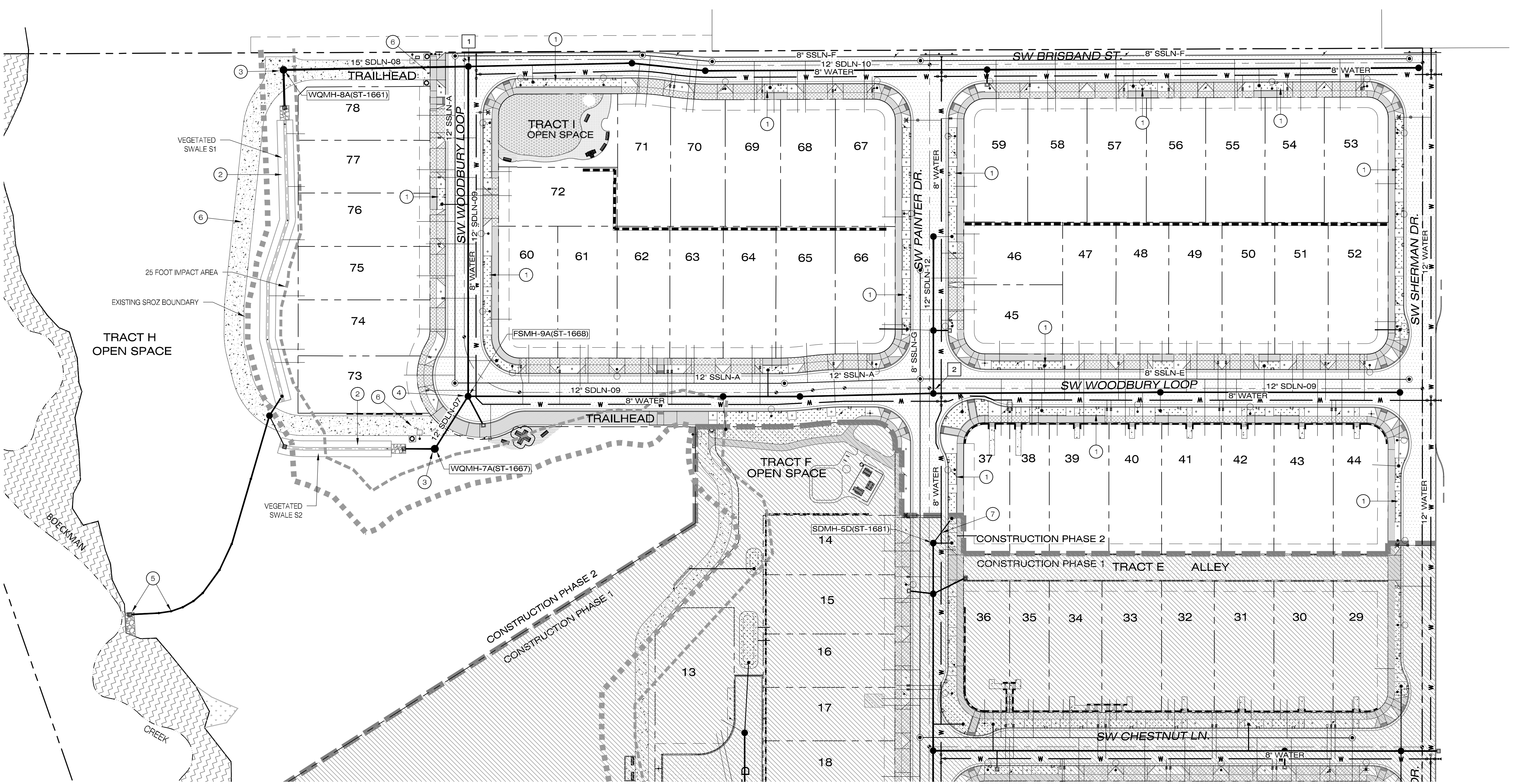
MORGAN FARM PHASE 2



XPSTORM HYDRAULIC LAYOUT: MORGAN FARM PHASE 1 STORM SYSTEM

XPSTORM RUNOFF DATA - MORGAN FARM PHASE 2 - HYDRAULIC ANAYLSIS						
DOWNSTREAM STORM ANALYSIS						
Node Name	Runoff Parameters (Input)					Output
	Area	Imp	CN	Tc	Precip	Peak
	ac	%		min.	in	cfs
25-YEAR						
SDMH-10D	0.72	64.3	74	5	3.90	0.51
SDMH-10C	0.25	64.3	74	5	3.90	0.18
SDMH-10B	0.09	64.3	74	5	3.90	0.06
SDMH-10A	0.38	64.3	74	5	3.90	0.27
SDBH-S1	0.56	64.3	74	5	3.90	0.40
SDMH-9E	1.24	64.3	74	5	3.90	0.88
SDMH-9C	0.27	64.3	74	5	3.90	0.19
SDMH-9B	0.70	64.3	74	5	3.90	0.50
FSMH-9A	0.78	64.3	74	5	3.90	0.55
SDMH-12B	0.26	64.3	74	5	3.90	0.19
SDMH-12A	0.36	64.3	74	5	3.90	0.26
SDMH-9F	0.90	64.3	74	5	3.90	0.64
FGES OUT3	0.24	100	98	5	3.90	0.52
	0.66	0	80	5		

XPSTORM RUNOFF DATA - MORGAN FARM PHASE 2 - HYDRAULIC ANAYLSIS						
DOWNSTREAM STORM ANALYSIS						
Node Name	Runoff Parameters (Input)					Output
	Area	Imp	CN	Tc	Precip	Peak
	ac	%		min.	in	cfs
25-YEAR						
SDMH-10D	0.72	64.3	74	5	3.90	0.51
SDMH-10C	0.25	64.3	74	5	3.90	0.18
SDMH-10B	0.09	64.3	74	5	3.90	0.06
SDMH-10A	0.38	64.3	74	5	3.90	0.27
SDBH-S1	0.56	64.3	74	5	3.90	0.40
SDMH-9E	1.24	64.3	74	5	3.90	0.88
SDMH-9C	0.27	64.3	74	5	3.90	0.19
SDMH-9B	0.70	64.3	74	5	3.90	0.50
FSMH-9A	0.78	64.3	74	5	3.90	0.55
SDMH-12B	0.26	64.3	74	5	3.90	0.19
SDMH-12A	0.36	64.3	74	5	3.90	0.26
SDMH-9F	0.90	64.3	74	5	3.90	0.64
FGES OUT3	0.24	100	98	5	3.90	0.52
	0.66	0	80	5		



PROPOSED UTILITY NOTES

1. ORIENT MANHOLE CONE, STEPS, AND MANHOLE COVER TO THE SOUTHEAST TO PROVIDE ADDITIONAL CLEARANCE BETWEEN THE MANHOLE STRUCTURE AND THE MONUMENT BOX. CURRENT CLEARANCE IS 2.32'.
2. ORIENT MANHOLE CONE, STEPS, AND MANHOLE COVER TO THE SOUTHEAST TO PROVIDE ADDITIONAL CLEARANCE BETWEEN THE MANHOLE STRUCTURE AND THE MONUMENT BOX. CURRENT CLEARANCE IS 1.50'.

CONSTRUCTION NOTES

1. INSTALL ON-STREET LIDA SWALE (TYP.) PER WILSONVILLE DETAIL 6045. SEE LIDA DETAIL SHEETS FOR DESIGN DETAILS.
2. PROPOSED 12' WIDE VEGETATED SWALE WITH UNDER DRAIN SYSTEM TO BE CONSTRUCTED PER WILSONVILLE DETAIL ST-6045, SEE SHEET C4.7 FOR SWALE DETAILS. THESE SWALES ARE TO BE COMPLETELY LINED WITH A 30 MIL LINER OR APPROVED EQUAL.
3. PROPOSED 60 INCH STORMWATER PRETREATMENT MANHOLE TO BE CONSTRUCTED PER WILSONVILLE DETAILS S-2050 & S-2051.
4. PROPOSED FLOW SPLITTER MANHOLE, SEE SHEET C4.7 FOR FLOW SPLITTER MANHOLE DETAILS.
5. 12" FUSED HDPE OUTFALL PIPE TO BE INSTALLED AT GRADE TO DISCHARGE INTO THE EXISTING DRAINAGE WAY. SEE STORM LINE PROFILE FOR DESIGN DETAILS.
6. PROPOSED 15' WIDE CONCRETE TRAIL FOR MAINTENANCE ACCESS TO VEGETATED SWALES AND CONTROL STRUCTURES.
7. CONTRACTOR TO TRENCH CUT AND CONNECT 6 INCH LATERAL TO EXISTING MANHOLE SDMH-5D (ST-1681). REPAIR STREET PAVEMENT PER CITY OF WILSONVILLE DETAIL S-2145. FINAL PAVEMENT REPAIR LIMITS TO BE DETERMINED BY THE CITY INSPECTOR IN THE FIELD.

LEGEND

- PROPOSED EASEMENT LINE
- PROPOSED LIDA SWALE/PLANTER
- PROPOSED PRIVATE LIDA PLANTER
- PROPOSED STORM LINE & MANHOLE
- PROPOSED SANITARY LINE & MANHOLE
- PROPOSED WATERLINE & VALVE
- PROPOSED WATER METER & SERVICE
- PROPOSED IRRIGATION METER & SERVICE
- PROPOSED HYDRANT
- PROPOSED STREET LIGHT LOCATION
- PROPOSED TRAIL HEAD LIGHT LOCATION

N

GRAPHIC SCALE

40 0 20 40 80

(IN FEET)
1 inch = 40 ft.

THIS DESIGN COMPLIES WITH ORS 92.044 (7) IN THAT NO UTILITY INFRASTRUCTURE IS DESIGNED TO BE WITHIN ONE (1) FOOT OF A SURVEY MONUMENT LOCATION SHOWN ON A SUBDIVISION OR PARTITION PLAT. NO DESIGN EXCEPTIONS NOR FINAL FIELD LOCATION CHANGES SHALL BE PERMITTED IF THAT CHANGE WOULD CAUSE ANY UTILITY INFRASTRUCTURE TO BE PLACED WITHIN THE PROHIBITED AREA.

B:\Land Projects 2004\338-001\dwg\engineering\Phase 2\3381_C3-0UTIL.dwg 12/18/2019 12:44:01 PM

WILSONVILLE APP. NO. DB18-0018 - DB18-0021

PIONEER DESIGN GROUP
CIVIL ENGINEERING • LAND USE PLANNING • LAND SURVEYING • LANDSCAPE ARCHITECTURE
9020 SW WASHINGTON SQUARE RD., SUITE 170 PORTLAND, OREGON 97223
p 503.643.8286 www.pd-grp.com

REGISTERED PROFESSIONAL ENGINEER 54627PE OREGON MAR. 12, 2002 BRENT E. FITCH
VALID THROUGH 12-31-19

COMPOSITE UTILITY PLAN

MORGAN FARM PHASE 2
CITY OF WILSONVILLE, OREGON

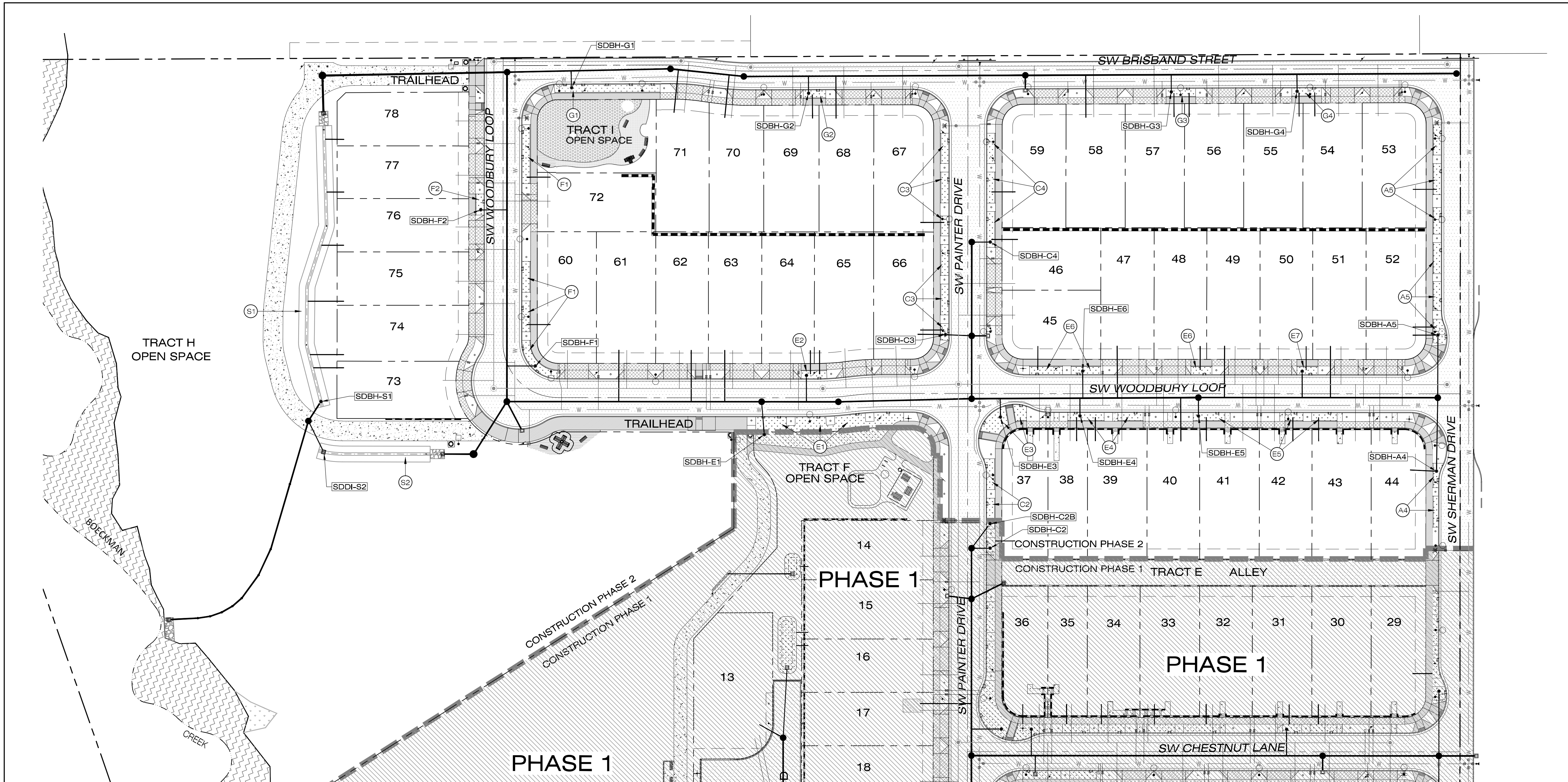
Designed by	TCC	**Date**	12/2018
Drawn by	TCC	**Date**	12/2018
Reviewed by	BEF	**Date**	12/2018
Project No.	321-002	**REF.**	
Horiz. Scale:	N/A		
Vert. Scale:	N/A		

3381_C3-0UTIL.dwg

No.	Date	Revision	By

RECORD DRAWINGS
DATE 12/18/2019 THESE RECORD DRAWINGS HAVE BEEN PREPARED BASED ON FIELD OBSERVATION AND SURVEYED INFORMATION.

Project MORGAN FARM PH.2
No. 321-002
Type AS-BUILTS
Sheet C3.0



BEEHIVE #	ORIFICE DIAMETER SIZE (IN)	BEEHIVE #	ORIFICE DIAMETER SIZE (IN)
SDBH-A4	0.83	SDBH-E6	1.07
SDBH-A5	1.18	SDBH-E7	0.79
SDBH-C2B	0.3	SDBH-F1	1.21
SDBH-C3	1.06	SDBH-F2	0.42
SDBH-C4	1.00	SDBH-G1	0.96
SDBH-E1	0.94	SDBH-G2	0.76
SDBH-E2	1.00	SDBH-G3	0.97
SDBH-E3	0.36	SDBH-G4	0.99
SDBH-E4	0.89	SDBH-S1	2.26
SDBH-E5	1.23	SDBH-S2	1.50

CONTRACTOR TO INSTALL MONOLITHIC CURB AND 5 FOOT SIDEWALKS ADJACENT TO STREET SIDE SWALES WITH SWALE CONSTRUCTION.

LIDA FACILITY NOTES

(L#) ON-STREET LIDA SWALE CALL OUT
L = LETTER OF STREET SWALE IS LOCATED ON
# = LIDA SWALE CALL OUT NUMBER

LEGEND

- PROPOSED EASEMENT LINE
- PROPOSED PUBLIC LIDA SWALE/PLANTER
- PROPOSED PRIVATE LIDA PLANTER
- PROPOSED STORM LINE & MANHOLE
- PROPOSED SANITARY LINE & MANHOLE
- PROPOSED WATERLINE & VALVE
- PROPOSED WATER METER & SERVICE
- PROPOSED IRRIGATION METER & SERVICE

N

GRAPHIC SCALE
40 0 20 40 80
(IN FEET)
1 inch = 40 ft.

WILSONVILLE APP. NO. DB18-0018 - DB18-0021

PIONEER DESIGN GROUP
CIVIL ENGINEERING • LAND USE PLANNING • LAND SURVEYING • LANDSCAPE ARCHITECTURE
9020 SW WASHINGTON SQUARE RD., SUITE 170 PORTLAND, OREGON 97223
p 503.643.8286
www.pd-grp.com

REGISTERED PROFESSIONAL ENGINEER
54627PE
OREGON
MAR. 12, 2002
BRENT E. FITCH
VALID THROUGH 12-31-19

LIDA SWALE SITE PLAN

MORGAN FARM PHASE 2
CITY OF WILSONVILLE, OREGON

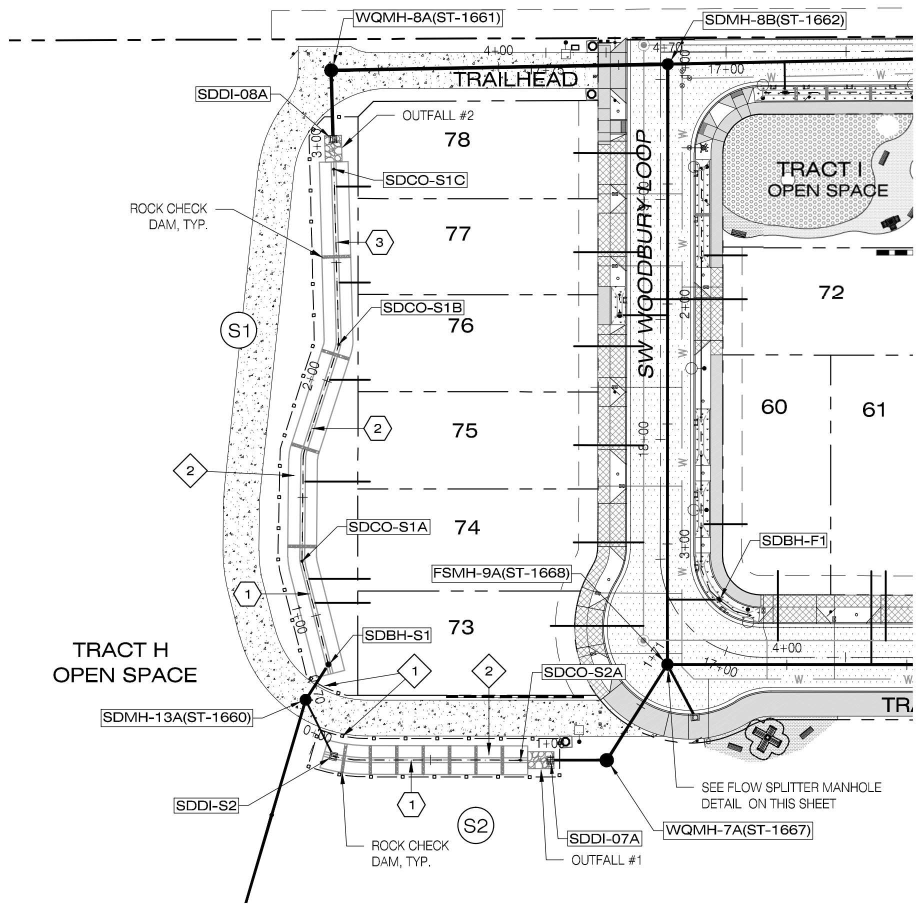
Designed by TCC Date 12/2018
Drawn by TCC Date 12/2018
Reviewed by BEF Date 12/2018
Project No. 321-002 REF.
Horiz. Scale: N/A
Vert. Scale: N/A
3381_C4-0LIDA.dwg

No.	Date	Revision	By

RECORD DRAWINGS
DATE 12/18/2019 THESE RECORD DRAWINGS HAVE BEEN PREPARED BASED ON FIELD OBSERVATION AND SURVEYED INFORMATION.

Project
MORGAN FARM PH.2
No.
321-002
Type
AS-BUILTS
Sheet
C4.0

B:\Land Projects 2004\338-001\dwg\engineering\Phase 2\3381_C4-0LIDA.dwg 12/18/2019 12:46:01 PM



SDLN-07 / SDLN-08 / SWALES 1 & 2 - PLAN

SCALE: 1"=40' (H)

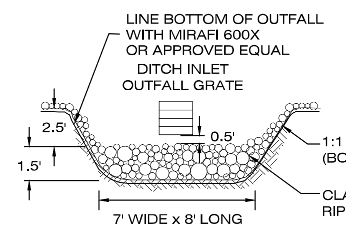
BEEHIVE INLET STRUCTURE DATA							
TAG	TYPE	STATION	RIM ELEV	IE IN	IE OUT	SLOPE	PIPE
SDBH-S1	Beehive Inlet	0+78.89 0.00' RT SDLN-08	193.85	189.35	188.48	0.0337	17.50 LF 12" PVC D-3034
SDDI-S2	Ditch Inlet	0+09.50 0.00' RT SDLN-07	195.33	191.14	190.98	0.1091	26.21 LF 6" PVC D-3034

VEGETATED SWALE 1	
SWALE SIZE (SF)	2604 SF
1	44.5 LF - 6' ABS SCH.40 PERF PIPE
2	92.6 LF - 6' ABS SCH.40 PERF PIPE
3	73.1 LF - 6' ABS SCH.40 PERF PIPE

VEGETATED SWALE 2	
SWALE SIZE (SF)	1020 SF
1	78.0 LF - 6' ABS SCH.40 PERF PIPE

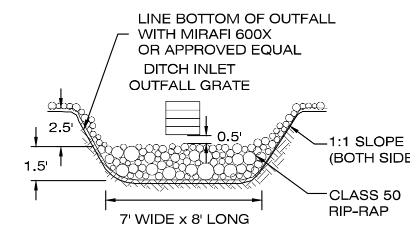
CONSTRUCTION NOTES

1. INSTALL 4' HIGH ORNAMENTAL FENCE WITH 12' WIDE ACCESS GATE. SEE LANDSCAPE PLANS FOR FENCING DETAILS.
2. VEGETATED SWALES TO BE COMPLETELY LINED WITH 30 MIL PLASTIC LINER OR APPROVED EQUAL PER CITY DETAIL ST-6045.



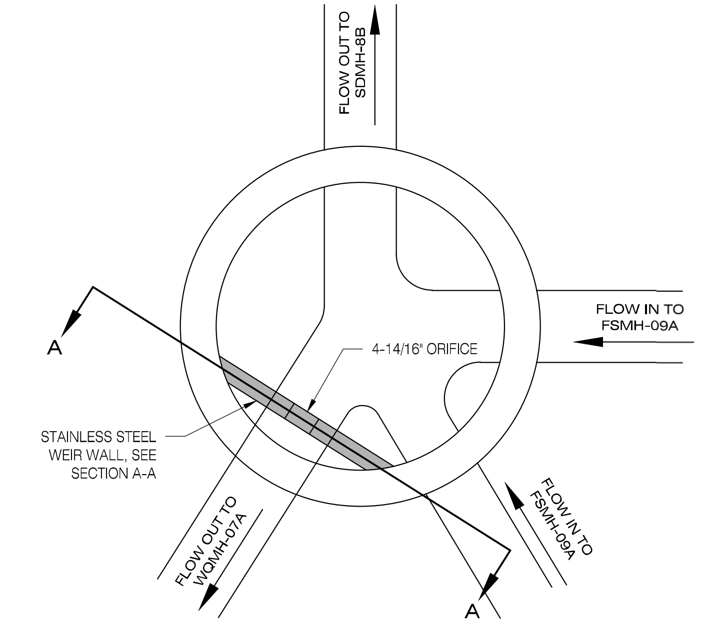
OUTFALL #1 PROTECTION

N.T.S.



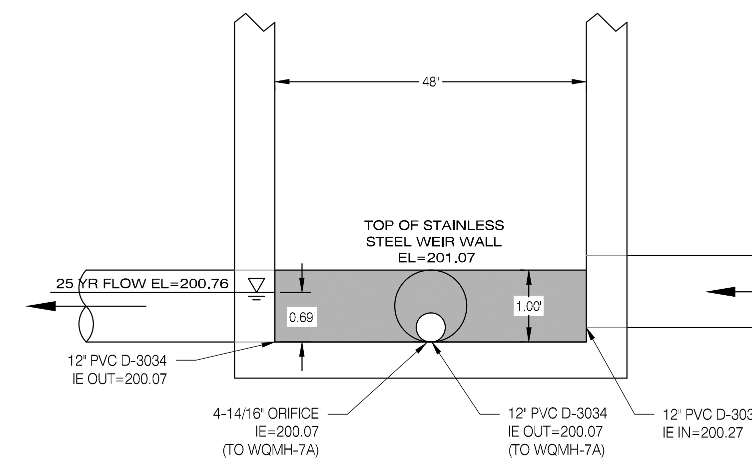
OUTFALL #2 PROTECTION

N.T.S.



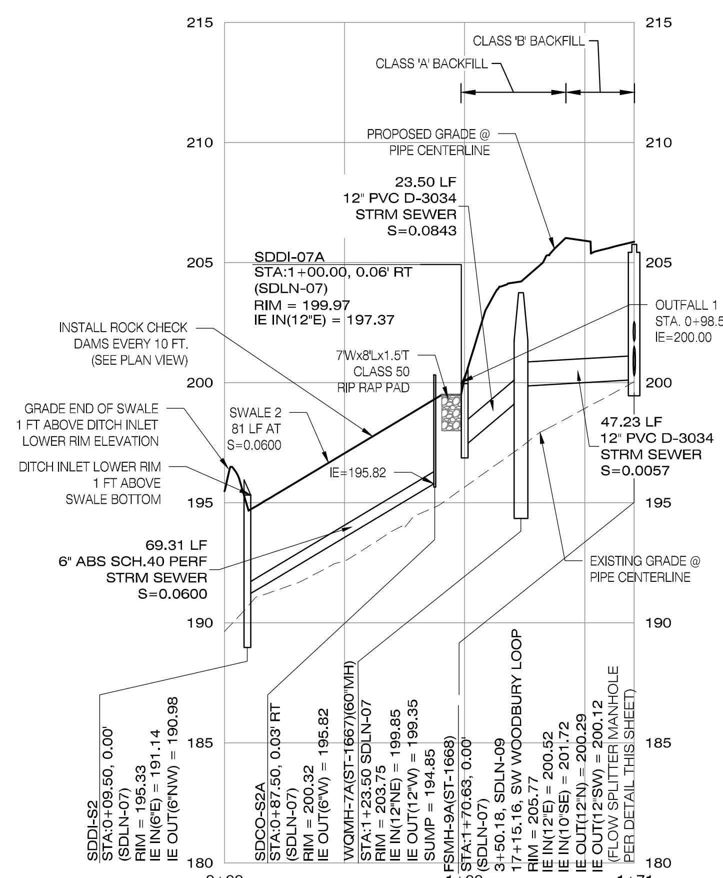
FLOW SPLITTER MANHOLE 9A - PLAN (48" DIA.)

