FROELICH ENGINEERS

Land Use Stormwater Drainage Report

Springdale Fire Station Improvements

31727 East Historic Columbia River Highway; Troutdale, OR 97019

For

Corbett Fire District

Regular maintenance and inspection are required on all components of the stormwater system. This plan provides instructions on how to maintain and inspect the system.

Prepared by: Evan Eykelbosch, PE
Froelich Engineers
17700 SW Upper Boones Ferry Rd, Suite 115
Portland, OR 97224
Froelich Project Number: 23-C021
Date: July 18, 2025

Contents

I. Project Overview and Description

Existing Conditions

The existing site is located at 31727 East Historic Columbia River Highway (See Appendix A: Vicinity Map). The site is partially developed with a single fire truck garage and parking lot on the southern end of the site and a large undeveloped grass field on the northern half of the site. A retaining wall and a sloped hillside separate the north and south ends of the site. The site drains to the south. Along the southern property line is the East Historic Columbia River Highway, owned by ODOT. Within the street is a public stormwater system. This stormwater main crosses the road just west of our site and discharges into Springdale Creek.

Proposed Conditions

The proposed development includes a new fire truck garage and parking lot. A new retaining wall will be constructed that pushes into the hillside to create sufficient space for the development of the site. Site improvements will include new concrete, asphalt, gravel and landscaped surfaces. In addition, some areas of existing impervious surface are being removed, resulting in a net reduction of impervious area when comparing existing conditions and proposed conditions. See Table 1 and Appendix B: Basin Maps.

II. Methodology

Stormwater Requirements

Multnomah County is the jurisdiction with authority over the stormwater requirements for this site. Per Multnomah County Zone Code Section 39.4575(F)(2), “Stormwater /drainage control systems are required for new impervious surfaces greater than 500 square feet in area. The system shall be adequate to ensure that the rate of runoff from the lot for 10 year 24-hour storm event is not greater than that before the development.” Our understanding is that this refers to the increase in total impervious area of the site. Therefore, because the site has a net reduction of the impervious area between the existing condition and the proposed conditions, no stormwater management requirements (treatment or detention) are triggered. The project will provide conveyance for the new impervious areas as well as some of the existing areas.

Due to the stormwater system being located within the ODOT right-of-way, ODOT has additional detention requirements for the site. ODOT requires the post-development 50-year storm peak runoff not exceed the existing 50-year storm peak runoff. Because the site has a net decrease in the impervious area, this site meets the runoff requirements. (See Table 2 & 3 below)

Proposed Stormwater System

The proposed development will include a new fire truck garage, a courtyard, a paved service/parking area, and a graveled service/parking area. These areas will be collected within a series of area drains and downspouts. The runoff will be conveyed into a system of stormwater pipes, which will be routed into a public catch basin located along the East Historic Columbia River Highway. The site improvements are limited to Basin B. Runoff from “Subbasin B-1” is collected and conveyed through a buried 4” diameter stormwater pipe. Runoff from “Subbasin B-2” surface flows south toward the street (See Appendix B: Basin Areas). The total impervious area runoff decreases; therefore, there are no treatment or detention requirements. See Appendix F: Utility Plan/Details.

Stormwater conveyance is designed to accommodate the 50-year stormwater event. See Appendix D: Conveyance Calculations and Appendix B: Basin Areas for the indicated subbasins.

Columbia West completed infiltration testing, and it was determined that, due to high groundwater and poor infiltration, infiltration for disposal would not be acceptable on this site. See Appendix E: Geotechnical Report.

III. Analysis

Table 1a:
Existing Conditions

Basins	Pervious		Impervious		total		Flow Q (50yr)
	sf	ac	sf	ac	sf	ac	cfs
Basin A	11,576	0.266	400	0.009	11,976	0.275	0.20
Basin B	476	0.011	7,948	0.182	8,424	0.193	0.22
total =	12,052		8,348		20,400		0.42

Table 1b:
Proposed Conditions

Basins	Pervious		Impervious		total		Flow Q (50yr)
	sf	ac	sf	ac	sf	ac	cfs
Basin A	9,307	0.214	0	0.000	9,307	0.214	0.15
Basin B	3,116	0.072	7,977	0.183	11,093	0.255	0.26
total =	12,423		7,977		20,400		0.41

Table 2:
Stormwater Flow Rate Table

Sub-Basins	Pervious		Impervious		total		Flow Q (50yr)
	sf	ac	sf	ac	sf	ac	cfs
SubBasin B-1	1,832	0.042	3,444	0.079	5,276	0.121	0.12
SubBasin B-2	1,284	0.029	4,533	0.104	5,817	0.134	0.14

Table 3: Stormwater Conveyance

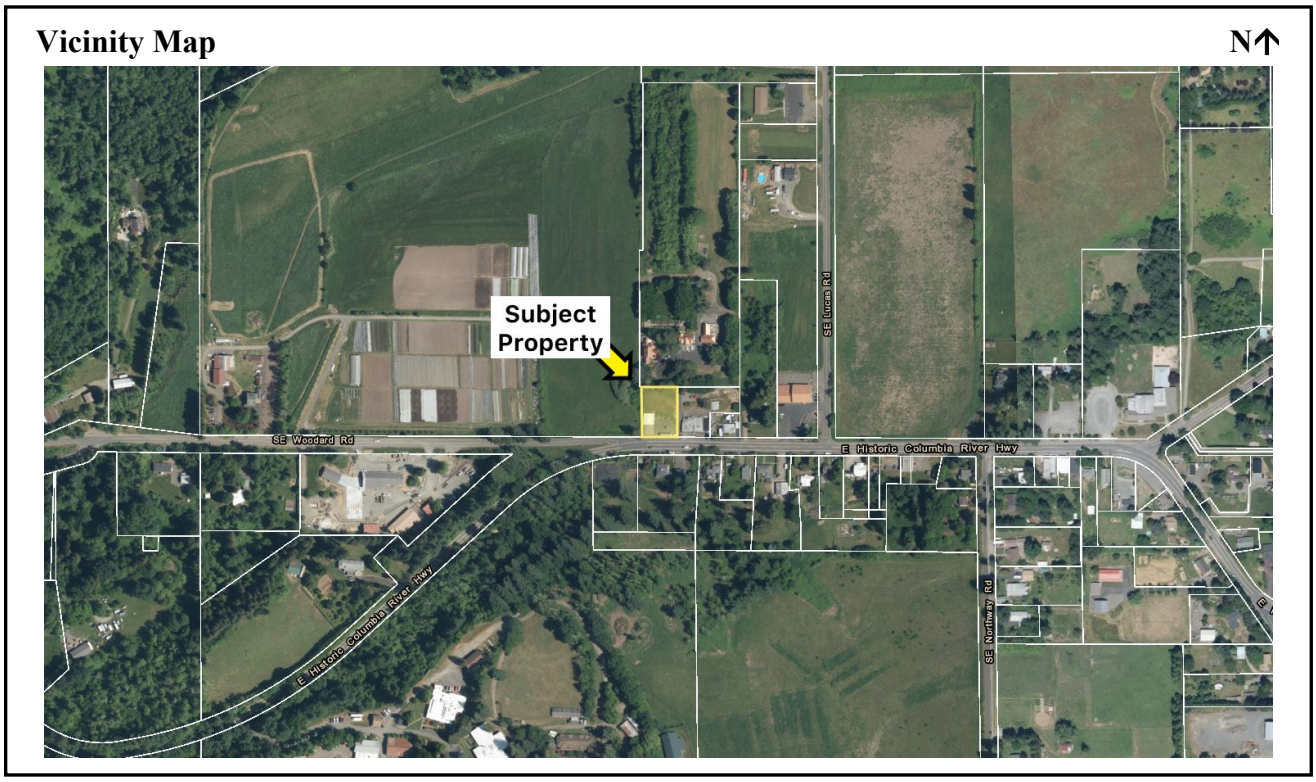
Peak Flow Rate (cfs) for a 24-hour Storm Event	
50-yr Existing	**50-yr Proposed**
0.42 cfs	0.41 cfs

IV. Engineering Conclusion

The proposed design meets and exceeds the requirements for stormwater management set forth by Multnomah County.

V. Appendices

Appendix A: Vicinity Map



Appendix B: Basin Maps

EXISTING CONDITION

SCALE 1 INCH = 10 FEET
10 0 10 20

FROELICH ENGINEERS
CIVIL · STRUCTURAL
Portland, OR. | Bend, OR. | Denver, CO.
(503) 624-7005

