Drainage Report

Puyallup High School Portables

711, 721 & 701 West Main
Puyallup, WA 98371

Prepared for
Puyallup School District
c/o Studio Meng Strazzara
2001 Western Ave, Suite 200
Seattle, WA 98121
206.587.3797

Prepared by
JMJ Team
905 Main Street, Suite 200
Sumner, WA 98390
206.596.2020
Justin Jones, PE

October 3, 2024

JMJTEAM

PROJECT ENGINEER'S CERTIFICATION

"I hereby state that this Drainage Control Plan for the Puyallup High School Portables has been prepared by me or under my supervision and meets minimum standard of care and expertise which is usual and customary in this community for professional engineers. I understand that the City of Puyallup does not and will not assume liability for the sufficiency, suitability, or performance of drainage facilities prepared by me."

____

Justin Jones, PE

10-03-2024

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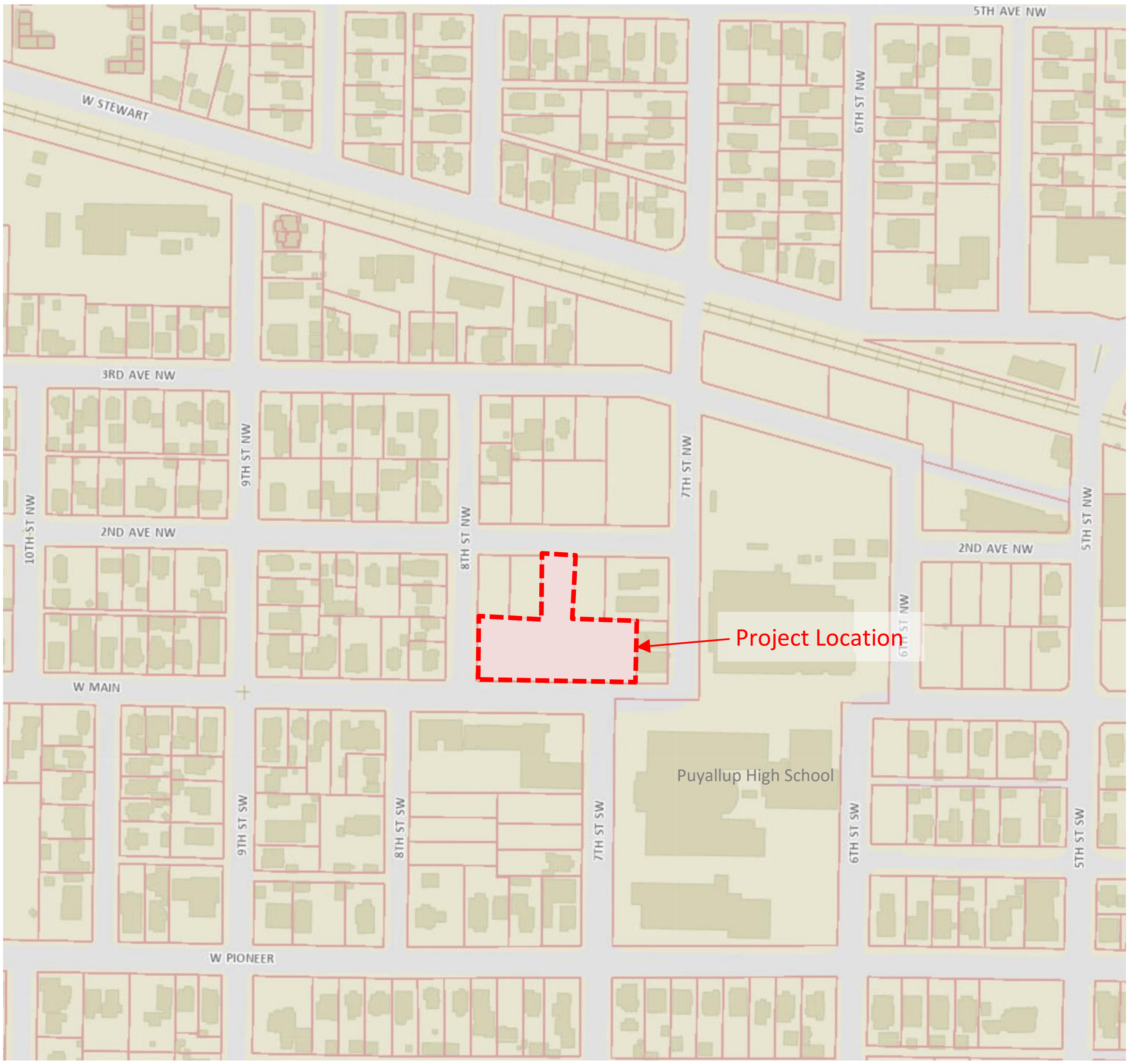
PROJECT OVERVIEW AND VICINITY MAP

The Puyallup High School Portables project is located at the intersection of West Main and 7th Street SW in the City of Puyallup. The project site includes parcels 5870000231, 5870000190, 5870000200, and 5870000171, with a total lot area of 1.00 AC. The project has a total site area of 0.38 acres. The site is currently developed as a PF – Public Facilities lot. New development on-site includes the construction of 3 portable classroom buildings, open-graded gravel pad, and the construction of permeable asphalt walkways. The stormwater approach is to fully infiltrate runoff on-site.



Vicinity Map

Proposed Site Area Map

EXISTING CONDITIONS SUMMARY

The Puyallup High School Portables project has a lot area of 1.00 acre. The existing site consists of landscaping, asphalt parking lot, and existing portables east of the parking lot. The site is fairly flat and has a slight slope towards the north and west side of the property.

The existing storm system consists of downspout dispersion and gravity pipe conveyance system. Runoff from roof disperses onto parking lot and is captured via Contech Catch Basin Inlet Filter that connects to the City of Puyallup stormwater system along West Main. Runoff is then conveyed to the Puyallup River via gravity pipe conveyance system.

The site is located within Lahar Hazard area.

There are no critical areas within site.

PROPOSED CONDITIONS SUMMARY

The proposed development is located in the landscaped area west of the existing parking lot. New development includes the construction of 3 portable classroom buildings, perforated aluminum landing, and site improvements.

The proposed development will result in an addition of 8,678 SF of new impervious surfaces within the project site area. Total land disturbing activity on-site to be approximately 16,850 SF. Minimum requirements 1-9 will apply to this project. Lot Coverage Table has been provided in the report following.

Site improvements include the construction of permeable open-graded gravel pad, permeable asphalt walkways, landscaping, and stormwater conveyance and infiltration trenches. The portables will also have utility service connections for power and communications.

Stormwater runoff from the new portables will be collected via roof downspouts and conveyed to infiltration trenches to be fully infiltrated. Runoff from aluminum landing will drain through the perforated surface and be collected on the permeable gravel pad where stormwater will fully infiltrate into native soils. Runoff from permeable asphalt walkways will infiltrate through the porous surface and fully infiltrate into native soils.

Infiltration suitability was evaluated during the wet season (December 1st - April 1st) to determine infiltration rate and groundwater separation. Small PIT tests and groundwater monitoring were performed in accordance with the 2019 Stormwater Management Manual for Western Washington (DOE Manual) to determine infiltration feasibility. The infiltration rate was determined to be 0.64 in/hr (corrected). Infiltration Report has been provided in Appendix D. Fine sandy loam soil was observed during PIT test. This is consistent with measured infiltration rate and USDA soil survey.

LOT COVERAGE

The following tables show the existing and proposed lot coverage for the Puyallup High School Portables project site.

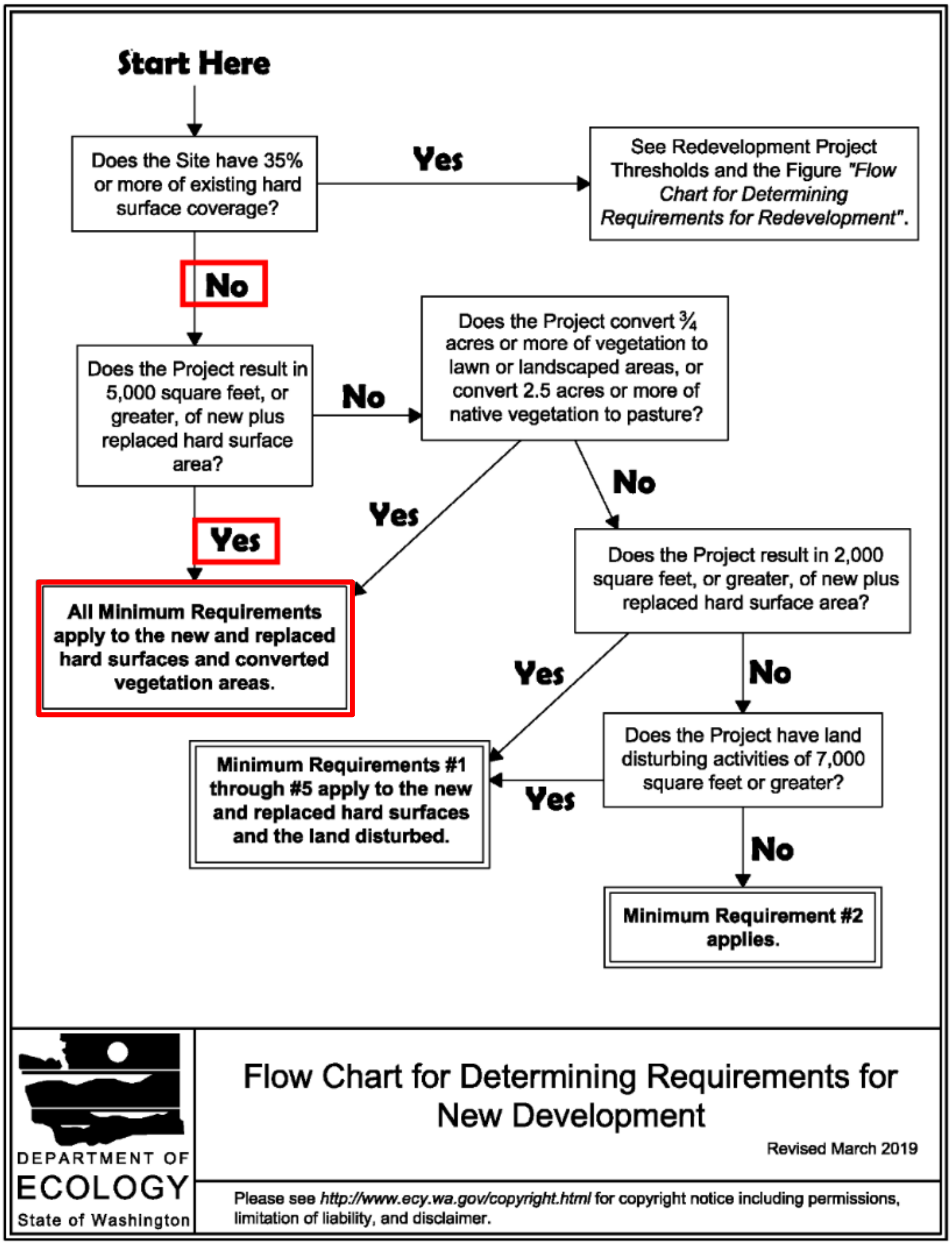
Existing Lot Coverage – 43,574 SF (1.00 AC) Lot Area			
Coverage	**Area (SF)**	**Area (Acres)**	**% of Site**
Impervious			
Roof	1,722	0.04	
Concrete Sidewalk	964	0.03	
Asphalt Parking Lot	6,686	0.15	
Total Site Impervious	**9,372**	**0.22**	**22.0%**
Pervious			
Landscape	34,202	0.78	
Total Site Pervious	**34,202**	**0.78**	**78.0%**

Proposed Lot Coverage – 43,574 SF (1.00 AC) Lot Area			
Coverage	**Area (SF)**	**Area (Acres)**	**% of Site**
Impervious			
Ex. Roof	1,722	0.04	
Ex. Concrete Sidewalk	964	0.03	
Ex. Asphalt Parking Lot	6,686	0.15	
New Roof	5,785	0.12	
New Permeable Asphalt Sidewalk	663	0.02	
New Permeable Gravel Pad	1,570	0.04	
New Perforated Aluminum Landing	660	0.02	
Total New Impervious	**8,678**	**0.20**	**20.0%**
Total Site Impervious	**18,050**	**0.42**	**42.0%**
Pervious			
Landscape	25,524	0.58	
Total Site Pervious	**25,524**	**0.58**	**58.0%**

SUMMARY OF MINIMUM REQUIREMENTS

The City of Puyallup adopts the 2019 Stormwater Management Manual for Western Washington (DOE Manual). Volume 1 of the DOE Manual describes the minimum requirements for a development project. Using the flowchart below, Minimum Requirements #1-9 applies to the project site.

Figure I-3.1: Flow Chart for Determining Requirements for New Development



MINIMUM REQUIREMENT 1: PREPARATION OF STORMWATER SITE PLANS

Stormwater Site Plan drawings have been prepared per the City of Puyallup development codes and the 2019 Stormwater Management Manual for Western Washington (DOE Manual), see Appendix A.

MINIMUM REQUIREMENT 2: CONSTRUCTION STORMWATER POLLUTION PREVENTION

A Temporary Erosion and Sediment Control Plan has been prepared per the City of Puyallup development codes and the 2019 DOE Manual and is included in this report, see Appendix A. Construction Stormwater Pollution Prevention measures may include storm drain inlet protection; construction entrance; silt fence and a sediment trap.

MINIMUM REQUIREMENT 3: SOURCE CONTROL OF POLLUTION

Source control BMPs will be implemented to minimize stormwater contamination and help comply with the DOE Manual. BMP's for the project may include:

- *Inspect and clean treatment BMPs, conveyance systems, and catch basins as needed, and determine necessary O & M Improvements.*
- *Clean catch basins when the depth of deposits reaches 60-percent of the sump depth as measured from the bottom of basin to the invert of the lowest pipe into or out of the basin.*
- *Clean woody debris in a catch basin as frequently as needed to ensure proper operation of the catch basin.*

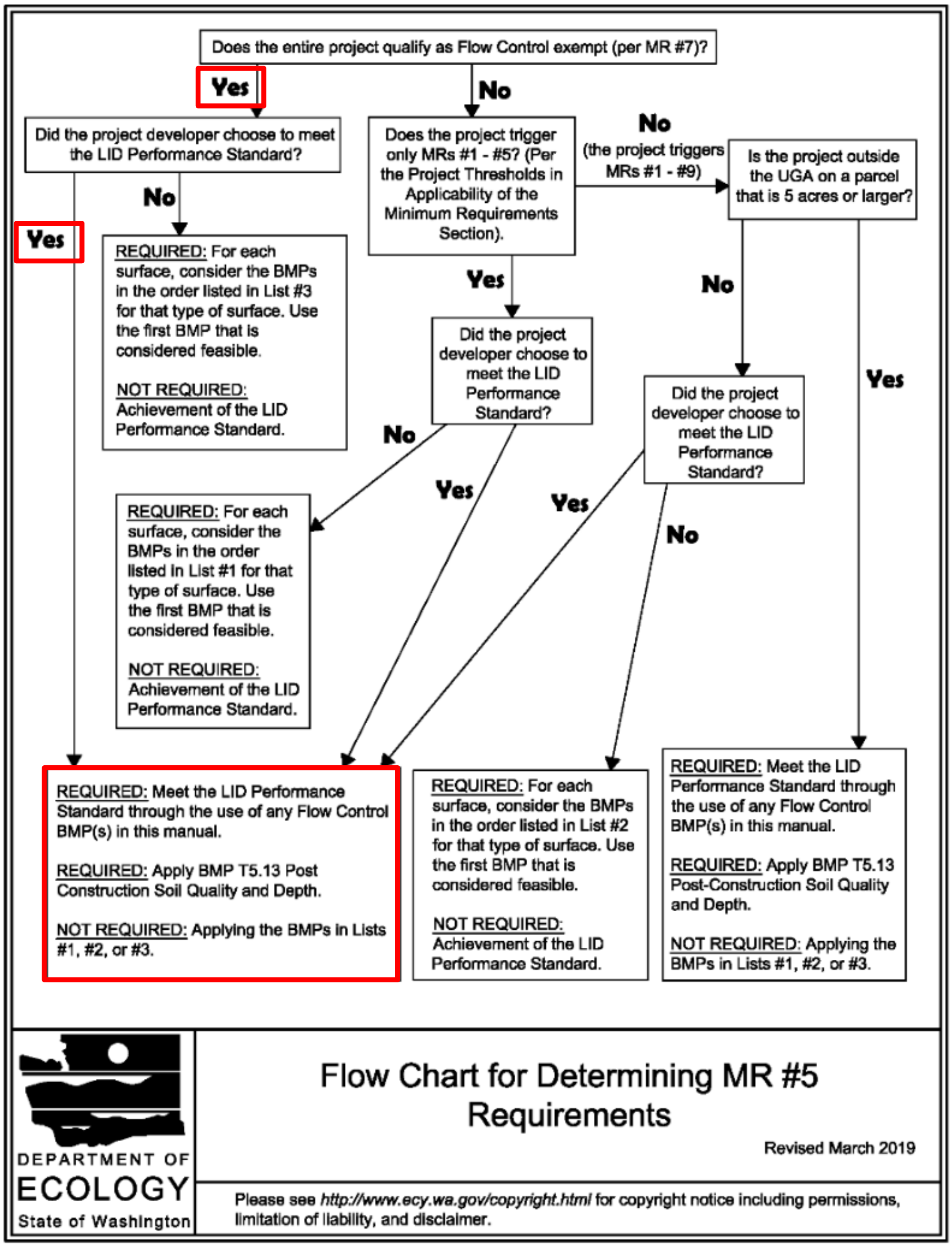
MINIMUM REQUIREMENT 4: PRESERVATION OF NATURAL DRAINAGE SYSTEMS AND OUTFALLS

Natural drainage for the developed site area surface flows towards the north and west side of the site and infiltrates into native soil. The project proposes to maintain natural drainage patterns and discharge at natural location.

MINIMUM REQUIREMENT 5: ONSITE STORMWATER MANAGEMENT

Per Figure I-3.3 of the 2019 DOE Manual, the Puyallup High School Portables project is required to either meet LID Performance Standards or utilize List #3 to determine appropriate stormwater management BMPs for various surfaces. This project proposes to meet LID Performance Standards.

Figure I-3.3: Flow Chart for Determining MR #5 Requirements



To meet LID Performance Standards, stormwater discharges must match developed discharge durations to pre-developed discharge rates from 8% of the 2-year peak flow to the full 50-year flow.

The following BMPs were considered for the site:

- Roofs:
  - Downspout Full Infiltration:

    Downspout Full Infiltration was evaluated and was deemed feasible for the site. Runoff from proposed roof areas will be routed to downspout infiltration trenches and infiltrate 100% of roof runoff into native soils. The infiltration trenches have been sized utilizing 2019 DOE Manual sizing criteria as follow:

    - Soil Type: Fine sand, loamy sand
    - Min. Length Required per Portables: 145 LF
      - 75 LF per 1,000 SF of Roof Area
      - 1,929 SF / 1,000 SF = 1.93 x 75 LF = 144.7 LF -> 145 LF
    - Trench Width x Depth: 2-feet x 1.5-feet
    - Minimum 1-foot of separation between the bottom of the infiltration gallery and the seasonal high groundwater level.

  145 LF of trench was determined to be the minimum length needed to fully infiltrate runoff from a single portable. 300 LF of infiltration trench was proposed to manage runoff from two (2) portables. 147 LF of infiltration trench was proposed to manage runoff from a single portable.

- Other Hard Surfaces:
  - Permeable Pavements:

    Permeable Pavements were evaluated for the management of runoff from the gravel pad and asphalt walkway. This BMP was deemed feasible for the project. Runoff will permeate through the open-graded gravel pad and asphalt walkway and fully infiltrate into native soils. The permeable pavements have been sized utilizing the WWHM model based on the following criteria:

    - Infiltration rate: 0.64 in/hr
    - Layers for each surface type:
      - Gravel Pad: 10” Open-Graded Gravel (0.33 porosity)
      - Asphalt Walkways: 4” Porous Asphalt (0.33 porosity)
6” Permeable Ballast (0.33 porosity)

        - Minimum 1-foot of separation between the bottom of the permeable pavement and the seasonal high groundwater level.

    The modeling determined that the proposed layers were sufficient to infiltrate 100% of runoff. See Appendix C for WWHM modeling.

- Lawn and Landscaped Areas:
    - This project is required to retain and protect undisturbed soil in areas not being developed and, prior to completion of the project, amend all new, replaced, and disturbed topsoil (including construction lay-down areas) with organic matter in accordance with BMP T5.13 of the 2019 DOE Manual.

This project proposes to infiltrate 100% of influent runoff on-site, resulting in no net gain of stormwater discharge from the developed site; therefore, this project meets or exceeds the LID Performance Threshold.

MINIMUM REQUIREMENT 6: RUNOFF TREATMENT

Per the 2019 DOE Manual, Runoff Treatment is required if the site Threshold Discharge Area (TDA) has a total of 5,000 SF of pollution generating hard surfaces (PGHS) or 3/4 acres of pollution generating pervious surfaces (PGPS). The Puyallup High School Portables project does not meet these thresholds as the site does not propose any PGHS or PGPS; therefore, runoff treatment is not required on-site.

MINIMUM REQUIREMENT 7: FLOW CONTROL

Per 2019 DOE Manual, Flow Control BMPs are required if the site TDA meets any of the following thresholds:

- TDAs that have a total of 10,000 SF or more of effective impervious surfaces, or
- TDAs that convert 3/4 acres or more of native vegetation, pasture, scrub/shrub, or unmaintained non-native vegetation to lawn or landscape, or convert 2.5 acres or more of native vegetation to pasture, and from which there is a surface discharge in a natural or man-made conveyance system from the TDA, or
- TDAs that through a combination of effective hard surfaces and converted vegetation areas cause a 0.15 cubic feet per second (cfs) or greater increase in the 100-year flow frequency as estimated using an approved continuous simulation model and 15-minute time step.

Effective impervious surfaces can be defined as those impervious surfaces that are connected via sheet flow or discrete conveyance to a drainage system. Impervious surfaces are considered ineffective if approved runoff modeling methods indicate that the entire runoff file is infiltrated.

The Puyallup High School Portables project is proposing to infiltrate 100% of runoff file using an infiltration gallery and permeable pavements; therefore, all proposed impervious areas are deemed ineffective. Since the project is not proposing any effective impervious, TDA Thresholds stated above are not triggered and Flow Control BMPs are not required.

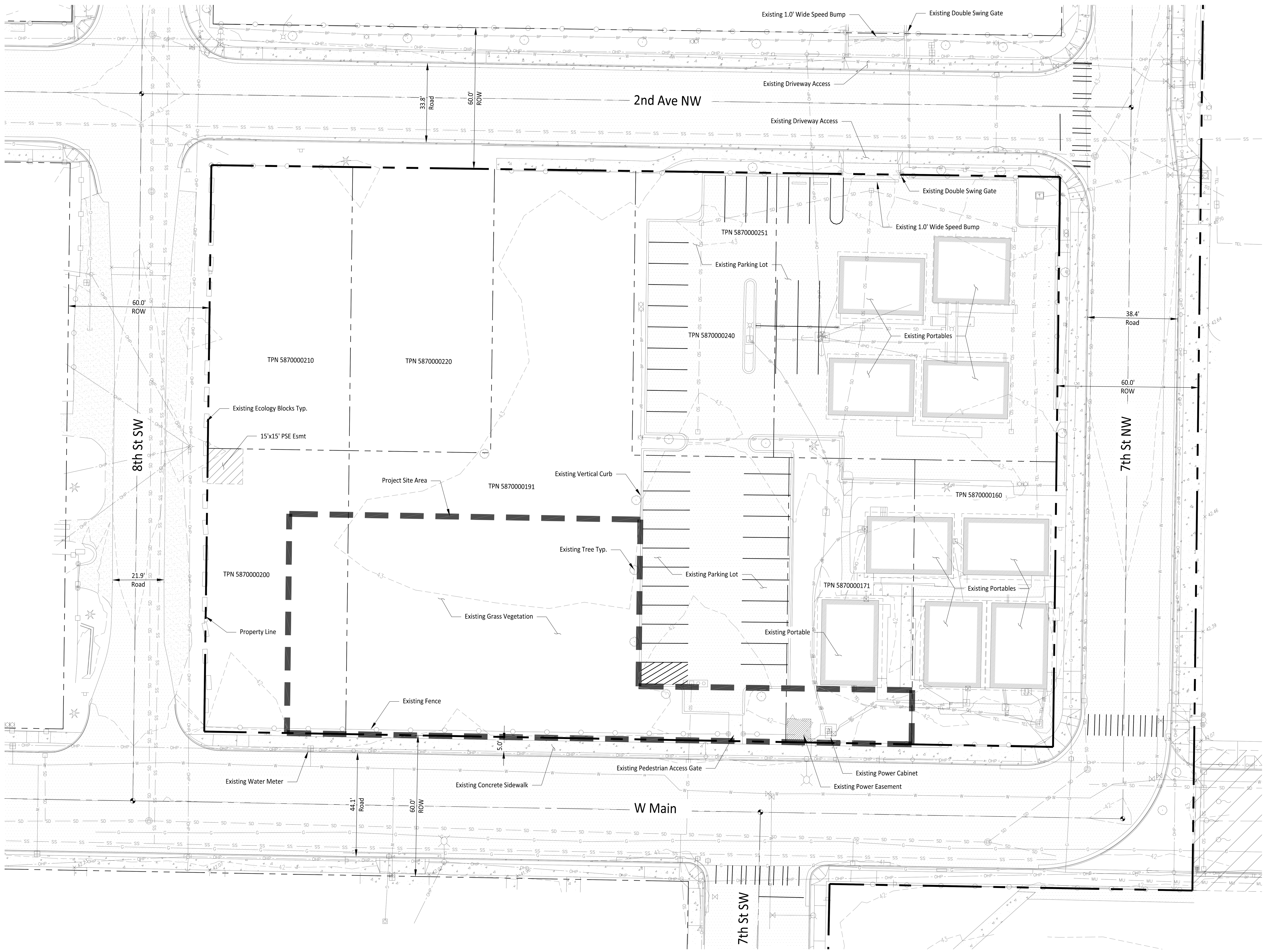
MINIMUM REQUIREMENT 8: WETLAND PROTECTION

This minimum requirement applies only to TDAs whose stormwater discharges to wetlands. This project does not propose to discharge stormwater to wetlands; therefore, this minimum requirement does not apply to the project.

MINIMUM REQUIREMENT 9: OPERATION AND MAINTENANCE

An operation and maintenance manual shall be provided for Stormwater Management BMPs in accordance with the 2019 DOE Manual. This manual will be developed prior to building occupancy.