NTS



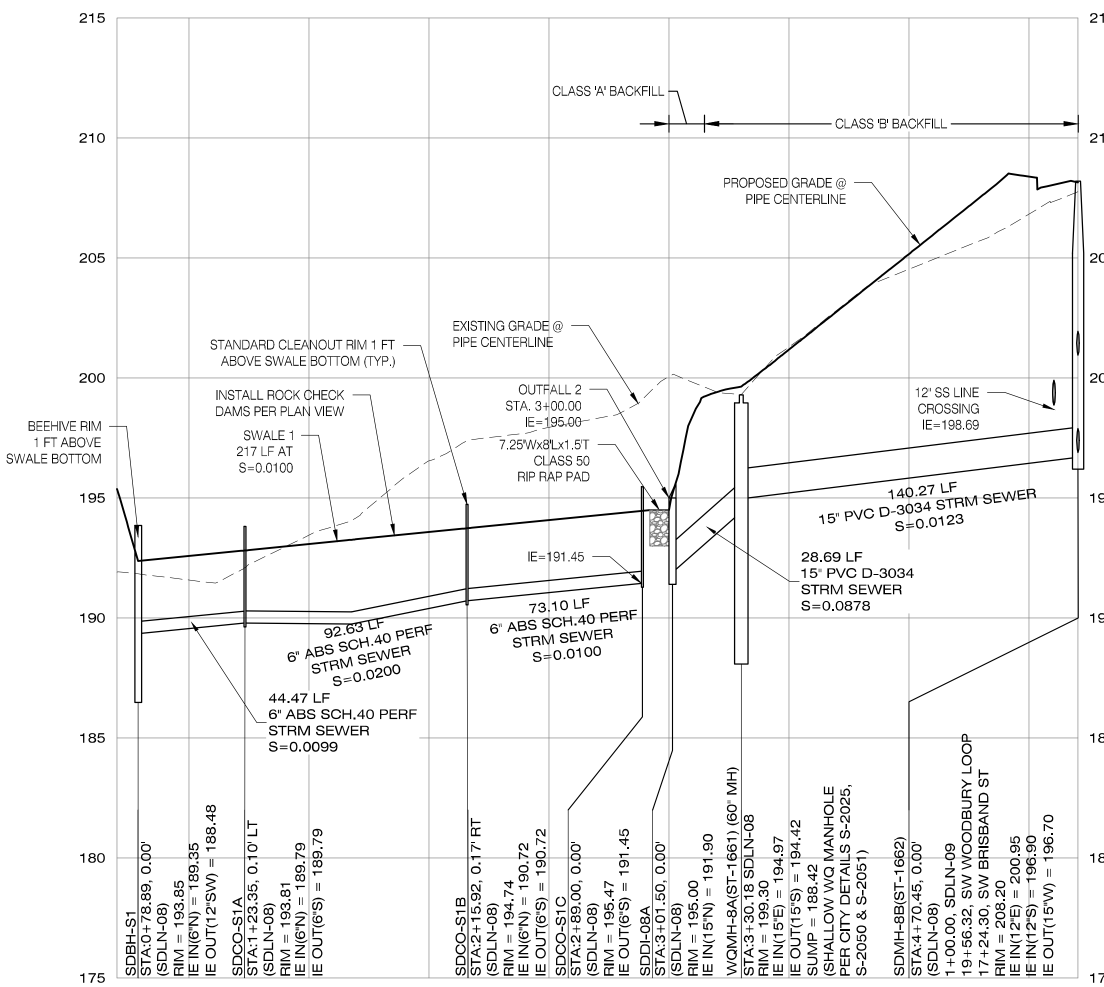
FLOW SPLITTER MANHOLE 9A - SECTION A-A

NTS



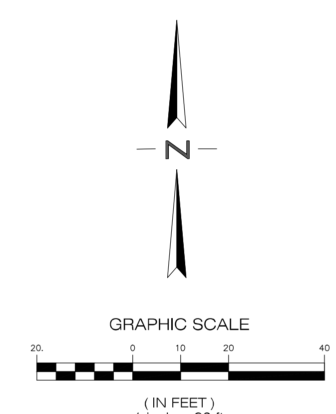
SDLN-07 / SWALE 2 - PROFILE

SCALE: 1"=40' (H), 1"=4' (V)



SDLN-08 / SWALE 1 - PROFILE

SCALE: 1"=40' (H), 1"=4' (V)



PIONEER DESIGN GROUP

CIVIL ENGINEERING • LAND USE PLANNING • LAND SURVEYING • LANDSCAPE ARCHITECTURE

9020 SW WASHINGTON SQUARE RD., SUITE 170 PORTLAND, OREGON 97223

REGISTERED PROFESSIONAL ENGINEER 54627PE OREGON BRENT E. FITCH

VALID THROUGH 12-31-19

SDLN-07, SDLN-08, SWALES 1 & 2 - PLAN AND PROFILE

MORGAN FARM PHASE 2

CITY OF WILSONVILLE, OREGON

Designed by	TCC	Date	12/2018
Drawn by	TCC	Date	12/2018
Reviewed by	BEF	Date	12/2018
Project No.	321-002	REF.	
Horiz. Scale:	N/A		
Vert. Scale:	N/A		

3381_C4-7WQPF.dwg

No.	Date	Revision	By

RECORD DRAWINGS

DATE 12/18/2019 THESE RECORD DRAWINGS HAVE BEEN PREPARED BASED ON FIELD OBSERVATION AND SURVEYED INFORMATION.

Project MORGAN FARM PH.2

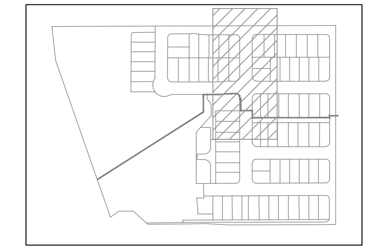
No. 321-002

Type AS-BUILTS

Sheet C4.7

WILSONVILLE APP. NO. DB18-0018 - DB18-0021

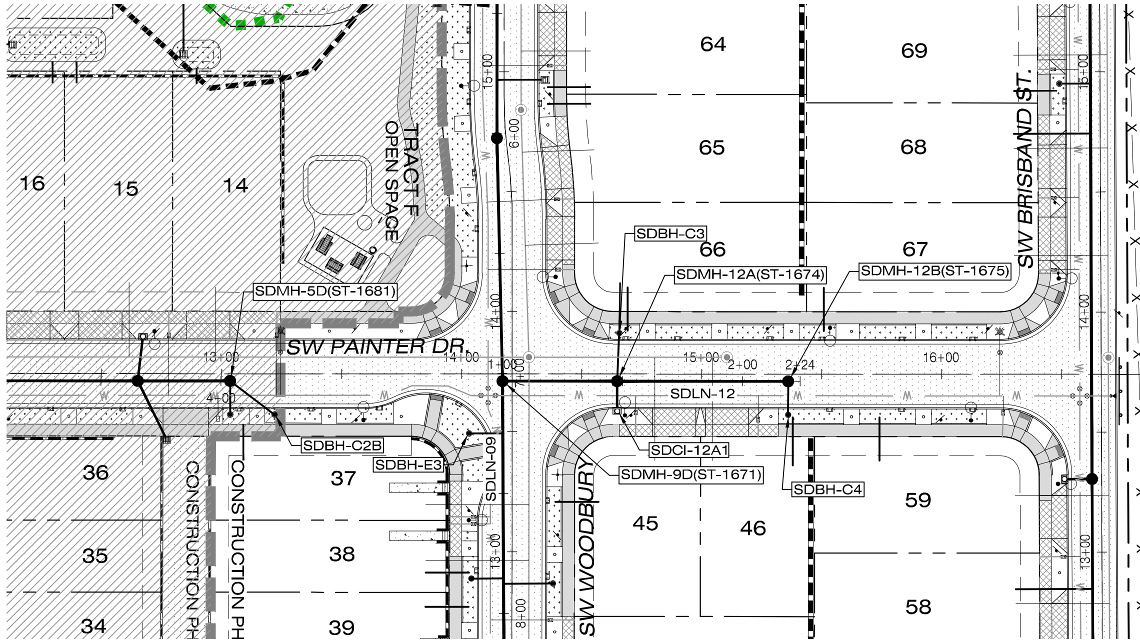
B:\Land Projects 2004\338-001\dwg\engineering\Phase 2\3381_C4-7WQPF.dwg 12/18/2019 12:48:20 PM



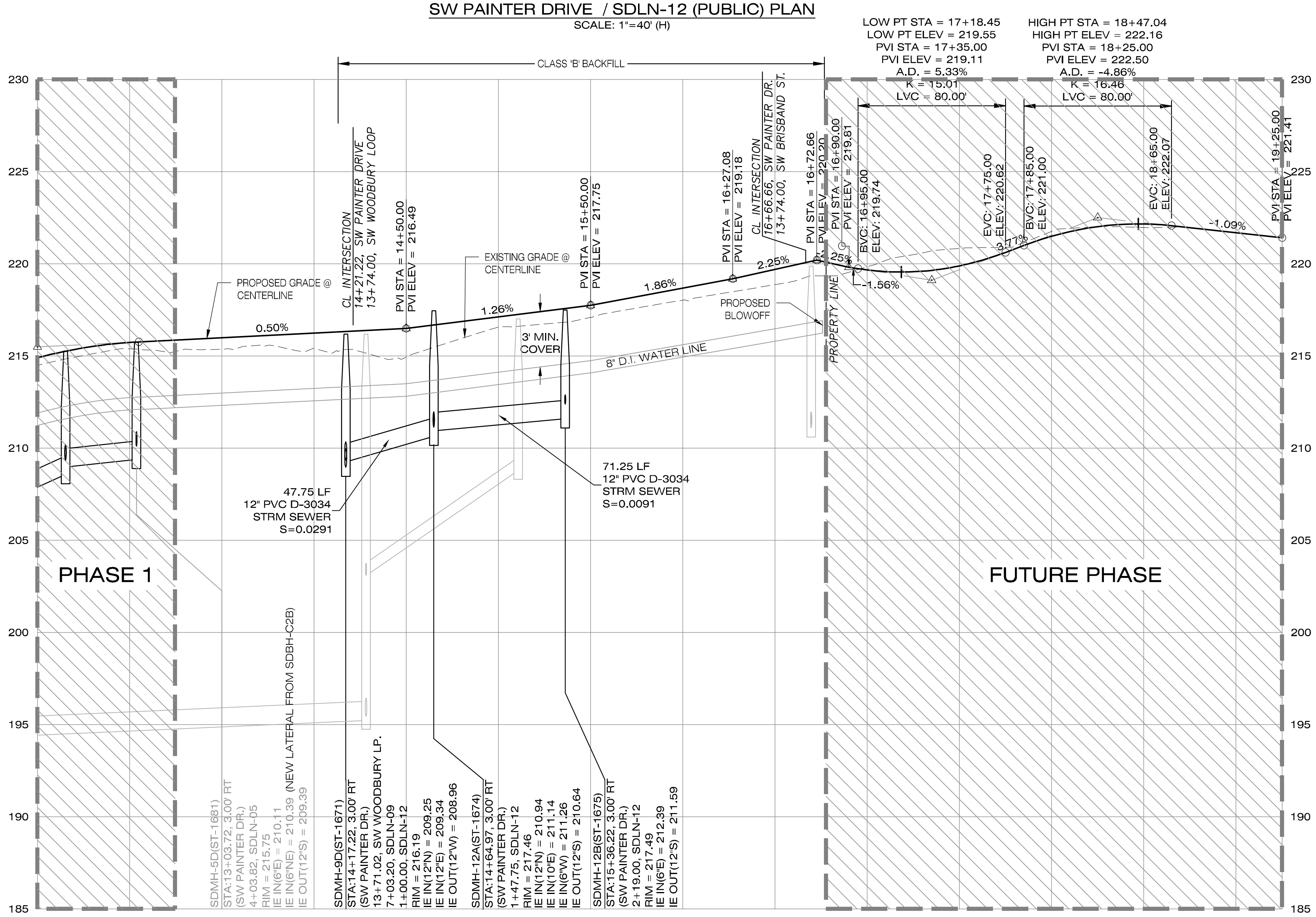
KEY MAP
NTS

LEGEND

- PROPOSED SIDEWALK WITH FACILITY PERMIT
- PROPOSED SIDEWALK (BY HOMEBUILDER)
- PROPOSED CONCRETE CURB AND GUTTER
- PROPOSED STORM LINE & MANHOLE
- PROPOSED SANITARY LINE & MANHOLE
- PROPOSED WATERLINE & VALVE
- PROPOSED PAVEMENT



SW PAINTER DRIVE / SDLN-12 (PUBLIC) PLAN
SCALE: 1"=40' (H)



SW PAINTER DRIVE / SDLN-12 (PUBLIC) PROFILE
SCALE: 1"=40' (H), 1"=4' (V)

STORM LATERAL DATA

LOT NO.	D.S. M.H.	DIST. FROM D.S. M.H.	LENGTH	INV. EL. @ MAINLINE	INV. EL. @ PLUG	SLOPE	DEPTH @ PLUG
46	LIDA	--	20.0'	216.27	216.47	0.0100	0.9'
59	LIDA	--	18.0'	216.81	216.99	0.0100	3.5'
66	LIDA	--	18.0'	215.37	215.55	0.0100	0.9'
67	LIDA	--	18.0'	216.40	216.58	0.0100	0.8'

NOTE: STORM LATERALS TO BE 6" DUCTILE IRON PIPE.

PUBLIC CATCH BASIN DATA

TAG	TYPE	STATION	TC ELEV	IE IN	IE OUT	SLOPE	PIPE
SDCI-12A1	CG-30	14+64.97 14.00' RT SW PAINTER	216.76		211.94	0.0649	12.37 LF 10" PVC C900

BEEHIVE LATERAL DATA

BEEHIVE NO.	D.S. M.H.	DIST. FROM D.S. M.H.	LENGTH	INV. EL. @ MAINLINE	INV. EL. @ BEEHIVE	SLOPE
C2B	5D	0.00'	23.2'	210.39	210.76	0.0159
C3	12A	0.00'	20.0'	211.26	212.12	0.0430
C4	12B	0.00'	14.0'	212.39	213.26	0.0621

CONSTRUCTION NOTES

ALL 6" STORM LATERALS THAT OUTFALL INTO STREET SIDE SWALES WILL BE DUCTILE IRON PIPE INSTALLED UNDER THE SIDEWALK AT S=0.0100 TO MAXIMIZE COVER AT THE END OF THE PIPE. SEE STORM LATERAL TO SWALE DETAIL ON SHEET C4.2.

STORM SEWER NOTES

UNLESS OTHERWISE NOTED, ALL LATERALS ARE TO BE 6" PVC (ASTM D3034) WITH A MINIMUM SLOPE OF 0.0100. LATERAL CONNECTIONS TO MAIN SEWER LINE TO BE MADE WITH MANUFACTURED TEES.

ALL 2"x 4" STORM SERVICE CONNECTION MARKERS TO BE COLOR CODED WHITE. CONTRACTOR TO NOTE LENGTH OF BOARD USED ON EACH MARKER.

BACKFILL NOTE: PIPES UNDER PAVED SURFACES REQUIRE GRANULAR BACKFILL. FOR PIPES OUTSIDE PAVEMENT, NATIVE BACKFILL IS PERMITTED, UNLESS OTHERWISE NOTED.

THE CONTRACTOR SHALL FIELD VERIFY THE SIZE, LOCATION & DEPTH OF EXISTING UTILITIES PRIOR TO CONSTRUCTION.

Z

GRAPHIC SCALE
40 0 20 40 80
(IN FEET)
1 inch = 40 ft.

WILSONVILLE APP. NO. DB18-0018 - DB18-0021

PIONEER DESIGN GROUP
CIVIL ENGINEERING • LAND USE PLANNING • LAND SURVEYING • LANDSCAPE ARCHITECTURE
9020 SW WASHINGTON SQUARE RD., SUITE 170 PORTLAND, OREGON 97223
p 503.643.8286 www.pd-grp.com

REGISTERED PROFESSIONAL ENGINEER 54627PE OREGON MAY 12, 2004 BRENT E. FITCH
VALID THROUGH 12-31-19

SW PAINTER DRIVE - SDLN-12 PLAN AND PROFILE

MORGAN FARM PHASE 2
CITY OF WILSONVILLE, OREGON

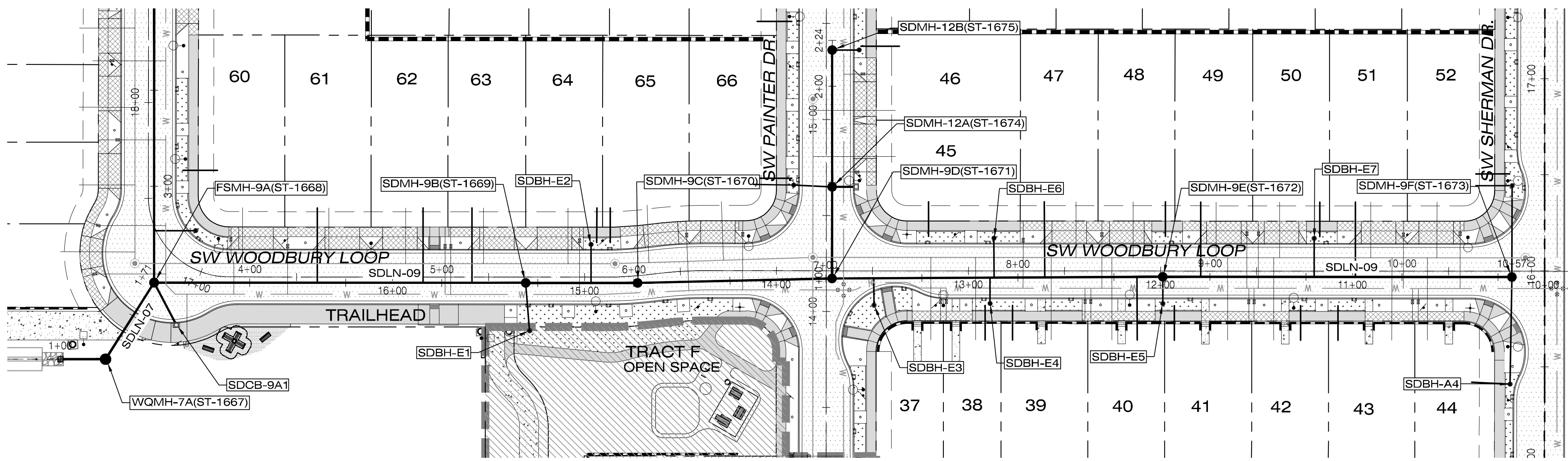
Designed by	TCC	Date 12/2018
Drawn by	TCC	Date 12/2018
Reviewed by	BEF	Date 12/2018
Project No.	321-002	REF.
Horiz. Scale: 1" = 40'		
Vert. Scale: 1" = 4'		
3381_C5-1STRT.dwg		

No. | Date | Revision | By

RECORD DRAWINGS
DATE 12/18/2019 THESE RECORD DRAWINGS HAVE BEEN PREPARED BASED ON FIELD OBSERVATION AND SURVEYED INFORMATION.

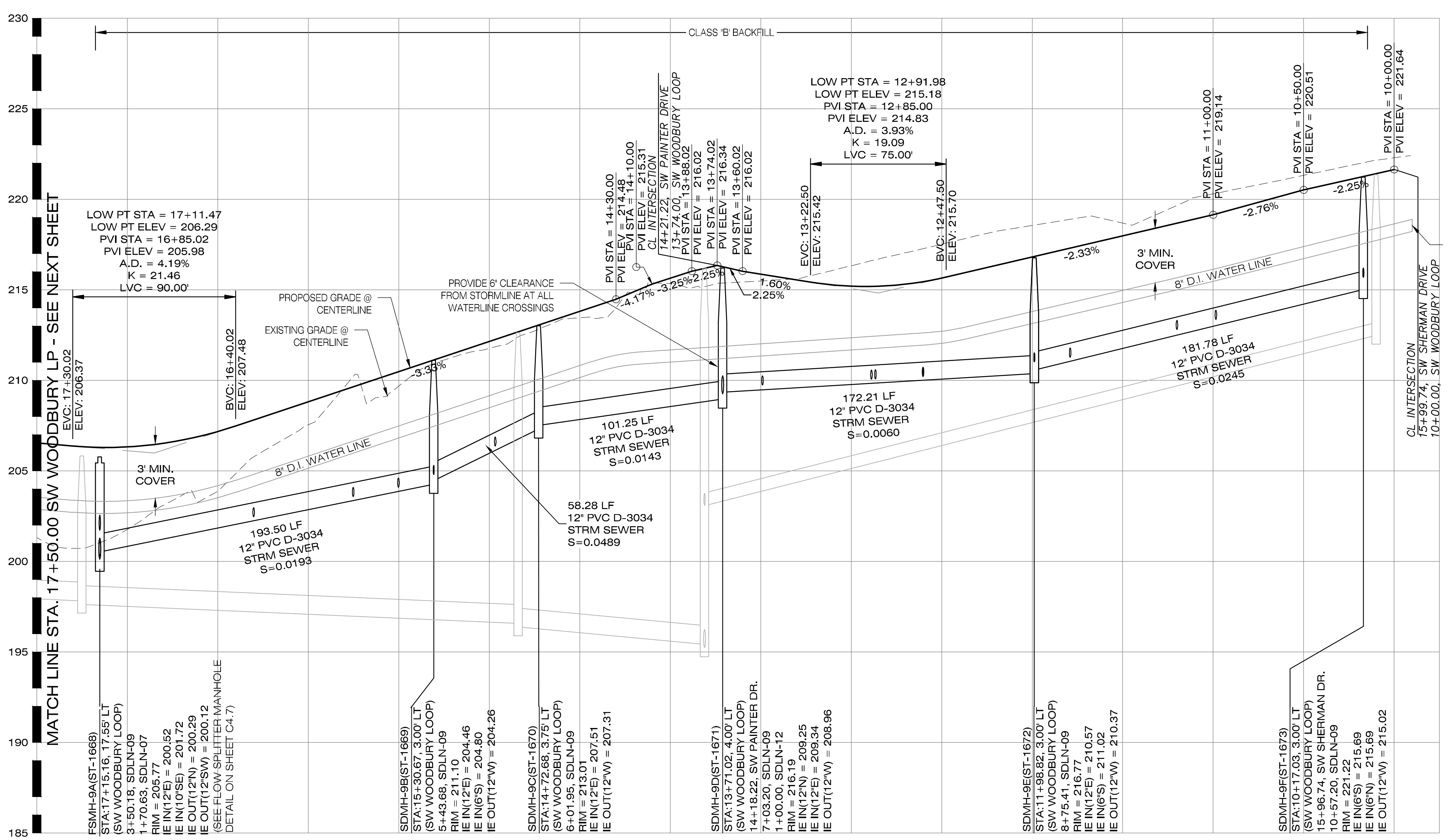
Project MORGAN FARM PH.2
No. 321-002
Type AS-BUILTS
Sheet C5.1

B:\Land Projects 2004\338-001\dwg\engineering\Phase 2\3381_C5-1STRT.dwg 12/18/2019 12:49:00 PM



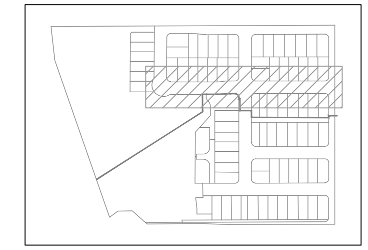
SW WOODBURY LOOP / SDLN-09 (PUBLIC) PLAN

SCALE: 1"=40' (H)



SW WOODBURY LOOP / SDLN-09 (PUBLIC) PROFILE

SCALE: 1"=40' (H), 1"=4' (V)



KEY MAP

NTS

LEGEND

- PROPOSED SIDEWALK WITH FACILITY PERMIT
- PROPOSED SIDEWALK (BY HOMEBUILDER)
- PROPOSED CONCRETE CURB AND GUTTER
- PROPOSED STORM LINE & MANHOLE
- PROPOSED SANITARY LINE & MANHOLE
- PROPOSED WATERLINE & VALVE
- PROPOSED PAVEMENT

STORM LATERAL DATA

LOT NO.	D.S. M.H.	DIST. FROM D.S. M.H.	LENGTH	INV. EL. @ MAINLINE	INV. EL. @ PLUG	SLOPE	DEPTH @ PLUG
38	LIDA	--	18.0'	214.06	214.24	0.0100	2.8'
39	LIDA	--	18.0'	214.05	214.23	0.0100	3.2'
40	9D	158.73'	32.9'	210.46	212.12	0.0503	5.0'
41	LIDA	--	18.0'	215.48	215.66	0.0100	3.1'
42	LIDA	--	18.0'	217.12	217.30	0.0100	2.9'
43	LIDA	--	18.0'	217.55	217.73	0.0100	2.9'
45	LIDA	--	18.0'	213.87	214.05	0.0100	1.1'
47	9D	110.73'	39.4'	210.16	210.92	0.0193	5.0'
48	LIDA	--	18.0'	215.43	215.61	0.0100	0.9'
49	9E	19.80'	39.0'	211.31	212.61	0.0333	5.0'
50	LIDA	--	18.0'	217.37	217.55	0.0100	0.9'
51	9E	100.30'	39.0'	213.28	214.48	0.0308	5.0'
61	9A	85.00'	39.0'	202.41	202.86	0.0114	5.0'
62	9A	140.00'	39.0'	203.47	204.69	0.0313	5.0'
63	9A	165.50'	39.0'	203.96	205.50	0.0395	5.0'
64	LIDA	--	18.0'	211.12	211.30	0.0100	1.1'
65	LIDA	--	18.0'	211.17	211.35	0.0100	1.1'

NOTE: STORM LATERALS TO BE 6" PVC D-3034

PUBLIC CATCH BASIN DATA

TAG	TYPE	STATION	TC ELEV	IE IN	IE OUT	SLOPE	PIPE
SDCB-9A1	CG-30	17+02.26 27.70' LT WOODBURY	205.54	--	202.54	0.0330	24.87 LF 10" PVC C900

BEEHIVE LATERAL DATA

BEEHIVE NO.	D.S. M.H.	DIST. FROM D.S. M.H.	LENGTH	INV. EL. @ MAINLINE	INV. EL. @ BEEHIVE	SLOPE
E1	9B	0.00'	25.1'	204.80	206.56	0.0702
E2	9B	34.00'	20.0'	206.37	208.05	0.0840
E3	9D	18.80'	14.1'	209.70	210.88	0.0839
E4	9D	82.21'	13.5'	210.08	210.75	0.0497
E5	9E	0.00'	14.0'	211.02	212.08	0.0757
E6	9D	84.41'	20.5'	210.10	210.66	0.0273
E7	9E	78.80'	20.0'	212.75	213.95	0.0600

CONSTRUCTION NOTES

ALL 6" STORM LATERALS THAT OUTFALL INTO STREET SIDE SWALES WILL BE DUCTILE IRON PIPE INSTALLED UNDER THE SIDEWALK AT S=0.0100 TO MAXIMIZE COVER AT THE END OF THE PIPE. SEE STORM LATERAL TO SWALE DETAIL ON SHEET C4.2.