PRELIMINARY NOT FOR CONSTRUCTION

SPRINGDALE FIRE STATION IMPROVEMENTS

31727 EAST HISTORIC COLUMBIA RIVER HWY
TROUTDALE, OR, 97019

LAND USE SET

REV	DATE	ISSUE TITLE

PROJECT MANAGER:	EME
DESIGNER:	EME
DRAWN BY:	EEYKELBOSCH
PROJECT NO:	----
DATE:	10/11/24
SCALE:	AS SHOWN

SHEET TITLE:
EXISTING CONDITIONS

SHEET NUMBER:
C1.01
LAND USE SET

File: P:\2023\23-C021 (Springdale Fire Station Improvements)\300 Document Development - Froelich\302 CAD\PLOT\23_C021_C1.00_COVR.dwg TAB C1.01
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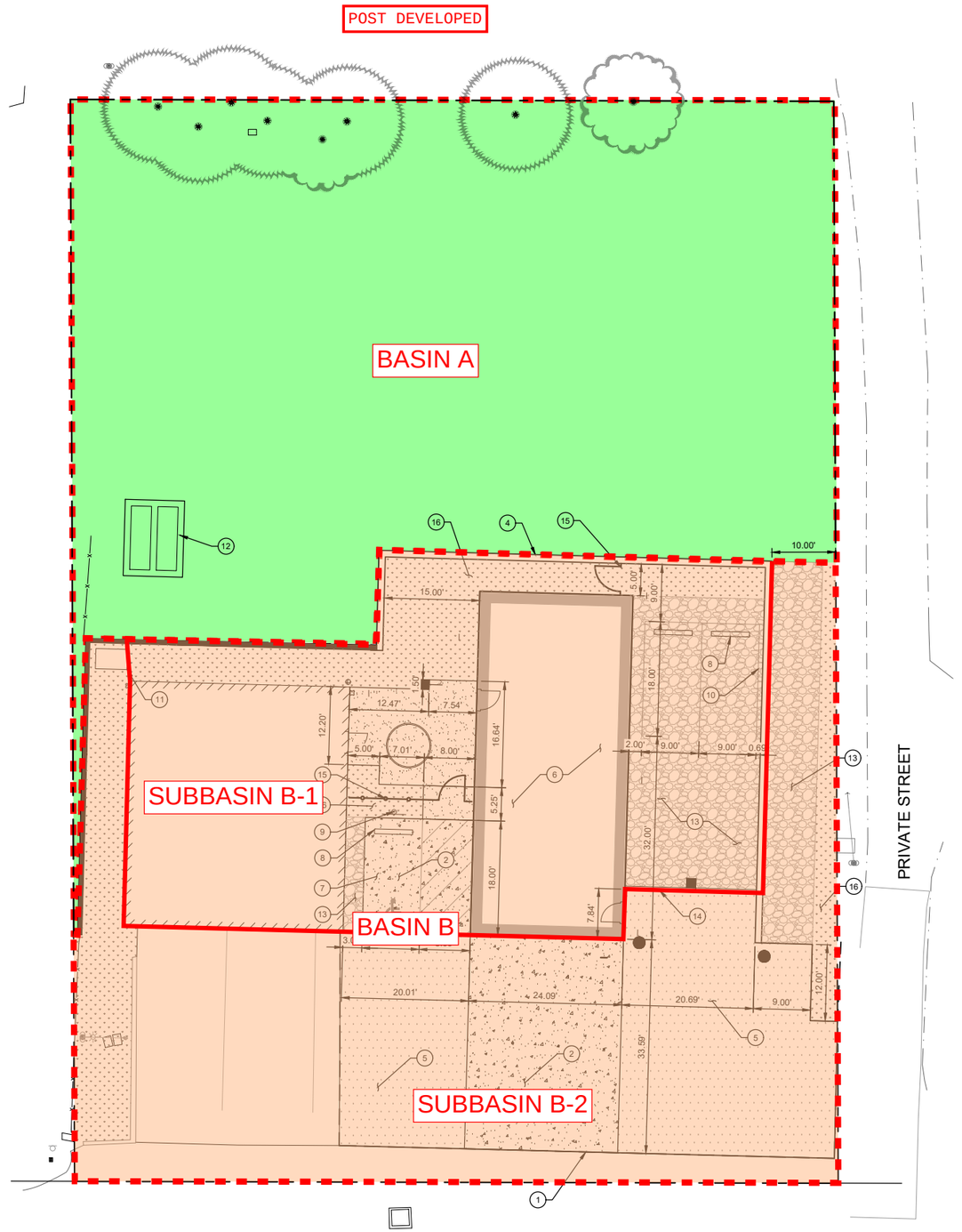

KEY NOTES

1 SAWCUT LINE
2 HEAVY CONCRETE
3 STANDARD CONCRETE
4 RETAINING WALL PER STRUCTURAL PLANS
5 ASPHALT PAVEMENT
6 PROPOSED BUILDING PER ARCHITECTURAL PLANS
7 ADA PARKING STALL
8 WHEEL STOP
9 ADA SIGN
10 PARKING STALL STRIPING
11 GENERATOR, BY OTHERS
12 PROPANE TANKS, BY OTHERS
13 GRAVEL
14 FLUSH CONCRETE CURB (0" EXPOSURE)
15 FENCE AND GATE PER ARCHITECTURAL PLANS
16 LANDSCAPING, BY OTHERS

SHEET LEGEND

PROPERTY LINE
CONCRETE SIDEWALK
STANDARD ASPHALT PAVEMENT
HEAVY CONCRETE
GRAVEL
LANDSCAPING (BY OTHERS)

SCALE 1 INCH = 10 FEET
10 0 10 20

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(503) 624-7005

PRELIMINARY NOT FOR CONSTRUCTION

SPRINGDALE FIRE STATION IMPROVEMENTS

3172? EAST HISTORIC COLUMBIA RIVER HWY
TROUTDALE, OR, 97019

LAND USE SET

REV	DATE	ISSUE TITLE

PROJECT MANAGER: EME
DESIGNER: EME
DRAWN BY: EEYKELBOSCH
PROJECT NO: ---
DATE: 10/11/24
SCALE: AS SHOWN

SHEET TITLE:
SITE PLAN

SHEET NUMBER:
C2.00
LAND USE SET

File: P:\2023\23-C021 (Springdale Fire Station Improvements)\300 Document Development - Froelich\302 CAD\PLOT\23_C021_C2.00_SITE.dwg TAB:C2.00
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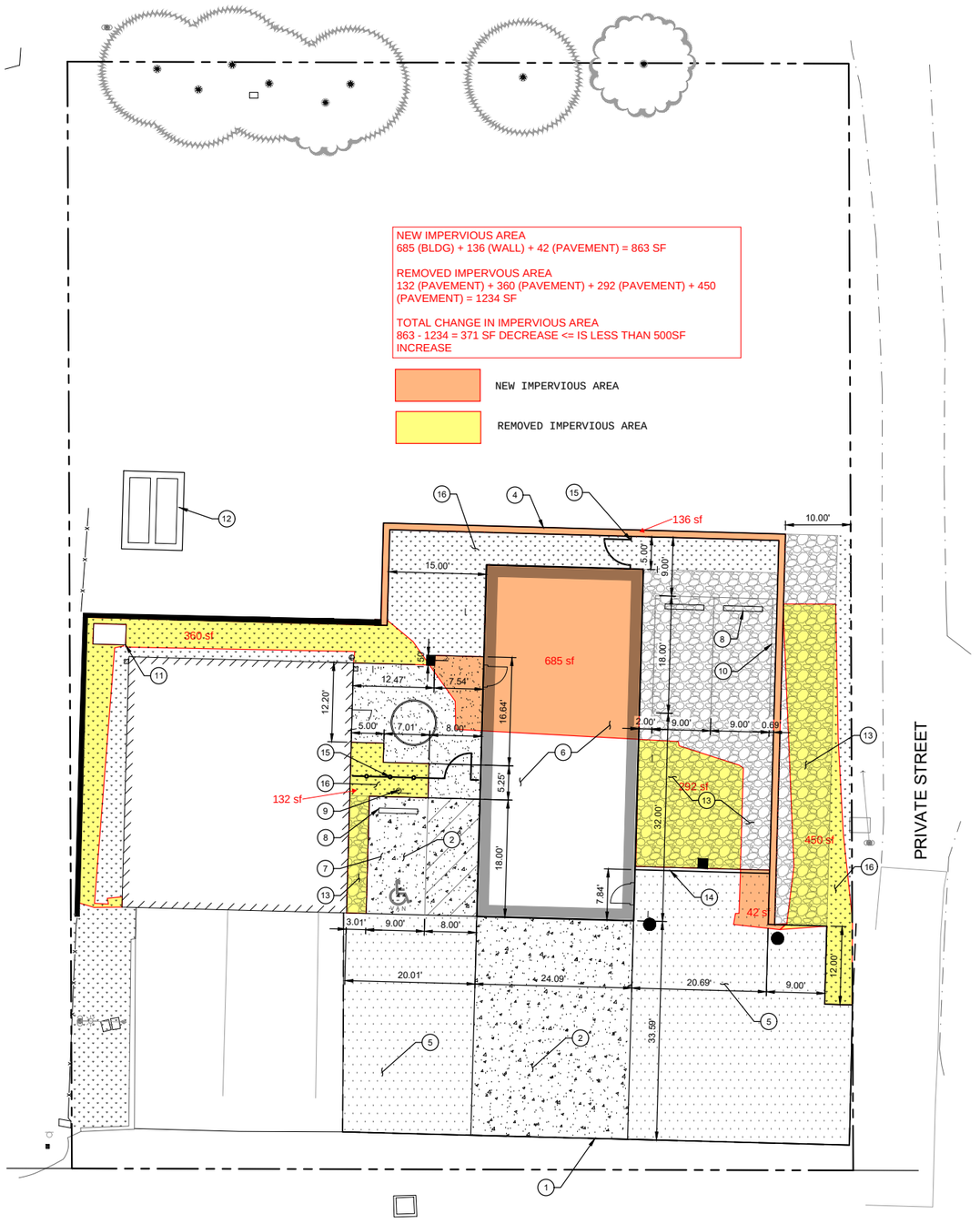

KEY NOTES

1. SAWCUT LINE
2. HEAVY CONCRETE
3. STANDARD CONCRETE
4. RETAINING WALL PER STRUCTURAL PLANS
5. ASPHALT PAVEMENT
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PRELIMINARY NOT FOR CONSTRUCTION

SPRINGDALE FIRE STATION IMPROVEMENTS

31727 EAST HISTORIC COLUMBIA RIVER HWY
TROUTDALE, OR. 97019

LAND USE SET

REV	DATE	ISSUE TITLE

PROJECT MANAGER:	EME
DESIGNER:	EME
DRAWN BY:	ATOMLINSON
PROJECT NO:	---
DATE:	10/11/24
SCALE:	AS SHOWN

SHEET TITLE:
SITE PLAN

SHEET NUMBER:
C2.00
LAND USE SET

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Plotted: 3/18/25 at 2:01pm By: atomlinson

Appendix C: Assumptions

Santa Barbara Unit Hydrograph (SBUH) Assumptions:

(used for Water Quality, Flow Control, Conveyance)