APPENDIX A



EXISTING LOT COVERAGE

Total Lot Area	43,574 SF (1.00 AC)		
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Pervious			
Landscape	34,202	0.78	
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0 20 40 FEET
1" = 20'

LEGEND

- Found Monument As Noted
- Calculated Monument Position
- Found Rebar / Iron Pipe As Notes
- Survey Control Point, As Noted
- Sanitary Sewer Manhole
- Sanitary Sewer Clean Out
- Storm Manhole
- Storm Catch Basin
- Storm Culvert
- Storm Clean Out
- Roof Drain
- Water Valve
- Water Meter
- Fire Hydrant
- Fire Department Connection
- Water Blow Off
- Post Indicator Valve
- Irrigation Control Valve
- Gas Valve
- Gas Meter
- Utility Pole
- Guy Anchor
- Junction Box
- Power Vault
- Power Cabinet
- Power Manhole
- Light Pole
- Utility Vault
- Electric Meter
- Power Transformer
- Column
- Bollard
- Gate Post
- Communications Vault
- Communications Manhole
- Telephone Cabinet
- Sign
- Mailbox
- Flag Pole
- Deciduous Tree
- Evergreen Tree
- TPN — Tax Parcel Number
- FF — Finish Floor Elevation
- Road Centerline
- SD — Storm Drain Line
- SS — Sanitary Sewer Line
- W — Buried Water Line
- G — Buried Gas Line
- BP — Buried Power Line
- TEL — Buried Telecommunications Line
- OHP — Overhead Power Line
- Chain Link Fence
- Wood Fence
- SD — Record Storm Line
- SS — Record Sanitary Line
- Asphalt Surface
- Concrete Surface
- Gravel Surface

HORIZONTAL DATUM

Washington Plane Coordinate System, South Zone,
NAD 83/2011
Based on GPA observation utilizing the Washington State Reference Network (WSRN)

Measured south 88°57'44" east between two found monuments along west main st. at the intersections with 8th st nw and 7th st nw

VERTICAL DATUM

NAVD88
Based on GPS observation utilizing the WSRN with NGS GEOID18 Loaded

Temporary Benchmark Elevation = 41.76
Description: Rebar & Control Cap #12
Located at the intersection of West Main & 7th ST NW
SE of the radial curb line

SITE DATA

- Total Lot Area: 43,574 SF (1.00 AC)
- Total Project Site Area: 16,587 SF (0.38 AC)
- Tax Parcel Numbers: 5870000171, 5870000190, 5870000200, 5870000231
- Zoning: PF- Public Facilities

APPROVED

BY ____________
CITY OF PUYALLUP
DEVELOPMENT ENGINEERING

DATE ____________

NOTE: THIS APPROVAL IS VOID AFTER 180 DAYS FROM APPROVAL DATE.
THE CITY WILL NOT BE RESPONSIBLE FOR ERRORS AND/OR OMISSIONS ON THESE PLANS.
FIELD CONDITIONS MAY DICTATE CHANGES TO THESE PLANS AS DETERMINED BY THE DEVELOPMENT ENGINEERING MANAGER.

CALL TWO BUSINESS DAYS BEFORE YOU DIG
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PUYALLUP SCHOOL DISTRICT
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TITLE
PUYALLUP HS NEW PORTABLES 2023

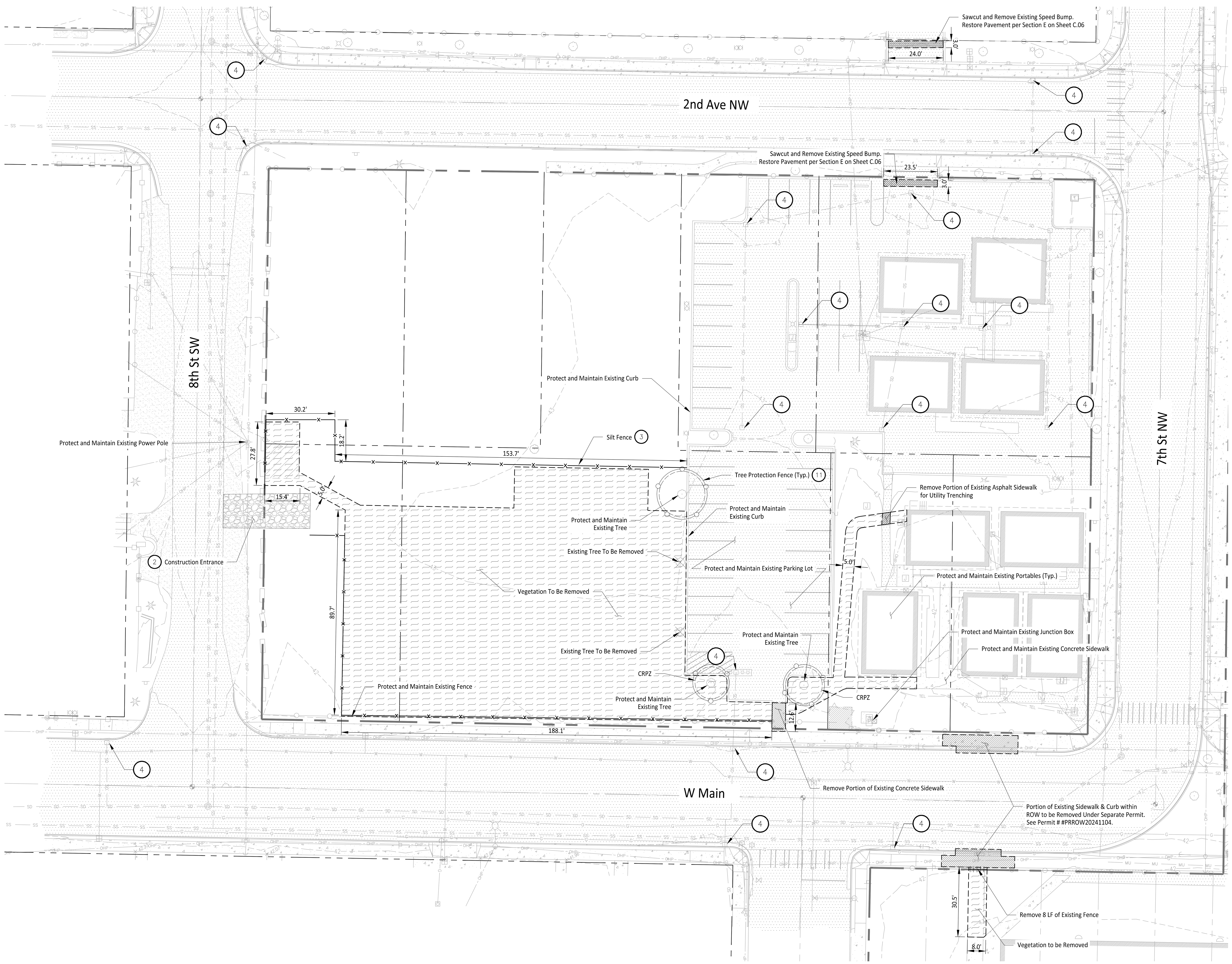
STAMP
JUSTIN M. JONES
STATE OF WASHINGTON
41829
REGISTERED PROFESSIONAL ENGINEER
10-03-24

ISSUED:	DATE:
CONDITIONAL USE PERMIT	OCT, 11 2023
CUP CC#1 RESPONSE	APR, 5 2024
BUILDING PERMIT SET	MAY 3, 2024
ROW PERMIT SET	JULY 10, 2024
ROW PERMIT SET REV. 1	AUG 20, 2024
ROW PERMIT SET REV. 2	OCT 02, 2024
PERMIT CC#1 RESPONSE	OCT 03, 2024

EXISTING SITE PLAN

Building Permit #:	-
CUP #:	PLCUP20230109
Owner's Project #:	-
Architect's Project #:	2023106
Drawn By	MO
Checked By	JJ

C.01



LEGEND

- Construction Entrance
- Vegetation To Be Removed
- Concrete To Be Removed
- Asphalt To Be Removed
- Existing Asphalt Pavement
- Existing Gravel Pavement
- Existing Concrete Pavement
- Property Line
- Parcel Line
- Silt Fence
- Existing Fence to be Removed
- Existing Overhed Power Line
- Existing Sewer Line
- Existing Storm Line
- Existing Water Line
- Existing Gas Line
- Existing Building Line
- Existing Chainlink Fence Line
- Tree Protection Fence Line
- Existing Tree
- Existing Type II Storm Manhole
- Existing Type I Storm Catch Basin
- Existing Sewer Manhole
- Existing Light Pole
- Existing Power Pole

(#) TESC NOTES

1. Contractor to install TESC measures as necessary to ensure stormwater leaving the site is free of settleable solids.
2. Install and maintain construction entrance per City of Puyallup Standard Detail 05.01.01 and install wheel wash as needed per Washington DOE BMP C106.
3. Install silt fence per City of Puyallup Standard Detail 02.03.02. Silt Fence to mark clearing limits in the field.
4. Maintain and Install storm drain inlet protection in all existing catch basins within the project vicinity per WSDOT Standard Plan I-40.20-00 and storm drain barriers per City of Puyallup Standard Details 02.03.05 and 02.03.06. Catch Basins within drivable areas are only to use the storm drain inlet protection, and not City Standard 02.03.05 and 02.03.06.
5. Roads shall be cleared thoroughly as needed to protect stormwater infrastructure and downstream water resources. Sediment shall be removed from roads by shoveling or pickup sweeping and be transported to a controlled sediment disposal area.
6. Exposed soils shall be watered as necessary to prevent dust from leaving the site.
7. Concrete handling and equipment washing in accordance with DOE BMP C151.
8. Disturbed soils to be amended per DOE BMP T5.13
9. If necessary, alternative sediment control methods shall be submitted by the contractor for review and approval prior to construction.
10. A CESCL shall be present on-site or on-call for the duration of construction operations.
11. Install tree protection fence per City of Puyallup Detail on Sheet C-03.

DEMOLITION NOTES

- Vegetation to be Removed: 16,750 SF
- Concrete to be Removed: 75 SF
- Disturbed Area On-site: 16,850 SF

APPROVED

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DEVELOPMENT ENGINEERING

DATE ______________________

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TESC & DEMOLITION PLAN

Building Permit #:	-
CUP #:	PLCUP20230109
Owner's Project #:	-
Architect's Project #:	2023106
Drawn By	MO
Checked By	JJ

C.02

ARCHITECT

studio MENG STRAZZARA

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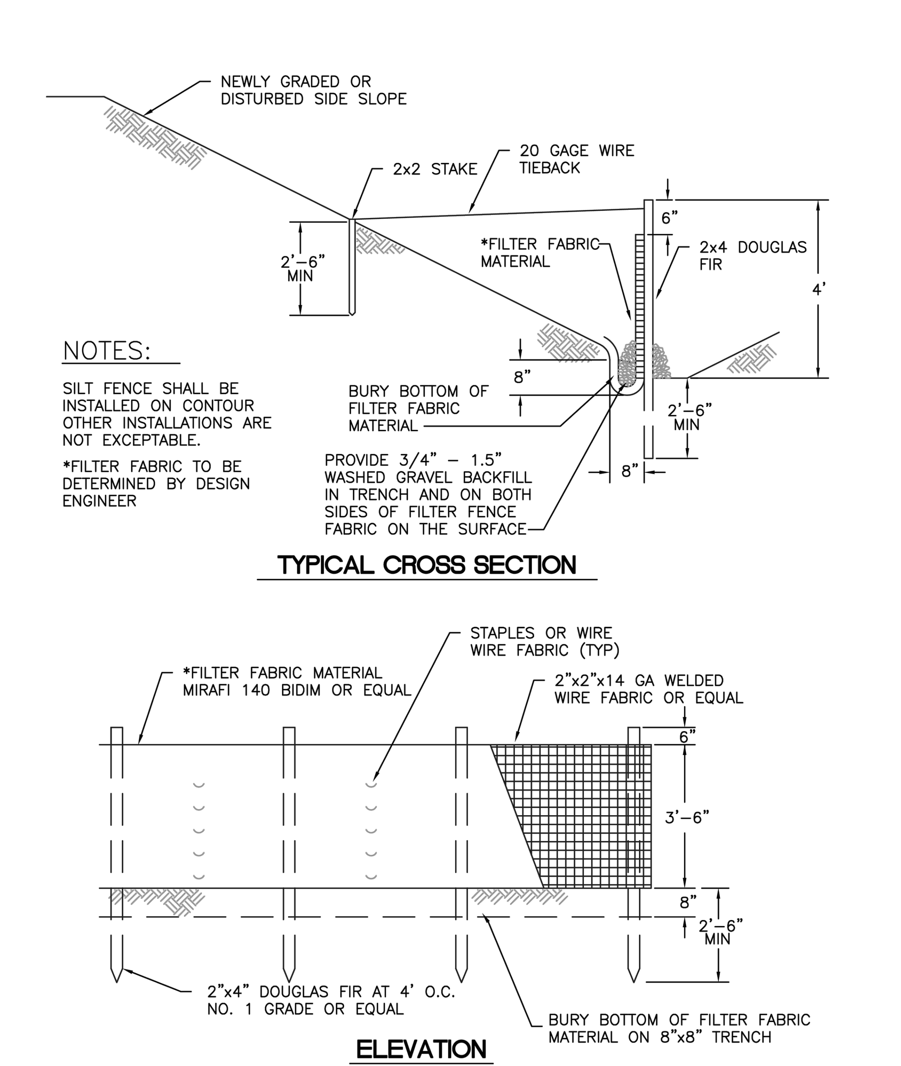
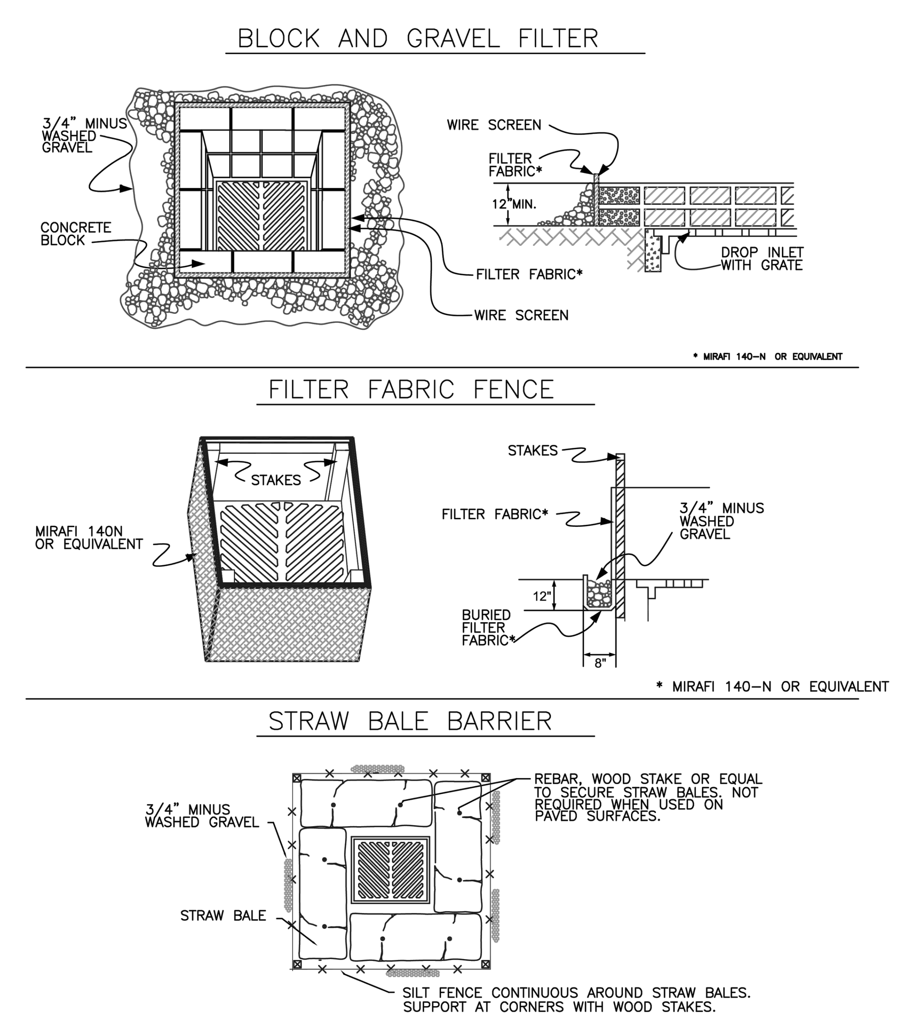


CITY OF PUYALLUP
DEVELOPMENT ENGINEERING and PUBLIC WORKS DEPARTMENTS

SILTATION FENCE

CITY STANDARD 02.03.02



CITY OF PUYALLUP
DEVELOPMENT ENGINEERING and PUBLIC WORKS DEPARTMENTS

STORM DRAIN BARRIERS

CITY STANDARD 02.03.05

CONDITIONS WHERE PRACTICE APPLIES

1. BLOCK AND GRAVEL FILTER – APPLICABLE FOR AREAS GREATER THAN 5% SLOPE.
2. FILTER FABRIC FENCE – APPLICABLE WHERE THE INLET DRAINS A RELATIVELY SMALL (ONE ACRE OR LESS) AND FLAT AREA (LESS THAN 5% SLOPE).
3. STRAW BALE BARRIER – APPLICABLE WHERE INLET DRAINS A RELATIVELY FLAT DISTURBED AREA (LESS THAN 5% SLOPE) IN WHICH SHEET FLOW (NOT EXCEEDING 0.5 FT/SEC.) OCCURES. BARRIERS OF THIS TYPE SHOULD NOT BE PLACED AROUND INLETS RECEIVING CONCENTRATED FLOWS SUCH AS THOSE ALONG MAJOR STREETS AND HIGHWAYS.

1. BLOCK AND GRAVEL FILTER – INSTALLATION PROCEDURE

A: PLACE WIRE MESH OVER THE DROP INLET SO THAT THE WIRE EXTENDS A MINIMUM OF ONE FOOT BEYOND EACH SIDE OF THE INLET STRUCTURE. USE WIRE SCREEN WITH 1/2–INCH OPENINGS. IF MORE THAN ONE STRIP OF MESH IS NECESSARY, OVERLAP THE STRIPS. PLACE FILTER FABRIC* OVER WIRE MESH.

B: PLACE CONCRETE BLOCKS LENGTHWISE ON THEIR SIDES IN A SINGLE ROW AROUND THE PERIMETER OF THE INLET, SO THAT THE OPEN ENDS FACE OUTWARD, NOT UPWARD. THE ENDS OF ADJACENT BLOCKS SHOULD ABUT. THE HIEGHT OF THE BARRIER CAN BE VARIED, DEPENDING ON DESIGN NEEDS, BY STACKING COMBINATIONS OF BLOCKS THAT ARE 4–INCH, 8–INCH AND 12–INCH WIDE. THE ROW OF BLOCKS SHOULD BE AT LEAST 12–INCHES BUT NO GREATER THAN 24–INCHES HIGH.

C: PLACE WIRE SCREEN OVER THE OVERSIDE VERTICAL FACE (OPEN END) OF THE CONCRETE BLOCKS TO PREVENT STONES FROM BEING WASHED THROUGH THE BLOCKS. USE WIRE SCREEN WITH 1/2–INCH OPENINGS.

D: PILE STONES AGAINST THE WIRE MESH TO THE TOP OF THE BLOCKS. USE 3/4" MINUS WASHED GRAVEL.

2. FILTER FABRIC FENCE – INSTALLATION PROCEDURE

A: PLACE 2–INCH BY 2–INCH WOODEN STAKES AROUND THE PERIMETER OF THE INLET A MAXIMUM OF 3 FEET APART AND DRIVE THEM AT LEAST 8–INCHES INTO THE GROUND. THE STAKES MUST BE AT LEAST 3 FEET LONG.

B: EXCAVATE A TRENCH APPROXIMATELY 8–INCHES WIDE AND 12–INCHES DEEP AROUND THE OUTSIDE PERIMETER OF THE STAKES.

C: STAPLE THE FILTER FABRIC* TO THE WOODEN STAKES SO THAT 32–INCHES OF THE FABRIC EXTENDS AND CAN BE FORMED INTO THE TRENCH, AND USE HEAVY–DUTY WIRE STAPLES AT LEAST 1/2–INCHES LONG.

D: BACKFILL THE TRENCH WITH 3/4–INCH MINUS WASHED GRAVEL ALL THE WAY AROUND.

3. STRAW BALE BARRIER – INSTALLATION PROCEDURE

A: EXCAVATE A 4–INCH DEEP TRENCH AROUND THE INLET. MAKE THE TRENCH AS WIDE AS A STRAW BALE.

B: ORIENT STRAW BALES WITH THE BINDINGS AROUND THE SIDES OF THE BALES RATHER THAN OVER AND UNDER THE BALES.

C: PLACE BALES LENGTHWISE AROUND THE INLET AND PRESS THE ENDS OF ADJACENT BALES SECURELY IN PLACE.

D: DRIVE TWO 2–INCH BY 2–INCH STAKES THROUGH EACH BALE TO ANCHOR THE BALE SECURELY IN PLACE.

E: BACKFILL THE EXCAVATED SOIL AND COMPACT IT AGAINST THE BALE.

F: WEDGE LOOSE STRAW BETWEEN BALES TO PREVENT WATER FROM FLOWING BETWEEN BALES.

* MIRAFI 140–N OR EQUIVALENT

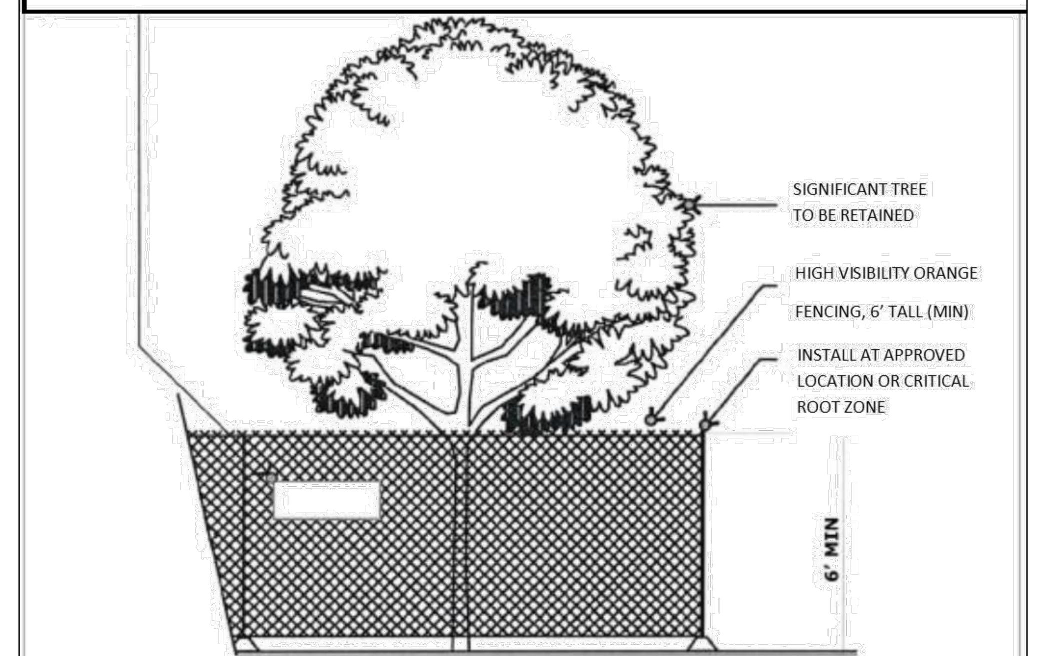
CITY OF PUYALLUP
DEVELOPMENT ENGINEERING and PUBLIC WORKS DEPARTMENTS

STORM DRAIN BARRIERS NOTES

DRAWN BY	CHECKED BY	APPROVED BY	REVISED BY	CITY STANDARD
LINDA LANSING	LINDA LIAN	COLLEEN HARRIS	XXXX	02.03.06
FILE NAME F:\DWG\COMMON\STDS\CITY\2009\02_SD\02.03.06		DATE APPROVED 09/01/1992	DATE REVISED 06/01/2003	SCALE NTS

TREE PROTECTION ZONE (TPZ)

NO ENTRY. NO GRADE CHANGES, STORAGE/STOCKPILING OF MATERIALS OR EQUIPMENT, PLACEMENT OF FILL OR TOP SOIL, TRENCHING OR VEHICULAR/FOOT TRAFFIC PERMITTED WITHIN THE TPZ. THIS TREE BARRIER SHALL NOT BE REMOVED WITHOUT AUTHORIZATION FROM PUYALLUP PLANNING DEPARMENT—SUBJECT TO FINES AND ENFORCEMENT ACTION BY THE CITY—TO REPORT VIOLATIONS OR FOR MORE INFORMATION—CALL (253) 864.4165



- MINIMUM SIX (6) FOOR HIGH TEMPORARY HIGH VISIBILITY ORANGE CONSTRUCTION FENCING SHALL BE PLACED AT THE CRITICAL ROOT ZONE OR DESIGNATED LIMIT OF DISTURBANCE ON APPROVED FINAL LANDSCAPE PLAN SET; FENCING SHALL BE INSTALLED USING POSTS DRIVEN INTO GROUND—PIER BLOCKS SHALL NOT BE USED. AVOID POSTS DRIVEN INTO ROOTS LARGER THAN 1" DIAMETER. FENCING SHALL BE INSTALLED PRIOR TO WORK COMMENCING ON SITE AND REMAIN IN PLACE THROUGHOUT ALL PHASES ON CONSTRUCTION—CALL THE CITY'S PLANNING DIVISION WITH REQUESTS TO MODIFY THE LOCATION OF THE TREE PROTECTION FENCING—(253) 864-4165
- TREATMENT OF ROOTS EXPOSED DURING CONSTRUCTION: FOR ROOTS OVER ONE (1) INCH DIAMETER DAMAGED DURING CONSTRUCTION, MAKE A CLEAN STRAIGHT CUT TO REMOVE DAMAGED PORTION OF ROOT. ALL EXPOSED ROOTS SHALL BE TEMPORARILY COVERED WITH DAMP BURLAP TO PREVENT DRYING AND COVERED WITH SOIL AS SOON AS POSSIBLE. OTHER PRE-TREATMENT MEASURES MAY BE REQUIRED TO PROTECT ROOT SYSTEM—SEE APPROVED TREE PROTECTION OR FINAL LANDSCAPE PLAN FOR FURTHER DETAILS.
- NO STOCKPILING OF MATERIALS, VEHICULAR TRAFFIC, PLACEMENT OF TOP SOIL OR FILL MATERIAL, STORAGE OF EQUIPMENT OR MACHINERY SHALL BE ALLOWED WITHIN THE LIIMITS OF THE ESTABLISHED FENCING. FENCING SHALL NOT BE MOVED OR REMOVED UNLESS APPROVED BY THE CITY PLANNING DIVISION. WORK WIHTIN PROTECTION FENCE SHALL BE DONE MANUALLY UNDER THE SUPERVISION OF THE ON-SITE ARBORIST WITH PRIOR WRITTEN APPROVAL BY THE CITY PLANNING DIVISION.
- THE ABOVE REFERENCED TPZ SIGNS SHALL BE PLACED EVERY 15 FEET ALONG THE FENCING AND SHALL REMAIN IN PLACE THROUGHOUT ALL PHASES OF CONSTRUCTION.