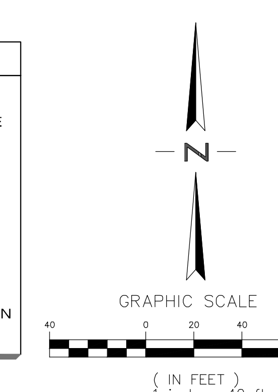
STORM SEWER NOTES

UNLESS OTHERWISE NOTED, ALL LATERALS ARE TO BE 6" PVC (ASTM D3034) WITH A MINIMUM SLOPE OF 0.0100. LATERAL CONNECTIONS TO MAIN SEWER LINE TO BE MADE WITH MANUFACTURED TEES.

ALL 2"x 4" STORM SERVICE CONNECTION MARKERS TO BE COLOR CODED WHITE. CONTRACTOR TO NOTE LENGTH OF BOARD USED ON EACH MARKER.

BACKFILL NOTE: PIPES UNDER PAVED SURFACES REQUIRE GRANULAR BACKFILL. FOR PIPES OUTSIDE PAVEMENT, NATIVE BACKFILL IS PERMITTED, UNLESS OTHERWISE NOTED.

THE CONTRACTOR SHALL FIELD VERIFY THE SIZE, LOCATION & DEPTH OF EXISTING UTILITIES PRIOR TO CONSTRUCTION.



WILSONVILLE APP. NO. DB18-0018 - DB18-0021

PIONEER DESIGN GROUP
CIVIL ENGINEERING • LAND USE PLANNING • LAND SURVEYING • LANDSCAPE ARCHITECTURE
9020 SW WASHINGTON SQUARE RD., SUITE 170 PORTLAND, OREGON 97223

VALID THROUGH 12-31-19

SW WOODBURY LOOP - SDLN-09 PLAN AND PROFILE

MORGAN FARM PHASE 2

CITY OF WILSONVILLE, OREGON

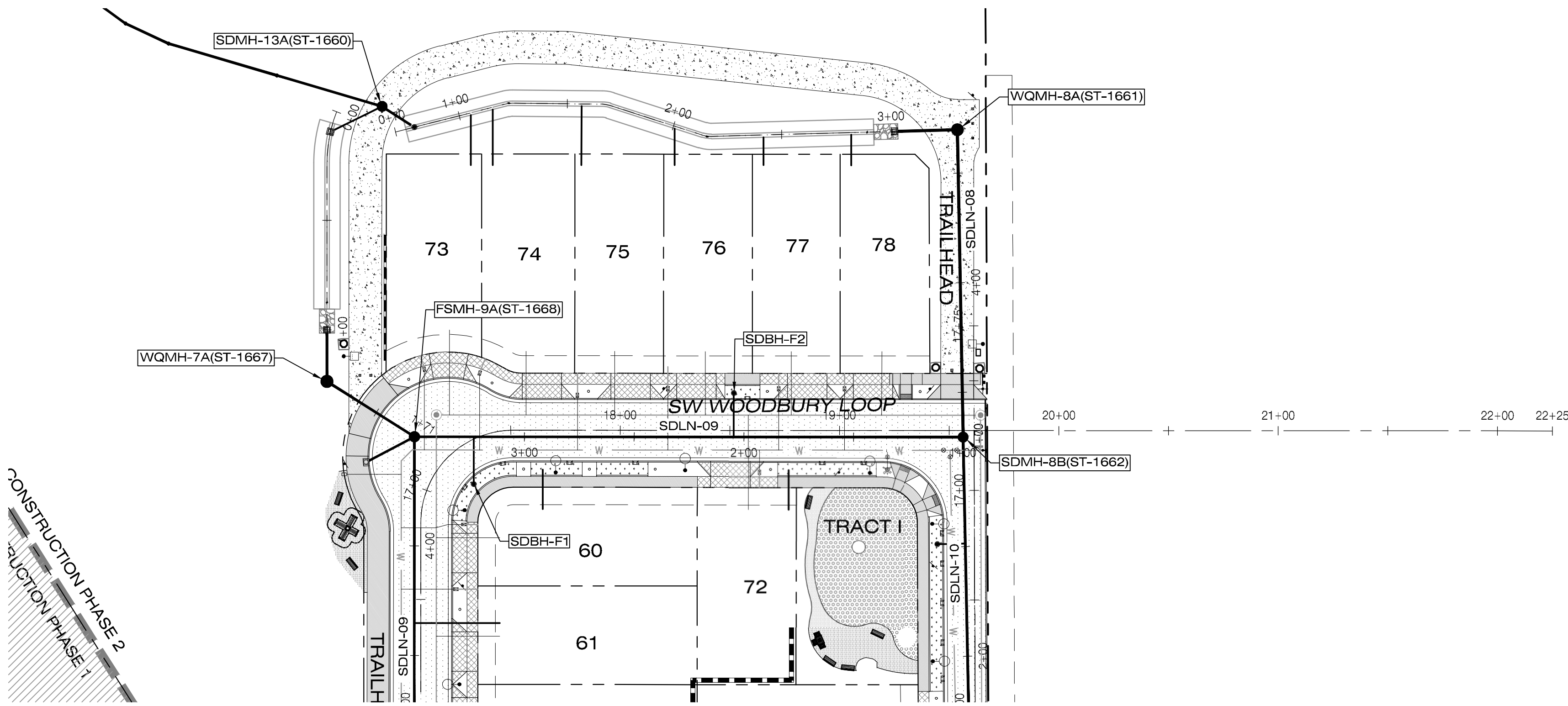
Designed by TCC Date 12/2018
Drawn by TCC Date 12/2018
Reviewed by BEF Date 12/2018
Project No. 321-002 REF.
Horiz. Scale: 1" = 40'
Vert. Scale: 1" = 4'
3381_C5-2STRT.dwg

No. | Date | Revision | By

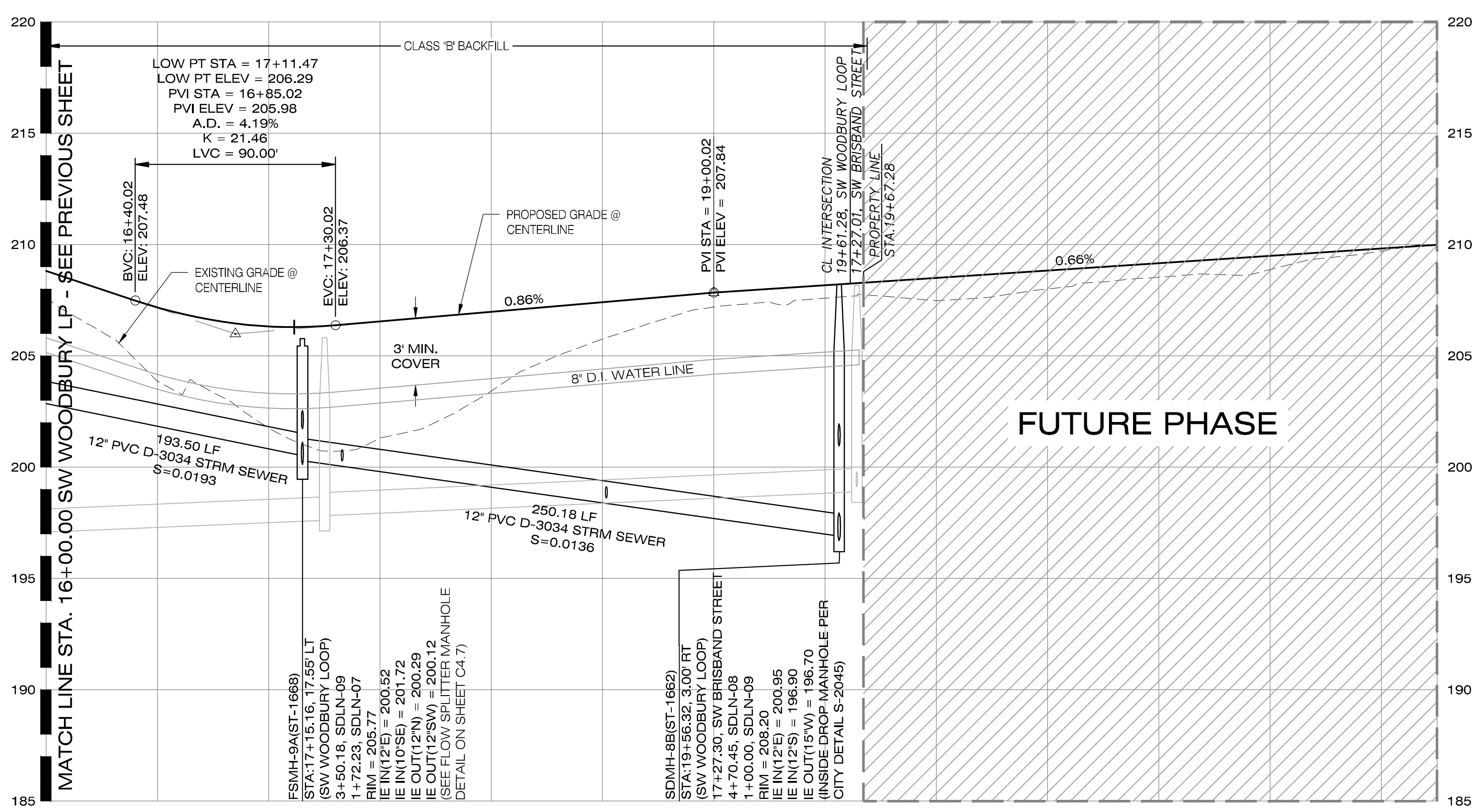
RECORD DRAWINGS
DATE 12/18/2019 THESE RECORD DRAWINGS HAVE BEEN PREPARED BASED ON FIELD OBSERVATION AND SURVEYED INFORMATION.

Project MORGAN FARM PH.2
No. 321-002
Type AS-BUILTS
Sheet C5.2

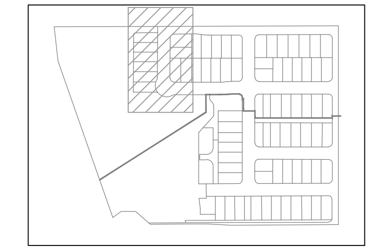
B:\Land Projects 2004\338-001\dwg\engineering\Phase 2\3381_C5-2STRT.dwg 12/18/2019 12:49:21 PM



SW WOODBURY LOOP / SDLN-09 (PUBLIC) PLAN
SCALE: 1"=40' (H)



SW WOODBURY LOOP / SDLN-09 (PUBLIC) PROFILE
SCALE: 1"=40' (H), 1"=4' (V)



KEY MAP
NTS

LEGEND

- PROPOSED SIDEWALK WITH FACILITY PERMIT
- PROPOSED SIDEWALK (BY HOMEBUILDER)
- PROPOSED CONCRETE CURB AND GUTTER
- PROPOSED STORM LINE & MANHOLE
- PROPOSED SANITARY LINE & MANHOLE
- PROPOSED WATERLINE & VALVE
- PROPOSED PAVEMENT

STORM LATERAL DATA

	LOT NO.	D.S. M.H.	DIST. FROM D.S. M.H.	LENGTH	INV. EL. @ MAINLINE	INV. EL. @ PLUG	SLOPE	DEPTH @ PLUG
1)	60	LIDA	--	18.0'	205.22	205.40	0.0100	0.90'
1)	72	LIDA	--	18.0'	206.31	206.49	0.0100	0.5'
	73	LIDA	--	22.8'	192.83	193.06	0.0100	3.4'
	74	LIDA	--	25.3'	193.00	193.25	0.0100	3.3'
	75	LIDA	--	26.9'	193.15	193.42	0.0100	3.9'
	76	LIDA	--	16.7'	193.75	193.92	0.0100	3.5'
	77	LIDA	--	12.8'	194.20	194.33	0.0100	3.5'
	78	LIDA	--	13.9'	194.54	194.68	0.0100	3.5'

1) STORM LATERAL TO BE 6" D.I.P.

BEEHIVE LATERAL DATA

BEEHIVE NO.	D.S. M.H.	DIST. FROM D.S. M.H.	LENGTH	INV. EL. @ MAINLINE	INV. EL. @ BEEHIVE	SLOPE
F1	8B	223.13'	21.6'	200.02	201.90	0.0870
F2	8B	104.59'	20.0'	198.50	202.32	0.1910

CONSTRUCTION NOTES

ALL 6" STORM LATERALS THAT OUTFALL INTO STREET SIDE SWALES WILL BE DUCTILE IRON PIPE INSTALLED UNDER THE SIDEWALK AT S=0.0100 TO MAXIMIZE COVER AT THE END OF THE PIPE. SEE STORM LATERAL TO SWALE DETAIL ON SHEET C4.2.

STORM SEWER NOTES

UNLESS OTHERWISE NOTED, ALL LATERALS ARE TO BE 6" PVC (ASTM D3034) WITH A MINIMUM SLOPE OF 0.0100. LATERAL CONNECTIONS TO MAIN SEWER LINE TO BE MADE WITH MANUFACTURED TEES.

ALL 2"x 4" STORM SERVICE CONNECTION MARKERS TO BE COLOR CODED WHITE. CONTRACTOR TO NOTE LENGTH OF BOARD USED ON EACH MARKER.

BACKFILL NOTE: PIPES UNDER PAVED SURFACES REQUIRE GRANULAR BACKFILL. FOR PIPES OUTSIDE PAVEMENT, NATIVE BACKFILL IS PERMITTED, UNLESS OTHERWISE NOTED.

THE CONTRACTOR SHALL FIELD VERIFY THE SIZE, LOCATION & DEPTH OF EXISTING UTILITIES PRIOR TO CONSTRUCTION.

N

GRAPHIC SCALE
40 0 20 40 80
(IN FEET)
1 inch = 40 ft.

WILSONVILLE APP. NO. DB18-0018 - DB18-0021

PIONEER DESIGN GROUP
CIVIL ENGINEERING • LAND USE PLANNING • LAND SURVEYING • LANDSCAPE ARCHITECTURE
9020 SW WASHINGTON SQUARE RD., SUITE 170 PORTLAND, OREGON 97223
p 503.643.8286
www.pd-grp.com

REGISTERED PROFESSIONAL ENGINEER 54627PE OREGON MAR. 12, 2004 BRENT E. FITCH
VALID THROUGH 12-31-19

SW WOODBURY LOOP - SDLN-09 PLAN AND PROFILE

MORGAN FARM PHASE 2
CITY OF WILSONVILLE, OREGON

Designed by	TCC	Date	12/2018
Drawn by	TCC	Date	12/2018
Reviewed by	BEF	Date	12/2018
Project No.	321-002	REF.	
Horiz. Scale:	1" = 40'		
Vert. Scale:	1" = 4'		

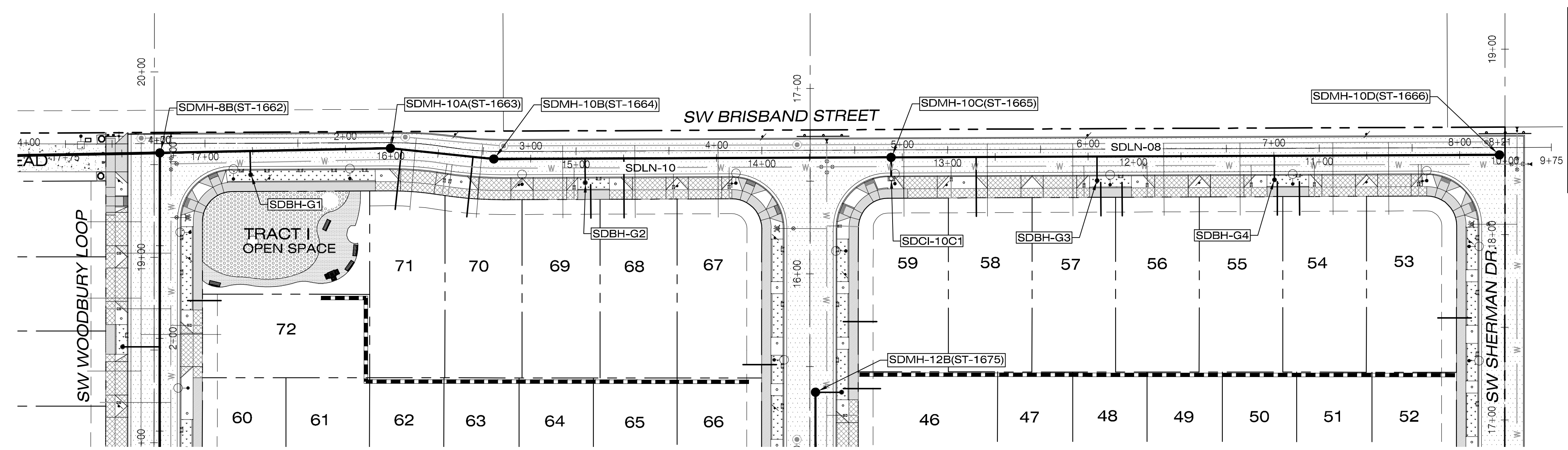
3381_C5-3STRT.dwg

No. | Date | Revision | By

RECORD DRAWINGS
DATE 12/18/2019 THESE RECORD DRAWINGS HAVE BEEN PREPARED BASED ON FIELD OBSERVATION AND SURVEYED INFORMATION.

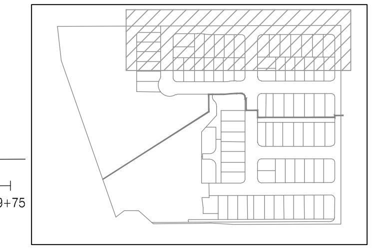
Project
MORGAN FARM PH.2
No.
321-002
Type
AS-BUILTS
Sheet
C5.3

B:\Land Projects 2004\338-001\dwg\engineering\Phase 2\3381_C5-3STRT.dwg 12/18/2019 12:49:39 PM



SW BRISBAND STREET / SDLN-10 (PUBLIC) PLAN

SCALE: 1"=40' (H)



LEGEND

- PROPOSED SIDEWALK WITH FACILITY PERMIT
- PROPOSED SIDEWALK (BY HOMEBUILDER)
- PROPOSED CONCRETE CURB AND GUTTER
- PROPOSED STORM LINE & MANHOLE
- PROPOSED SANITARY LINE & MANHOLE
- PROPOSED WATERLINE & VALVE
- PROPOSED PAVEMENT

STORM LATERAL DATA

	LOT NO.	D.S. M.H.	DIST. FROM D.S. M.H.	LENGTH	INV. EL. @ MAINLINE	INV. EL. @ PLUG	SLOPE	DEPTH @ PLUG
1)	54	LIDA	--	18.0'	222.37	222.55	0.0100	0.9'
1)	55	LIDA	--	18.0'	222.50	222.68	0.0100	0.9'
1)	56	LIDA	--	18.0'	221.94	222.12	0.0100	0.9'
1)	57	LIDA	--	18.0'	221.57	221.75	0.0100	0.9'
	58	10C	45.80'	32.0'	216.04	217.43	0.0434	5.0'
	68	10B	69.94'	32.0'	209.49	211.36	0.0584	5.0'
1)	69	LIDA	--	18.0'	213.75	213.93	0.0100	1.0'
	70	10A	44.71'	32.5'	205.93	207.08	0.0354	5.0'
	71	10A	6.00'	32.6'	204.12	205.07	0.0292	5.0'

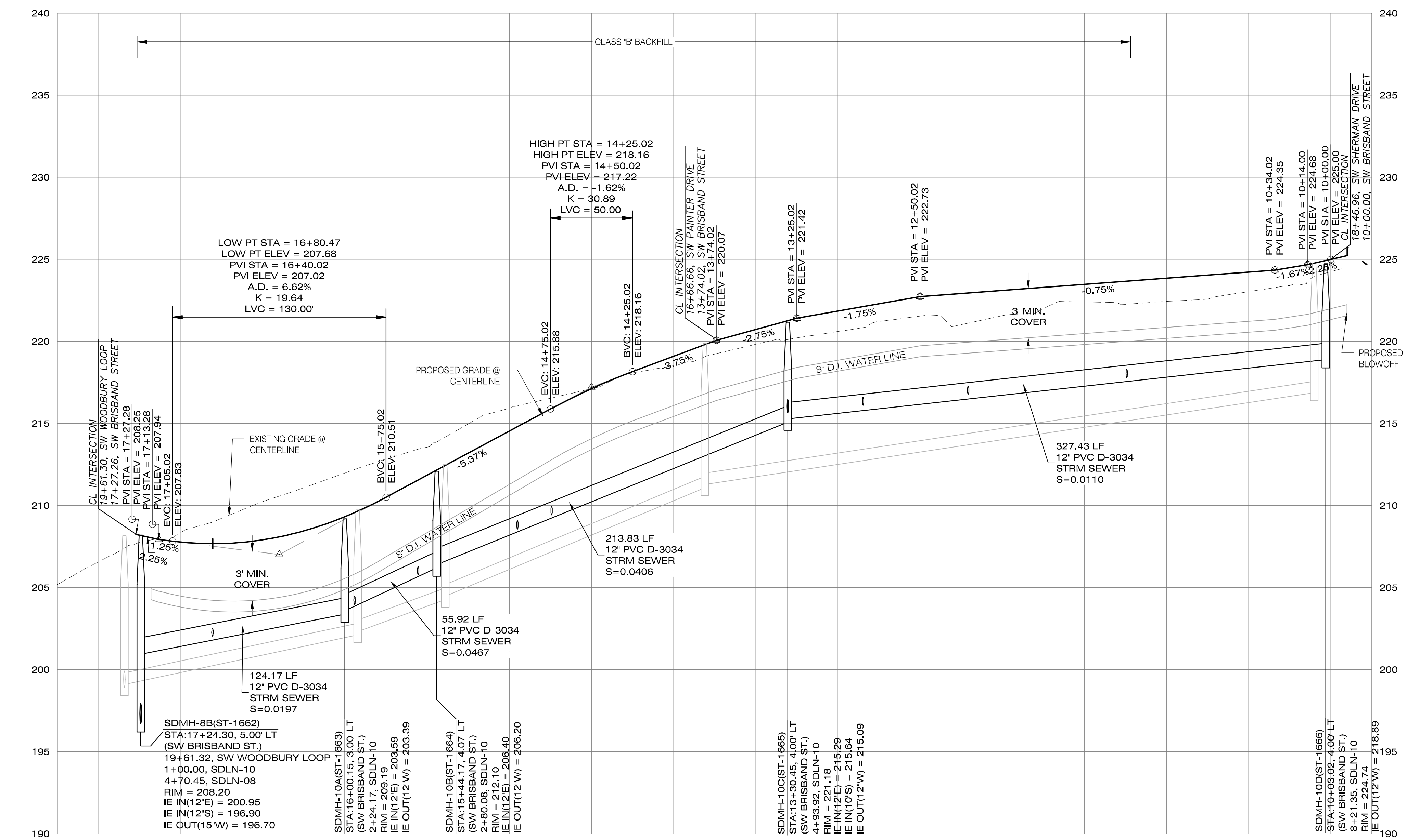
1) STORM LATERAL TO BE 6" DUCTILE IRON PIPE.

PUBLIC CATCH BASIN DATA

TAG	TYPE	STATION	TC ELEV	IE IN	IE OUT	SLOPE	PIPE
SDCI-10C1	CG-30	13+30.47 14.00' LT BRISBAND	221.30	--	216.40	0.0668	11.38 LF 10" PVC C900

BEEHIVE LATERAL DATA

BEEHIVE NO.	D.S. M.H.	DIST. FROM D.S. M.H.	LENGTH	INV. EL. @ MAINLINE	INV. EL. @ BEEHIVE	SLOPE
G1	8B	43.63'	12.8'	202.06	202.23	0.0133
G2	10B	49.13'	13.0'	208.64	210.38	0.1338
G3	10C	109.80'	13.0'	216.75	217.35	0.0462
G4	10C	206.30'	13.0'	217.80	218.42	0.0474



SW BRISBAND STREET / SDLN-10 (PUBLIC) PROFILE

SCALE: 1"=40' (H), 1"=4' (V)

CONSTRUCTION NOTES

ALL 6" STORM LATERALS THAT OUTFALL INTO STREET SIDE SWALES WILL BE DUCTILE IRON PIPE INSTALLED UNDER THE SIDEWALK AT S=0.0100 TO MAXIMIZE COVER AT THE END OF THE PIPE. SEE STORM LATERAL TO SWALE DETAIL ON SHEET C4.2.

STORM SEWER NOTES

UNLESS OTHERWISE NOTED, ALL LATERALS ARE TO BE 6" PVC (ASTM D3034) WITH A MINIMUM SLOPE OF 0.0100. LATERAL CONNECTIONS TO MAIN SEWER LINE TO BE MADE WITH MANUFACTURED TEES.

ALL 2"x 4" STORM SERVICE CONNECTION MARKERS TO BE COLOR CODED WHITE. CONTRACTOR TO NOTE LENGTH OF BOARD USED ON EACH MARKER.

BACKFILL NOTE: PIPES UNDER PAVED SURFACES REQUIRE GRANULAR BACKFILL. FOR PIPES OUTSIDE PAVEMENT, NATIVE BACKFILL IS PERMITTED, UNLESS OTHERWISE NOTED.

THE CONTRACTOR SHALL FIELD VERIFY THE SIZE, LOCATION & DEPTH OF EXISTING UTILITIES PRIOR TO CONSTRUCTION.

N

GRAPHIC SCALE

40 0 20 40 80

(IN FEET)
1 inch = 40 ft.