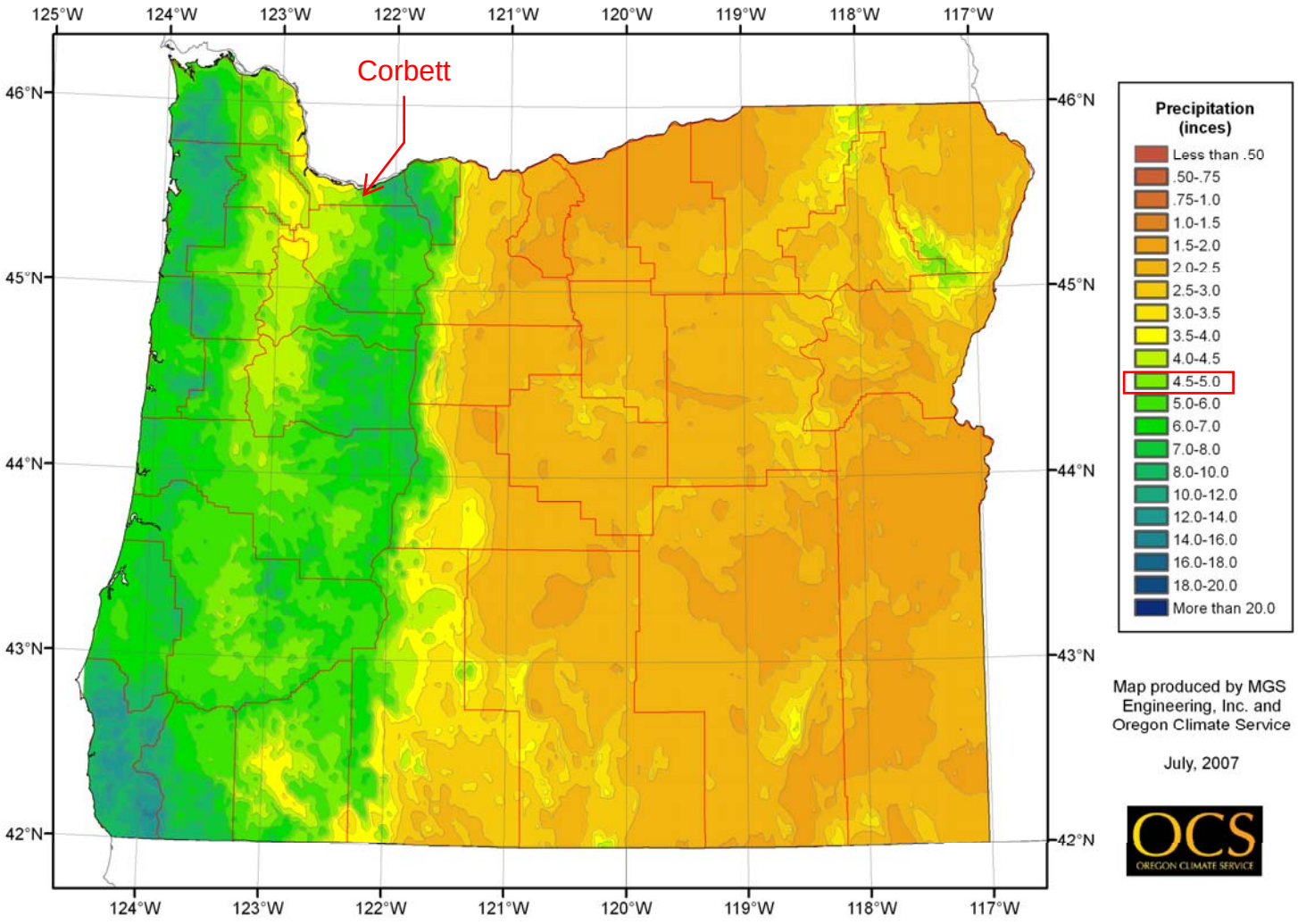
Water Quality (WQ) Storm Event =	1.5	in/24-hours per ODOT Hydraulics Manual
2-year Storm Event=	3.0	in/24-hours per ODOT Hydraulics Manual
10-year Storm Event=	4.0	in/24-hours per ODOT Hydraulics Manual
50-year Storm Event=	5.0	in/24-hours per ODOT Hydraulics Manual

Time of Concentration	**5.0**	minutes
Roughness Coefficient	**0.013**	

Curve Number Assumptions:

Impervious Area =	**98**	
Pervious Area =	**81**	Pre-Developed

24-hour 50-year Precipitation, Oregon



Map produced by MGS Engineering, Inc. and Oregon Climate Service

July, 2007

OCS
OREGON CLIMATE SERVICE

Appendix D: Conveyance Calculations

Existing Conditions

Basins	Pervious		Impervious		total		Flow Q (50yr)
	sf	ac	sf	ac	sf	ac	cfs
Basin A	11,576	0.266	400	0.009	11,976	0.275	0.20
Basin B	476	0.011	7,948	0.182	8,424	0.193	0.22
total =	12,052		8,348		20,400		

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Basins	Pervious		Impervious		total		Flow Q (50yr)
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Basin A	9,307	0.214	0	0.000	9,307	0.214	0.15
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Sub-Basins	Pervious		Impervious		total		Flow Q (50yr)
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SubBasin B-1	1,832	0.042	3,444	0.079	5,276	0.121	0.12
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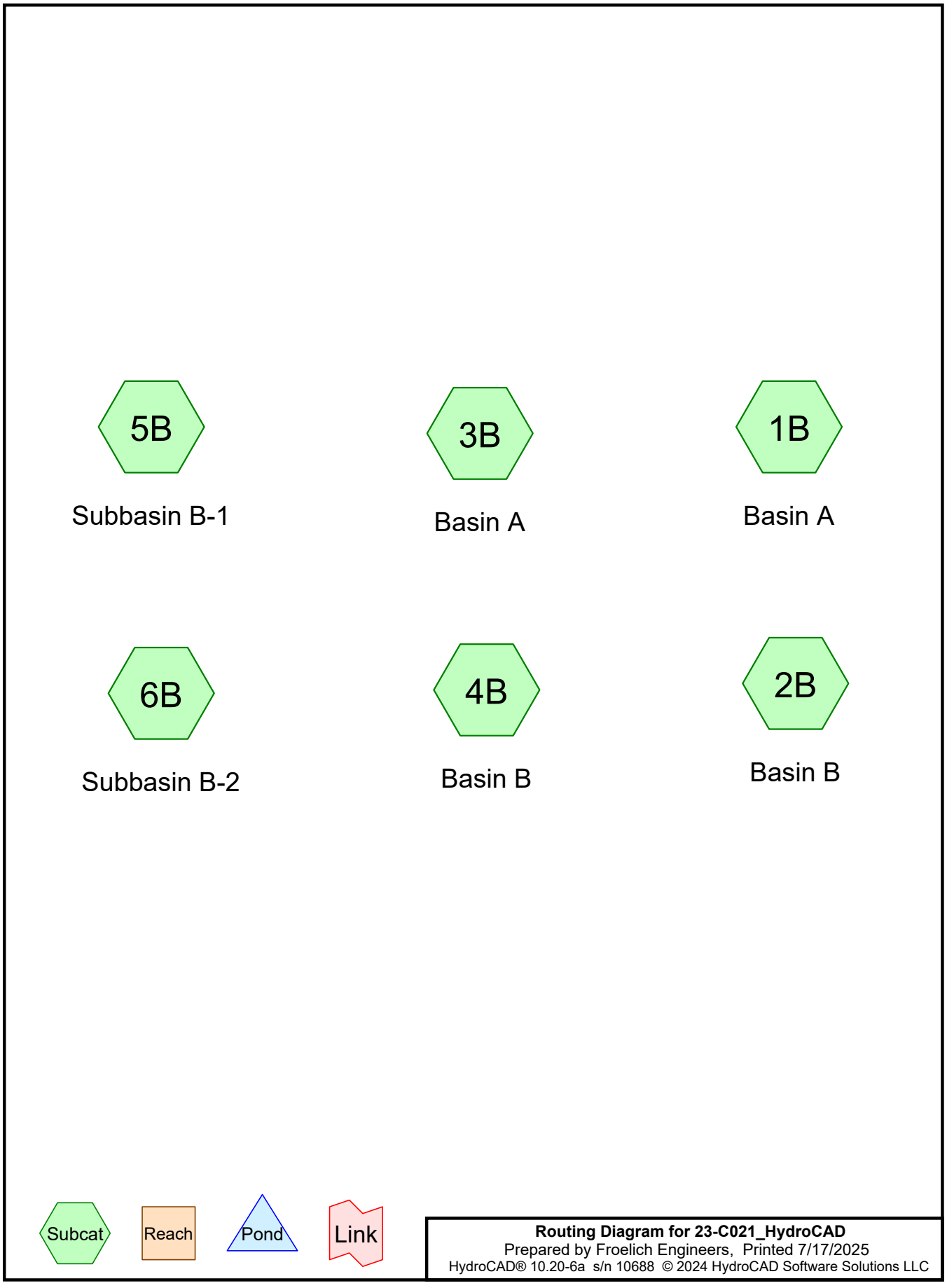


Routing Diagram for 23-C021_HydroCAD
Prepared by Froelich Engineers, Printed 7/17/2025

Rainfall Events Listing (selected events)

Event#	Event Name	Storm Type	Curve	Mode	Duration (hours)	B/B	Depth (inches)	AMC
1	50-Year	Type IA 24-hr		Default	24.00	1	5.00	2

Time span=0.04-36.00 hrs, dt=0.20 hrs, 181 points
Runoff by SBUH method, Weighted-Q
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment1B: Basin A Runoff Area=11,976 sf 3.34% Impervious Runoff Depth=3.05"
Tc=5.0 min CN=WQ Runoff=0.20 cfs 3,039 cf

Subcatchment2B: Basin B Runoff Area=8,424 sf 94.35% Impervious Runoff Depth>4.66"
Tc=5.0 min CN=WQ Runoff=0.22 cfs 3,274 cf

Subcatchment3B: Basin A Runoff Area=9,307 sf 0.00% Impervious Runoff Depth=2.99"
Tc=5.0 min CN=81 Runoff=0.15 cfs 2,316 cf

Subcatchment4B: Basin B Runoff Area=11,093 sf 71.91% Impervious Runoff Depth>4.26"
Tc=5.0 min CN=WQ Runoff=0.26 cfs 3,942 cf

Subcatchment5B: Subbasin B-1 Runoff Area=5,276 sf 65.28% Impervious Runoff Depth>4.15"
Tc=5.0 min CN=WQ Runoff=0.12 cfs 1,823 cf

Subcatchment6B: Subbasin B-2 Runoff Area=5,817 sf 77.93% Impervious Runoff Depth>4.37"
Tc=5.0 min CN=WQ Runoff=0.14 cfs 2,119 cf

Total Runoff Area = 51,893 sf Runoff Volume = 16,512 cf Average Runoff Depth = 3.82"
53.17% Pervious = 27,591 sf 46.83% Impervious = 24,302 sf