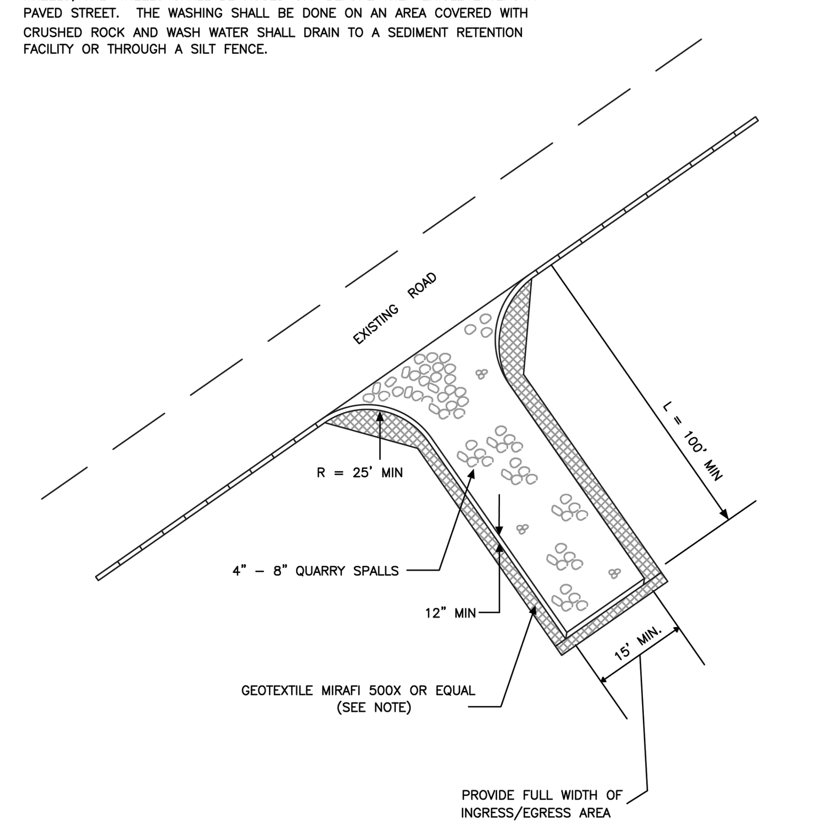
TREE PROTECTION FENCING DETAIL
(for public and private trees)

TITLE

PUYALLUP HS NEW PORTABLES 2023

NOTE:

1. GEOTEXTILE MIRAFI 500 X OR APPROVED EQUAL SHALL BE PLACED UNDER THE ENTIRETY OF THE TEMPORARY ENTRANCE.
2. ADDITIONAL ROCK SHALL BE ADDED PERIODICALLY TO MAINTAIN PROPER FUNCTION OF THE PAD.
3. IF THE PAD DOES NOT ADEQUATELY REMOVE THE MUD FROM THE VEHICLE'S WHEELS, THE WHEELS SHALL BE HOSED OFF BEFORE THE VEHICLE ENTERS A PAVED STREET. THE WASHING SHALL BE DONE ON AN AREA COVERED WITH CRUSHED ROCK AND WASH WATER SHALL DRAIN TO A SEDIMENT RETENTION FACILITY OR THROUGH A SILT FENCE.



CITY OF PUYALLUP
DEVELOPMENT ENGINEERING and PUBLIC WORKS DEPARTMENTS

TEMPORARY CONSTRUCTION ENTRANCE

CITY STANDARD 05.01.01

1. ALL LIMITS OF CLEARING AND AREAS OF VEGETATION PRESERVATION AS PRESCRIBED ON THE PLANS SHALL BE CLEARLY FLAGGED IN THE FIELD AND OBSERVED DURING CONSTRUCTION.

2. ALL REQUIRED SEDIMENTATION AND EROSION CONTROL FACILITIES MUST BE CONSTRUCTED AND IN OPERATION PRIOR TO ANY LAND CLEARING AND/OR OTHER CONSTRUCTION TO ENSURE THAT SEDIMENT LADEN WATER DOES NOT ENTER THE NATURAL DRAINAGE SYSTEM. THE CONTRACTOR SHALL SCHEDULE AN INSPECTION OF THE EROSION CONTROL FACILITIES PRIOR TO ANY LAND CLEARING AND/OR CONSTRUCTION. ALL EROSION AND SEDIMENT FACILITIES SHALL BE MAINTAINED IN A SATISFACTIRY CONDITION AS DETERMINED BY THE CITY, UNTIL SUCH TIME THAT CLEARING AND/OR CONSTRUCTION IS COMPLETED AND THE POTENTIAL FOR ON–SITE EROSION HAS PASSED. THE IMPLEMENTATION, MAINTENANCE, REPLACEMENT, AND ADDITIONS TO THE EROSION AND SEDIMENTATION CONTROL SYSTEMS SHALL BE THE RESPONSIBILITY OF THE PERMITEE.

3. THE EROSION AND SEDIMENTATION CONTROL SYSTEM FACILITIES DEPICTED ON THESE PLANS ARE INTENDED TO BE MINIMUM REQUIREMENTS TO MEET ANTICIPATED SITE CONDITIONS. AS CONSTRUCTION PROGRESSES AND UNEXPECTED OR SEASONAL CONDITIONS DICTATE, FACILITIES WILL BE NECESSARY TO ENSURE COMPLETE SILTATION CONTROL ON THE SITE. DURING THE COURSE OF CONSTRUCTION, IT SHALL BE THE OBLIGATION AND RESPONSIBILITY OF THE PERMITEE TO ADDRESS ANY NEW CONDITIONS THAT MAY BE CREATED BY HIS ACTIVITIES AND TO PROVIDE ADDITIONAL FACILITIES, OVER AND ABOVE THE MINIMUM REQUIREMENTS, AS MAY BE NEEDED TO PROTECT ADJACENT PROPERTIES, SENSITIVE AREAS, NATURAL WATER COURSES, AND/OR STORM DRAINAGE SYSTEMS.

4. APPROVAL OF THESE PLANS IS FOR GRADING, TEMPORARY DRAINAGE, EROSION AND SEDIMENTATION CONTROL ONLY. IT DOES NOT CONSTITUTE AN APPROVAL OF PERMANENT STORM DRAINAGE DESIGN, SIZE OR LOCATION OF PIPES, RESTRICTORS, CHANNELS, OR RETENTION FACILITIES.

5. ANY DISTURBED AREA WHICH HAS BEEN STRIPPED OF VEGETATION AND WHERE NO FURTHER WORK IS ANTICIPATED FOR A PERIOD OF 30 DAYS OR MORE, MUST BE IMMEDIATELY STABILIZED WITH MULCHING, GRASS PLANTING, OR OTHER APPROVED EROSION CONTROL TREATMENT APPLICABLE TO THE TIME OF YEAR IN QUESTION. GRASS SEEDING ALONE WILL BE ACCEPTABLE ONLY DURING THE MONTHS OF APRIL THROUGH SEPTEMBER INCLUSVE. SEEDING MAY PROCEED OUTSIDE THE SPECIFIED TIME PERIOD WHENEVER IT IS IN THE INTEREST OF THE PERMITEE BUT MUST BE AUGMENTED WITH MULCHING, NETTING, OR OTHER TREATMENT APPROVED BY THE CITY.

6. IN CASE EROSION OR SEDIMENTATION OCCURS TO ADJACENT PROPERTIES, ALL CONSTRUCTION WORK WITHIN THE DEVELOPMENT THAT WILL FURTHER AGGRAVATE THE SITUATION MUST CEASE, AND THE OWNER/CONTRACTOR WILL IMMEDIATELY COMMENCE RESTORATION METHODS. RESTORATION ACTIVITY WILL CONTINUE UNTIL SUCH TIME AS THE AFFECTED PROPERTY OWNER IS SATISFIED.

7. NO TEMPORARY OR PERMANENT STOCKPILING OF MATERIALS OR EQUIPMENT SHALL OCCUR WITHIN CRITICAL AREAS OR ASSOCIATED BUFFERS, OR THE CRITICAL ROOT ZONE FOR VEGETATION PROPOSED FOR RETENTION.

CITY OF PUYALLUP
DEVELOPMENT ENGINEERING and PUBLIC WORKS DEPARTMENTS

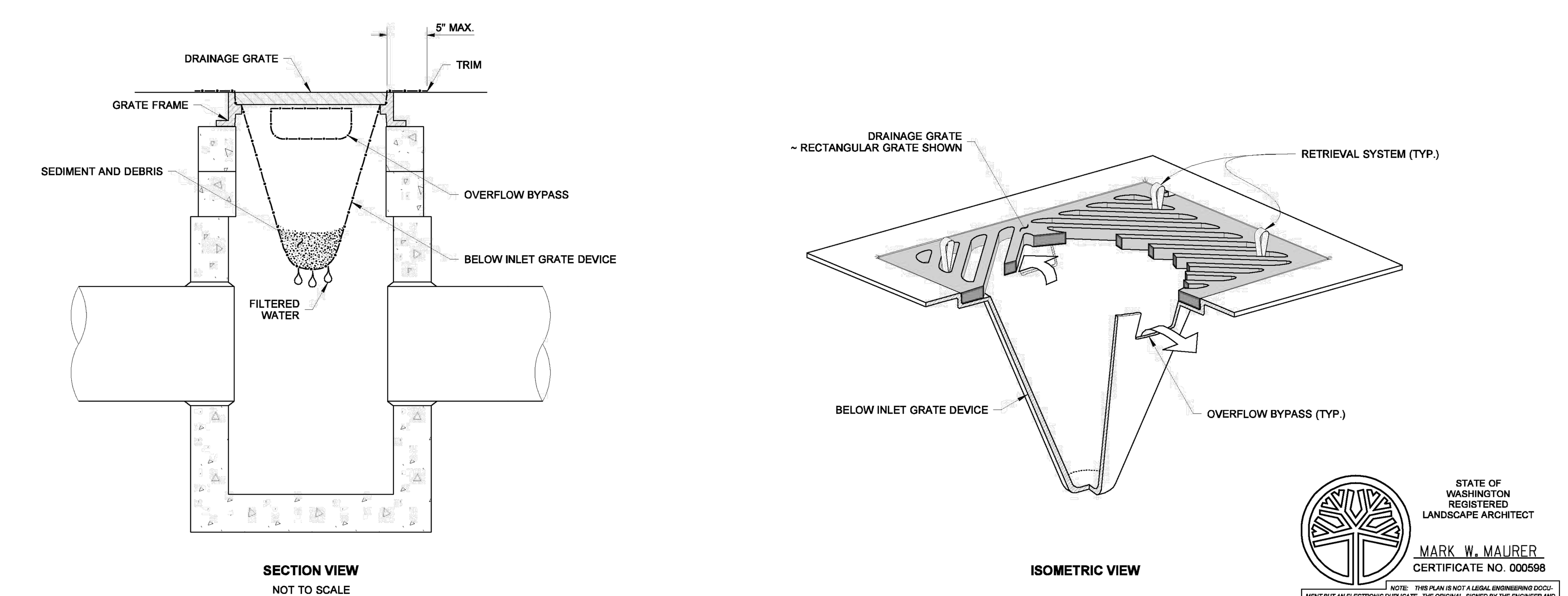
GRADING, EROSION, AND SEDIMENTATION CONTROL NOTES

CITY STANDARD 05.02.01

DRAWN BY: LISA CYFORD

NOTES

1. Size the Below Inlet Grate Device (BIGD) for the storm water structure it will service.
2. The BIGD shall have a built-in high-flow relief system (overflow bypass).
3. The retrieval system must allow removal of the BIGD without spilling the collected material.
4. Perform maintenance in accordance with Standard Specification 8-01.3(15).



STATE OF WASHINGTON REGISTERED LANDSCAPE ARCHITECT
MARK W. MAURER
CERTIFICATE NO. 000598

NOTE: THIS PLAN IS NOT A LEGAL ENGINEERING DOCUMENT BUT AN ELECTRONIC DUPLICATE. THE ORIGINAL, SIGNED BY THE ENGINEER AND APPROVED FOR PUBLICATION, IS KEPT ON FILE AT THE WASHINGTON STATE DEPARTMENT OF TRANSPORTATION. A COPY MAY BE OBTAINED UPON REQUEST.

STORM DRAIN INLET PROTECTION

STANDARD PLAN I-40.20-00

SHEET 1 OF 1 SHEET

APPROVED FOR PUBLICATION
Pasco Bakotich III — STATE DESIGN ENGINEER
09-20-07 — DATE
Washington State Department of Transportation

STAMP

JUSTIN M. JONES, STATE OF WASHINGTON, 41829, REGISTERED PROFESSIONAL ENGINEER

10-03-24

ISSUED:	DATE:
CONDITIONAL USE PERMIT	OCT, 11 2023
CUP CC#1 RESPONSE	APR, 5 2024
BUILDING PERMIT SET	MAY 3, 2024
ROW PERMIT SET	JULY 10, 2024
ROW PERMIT SET REV. 1	AUG 20, 2024
ROW PERMIT SET REV. 2	OCT 02, 2024
PERMIT CC#1 RESPONSE	OCT 03, 2024

TESC DETAILS

APPROVED

BY ____________ CITY OF PUYALLUP DEVELOPMENT ENGINEERING

DATE ____________

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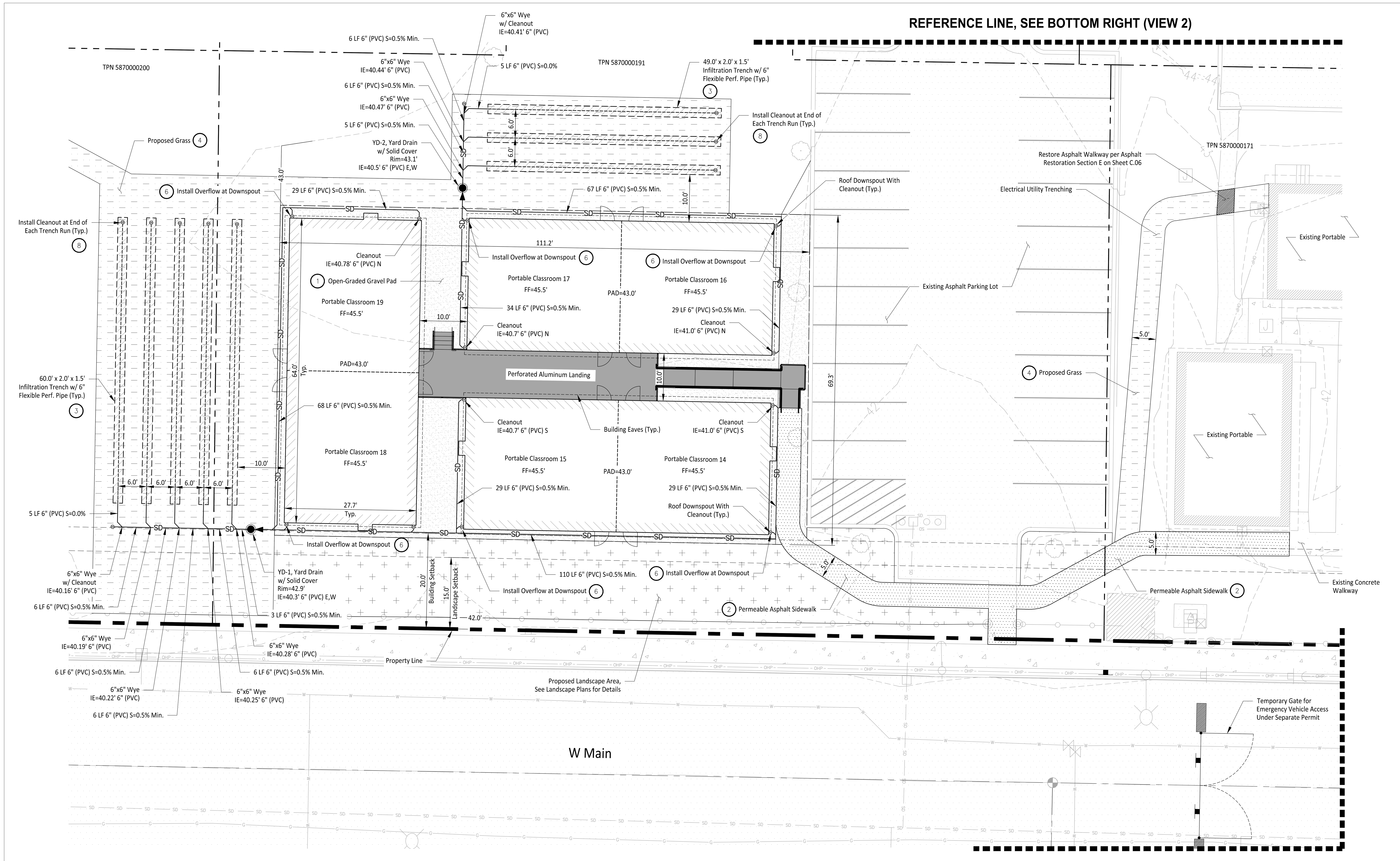
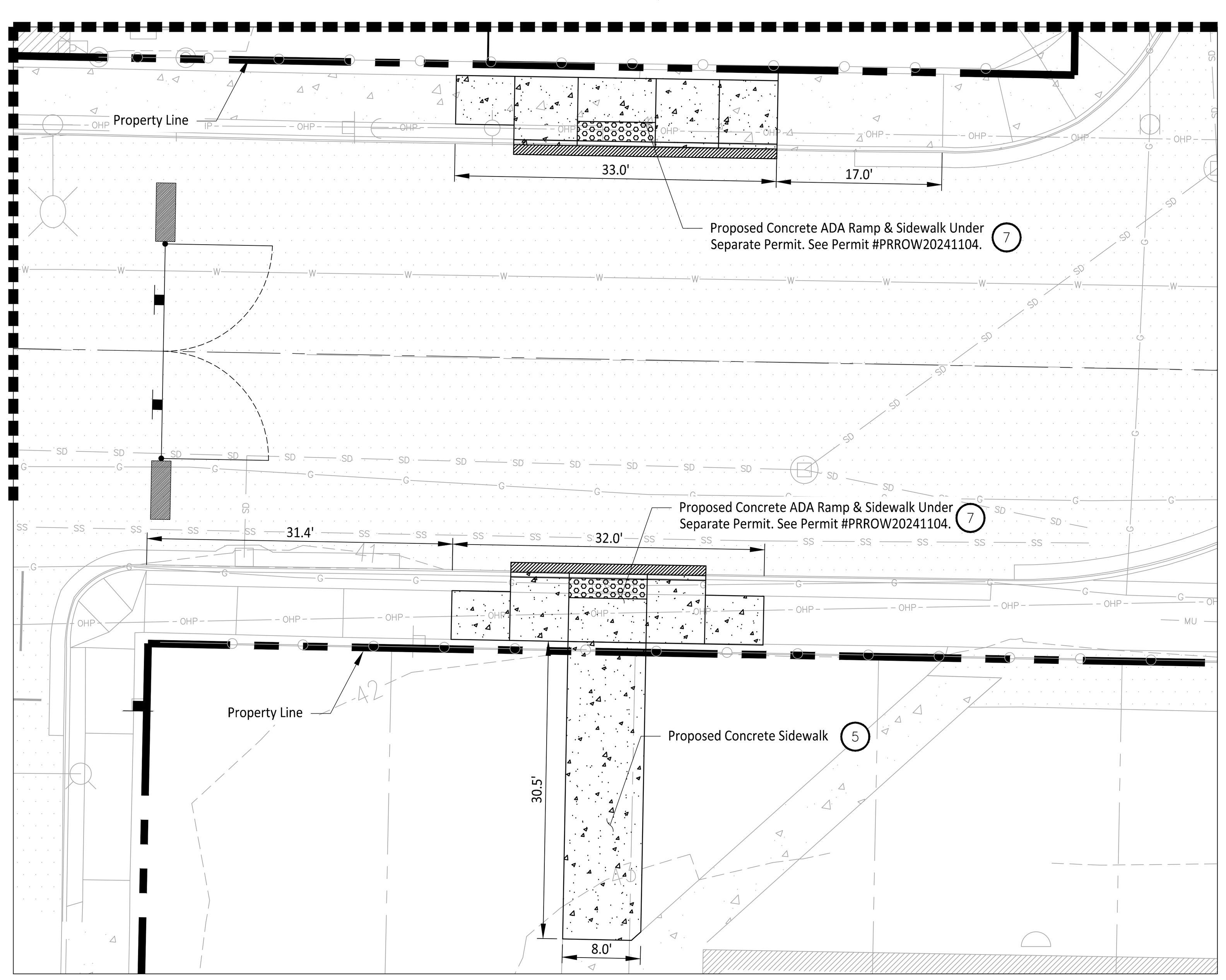
CALL TWO BUSINESS DAYS BEFORE YOU DIG
1-800-424-5555
UTILITIES UNDERGROUND LOCATION CENTER

Building Permit #:	-
CUP #:	PLCUP20230109
Owner's Project #:	-
Architect's Project #:	2023106
Drawn By	MO
Checked By	JJ

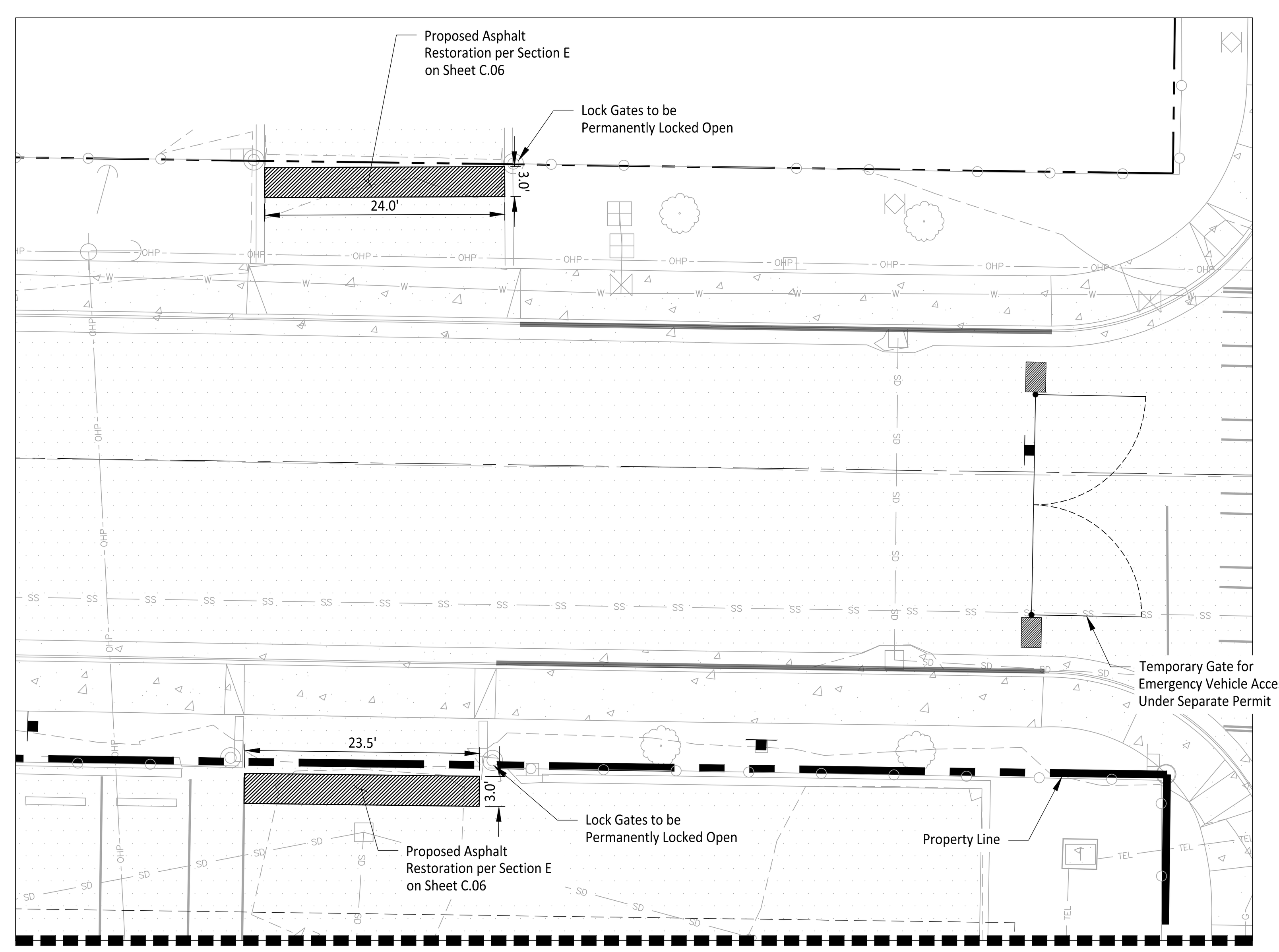
C.03



REFERENCE LINE, SEE TOP



VIEW 1



REFERENCE LINE, SEE TOP

VIEW 2

LEGEND

- Existing Asphalt
- Existing Concrete
- Proposed Permeable Asphalt
- Proposed Open-Graded Gravel
- Proposed Perforated Aluminum Landing
- Proposed Landscape Area
- Proposed Grass
- Proposed Infiltration Trench
- Restored Asphalt Walkway
- Proposed Catch Basin Type 1, Open Grate
- Proposed Yard Drain
- Proposed Cleanout
- Existing Catch Basin
- Proposed Storm Drain Line
- Existing Storm Drain Line

SITE DATA

- Total Lot Area: 43,574 SF (1.00 AC)
- Total Project Site Area: 16,587 SF (0.38 AC)
- Tax Parcel Numbers: 5870000171, 5870000191, 5870000200
- Zoning: PF- Public Facilities

PROPOSED LOT COVERAGE

Total Lot Area	43,574 SF (1.00 AC)		
Coverage	Area (SF)	Area (AC)	% of Site
Impervious			
Ex. Roof	1,722	0.04	
Ex. Concrete Sidewalk	964	0.03	
Ex. Asphalt Parking Lot	6,686	0.15	
New Roof	5,785	0.12	
New Permeable Asphalt Sidewalk	663	0.02	
New Open-Graded Gravel Pad	1,570	0.04	
New Perforated Aluminum Landing	660	0.02	
Total New Impervious	8,678	0.20	20.0%
Total Site Impervious	18,050	0.42	42.0%
Pervious			
Landscape	25,524	0.58	
Total Site Pervious	25,524	0.58	58.0%

(#) CONSTRUCTION NOTES

1. Install Open-Graded gravel pad per Section A on Sheet C.06.
2. Install Permeable Asphalt Sidewalk per Section B on Sheet C.06.
3. Install Infiltration Trench per Downspout Infiltration Trench Detail on Sheet C.06.
4. Disturbed soils to be amended per City of Puyallup Std. Dtl. 01.02.08a on Sheet C.07.
5. Install Sidewalk per City of Puyallup Std. Dtl. 01.02.01 on Sheet C.07.
6. Install Downspout Overflow per Downspout Infiltration Trench Detail on Sheet C.06.
7. Proposed ADA ramps on W Main to be barricaded and signed to prevent pedestrians from crossing W Main. Once roadway is closed to vehicle traffic with the proposed one year pilot these restrictions can be removed. A crosswalk at this location (with vehicle traffic present) does not meet engineering standards.
8. Install Cleanouts per City of Puyallup Std. Dtl. 02.01.09 on Sheet C.07.

LANDSCAPE NOTE

1. All planting areas shall be mulched with a uniform four (4") inch layer of organic compost mulch material or wood chips over a properly cleaned, amended and graded subsurface.