WILSONVILLE APP. NO. DB18-0018 - DB18-0021

PIONEER DESIGN GROUP
CIVIL ENGINEERING • LAND USE PLANNING • LAND SURVEYING • LANDSCAPE ARCHITECTURE
9020 SW WASHINGTON SQUARE RD., SUITE 170 PORTLAND, OREGON 97223
p 503.643.8286
www.pd-grp.com

REGISTERED PROFESSIONAL ENGINEER 54627PE OREGON MAR. 12, 2004 BRENT E. FITCH
VALID THROUGH 12-31-19

SW BRISBAND STREET - SDLN-10 PLAN AND PROFILE

MORGAN FARM PHASE 2
CITY OF WILSONVILLE, OREGON

Designed by	TCC	Date	12/2018
Drawn by	TCC	Date	12/2018
Reviewed by	BEF	Date	12/2018
Project No.	321-002	REF.	
Horiz. Scale:	1" = 40'		
Vert. Scale:	1" = 4'		

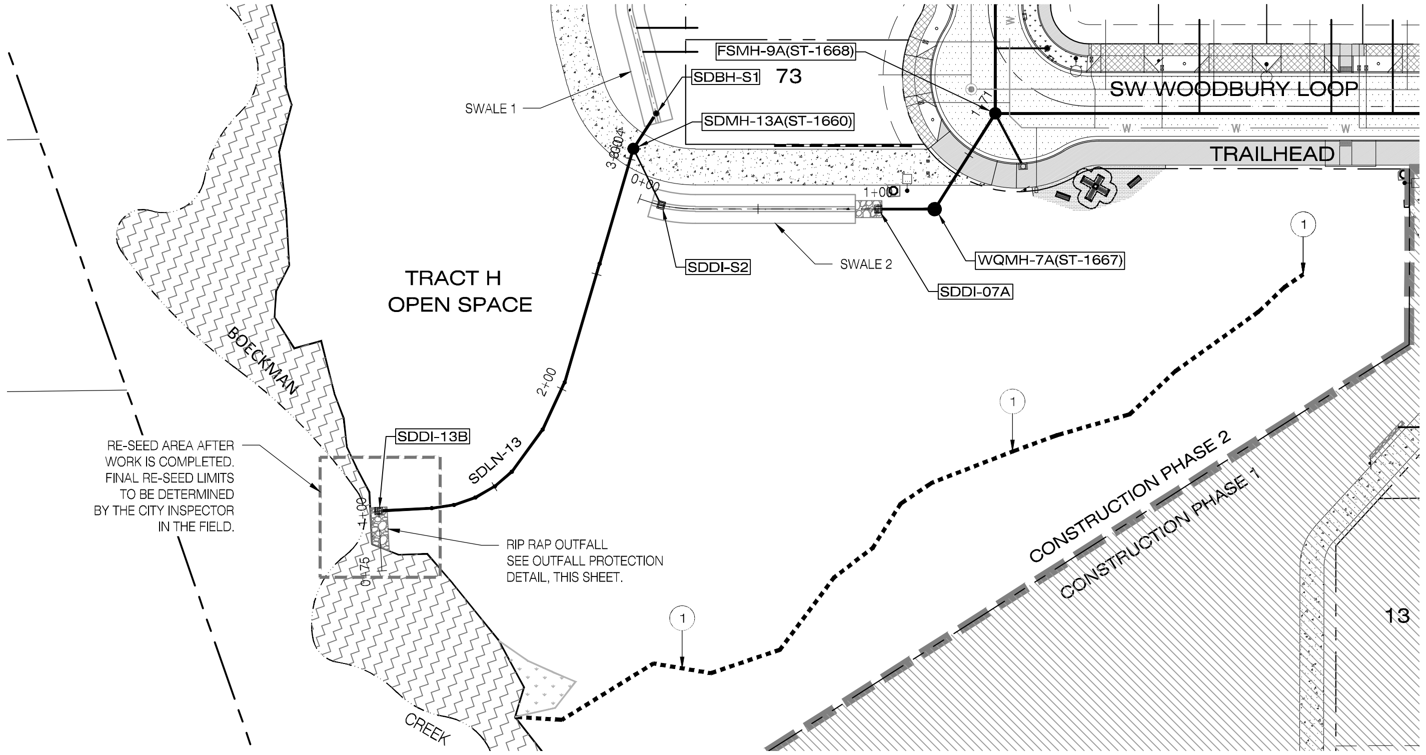
3381_C5-4STRT.dwg

No.	Date	Revision	By

RECORD DRAWINGS
DATE 12/18/2019 THESE RECORD DRAWINGS HAVE BEEN PREPARED BASED ON FIELD OBSERVATION AND SURVEYED INFORMATION.

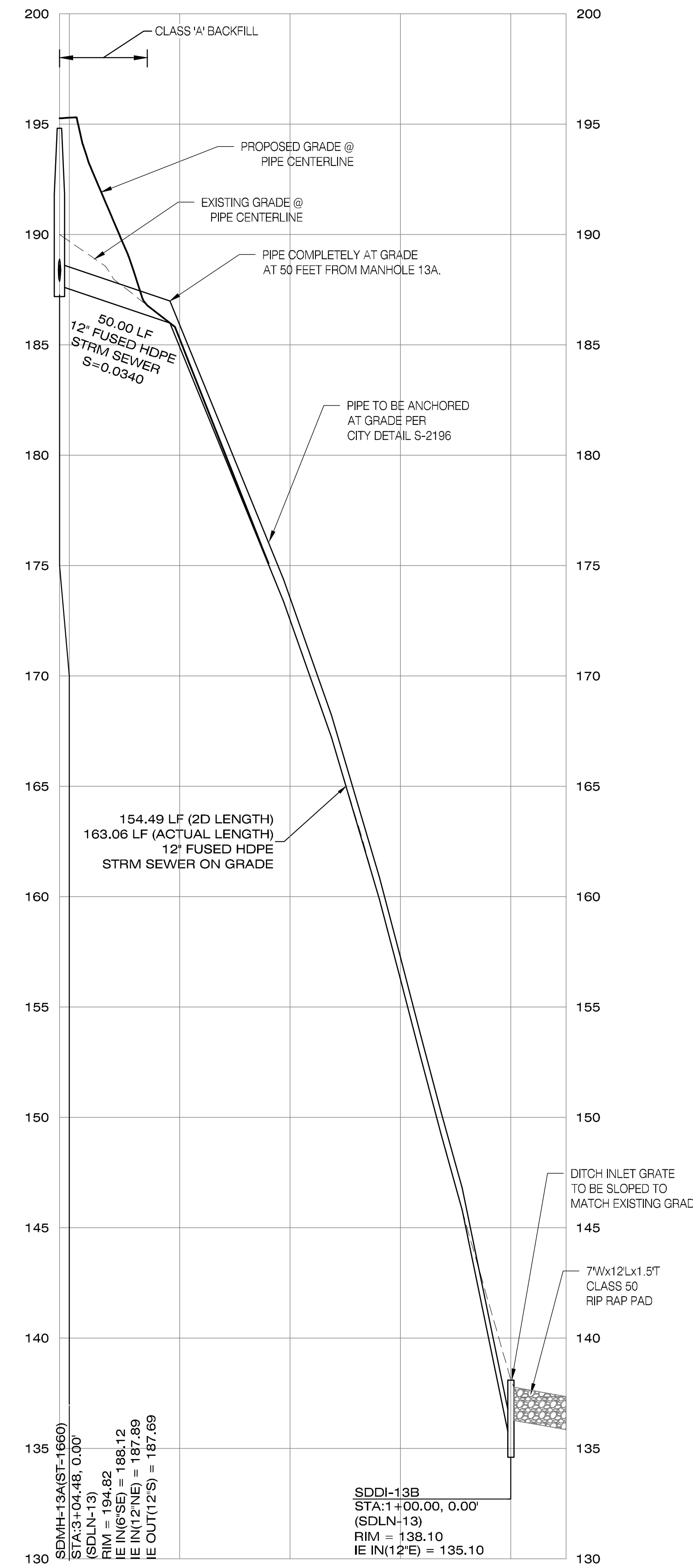
Project MORGAN FARM PH.2
No. 321-002
Type AS-BUILTS
Sheet C5.4

B:\Land Projects 2004\338-001\dwg\engineering\Phase 2\3381_C5-4STRT.dwg 12/18/2019 12:50:01 PM



SDLN-13 (PUBLIC) PLAN

SCALE: 1"=40' (H)

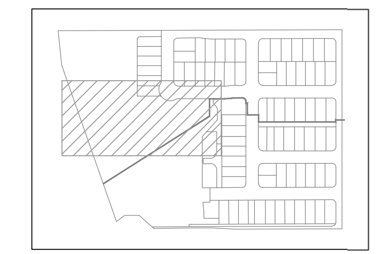


SDLN-13 (PUBLIC) PROFILE

SCALE: 1"=40' (H), 1"=4' (V)

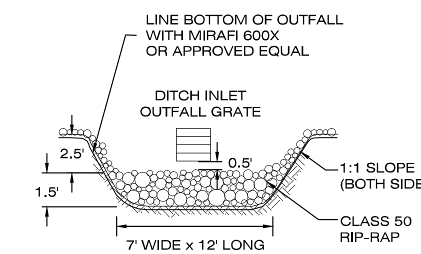
LEGEND

PROPOSED SIDEWALK WITH FACILITY PERMIT	
PROPOSED SIDEWALK (BY HOMEBUILDER)	
PROPOSED CONCRETE CURB AND GUTTER	
PROPOSED STORM LINE & MANHOLE	
PROPOSED SANITARY LINE & MANHOLE	
PROPOSED WATERLINE & VALVE	
PROPOSED PAVEMENT	



KEY MAP

NTS



DITCH INLET OUTFALL PROTECTION

N.T.S.

STORM SEWER NOTES

UNLESS OTHERWISE NOTED, ALL LATERALS ARE TO BE 6" PVC (ASTM D3034) WITH A MINIMUM SLOPE OF 0.0100. LATERAL CONNECTIONS TO MAIN SEWER LINE TO BE MADE WITH MANUFACTURED TEES.

ALL 2"x 4" STORM SERVICE CONNECTION MARKERS TO BE COLOR CODED WHITE. CONTRACTOR TO NOTE LENGTH OF BOARD USED ON EACH MARKER.

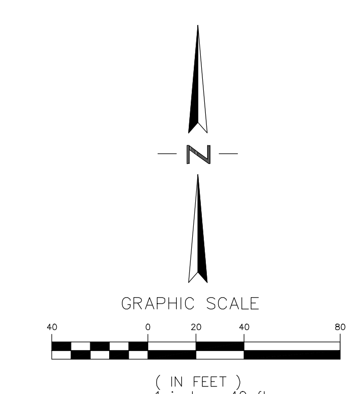
BACKFILL NOTE: PIPES UNDER PAVED SURFACES REQUIRE GRANULAR BACKFILL. FOR PIPES OUTSIDE PAVEMENT, NATIVE BACKFILL IS PERMITTED, UNLESS OTHERWISE NOTED.

THE CONTRACTOR SHALL FIELD VERIFY THE SIZE, LOCATION & DEPTH OF EXISTING UTILITIES PRIOR TO CONSTRUCTION.

CONSTRUCTION NOTES

1. STREAM STABILIZATION USING BEAVER DAM ANALOGS TO BE COMPLETED ALONG THE EXISTING DRAINAGEWAY. REFER TO APPROVED REPORT AND DESIGN PLANS FROM WOLFE WATER RESOURCES INC. DATED JULY 2018. THIS WORK WILL BE COMPLETED BY OTHERS AND IS NOTED FOR REFERENCE ONLY.

CONTRACTOR TO VERIFY FINAL LOCATION OF FUSED HDPE PIPE IN THE FIELD PRIOR TO INSTALLATION. SHOULD THE LOCATION OF PIPE NEED TO CHANGE, CONTACT THE ENGINEER IMMEDIATELY .



WILSONVILLE APP. NO. DB18-0018 - DB18-0021

PIONEER DESIGN GROUP
CIVIL ENGINEERING • LAND USE PLANNING • LAND SURVEYING • LANDSCAPE ARCHITECTURE
9020 SW WASHINGTON SQUARE RD., SUITE 170 PORTLAND, OREGON 97223
p 503.643.8286
www.pd-grp.com

REGISTERED PROFESSIONAL ENGINEER 54627PE OREGON MAR. 12, 2002 BRENT E. FITCH
VALID THROUGH 12-31-19

SDLN-13 PLAN AND PROFILE

MORGAN FARM PHASE 2
CITY OF WILSONVILLE, OREGON

Designed by	TCC	Date	12/2018
Drawn by	TCC	Date	12/2018
Reviewed by	BEF	Date	12/2018
Project No.	321-002	REF.	
Horiz. Scale:	1" = 40'		
Vert. Scale:	1" = 4'		

3381_C5-5STRM.dwg

No.	Date	Revision	By

RECORD DRAWINGS
DATE 12/18/2019 THESE RECORD DRAWINGS HAVE BEEN PREPARED BASED ON FIELD OBSERVATION AND SURVEYED INFORMATION.

Project: MORGAN FARM PH.2
No.: 321-002
Type: AS-BUILTS
Sheet: **C5.5**

PIONEER DESIGN GROUP

STORMWATER CONVEYANCE CALCULATIONS

JOB NUMBER: 321-002
PROJECT: Morgan Farm Ph. 2

FILE: 3212_FINAL hydro
Design Storm: 25 YR
Storm Duration: 24 HRS
Precipitation: 4 IN
Manning's "n" 0.013

LINE	INC. AREA (AC)	AREA TOTAL (AC)	% IMP.	AREA PERV. (AC)	CN PER.	AREA IMP. (AC)	CN IMP.	TIME (MIN)	Q (CFS)	PIPE SIZE (IN)	SLOPE (FT/FT)	Qf (CFS)	Q/Qf (%)	Vf (FPS)	V/Vf (%)	ACTUAL V (FPS)	LENGTH (FT)	INC. TIME (MIN)
NORTH BASIN																		
SDLN-12																		
SDMH 12B TO 12A	0.26	0.26	64.3	0.09	74	0.17	98	5.00	0.21	12	0.0098	3.54	5.89%	4.50	0.26	1.17	71.25	1.02
SDMH 12A TO 9D	0.36	0.62	64.3	0.22	74	0.40	98	6.02	0.48	12	0.0246	5.60	8.50%	7.13	0.29	2.03	46.75	0.38
SDLN-9																		
SDMH 9F TO 9E	0.90	0.90	64.3	0.32	74	0.58	98	5.00	0.72	12	0.0259	5.75	12.54%	7.32	0.33	2.38	181.78	1.27
SDMH 9E TO 9D	1.24	2.14	64.3	0.76	74	1.38	98	6.27	1.63	12	0.0050	2.53	64.46%	3.22	0.84	2.72	172.20	1.06
SDMH 9D TO 9C	0.00	2.76	64.3	0.99	74	1.77	98	7.33	2.06	12	0.0206	5.13	40.25%	6.53	0.60	3.93	101.28	0.43
SDMH 9C TO 9B	0.27	3.03	64.3	1.08	74	1.95	98	7.76	2.26	12	0.0170	4.66	48.45%	5.93	0.68	4.06	58.28	0.24
SDMH 9B TO 9A	0.70	3.73	64.3	1.33	74	2.40	98	8.00	2.77 ↓ Q into Flow Splitter Manhole	12	0.0222	5.32	52.06%	6.78	0.72	4.88	192.50	0.66
SDLN-7																		
SDMH 9A TO 7A	0.00	0.57 ↓ Area diverted to small swale	64.3	0.20	74	0.37	98	8.65	0.42	12	0.0050	2.53	16.64%	3.22	0.37	1.18	47.23	0.67
SDMH 7A TO SMALL SWALE	0.00	0.57	64.3	0.20	74	0.37	98	9.32	0.42 ↓ Q into WQ Manhole 7A	12	0.0050	2.53	16.49%	3.22	0.36	1.17 8.0'L x 7.0'W x 1.5'D CL 50 Riprap Pad	25.00	0.35
SDLN-9 (cont.)																		
SDMH 9A TO 8B	0.78	3.94 ↓ Area after diversion	64.3	1.41	74	2.53	98	8.65	2.90	12	0.0132	4.10	70.78%	5.23	0.91	4.74	252.18	0.89

SDLN-10																		
SDMH 10E TO 10D	0.63	0.63	64.3	0.22	74	0.41	98	5.00	0.50	12	0.0107	3.70	13.66%	4.70	0.34	1.58	206.30	2.17
SDMH 10D TO 10C	0.09	0.72	64.3	0.26	74	0.46	98	7.17	0.54	12	0.0359	6.77	7.96%	8.62	0.28	2.41	143.89	1.00
SDMH 10C TO 10B	0.25	0.97	64.3	0.35	74	0.62	98	8.17	0.72	12	0.0508	8.05	8.93%	10.25	0.29	2.97	69.94	0.39
SDMH 10B TO 10A	0.09	1.06	64.3	0.38	74	0.68	98	8.56	0.78	12	0.0473	7.77	10.07%	9.89	0.30	2.97	47.19	0.26
SDMH 10A TO 8B	0.38	1.44	64.3	0.51	74	0.93	98	8.82	1.06	12	0.0187	4.89	21.69%	6.22	0.42	2.59	132.92	0.85
SDLN-8																		
SDMH 8B TO 8A	0.00	5.38	64.3	1.92	74	3.46	98	9.68	3.91	15	0.0118	7.04	55.62%	5.73	0.76	4.34	140.32	0.54
									↓ Q into WQ Manhole 8A									
SDMH 8A TO LARGE SWALE	0.00	5.38	64.3	1.92	74	3.46	98	10.22	3.88	15	0.0050	4.58	84.78%	3.73	1.05	3.91	30.19	0.13
																8.0'L x 7.25'W x 1.5'D CL 50 Riprap Pad		
SDLN-13																		
SDBH S1 TO SDMH 13A	0.56	5.94	64.3	2.12	74	3.82	98	5.00	4.76	12	0.0371	6.88	69.16%	8.76	0.89	7.81	17.50	0.04
SDBH S2 TO SDMH 13A	0.00	0.57	64.3	0.20	74	0.37	98	5.00	0.46	6	0.1114	1.88	24.32%	9.56	0.44	4.24	26.21	0.10
SDMH 13A TO OUTFALL	0.00	6.51	64.3	2.32	74	4.19	98	5.00	5.22	12	0.0356	6.74	77.38%	8.58	0.97	8.36	204.54	0.41
											↓ (slope used for pipe sizing)							
SDMH 13A TO OUTFALL	0.00	6.51	64.3	2.32	74	4.19	98	5.00	5.22	12	0.4836	24.84	20.99%	31.63	0.41	12.97	204.54	0.26
											↓ (slope used for velocity calculations)					Ditch Inlet Energy Dissipater used with 12.0'L x 7.0'W x 1.5'D CL 50 Riprap Pad		

OPERATIONS & MAINTENANCE *DRAFT*

Stormwater Planters
Operations & Maintenance Plan

What to Look For	What to Do
Structural Components, including inlets and outlets/overflows, shall freely convey stormwater.	
Clogged inlets or outlets	-Remove sediment and debris from catch basins, trench drains and curb inlets and pipes to maintain at least 50% conveyance capacity at all times.
Cracked Drain Pipes	-Repair/seal cracks. Replace when repair is insufficient.
Check Dams	-Maintain 4 to 10 inch deep rock check dams at design intervals.
Vegetation	
Dead or strained vegetation	-Replant per original planting plan, or substitute from Appendix A. -Irrigate as needed. Mulch banks annually. DO NOT apply fertilizers, herbicides, or pesticides.
Tall Grass and Vegetation	-Cut back grass and prune overgrowth 1-2 times per year. Remove cuttings
Weeds	-Manually remove weeds. Remove all plant debris.
Growing/Filter Medium, including soil and gravels, shall sustain healthy plant cover and infiltrate within 72 hours.	
Gullies	-Fill, lightly compact, and plant vegetation to disperse flow.
Erosion	-Replace splash blocks or inlet gravel/rock.
Slope Slippage	-Stabilize 3:1 slopes/banks with plantings from Appendix A
Ponding	-Rake, till, or amend to restore infiltration rate.

Annual Maintenance Schedule:

Summer. Make any structural repairs. Improve filter medium as needed. Clear drain. Irrigate as needed.
Fall. Replant exposed soil and replace dead plants. Remove sediment and plant debris.
Winter. Monitor infiltration/flow-through rates. Clear inlets and outlets/overflows to maintain conveyance.
Spring. Remove sediment and plant debris. Replant exposed soil and replace dead plants. Mulch.
All seasons. Weed as necessary.
Maintenance Records: Record date, description, and contractor (if applicable) for all structural repairs, landscape maintenance, and facility cleanout activities. Keep work orders and invoices on file and make available upon request of the inspector.
Access: Maintain ingress/egress to design standards.
Infiltration/Flow Control: All facilities shall drain within 72 hours. Record time/date, weather, and site conditions when ponding occurs.
Pollution Prevention: All sites shall implement best management practices to prevent hazardous or solid wastes or excessive oil and sediment from contaminating stormwater. Contact ___________ for immediate assistance responding to spills. Record time/date, weather, and site conditions if site activities contaminate stormwater.
Vectors (Mosquitoes & Rodents): Stormwater facilities shall not harbor mosquito larvae or rats that pose a threat to public health or that undermine the facility structure. Monitor standing water for small wiggling sticks perpendicular to the water's surface. Note holes/burrows in and around facilities. Call Clackamas County Vector Control for immediate assistance to eradicate vectors. Record time/date, weather, and site conditions when vector activity observed.

Stormwater Planter O & M Plan			CITY OF WILSONVILLE PUBLIC WORKS STANDARDS
DRAWING NUMBER: ST-6015	DRAWN BY: SR	SCALE: N.T.S.	
FILE NAME: ST-6015.DWG	APPROVED BY: NK	DATE: 10/8/14	

Rain Gardens
Operations & Maintenance Plan

What to Look For	What to Do
Structural Components, including inlets and outlets/overflows, shall freely convey stormwater.	
Clogged inlets or outlets	-Remove sediment and debris from catch basins, trench drains and curb inlets and pipes to maintain at least 50% conveyance capacity at all times.
Cracked Drain Pipes	-Repair/seal cracks. Replace when repair is insufficient.
Check Dams	-Maintain 4 to 10 inch deep rock check dams at design intervals.
Vegetation	
Dead or strained vegetation	-Replant per original planting plan, or substitute from Appendix A. -Irrigate as needed. Mulch banks annually. DO NOT apply fertilizers, herbicides, or pesticides.
Tall Grass and Vegetation	-Cut back grass and prune overgrowth 1-2 times per year. Remove cuttings
Weeds	-Manually remove weeds. Remove all plant debris.
Growing/Filter Medium, including soil and gravels, shall sustain healthy plant cover and infiltrate within 72 hours.	
Gullies	-Fill, lightly compact, and plant vegetation to disperse flow.
Erosion	-Replace splash blocks or inlet gravel/rock.
Slope Slippage	-Stabilize 3:1 slopes/banks with plantings from Appendix A
Ponding	-Rake, till, or amend to restore infiltration rate.

Annual Maintenance Schedule:

Summer. Make any structural repairs. Improve filter medium as needed. Clear drain. Irrigate as needed.
Fall. Replant exposed soil and replace dead plants. Remove sediment and plant debris.
Winter. Monitor infiltration/flow-through rates. Clear inlets and outlets/overflows to maintain conveyance.
Spring. Remove sediment and plant debris. Replant exposed soil and replace dead plants. Mulch.
All seasons. Weed as necessary.
Maintenance Records: Record date, description, and contractor (if applicable) for all structural repairs, landscape maintenance, and facility cleanout activities. Keep work orders and invoices on file and make available upon request of the inspector.
Access: Maintain ingress/egress to design standards.
Infiltration/Flow Control: All facilities shall drain within 72 hours. Record time/date, weather, and site conditions when ponding occurs.
Pollution Prevention: All sites shall implement best management practices to prevent hazardous or solid wastes or excessive oil and sediment from contaminating stormwater. Contact ___________ for immediate assistance responding to spills. Record time/date, weather, and site conditions if site activities contaminate stormwater.
Vectors (Mosquitoes & Rodents): Stormwater facilities shall not harbor mosquito larvae or rats that pose a threat to public health or that undermine the facility structure. Monitor standing water for small wiggling sticks perpendicular to the water's surface. Note holes/burrows in and around facilities. Call Clackamas County Vector Control for immediate assistance to eradicate vectors. Record time/date, weather, and site conditions when vector activity observed.

Rain Garden O & M Plan			CITY OF WILSONVILLE PUBLIC WORKS STANDARDS
DRAWING NUMBER: ST-6030	DRAWN BY: SR	SCALE: N.T.S.	
FILE NAME: ST-6030.DWG	APPROVED BY: NK	DATE: 10/15/14	

Vegetated Swales
Operations & Maintenance Plan

What to Look For	What to Do
Structural Components, including inlets and outlets/overflows, shall freely convey stormwater.	
Clogged inlets or outlets	-Remove sediment and debris from catch basins, trench drains, curb inlets and pipes to maintain at least 50% conveyance capacity at all times.
Cracked Drain Pipes	-Replace/seal cracks. Replace when repair is insufficient.
Check Dams	-Maintain 4 - 10 inch deep rock check dams at design intervals.
Vegetation	
Dead or strained vegetation	-Replant per original planting plan, or substitute from Appendix A. -Irrigate as needed. Mulch banks annually. DO NOT apply fertilizers, herbicides, or pesticides.
Tall Grass and Vegetation	-Cut back to 4-6 inches, 1-2 times per year. Remove cuttings
Weeds	-Manually remove weeds. Remove all plant debris.
Growing/Filter Medium, including soil and gravels, shall sustain healthy plant cover and infiltrate within 72 hours.	
Gullies	-Fill, lightly compact, and plant vegetation to disperse flow.
Erosion	-Restore or create outfalls, checkdams, or splash blocks where necessary.
Slope Sippage	-Stabilize Slope.
Ponding	-Rake, till, or amend to restore infiltration rate.

Annual Maintenance Schedule:

Summer. Make any structural repairs. Improve filter medium as needed. Clear drain. Irrigate as needed.
Fall. Replant exposed soil and replace dead plants. Remove sediment and plant debris.
Winter. Monitor infiltration/flow-through rates. Clear inlets and outlets/overflows to maintain conveyance.
Spring. Remove sediment and plant debris. Replant exposed soil and replace dead plants. Mulch.
All seasons. Weed as necessary.
Maintenance Records: Record date, description, and contractor (if applicable) for all structural repairs, landscape maintenance, and facility cleanout activities. Keep work orders and invoices on file and make available upon request of the inspector.
Access: Maintain ingress/egress to design standards.
Infiltration/Flow Control: All facilities shall drain within 72 hours. Record time/date, weather, and site conditions when ponding occurs.
Pollution Prevention: All sites shall implement best management practices to prevent hazardous or solid wastes or excessive oil and sediment from contaminating stormwater. Contact ___________ for immediate assistance responding to spills. Record time/date, weather, and site conditions if site activities contaminate stormwater.
Vectors (Mosquitoes & Rodents): Stormwater facilities shall not harbor mosquito larvae or rats that pose a threat to public health or that undermine the facility structure. Monitor standing water for small wiggling sticks perpendicular to the water's surface. Note holes/burrows in and around facilities. Call Clackamas County Vector Control for immediate assistance to eradicate vectors. Record time/date, weather, and site conditions when vector activity observed.

This Detail Drawing may not be altered or changed in any manner except by the City Engineer. It is the responsibility of the user to acquire the most current version.

Detention Pond
Operations & Maintenance Plan

Detention Pond removes pollutants through several processes: sedimentation, filtration, and biological processes. The facility owner must keep a log, recording all inspection dates, observations, and maintenance activities. The following items shall be inspected and maintained as stated:

What to Look For	What to Do
Structural Components, including inlets and outlets/overflows, shall freely convey stormwater.	
Clogged inlets or outlets	-Remove sediment and debris from catch basins, trench drains, curb inlets and pipes to maintain at least 50% conveyance capacity at all times.
Cracked Drain Pipes	-Repair/seal cracks. Replace when repair is insufficient.
Check Dams	-Maintain 4 - 10 inch deep rock check dams at design intervals.
Vegetation shall cover 90% of the facility.	
Dead or strained vegetation	-Replant per original planting plan, or substitute from Appendix A. -Irrigate as needed. Mulch banks annually. DO NOT apply fertilizers, herbicides, or pesticides.
Tall Grass and Vegetation	-Cut back grass and prune overgrowth 1-2 times per year. Remove cuttings.
Weeds	-Manually remove weeds. Remove all plant debris.
Growing/Filter Medium, including soil and gravels, shall sustain healthy plant cover and infiltrate within 72 hours.	
Gullies	-Fill, lightly compact, and plant vegetation to disperse flow.
Erosion	-Replace splash blocks or inlet gravel/rock.
Slope Sippage	-Stabilize 3:1 Slopes/banks with plantings from Appendix A
Ponding	-Rake, till, or amend to restore infiltration rate.

Annual Maintenance Schedule:

All facility components, vegetation, and source controls shall be inspected for proper operations and structural stability. These inspections shall occur, at a minimum, quarterly for the first 2 years from the date of installation, and 2 times per year thereafter, and within 48 hours after each major storm event.

Access: Maintain ingress/egress to design standards.