Summary for Subcatchment 1B: Basin A

[49] Hint: Tc<2dt may require smaller dt

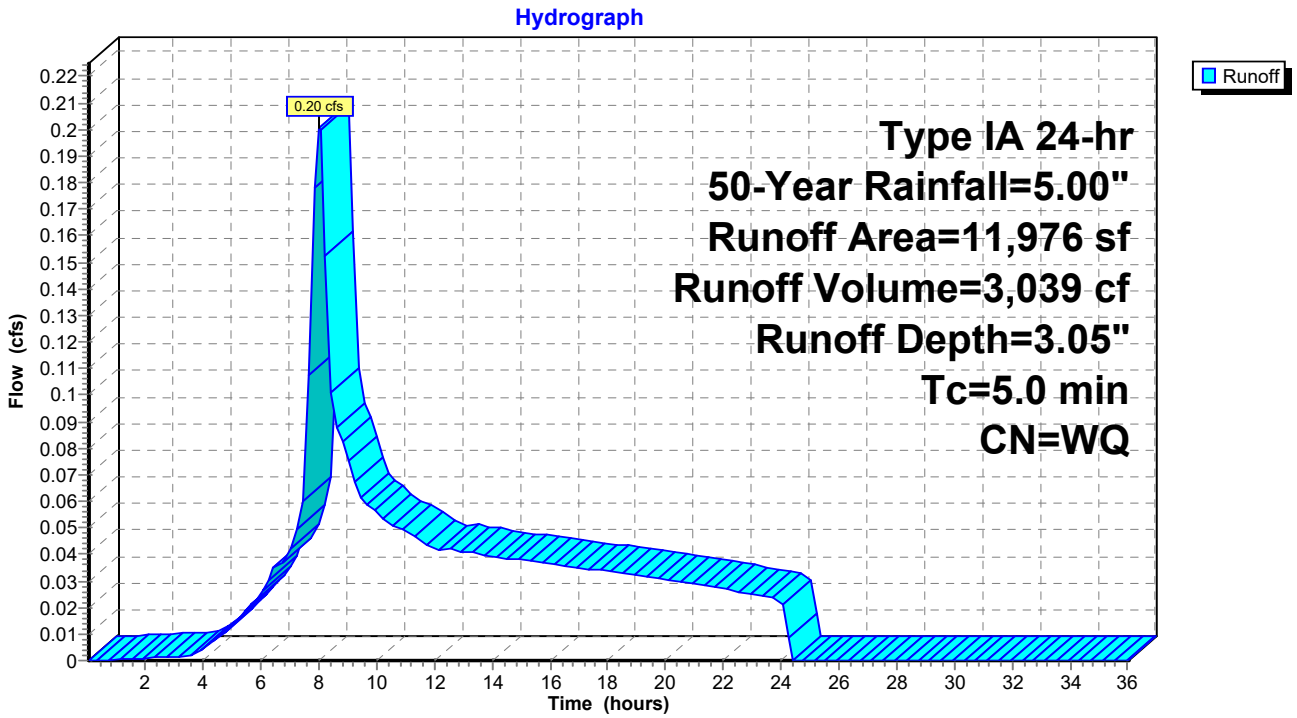
Runoff = 0.20 cfs @ 8.00 hrs, Volume= 3,039 cf, Depth= 3.05"

Runoff by SBUH method, Weighted-Q, Time Span= 0.04-36.04 hrs, dt= 0.20 hrs
Type IA 24-hr 50-Year Rainfall=5.00"

	Area (sf)	CN	Description
*	11,576	81	
*	400	98	
	11,976		Weighted Average
	11,576	81	96.66% Pervious Area
	400	98	3.34% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**

Subcatchment 1B: Basin A



Summary for Subcatchment 2B: Basin B

[49] Hint: Tc<2dt may require smaller dt

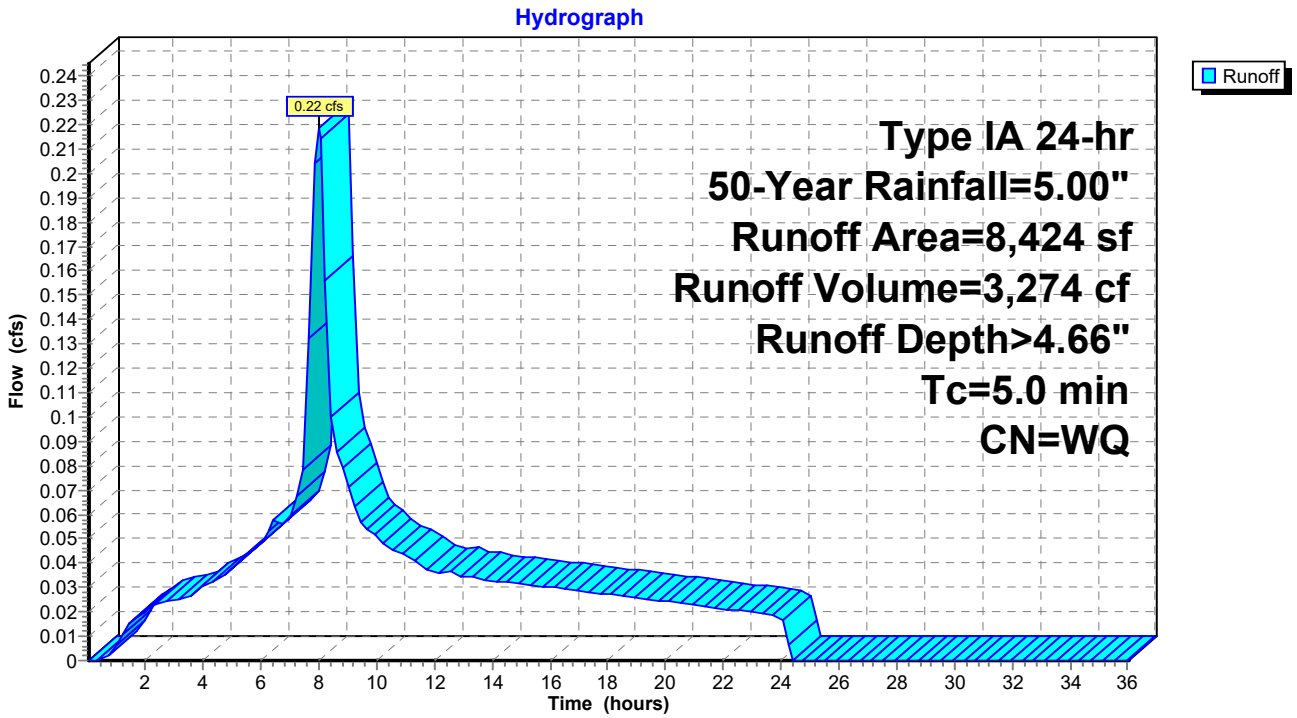
Runoff = 0.22 cfs @ 7.97 hrs, Volume= 3,274 cf, Depth> 4.66"

Runoff by SBUH method, Weighted-Q, Time Span= 0.04-36.04 hrs, dt= 0.20 hrs
Type IA 24-hr 50-Year Rainfall=5.00"

	Area (sf)	CN	Description
*	476	81	
*	7,948	98	
	8,424		Weighted Average
	476	81	5.65% Pervious Area
	7,948	98	94.35% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**

Subcatchment 2B: Basin B



Summary for Subcatchment 3B: Basin A

[49] Hint: Tc<2dt may require smaller dt

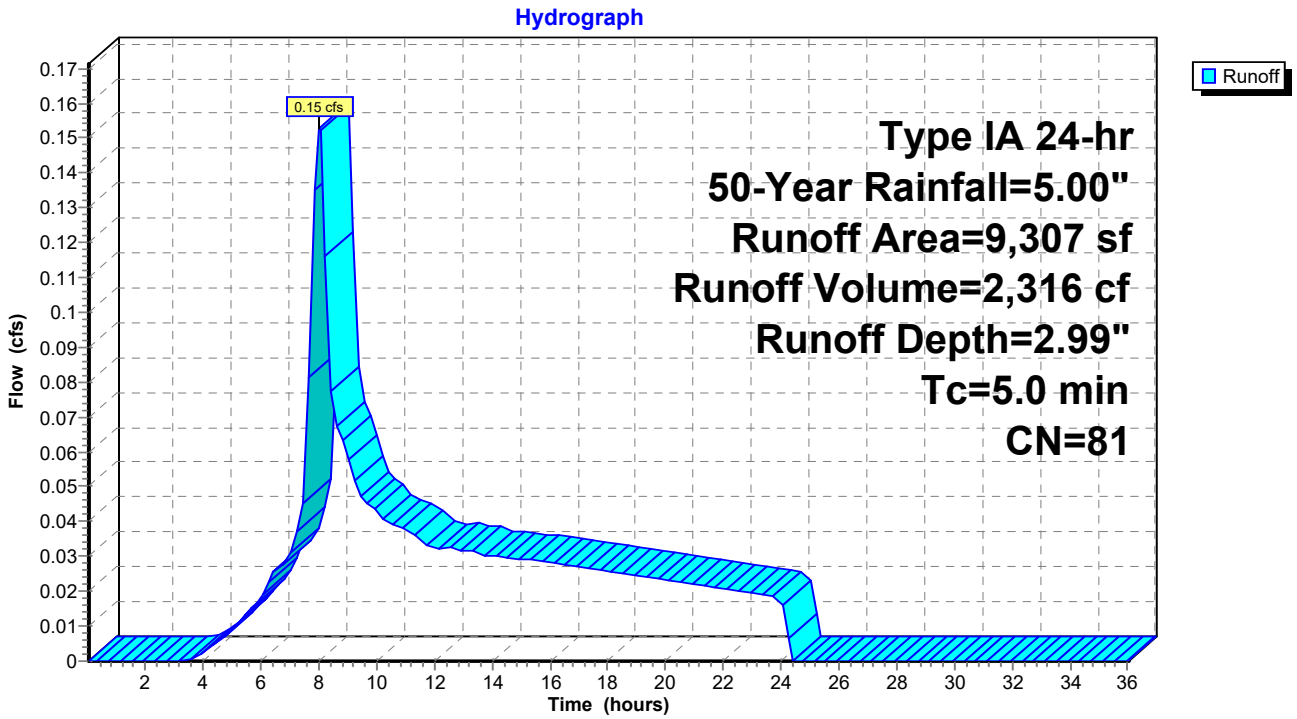
Runoff = 0.15 cfs @ 8.00 hrs, Volume= 2,316 cf, Depth= 2.99"