APPROVED

BY ______
CITY OF PUYALLUP
DEVELOPMENT ENGINEERING

DATE ______

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0 10 20 FEET
1" = 10'

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ARCHITECT
studio MENG STRAZZARA
2001 WESTERN AVE, STE# 200, SEATTLE, WA 98121
www.studioms.com | P: 206.587.3797

CONSULTANT
JMJ TEAM
JMJ Team
905 Main Street, Suite #200
Sumner, WA 98390
(206) 596-2020

CLIENT/OWNER
PUYALLUP SCHOOL DISTRICT
A Tradition of Excellence

TITLE
PUYALLUP HS NEW PORTABLES 2023

STAMP
JUSTIN M. JONES, STATE OF WASHINGTON, 41829, REGISTERED PROFESSIONAL ENGINEER
10-03-24

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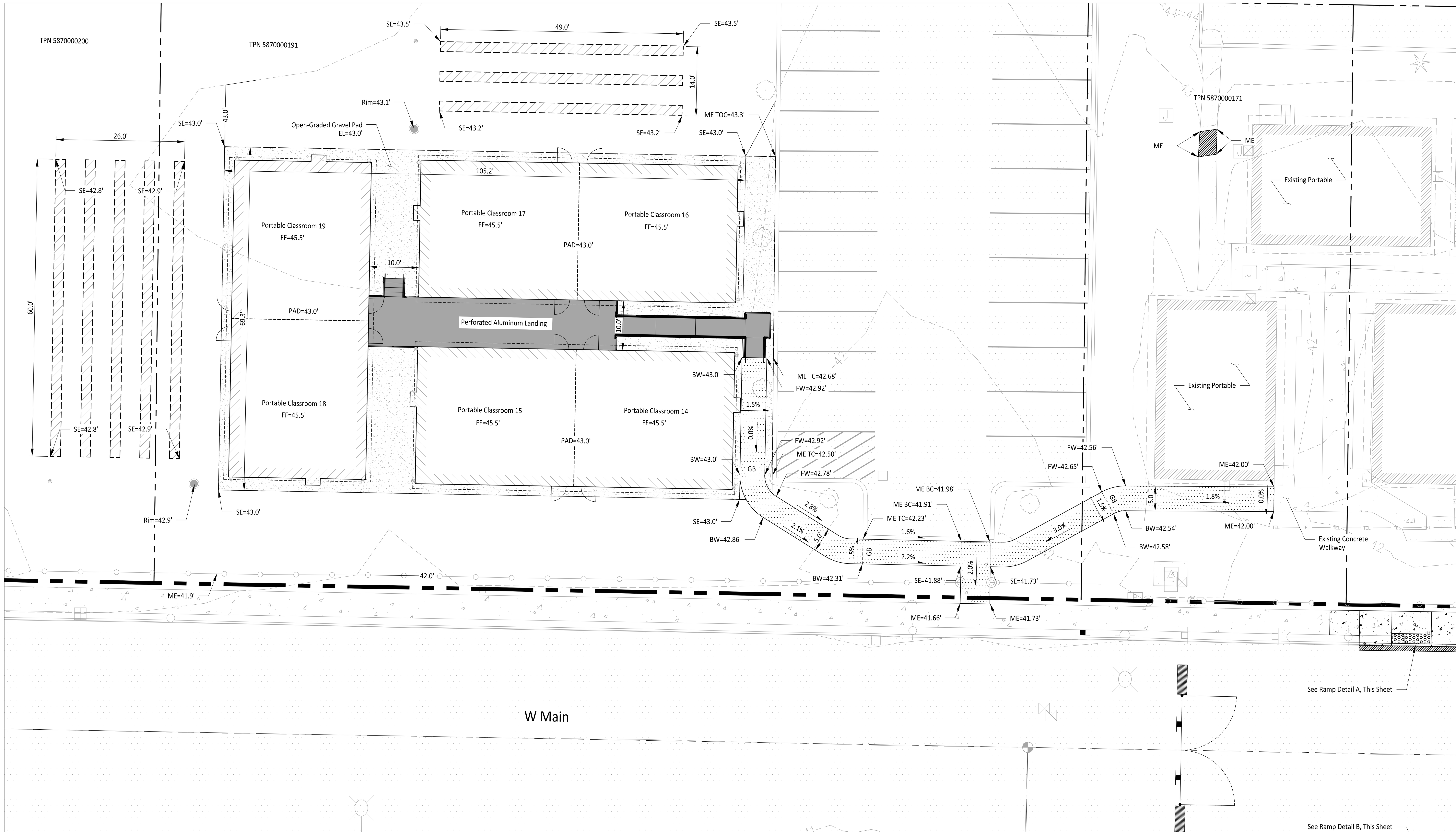
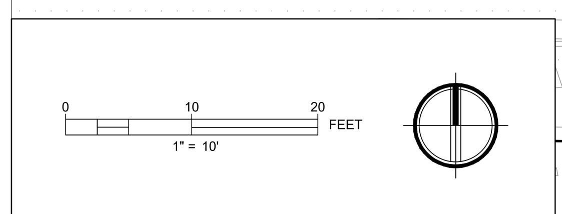
ROW PERMIT SET REV. 1	AUG 20, 2024
ROW PERMIT SET REV. 2	OCT 02, 2024
PERMIT CC#1 RESPONSE	OCT 03, 2024

PROPOSED SITE & STORM PLAN

Building Permit #:	-
CUP #:	PLCUP20230109
Owner's Project #:	-
Architect's Project #:	2023106
Drawn By	MO
Checked By	JJ

C.04



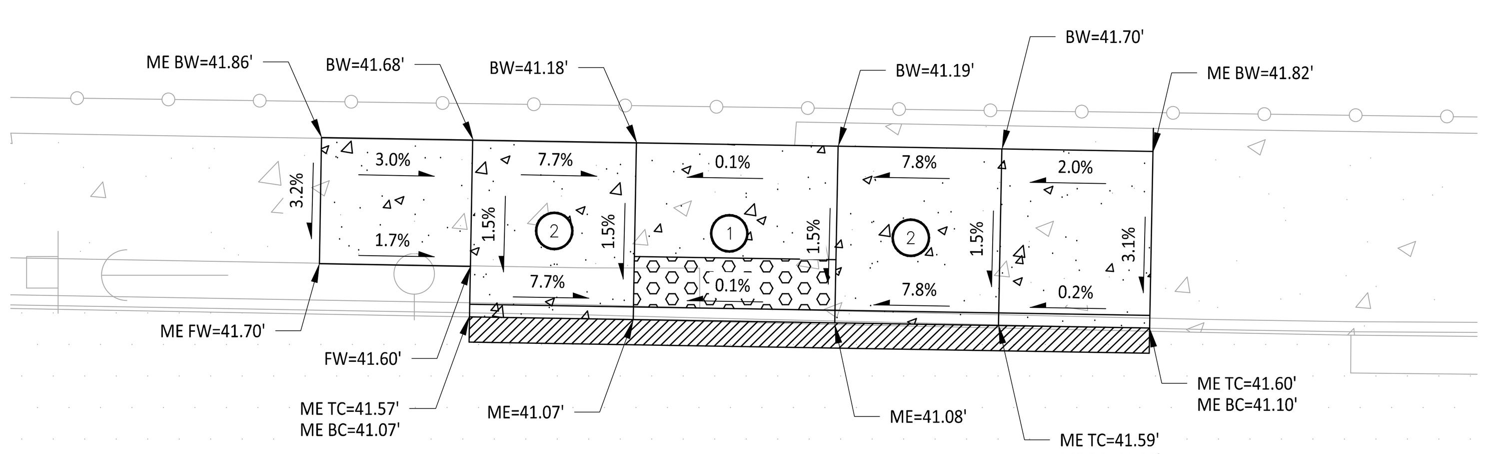


LEGEND

- Existing Asphalt
- Existing Concrete
- Proposed Permeable Asphalt
- Proposed Open-Graded Gravel
- Proposed Perforated Aluminum Landing
- Proposed Infiltration Trench
- Proposed Catch Basin Type 1, Open Grate
- Proposed Yard Drain
- Proposed Cleanout
- Existing Catch Basin
- FF — Finished Floor Elevation
- SE — Spot Elevation
- ME — Match Existing Elevation
- FW — Face of Walk Elevation
- BW — Back of Walk Elevation
- TC — Top of Curb Elevation
- BC — Bottom of Curb Elevation
- GB — Grade Break

GENERAL NOTES

1. Landing shall not exceed 2.0% running or cross slope.
2. All sidewalk ramps shall not exceed 8.33% running slope or 2.0% cross slope.
3. Install 6" Cement Concrete Traffic Curb per WSDOT Std. Plan F-10.12-04. See Sheet C.07 for Detail.
4. Install Concrete Sidewalk per City of Puyallup Std. Detail 01.02.01. See Sheet C.07 for Detail.

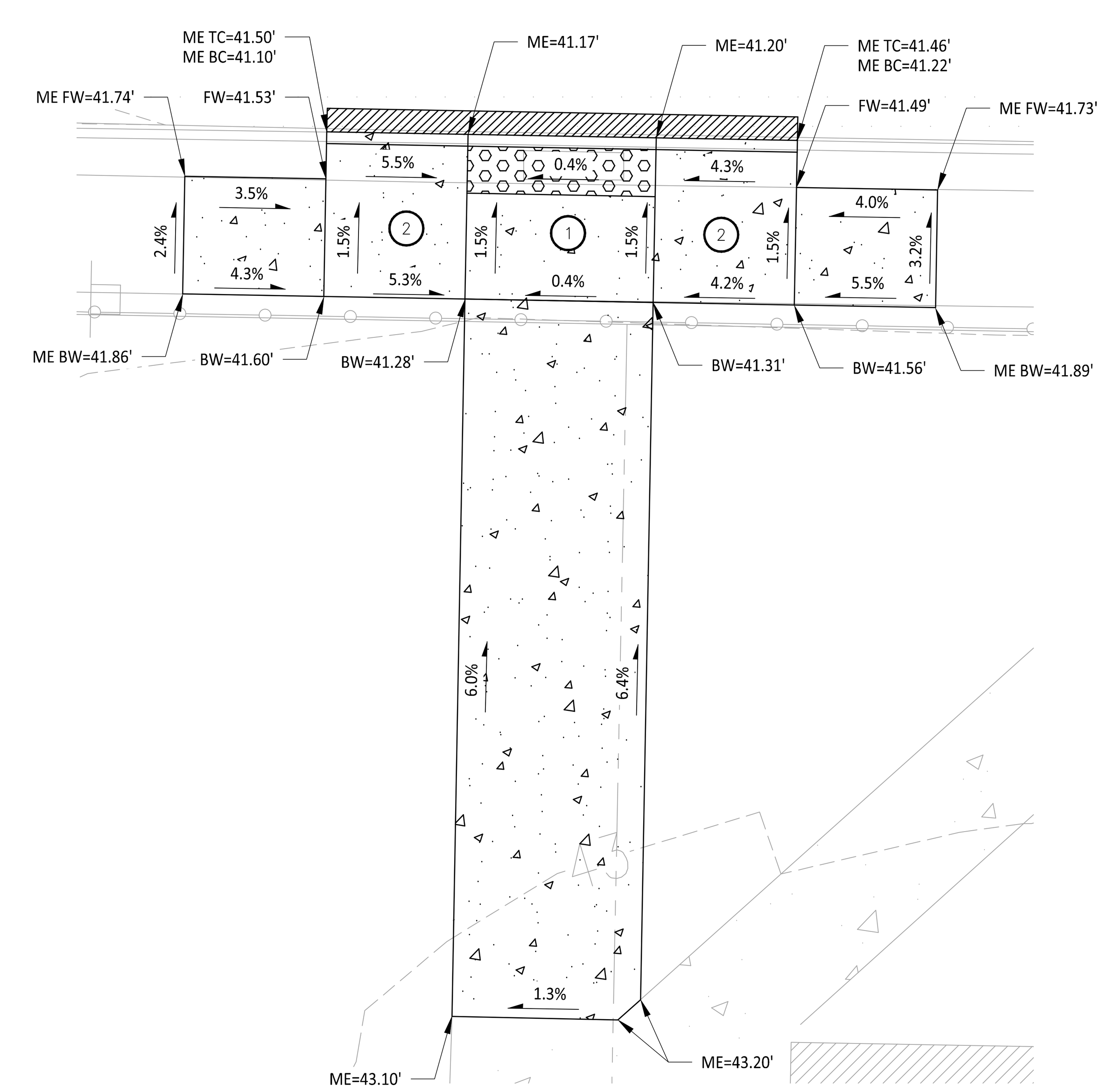


CONSTRUCTION NOTE:

1. Proposed improvements within ROW under separate permit. See Permit #PRROW20241104.

RAMP DETAIL (A)

SCALE: 1"=5'



CONSTRUCTION NOTE:

1. Proposed improvements within ROW under separate permit. See Permit #PRROW20241104.

RAMP DETAIL (B)

SCALE: 1"=5'

APPROVED

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CITY OF PUYALLUP DEVELOPMENT ENGINEERING

DATE ______

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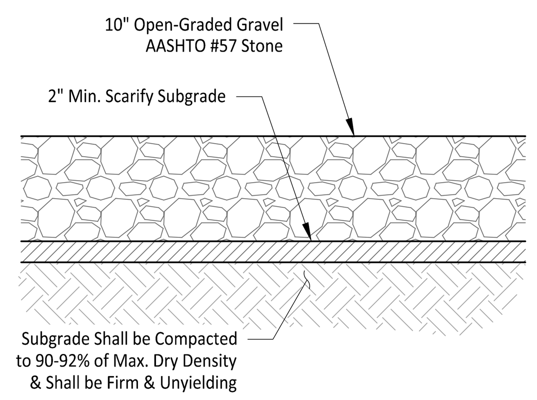
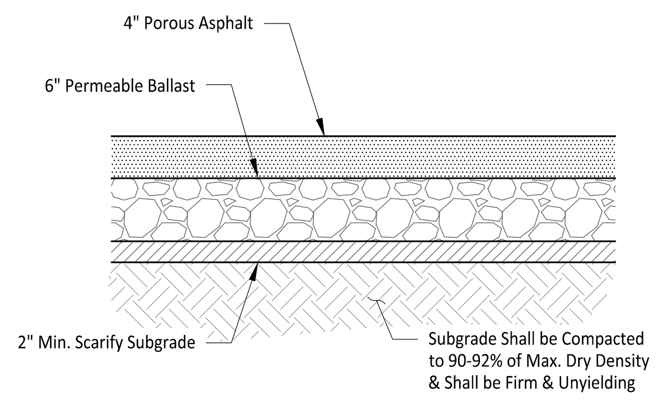
PROPOSED GRADING PLAN

Building Permit #:	-
CUP #:	PLCUP20230109
Owner's Project #:	-
Architect's Project #:	2023106
Drawn By	MO
Checked By	JJ

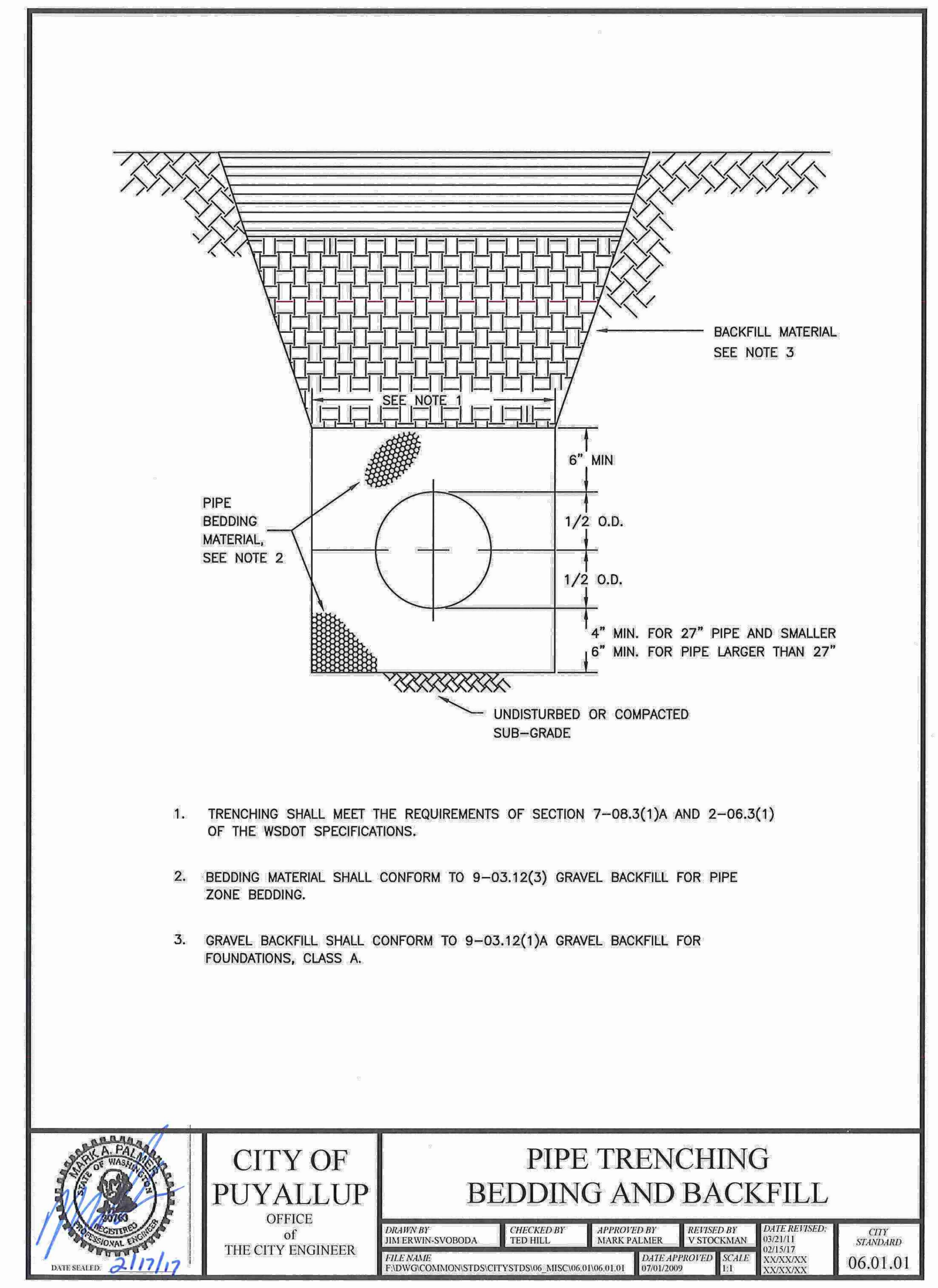
C.05

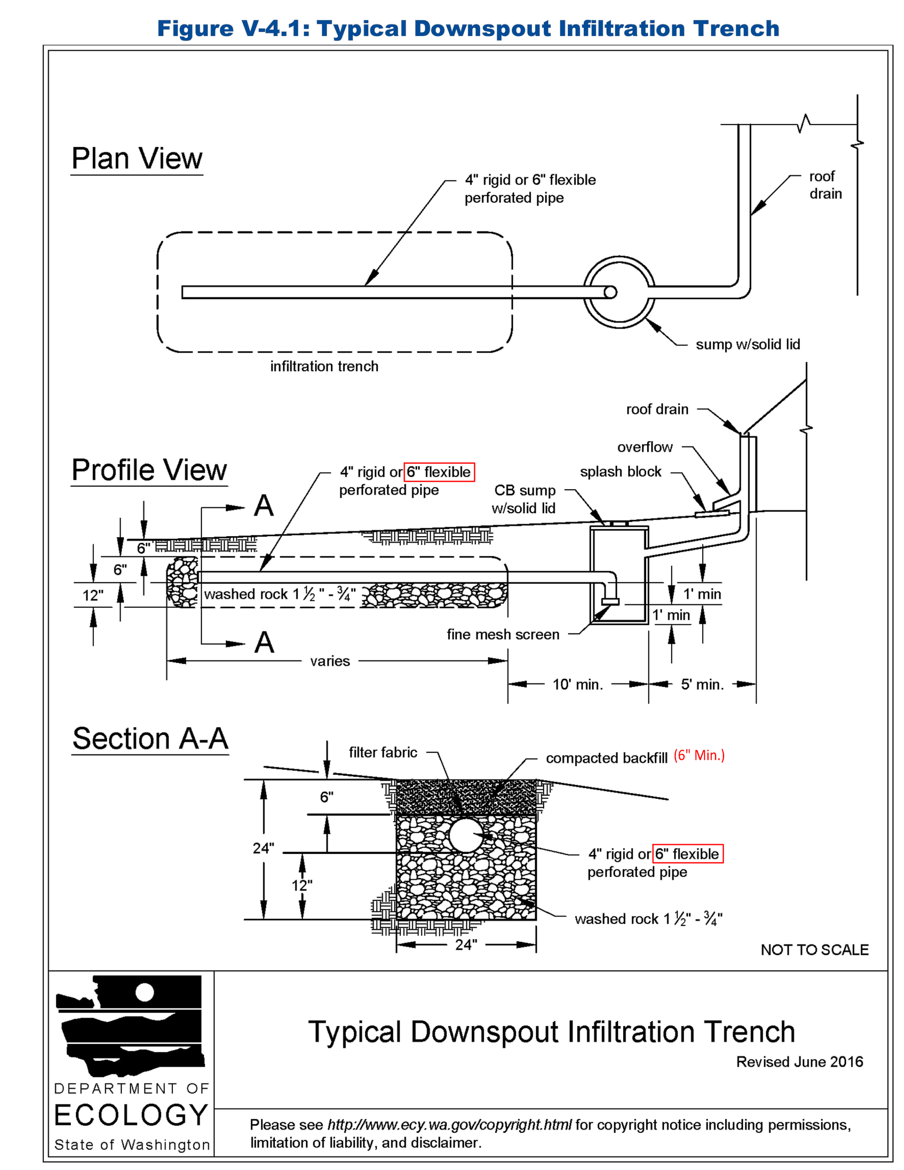


OPEN-GRADED GRAVEL
SECTION (A)
1" = 1'



PERMEABLE ASPHALT
SECTION (B)
1" = 1'



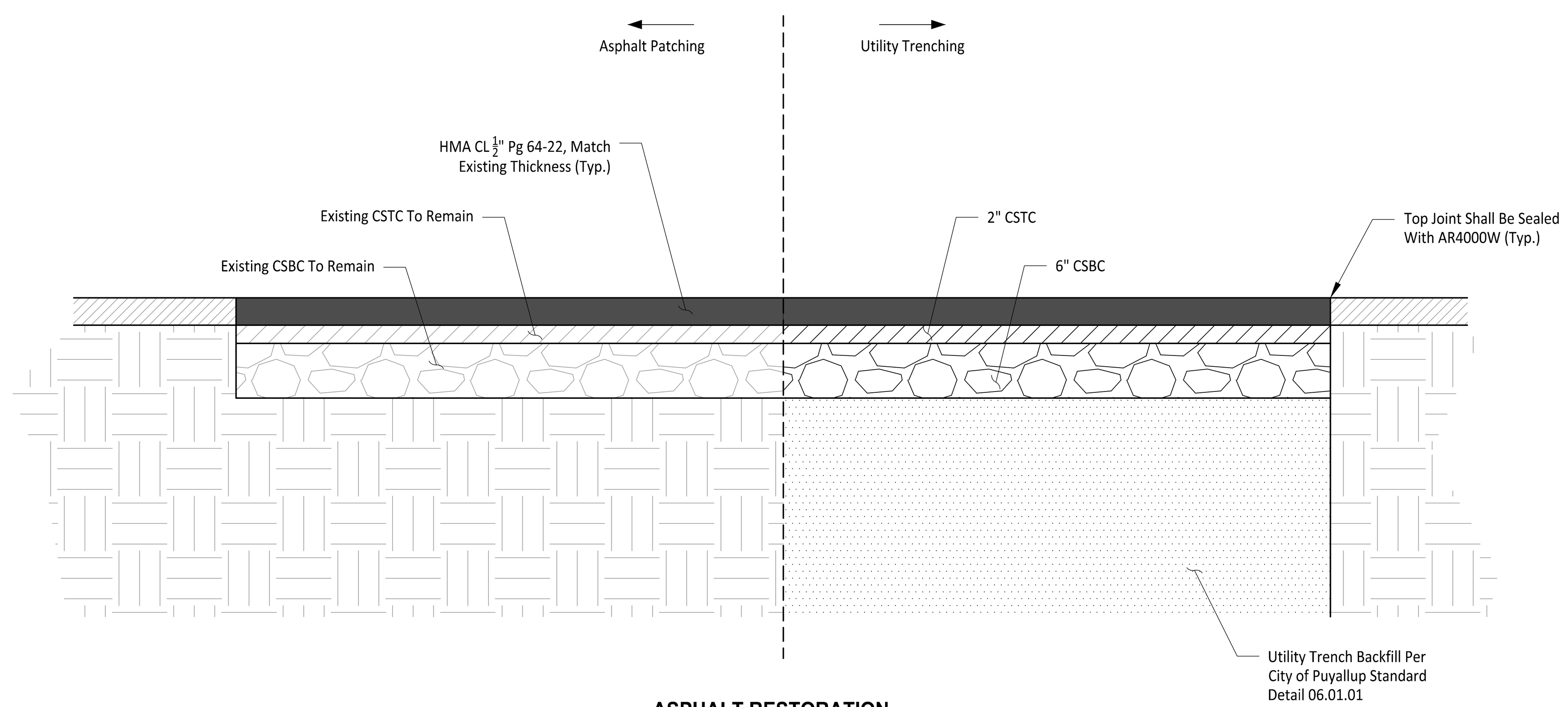


2019 Stormwater Management Manual for Western Washington

Volume V - Chapter 4 - Page 709

CITY OF PUYALLUP STORMWATER NOTES

1. All work in City right-of-way requires a permit from the City of Puyallup. Prior to any work commencing, the general contractor shall arrange for a preconstruction meeting at the Development Services Center to be attended by all contractors that will perform work shown on the engineering plans, representatives from all applicable Utility Companies, the project owner and appropriate City staff. Contact Engineering Services to schedule the meeting (253) 841-5568. The contractor is responsible to have their own approved set of plans at the meeting.
2. After completion of all items shown on these plans and before acceptance of the project, the contractor shall obtain a "punch list" prepared by the City's inspector detailing remaining items of work to be completed. All items of work shown on these plans shall be completed to the satisfaction of the City prior to acceptance of the water system and provision of sanitary sewer service.
3. All materials and workmanship shall conform to the Standard Specifications for Road, Bridge, and Municipal Construction (hereinafter referred to as the "Standard Specifications"), Washington State Department of Transportation and American Public Works Association, Washington State Chapter, latest edition, unless superseded or amended by the City of Puyallup City Standards for Public Works Engineering and Construction (hereinafter referred to as the "City Standards").
4. A copy of these approved plans and applicable city developer specifications and details shall be on site during construction.
5. Any revisions made to these plans must be reviewed and approved by the developer's engineer and the Engineering Services Staff prior to any implementation in the field. The City shall not be responsible for any errors and/or omissions on these plans.
6. The contractor shall have all utilities verified on the ground prior to any construction. Call (811) at least two working days in advance. The owner and his/her engineer shall be contacted immediately if a conflict exists.
7. Any structure and/or obstruction which require removal or relocation relating to this project, shall be done so at the developer's expense.
8. During construction, all existing and newly installed drainage structures shall be protected from sediments.
9. All storm manholes shall conform to City Standard Detail No. 02.01.01. Flow control manhole/oil water separator shall conform to City Standard Detail No. 02.01.06 and 02.01.07.
10. Manhole ring and cover shall conform to City Standard Detail 06.01.02.
11. Catch basins Type I shall conform to City Standard Detail No.02.01.02 and 02.01.03 and shall be used only for depths less than 5 feet from top of the grate to the invert of the storm pipe.
12. Catch basins Type II shall conform to City Standard Detail No.02.01.04 and shall be used for depths greater than 5 feet from top of the grate to invert of the storm pipe.
13. Cast iron or ductile iron frame and grate shall conform to City Standard Detail No.02.01.05. Grate shall be marked with "drains to stream". Solid catch basin lids (square unless noted as round) shall conform to WSDOT Standard Plan B-30.20-04 (Olympic Foundry No. SM60 or equal). Vaned grates shall conform to WSDOT Standard Plan B-30.30-03 (Olympic Foundry o. SM60V or equal).
14. Stormwater pipe shall be only PVC, concrete, ductile iron, or dual walled Polypropylene pipe.
    a. The use of any other type shall be reviewed and approved by the Engineering Services Staff prior to installation.
    b. PVC pipe shall be per ASTM D3034, SDR 35 for pipe size 15-inch and smaller and F679 for pipe sizes 18 to 27 inch. Minimum cover on PVC pipe shall be 3.0 feet.
    c. Concrete pipe shall conform to the WSDOT Standard Specifications for concrete underdrain pipe. Minimum cover on concrete pipe shall not less than 3.0 feet.
    d. Ductile iron pipe shall be Class 50, conforming to AWWA C151. Minimum cover on ductile iron pipe shall be 1.0 foot.
    e. Polypropylene Pipe (PP) shall be dual walled, have a smooth interior and exterior corrugations and meet WSDOT 9-05.24(1). 12-inch through 30-inch pipe shall meet or exceed ASTM F2736 and AASHTO M330, Type S, or Type D. 36-inch through 60-inch pipe shall meet or exceed ASTM F2881 and AASHTO M330, Type S, or Type D. Testing shall be per ASTM F1417. Minimum cover over Polypropylene pipe shall be 3-feet.
15. Trenching, bedding, and backfill for pipe shall conform to City Standard Detail No. 06.01.01.
16. Storm pipe shall be a minimum of 10 feet away from building foundations and/or roof lines.
17. All storm pipe shall be tested and inspected for acceptance as outlined in Section 209 of the City of Puyallup Stormwater Management Standards.
18. All temporary sedimentation and erosion control measures, and protective measures for critical areas and significant trees shall be installed prior to initiating any construction activities.
19. Registration is required for all Class V UIC wells within public drainage tracts or public rightof-way and must be submitted sixty (60) days prior to well construction. A copy of the online registration shall be submitted to the City prior to construction.