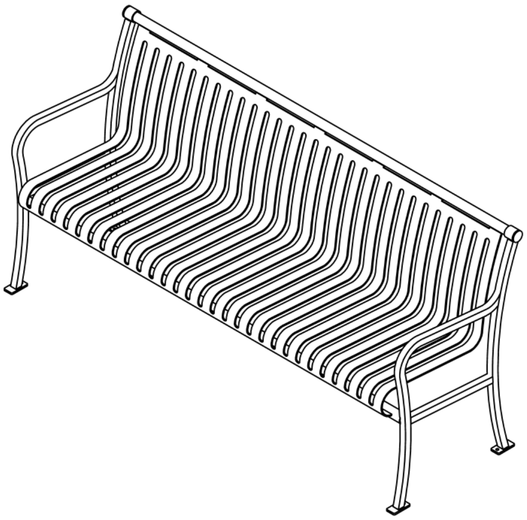
Infiltration/Flow Control: All facilities shall drain within 72 hours. Record time/date, weather, and site conditions when ponding occurs.

Pollution Prevention: All sites shall implement best management practices to prevent hazardous or solid wastes or excessive oil and sediment from contaminating stormwater. Contact ___________ for immediate assistance responding to spills. Record time/date, weather, and site conditions if site activities contaminate stormwater.

Vectors (Mosquitoes & Rodents): Stormwater facilities shall not harbor mosquito larvae or rats that pose a threat to public health or that undermine the facility structure. Monitor standing water for small wiggling sticks perpendicular to the water's surface. Note holes/burrows in and around facilities. Call Clackamas County Vector Control for immediate assistance to eradicate vectors. Record time/date, weather, and site conditions when vector activity observed.

Site Bench

Willamette Bench by Huntco
https://huntco.com/willamette-bench
Color: TBD



Site Picnic Tables

Supplier: Wabash Valley
Products:
Signature Series
- (2) 6’ picnic table, multi-pedestal, inground
- (1) 8’ picnic table, multi-pedestal, inground, ADA accessible
Seat type: perforated
Color: TBD
https://www.wabashvalley.com/product/picnic-table-multi-pedestal-signature-series-inground/

Play Equipment

Manufacturer: Playworld and Landscape Structures
All Colors TBD

Equipment, Cubes

Equipment, Dome
https://playworld.com/products/unity-dome#gref

Equipment, Spinner
https://playworld.com/products/accessible-whirl

Equipment, Ramped

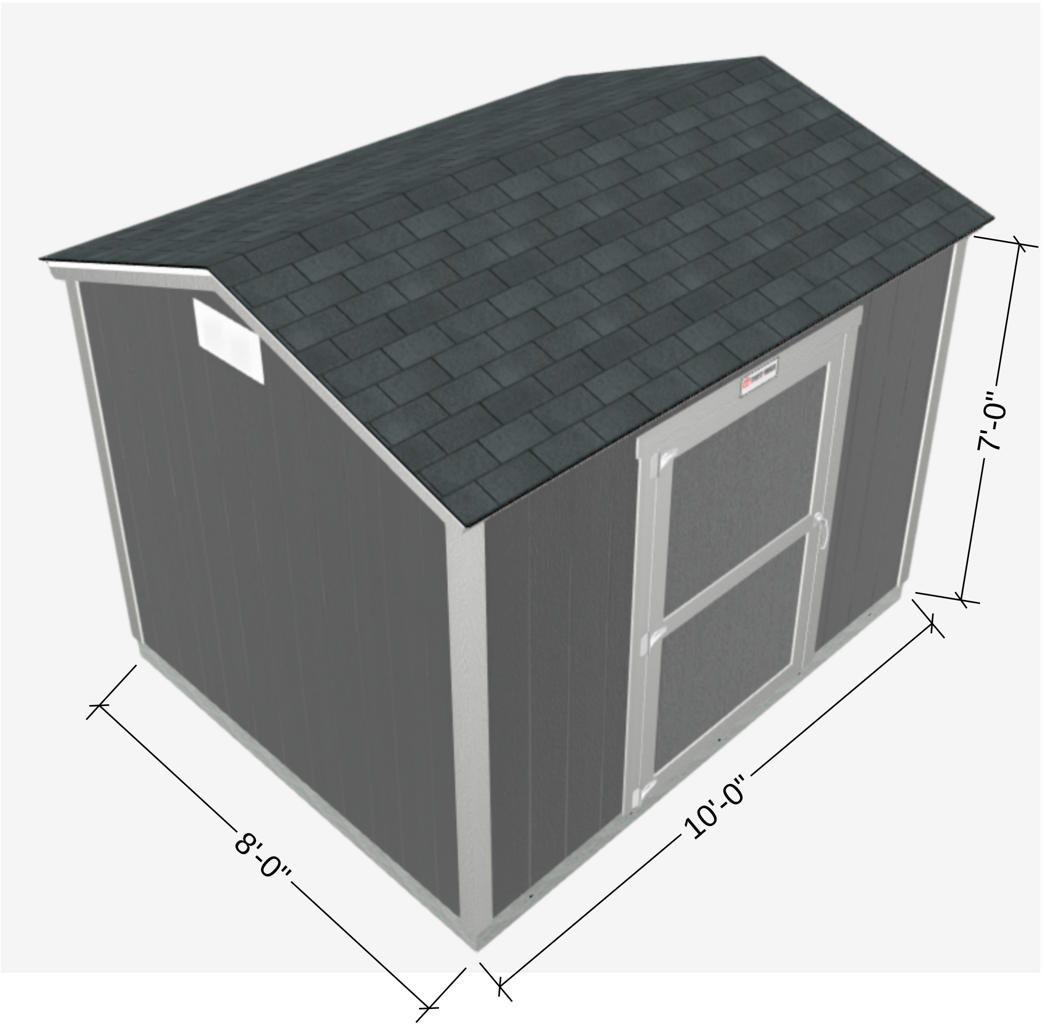
Equipment, Swings

Arch Swing with standard belt swing seats
https://www.playlsi.com/en/commercial-playground-equipment/playground-components/5-arch-swing-frame2/

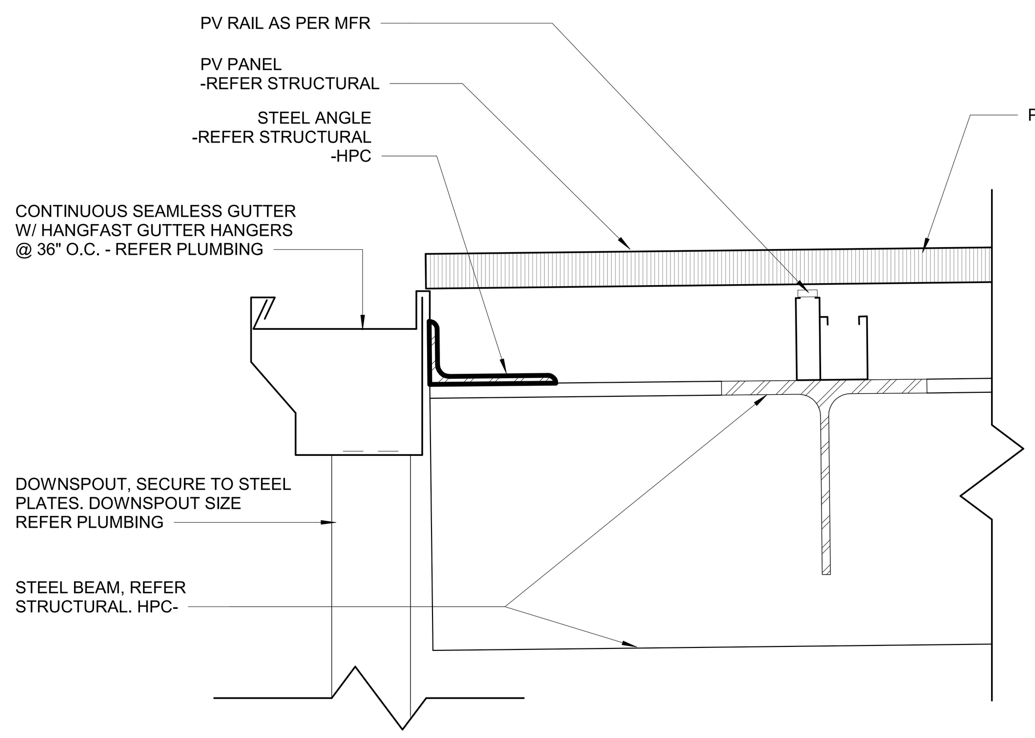
Friendship Swing
https://www.playlsi.com/en/commercial-playground-equipment/playground-components/friendship-swing-with-5-arch-swing-frame/

Student Garden

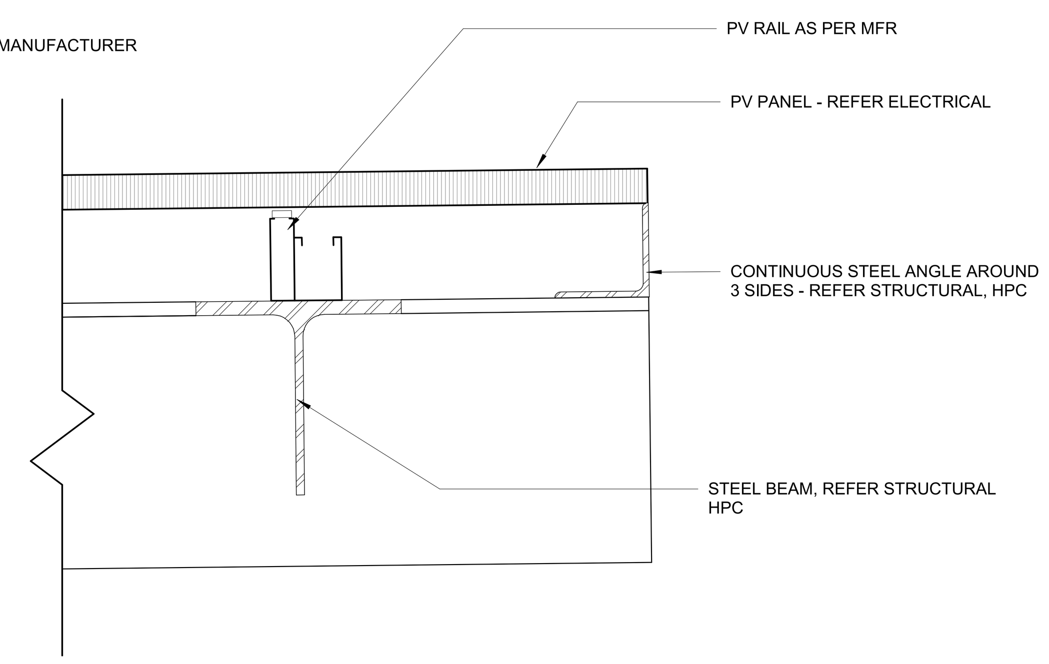
Storage Shed, basis of design: TuffShed.com



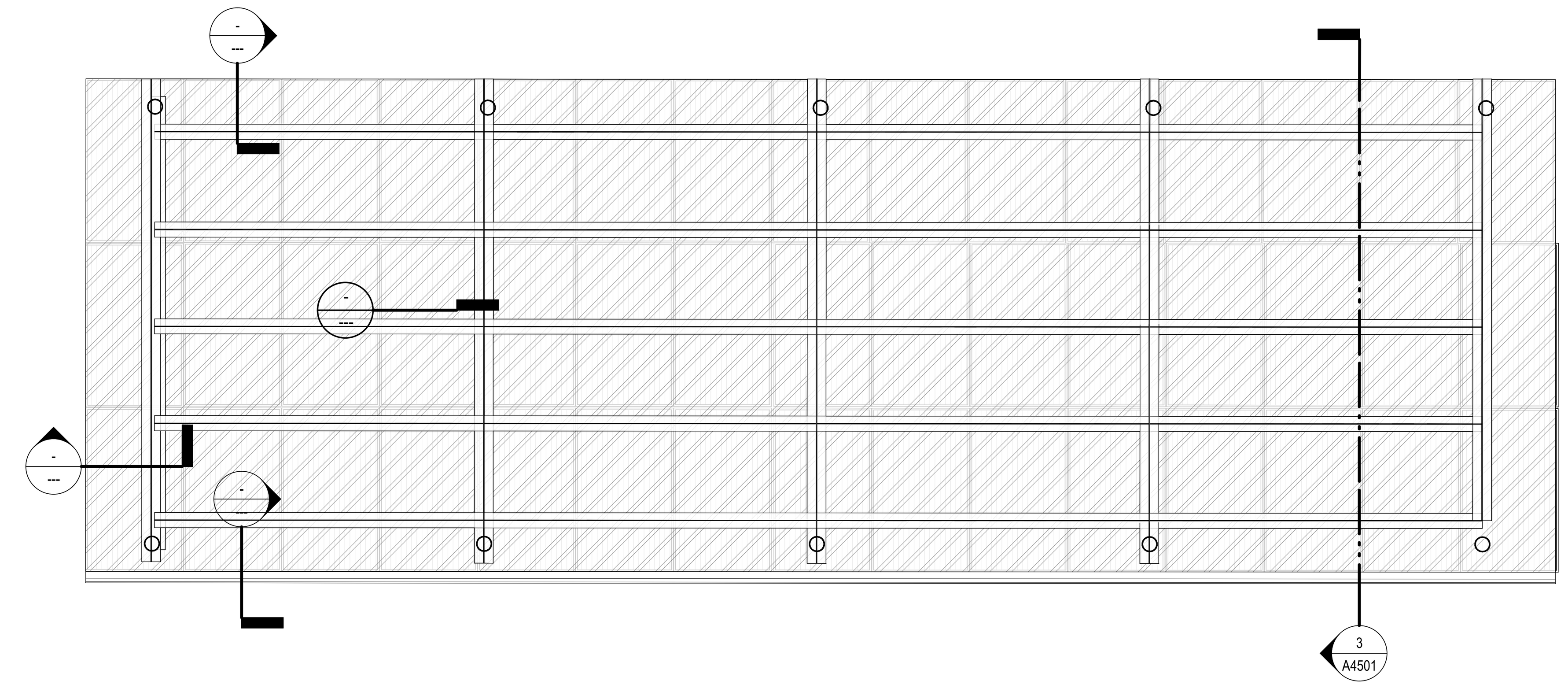
Raised planters, custom design, material: composite lumber



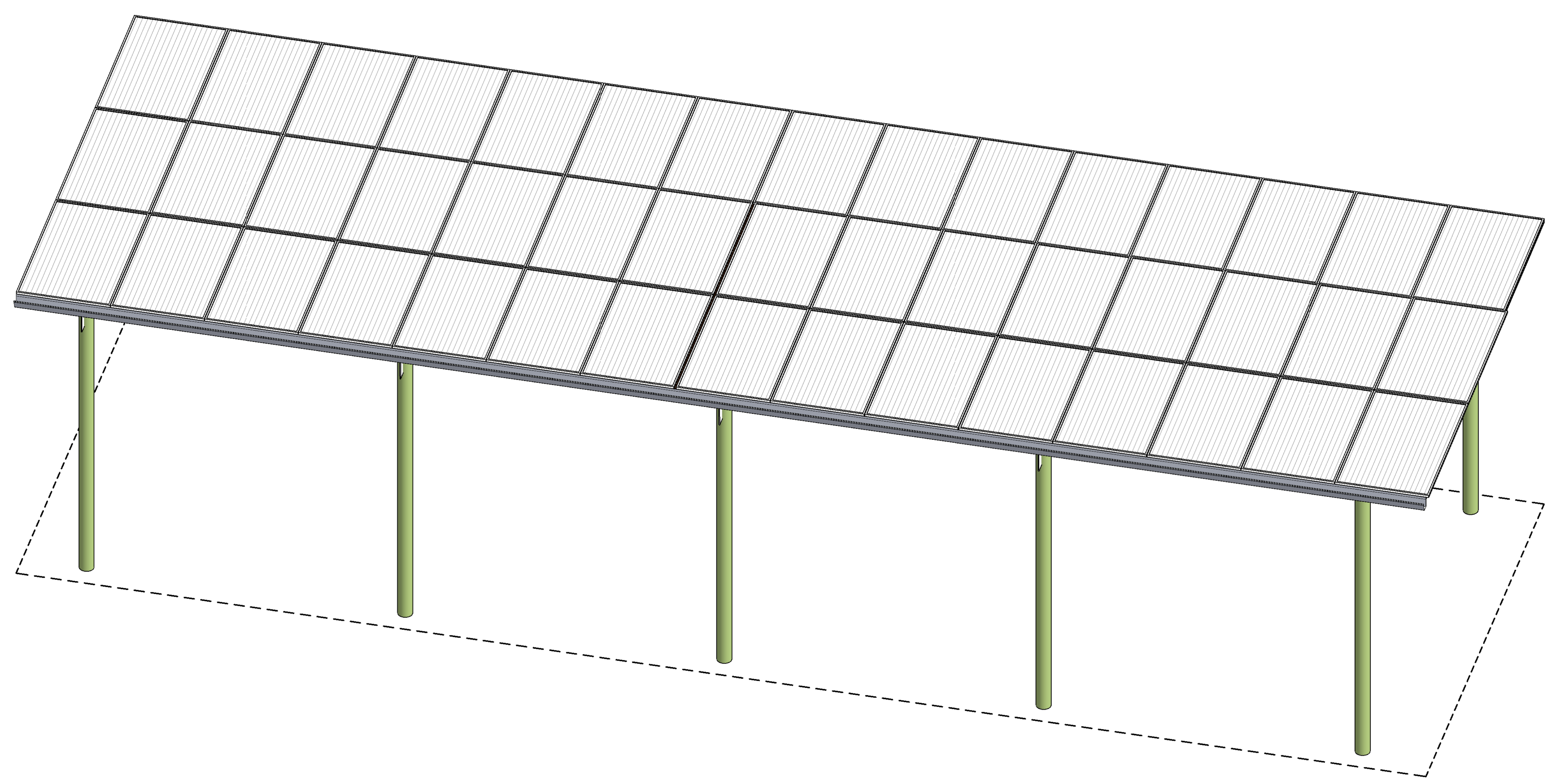
6 PV CANOPY GUTTER
SCALE: 3" = 1'-0"



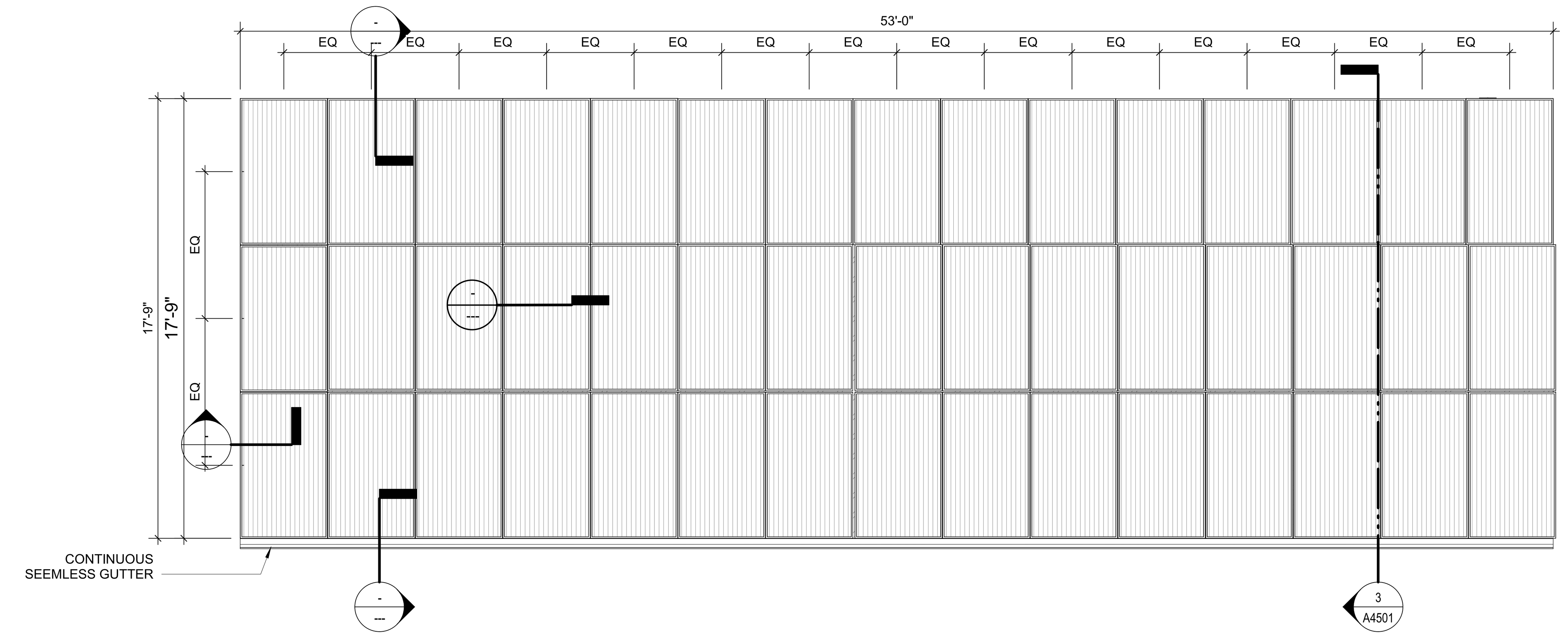
7 PV CANOPY EDGE
SCALE: 3" = 1'-0"



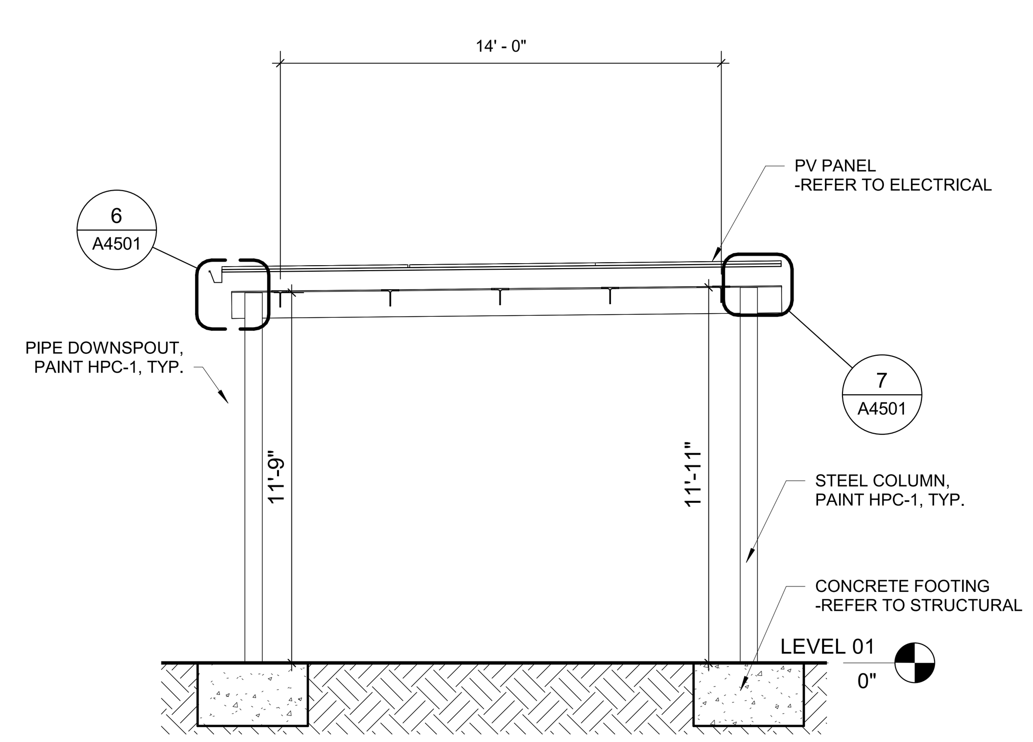
5 PV CANOPY REFLECTED CEILING PLAN
SCALE: 1/4" = 1'-0"



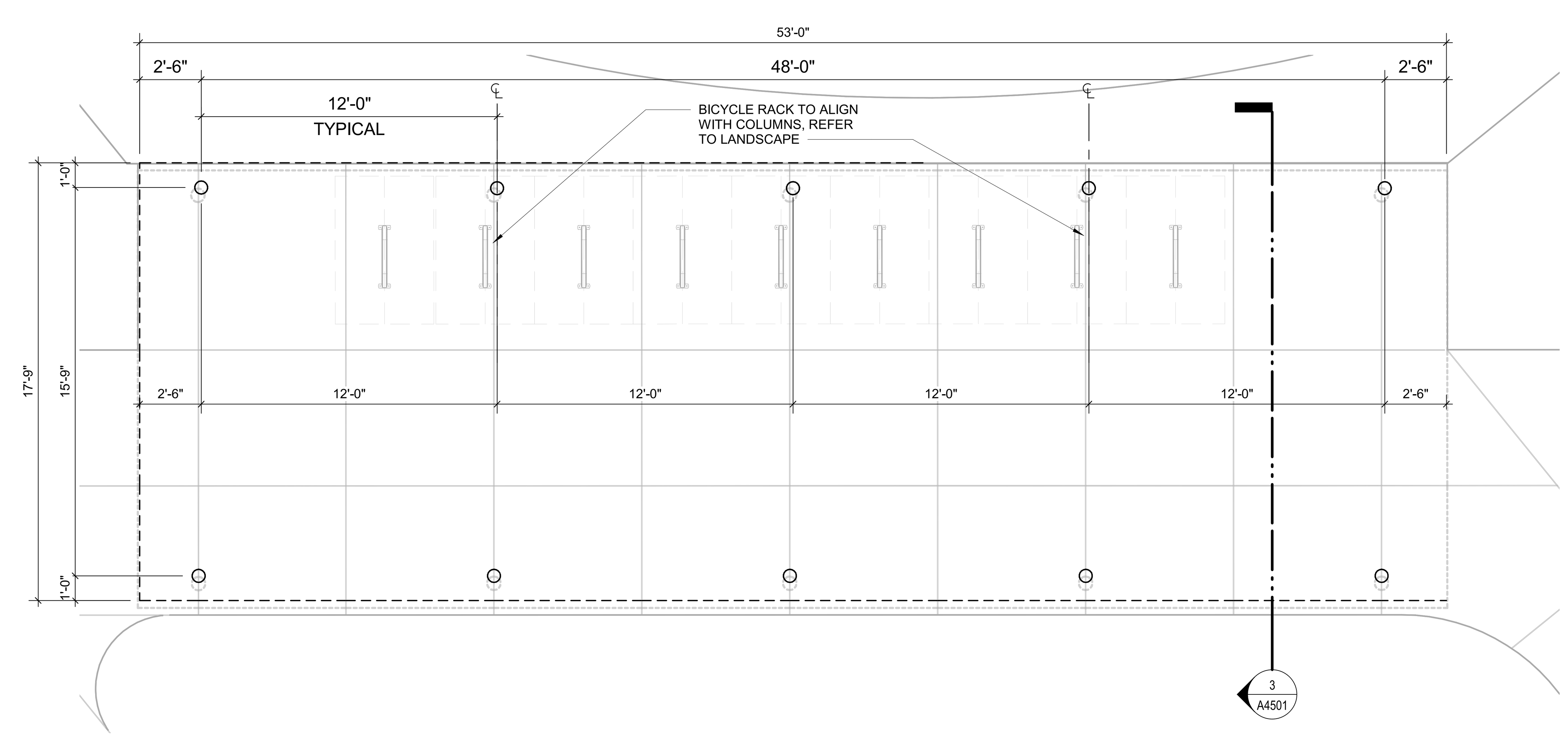
4 PV CANOPY AXONOMETRIC
SCALE:



2 PV CANOPY ROOF PLAN
SCALE: 1/4" = 1'-0"



3 PV CANOPY SECTION
SCALE: 1/4" = 1'-0"



1 PV CANOPY PLAN
SCALE: 1/4" = 1'-0"

2023-01-13 3:41:59 PM

CLIENT
West Linn-Wilsonville School District
2755 SW Borland Road,
Tualatin, OR 97062

ISSUES

No.	DESCRIPTION	DATE
	CD CHECK SET #1	2022-11-04
	60% CONSTRUCTION DOCUMENTS	2022-12-16

NOT FOR CONSTRUCTION

CONSULTANTS

SEAL

PRIME CONSULTANT
IBI GROUP
907 SW Harvey Milk Street
Portland, OR 97205, USA
tel 503 226 6950 fax 503 273 9192
ibigroup-edpnw.com

PROJECT
New Wilsonville Primary School
7151 Boeckman Road
Wilsonville, OR 97070

PROJECT NO:
137469

SHEET TITLE
CANOPY TYPE - PV

SHEET NUMBER
A4501

Frog Pond Primary School

Land Use

01/13/2022

GLUMAC lightingstudio

Radean Post Top
LED Area Luminaire

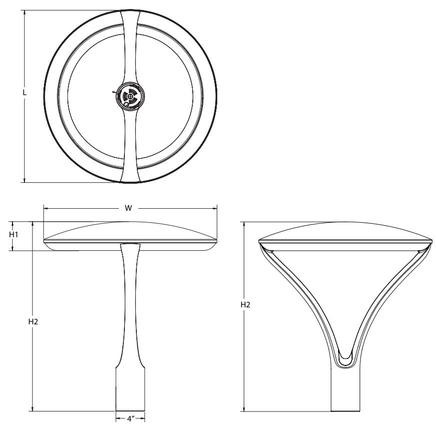
Buy American

Catalog Number	
Notes	
Type	

Hit the Tab key or mouse over the page to see all interactive elements.