Runoff by SBUH method, Weighted-Q, Time Span= 0.04-36.04 hrs, dt= 0.20 hrs
Type IA 24-hr 50-Year Rainfall=5.00"

	Area (sf)	CN	Description
*	9,307	81	
	9,307	81	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**

Subcatchment 3B: Basin A



Summary for Subcatchment 4B: Basin B

[49] Hint: Tc<2dt may require smaller dt

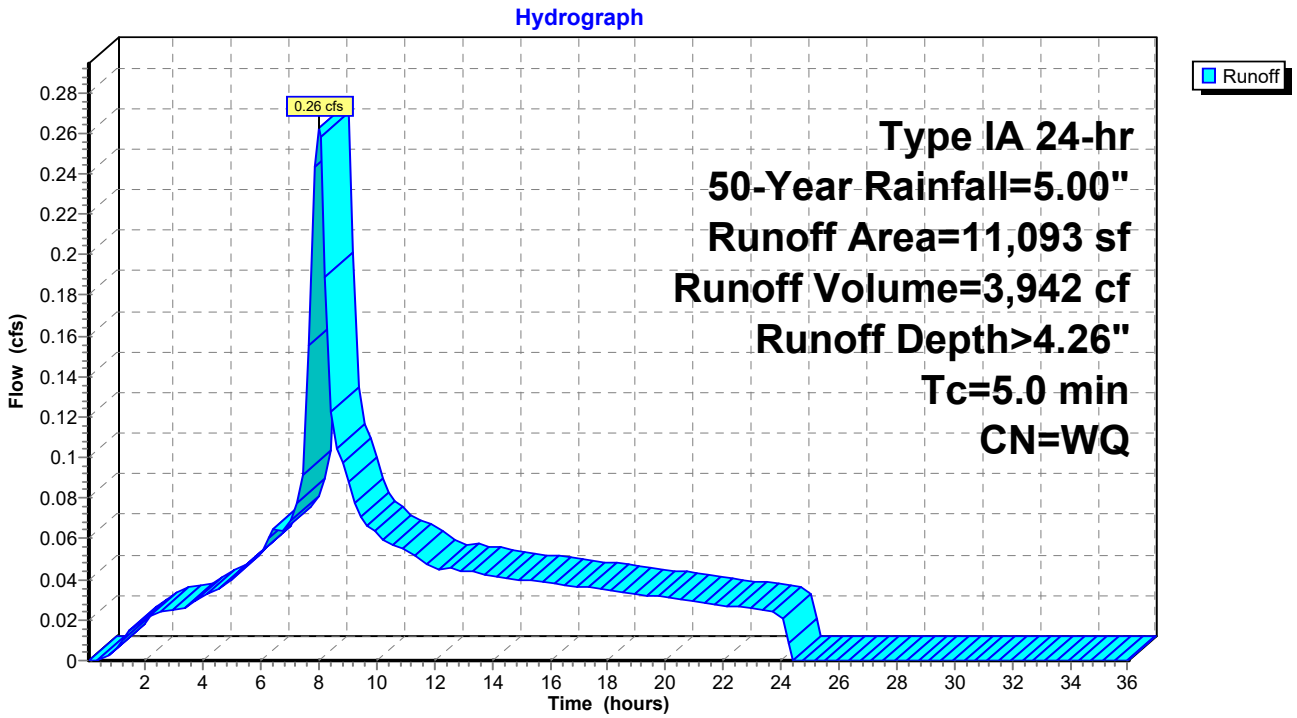
Runoff = 0.26 cfs @ 7.98 hrs, Volume= 3,942 cf, Depth> 4.26"

Runoff by SBUH method, Weighted-Q, Time Span= 0.04-36.04 hrs, dt= 0.20 hrs
Type IA 24-hr 50-Year Rainfall=5.00"

	Area (sf)	CN	Description
*	3,116	81	
*	7,977	98	
	11,093		Weighted Average
	3,116	81	28.09% Pervious Area
	7,977	98	71.91% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**

Subcatchment 4B: Basin B



Summary for Subcatchment 5B: Subbasin B-1

[49] Hint: Tc<2dt may require smaller dt

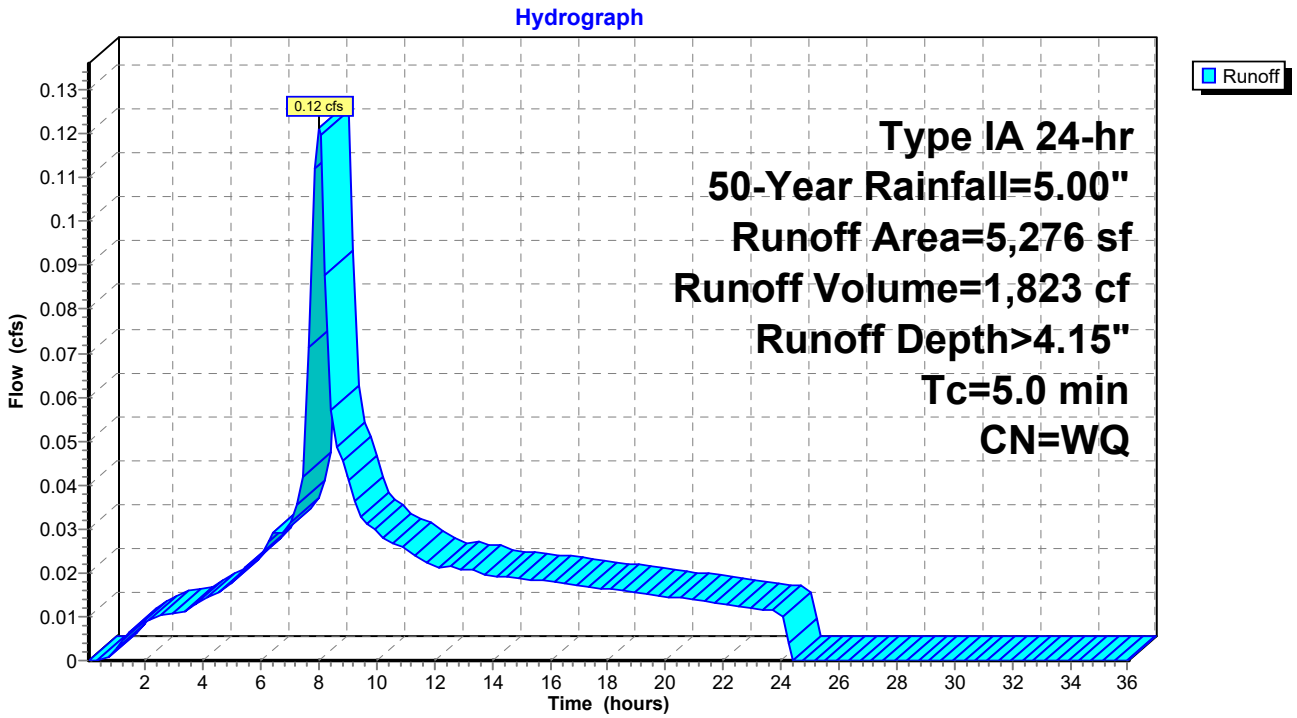
Runoff = 0.12 cfs @ 7.98 hrs, Volume= 1,823 cf, Depth> 4.15"

Runoff by SBUH method, Weighted-Q, Time Span= 0.04-36.04 hrs, dt= 0.20 hrs
Type IA 24-hr 50-Year Rainfall=5.00"

	Area (sf)	CN	Description
*	1,832	81	
*	3,444	98	
	5,276		Weighted Average
	1,832	81	34.72% Pervious Area
	3,444	98	65.28% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**

Subcatchment 5B: Subbasin B-1



Summary for Subcatchment 6B: Subbasin B-2

[49] Hint: Tc<2dt may require smaller dt

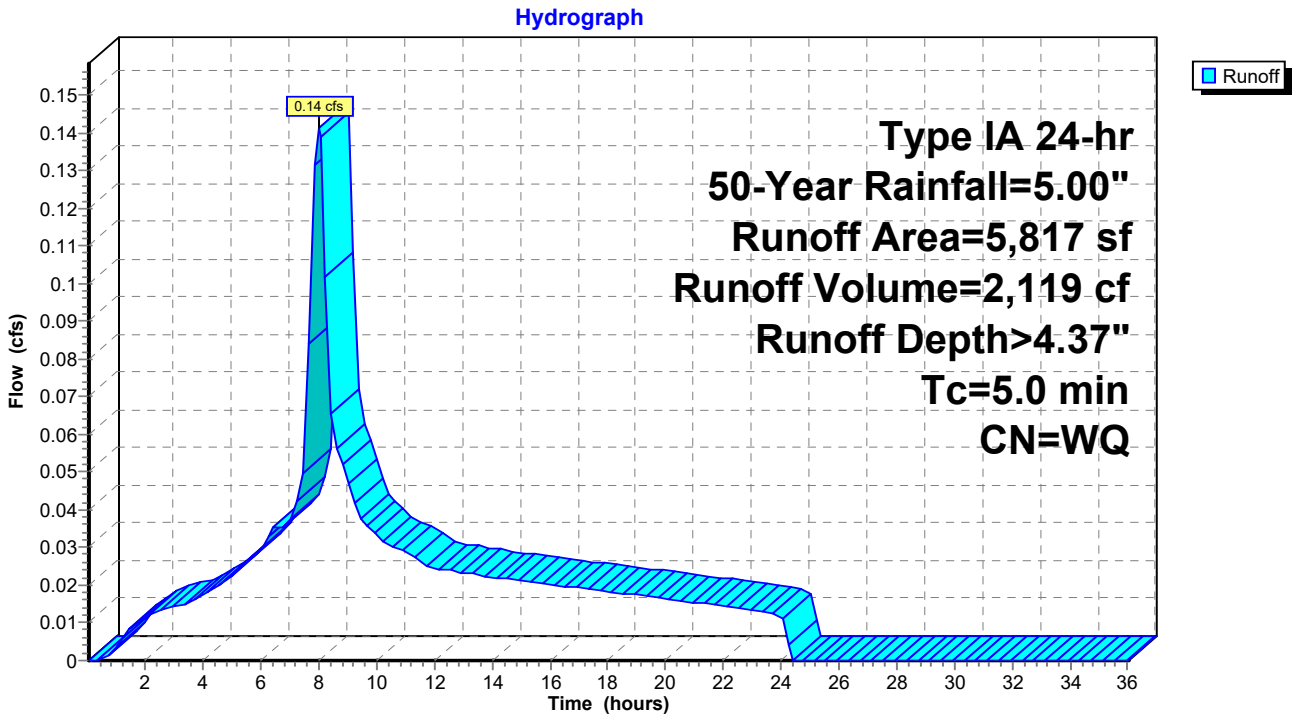
Runoff = 0.14 cfs @ 7.97 hrs, Volume= 2,119 cf, Depth> 4.37"