ASPHALT RESTORATION
SECTION (E)
1" = 1'

APPROVED

BY ____________________
CITY OF PUYALLUP
DEVELOPMENT ENGINEERING

DATE ____________________

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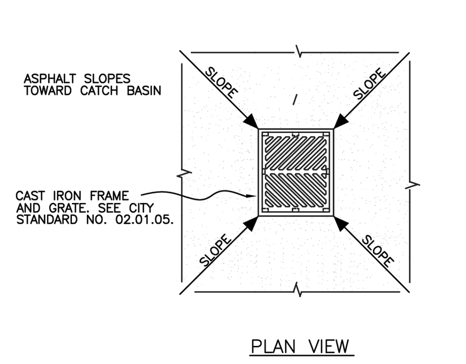
BUILDING PERMIT SET	MAY 3, 2024
ROW PERMIT SET	JULY 10, 2024
ROW PERMIT SET REV. 1	AUG 20, 2024
ROW PERMIT SET REV. 2	OCT 02, 2024
PERMIT CC#1 RESPONSE	OCT 03, 2024

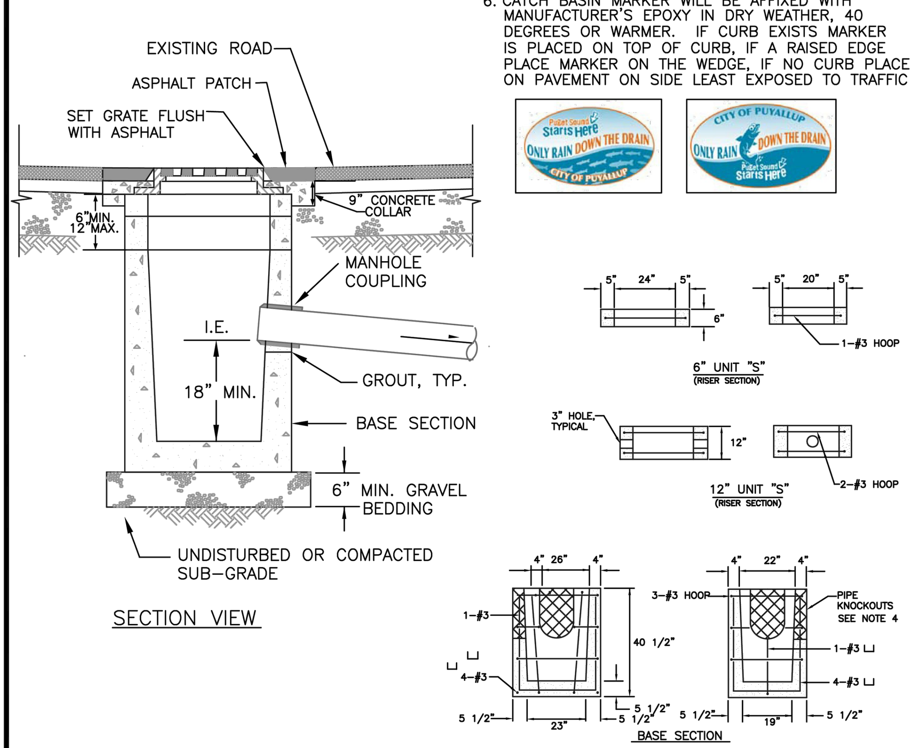
NOTES & DETAILS

Building Permit #:	-
CUP #:	PLCUP20230109
Owner's Project #:	-
Architect's Project #:	2023106
Drawn By	MO
Checked By	JJ

C.06



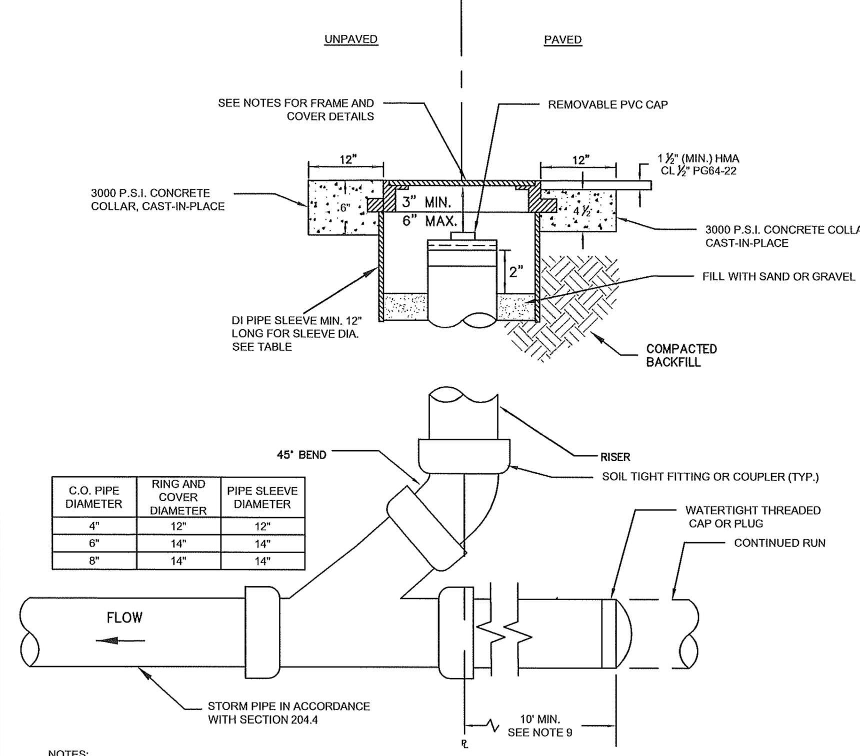
NOTES:
1. MAXIMUM LENGTH OF PIPE BETWEEN CATCH BASINS SHALL BE 400'.
2. TYPE I CATCH BASIN IS USED FOR DEPTHS LESS THAN 5'–0" FROM TOP OF GRATE TO I.E.(PIPE INVERT).
3. PRECAST BASE SECTION SHALL BE FURNISHED WITH CUTOUTS OR KNOCKOUTS. KNOCKOUTS SHALL HAVE A WALL THICKNESS OF 2" MIN. KNOCKOUTS SHALL BE ON 4 SIDES WITH A MAXIMUM DIAMETER OF 20" TO PROVIDE FOR A MINIMUM SUMP DEPTH OF 18".
4. THE TAPER ON THE SIDES OF THE PRECAST BASE SECTION SHALL NOT EXCEEED 1/2" PER FOOT.
5. CATCH BASIN SHALL BE CONSTRUCTED IN ACCORDANCE WITH ASTM C 478 (AASHTO M 199) AND ASTM C 890 UNLESS OTHERWISE NOTED.
6. CATCH BASIN MARKER WILL BE AFFIXED WITH MANUFACTURER'S EPOXY IN DRY WEATHER, 40 DEGREES OR WARMER. IF CURB EXISTS MARKER IS PLACED ON TOP OF CURB, IF A RAISED EDGE PLACE MARKER ON THE WEDGE, IF NO CURB PLACE ON PAVEMENT ON SIDE LEAST EXPOSED TO TRAFFIC



CITY OF PUYALLUP
DEVELOPMENT ENGINEERING and PUBLIC WORKS DEPARTMENTS

CATCH BASIN TYPE 1 (AREA DRAIN)

CITY STANDARD 02.01.02



C.O. PIPE DIAMETER	RING AND COVER DIAMETER	PIPE SLEEVE DIAMETER
4"	12"	12"
6"	14"	14"
8"	14"	14"

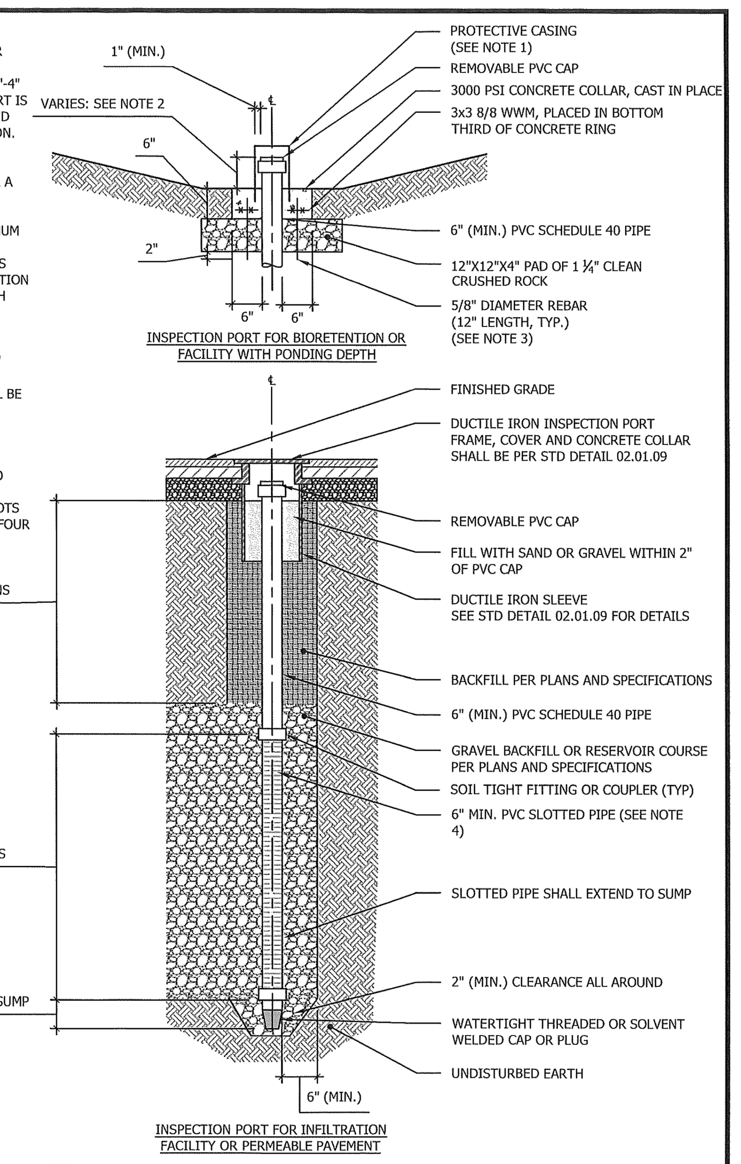
NOTES:
1. CAST IRON COVER MARKED "FDCO" FOR FOOTING DRAINS OR "SDCO" FOR STORM LINES.
2. CAST IRON FRAME AND COVER SHALL BE DRILLED AND TAPPED WITH ⅝"-11 NC STAINLESS STEEL TYPE 304 ALLEN HEAD BOLTS, 2" LONG.
3. BOLT-LOCKING CAST IRON FRAME AND COVER SHALL BE HS-20 RATED IF USED IN RIGHT-OF-WAY OR EASEMENTS.
4. 14" BOLT-LOCKING CAST IRON FRAME AND COVER SHALL BE EQUAL TO OLYMPIC FOUNDRY PART # M1060.
5. CAST IRON FRAME AND COVER SHALL BE FLUSH WITH FINISHED GRADE.
6. CLEANOUTS REQUIRED FOR EACH PIPE LENGTH GREATER THAN 100' AND FOR EACH 90 DEGREE BEND.
7. STORM PIPE BEDDING AND BACKFILL SHALL CONFORM TO STD DETAIL 06.01.01.
8. FINAL JOINTS SHALL BE SAW CUT, FACE OF CUT TACKED AND ALL JOINTS SEALED WITH SEALANT (AR4000W).
9. STORM DRAIN STUB SHALL EXTEND 10' BEYOND THE PROPERTY LINE OR EASEMENT LINE TO PREVENT DAMAGE AND MINIMIZE CONFLICT WITH FUTURE UTILITIES.
10. EACH CLEANOUT ASSEMBLY SHALL CONSIST OF: ONE CLEANOUT ADAPTOR, (HUB x FEMALE INSIDE PIPE THREAD, PVC SLIP IN), AND ONE CLEANOUT PLUG (MALE OUTSIDE THREAD WITH RAISED NUT, PVC).
11. FOR LANDSCAPED AREAS (OUTSIDE OF CITY ROW, EASEMENTS AND FACILITIES) A GREEN "CARSON" MODEL 910 YARD BOX MAY BE USED FOR C.O. PIPE DIA. LESS THAN OR EQUAL TO 6". YARD BOX SHALL BE FASTENED WITH ⅜" HEX BOLTS, THE COVER MARKED "STORM" AND FLUSH WITH FINISHED GRADE.

CITY OF PUYALLUP
PUBLIC WORKS AND DEVELOPMENT ENGINEERING
APPROVED FOR PUBLICATION
DATE SEALED: 2/28/23

STORM DRAIN CLEANOUT

SCALE: NTS | DATE REVISED: 01/06/2023 | CITY STANDARD 02.01.09
FILE NAME: Y:\Shared\Drawings\City Standards\2018\02 - PART 2 - STANDARD DETAILS\CAD\200\02.01.09

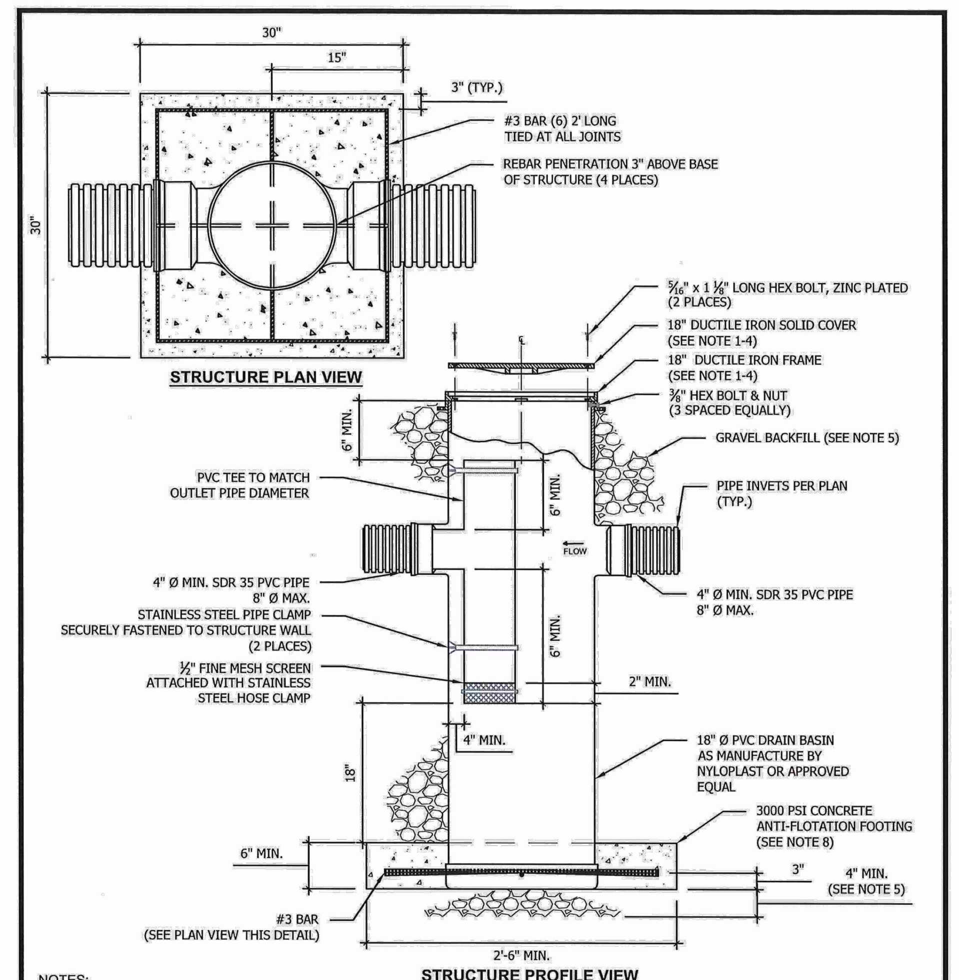
NOTES:
1. INSPECTION PORT COVER SHALL BE SECURED IN CONCRETE SURROUND (1'-4" TOTAL DIAMETER) IF PORT IS NOT OTHERWISE SECURED BY SURFACE RESTORATION.
2. FOR INSPECTION PORTS LOCATED WITHIN BIORETENTION CELLS OR A FACILITY WITH PONDING DEPTH, PVC CAP SHALL EXTEND 2" ABOVE MAXIMUM PONDING DEPTH.
3. FOR OBSERVATION PORTS LOCATED IN A BIORETENTION CELL OR A FACILITY WITH PONDING DEPTH, PLACE THREE (3) LENGTHS OF REBAR EVENLY SPACED AROUND COLLAR, AND 3" FROM OUTER EDGE.
4. SLOTTED PVC PIPE SHALL BE PER ASTM D1785 SCH 40 WITH SLOTS CUT PERPENDICULAR TO THE LONG AXIS OF THE PIPE. SLOTS SHALL BE 0.04" TO 0.069" BY 1" LONG AND SPACED 0.25" APART. SLOTS SHALL BE ARRANGED IN FOUR (4) ROWS SPACED ON 45-DEGREE CENTERS.



CITY OF PUYALLUP
PUBLIC WORKS AND DEVELOPMENT ENGINEERING

STORM DRAIN INSPECTION PORT

CITY STANDARD 02.01.10

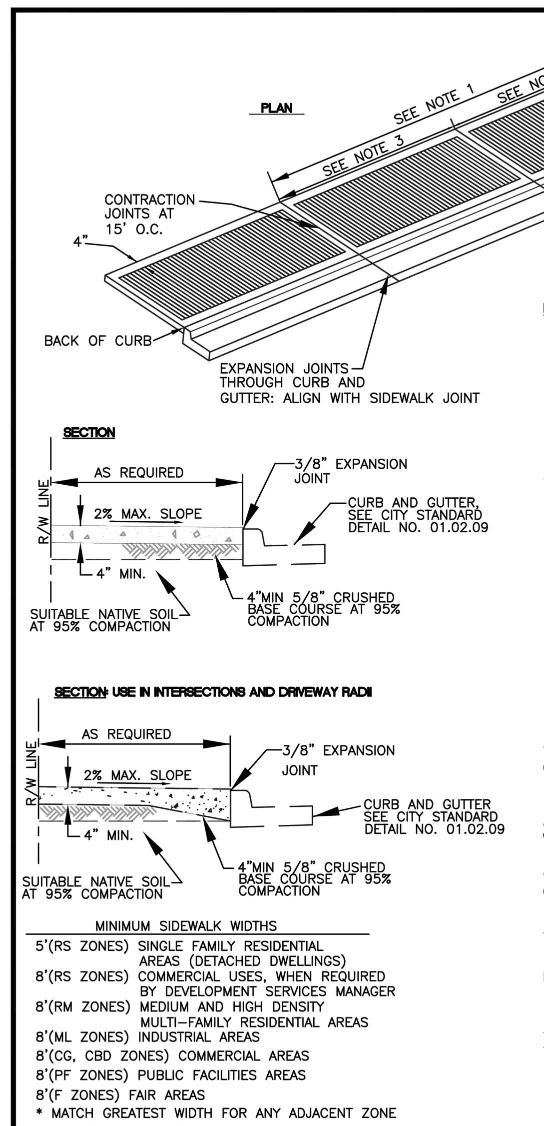


NOTES:
1. TRAFFIC APPLICATIONS SHALL BE HS-20 RATED, NOT FOR USE IN PUBLIC RIGHT-OF-WAY, PUBLIC EASEMENTS, OR TRACTS.
2. 18" SOLID LOCKING DUCTILE IRON FRAME AND COVER BY NYLOPLAST - TYPE C OR APPROVED EQUAL.
3. DUCTILE IRON FRAME AND COVER SHALL BE DRILLED AND TAPPED WITH 5⁄16"- 8 ZINC-PLATED HEX BOLT 1 ⅛" LONG.
4. DUCTILE IRON FRAME AND COVER SHALL BE FLUSH WITH FINISHED GRADE.
5. STORM PIPE AND STRUCTURE BEDDING AND BACKFILL SHALL CONFORM TO STD DETAIL 06.01.01.
6. ALL BOLT HOLES DRILLED IN THE STRUCTURE SHALL BE WATERTIGHT WITH RUBBER SEALING WASHERS OR APPROVED EQUAL.
7. ALL PIPE JOINTS SHALL BE WATERTIGHT.
8. A CONCRETE FOOTING SHALL BE PROVIDED AT THE BASE OF THE STRUCTURE WHEN THE BOTTOM ELEVATION OF THE STRUCTURE IS WITHIN 6" OF HIGH GROUNDWATER.
9. THE MAXIMUM DEPTH FROM FINISHED GRADE TO THE PIPE INVERT IS 5'-0".

CITY OF PUYALLUP
PUBLIC WORKS AND DEVELOPMENT ENGINEERING
APPROVED FOR PUBLICATION
DATE SEALED: 7/6/23

YARD DRAIN

SCALE: NTS | DATE REVISED: 12/05/2022 | CITY STANDARD 02.05.02
FILE NAME: Y:\Shared\Drawings\City Standards\2018\02 - PART 2 - STANDARD DETAILS\CAD\200\02.05.02



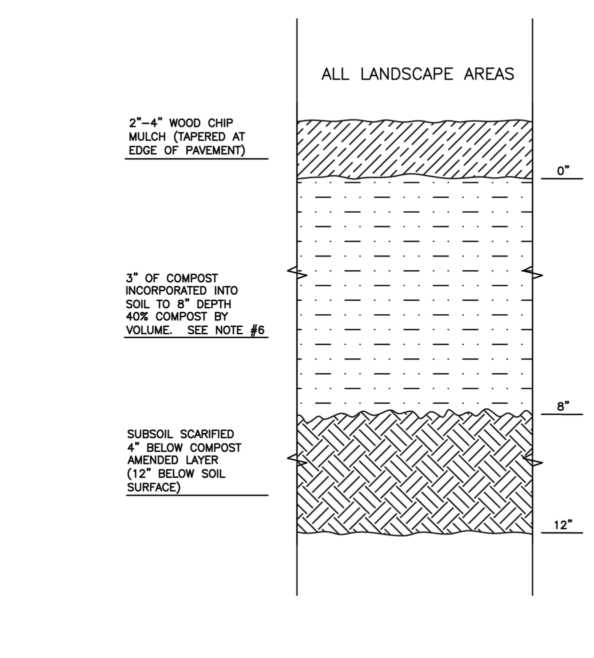
MINIMUM SIDEWALK WIDTHS
5'(RS ZONES) SINGLE FAMILY RESIDENTIAL AREAS (DETACHED DWELLINGS)
8'(RS ZONES) COMMERCIAL USES, WHEN REQUIRED BY DEVELOPMENT SERVICES MANAGER
8'(RM ZONES) MEDIUM AND HIGH DENSITY MULTI–FAMILY RESIDENTIAL AREAS
8'(ML ZONES) INDUSTRIAL AREAS
8'(CG, CBD ZONES) COMMERCIAL AREAS
8'(PF ZONES) PUBLIC FACILITIES AREAS
8'(F ZONES) FAIR AREAS
* MATCH GREATEST WIDTH FOR ANY ADJACENT ZONE

NOTES:
1. CONTRACTION JOINTS SHALL BE 3/8" x 1 1/2" ASPHALT SATURATED FELT PLACED AT 15' O.C.
2. THRU JOINTS SHALL BE 3/8" x 4" ASPHALT SATURATED FELT PLACED AT DRIVEWAYS, ALLEY RETURNS AND WHEELCHAIR RAMPS AND RADII.
3. V–GROOVEMARKS SHALL BE 1/8" DEEP AND 1/4" WIDE PLACED AT 5' O.C. FOR 5' SIDEWALKS AND 7.5' O.C. FOR 8' SIDEWALKS.
4. ALL JOINTS SHALL BE CLEAN AND EDGED TO A 1/4" RADIUS. JOINTS SHALL BE FLUSH WITH THE FINISHED SURFACE.
5. ALL UTILITY POLES AND STREET SIGN POSTS IN SIDEWALK AREA NOT REQUIRED TO BE RELOCATED SHALL HAVE A SQUARE SECTION OF CONCRETE SURROUNDED BY 3/8" EXPANSION JOINT MATERIAL AROUND THE POLE. THE JOINT SHALL BE NO CLOSER THAN 6" TO ANY SIDE OF THE POLE.
6. FORMS SHALL BE EITHER WOOD OR STEEL AND SHALL MEET ALL REQUIREMENTS OF THESE SPECIFICATIONS.
7. CONCRETE SHALL BE CLASS 3000 COMMERCIAL CONCRETE, 5.5 SACK MINIMUM, AASHTO GRADING 467 COARSE AGGREGATE, NO FLY ASH.
8. SIDEWALK MINIMUM UNOBSTRUCTED CLEAR WIDTH SHALL BE 4', EXCLUSIVE OF THE WIDTH OF THE CURB.
9. GRATINGS, ACCESS COVERS, JUNCTION BOXES, CABLE VAULTS, PULL BOXES AND OTHER APPURTENANCES WITHIN THE SIDEWALK (RIGHT–OF–WAY) MUST HAVE SLIP RESISTANT SURFACE AND MATCH THE GRADE OF THE SIDEWALK.
10. CURB RAMPS SHALL BE CONSTRUCTED AT INTERSECTIONS USING A DESIGN PREPARED BY A LICENSED PROFESSIONAL ENGINEER. WHEN A RAMP DESIGN FAILS TO MEET ALL APPLICABLE DESIGN STANDARDS, THE ENGINEER SHALL DOCUMENT WHY THE PROPOSED RAMP ACHIEVES DESIGN STANDARDS TO THE MAXIMUM EXTENT FEASIBLE.