Specifications

EPA:	1.02 ft^2 (0.105 m^2)
Length:	24" (61cm)
Width:	24" (61cm)
H1 Luminaire Height:	4" (10.16cm)
H2 Luminaire Height:	26" (66.04cm)
Weight:	38lbs (17.24Kg)



Introduction

The architecturally-inspired shape of the RADEAN™ post top area luminaire embodies the grace and strength of the RADEAN family. The twin copper-core cast aluminum arms support the slender superstructure, creating a beautiful sculpture by day transforming into a beacon of comfort by night. Triangular arms redirect reflection maintaining its visually quiet appearance. With sleek lines and simple silhouettes, these LED luminaires use specialized lighting and visual comfort to transform common areas like courtyards, outdoor retail locations, universities and corporate campuses into pedestrian-friendly nighttime environments.

Ordering Information

EXAMPLE: RADPT LED P3 30K SYM MVOLT PT4 PIR DNAXD

RADPT LED					
Series	**Performance package**	**Color temperature**	**Distribution**	**Voltage**	**Mounting** *(required)*
RADPT LED	P1 3,000 Lumens P2 5,000 Lumens P3 7,000 Lumens P4 10,000 Lumens P5 15,000 Lumens	27K 2700K 30K 3000K 35K 3500K 40K 4000K 50K 5000K	SYM Symmetric type V ASY Asymmetric type IV PATH Pathway Type III	MVOLT [2] 120 [2] 208 [2] 240 [2] 277 [2] 347 480	PT4 [3] Slips inside a 4" OD round metal pole RADPT20 Slips over a 2 3/8" diameter tenon RADPT25 Slips over a 2 7/8" diameter tenon

Control options	**Other options**	**Finish** *(required)*
Shipped installed NLTAIR2 nLight AIR 2.0 enabled [4] PIR Bi-level motion/sensor (100% to 30%) [5,6,7,8] PE Button photocell [7] FAO Field adjustable output [5,9]	SF Single Fuse [2] DF Double Fuse [2] R90 Rotated optics [10] **Shipped installed** HS Houseside shield [11]	DDBXD Dark bronze DBLXD Black DNAXD Natural aluminum DWHXD White DDBTXD Textured dark bronze DBLBXD Textured black DNATXD Textured natural aluminum DWHGXD Textured white

One Lithonia Way • Conyers, Georgia 30012 • Phone: 1-800-705-SERV (7378) • www.lithonia.com

Ordering Information

Accessories

Ordered and shipped separately.

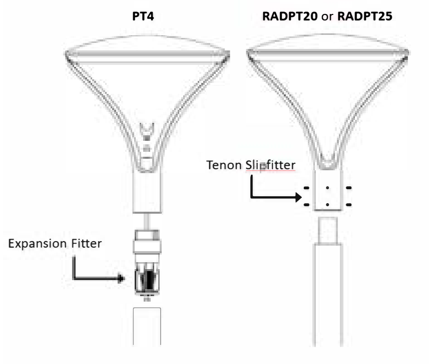
RADHS	Houseside shield (shield is white)
RADCS DDBXD U	Decorative clamshell base for 4" RSS pole (specify finish)
RADFBC DDBXD U	Full base cover for 4" RSS pole (specify finish)

For more control options, visit DTL and ROAM online.

NOTES

1 2700K and 3500K may require extended lead-times.
2 MVOLT driver operates on any line voltage from 120-277V (50/60 Hz). Single fuse (SF) requires 120, 277 or 347 voltage option. Double fuse (DF) requires 208, 240 or 480 voltage option.
3 Required nominal 4" round straight metal pole.
4 NLTAIR2 not available with PIR, PE or FAO. Must link to external nLight Air network.
5 PIR will work with FAO, if adjustable low-end trim is required.
6 PIR must specify 120V, 277V, 347V or 480V. Not available in MVOLT, 208V or 240V.
7 PE and PIR are available together.
8 PIR for use only on luminaires mounted under 15'.
9 Field adjustable high-end trim.
10 For left rotation, select R90 and rotate luminaire 180° on pole.
11 Also available as a separate accessory; see Accessories information at left. HS not available with R90. Shield is field rotatable shield in 180° increments.

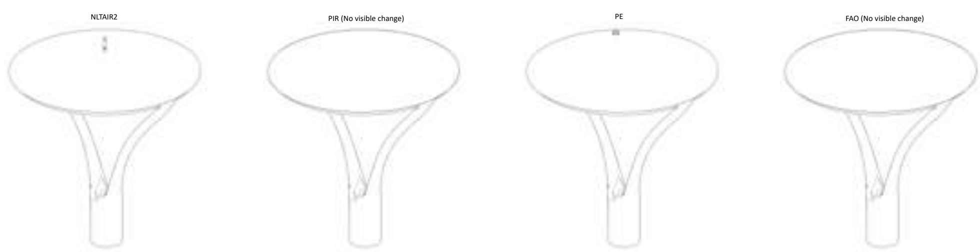
Mounting



Recommended Poles for use with RADEAN RADPT LED Luminaires.			
Acuity Part Number	**Description**	**For luminaires**	**Used with Mounting**
RSS 10 4B PT DDBXD	10' Round Straight Steel - 4" O.D. - Open Top	RADPT LED	PT4
RSS 12 4B PT DDBXD	12' Round Straight Steel - 4" O.D. - Open Top	RADPT LED	PT4
RSS 14 4B PT DDBXD	14' Round Straight Steel - 4" O.D. - Open Top	RADPT LED	PT4
RSS 16 4B PT DDBXD	16' Round Straight Steel - 4" O.D. - Open Top	RADPT LED	PT4
RSS 18 4B PT DDBXD	18' Round Straight Steel - 4" O.D. - Open Top	RADPT LED	PT4
RSS 20 4B PT DDBXD	20' Round Straight Steel - 4" O.D. - Open Top	RADPT LED	PT4
RSS 25 4B PT DDBXD	25' Round Straight Steel - 4" O.D. - Open Top	RADPT LED	PT4
RSS 10 4B T20 DDBXD	10' Round Straight Steel - 4" O.D. - Tenon Top	RADPT LED	RADPT20
RSS 12 4B T20 DDBXD	12' Round Straight Steel - 4" O.D. - Tenon Top	RADPT LED	RADPT20
RSS 14 4B T20 DDBXD	14' Round Straight Steel - 4" O.D. - Tenon Top	RADPT LED	RADPT20
RSS 16 4B T20 DDBXD	16' Round Straight Steel - 4" O.D. - Tenon Top	RADPT LED	RADPT20
RSS 18 4B T20 DDBXD	18' Round Straight Steel - 4" O.D. - Tenon Top	RADPT LED	RADPT20
RSS 20 4B T20 DDBXD	20' Round Straight Steel - 4" O.D. - Tenon Top	RADPT LED	RADPT20
RSS 25 4B T20 DDBXD	25' Round Straight Steel - 4" O.D. - Tenon Top	RADPT LED	RADPT20

* Customer must verify pole loading per required design criteria and specified wind speed. Consult pole specification sheet for additional details.

Control Options



Performance Data

Lumen Output

Lumen values are from photometric tests performed in accordance with IESNA LM-79-08. Data is considered to be representative of the configurations shown. Contact factory for performance data on any configurations not shown here.

Performance Package	Input Wattage	Distribution	2700K					3000K					3500K					4000K					5000K				
			Lumens	B	U	G	LPW	Lumens	B	U	G	LPW	Lumens	B	U	G	LPW	Lumens	B	U	G	LPW	Lumens	B	U	G	LPW
P1	25	ASY	2,924	2	1	2	115	3,022	2	2	2	119	3,095	2	2	2	122	3,168	2	2	2	125	3,168	2	2	2	125
		PATH	2,529	2	1	2	100	2,613	2	2	2	103	2,676	2	2	2	105	2,739	2	2	2	108	2,739	2	2	2	108
		SYM	3,086	2	1	1	121	3,189	2	1	1	126	3,266	2	1	1	129	3,344	2	1	1	132	3,344	2	1	1	132
P2	38	ASY	4,521	3	2	3	119	4,672	3	2	3	123	4,785	3	2	3	126	4,898	3	2	3	129	4,898	3	2	3	129
		PATH	3,909	2	2	2	103	4,040	2	2	2	106	4,137	2	2	2	109	4,235	3	2	3	111	4,235	3	2	3	111
		SYM	4,772	2	2	1	126	4,931	3	2	1	130	5,050	3	2	1	133	5,169	3	2	1	136	5,169	3	2	1	136
P3	54	ASY	6,387	3	2	3	119	6,600	3	2	3	123	6,760	3	2	3	126	6,919	3	2	3	129	6,919	3	2	3	129
		PATH	5,523	3	2	3	103	5,707	3	2	3	106	5,845	3	2	3	109	5,983	3	2	3	112	5,983	3	2	3	112
		SYM	6,741	3	2	2	126	6,966	3	2	2	130	7,135	3	2	2	133	7,303	3	2	2	136	7,303	3	2	2	136
P4	86	ASY	10,150	4	2	4	118	10,489	4	2	4	122	10,742	4	2	4	125	10,996	4	2	4	128	10,996	4	2	4	128
		PATH	8,777	3	2	3	102	9,070	3	2	3	106	9,289	3	2	3	108	9,509	3	2	3	111	9,509	3	2	3	111
		SYM	10,713	3	2	2	125	11,071	3	2	2	129	11,338	3	2	2	132	11,606	3	2	2	135	11,606	3	2	2	135
P5	123	ASY	14,250	4	2	4	116	14,724	4	2	4	120	15,081	4	3	4	123	15,437	4	3	4	126	15,437	4	3	4	126
		PATH	12,322	4	2	4	101	12,733	4	3	4	104	13,041	4	3	4	106	13,349	4	3	4	109	13,349	4	3	4	109
		SYM	15,040	4	2	3	123	15,541	4	2	3	127	15,917	4	2	3	130	16,293	4	2	3	133	16,293	4	2	3	133

Lumen Ambient Temperature (LAT) Multipliers

Use these factors to determine relative lumen output for average ambient temperatures from 0-40°C (32-104°F).

Ambient		LAT Factor
0°C	32°F	1.06
5°C	41°F	1.05
10°C	50°F	1.04
15°C	59°F	1.02
20°C	68°F	1.01
25°C	**77°F**	**1.00**
30°C	86°F	0.99
35°C	95°F	0.98
40°C	104°F	0.96

Projected LED Lumen Maintenance

Data references the extrapolated performance projections for the **RADPT LED** platform in a **25°C ambient**, based on 10,000 hours of LED testing (tested per IESNA LM-80-08 and projected per IESNA TM-21-11).

To calculate LLF, use the lumen maintenance factor that corresponds to the desired number of operating hours below. For other lumen maintenance values, contact factory.

Projected LED Lumen Maintenance				
	0	25,000	50,000	100,000
P1	1.00	0.96	0.91	0.82
P2	1.00	0.96	0.91	0.82
P3	1.00	0.96	0.91	0.82
P4	1.00	0.96	0.91	0.82
P5	1.00	0.95	0.89	0.78

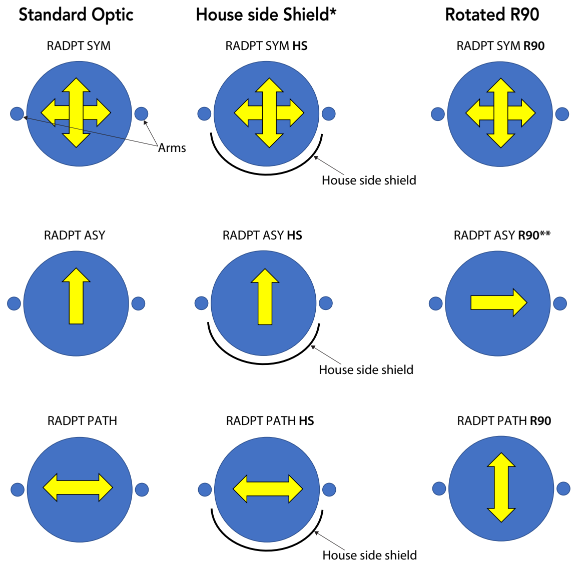
Electrical Load

					Current (A)					
Lumen Package	LED Drive Current	Voltage	Wattage		120	208	240	277	347	480
P1	500	42.8	21.4	Input Current	0.22	0.13	0.11	0.1	0.08	0.06
				System Watts	26	26	26	27	25	26
P2	770	43	33.1	Input Current	0.33	0.19	0.16	0.14	0.11	0.08
				System Watts	39	39	39	39	38	38
P3	1100	43.2	47.5	Input Current	0.46	0.26	0.23	0.2	0.16	0.12
				System Watts	55	54	54	54	54	54
P4	900	87.3	78.6	Input Current	0.73	0.42	0.36	0.32	0.25	0.18
				System Watts	87	86	86	86	86	86
P5	1250	88.2	110.2	Input Current	1	0.58	0.5	0.44	0.35	0.25
				System Watts	120	119	119	119	120	120

Orientation Diagrams

To see complete photometric reports or download .ies files for this product, visit Lithonia Lighting's RADPT LED homepage.

Isofootcandle plots are considered to be representative of available optical distributions.



*HS not available with R90
**For L90, use R90 and rotate luminaire 180° on pole

FEATURES & SPECIFICATIONS

INTENDED USE
Pedestrian areas such as parks, campuses, pathways, courtyards and pedestrians malls.

CONSTRUCTION
Single-piece die-cast aluminum housing with nominal wall thickness of 0.125" on a 6mm thick acrylic waveguide is fully gasketd with a single piece tubular silicone gasket.

FINISH
Exterior parts are protected by a zinc-infused Super Durable TGIC thermoset powder coat finish that provides superior resistance to corrosion and weathering. A tightly controlled multi-stage process ensures a minimum 3 mils thickness for a finish that can withstand extreme climate changes without cracking or peeling. Standard Super Durable colors include dark bronze, black, natural aluminum and white. Available in textured and non-textured finishes.

OPTICS
6MM thick acrylic waveguide with 360° flexible LED board. Available in 2700K, 3000K, 3500K, 4000K and 5000K (80CRI) CCT configurations.

ELECTRICAL
Light engine consists of 96 high-efficacy LEDs mounted to a flexible circuit board and aluminum heat sink, ensuring optimal thermal management and long life. Class 1 electronic driver has a power factor >90%, THD <20%, and has an expected life of 100,000 hours with <1% failure rate. Easily-serviceable 10kV surge protection device meets a minimum Category C Low for operation (per ANSI/IEEE C62.41.2).

INSTALLATION
Standard post-top mounting configuration fits into a 4" OD open pole top (round pole only). Alternate tenon (2-3/8" or 2-7/8") mounting also available.

LISTINGS
CSA certified to U.S. and Canadian standards. Luminaire is IP65 rated. Rated for -40°C minimum ambient.

DesignLights Consortium® (DLC) Premium qualified product and DLC qualified product. Not all versions of this product may be DLC Premium qualified or DLC qualified. Please check the DLC Qualified Products List at www.designlights.org/QPL to confirm which versions are qualified.

International Dark-Sky Association (IDA) Fixture Seal of Approval (FSA) is available for all products on this page utilizing 3000K color or less. U.S. Patent No. D925,088S

BUY AMERICAN
This product is assembled in the USA and meets the Buy America(n) government procurement requirements under FARS, DFARS and DOT. Please refer to www.acuitybrands.com/resources/buy-american for additional information.

WARRANTY
5-year limited warranty. This is the only warranty provided and no other statements in this specification sheet create any warranty of any kind. All other express and implied warranties are disclaimed. Complete warranty terms located at: www.acuitybrands.com/support/customer-support/terms-and-conditions

Note: Actual performance may differ as a result of end-user environment and application. All values are design or typical values, measured under laboratory conditions at 25 °C. Specifications subject to change without notice.

Radean Post Top
LED Area Luminaire

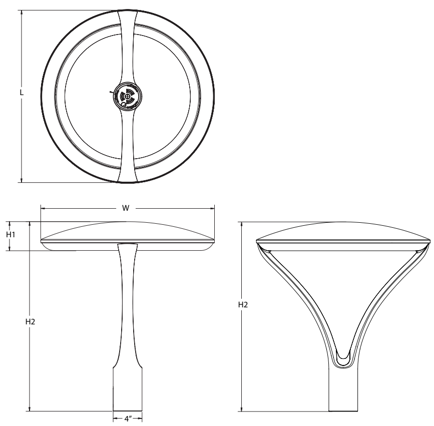
Buy American

Catalog Number	
Notes	
Type	

Hit the Tab key or mouse over the page to see all interactive elements.

Specifications

EPA:	1.02 ft^2 (0.105 m^2)
Length:	24" (61cm)
Width:	24" (61cm)
H1 Luminaire Height:	4" (10.16cm)
H2 Luminaire Height:	26" (66.04cm)
Weight:	38lbs (17.24Kg)



Introduction

The architecturally-inspired shape of the RADEAN™ post top area luminaire embodies the grace and strength of the RADEAN family. The twin copper-core cast aluminum arms support the slender superstructure, creating a beautiful sculpture by day transforming into a beacon of comfort by night. Triangular arms redirect reflection maintaining its visually quiet appearance. With sleek lines and simple silhouettes, these LED luminaires use specialized lighting and visual comfort to transform common areas like courtyards, outdoor retail locations, universities and corporate campuses into pedestrian-friendly nighttime environments.

Ordering Information

EXAMPLE: RADPT LED P3 30K SYM MVOLT PT4 PIR DNAXD

RADPT LED					
Series	**Performance package**	**Color temperature**	**Distribution**	**Voltage**	**Mounting** *(required)*
RADPT LED	P1 3,000 Lumens P2 5,000 Lumens P3 7,000 Lumens P4 10,000 Lumens P5 15,000 Lumens	27K 2700K 30K 3000K 35K 3500K 40K 4000K 50K 5000K	SYM Symmetric type V ASY Asymmetric type IV PATH Pathway Type III	MVOLT [2] 120 [2] 208 [2] 240 [2] 277 [2] 347 480	PT4 [3] Slips inside a 4" OD round metal pole RADPT20 Slips over a 2 3/8" diameter tenon RADPT25 Slips over a 2 7/8" diameter tenon

Control options	**Other options**	**Finish** *(required)*
Shipped installed NLTAIR2 nLight AIR 2.0 enabled [4] PIR Bi-level motion/sensor (100% to 30%) [5,6,7,8] PE Button photocell [7] FAO Field adjustable output [5,9]	SF Single Fuse [2] DF Double Fuse [2] R90 Rotated optics [10] **Shipped installed** HS Houseside shield [11]	DDBXD Dark bronze DBLXD Black DNAXD Natural aluminum DWHXD White DDBTXD Textured dark bronze DBLBXD Textured black DNATXD Textured natural aluminum DWHGXD Textured white

Ordering Information

Accessories

Ordered and shipped separately.

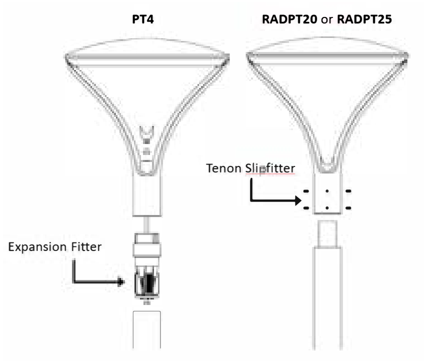
RADHS	Houseside shield (shield is white)
RADCS DDBXD U	Decorative clamshell base for 4" RSS pole (specify finish)
RADFBC DDBXD U	Full base cover for 4" RSS pole (specify finish)

For more control options, visit DTL and ROAM online.

NOTES

1 2700K and 3500K may require extended lead-times.
2 MVOLT driver operates on any line voltage from 120-277V (50/60 Hz). Single fuse (SF) requires 120, 277 or 347 voltage option. Double fuse (DF) requires 208, 240 or 480 voltage option.
3 Required nominal 4" round straight metal pole.
4 NLTAIR2 not available with PIR, PE or FAO. Must link to external nLight Air network.
5 PIR will work with FAO, if adjustable low-end trim is required.
6 PIR must specify 120V, 277V, 347V or 480V. Not available in MVOLT, 208V or 240V.
7 PE and PIR are available together.
8 PIR for use only on luminaires mounted under 15'.
9 Field adjustable high-end trim.
10 For left rotation, select R90 and rotate luminaire 180° on pole.
11 Also available as a separate accessory; see Accessories information at left. HS not available with R90. Shield is field rotatable shield in 180° increments.

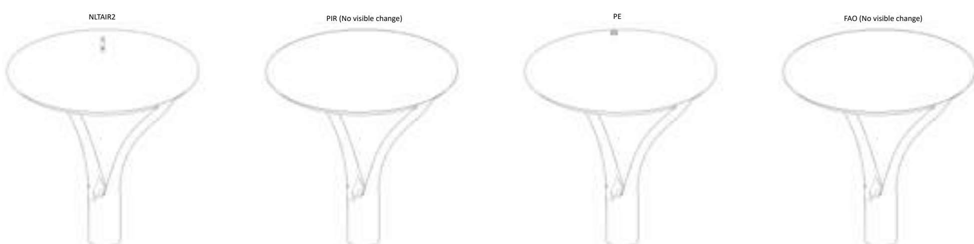
Mounting



Recommended Poles for use with RADEAN RADPT LED Luminaires.			
Acuity Part Number	**Description**	**For luminaires**	**Used with Mounting**
RSS 10 4B PT DDBXD	10' Round Straight Steel - 4" O.D. - Open Top	RADPT LED	PT4
RSS 12 4B PT DDBXD	12' Round Straight Steel - 4" O.D. - Open Top	RADPT LED	PT4
RSS 14 4B PT DDBXD	14' Round Straight Steel - 4" O.D. - Open Top	RADPT LED	PT4
RSS 16 4B PT DDBXD	16' Round Straight Steel - 4" O.D. - Open Top	RADPT LED	PT4
RSS 18 4B PT DDBXD	18' Round Straight Steel - 4" O.D. - Open Top	RADPT LED	PT4
RSS 20 4B PT DDBXD	20' Round Straight Steel - 4" O.D. - Open Top	RADPT LED	PT4
RSS 25 4B PT DDBXD	25' Round Straight Steel - 4" O.D. - Open Top	RADPT LED	PT4
RSS 10 4B T20 DDBXD	10' Round Straight Steel - 4" O.D. - Tenon Top	RADPT LED	RADPT20
RSS 12 4B T20 DDBXD	12' Round Straight Steel - 4" O.D. - Tenon Top	RADPT LED	RADPT20
RSS 14 4B T20 DDBXD	14' Round Straight Steel - 4" O.D. - Tenon Top	RADPT LED	RADPT20
RSS 16 4B T20 DDBXD	16' Round Straight Steel - 4" O.D. - Tenon Top	RADPT LED	RADPT20
RSS 18 4B T20 DDBXD	18' Round Straight Steel - 4" O.D. - Tenon Top	RADPT LED	RADPT20
RSS 20 4B T20 DDBXD	20' Round Straight Steel - 4" O.D. - Tenon Top	RADPT LED	RADPT20
RSS 25 4B T20 DDBXD	25' Round Straight Steel - 4" O.D. - Tenon Top	RADPT LED	RADPT20

* Customer must verify pole loading per required design criteria and specified wind speed. Consult pole specification sheet for additional details.

Control Options



Performance Data

Lumen Output

Lumen values are from photometric tests performed in accordance with IESNA LM-79-08. Data is considered to be representative of the configurations shown. Contact factory for performance data on any configurations not shown here.

Performance Package	Input Wattage	Distribution	2700K					3000K					3500K					4000K					5000K				
			Lumens	B	U	G	LPW	Lumens	B	U	G	LPW	Lumens	B	U	G	LPW	Lumens	B	U	G	LPW	Lumens	B	U	G	LPW
P1	25	ASY	2,924	2	1	2	115	3,022	2	2	2	119	3,095	2	2	2	122	3,168	2	2	2	125	3,168	2	2	2	125
		PATH	2,529	2	1	2	100	2,613	2	2	2	103	2,676	2	2	2	105	2,739	2	2	2	108	2,739	2	2	2	108
		SYM	3,086	2	1	1	121	3,189	2	1	1	126	3,266	2	1	1	129	3,344	2	1	1	132	3,344	2	1	1	132
P2	38	ASY	4,521	3	2	3	119	4,672	3	2	3	123	4,785	3	2	3	126	4,898	3	2	3	129	4,898	3	2	3	129
		PATH	3,909	2	2	2	103	4,040	2	2	2	106	4,137	2	2	2	109	4,235	3	2	3	111	4,235	3	2	3	111
		SYM	4,772	2	2	1	126	4,931	3	2	1	130	5,050	3	2	1	133	5,169	3	2	1	136	5,169	3	2	1	136
P3	54	ASY	6,387	3	2	3	119	6,600	3	2	3	123	6,760	3	2	3	126	6,919	3	2	3	129	6,919	3	2	3	129
		PATH	5,523	3	2	3	103	5,707	3	2	3	106	5,845	3	2	3	109	5,983	3	2	3	112	5,983	3	2	3	112
		SYM	6,741	3	2	2	126	6,966	3	2	2	130	7,135	3	2	2	133	7,303	3	2	2	136	7,303	3	2	2	136
P4	86	ASY	10,150	4	2	4	118	10,489	4	2	4	122	10,742	4	2	4	125	10,996	4	2	4	128	10,996	4	2	4	128
		PATH	8,777	3	2	3	102	9,070	3	2	3	106	9,289	3	2	3	108	9,509	3	2	3	111	9,509	3	2	3	111
		SYM	10,713	3	2	2	125	11,071	3	2	2	129	11,338	3	2	2	132	11,606	3	2	2	135	11,606	3	2	2	135
P5	123	ASY	14,250	4	2	4	116	14,724	4	2	4	120	15,081	4	3	4	123	15,437	4	3	4	126	15,437	4	3	4	126
		PATH	12,322	4	2	4	101	12,733	4	3	4	104	13,041	4	3	4	106	13,349	4	3	4	109	13,349	4	3	4	109
		SYM	15,040	4	2	3	123	15,541	4	2	3	127	15,917	4	2	3	130	16,293	4	2	3	133	16,293	4	2	3	133

Lumen Ambient Temperature (LAT) Multipliers

Use these factors to determine relative lumen output for average ambient temperatures from 0-40°C (32-104°F).