Runoff by SBUH method, Weighted-Q, Time Span= 0.04-36.04 hrs, dt= 0.20 hrs
Type IA 24-hr 50-Year Rainfall=5.00"

	Area (sf)	CN	Description
*	1,284	81	
*	4,533	98	
	5,817		Weighted Average
	1,284	81	22.07% Pervious Area
	4,533	98	77.93% Impervious Area

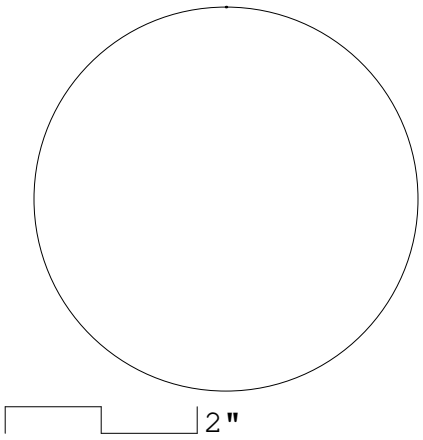
Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**

Subcatchment 6B: Subbasin B-2



Project 23-C012
Springdale Fire Station Improvements

GRAVITY PIPE FLOW (Chezy-Manning)
4-inch Pipe @ 1%



diameter = 4.0"
slope = 1.00%
material: ABS, PVC
Manning's n = 0.013
depth of flow = 100.00% of diameter (full)

wetted perimeter = 1.05'
area = 0.09 s.f.
hydraulic radius = 0.08'
velocity = 2.18 fps
flow = 0.19 cfs

Appendix E: Geotechnical Report

Report of Geotechnical Engineering Services

Springdale Station

Troutdale, Oregon

March 29, 2024

Geotechnical ■ Environmental ■ Special Inspections

Columbia West

Engineering, Inc

www.columbiawestengineering.com

Geotechnical ▪ Environmental ▪ Special Inspections
Columbia West Engineering, Inc

Vancouver, Washington • Phone: 360-823-2900
Portland, Oregon • Phone: 971-384-1666
www.columbiawestengineering.com

March 29, 2024

Corbett Fire District #14
36930 Historic Columbia River Highway
Corbett, OR 97019

Attn: Dave Flood

Re: Report of Geotechnical Engineering Services
Springdale Station
31727 Historic Columbia River Highway
Troutdale, Oregon
CWE Project: CFD-1-01-1

Columbia West Engineering, Inc. (Columbia West) is pleased to present this report of geotechnical engineering services for the Springdale Station project located in Troutdale, Oregon. Our services were conducted in accordance with our proposal dated January 23, 2024.

We appreciate the opportunity to work on the project. Please contact us if you have any questions regarding this document.

Sincerely,

Jason F. Merritt, PE
Senior Project Engineer

Signed for
Brett A. Shipton, PE, GE
Principal Engineer

cc: Erik Matthews, em architecture llc

JFM:NNP:kat
Attachments
Document ID: CFD-1-01-1-032924-geor.docx

EXECUTIVE SUMMARY

This executive summary presents the primary geotechnical considerations associated with the Springdale Station project located in Troutdale, Oregon. Our conclusions and recommendations are based on the subsurface information presented in the report and proposed development information provided by the design team. A detailed discussion of the geotechnical considerations summarized here is presented in respective sections of the report.

- The proposed structure can be supported on conventional spread footings bearing on firm, native soil or structural fill overlying firm, native soil.

- Based on the results of our site-specific seismic hazard evaluation, the parameters provided by ASCE 7-16 general response spectrum for Site Class C should be used for the site.

- Although not observed in the borings, undocumented fill may be present at the site, particularly below existing structural elements. All undocumented fill beneath proposed improvements should be assessed by Columbia West following demolition when subgrade conditions are exposed.

- Moisture conditioning will be likely be required to use the on-site soil as structural fill. Accordingly, extended dry weather will be required to adequately condition and place the silt as structural fill. It will be difficult, if not impossible, to adequately compact the on-site soil during the rainy season or during prolonged periods of rainfall.

- Based on results of in-situ infiltration testing in one of the borings, on-site stormwater infiltration systems are not feasible at the site.

3.3.2 Soil Conditions

3.3.2.1 Pavement Section

Borings B-1 and B-2 were drilled through a pavement section consisting of 5 inches of AC underlain by 6 inches of aggregate base.

3.3.2.2 Fine-Grained Alluvium

Silt with varying proportions of sand is present below the AC sections (B-1 and B-2) and in the south-facing slope (HA-1). The silt observed in the borings varies from medium stiff to stiff. Laboratory testing indicates the moisture content of native silt ranges from 29 to 38 percent and the fines content (percent passing the U.S. Standard No. 200 sieve) is between 53 and 95 percent. Atterberg limit testing indicates the silt has medium plasticity.

3.3.3 Groundwater

Perched groundwater was observed in borings B-1 and B-2 at depths of 3 and 3.5 feet BGS, respectively. Seeps were observed in boring HA-1 at a depth of approximately 4 feet below top of slope elevation and are likely from surface infiltration. The depth to perched groundwater may fluctuate in response to prolonged rainfall, seasonal changes, changes in surface topography, and other factors not observed during this study. Perched groundwater could be higher than observed in our explorations during the wet season or periods of persistent rainfall.

3.4 INFILTRATION TESTING

Infiltration testing was performed in boring B-2 at a depth of 2.5 feet BGS. Infiltration testing was conducted using the encased falling head method. Infiltration was not observed in the boring. Based on the results of our testing and observations, subsurface disposal of stormwater is not feasible in our opinion.

4.0 DESIGN

4.1 FOUNDATION SUPPORT

4.1.1 General

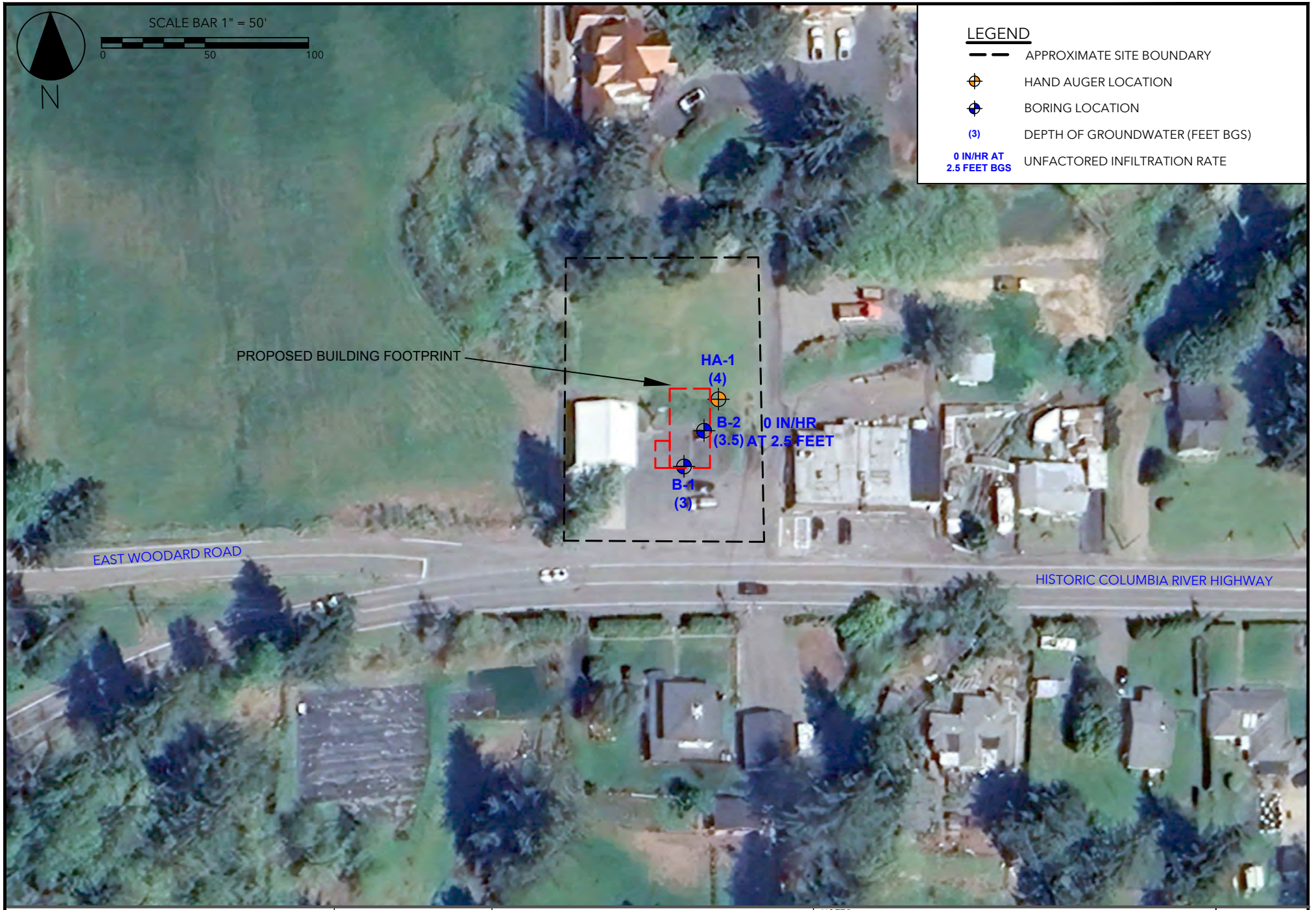
Provided foundation and floor slab loads are as described in Section 1.0 (Introduction) and the site is prepared as recommended in Section 5.0 (Construction), it is our opinion that the proposed building can be supported on conventional spread footings that bear on undisturbed, native soil or structural fill overlying undisturbed, native soil.