CITY OF PUYALLUP
DEVELOPMENT ENGINEERING and PUBLIC WORKS DEPARTMENTS

SIDEWALK WITHOUT PLANTING STRIP

CHECKED BY LINDA LIAN | APPROVED BY COLLEEN HARRIS | REVISED BY LINDA LIAN | CITY STANDARD 01.02.01



NOTES:
1. ALL SOIL AREAS DISTURBED OR COMPACTED DURING CONSTRUCTION, AND NOT COVERED BY BUILDINGS OR PAVEMENT, SHALL BE AMENDED WITH COMPOST AS DESCRIBED BELOW.
2. SUBSOIL SHOULD BE SCARIFIED (LOOSENED) 4 INCHES BELOW AMENDED LAYER, TO PRODUCE 12–INCH DEPTH OF UN–COMPACTED SOIL, EXCEPT WHERE SCARIFICATION WOULD DAMAGE TREE ROOTS OR AS DETERMINED BY THE ENGINEER. SEE NOTE BELOW REGARDING PLANTING STEPS FOR STREET TREES.
3. COMPOST SHALL BE TILLED IN TO 8 INCH DEPTH INTO EXISTING SOIL, OR PLACE 8 INCHES OF COMPOST–AMENDED SOIL, PER SOIL SPECIFICATION.
4. PLANTING BEDS SHALL RECEIVE 3 INCHES OF COMPOST TILLED IN TO 8–INCH DEPTH, OR MAY SUBSTITUTE 8" OF IMPORTED SOIL CONTAINING 35–40% COMPOST BY VOLUME. MULCH AFTER PLANTING, WITH 4 INCHES OF ARBORIST WOOD CHIP MULCH OR APPROVED EQUAL (6" OF LOOSE WOOD CHIPS AT THE TIME OF PLANTING TO ALLOW SETTLING TO 4").
5. SETBACKS: TO PREVENT UNEVEN SETTLING, DO NOT COMPOST–AMEND SOILS WITHIN 3 FEET OF UTILITY INFRASTRUCTURES (POLES, VAULTS, METERS ETC.). WITHIN ONE FOOT OF PAVEMENT EDGE, CURBS AND SIDEWALKS SOIL SHOULD BE COMPACTED TO APPROXIMATELY 95% PROCTOR TO ENSURE A FIRM SURFACE.
6. SEE SECTION 8.2(B) OF THE VMS FOR SOIL AMENDMENT AND INSTRUCTION PROCEDURES FOR STREET TREE PLANTER STRIPS. ALL STREET TREE PLANTER STRIPS SHALL RECEIVE 40% COMPOST AMENDED SOIL TO THE FULL DEPTH OF THE STREET TREE ROOTBALL.

CITY OF PUYALLUP
DEVELOPMENT ENGINEERING and PUBLIC WORKS DEPARTMENTS

SOIL AMENDMENT AND DEPTH

CITY STANDARD 01.02.08a

APPROVED
BY ______ CITY OF PUYALLUP DEVELOPMENT ENGINEERING
DATE ______
NOTE: THIS APPROVAL IS VOID AFTER 180 DAYS FROM APPROVAL DATE. THE CITY WILL NOT BE RESPONSIBLE FOR ERRORS AND/OR OMISSIONS ON THESE PLANS. FIELD CONDITIONS MAY DICTATE CHANGES TO THESE PLANS AS DETERMINED BY THE DEVELOPMENT ENGINEERING MANAGER.

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CONSULTANT
JMJ TEAM
JMJ Team
905 Main Street, Suite #200
Sumner, WA 98390
(206) 596-2020

CLIENT/OWNER
PUYALLUP SCHOOL DISTRICT
A Tradition of Excellence

TITLE
PUYALLUP HS NEW PORTABLES 2023

STAMP
JUSTIN M. JONES, STATE OF WASHINGTON, 41829, REGISTERED PROFESSIONAL ENGINEER
10-03-24

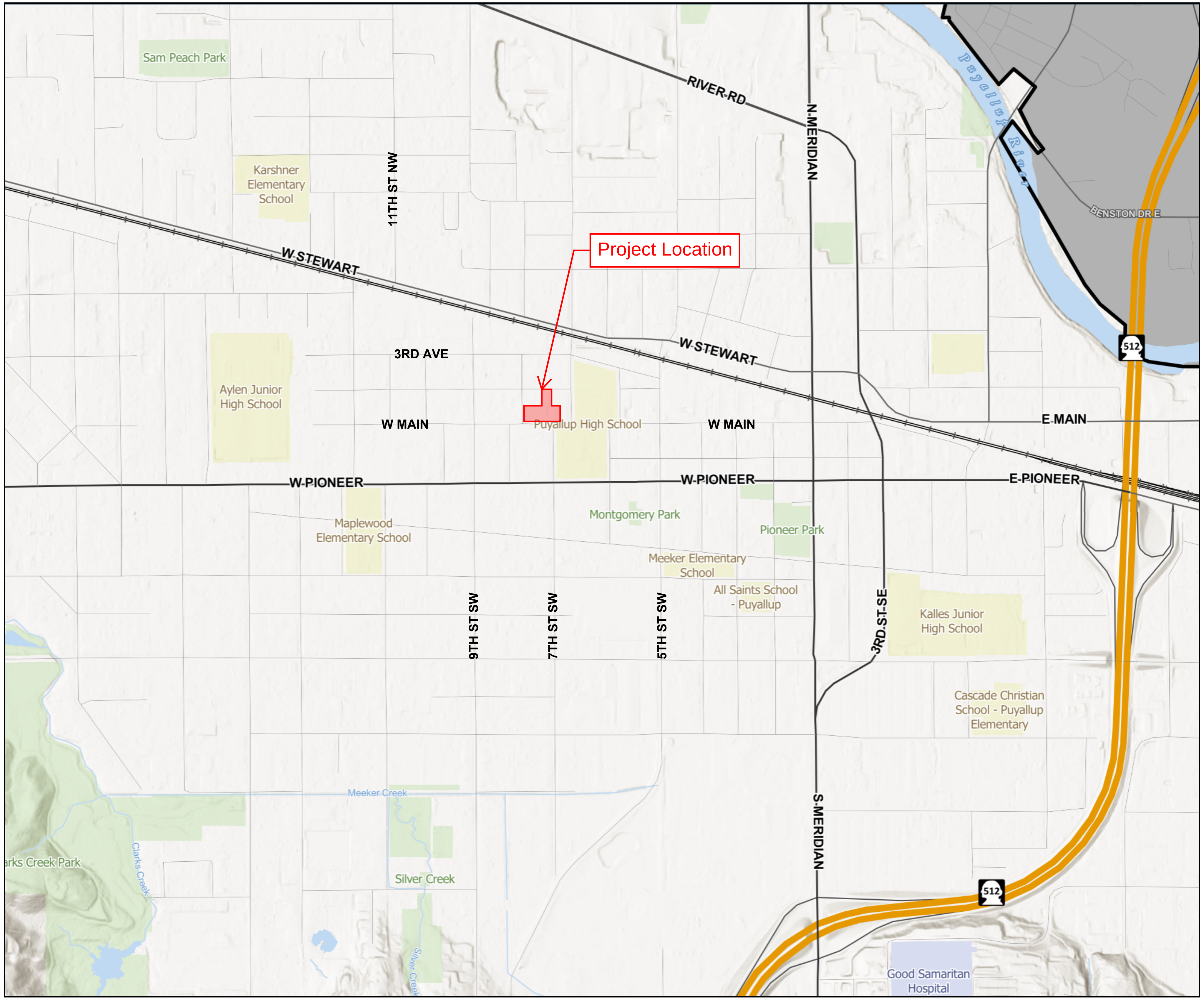
ISSUED:	DATE:
CONDITIONAL USE PERMIT	OCT, 11 2023
CUP CC#1 RESPONSE	APR, 5 2024
BUILDING PERMIT SET	MAY 3, 2024
ROW PERMIT SET	JULY 10, 2024
ROW PERMIT SET REV. 1	AUG 20, 2024
ROW PERMIT SET REV. 2	OCT 02, 2024
PERMIT CC#1 RESPONSE	OCT 03, 2024

NOTES & DETAILS

Building Permit #:	-
CUP #:	PLCUP20230109
Owner's Project #:	-
Architect's Project #:	2023106
Drawn By	MO
Checked By	JJ

C.07

APPENDIX B



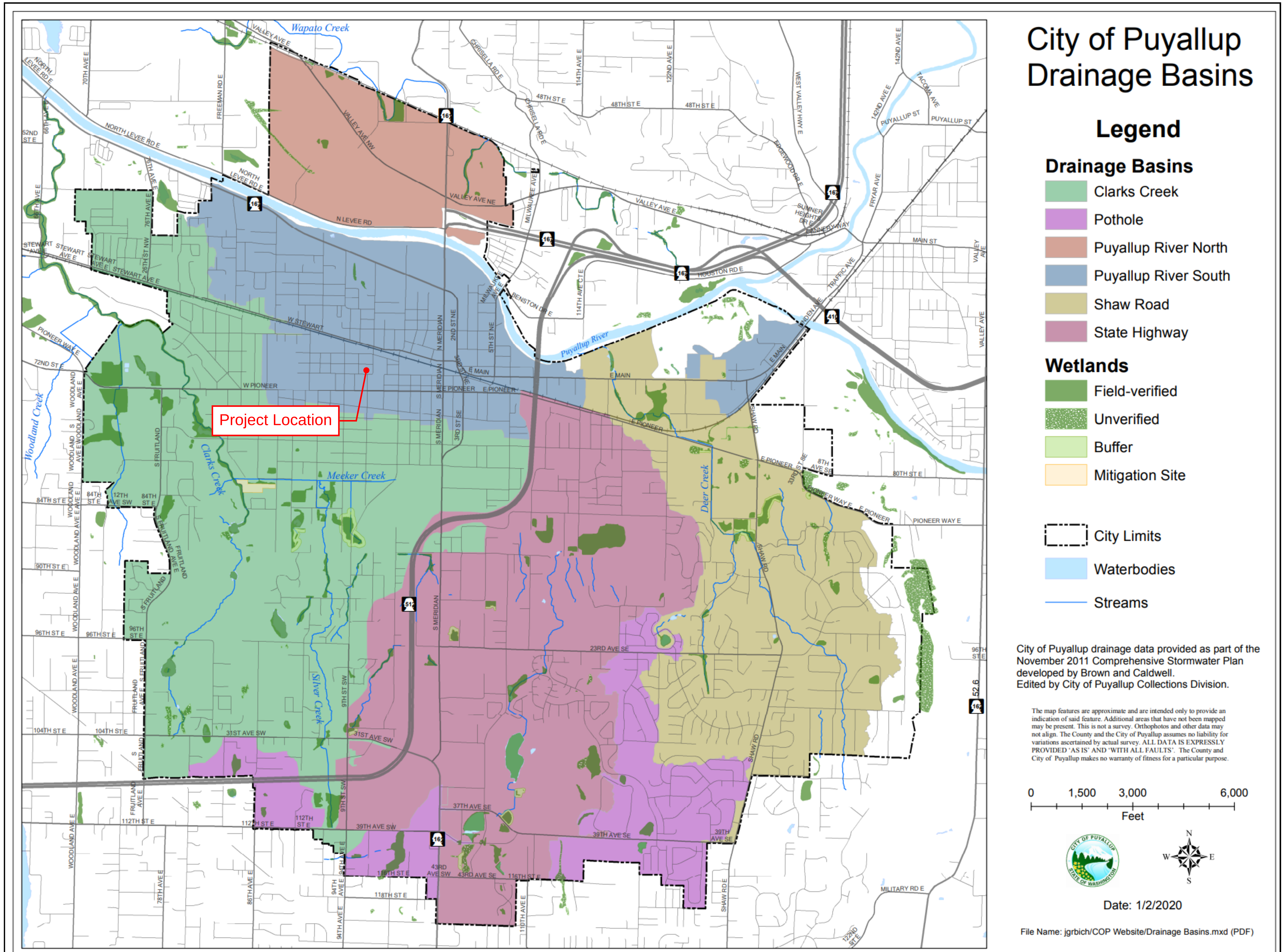
NOT TO SCALE

JMJTEAM

PHS Portables

Vicinity Map

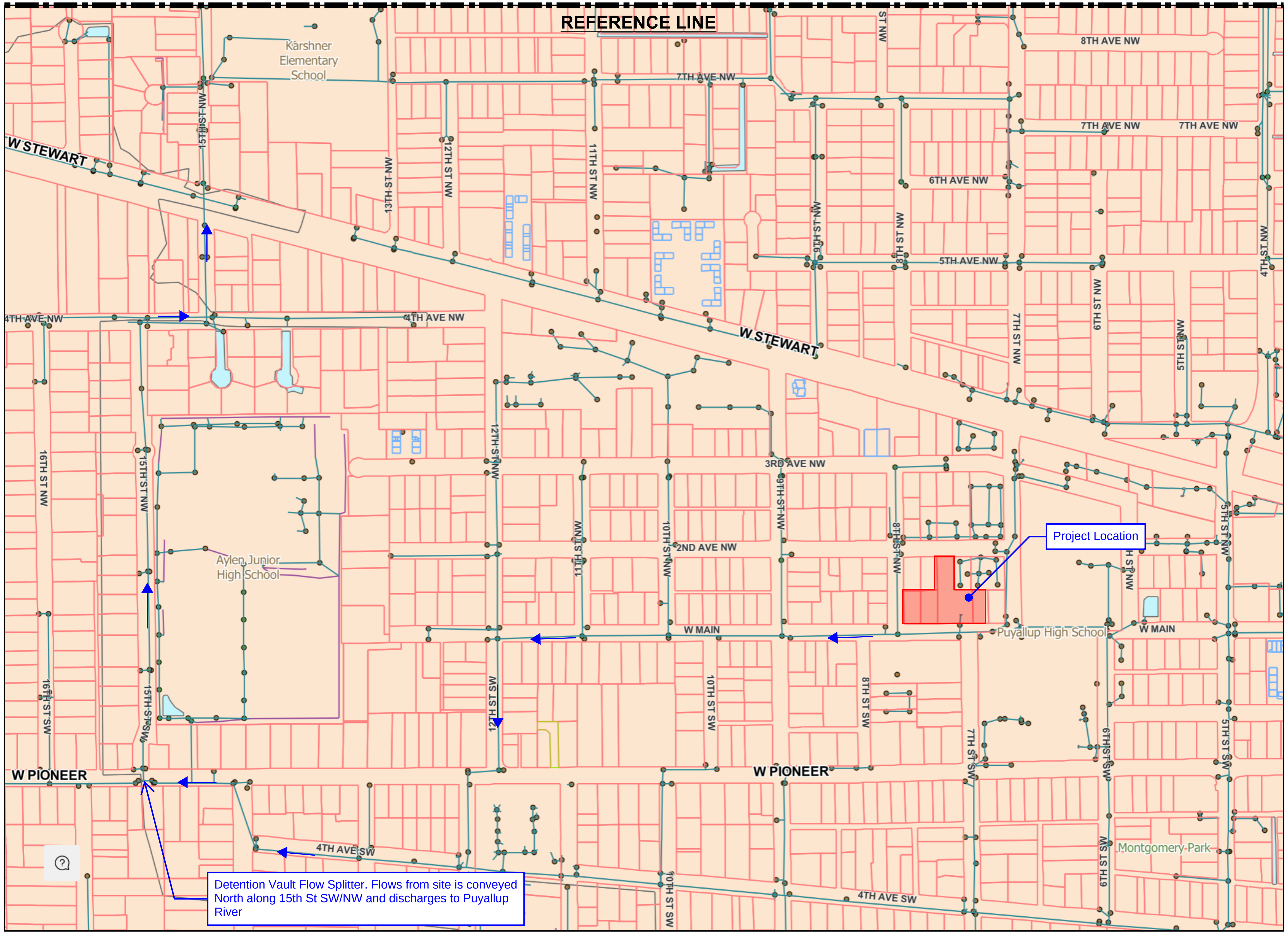
Figure 1



NOT TO SCALE

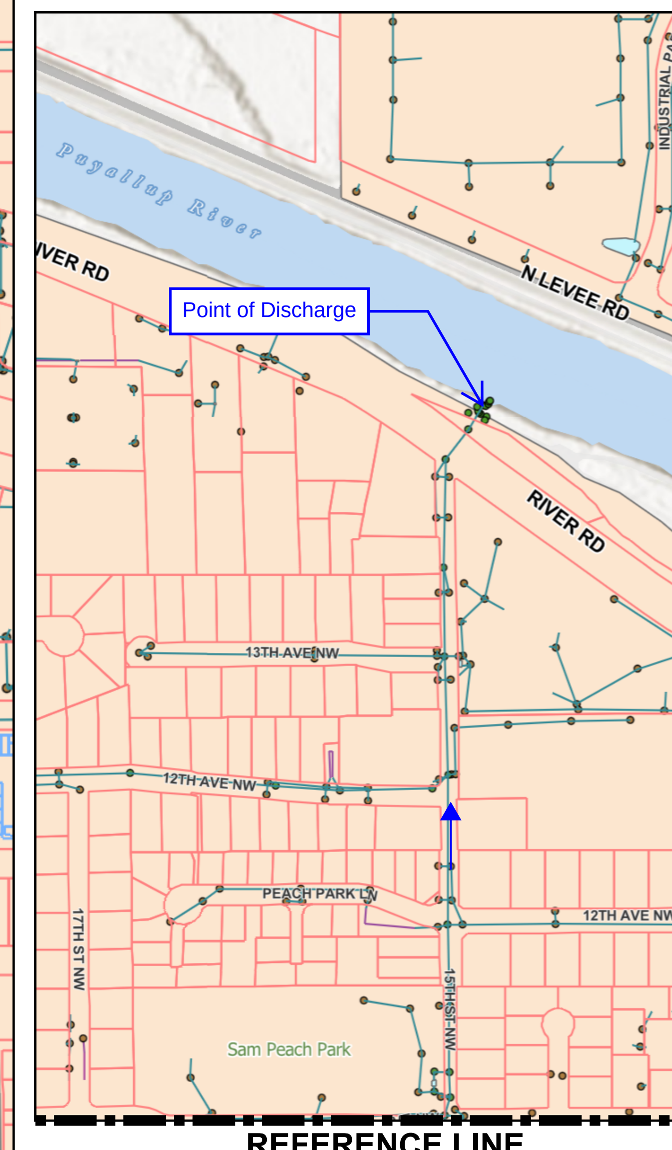
JMJTEAM

PHS Portables
Drainage Basin Map
Figure 2



GENERAL NOTE

Map taken from City of Puyallup Public Data Viewer.

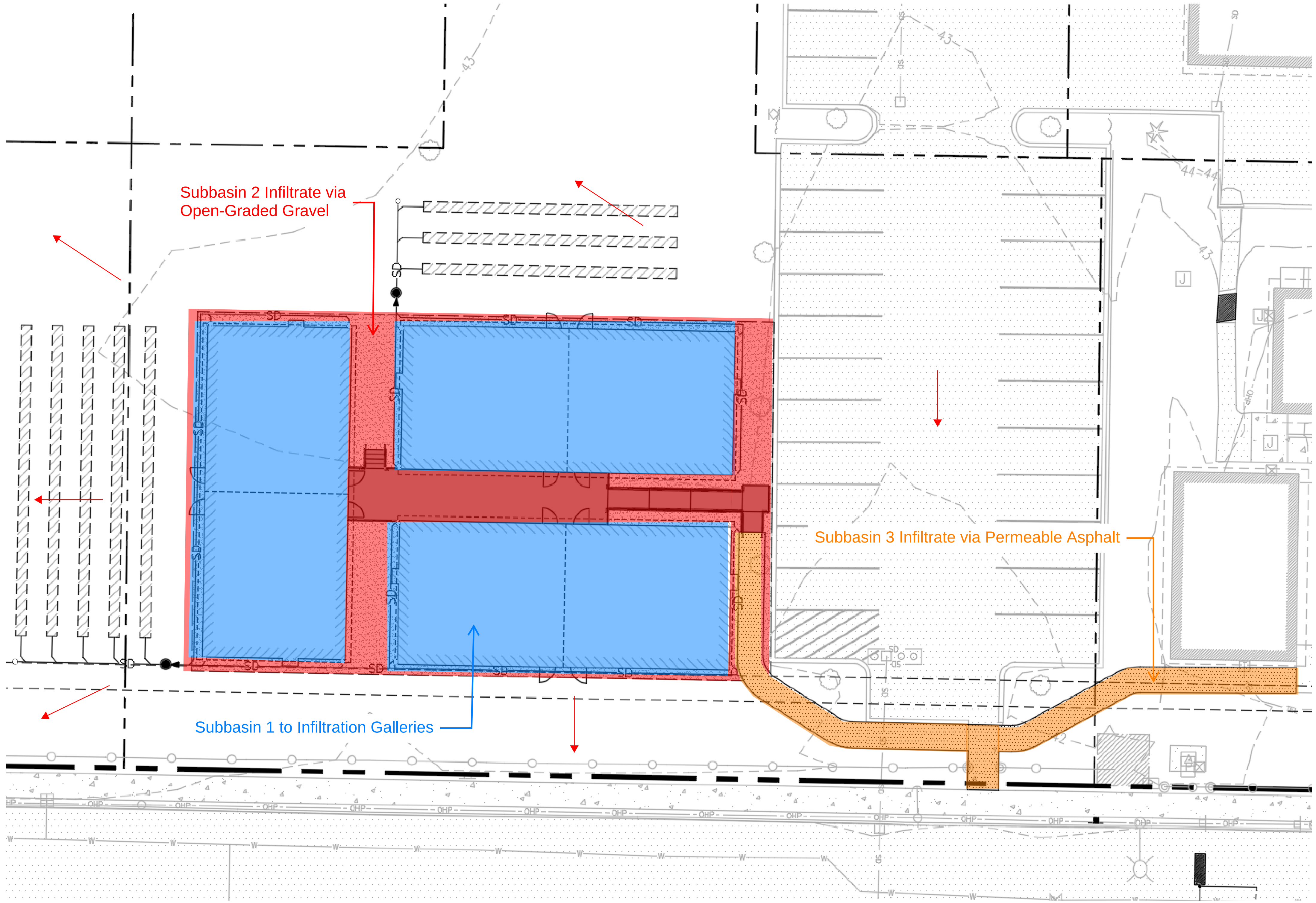


NOT TO SCALE

PHS Portables

Downstream Drainage Map

Figure 3



LEGEND

- Subbasin 1
- Subbasin 2
- Subbasin 3
- Flow Path

PROPOSED BASINS

Subbasin 1:
Impervious:

Roof:	5,785 SF	
Total:	5,785 SF	(0.13 AC)

Subbasin 2:
Impervious:

Perm. Gravel:	1,570 SF	
Landing:	660 SF	
Total:	2,230 SF	(0.05 AC)

Subbasin 3:
Impervious:

Perm. Asphalt:	663 SF	
Total:	663 SF	(0.02 AC)

NOT TO SCALE

JMJTEAM

PHS Portables
Proposed Basin Map
Figure 4

APPENDIX C

WWHM2012

PROJECT REPORT

General Model Information

WWHM2012 Project Name: Combined Basins

Site Name:

Site Address:

City:

Report Date:	10/4/2024
Gage:	40 IN EAST
Data Start:	10/01/1901
Data End:	09/30/2059
Timestep:	15 Minute
Precip Scale:	1.000
Version Date:	2023/01/27
Version:	4.2.19

POC Thresholds

Low Flow Threshold for POC1:	50 Percent of the 2 Year
High Flow Threshold for POC1:	50 Year

Landuse Basin Data
Predeveloped Land Use

Basin 1

Bypass:	No
GroundWater:	No
Pervious Land Use	acre
C, Forest, Flat	0.2
Pervious Total	0.2
Impervious Land Use	acre
Impervious Total	0
Basin Total	0.2

Mitigated Land Use

Portable Roofs

Bypass:	No
GroundWater:	No
Pervious Land Use	acre
Pervious Total	0
Impervious Land Use	acre
ROOF TOPS FLAT	0.13
Impervious Total	0.13
Basin Total	0.13

Routing Elements
Predeveloped Routing

Mitigated Routing

Gravel Trench Bed 1

Bottom Length:	29.90 ft.
Bottom Width:	29.90 ft.
Trench bottom slope 1:	0 To 1
Trench Left side slope 0:	0 To 1
Trench right side slope 2:	0 To 1
Material thickness of first layer:	1.5
Pour Space of material for first layer:	0.33
Material thickness of second layer:	0
Pour Space of material for second layer:	0
Material thickness of third layer:	0
Pour Space of material for third layer:	0
Infiltration On	
Infiltration rate:	1.43
Infiltration safety factor:	0.45
Total Volume Infiltrated (ac-ft.):	55.331
Total Volume Through Riser (ac-ft.):	0.077
Total Volume Through Facility (ac-ft.):	55.408
Percent Infiltrated:	99.86
Total Precip Applied to Facility:	0
Total Evap From Facility:	0

Discharge Structure

Riser Height: 1.4 ft.

Riser Diameter: 12 in.