Ambient		LAT Factor
0°C	32°F	1.06
5°C	41°F	1.05
10°C	50°F	1.04
15°C	59°F	1.02
20°C	68°F	1.01
25°C	**77°F**	**1.00**
30°C	86°F	0.99
35°C	95°F	0.98
40°C	104°F	0.96

Projected LED Lumen Maintenance

Data references the extrapolated performance projections for the **RADPT LED** platform in a **25°C ambient**, based on 10,000 hours of LED testing (tested per IESNA LM-80-08 and projected per IESNA TM-21-11).

To calculate LLF, use the lumen maintenance factor that corresponds to the desired number of operating hours below. For other lumen maintenance values, contact factory.

Projected LED Lumen Maintenance				
	0	25,000	50,000	100,000
P1	1.00	0.96	0.91	0.82
P2	1.00	0.96	0.91	0.82
P3	1.00	0.96	0.91	0.82
P4	1.00	0.96	0.91	0.82
P5	1.00	0.95	0.89	0.78

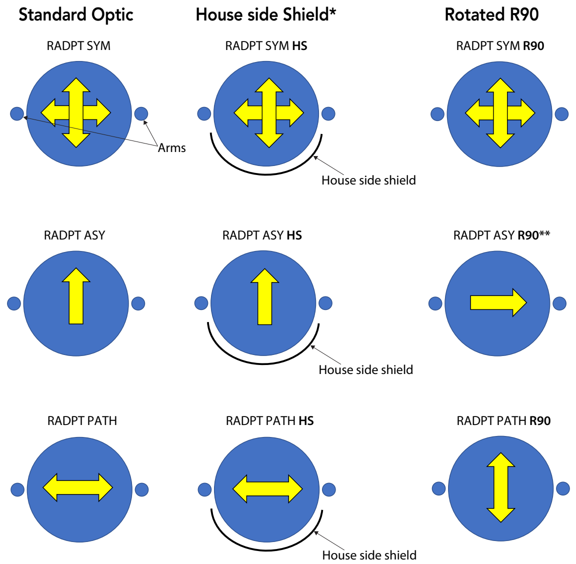
Electrical Load

Lumen Package	LED Drive Current	Voltage	Wattage		Current (A)					
					120	208	240	277	347	480
P1	500	42.8	21.4	Input Current	0.22	0.13	0.11	0.1	0.08	0.06
				System Watts	26	26	26	27	25	26
P2	770	43	33.1	Input Current	0.33	0.19	0.16	0.14	0.11	0.08
				System Watts	39	39	39	39	38	38
P3	1100	43.2	47.5	Input Current	0.46	0.26	0.23	0.2	0.16	0.12
				System Watts	55	54	54	54	54	54
P4	900	87.3	78.6	Input Current	0.73	0.42	0.36	0.32	0.25	0.18
				System Watts	87	86	86	86	86	86
P5	1250	88.2	110.2	Input Current	1	0.58	0.5	0.44	0.35	0.25
				System Watts	120	119	119	119	120	120

Orientation Diagrams

To see complete photometric reports or download .ies files for this product, visit Lithonia Lighting's RADPT LED homepage.

Isofootcandle plots are considered to be representative of available optical distributions.



*HS not available with R90
**For L90, use R90 and rotate luminaire 180° on pole

FEATURES & SPECIFICATIONS

INTENDED USE
Pedestrian areas such as parks, campuses, pathways, courtyards and pedestrians malls.

CONSTRUCTION
Single-piece die-cast aluminum housing with nominal wall thickness of 0.125" on a 6mm thick acrylic waveguide is fully gasketd with a single piece tubular silicone gasket.

FINISH
Exterior parts are protected by a zinc-infused Super Durable TGIC thermoset powder coat finish that provides superior resistance to corrosion and weathering. A tightly controlled multi-stage process ensures a minimum 3 mils thickness for a finish that can withstand extreme climate changes without cracking or peeling. Standard Super Durable colors include dark bronze, black, natural aluminum and white. Available in textured and non-textured finishes.

OPTICS
6MM thick acrylic waveguide with 360° flexible LED board. Available in 2700K, 3000K, 3500K, 4000K and 5000K (80CRI) CCT configurations.

ELECTRICAL
Light engine consists of 96 high-efficacy LEDs mounted to a flexible circuit board and aluminum heat sink, ensuring optimal thermal management and long life. Class 1 electronic driver has a power factor >90%, THD <20%, and has an expected life of 100,000 hours with <1% failure rate. Easily-serviceable 10kV surge protection device meets a minimum Category C Low for operation (per ANSI/IEEE C62.41.2).

INSTALLATION
Standard post-top mounting configuration fits into a 4" OD open pole top (round pole only). Alternate tenon (2-3/8" or 2-7/8") mounting also available.

LISTINGS
CSA certified to U.S. and Canadian standards. Luminaire is IP65 rated. Rated for -40°C minimum ambient.

DesignLights Consortium® (DLC) Premium qualified product and DLC qualified product. Not all versions of this product may be DLC Premium qualified or DLC qualified. Please check the DLC Qualified Products List at www.designlights.org/QPL to confirm which versions are qualified.

International Dark-Sky Association (IDA) Fixture Seal of Approval (FSA) is available for all products on this page utilizing 3000K color or less. U.S. Patent No. D925,088S

BUY AMERICAN
This product is assembled in the USA and meets the Buy America(n) government procurement requirements under FARS, DFARS and DOT. Please refer to www.acuitybrands.com/resources/buy-american for additional information.

WARRANTY
5-year limited warranty. This is the only warranty provided and no other statements in this specification sheet create any warranty of any kind. All other express and implied warranties are disclaimed. Complete warranty terms located at: www.acuitybrands.com/support/customer-support/terms-and-conditions

Note: Actual performance may differ as a result of end-user environment and application. All values are design or typical values, measured under laboratory conditions at 25 °C. Specifications subject to change without notice.

Application
This LED wall mounted luminaire has light output in one direction. Arranged individually or in groups, it is a great design element for a host of lighting applications. Downward orientation only.

Materials
Luminaire housing and constructed of die-cast marine grade, copper free (≤0.3% copper content) A360.0 aluminum alloy
Matte safety glass
High temperature silicone gasket
Mechanically captive stainless steel fasteners

NRTL listed to North American Standards, suitable for wet locations
Protection class IP65
Weight: 4.2 lbs

Electrical

Operating voltage	120-277V AC
Minimum start temperature	-20° C
LED module wattage	15.4 W
System wattage	20.5 W
Controllability	0-10V, TRIAC, and ELV dimmable
Color rendering index	Ra > 80
Luminaire lumens	1024 lumens (3000K)
LED service life (L70)	60,000 hours

LED color temperature
☐ 4000K - Product number + **K4**
☐ 3500K - Product number + **K35**
☐ 3000K - Product number + **K3** ***(EXPRESS)***
☐ 2700K - Product number + **K27**
☐ Amber - Product number + **AMB**

Wildlife friendly amber LED - Optional
Luminaire is optionally available with a narrow bandwidth, amber LED source (585-600nm) approved by the FWC. This light output is suggested for use within close proximity to sea turtle nesting and hatching habitats. Electrical and control information may vary from standard luminaire.

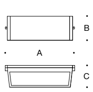
LED module wattage	12.0 W (Amber)
System wattage	15.0 W (Amber)
Luminaire lumens	243 lumens (Amber)

BEGA can supply you with suitable LED replacement modules for up to 20 years after the purchase of LED luminaires - see website for details

Finish
All BEGA standard finishes are matte, textured polyester powder coat with minimum 3 mil thickness.

Available colors	☐ Black (BLK)	☐ White (WHT)	☐ RAL:
	☐ Bronze (BRZ)	☐ Silver (SLV)	☐ CUS:

Type:
BEGA Product:
Project:
Modified:



LED wall luminaire · light output on one side

		LED	A	B	C
22360	ADA	15.4 W	12½	4⅜	4

BEGA 1000 BEGA Way, Carpinteria, CA 93013 (805) 684-0533 info@bega-us.com

Updated 03/19/19

WPX LED
Wall Packs

5 YEAR warranty

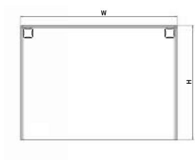
Catalog Number

Notes

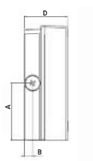
Type

Hit the Tab key or mouse over the page to see all interactive elements.

Specifications



Front View



Side View

Luminaire	Height (H)	Width (W)	Depth (D)	Side Conduit Location A	Side Conduit Location B	Weight
WPX1	8.1" (20.6 cm)	11.1" (28.3 cm)	3.2" (8.1 cm)	4.0" (10.3 cm)	0.6" (1.6 cm)	6.1 lbs (2.8kg)
WPX2	9.1" (23.1 cm)	12.3" (31.1 cm)	4.1" (10.5 cm)	4.5" (11.5 cm)	0.7" (1.7 cm)	8.2 lbs (3.7kg)
WPX3	9.5" (24.1 cm)	13.0" (33.0 cm)	5.5" (13.7 cm)	4.7" (12.0 cm)	0.7" (1.7 cm)	11.0 lbs (5.0kg)

Introduction

The WPX LED wall packs are energy-efficient, cost-effective, and aesthetically appealing solutions for both HID wall pack replacement and new construction opportunities. Available in three sizes, the WPX family delivers 1,550 to 9,200 lumens with a wide, uniform distribution.

The WPX full cut-off solutions fully cover the footprint of the HID glass wall packs that they replace, providing a neat installation and an upgraded appearance. Reliable IP66 construction and excellent LED lumen maintenance ensure a long service life. Photocell and emergency egress battery options make WPX ideal for every wall mounted lighting application.

Ordering Information

EXAMPLE: WPX2 LED 40K MVOLT DDBXD

Series		Color Temperature		Voltage		Options		Finish	
WPX1 LED P1	1,550 Lumens, 11W [1]	30K	3000K	MVOLT	120V - 277V	(blank)	None	DDBXD	Dark bronze
WPX1 LED P2	2,900 Lumens, 24W	40K	4000K	347	347V [3]	E4WH	Emergency battery backup, CEC compliant (4W, 0°C min) [2]	DWHXD	White
WPX2 LED	6,000 Lumens, 47W	50K	5000K			E14WC	Emergency battery backup, CEC compliant (14W, -20°C min) [2]	DBLXD	Black
WPX3 LED	9,200 Lumens, 69W					PE	Photocell [3]	Note : For other options, consult factory.	

Note: The lumen output and input power shown in the ordering tree are average representations of all configuration options. Specific values are available on request.

NOTES
1. All WPX wall packs come with 6kV surge protection standard, except WPX1 LED P1 package which comes with 2.5kV surge protection standard. Add SPD6KV option to get WPX1 LED P1 with 6kV surge protection.
   Sample nomenclature: WPX1 LED P1 40K MVOLT SPD6KV DDBXD
2. Battery pack options only available on WPX1 and WPX2.
3. Battery pack options not available with 347V and PE options.

FEATURES & SPECIFICATIONS

INTENDED USE
The WPX LED wall packs are designed to provide a cost-effective, energy-efficient solution for the one-for-one replacement of existing HID wall packs. The WPX1, WPX2 and WPX3 are ideal for replacing up to 150W, 250W, and 400W HID luminaires respectively. WPX luminaires deliver a uniform, wide distribution. WPX is rated for -40°C to 40°C.

CONSTRUCTION
WPX feature a die-cast aluminum main body with optimal thermal management that both enhances LED efficacy and extends component life. The luminaires are IP66 rated, and sealed against moisture or environmental contaminants.

ELECTRICAL
Light engine(s) configurations consist of high-efficacy LEDs and LED lumen maintenance of L90/100,000 hours. Color temperature (CCT) options of 3000K, 4000K and 5000K with minimum CRI of 70. Electronic drivers ensure system power factor >90% and THD <20%. All luminaires have 6kV surge protection (Note: WPX1 LED P1 package comes with a standard surge protection rating of 2.5kV. It can be ordered with an optional 6kV surge protection).
All photocell (PE) operate on MVOLT (120V - 277V) input.

Note: The standard WPX LED wall pack luminaires come with field-adjustable drive current feature. This feature allows tuning the output current of the LED drivers to adjust the lumen output (to dim the luminaire).

INSTALLATION
WPX can be mounted directly over a standard electrical junction box. Three 1/2 inch conduit ports on three sides allow for surface conduit wiring. A port on the back surface allows poke-through conduit wiring on surfaces that don't have an electrical junction box. Wiring can be made in the integral wiring compartment in all cases. WPX is only recommended for installations with LEDs facing downwards.

LISTINGS
CSA Certified to meet U.S. and Canadian standards. Suitable for wet locations. IP66 Rated. DesignLights Consortium® (DLC) qualified product. Not all versions of this product may be DLC qualified. Please check the DLC Qualified Products List at www.designlights.org/QPL to confirm which versions are qualified. International Dark Sky Association (IDA) Fixture Seal of Approval (FSA) is available for all products on this page utilizing 3000K color temperature only.

WARRANTY
5-year limited warranty. This is the only warranty provided and no other statements in this specification sheet create any warranty of any kind. All other express and implied warranties are disclaimed. Complete warranty terms located at:
www.acuitybrands.com/CustomerResources/Terms_and_conditions.aspx.

Note: Actual performance may differ as a result of end-user environment and application. All values are design or typical values, measured under laboratory conditions at 25°C. Specifications subject to change without notice.

Performance Data

Electrical Load

Luminaire	Input Power (W)	120V	208V	240V	277V	347V
WPX1 LED P1	11W	0.09	0.05	0.05	0.04	0.03
WPX1 LED P2	24W	0.20	0.12	0.10	0.09	0.07
WPX2	47W	0.39	0.23	0.20	0.17	0.14
WPX3	69W	0.58	0.33	0.29	0.25	0.20

Projected LED Lumen Maintenance

Data references the extrapolated performance projections in a 25°C ambient, based on 6,000 hours of LED testing (tested per IESNA LM-80-08 and projected per IESNA TM-21-11).

To calculate LLF, use the lumen maintenance factor that corresponds to the desired number of operating hours below. For other lumen maintenance values, contact factory.

Operating Hours	50,000	75,000	100,000
Lumen Maintenance Factor	>0.94	>0.92	>0.90

Lumen Output

Luminaire	Color Temperature	Lumen Output
WPX1 LED P1	3000K	1,537
	4000K	1,568
	5000K	1,602
WPX1 LED P2	3000K	2,748
	4000K	2,912
	5000K	2,954
WPX2	3000K	5,719
	4000K	5,896
	5000K	6,201
WPX3	3000K	8,984
	4000K	9,269
	5000K	9,393

Lumen Ambient Temperature (LAT) Multipliers

Use these factors to determine relative lumen output for average ambient temperatures from 0-50°C (32-122°F).

Ambient	Ambient	Lumen Multiplier
0°C	32°F	1.05
5°C	41°F	1.04
10°C	50°F	1.03
15°C	59°F	1.02
20°C	68°F	1.01
25°C	77°F	1.00
30°C	86°F	0.99
35°C	95°F	0.98
40°C	104°F	0.97

HID Replacement Guide

Luminaire	Equivalent HID Lamp	WPX Input Power
WPX1 LED P1	100W	11W
WPX1 LED P2	150W	24W
WPX2	250W	47W
WPX3	400W	69W

Emergency Egress Battery Packs

The emergency battery backup is integral to the luminaire — no external housing or back box is required. The emergency battery will power the luminaire for a minimum duration of 90 minutes and deliver minimum initial output of 550 lumens. Both battery pack options are CEC compliant.

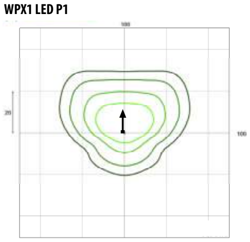
Battery Type	Minimum Temperature Rating	Power (Watts)	Controls Option	Ordering Example
Standard	0°C	4W	E4WH	WPX2 LED 40K MVOLT **E4WH** DDBXD
Cold Weather	-20°C	14W	E14WC	WPX2 LED 40K MVOLT **E14WC** DDBXD

Photometric Diagrams

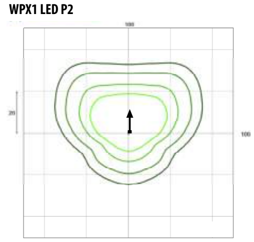
To see complete photometric reports or download .ies files for this product, visit the Lithonia Lighting WPX LED homepage. Tested in accordance with IESNA LM-79 and LM-80 standards

LEGEND
- 0.1 fc
- 0.2 fc
- 0.5 fc
- 1.0 fc

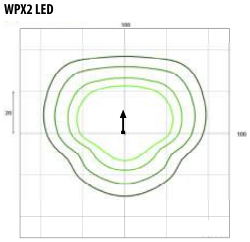
WPX1 LED P1



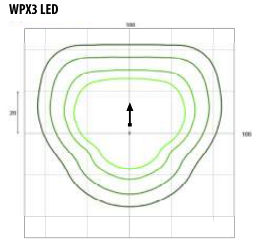
WPX1 LED P2



WPX2 LED



WPX3 LED



Mounting Height = 12 Feet.

DELTA STAR LED

IP66 RATED

DATE:	PROJECT:	TYPE:

CATALOG NUMBER LOGIC:

**Designed for use with LED transformer. Requires magnetic low voltage dimmer.*

***Please see Adjust-e-Lume photometry to determine desired intensity.*

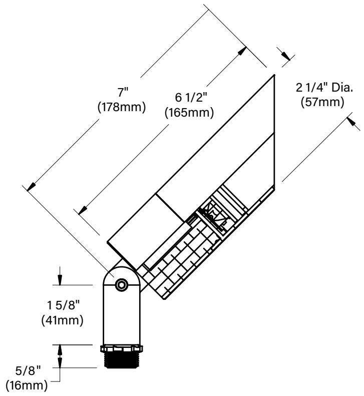
****The 360SL cost is already included in the price of UPM, UPM dual, and Power Canopy.*

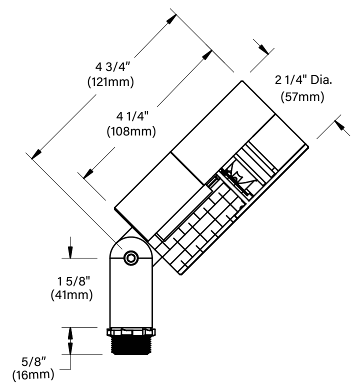
CATALOG NUMBER LOGIC	
Example: B - DS - LED - e64 - SP - A7 - BZP - 12 - 11 - A - 360SL	
MATERIAL	
(Blank) - Aluminum B - Brass S - Stainless Steel	
SERIES	
DS - Delta Star	
SOURCE	
LED - with Integral Dimming Driver (25W min. load when dimmed)*	
LED TYPE	
e64 - 7W LED/2700K	e66 - 7W LED/4000K
e65 - 7W LED/3000K	e74 - 7W LED/Amber
OPTICS	
NSP - Narrow Spot (13°)	MFL - Medium Flood (23°)
SP - Spot (16°)	WFL - Wide Flood (31°)
ADJUST-E-LUME® OUTPUT INTENSITY**	
A9 (Standard), A8, A7, A6, A5, A4, A3, A2, A1	
FINISH (See page 2 for full-color swatches)	
Standard Finishes (BZP, BZW, BLP, BLW, WHP, WHW, SAP, VER)	
Premium Finish (ABP, AMG, AQW, BCM, BGE, BPP, CAP, CMG, CRI, CRM, HUG, MDS, NBP, OCP, RMG, SDS, SMG, TXF, WCP, WIR)	
Also available in RAL Finishes	
Brass Finishes (MAC, POL, MIT)	
Stainless Steel Finishes (MAC, POL)	
LENS TYPE	
12 - Soft Focus	13 - Rectilinear
SHIELDING	
11 - Honeycomb Baffle	
CAP STYLE	
A - 45°	
B - 90°	
C - Flush Lens	
D - 45° Less Weephole (Interior use only)	
E - 90° Less Weephole (Interior use only)	
F - 90° with Flush Lens	
OPTIONS	
360SL - Knuckle Mounting System***	

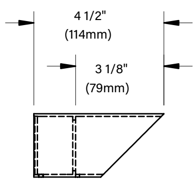
DELTA STAR LED

IP66 RATED

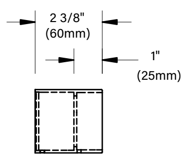
DATE:	PROJECT:	TYPE:



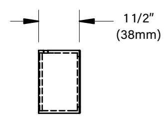




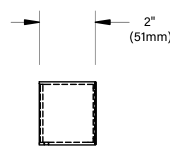
A/D CAP



B/E CAP



C CAP



F CAP

STANDARD FINISHES

Satin Black (BLP)	Satin Bronze (BZP)	Satin White (WHP)	Satin Aluminum (SAP)
Black Wrinkle (BLW)	Bronze Wrinkle (BZW)	White Wrinkle (WHW)	Verde (VER)

Click Here to view larger, full-color swatches of all available finishes on our website.

PREMIUM FINISHES

Cascade Mtn. Granite (CMG)	Rocky Mtn. Granite (RMG)	Sierra Mtn Granite (SMG)	Aleutian Mtn Granite (AMG)	Textured Forest (TXF)
Black Chrome (BCM)	Beige (BGE)	Weathered Copper (WCP)	Old Copper (OCP)	Hunter Green (HUG)
Cracked Ice (CRI)	Mojave Desert Sandstone (MDS)	Antique Brass Powder (ABP)	Brown Patina Powder (BPP)	Sonoran Desert Sandstone (SDS)
Weathered Iron (WIR)	Clear Anodized Powder (CAP)	Cream (CRM)	Antique White (AQW)	Natural Brass Powder (NBP)

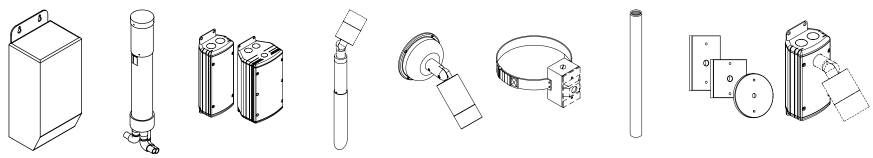
01/15/2020 SKU-739
SUB000930

DELTA STAR LED

IP66 RATED

DATE:	PROJECT:	TYPE:

Accessories (Configure separately)



TR Series | Power Pipe | UPMRM | Power Pipe | Power Canopy | Tree Strap | Stems | Canopies | UPM

SPECIFICATIONS

ELECTRICAL	WATTAGE	7W LED
	WIRING	XLPE, 18GA,150C, 600V, rated and certified to UL3321.
	REMOTE TRANSFORMER	For use with 12VAC remote transformer or magnetic transformers only. B-K Lighting cannot guarantee performance with third party manufacturers' transformers.
PHYSICAL	MATERIALS	Furnished in copper-free aluminum (6061-T6), brass (360) or stainless steel (304).
	BODY	Unibody design with enclosed, water-proof wireway and integral heat sink is fully machined from solid billet.
	KNUCKLE	LOCK Knuckle is integral to the body and features an interior taper machined from solid billet and a second, reverse angle taper allowing full 180° vertical adjustment without the use of aim-limiting serrated teeth. High temperature, silicone 'O' Ring provides water-tight seal and compressive resistance to maintain fixture position. Design withstands 73 lbs. static load prior to movement for optical alignment with a ½" pipe thread for mounting. Optional 360SL provides biaxial source control with 360° horizontal rotation in addition to vertical adjustment.
	CAP	Fully machined and accommodates two (2) lens or louver media.
	LENS	Shock-resistant, tempered glass lens is factory adhered to fixture cap and provides hermetically sealed optical compartment.
	LED	Integrated solid state system and modular design with electrical disconnects allow for easy field upgrade and maintenance. High power, forward throw source complies with ANSI C78.377 binning requirements and exceeds ENERGY STAR® lumen maintenance requirements. LM-80 certified components. Integral, constant current driver. 12VAC/VDC input. 50/60Hz. Proprietary input control scheme achieves power factor correction and eliminates inrush current (limited to <250mA non-dimming). Output, overvoltage, open-circuit, and short circuit protected. Conforms to Safety Std. C22.2 No. 250.13-12.
	DIMMING	Line voltage dimmable via magnetic low voltage dimmer with dedicated neutral conductor. Remote magnetic transformer with LED loads should be loaded to 25% of the transformer VA (watts) rated value.
	ADJUST-E-LUME	Integral electronics allow for dynamic lumen response at the individual fixture. Indexed (100% to 25% nom.) lumen output. Maintains output at desired level or may be changed. Specify factory preset output intensity.
	OPTICS	Interchangeable OPTIKIT modules permit optical field changes. Color-code: Narrow Spot (NSP) = red; Spot (SP) = green; Medium Flood (MFL) = yellow; Wide Flood (WFL) = blue.
	HARDWARE	Tamper-resistant, stainless steel hardware. LOCK aiming screw is black oxide treated for additional corrosion resistance.
	FINISH	StarGuard, our 15-stage chromate-free process cleans and conversion coats aluminum components prior to application of Class 'A' TGIC polyester powder coating and is RoHS compliant. Powder coat or metal finish options available for brass material and metal finish option only for stainless steel material.
	WARRANTY	5-year limited warranty.
	CERTIFICATION & LISTING	ITL tested to IESNA LM-79. UL Listed. Certified to CAN/CSA/ANSI Standards. RoHS compliant. Suitable for indoor or outdoor use, in wet locations, and for installation within 4' of the ground. IP66 Rated. Made in the USA with sustainable processes.

01/15/2020 SKU-739
SUB000930

LAMP & DRIVER DATA (e64, e65, e66, e74)

DATE:	PROJECT:	TYPE:

CATALOG NUMBER LOGIC:

DRIVER DATA	Input Volts	InRush Current	Operating	Dimmable	Operation Ambient Temperature
	12VAC/DC 50/60Hz	<250mA (non-dimmed)	700mA	Magnetic Low Voltage Dimmer	-22°F-194°F (-30°C - 90°C)

LM79 DATA				L70 DATA	OPTICAL DATA			
BK No.	CCT (Typ.)	CRI (Typ.)	Input Watts (Typ.)	Minimum Rated Life (hrs.) 70% of initial lumens (L_{70})	Angle	CBCP	Delivered Lumens	Multiplier
e64	2700K	80	7	50,000	13°	5993	456	0.87
	2700K	80	7	50,000	16°	4546	445	0.87
	2700K	80	7	50,000	23°	1726	397	0.87
	2700K	80	7	50,000	31°	1131	399	0.87
e65	3000K	80	7	50,000	13°	6131	466	0.89
	3000K	80	7	50,000	16°	4650	455	0.89
	3000K	80	7	50,000	23	1766	406	0.89
	3000K	80	7	50,000	31°	1157	409	0.89
e66	4000K	80	7	50,000	13°	6889	524	
	4000K	80	7	50,000	16°	5225	511	
	4000K	80	7	50,000	23°	1984	456	
	4000K	80	7	50,000	31°	1300	459	
e74	Amber	80	7	50,000	13°	3,927	299	0.57
	Amber	80	7	50,000	16°	2,978	291	0.57
	Amber	80	7	50,000	23°	1,131	260	0.57
	Amber	80	7	50,000	31°	741	262	0.57

OPTICS

Optic	Angle
NSP - Narrow Spot	13°
SP - Spot	16°
MFL - Medium Flood	23°
WFL - Wide Flood	31°

Application
The LED wall mounted luminaire has light output on one side. Arranged individually or in groups, this is a great design element for a host of lighting applications. For downlight applications only.