Foundations should not be supported on topsoil, tilled soil, undocumented fill, or loose/disturbed soil. If present below planned footings, these materials should be removed and replaced with structural fill as recommended in this report.

4.1.2 Bearing Capacity

Continuous perimeter wall and isolated spread footings should have minimum widths of 18 and 24 inches, respectively. The base of exterior footings should be at least 18 inches below the lowest adjacent exterior grade. The base of interior footings should bear at least 12 inches below the base of the floor.

Footings bearing on subgrade prepared as recommended in Section 5.1 (Site Preparation) should be sized based on an allowable bearing pressure of 2,500 psf. As the allowable bearing pressure



Geotechnical ▪ Environmental ▪ Special Inspections
Columbia West Engineering, Inc

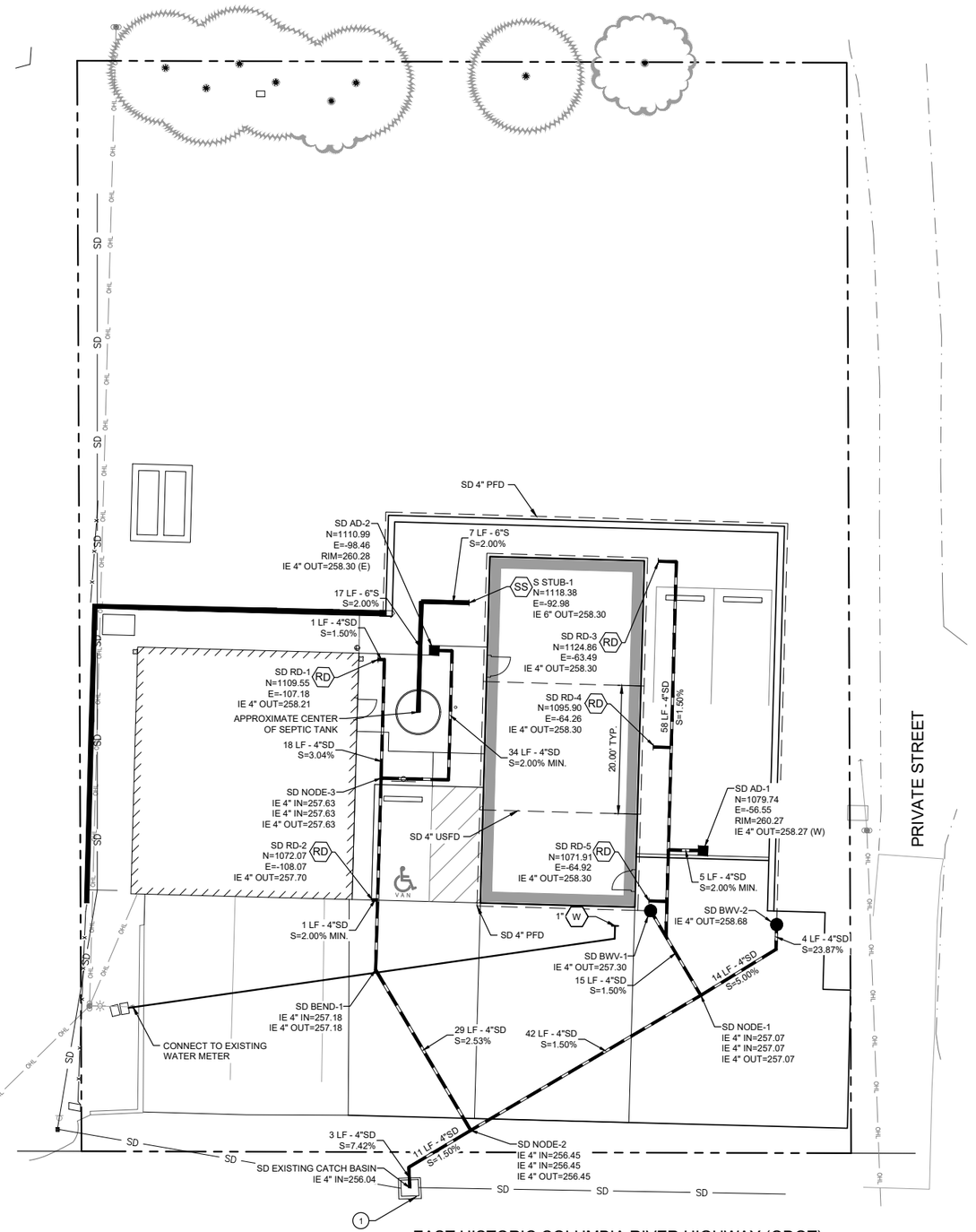
Job No: CFD-1-01-1
Date: 03/20/24
Drawn: SSC
Checked: JFM

EXPLORATION LOCATION MAP
SPRINGDALE STATION
TROUTDALE, OREGON

NOTES:
1. SITE LOCATION: 31727 HISTORIC COLUMBIA RIVER HIGHWAY, TROUTDALE, OREGON.
2. SITE CONSISTS OF PROPERTY ID NO. R322491 TOTALING APPROXIMATELY 0.47 ACRE.
3. AERIAL PHOTO SOURCED FROM GOOGLE EARTH.
4. EXPLORATION LOCATIONS ARE APPROXIMATE AND NOT SURVEYED.
5. BORINGS BACKFILLED WITH BENTONITE AND CAPPED WITH ASPHALT CONCRETE ON MARCH 1, 2024.
6. HAND AUGER BACKFILLED WITH ON-SITE SOIL ON MARCH 1, 2024.

FIGURE
2

Appendix F: Utility Plan / Details



SHEET NOTES

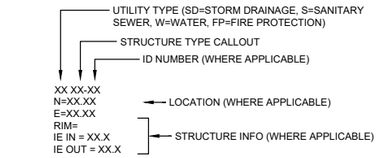
1. PIPE BEDDING AND BACKFILL FOR ALL UTILITIES SHALL BE DONE PER DETAIL X/C5.X.
2. STRUCTURES LOCATIONS ARE BASED ON CENTER OF STRUCTURE.
3. PROPOSED WATER LINES SHOULD BE BORED UNDER THE CONCRETE PAVEMENT.

KEY NOTES

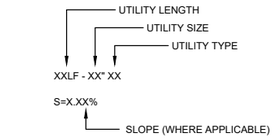
1 FIELD VERIFY LOCATION AND IE OF EXISTING CATCH BASIN PRIOR TO CONSTRUCTION.

UTILITY LABEL LEGEND

STRUCTURE LABEL



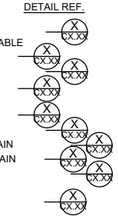
PIPE LABEL



STRUCTURE TYPE

CALLOUT	DESCRIPTION
AD	AREA DRAIN
BEND	BEND, USE FITTING IF APPLICABLE
BWV	BACKWATER VALVE
CB	CATCH BASIN
COTG	CLEANOUT TO GRADE
CONN	CONNECTION
DI	DITCH INLET
FCMH	FLOW CONTROL MANHOLE
PFD	PERIMETER FOUNDATION DRAIN
USFD	UNDERSLAB FOUNDATION DRAIN
GV	GATE VALVE
RD	ROOF DRAIN
TD	TRENCH DRAIN
TEE	TEE CONNECTION
WYE	WYE CONNECTION

DETAIL REF.



SHEET LEGEND

- RD — CONNECT TO STORM DRAIN/ROOF DRAIN. SEE PLUMBING PLANS FOR CONTINUATION. SIZE AND IE AS NOTED.
- SS — CONNECT TO SANITARY SEWER LINE. SEE PLUMBING PLANS FOR CONTINUATION. SIZE AND IE AS NOTED.
- !! — UTILITY CROSSING. PROVIDE 12" MIN. CLEARANCE, U.N.O.
- W — CONNECT TO COLD WATER SYSTEM. SEE PLUMBING PLANS FOR CONTINUATION. SIZE AS NOTED.

SCALE 1 INCH = 10 FEET
10 0 10 20

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SPRINGDALE FIRE STATION IMPROVEMENTS

31727 EAST HISTORIC COLUMBIA RIVER HWY
TROUTDALE, OR, 97019

LAND USE SET

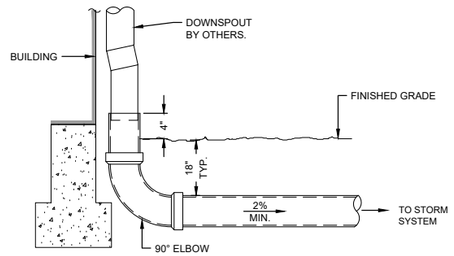
REV	DATE	ISSUE TITLE

PROJECT MANAGER:	EME
DESIGNER:	EME
DRAWN BY:	ATOMLINSON
PROJECT NO:	----
DATE:	10/11/24
SCALE:	AS SHOWN

SHEET TITLE:
UTILITY PLAN

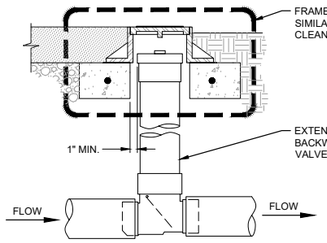
SHEET NUMBER:
C4.00
LAND USE SET

File: P:\2023\23-C021 (Springdale Fire Station Improvements)\300 Document Development - Froelich\302 CAD\PLOT\23_C021_C4.00_UTIL.dwg TAB:C4.00
Plotted: 7/17/25 at 1:29pm By: atomlinson



X DOWNSPOUT/STORM DRAIN CONNECTION

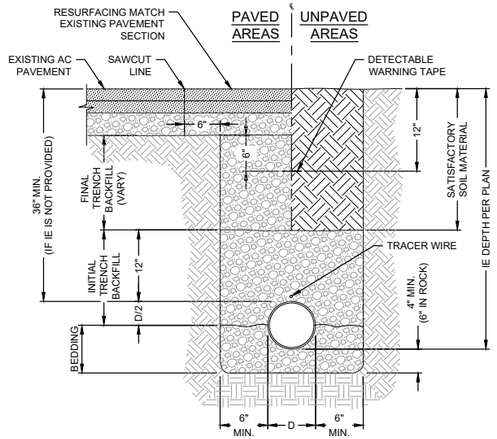
SCALE: NTS



NOTES:
1. EXTENDABLE BACKWATER VALVE TO BE MANUFACTURED BY CLEAN CHECK OR APPROVED EQUAL AND SHALL BE INSTALLED PER MANUFACTURER'S RECOMMENDATIONS.