Element Flows To:

Outlet 1 Outlet 2

Gravel Trench Bed Hydraulic Table

Stage(feet)	Area(ac.)	Volume(ac-ft.)	Discharge(cfs)	Infilt(cfs)
0.0000	0.020	0.000	0.000	0.000
0.0167	0.020	0.000	0.000	0.013
0.0333	0.020	0.000	0.000	0.013
0.0500	0.020	0.000	0.000	0.013
0.0667	0.020	0.000	0.000	0.013
0.0833	0.020	0.000	0.000	0.013
0.1000	0.020	0.000	0.000	0.013
0.1167	0.020	0.000	0.000	0.013
0.1333	0.020	0.000	0.000	0.013
0.1500	0.020	0.001	0.000	0.013
0.1667	0.020	0.001	0.000	0.013
0.1833	0.020	0.001	0.000	0.013
0.2000	0.020	0.001	0.000	0.013
0.2167	0.020	0.001	0.000	0.013
0.2333	0.020	0.001	0.000	0.013
0.2500	0.020	0.001	0.000	0.013
0.2667	0.020	0.001	0.000	0.013
0.2833	0.020	0.001	0.000	0.013
0.3000	0.020	0.002	0.000	0.013
0.3167	0.020	0.002	0.000	0.013
0.3333	0.020	0.002	0.000	0.013
0.3500	0.020	0.002	0.000	0.013
0.3667	0.020	0.002	0.000	0.013
0.3833	0.020	0.002	0.000	0.013

0.4000	0.020	0.002	0.000	0.013
0.4167	0.020	0.002	0.000	0.013
0.4333	0.020	0.002	0.000	0.013
0.4500	0.020	0.003	0.000	0.013
0.4667	0.020	0.003	0.000	0.013
0.4833	0.020	0.003	0.000	0.013
0.5000	0.020	0.003	0.000	0.013
0.5167	0.020	0.003	0.000	0.013
0.5333	0.020	0.003	0.000	0.013
0.5500	0.020	0.003	0.000	0.013
0.5667	0.020	0.003	0.000	0.013
0.5833	0.020	0.004	0.000	0.013
0.6000	0.020	0.004	0.000	0.013
0.6167	0.020	0.004	0.000	0.013
0.6333	0.020	0.004	0.000	0.013
0.6500	0.020	0.004	0.000	0.013
0.6667	0.020	0.004	0.000	0.013
0.6833	0.020	0.004	0.000	0.013
0.7000	0.020	0.004	0.000	0.013
0.7167	0.020	0.004	0.000	0.013
0.7333	0.020	0.005	0.000	0.013
0.7500	0.020	0.005	0.000	0.013
0.7667	0.020	0.005	0.000	0.013
0.7833	0.020	0.005	0.000	0.013
0.8000	0.020	0.005	0.000	0.013
0.8167	0.020	0.005	0.000	0.013
0.8333	0.020	0.005	0.000	0.013
0.8500	0.020	0.005	0.000	0.013
0.8667	0.020	0.005	0.000	0.013
0.8833	0.020	0.006	0.000	0.013
0.9000	0.020	0.006	0.000	0.013
0.9167	0.020	0.006	0.000	0.013
0.9333	0.020	0.006	0.000	0.013
0.9500	0.020	0.006	0.000	0.013
0.9667	0.020	0.006	0.000	0.013
0.9833	0.020	0.006	0.000	0.013
1.0000	0.020	0.006	0.000	0.013
1.0167	0.020	0.006	0.000	0.013
1.0333	0.020	0.007	0.000	0.013
1.0500	0.020	0.007	0.000	0.013
1.0667	0.020	0.007	0.000	0.013
1.0833	0.020	0.007	0.000	0.013
1.1000	0.020	0.007	0.000	0.013
1.1167	0.020	0.007	0.000	0.013
1.1333	0.020	0.007	0.000	0.013
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1.1833	0.020	0.008	0.000	0.013
1.2000	0.020	0.008	0.000	0.013
1.2167	0.020	0.008	0.000	0.013
1.2333	0.020	0.008	0.000	0.013
1.2500	0.020	0.008	0.000	0.013
1.2667	0.020	0.008	0.000	0.013
1.2833	0.020	0.008	0.000	0.013
1.3000	0.020	0.008	0.000	0.013
1.3167	0.020	0.008	0.000	0.013
1.3333	0.020	0.009	0.000	0.013
1.3500	0.020	0.009	0.000	0.013

1.3667	0.020	0.009	0.000	0.013
1.3833	0.020	0.009	0.000	0.013
1.4000	0.020	0.009	0.000	0.013
1.4167	0.020	0.009	0.022	0.013
1.4333	0.020	0.009	0.064	0.013
1.4500	0.020	0.009	0.118	0.013
1.4667	0.020	0.009	0.182	0.013
1.4833	0.020	0.010	0.254	0.013
1.5000	0.020	0.010	0.333	0.013

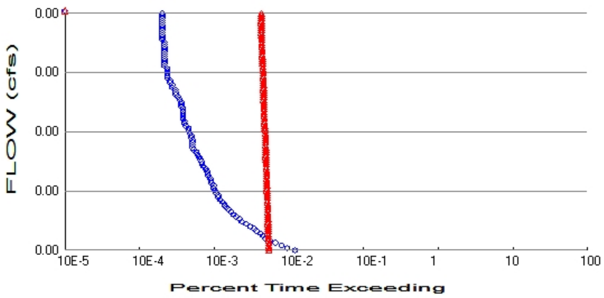
Open-Graded Gravel

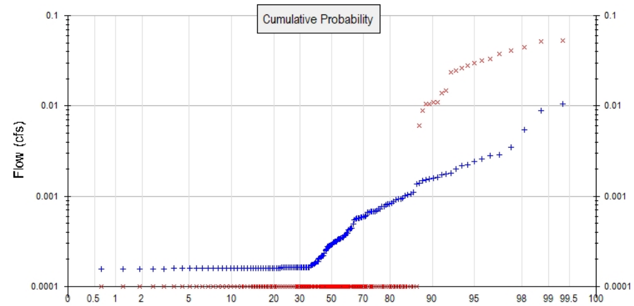
Pavement Area:0.0511 acre.Pavement Length:	47.20 ft.
Pavement Width:	47.20 ft.
	Pavement slope 1:0 To 1
Pavement thickness:	0.83
Pour Space of Pavement:	0.33
Material thickness of second layer:	0
Pour Space of material for second layer:	0
Material thickness of third layer:	0
Pour Space of material for third layer:	0
Infiltration On	
Infiltration rate:	1.43
Infiltration safety factor:	0.45
Total Volume Infiltrated (ac-ft.):	20.256
Total Volume Through Riser (ac-ft.):	0
Total Volume Through Facility (ac-ft.):	20.256
Percent Infiltrated:	100
Total Precip Applied to Facility:	0
Total Evap From Facility:	1.359

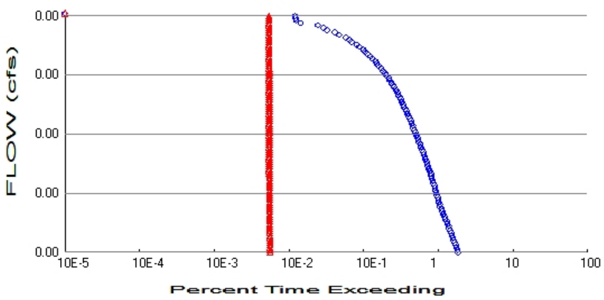
Permeable Asphalt

Pavement Area:0.0152 acre.Pavement Length:	132.60 ft.
Pavement Width:	5.00 ft.
	Pavement slope 1:0 To 1
Pavement thickness:	0.33
Pour Space of Pavement:	0.33
Material thickness of second layer:	0.5
Pour Space of material for second layer:	0.33
Material thickness of third layer:	0
Pour Space of material for third layer:	0
Infiltration On	
Infiltration rate:	1.43
Infiltration safety factor:	0.45
Total Volume Infiltrated (ac-ft.):	5.827
Total Volume Through Riser (ac-ft.):	0
Total Volume Through Facility (ac-ft.):	5.827
Percent Infiltrated:	100
Total Precip Applied to Facility:	0
Total Evap From Facility:	0.404

Analysis Results
POC 1







+ Predeveloped x Mitigated

Predeveloped Landuse Totals for POC #1
Total Pervious Area: 0.2
Total Impervious Area: 0

Mitigated Landuse Totals for POC #1
Total Pervious Area: 0
Total Impervious Area: 0.196364

Flow Frequency Method: Log Pearson Type III 17B

Flow Frequency Return Periods for Predeveloped. POC #1

Return Period	**Flow(cfs)**
2 year	0.000331
5 year	0.000793
10 year	0.001352
25 year	0.002536
50 year	0.003939
100 year	0.005993

Flow Frequency Return Periods for Mitigated. POC #1

Return Period	**Flow(cfs)**
2 year	0
5 year	0
10 year	0
25 year	0
50 year	0
100 year	0

Annual Peaks

Annual Peaks for Predeveloped and Mitigated. POC #1

Year	Predeveloped	Mitigated
1902	0.000	0.000
1903	0.000	0.000
1904	0.003	0.000
1905	0.000	0.000
1906	0.000	0.000
1907	0.001	0.000
1908	0.000	0.000
1909	0.000	0.000
1910	0.001	0.000
1911	0.000	0.000
1912	0.011	0.006
1913	0.000	0.000
1914	0.000	0.000
1915	0.000	0.000
1916	0.001	0.000
1917	0.000	0.000
1918	0.000	0.000
1919	0.000	0.000
1920	0.001	0.000
1921	0.000	0.000
1922	0.002	0.000
1923	0.000	0.000
1924	0.000	0.000
1925	0.000	0.000
1926	0.000	0.000
1927	0.000	0.000
1928	0.000	0.000
1929	0.001	0.000
1930	0.000	0.000
1931	0.000	0.000
1932	0.000	0.000
1933	0.000	0.000
1934	0.002	0.000
1935	0.000	0.000
1936	0.000	0.000
1937	0.001	0.000
1938	0.000	0.000
1939	0.000	0.000
1940	0.000	0.000
1941	0.000	0.000
1942	0.001	0.000
1943	0.000	0.000
1944	0.001	0.052
1945	0.000	0.000
1946	0.001	0.000
1947	0.000	0.000
1948	0.000	0.014
1949	0.000	0.009
1950	0.000	0.000
1951	0.000	0.000
1952	0.003	0.041
1953	0.002	0.038
1954	0.000	0.000
1955	0.000	0.000
1956	0.000	0.000
1957	0.000	0.000

1958	0.002	0.011
1959	0.002	0.000
1960	0.000	0.000
1961	0.002	0.011
1962	0.000	0.000
1963	0.000	0.000
1964	0.000	0.000
1965	0.001	0.000
1966	0.000	0.000
1967	0.001	0.000
1968	0.000	0.000
1969	0.000	0.000
1970	0.001	0.000
1971	0.001	0.023
1972	0.001	0.032
1973	0.001	0.000
1974	0.001	0.000
1975	0.002	0.028
1976	0.002	0.000
1977	0.000	0.000
1978	0.001	0.000
1979	0.000	0.000
1980	0.001	0.000
1981	0.000	0.000
1982	0.000	0.000
1983	0.001	0.000
1984	0.000	0.000
1985	0.002	0.000
1986	0.000	0.000
1987	0.001	0.000
1988	0.000	0.000
1989	0.000	0.000
1990	0.001	0.000
1991	0.000	0.000
1992	0.001	0.000
1993	0.000	0.000
1994	0.001	0.000
1995	0.000	0.000
1996	0.001	0.000
1997	0.000	0.000
1998	0.001	0.000
1999	0.000	0.000
2000	0.000	0.000
2001	0.000	0.000
2002	0.003	0.000
2003	0.000	0.000
2004	0.000	0.000
2005	0.005	0.000
2006	0.000	0.000
2007	0.000	0.000
2008	0.000	0.000
2009	0.000	0.000
2010	0.000	0.000
2011	0.000	0.000
2012	0.000	0.025
2013	0.000	0.000
2014	0.001	0.000
2015	0.001	0.000

2016	0.000	0.000
2017	0.000	0.053
2018	0.002	0.000
2019	0.002	0.045
2020	0.001	0.000
2021	0.001	0.000
2022	0.000	0.000
2023	0.000	0.000
2024	0.009	0.015
2025	0.000	0.000
2026	0.000	0.000
2027	0.000	0.000
2028	0.000	0.000
2029	0.000	0.000
2030	0.001	0.011
2031	0.000	0.000
2032	0.000	0.000
2033	0.000	0.000
2034	0.000	0.000
2035	0.001	0.026
2036	0.000	0.000
2037	0.000	0.000
2038	0.001	0.000
2039	0.000	0.000
2040	0.000	0.000
2041	0.000	0.000
2042	0.001	0.030
2043	0.001	0.000
2044	0.001	0.000
2045	0.000	0.000
2046	0.000	0.000
2047	0.000	0.000
2048	0.000	0.000
2049	0.000	0.000
2050	0.000	0.000
2051	0.001	0.010
2052	0.000	0.000
2053	0.000	0.000
2054	0.001	0.033
2055	0.000	0.000
2056	0.000	0.000
2057	0.000	0.000
2058	0.000	0.000
2059	0.003	0.000

Ranked Annual Peaks

Ranked Annual Peaks for Predeveloped and Mitigated. POC #1

Rank	**Predeveloped**	**Mitigated**
1	0.0106	0.0525
2	0.0089	0.0521
3	0.0055	0.0450
4	0.0035	0.0407
5	0.0029	0.0379
6	0.0028	0.0333
7	0.0026	0.0318
8	0.0024	0.0297
9	0.0022	0.0278
10	0.0022	0.0264

11	0.0020	0.0247
12	0.0018	0.0234
13	0.0018	0.0149
14	0.0017	0.0140
15	0.0016	0.0110
16	0.0016	0.0110
17	0.0015	0.0106
18	0.0015	0.0105
19	0.0015	0.0088
20	0.0014	0.0060
21	0.0014	0.0000
22	0.0011	0.0000
23	0.0010	0.0000
24	0.0010	0.0000
25	0.0010	0.0000
26	0.0009	0.0000
27	0.0009	0.0000
28	0.0009	0.0000
29	0.0009	0.0000
30	0.0009	0.0000
31	0.0008	0.0000
32	0.0008	0.0000
33	0.0008	0.0000
34	0.0008	0.0000
35	0.0008	0.0000
36	0.0008	0.0000
37	0.0007	0.0000
38	0.0007	0.0000
39	0.0007	0.0000
40	0.0007	0.0000
41	0.0007	0.0000
42	0.0007	0.0000
43	0.0007	0.0000
44	0.0007	0.0000
45	0.0007	0.0000
46	0.0006	0.0000
47	0.0006	0.0000
48	0.0006	0.0000
49	0.0006	0.0000
50	0.0006	0.0000
51	0.0006	0.0000
52	0.0006	0.0000
53	0.0006	0.0000
54	0.0006	0.0000
55	0.0005	0.0000
56	0.0005	0.0000
57	0.0004	0.0000
58	0.0004	0.0000
59	0.0004	0.0000
60	0.0004	0.0000
61	0.0004	0.0000
62	0.0004	0.0000
63	0.0004	0.0000
64	0.0004	0.0000
65	0.0004	0.0000
66	0.0004	0.0000
67	0.0003	0.0000
68	0.0003	0.0000

69	0.0003	0.0000
70	0.0003	0.0000
71	0.0003	0.0000
72	0.0003	0.0000
73	0.0003	0.0000
74	0.0003	0.0000
75	0.0003	0.0000
76	0.0003	0.0000
77	0.0003	0.0000
78	0.0003	0.0000
79	0.0003	0.0000
80	0.0003	0.0000
81	0.0003	0.0000
82	0.0003	0.0000
83	0.0003	0.0000
84	0.0003	0.0000
85	0.0003	0.0000
86	0.0003	0.0000
87	0.0003	0.0000
88	0.0002	0.0000
89	0.0002	0.0000
90	0.0002	0.0000
91	0.0002	0.0000
92	0.0002	0.0000
93	0.0002	0.0000
94	0.0002	0.0000
95	0.0002	0.0000
96	0.0002	0.0000
97	0.0002	0.0000
98	0.0002	0.0000
99	0.0002	0.0000
100	0.0002	0.0000
101	0.0002	0.0000
102	0.0002	0.0000
103	0.0002	0.0000
104	0.0002	0.0000
105	0.0002	0.0000
106	0.0002	0.0000
107	0.0002	0.0000
108	0.0002	0.0000
109	0.0002	0.0000
110	0.0002	0.0000
111	0.0002	0.0000
112	0.0002	0.0000
113	0.0002	0.0000
114	0.0002	0.0000
115	0.0002	0.0000
116	0.0002	0.0000
117	0.0002	0.0000
118	0.0002	0.0000
119	0.0002	0.0000
120	0.0002	0.0000
121	0.0002	0.0000
122	0.0002	0.0000
123	0.0002	0.0000
124	0.0002	0.0000
125	0.0002	0.0000
126	0.0002	0.0000

127	0.0002	0.0000
128	0.0002	0.0000
129	0.0002	0.0000
130	0.0002	0.0000
131	0.0002	0.0000
132	0.0002	0.0000
133	0.0002	0.0000
134	0.0002	0.0000
135	0.0002	0.0000
136	0.0002	0.0000
137	0.0002	0.0000
138	0.0002	0.0000
139	0.0002	0.0000
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144	0.0002	0.0000
145	0.0002	0.0000
146	0.0002	0.0000
147	0.0002	0.0000
148	0.0002	0.0000
149	0.0002	0.0000
150	0.0002	0.0000
151	0.0002	0.0000
152	0.0002	0.0000
153	0.0002	0.0000
154	0.0002	0.0000
155	0.0002	0.0000
156	0.0002	0.0000
157	0.0002	0.0000
158	0.0002	0.0000

LID Duration Flows
The Facility PASSED

Flow(cfs)	Predev	Mit	Percentage	Pass/Fail
0.0000	101494	307	0	Pass
0.0000	99444	307	0	Pass
0.0000	95732	307	0	Pass
0.0000	93793	307	0	Pass
0.0000	90469	307	0	Pass
0.0000	88696	307	0	Pass
0.0000	87034	307	0	Pass
0.0000	83655	307	0	Pass
0.0000	82159	305	0	Pass
0.0000	79168	304	0	Pass
0.0000	77505	304	0	Pass
0.0000	76065	304	0	Pass
0.0000	72796	304	0	Pass
0.0000	71356	304	0	Pass
0.0000	68420	304	0	Pass
0.0000	66869	304	0	Pass
0.0000	65262	304	0	Pass
0.0001	62547	304	0	Pass
0.0001	61329	304	0	Pass
0.0001	59002	304	0	Pass
0.0001	57894	304	0	Pass
0.0001	57007	304	0	Pass
0.0001	55190	304	0	Pass
0.0001	54309	304	0	Pass
0.0001	52675	304	0	Pass
0.0001	51888	304	0	Pass
0.0001	51179	304	0	Pass
0.0001	49678	304	0	Pass
0.0001	48946	304	0	Pass
0.0001	47445	303	0	Pass
0.0001	46669	303	0	Pass
0.0001	45229	303	0	Pass
0.0001	44509	303	0	Pass
0.0001	43850	302	0	Pass
0.0001	42370	302	0	Pass
0.0001	41683	302	0	Pass
0.0001	40105	302	0	Pass
0.0001	39429	301	0	Pass
0.0001	38659	301	0	Pass
0.0001	37334	301	0	Pass
0.0001	36636	301	0	Pass
0.0001	35207	301	0	Pass
0.0001	34454	301	0	Pass
0.0001	33817	301	0	Pass
0.0001	32465	301	0	Pass
0.0001	31789	301	0	Pass
0.0001	30553	301	0	Pass
0.0001	29916	301	1	Pass
0.0001	29224	301	1	Pass
0.0001	28072	301	1	Pass
0.0001	27495	301	1	Pass
0.0001	26277	301	1	Pass
0.0001	25728	301	1	Pass

0.0001	25191	301	1	Pass
0.0001	24149	301	1	Pass
0.0001	23706	301	1	Pass
0.0001	22753	301	1	Pass
0.0001	22177	301	1	Pass
0.0001	21628	300	1	Pass
0.0001	20687	300	1	Pass
0.0001	20166	300	1	Pass
0.0001	19074	300	1	Pass
0.0001	18598	300	1	Pass
0.0001	18182	300	1	Pass
0.0001	17257	300	1	Pass
0.0001	16820	300	1	Pass
0.0001	16022	300	1	Pass
0.0001	15579	300	1	Pass
0.0001	15141	300	1	Pass
0.0001	14249	300	2	Pass
0.0001	13745	300	2	Pass
0.0001	12931	300	2	Pass
0.0001	12454	300	2	Pass
0.0001	12077	300	2	Pass
0.0001	11202	300	2	Pass
0.0001	10809	300	2	Pass
0.0001	10000	300	3	Pass
0.0001	9568	300	3	Pass
0.0001	8781	299	3	Pass
0.0001	8316	298	3	Pass
0.0001	7967	298	3	Pass
0.0001	7185	298	4	Pass
0.0001	6859	298	4	Pass
0.0001	6116	298	4	Pass
0.0001	5778	298	5	Pass
0.0001	5465	298	5	Pass
0.0001	4802	298	6	Pass
0.0001	4434	298	6	Pass
0.0002	3829	298	7	Pass
0.0002	3539	298	8	Pass
0.0002	3192	298	9	Pass
0.0002	2611	298	11	Pass
0.0002	2293	298	12	Pass
0.0002	1781	298	16	Pass
0.0002	1593	298	18	Pass
0.0002	1356	298	21	Pass
0.0002	793	298	37	Pass
0.0002	688	298	43	Pass
0.0002	676	298	44	Pass
0.0002	664	298	44	Pass

Duration Flows

The Duration Matching Failed

Flow(cfs)	Predev	Mit	Percentage	Pass/Fail
0.0002	664	298	44	Pass
0.0002	522	296	56	Pass
0.0002	439	296	67	Pass
0.0003	366	296	80	Pass
0.0003	308	295	95	Pass
0.0004	267	294	110	Pass
0.0004	249	293	117	Fail
0.0004	231	293	126	Fail
0.0005	203	292	143	Fail
0.0005	187	292	156	Fail
0.0005	168	292	173	Fail
0.0006	147	291	197	Fail
0.0006	129	291	225	Fail
0.0007	120	290	241	Fail
0.0007	108	289	267	Fail
0.0007	100	289	289	Fail
0.0008	93	289	310	Fail
0.0008	85	289	340	Fail
0.0009	79	287	363	Fail
0.0009	76	286	376	Fail
0.0009	72	285	395	Fail
0.0010	67	283	422	Fail
0.0010	63	283	449	Fail
0.0010	62	283	456	Fail
0.0011	58	283	487	Fail
0.0011	56	282	503	Fail
0.0012	55	281	510	Fail
0.0012	54	280	518	Fail
0.0012	51	278	545	Fail
0.0013	50	278	556	Fail
0.0013	49	278	567	Fail
0.0013	46	278	604	Fail
0.0014	45	278	617	Fail
0.0014	44	278	631	Fail
0.0015	43	276	641	Fail
0.0015	40	274	685	Fail
0.0015	38	273	718	Fail
0.0016	37	273	737	Fail
0.0016	36	272	755	Fail
0.0017	35	271	774	Fail
0.0017	33	270	818	Fail
0.0017	32	270	843	Fail
0.0018	29	270	931	Fail
0.0018	28	270	964	Fail
0.0018	28	269	960	Fail
0.0019	28	267	953	Fail
0.0019	28	267	953	Fail
0.0020	27	267	988	Fail
0.0020	27	267	988	Fail
0.0020	26	267	1026	Fail
0.0021	25	266	1064	Fail
0.0021	25	263	1052	Fail
0.0021	23	261	1134	Fail
0.0022	22	259	1177	Fail

0.0022	22	258	1172	Fail
0.0023	21	258	1228	Fail
0.0023	21	257	1223	Fail
0.0023	21	257	1223	Fail
0.0024	21	257	1223	Fail
0.0024	21	256	1219	Fail
0.0025	20	255	1275	Fail
0.0025	20	255	1275	Fail
0.0025	20	255	1275	Fail
0.0026	19	254	1336	Fail
0.0026	18	253	1405	Fail
0.0026	17	253	1488	Fail
0.0027	17	253	1488	Fail
0.0027	17	253	1488	Fail
0.0028	15	252	1679	Fail
0.0028	15	252	1679	Fail
0.0028	14	251	1792	Fail
0.0029	14	250	1785	Fail
0.0029	13	250	1923	Fail
0.0029	13	250	1923	Fail
0.0030	13	249	1915	Fail
0.0030	13	249	1915	Fail
0.0031	13	248	1907	Fail
0.0031	12	247	2058	Fail
0.0031	12	246	2050	Fail
0.0032	12	245	2041	Fail
0.0032	12	244	2033	Fail
0.0033	12	244	2033	Fail
0.0033	12	243	2025	Fail
0.0033	12	242	2016	Fail
0.0034	12	241	2008	Fail
0.0034	12	239	1991	Fail
0.0034	12	239	1991	Fail
0.0035	12	239	1991	Fail
0.0035	11	238	2163	Fail
0.0036	11	238	2163	Fail
0.0036	11	237	2154	Fail
0.0036	11	236	2145	Fail
0.0037	11	236	2145	Fail
0.0037	11	235	2136	Fail
0.0037	11	235	2136	Fail
0.0038	11	235	2136	Fail
0.0038	11	235	2136	Fail
0.0039	11	235	2136	Fail
0.0039	11	235	2136	Fail
0.0039	11	235	2136	Fail

The development has an increase in flow durations from 1/2 Predeveloped 2 year flow to the 2 year flow or more than a 10% increase from the 2 year to the 50 year flow.
The development has an increase in flow durations for more than 50% of the flows for the range of the duration analysis.

Water Quality

Water Quality BMP Flow and Volume for POC #1
On-line facility volume: 0 acre-feet
On-line facility target flow: 0 cfs.
Adjusted for 15 min: 0 cfs.
Off-line facility target flow: 0 cfs.
Adjusted for 15 min: 0 cfs.

LID Report

LID Technique	Used for Treatment ?	Total Volume Needs Treatment (ac-ft)	Volume Through Facility (ac-ft)	Infiltration Volume (ac-ft)	Cumulative Volume Infiltration Credit	Percent Volume Infiltrated	Water Quality	Percent Water Quality Treated	Comment
Gravel Trench Bed 1 POC	☐	50.42			☐	99.86			
Open-Graded Gravel POC	☐	18.43			☐	100.00			
Permeable Asphalt POC	☐	5.30			☐	100.00			
Total Volume Infiltrated		74.16	0.00	0.00		99.91	0.00	0%	No Treat. Credit
Compliance with LID Standard 8% of 2-yr to 50% of 2-yr									Duration Analysis Result = Passed

Model Default Modifications

Total of 0 changes have been made.

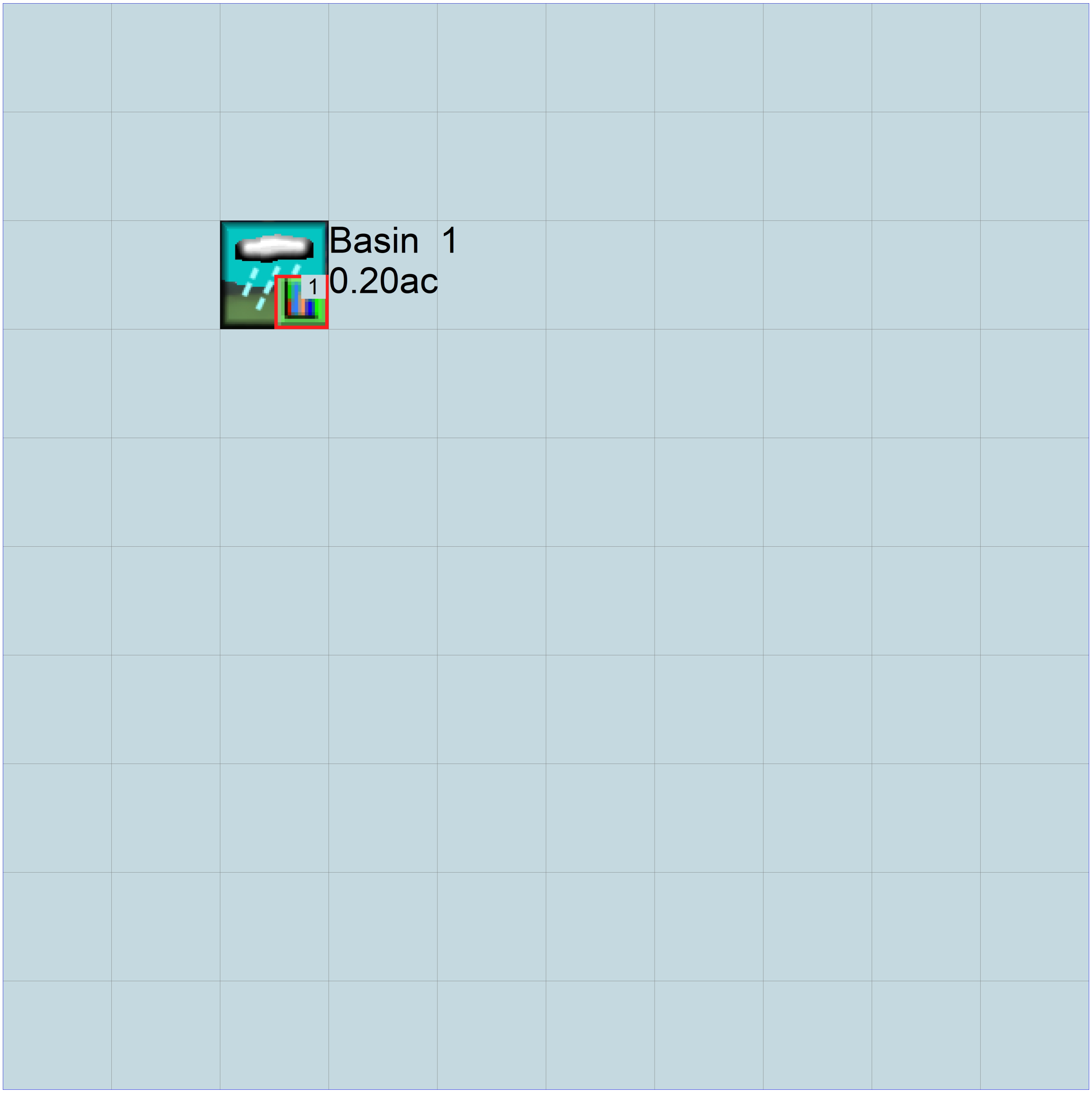
PERLND Changes

No PERLND changes have been made.