Materials
Luminaire housing constructed of die-cast and extruded marine grade, copper free (≤0.3% copper content) A360.0 aluminum alloy
Matte safety glass
High temperature silicone gasket
Mechanically captive stainless steel fasteners

NRTL listed to North American Standards, suitable for wet locations
Protection class IP65
Weight: 26.2 lbs

Electrical

Operating voltage	120-277V AC
Minimum start temperature	-30° C
LED module wattage	30.4 W
System wattage	36 W
Controllability	0-10V dimmable
Color rendering index	Ra > 80
Luminaire lumens	1399 lumens (3000K)
Lifetime at Ta = 15° C	>500,000 h (L70)
Lifetime at Ta = 45° C	229,000 h (L70)

LED color temperature

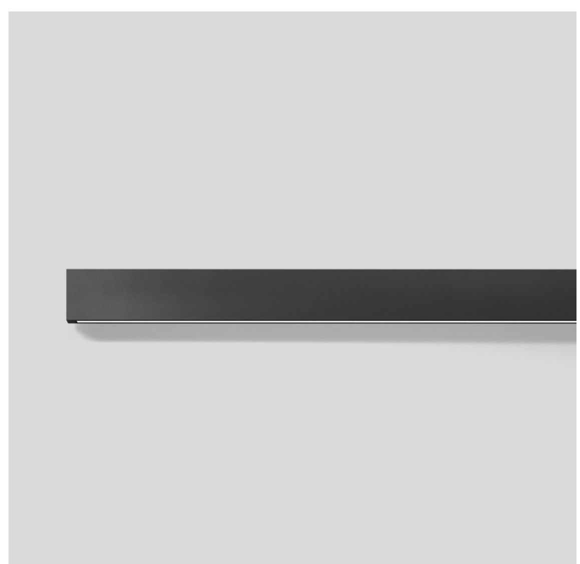
- ☐ 4000K - Product number + **K4**
- ☐ 3500K - Product number + **K35**
- ☐ 3000K - Product number + **K3**
- ☐ 2700K - Product number + **K27**

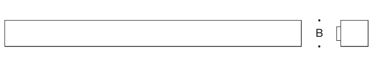
BEGA can supply you with suitable LED replacement modules for up to 20 years after the purchase of LED luminaires - see website for details

Finish
All BEGA standard finishes are matte, textured polyester powder coat with minimum 3 mil thickness.

Available colors			
	☐ Black (BLK)	☐ White (WHT)	☐ RAL:
	☐ Bronze (BRZ)	☐ Silver (SLV)	☐ CUS:

Type:
BEGA Product:
Project:
Modified:





LED wall luminaire · light output on one side

	LED	A	B	C	Required wiring box
44419	30.4 W	59 7/8	4 1/8	5	**19537**

BEGA 1000 BEGA Way, Carpinteria, CA 93013 (805) 684-0533 info@bega-us.com

Updated 09/10/18

S9

Type:
BEGA Product:
Project:
Modified:

Application
A very compact ceiling mounted downlight with partially frosted crystal glass. This luminaire is designed for down lighting atriums, canopies, passages and other interior and exterior locations.

Materials
Luminaire housing and faceplate constructed of die-cast marine grade, copper free (≤ 0.3% copper content) A360.0 aluminum alloy
Partially frosted crystal glass
Reflector made of pure anodized aluminum
High temperature silicone gasket

NRTL listed to North American Standards, suitable for wet locations
Protection class IP 65
Weight: 2.6 lbs

Electrical

Operating voltage	120-277 V AC
Minimum start temperature	-30° C
LED module wattage	4.8 W
System wattage	6.4 W
Controllability	0-10V dimmable
Color rendering index	Ra > 80
Luminaire lumens	591 lumens (4000K)
LED service life	60,000 h (L70)

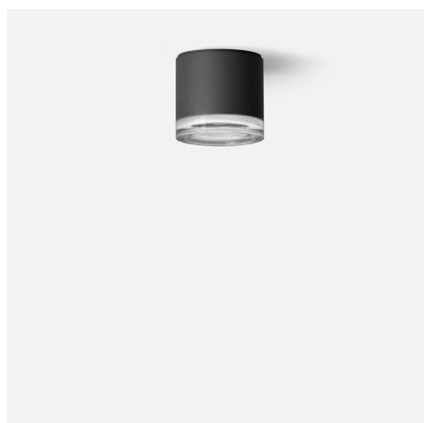
LED color temperature
☐ 4000K - Product number + **K4 (*EXPRESS*)**
☐ 3500K - Product number + **K35**
☐ 3000K - Product number + **K3 (*EXPRESS*)**
☐ 2700K - Product number + **K27**

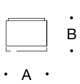
BEGA can supply you with suitable LED replacement modules for up to 20 years after the purchase of LED luminaires - see website for details

Finish
All BEGA standard finishes are matte, textured polyester powder coat with minimum 3 mil thickness.

Available colors	☐ Black (BLK)	☐ White (WHT)	☐ RAL:
	☐ Bronze (BRZ)	☐ Silver (SLV)	☐ CUS:

Available options
☐ **FSC** Fusing
☐ **MGU** Marine grade undercoat
See individual accessory spec sheet for details.





Surface mounted downlight · Partially frosted crystal glass

	LED	β	A	B
66 056	4.8 W	65°	4⅞	4⅝

β = Beam angle

BEGA 1000 BEGA Way, Carpinteria, CA 93013 (805) 684-0533 info@bega-us.com

Updated 06/25/20

American Beacon

The Proper Way to Light Your Flag!

An American Beacon Flagpole Lighting Package unites the patented Beacon Down Light with a Lifetime Pole Shaft Warranty from the industry's oldest and most recognized name in aluminum flagpoles… Concord American Flagpole.

The American Beacon is the most environmentally correct way to illuminate flags during night hours. For the first time, flags can be properly lit during nighttime hours without lighting adjoining property and the night sky. Patent #7,275,495.

- Minimize Light Pollution
- Rotates With The Flag, Focusing All Light On The Flag as the Wind Blows it Around the Flagpole
- Energy Efficient LED Bulbs Provide Years of Maintenance-Free Use
- Available for Flagpole Heights of 20' to 80'
- Residential Options Available
- Solar Packages Available
- Made in the USA

The Proper Way to Light Your Flag!

Official U.S. Flag Code
Section 2
A. "...when a patriotic effect is desired, the flag may be displayed twenty-four hours a day if properly illuminated during the hours of darkness."

Manufactured In USA

ETL LISTED US
Intertek
4010565
Conforms to UL STD 1598

International Dark Sky Association (IDA) is the recognized authority on light pollution and is the leading organization combating light pollution worldwide.

The IDA Device Seal of Approval was created to recognize a wide range of Dark Sky Friendly Technologies that aid in the mitigation of light pollution.

The American Beacon is certified by the International Dark Sky Association (IDA) as an IDA Approved Dark-Sky Friendly Fixture.

ida DARK SKY APPROVED darksky.org

IDA Approved Dark-Sky Friendly Fixture

S11

American Beacon – Internal Halyard Series

The American Beacon Internal Halyard Series provides lighting options for both Winch and Cam Cleat flagpoles systems in heights from 20' – 80'. These options provide the most environmentally correct way for flagpole illumination, properly lighting the flag during nighttime hours without lighting adjoining properties and the night sky!

- Internal Halyard 359° Revolving Truck
- 12 Volt System With Driver Contained Inside the Truck
- Warm White, 3000K LED Lights Rated for 25,000+ Hours
- 110V / 120V Input, 12 Volt Output
- Wire Provided For Flagpole Height Plus 10' (Flagpole Height To Be Provided in Part #)
- Standard 1-1/4" NPT Spindle
- Solar Options Available
- Standard 1/2"-13NC Top Drilling on Dual and Quad Internal Winch Models (5/8"-11NC Available Upon Request)

Patent #7,275,495

***** - Specifiy Finish Option**
SAT = Satin
BZT = BronzeTone Powder Coat
BLK = Black Powder Coat
WHT = White Powder Coat

Internal Halyard Beacon - Dual Light

Winch System - Wire Halyard

Flagpole Max Top Dia.	Description	Total Lumens	Beacon Size	Part Number	1+ Satin	1+ PowderCoat
Beacon						
3.5"	BEACON - Dual Light	500	6" Dia.	ABW2-##FS-***	$4,091	$4,206
4"	BEACON - Dual Light	500	8" Dia.	ABW2-##4S-***	$5,227	$5,342
Beacon Plus						
3.5"	BEACON PLUS - Dual Light	572	6" Dia.	ABW2-##FP-***	$4,634	$4,749
4"	BEACON PLUS - Dual Light	572	8" Dia.	ABW2-##4P-***	$5,227	$5,342

Example Part #: ABW2-30FS-SAT
American Beacon Internal Halyard Dual Light, 30' Flagpole, 3.5" Max Top Flagpole Diameter, Standard Beacon, Satin Finish

= Specifiy Flagpole Height (20, 25, 30 etc.)
***** = Specifiy Finish Option**

Beacon Plus - Dual Light
Illuminate the flag while at rest! The Internal Halyard, Dual Light Beacon Plus incorporates two vertical 2 Watt MR16 LED bulbs.

Internal Halyard Beacon - Quad Light

Winch System - Wire Halyard

Flagpole Max Top Dia.	Description	Total Lumens	Beacon Size	Part Number	1+ Satin	1+ PowderCoat
Beacon						
4"	BEACON - Quad Light	1000	8" Dia.	ABW4-##4S-***	$5,380	$5,495
Beacon Plus						
4"	BEACONPLUS-QuadLight	1072	8" Dia.	ABW4-##4P-***	$5,999	$6,114

Example Part #: ABW4-604P-BZT
American Beacon Internal Halyard Quad Light, 60' Flagpole, 4" Max Top Flagpole Diameter, Beacon Plus, BronzeTone Powder Coat Finish

= Specifiy Flagpole Height (20, 25, 30 etc.)
***** = Specifiy Finish Option**

Beacon Plus - Quad Light
Illuminate the flag while at rest! The Internal Halyard, Quad Light Beacon Plus incorporates two vertical 2 Watt MR16 LED bulbs.

Internal Halyard Cam Cleat Beacon

Rope Halyard - Cam Cleat System

- 8" Gold or Silver Anodized Ball Only
- Accepts up to 5/16" Rope Halyard

Flagpole Max Top Dia.	Ball Color	Description	Total Lumens	Beacon Size	Part Number	1+ Satin	1+ PowderCoat
Beacon							
3"	Gold	Cam Cleat BEACON	500	8" Dia.	ABCC-##3S-GLD-***	$3,582	$3,697
3.5"	Gold	Cam Cleat BEACON	500	8" Dia.	ABCC-##FS-GLD-***	$3,660	$3,775
4"	Gold	Cam Cleat BEACON	500	8" Dia.	ABCC-##4S-GLD-***	$4,508	$4,551
3"	Silver	Cam Cleat BEACON	500	8" Dia.	ABCC-##3S-SIL-***	$3,582	$3,697
3.5"	Silver	Cam Cleat BEACON	500	8" Dia.	ABCC-##FS-SIL-***	$3,660	$3,775
4"	Silver	Cam Cleat BEACON	500	8" Dia.	ABCC-##4S-SIL-***	$4,508	$4,623
Beacon Plus							
3"	Gold	Cam Cleat BEACON PLUS	572	8" Dia.	ABCC-##3P-GLD-***	$4,203	$4,318
3.5"	Gold	Cam Cleat BEACON PLUS	572	8" Dia.	ABCC-##FP-GLD-***	$4,160	$4,275
4"	Gold	Cam Cleat BEACON PLUS	572	8" Dia.	ABCC-##4P-GLD-***	$5,128	$5,243
3"	Silver	Cam Cleat BEACON PLUS	572	8" Dia.	ABCC-##3P-SIL-***	$4,203	$4,318
3.5"	Silver	Cam Cleat BEACON PLUS	572	8" Dia.	ABCC-##FP-SIL-***	$4,172	$4,286
4"	Silver	Cam Cleat BEACON PLUS	572	8" Dia.	ABCC-##4P-SIL-***	$5,128	$5,243

Example Part #: ABCC-25FS-GLD-BLK American Beacon Internal Halyard Cam Cleat, 25' Flagpole, 3.5" Max Top Flagpole Diameter, Standard Beacon, Gold Anodized Ball, Black Powder Coat Finish

= Specifiy Flagpole Height (20, 25, 30 etc.)
***** = Specifiy Finish Option**
(Specified Finishes Applied to Truck Only.)

Beacon Plus - Internal Cam Cleat
Illuminate the flag while at rest! The Internal Halyard Beacon Plus incorporates two vertical 2 Watt MR8 bulbs.

CONCORD AMERICAN FLAGPOLE

American Beacon – External Halyard Series

The American Beacon External Halyard Series provide lighting options for flagpole systems in heights from 20' – 50'. These options provide the most environmentally correct way for flagpole illumination, properly lighting the flag during nighttime hours without lighting adjoining properties and the night sky!

- External Halyard 359° Revolving Truck
- 12 Volt System With Driver Contained Inside the Ball
- Warm White, 3000K LED Lights Rated for 25,000+ Hours
- 110V / 120V Input, 12 Volt Output
- Wire Provided For Flagpole Height Plus 10' (Flagpole Height To Be Provided in Part #)
- Standard, 1-1/4" NPT Spindle
- Solar Options Available
- Double Truck Systems are NOT Available

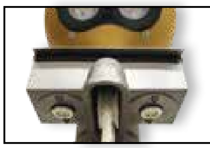
Patent #7,275,495

***** - Specifiy Finish Option**
SAT = Satin
BZT = BronzeTone Powder Coat
BLK = Black Powder Coat
WHT = White Powder Coat

External Halyard Beacon - Standard

Rope Halyard - Revolving - Spindle Truck

Flagpole Top Dia.	Ball Color	Description	Total Lumens	Beacon Dia.	Part Number	1+ Satin	1+ PowderCoat
			Beacon				
3.5"	Gold	External Halyard BEACON - Standard	500	8"	ABES-##FS-GLD-***	$2,021	$2,136
3.5"	Silver	External Halyard BEACON - Standard	500	8"	ABES-##FS-SIL-***	$2,039	$2,154
			Beacon Plus				
3.5"	Gold	Ext. Halyard BEACON PLUS - Standard	572	8"	ABES-##FP-GLD-***	$2,660	$2,775
3.5"	Silver	Ext. Halyard BEACON PLUS - Standard	572	8"	ABES-##FP-SIL-***	$2,660	$2,775



Beacon Plus - Standard External
Illuminate the flag while at rest! The Standard External Halyard Beacon Plus incorporates two vertical 2 Watt MR8 bulbs.

Example Part #: ABES-30FS-GLD-SAT
American Beacon External Halyard (Standard), 30' Flagpole, 3.5" Max Top Flagpole Diameter, Standard Beacon, Gold Anodized Ball, Satin Finish

= Specifiy Flagpole Height (20, 25, 30 etc.)
***** = Specifiy Finish Option**
(Specified Finishes Applied to Truck Only.)

External Halyard Beacon - Heavy-Duty

Rope Halyard - Revolving - Spindle Truck

Flagpole Top Dia.	Ball Color	Description	Total Lumens	Beacon Size	Part Number	1+ Satin	1+ PowderCoat
			Beacon				
5"	Gold	Ext. Halyard BEACON - Heavy-Duty	500	8" Dia.	ABEH-##5S-GLD-***	$3,370	$3,485
5"	Silver	Ext. Halyard BEACON - Heavy-Duty	500	8" Dia.	ABEH-##5S-SIL-***	$3,370	$3,485
			Beacon Plus				
5"	Gold	Ext. Halyard BEACON PLUS - Heavy-Duty	572	8" Dia.	ABEH-##5P-GLD-***	$3,987	$4,102
5"	Silver	Ext. Halyard BEACON PLUS - Heavy-Duty	572	8" Dia.	ABEH-##5P-SIL-***	$3,987	$4,102

Beacon Plus - Heavy-Duty External
Illuminate the flag while at rest! The Heavy-Duty External Halyard Beacon Plus incorporates two vertical 2 Watt MR8 bulbs.

Example Part #: ABEH-505P-SIL-BZT
American Beacon Heavy-Duty External Halyard, 50' Flagpole, 5" Max Top Flagpole Diameter, Beacon Plus, Silver Anodized Ball, BronzeTone Powder Coat Finish

= Specifiy Flagpole Height (20, 25, 30 etc.)
***** = Specifiy Finish Option**
(Specified Finishes Applied to Truck Only.)

Outrigger Stationary Beacon

Rope Halyard - Stationary - Cap Style Truck

Flagpole Top Dia.	Ball Color	Description	Total Lumens	Beacon Size	Part Number	1+ Satin	1+ PowderCoat
			Beacon				
2"	Gold	Outrigger Stationary Beacon	500	8" Dia.	ABOS-202S-GLD-***	$2,063	$2,178
2.5"	Gold	Outrigger Stationary Beacon	500	8" Dia.	ABOS-20DS-GLD-***	$2,063	$2,178

Example Part #: ABOS-20DS-GLD-SAT
American Beacon Outrigger Stationary Truck, 20' Flagpole, 2.5" Top Flagpole Diameter, Standard Beacon, Gold Anodized Ball, Satin Finish

Standard wire length on the Outrigger Stationary Beacon is 30'.
***** = Specifiy Finish Option**
(Specified Finishes Applied to Truck Only.)

CONCORD AMERICAN FLAGPOLE

American Beacon – Residential Series

The American Beacon Residential Series offers lighting options for External Halyard flagpoles in both Revolving and Stationary designs. These options provide the most environmentally correct way for flagpole illumination, properly lighting the flag during nighttime hours without lighting adjoining properties and the night sky!

- Revolving Option - External Halyard 359° Revolving Cap Style Truck
- 110 Volt System With Driver Contained Inside the Ball
- Can Be Converted to 12V for Solar Power Options
- Warm White, 3000K LED Light Rated for 25,000+ Hours
- 110V / 120V Input, 12 Volt Output
- Revolving Option - Wire Provided For Flagpole Height Plus 10' (Stationary Option Wire Length is 30')

Patent #7,275,495

***** - Specifiy Finish Option**
SAT = Satin
BZT = BronzeTone Powder Coat
BLK = Black Powder Coat
WHT = White Powder Coat

Residential Revolving Beacon

Rope Halyard - Revolving - Cap Style Truck

Flagpole Top Dia.	Ball Color	Description	Total Lumens	Beacon Dia.	Part Number	1+ Satin	1+ PowderCoat
1.875"-2"	Gold	Residential Revolving Beacon	250	5" Dia.	ABRR-##2S-GLD-***	$969	$1,084
1.875"-2"	Silver	Residential Revolving Beacon	250	5" Dia.	ABRR-##2S-SIL-***	$969	$1,084

= Specifiy Flagpole Height (20, 25, etc.)
***** = Specifiy Finish Option**
(Specified Finishes Applied to Truck Only.)

Residential Stationary Beacon

Rope Halyard - Stationary - Cap Style Truck

Flagpole Top Dia.	Description	Total Lumens	Beacon Dia.	Part Number	1+ Satin	1+ PowderCoat
Gold						
1.875"-2"	Residential Stationary Beacon	250	5" Dia.	ABRS-##2S-GLD-***	$588	$703
2.5"	Residential Stationary Beacon	250	5" Dia.	ABRS-##DS-GLD-***	$690	$805
3"	Residential Stationary Beacon	250	5" Dia.	ABRS-##3S-GLD-***	$713	$828
Silver						
1.875"-2"	Residential Stationary Beacon	250	5" Dia.	ABRS-##2S-SIL-***	$588	$703
2.5"	Residential Stationary Beacon	250	5" Dia.	ABRS-##DS-SIL-***	$690	$805
3"	Residential Stationary Beacon	250	5" Dia.	ABRS-##3S-SIL-***	$713	$828

= Specifiy Flagpole Height (20, 25, etc.)
***** = Specifiy Finish Option**
(Specified Finishes Applied to Truck Only.)

Solar Power Package

Wattage	Panel Dimensions	Max Power Voltage	Max Power Current	Open Current Voltage	Part Number	1+
20W	470mm x 430mm x 17mm	17.3V	1.16A	21.4V	ABSP-2000	$3,191
30W	360mm x 678mm x 25mm	18.25V	1.64A	21.96V	ABSP-3000	$3,383
40W	678mm x 500mm x 25mm	18.25V	2.19A	21.96V	ABSP-4000	$3,520

The American Beacon Solar Power Package includes one Solar Power Collector (20W, 30W, or 40W), one Battery Pack (9Ah, 12Ah, or 15Ah), and one Solar Power Pole Mount. Designed for use with our 12V Solar American Beacon designs (sold separately), this package allows for the proper illumination of the flag without the additional power expense.

Solar Power Pole Mount

- Used to attach a solar panel to the side of a flagpole
- Ultra-light and strong 5052 Aluminum

Solar Power Collector

- Panel Material – Monocrystalline High Efficiency Photovoltaic
- High Conversion Efficiency
- Low Power Tolerance of 0~+3%
- Low Degradation Under Light Exposure
- Withstands High Wind-Pressure, Snow Loads and Extreme Temperatures
- ISO 9001:2008 (Quality Management System) Certified Factory
- IEC61215, IEC61730, MCS CEC Certified Products
- TUV, CE Conformity

Solar Power Battery

- 3.2V 3000mAh Lithium Iron Phosphate Batteries
- Automatic Cell Balancing
- External on/off switch (Off: For shipping and storage. On: Fully automatic mode)
- Dusk to Dawn Auto-Switching Function
- All units field tested
- Internally fused: 1 Amp

COMcheck Software Version COMcheckWeb
Exterior Lighting Compliance Certificate

Project Information

Energy Code:	90.1 (2019) Standard
Project Title:	Frog Pond ES
Project Type:	New Construction
Exterior Lighting Zone	2 (Residential mixed use area (LZ2))

Construction Site:	Owner/Agent:	Designer/Contractor:

Allowed Exterior Lighting Power

A Area/Surface Category	B Quantity	C Allowed Watts /	D Tradable Wattage	E Allowed Watts (B X C)
Parking area	27530 ft2	0.04	Yes	1101
Driveway	31280 ft2	0.04	Yes	1251
Entry canopy	1952 ft2	0.25	Yes	488
Plaza area	9498 ft2	0.1	Yes	950
Walkway >= 10 feet wide	23375 ft2	0.1	Yes	2338
Walkway < 10 feet wide	1859 ft of	0.5	Yes	930
Emergency services, loading area	1399 ft2	0.35	No	490
			Total Tradable Watts (a) =	7057
			Total Allowed Watts =	7547
			Total Allowed Supplemental Watts (b) =	400

(a) Wattage tradeoffs are only allowed between tradable areas/surfaces.

(b) A supplemental allowance equal to 400 watts may be applied toward compliance of both non-tradable and tradable areas/surfaces.

Proposed Exterior Lighting Power

A Fixture ID : Description / Lamp / Wattage Per Lamp / Ballast	B Lamps/ Fixture	C # of Fixture	D Fixture Watt.	E (C X D)
Parking area (27530 ft2): Tradable Wattage				
S1C/S1C-HS: Other:	1	6	38	228
S6: Other:	1	2	7	14
Driveway (31280 ft2): Tradable Wattage				
S1C/S1C-HS: Other:	1	12	38	456
Entry canopy (1952 ft2): Tradable Wattage				
S9: Other:	1	3	36	108
S10: Other:	1	8	6	51
Plaza area (9498 ft2): Tradable Wattage				
S11: Other:	1	3	12	36
S2B: Other:	1	2	38	76
Walkway >= 10 feet wide (23375 ft2): Tradable Wattage				
S2C: Other:	1	6	25	150
S4: Other:	1	20	20	410
Walkway < 10 feet wide (1859 ft of walkway length): Tradable Wattage				

A Fixture ID : Description / Lamp / Wattage Per Lamp / Ballast	B Lamps/ Fixture	C # of Fixture	D Fixture Watt.	E (C X D)
S2A/S2A-HS: Other:	1	23	25	575
Emergency services, loading area (1399 ft2): Non-tradable Wattage				
S5: Other:	1	5	24	120
			Total Tradable Proposed Watts =	2104

Exterior Lighting PASSES: Design 72% better than code

Exterior Lighting Compliance Statement

Compliance Statement: The proposed exterior lighting design represented in this document is consistent with the building plans, specifications, and other calculations submitted with this permit application. The proposed exterior lighting systems have been designed to meet the 90.1 (2019) Standard requirements in COM*check* Version COMcheckWeb and to comply with any applicable mandatory requirements listed in the Inspection Checklist.

Jamie Tills		01/13/2023
Name - Title	Signature	Date

Requirements: 15.0% were addressed directly in the COM*check* software

Text in the "Comments/Assumptions" column is provided by the user in the COMcheck Requirements screen. For each requirement, the user certifies that a code requirement will be met and how that is documented, or that an exception is being claimed. Where compliance is itemized in a separate table, a reference to that table is provided.

Section # & Req.ID	Plan Review	Complies?	Comments/Assumptions
4.2.2, 8.4.1.1, 8.4.1.2, 8.7 [PR6][2]	Plans, specifications, and/or calculations provide all information with which compliance can be determined for the electrical systems and equipment and document where exceptions are claimed. Feeder connectors sized in accordance with approved plans and branch circuits sized for maximum drop of 3%.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	
9.7 [PR8][1]	Plans, specifications, and/or calculations provide all information with which compliance can be determined for the exterior lighting and electrical systems and equipment and document where exceptions to the standard are claimed. Information provided should include exterior lighting power calculations, wattage of bulbs and ballasts, transformers and control devices.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	Requirement will be met. **Location on plans/spec:** See luminaire schedule.

Additional Comments/Assumptions:

1	High Impact (Tier 1)	2	Medium Impact (Tier 2)	3	Low Impact (Tier 3)

Section # & Req.ID	Rough-In Electrical Inspection	Complies?	Comments/Assumptions
8.4.2 [EL10][2]	At least 50% of all 125 volt 15- and 20-Amp receptacles are controlled by an automatic control device.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	
8.4.3 [EL11][2]	New buildings have electrical energy use measurement devices installed. Where tenant spaces exist, each tenant is monitored separately. In buildings with a digital control system the energy use is transmitted to to control system and displayed graphically.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	
9.4.1.4 [EL3][2]	Automatic lighting controls for exterior lighting installed.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	Requirement will be met. **Location on plans/spec:** See LU4003.
9.4.1.4d [EL21][2]	Outdoor parking area luminaires >= 78W and <= 24 ft height controlled to reduce wattage by 50% when area unoccupied over 15 minutes. Controlled power limited to <= 1500W.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	**Exception:** Requirement does not apply.

Additional Comments/Assumptions:

1	High Impact (Tier 1)	2	Medium Impact (Tier 2)	3	Low Impact (Tier 3)

Section # & Req.ID	Final Inspection	Complies?	Comments/Assumptions
9.4.2 [FI19][1]	Exterior lighting power is consistent with what is shown on the approved lighting plans, demonstrating proposed watts are less than or equal to allowed watts.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	*See the Exterior Lighting fixture schedule for values.*

Additional Comments/Assumptions:

1	High Impact (Tier 1)	2	Medium Impact (Tier 2)	3	Low Impact (Tier 3)