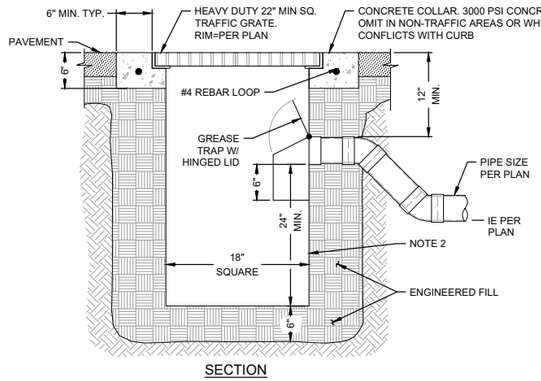
X EXTENDABLE BACKWATER VALVE

SCALE: NTS



X TYPICAL PIPE BEDDING AND BACKFILL

SCALE: NTS

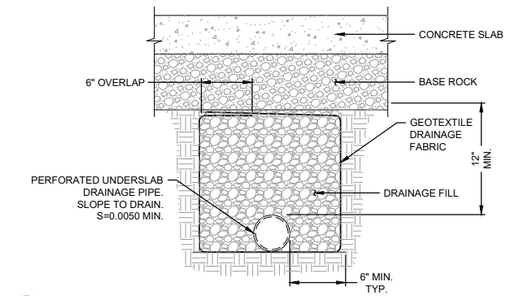


SECTION

NOTES:
1. CONTRACTOR TO WIDEN EXCAVATION AS REQUIRED TO OBTAIN COMPACTION WITH CONTRACTORS COMPACTION EQUIPMENT.
2. 1/4" STEEL PLATE, BITUMINOUS COATED. AS MANUFACTURED BY GIBSON STEEL BASINS OR APPROVED EQUAL.

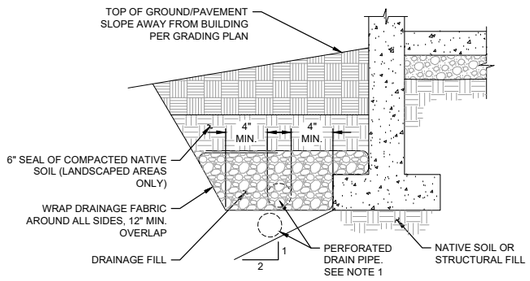
X TRAPPED CATCH BASIN

SCALE: NTS



X UNDERSLAB DRAIN

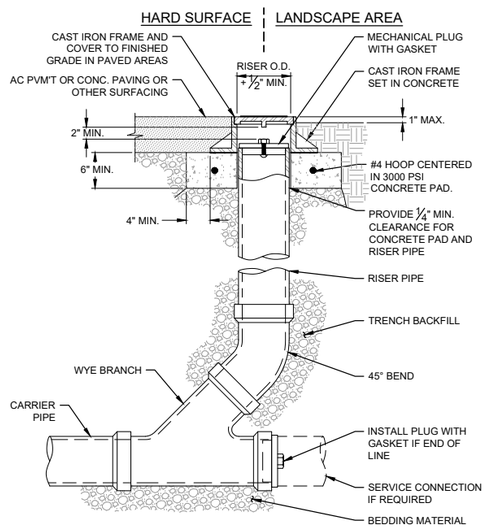
SCALE: NTS



NOTES:
1. LAY PERFORATED DRAIN PIPE ON MIN. 0.5% GRADIENT, WIDENING EXCAVATION AS REQUIRED. MAINTAIN PIPE ABOVE 2:1 SLOPE AS SHOWN.
2. CONNECT TO FOUNDATION DRAIN STUBOUT SHOWN ON PLANS.

X PERIMETER FOUNDATION DRAIN

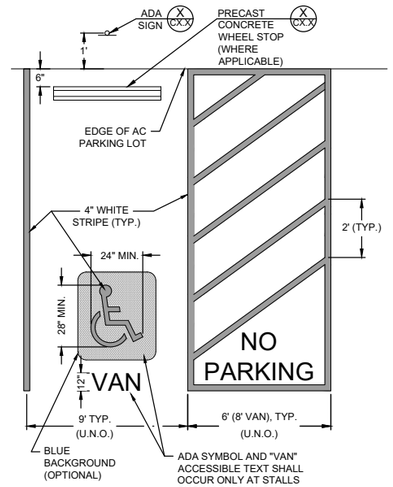
SCALE: NTS



NOTES:
1. CAST IRON FRAME AND COVER SHALL MEET H-20 LOAD REQUIREMENT.
2. FOR CARRIER PIPE SIZE 6"Ø AND LESS, PROVIDE RISER PIPE SIZE TO MATCH CARRIER PIPE.
3. FOR CARRIER PIPE SIZE 8"Ø AND LARGER, RISER PIPE SHALL BE 6"Ø.
4. RISER PIPE MATERIAL TO MATCH CARRIER PIPE MATERIAL.

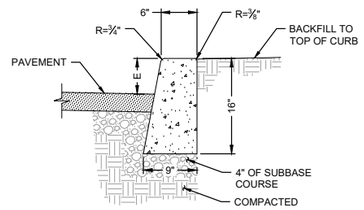
X STANDARD CLEANOUT (COTG)

SCALE: NTS



X TYPICAL PARKING LAYOUT

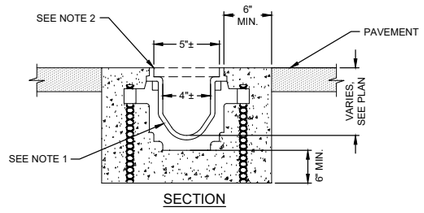
SCALE: NTS



NOTES:
1. CURB EXPOSURE 'E' = 6", TYP. VARY AS SHOWN ON PLANS OR AS DIRECTED.
2. CONSTRUCT CONTRACTION JOINTS AT 15' MAX. SPACING AND AT RAMPS. CONSTRUCT EXPANSION JOINTS AT 200' MAX SPACING AT POINTS OF TANGENCY AND AT ENDS OF EACH DRIVEWAY.
3. TOPS OF ALL CURBS SHALL SLOPE TOWARD THE ROADWAY AT 2% UNLESS OTHERWISE SHOWN OR AS DIRECTED.
4. DIMENSIONS ARE NOMINAL AND MAY VARY TO CONFORM WITH CURB MACHINE AS APPROVED BY THE ENGINEER.

X STANDARD CONCRETE CURB

SCALE: NTS

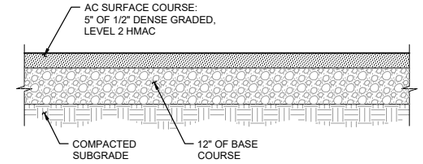


SECTION

NOTES:
1. TRENCH DRAIN SHALL BE PRE-SLOPED 4" WIDE ZURN OR ACO TRENCH DRAIN OR APPROVED EQUAL.
2. TRENCH DRAINS GRATE SHALL BE LOCKABLE HEAVY DUTY SLOTTED IRON TRENCH GRATE - CLASS C.
3. TRENCH SYSTEM SHALL BE INSTALLED PER MANUFACTURER'S INSTRUCTIONS.

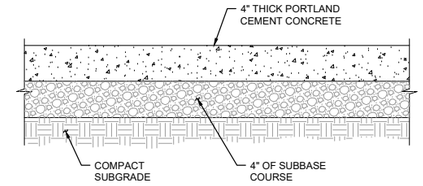
X TRENCH DRAIN - 4 INCH WIDE

SCALE: NTS



X ASPHALT PAVEMENT SECTION

SCALE: NTS



NOTES:
1. - CONSTRUCT CONTRACTION JOINTS AT 15' MAX. SPACING AND AT RAMPS.
   - CONSTRUCT EXPANSION JOINTS AT 200' MAX. SPACING AT POINTS OF TANGENCY AND AT ENDS OF EACH DRIVEWAY.
2. PROVIDE MEDIUM TO COARSE BROOM FINISH.

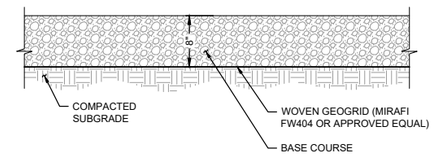
X CONCRETE PAVEMENT SECTION

SCALE: NTS

NOTES:
1. JOINTS:
   - CONSTRUCT CONTRACTION JOINTS AT 15' MAX. SPACING AND AT RAMPS.
   - CONSTRUCT EXPANSION JOINTS AT 200' MAX. SPACING AT POINTS OF TANGENCY AND AT ENDS OF EACH DRIVEWAY.
2. PROVIDE MEDIUM TO COARSE BROOM FINISH.

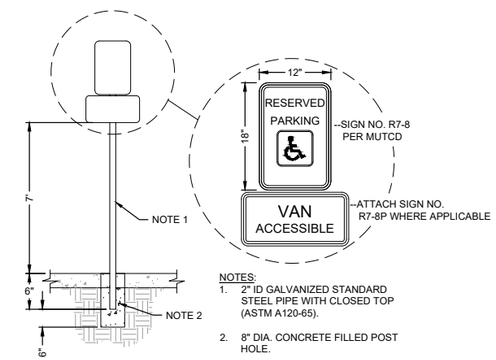
X REINFORCED CONCRETE PAVEMENT SECTION

SCALE: NTS



4 GRAVEL SECTION

SCALE: NTS



NOTES:
1. 2" ID GALVANIZED STANDARD STEEL PIPE WITH CLOSED TOP (ASTM A120-65).
2. 8" DIA. CONCRETE FILLED POST HOLE.

X ADA PARKING SIGN

SCALE: NTS

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SPRINGDALE FIRE STATION IMPROVEMENTS

31727 EAST HISTORIC COLUMBIA RIVER HWY
TROUTDALE, OR, 97019

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PROJECT MANAGER:	EME
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SCALE:	AS SHOWN

SHEET TITLE:
DETAILS

SHEET NUMBER:
C5.00
LAND USE SET

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Plotted: 7/17/25 at 1:29pm By: atomlinson

Appendix G: Operations and Maintenance

NOT INCLUDED WITH LAND USE