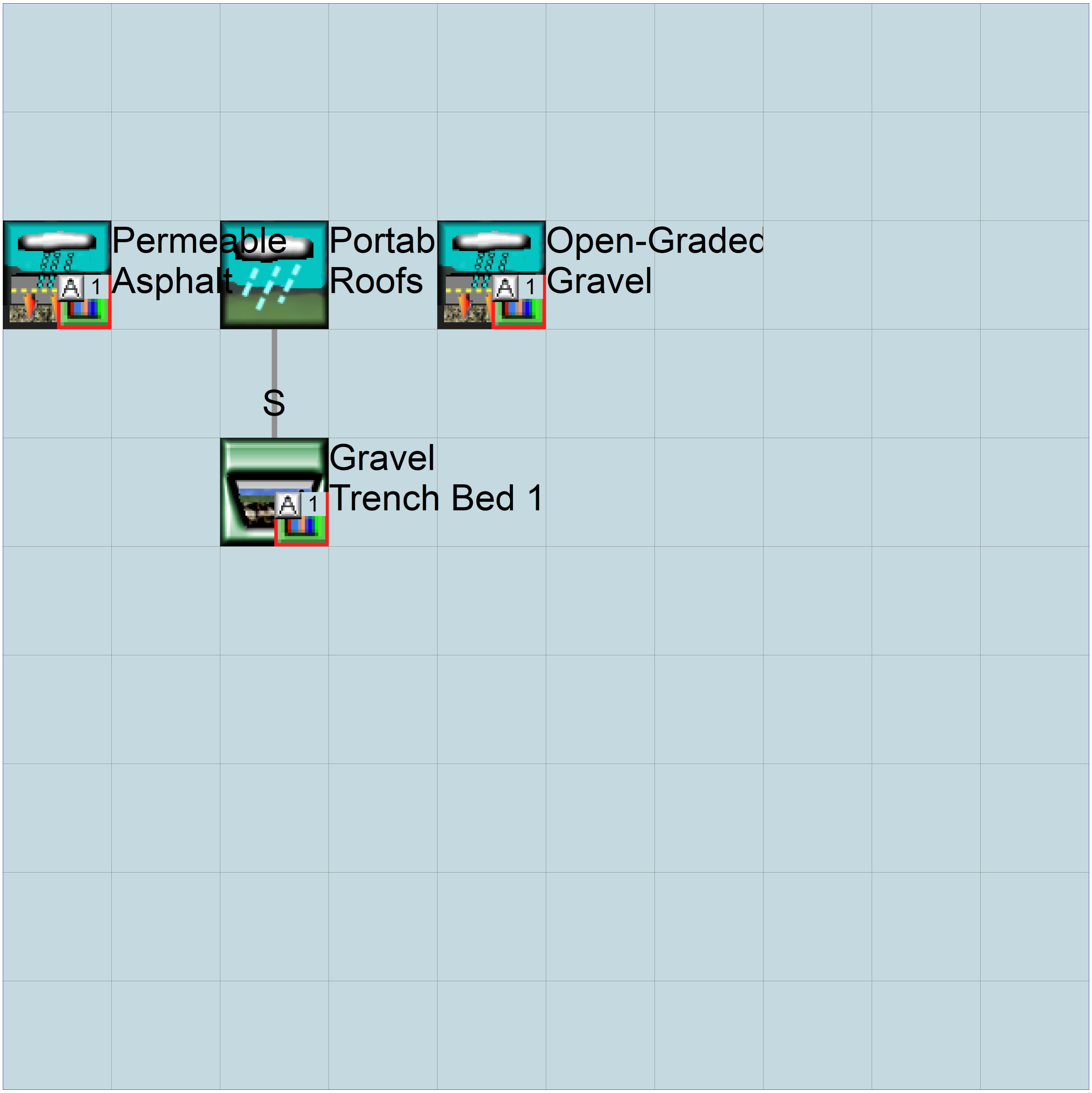
IMPLND Changes

No IMPLND changes have been made.

Appendix
Predeveloped Schematic



Mitigated Schematic



Predeveloped UCI File

Mitigated UCI File

```
RUN

GLOBAL
  WWHM4 model simulation
  START       1901 10 01        END    2059 09 30
  RUN INTERP OUTPUT LEVEL    3    0
  RESUME     0 RUN     1                   UNIT SYSTEM     1
END GLOBAL

FILES
<File>  <Un#>   <-----------File Name------------------------------>***
<-ID->                                                              ***
WDM        26   Combined Basins.wdm
MESSU      25   MitCombined Basins.MES
           27   MitCombined Basins.L61
           28   MitCombined Basins.L62
           30   POCCombined Basins1.dat
END FILES

OPN SEQUENCE
    INGRP              INDELT 00:15
      IMPLND       4
      IMPLND      17
      RCHRES       1
      IMPLND      18
      RCHRES       2
      RCHRES       3
      COPY         1
      COPY       501
      DISPLY       1
    END INGRP
END OPN SEQUENCE
DISPLY
  DISPLY-INFO1
    # -  #<----------Title----------->***TRAN PIVL DIG1 FIL1  PYR DIG2 FIL2 YRND
    1        Open-Graded Gravel          MAX                    1    2   30    9
  END DISPLY-INFO1
END DISPLY
COPY
  TIMESERIES
    # -  #  NPT  NMN ***
    1        1    1
  501        1    1
  END TIMESERIES
END COPY
GENER
  OPCODE
    #    # OPCD ***
  END OPCODE
  PARM
    #    #         K ***
  END PARM
END GENER
PERLND
  GEN-INFO
    <PLS ><-------Name------->NBLKS   Unit-systems   Printer ***
    # -  #                          User  t-series Engl Metr ***
                                          in  out            ***
  END GEN-INFO
  *** Section PWATER***

  ACTIVITY
    <PLS > ************* Active Sections *****************************
    # -  # ATMP SNOW PWAT  SED  PST  PWG PQAL MSTL PEST NITR PHOS TRAC ***
  END ACTIVITY

  PRINT-INFO
    <PLS > ***************** Print-flags ***************************** PIVL  PYR
```

```
    # -  # ATMP SNOW PWAT  SED  PST  PWG PQAL MSTL PEST NITR PHOS TRAC  *********
  END PRINT-INFO

  PWAT-PARM1
    <PLS >  PWATER variable monthly parameter value flags  ***
    # -  # CSNO RTOP UZFG  VCS  VUZ  VNN VIFW VIRC  VLE INFC  HWT ***
  END PWAT-PARM1

  PWAT-PARM2
    <PLS >      PWATER input info: Part 2         ***
    # -  # ***FOREST      LZSN    INFILT      LSUR     SLSUR     KVARY     AGWRC
  END PWAT-PARM2

  PWAT-PARM3
    <PLS >      PWATER input info: Part 3         ***
    # -  # ***PETMAX    PETMIN    INFEXP    INFILD    DEEPFR    BASETP    AGWETP
  END PWAT-PARM3
  PWAT-PARM4
    <PLS >     PWATER input info: Part 4                               ***
    # -  #     CEPSC      UZSN      NSUR     INTFW       IRC     LZETP ***
  END PWAT-PARM4

  PWAT-STATE1
    <PLS > *** Initial conditions at start of simulation
              ran from 1990 to end of 1992 (pat 1-11-95) RUN 21 ***
    # -  # ***  CEPS      SURS       UZS      IFWS       LZS      AGWS      GWVS
  END PWAT-STATE1

END PERLND

IMPLND
  GEN-INFO
    <PLS ><-------Name------->   Unit-systems   Printer ***
    # -  #                     User  t-series Engl Metr ***
                                      in  out           ***
    4      ROOF TOPS/FLAT         1    1    1   27    0
   17      Porous Pavement        1    1    1   27    0
   18      Porous Pavement        1    1    1   27    0
  END GEN-INFO
  *** Section IWATER***

  ACTIVITY
    <PLS > ************* Active Sections *****************************
    # -  # ATMP SNOW IWAT  SLD  IWG IQAL   ***
    4         0    0    1    0    0    0
   17         0    0    1    0    0    0
   18         0    0    1    0    0    0
  END ACTIVITY

  PRINT-INFO
    <ILS > ******** Print-flags ******** PIVL  PYR
    # -  # ATMP SNOW IWAT  SLD  IWG IQAL    *********
    4         0    0    4    0    0    4    1    9
   17         0    0    4    0    0    0    1    9
   18         0    0    4    0    0    0    1    9
  END PRINT-INFO

  IWAT-PARM1
    <PLS >  IWATER variable monthly parameter value flags  ***
    # -  # CSNO RTOP  VRS  VNN RTLI     ***
    4         0    0    0    0    0
   17         0    0    0    0    0
   18         0    0    0    0    0
  END IWAT-PARM1

  IWAT-PARM2
    <PLS >      IWATER input info: Part 2         ***
    # -  # ***  LSUR     SLSUR      NSUR     RETSC
    4            400      0.01       0.1       0.1
   17            400      0.01       0.1       0.1
```

```
  18            400      0.01       0.1       0.1
 END IWAT-PARM2

 IWAT-PARM3
   <PLS >      IWATER input info: Part 3         ***
   # -  # ***PETMAX    PETMIN
   4             0         0
  17             0         0
  18             0         0
 END IWAT-PARM3

 IWAT-STATE1
   <PLS > *** Initial conditions at start of simulation
   # -  # ***  RETS      SURS
   4             0         0
  17             0         0
  18             0         0
 END IWAT-STATE1

END IMPLND

SCHEMATIC
<-Source->                  <--Area-->     <-Target->   MBLK   ***
<Name>   #                  <-factor->     <Name>   #   Tbl#   ***
Portable Roofs***
IMPLND   4                        0.13     RCHRES   3      5
IMPLND  18                      0.0152     RCHRES   2      5
IMPLND  17                      0.0511     RCHRES   1      5

******Routing******
IMPLND   4                        0.13     COPY     1     15
RCHRES   3                           1     COPY   501     17
RCHRES   1                           1     COPY   501     17
RCHRES   2                           1     COPY   501     17
END SCHEMATIC

NETWORK
<-Volume-> <-Grp> <-Member-><--Mult-->Tran <-Target vols> <-Grp> <-Member->  ***
<Name>   #        <Name> # #<-factor->strg <Name>   #   #        <Name> # #  ***
COPY   501 OUTPUT MEAN   1 1   48.4        DISPLY   1     INPUT  TIMSER 1



<-Volume-> <-Grp> <-Member-><--Mult-->Tran <-Target vols> <-Grp> <-Member->  ***
<Name>   #        <Name> # #<-factor->strg <Name>   #   #        <Name> # #  ***
END NETWORK

RCHRES
  GEN-INFO
    RCHRES       Name        Nexits   Unit Systems   Printer                 ***
    # -  #<------------------><---> User T-series  Engl Metr LKFG            ***
                                          in  out                            ***
    1     Open-Graded Grav-008    2    1    1    1   28    0    1
    2     Permeable Asphal-009    2    1    1    1   28    0    1
    3     Gravel Trench Be-004    2    1    1    1   28    0    1
  END GEN-INFO
  *** Section RCHRES***

  ACTIVITY
    <PLS > ************* Active Sections *****************************
    # -  # HYFG ADFG CNFG HTFG SDFG GQFG OXFG NUFG PKFG PHFG ***
    1         1    0    0    0    0    0    0    0    0    0
    2         1    0    0    0    0    0    0    0    0    0
    3         1    0    0    0    0    0    0    0    0    0
  END ACTIVITY

  PRINT-INFO
    <PLS > ***************** Print-flags ******************* PIVL  PYR
    # -  # HYDR ADCA CONS HEAT  SED  GQL OXRX NUTR PLNK PHCB PIVL  PYR  *********
    1         4    0    0    0    0    0    0    0    0    0    1    9
```

```
    2         4    0    0    0    0    0    0    0    0    0    1    9
    3         4    0    0    0    0    0    0    0    0    0    1    9
  END PRINT-INFO

  HYDR-PARM1
    RCHRES  Flags for each HYDR Section                                 ***
    # -  #  VC A1 A2 A3  ODFVFG for each *** ODGTFG for each     FUNCT  for each
            FG FG FG FG  possible  exit  *** possible  exit      possible  exit
             *  *  *  *    *  *  *  *  *       *  *  *  *  *        ***
    1        0  1  0  0    4  5  0  0  0       0  0  0  0  0       2  2  2  2  2
    2        0  1  0  0    4  5  0  0  0       0  0  0  0  0       2  2  2  2  2
    3        0  1  0  0    4  5  0  0  0       0  0  0  0  0       2  2  2  2  2
  END HYDR-PARM1

  HYDR-PARM2
    # -  #    FTABNO       LEN     DELTH     STCOR        KS      DB50       ***
  <------><--------><--------><--------><--------><--------><-------->       ***
    1             1      0.01       0.0       0.0       0.5       0.0
    2             2      0.03       0.0       0.0       0.5       0.0
    3             3      0.01       0.0       0.0       0.5       0.0
  END HYDR-PARM2
  HYDR-INIT
    RCHRES  Initial conditions for each HYDR section                    ***
    # -  # ***   VOL     Initial  value  of COLIND     Initial  value  of OUTDGT
          *** ac-ft     for each possible exit       for each possible exit
  <------><-------->     <---><---><---><---><---> *** <---><---><---><---><--->
    1          0          4.0  5.0  0.0  0.0  0.0       0.0  0.0  0.0  0.0  0.0
    2          0          4.0  5.0  0.0  0.0  0.0       0.0  0.0  0.0  0.0  0.0
    3          0          4.0  5.0  0.0  0.0  0.0       0.0  0.0  0.0  0.0  0.0
  END HYDR-INIT
END RCHRES

SPEC-ACTIONS
END SPEC-ACTIONS
FTABLES
  FTABLE      3
   92    5
     Depth      Area    Volume  Outflow1  Outflow2  Velocity  Travel Time***
      (ft)   (acres) (acre-ft)    (cfs)     (cfs)   (ft/sec)    (Minutes)***
  0.000000  0.020524  0.000000  0.000000  0.000000
  0.016667  0.020524  0.000113  0.000000  0.013317
  0.033333  0.020524  0.000226  0.000000  0.013317
  0.050000  0.020524  0.000339  0.000000  0.013317
  0.066667  0.020524  0.000452  0.000000  0.013317
  0.083333  0.020524  0.000564  0.000000  0.013317
  0.100000  0.020524  0.000677  0.000000  0.013317
  0.116667  0.020524  0.000790  0.000000  0.013317
  0.133333  0.020524  0.000903  0.000000  0.013317
  0.150000  0.020524  0.001016  0.000000  0.013317
  0.166667  0.020524  0.001129  0.000000  0.013317
  0.183333  0.020524  0.001242  0.000000  0.013317
  0.200000  0.020524  0.001355  0.000000  0.013317
  0.216667  0.020524  0.001467  0.000000  0.013317
  0.233333  0.020524  0.001580  0.000000  0.013317
  0.250000  0.020524  0.001693  0.000000  0.013317
  0.266667  0.020524  0.001806  0.000000  0.013317
  0.283333  0.020524  0.001919  0.000000  0.013317
  0.300000  0.020524  0.002032  0.000000  0.013317
  0.316667  0.020524  0.002145  0.000000  0.013317
  0.333333  0.020524  0.002258  0.000000  0.013317
  0.350000  0.020524  0.002370  0.000000  0.013317
  0.366667  0.020524  0.002483  0.000000  0.013317
  0.383333  0.020524  0.002596  0.000000  0.013317
  0.400000  0.020524  0.002709  0.000000  0.013317
  0.416667  0.020524  0.002822  0.000000  0.013317
  0.433333  0.020524  0.002935  0.000000  0.013317
  0.450000  0.020524  0.003048  0.000000  0.013317
  0.466667  0.020524  0.003161  0.000000  0.013317
  0.483333  0.020524  0.003274  0.000000  0.013317
  0.500000  0.020524  0.003386  0.000000  0.013317
```

0.516667	0.020524	0.003499	0.000000	0.013317
0.533333	0.020524	0.003612	0.000000	0.013317
0.550000	0.020524	0.003725	0.000000	0.013317
0.566667	0.020524	0.003838	0.000000	0.013317
0.583333	0.020524	0.003951	0.000000	0.013317
0.600000	0.020524	0.004064	0.000000	0.013317
0.616667	0.020524	0.004177	0.000000	0.013317
0.633333	0.020524	0.004289	0.000000	0.013317
0.650000	0.020524	0.004402	0.000000	0.013317
0.666667	0.020524	0.004515	0.000000	0.013317
0.683333	0.020524	0.004628	0.000000	0.013317
0.700000	0.020524	0.004741	0.000000	0.013317
0.716667	0.020524	0.004854	0.000000	0.013317
0.733333	0.020524	0.004967	0.000000	0.013317
0.750000	0.020524	0.005080	0.000000	0.013317
0.766667	0.020524	0.005192	0.000000	0.013317
0.783333	0.020524	0.005305	0.000000	0.013317
0.800000	0.020524	0.005418	0.000000	0.013317
0.816667	0.020524	0.005531	0.000000	0.013317
0.833333	0.020524	0.005644	0.000000	0.013317
0.850000	0.020524	0.005757	0.000000	0.013317
0.866667	0.020524	0.005870	0.000000	0.013317
0.883333	0.020524	0.005983	0.000000	0.013317
0.900000	0.020524	0.006096	0.000000	0.013317
0.916667	0.020524	0.006208	0.000000	0.013317
0.933333	0.020524	0.006321	0.000000	0.013317
0.950000	0.020524	0.006434	0.000000	0.013317
0.966667	0.020524	0.006547	0.000000	0.013317
0.983333	0.020524	0.006660	0.000000	0.013317
1.000000	0.020524	0.006773	0.000000	0.013317
1.016667	0.020524	0.006886	0.000000	0.013317
1.033333	0.020524	0.006999	0.000000	0.013317
1.050000	0.020524	0.007111	0.000000	0.013317
1.066667	0.020524	0.007224	0.000000	0.013317
1.083333	0.020524	0.007337	0.000000	0.013317
1.100000	0.020524	0.007450	0.000000	0.013317
1.116667	0.020524	0.007563	0.000000	0.013317
1.133333	0.020524	0.007676	0.000000	0.013317
1.150000	0.020524	0.007789	0.000000	0.013317
1.166667	0.020524	0.007902	0.000000	0.013317
1.183333	0.020524	0.008014	0.000000	0.013317
1.200000	0.020524	0.008127	0.000000	0.013317
1.216667	0.020524	0.008240	0.000000	0.013317
1.233333	0.020524	0.008353	0.000000	0.013317
1.250000	0.020524	0.008466	0.000000	0.013317
1.266667	0.020524	0.008579	0.000000	0.013317
1.283333	0.020524	0.008692	0.000000	0.013317
1.300000	0.020524	0.008805	0.000000	0.013317
1.316667	0.020524	0.008918	0.000000	0.013317
1.333333	0.020524	0.009030	0.000000	0.013317
1.350000	0.020524	0.009143	0.000000	0.013317
1.366667	0.020524	0.009256	0.000000	0.013317
1.383333	0.020524	0.009369	0.000000	0.013317
1.400000	0.020524	0.009482	0.000000	0.013317
1.416667	0.020524	0.009595	0.022834	0.013317
1.433333	0.020524	0.009708	0.064540	0.013317
1.450000	0.020524	0.009821	0.118483	0.013317
1.466667	0.020524	0.009933	0.182234	0.013317
1.483333	0.020524	0.010046	0.254292	0.013317
1.500000	0.020524	0.010159	0.333520	0.013317
1.516667	0.020524	0.010501	0.418946	0.013317

END FTABLE 3
FTABLE 1
91 5

Depth (ft)	Area (acres)	Volume (acre-ft)	Outflow1 (cfs)	Outflow2 (cfs)	Velocity (ft/sec)	Travel Time*** (Minutes)***
0.000000	0.051144	0.000000	0.000000	0.000000		
0.005556	0.051144	0.000094	0.000000	0.033186		
0.011111	0.051144	0.000188	0.000000	0.033186		
0.016667	0.051144	0.000281	0.000000	0.033186		

0.022222	0.051144	0.000375	0.000000	0.033186
0.027778	0.051144	0.000469	0.000000	0.033186
0.033333	0.051144	0.000563	0.000000	0.033186
0.038889	0.051144	0.000656	0.000000	0.033186
0.044444	0.051144	0.000750	0.000000	0.033186
0.050000	0.051144	0.000844	0.000000	0.033186
0.055556	0.051144	0.000938	0.000000	0.033186
0.061111	0.051144	0.001031	0.000000	0.033186
0.066667	0.051144	0.001125	0.000000	0.033186
0.072222	0.051144	0.001219	0.000000	0.033186
0.077778	0.051144	0.001313	0.000000	0.033186
0.083333	0.051144	0.001406	0.000000	0.033186
0.088889	0.051144	0.001500	0.000000	0.033186
0.094444	0.051144	0.001594	0.000000	0.033186
0.100000	0.051144	0.001688	0.000000	0.033186
0.105556	0.051144	0.001782	0.000000	0.033186
0.111111	0.051144	0.001875	0.000000	0.033186
0.116667	0.051144	0.001969	0.000000	0.033186
0.122222	0.051144	0.002063	0.000000	0.033186
0.127778	0.051144	0.002157	0.000000	0.033186
0.133333	0.051144	0.002250	0.000000	0.033186
0.138889	0.051144	0.002344	0.000000	0.033186
0.144444	0.051144	0.002438	0.000000	0.033186
0.150000	0.051144	0.002532	0.000000	0.033186
0.155556	0.051144	0.002625	0.000000	0.033186
0.161111	0.051144	0.002719	0.000000	0.033186
0.166667	0.051144	0.002813	0.000000	0.033186
0.172222	0.051144	0.002907	0.000000	0.033186
0.177778	0.051144	0.003000	0.000000	0.033186
0.183333	0.051144	0.003094	0.000000	0.033186
0.188889	0.051144	0.003188	0.000000	0.033186
0.194444	0.051144	0.003282	0.000000	0.033186
0.200000	0.051144	0.003376	0.000000	0.033186
0.205556	0.051144	0.003469	0.000000	0.033186
0.211111	0.051144	0.003563	0.000000	0.033186
0.216667	0.051144	0.003657	0.000000	0.033186
0.222222	0.051144	0.003751	0.000000	0.033186
0.227778	0.051144	0.003844	0.000000	0.033186
0.233333	0.051144	0.003938	0.000000	0.033186
0.238889	0.051144	0.004032	0.000000	0.033186
0.244444	0.051144	0.004126	0.000000	0.033186
0.250000	0.051144	0.004219	0.000000	0.033186
0.255556	0.051144	0.004313	0.000000	0.033186
0.261111	0.051144	0.004407	0.000000	0.033186
0.266667	0.051144	0.004501	0.000000	0.033186
0.272222	0.051144	0.004594	0.000000	0.033186
0.277778	0.051144	0.004688	0.000000	0.033186
0.283333	0.051144	0.004782	0.000000	0.033186
0.288889	0.051144	0.004876	0.000000	0.033186
0.294444	0.051144	0.004970	0.000000	0.033186
0.300000	0.051144	0.005063	0.000000	0.033186
0.305556	0.051144	0.005157	0.000000	0.033186
0.311111	0.051144	0.005251	0.000000	0.033186
0.316667	0.051144	0.005345	0.000000	0.033186
0.322222	0.051144	0.005438	0.000000	0.033186
0.327778	0.051144	0.005532	0.000000	0.033186
0.333333	0.051144	0.005626	0.000000	0.033186
0.338889	0.051144	0.005720	0.000000	0.033186
0.344444	0.051144	0.005813	0.000000	0.033186
0.350000	0.051144	0.005907	0.000000	0.033186
0.355556	0.051144	0.006001	0.000000	0.033186
0.361111	0.051144	0.006095	0.000000	0.033186
0.366667	0.051144	0.006188	0.000000	0.033186
0.372222	0.051144	0.006282	0.000000	0.033186
0.377778	0.051144	0.006376	0.000000	0.033186
0.383333	0.051144	0.006470	0.000000	0.033186
0.388889	0.051144	0.006564	0.000000	0.033186
0.394444	0.051144	0.006657	0.000000	0.033186
0.400000	0.051144	0.006751	0.000000	0.033186
0.405556	0.051144	0.006845	0.000000	0.033186

```
0.411111  0.051144  0.006939  0.000000  0.033186
0.416667  0.051144  0.007032  0.000000  0.033186
0.422222  0.051144  0.007126  0.000000  0.033186
0.427778  0.051144  0.007220  0.000000  0.033186
0.433333  0.051144  0.007314  0.000000  0.033186
0.438889  0.051144  0.007407  0.000000  0.033186
0.444444  0.051144  0.007501  0.000000  0.033186
0.450000  0.051144  0.007595  0.000000  0.033186
0.455556  0.051144  0.007689  0.000000  0.033186
0.461111  0.051144  0.007782  0.000000  0.033186
0.466667  0.051144  0.007876  0.000000  0.033186
0.472222  0.051144  0.007970  0.000000  0.033186
0.477778  0.051144  0.008064  0.000000  0.033186
0.483333  0.051144  0.008157  0.000000  0.033186
0.488889  0.051144  0.008251  0.000000  0.033186
0.494444  0.051144  0.008345  0.000000  0.033186
0.500000  0.051144  0.008439  0.000000  0.033186
END FTABLE  1
FTABLE      2
 91    5
   Depth      Area    Volume  Outflow1  Outflow2  Velocity  Travel Time***
    (ft)   (acres) (acre-ft)   (cfs)      (cfs)   (ft/sec)    (Minutes)***
0.000000  0.015220  0.000000  0.000000  0.000000
0.005556  0.015220  0.000028  0.000000  0.009876
0.011111  0.015220  0.000056  0.000000  0.009876
0.016667  0.015220  0.000084  0.000000  0.009876
0.022222  0.015220  0.000112  0.000000  0.009876
0.027778  0.015220  0.000140  0.000000  0.009876
0.033333  0.015220  0.000167  0.000000  0.009876
0.038889  0.015220  0.000195  0.000000  0.009876
0.044444  0.015220  0.000223  0.000000  0.009876
0.050000  0.015220  0.000251  0.000000  0.009876
0.055556  0.015220  0.000279  0.000000  0.009876
0.061111  0.015220  0.000307  0.000000  0.009876
0.066667  0.015220  0.000335  0.000000  0.009876
0.072222  0.015220  0.000363  0.000000  0.009876
0.077778  0.015220  0.000391  0.000000  0.009876
0.083333  0.015220  0.000419  0.000000  0.009876
0.088889  0.015220  0.000446  0.000000  0.009876
0.094444  0.015220  0.000474  0.000000  0.009876
0.100000  0.015220  0.000502  0.000000  0.009876
0.105556  0.015220  0.000530  0.000000  0.009876
0.111111  0.015220  0.000558  0.000000  0.009876
0.116667  0.015220  0.000586  0.000000  0.009876
0.122222  0.015220  0.000614  0.000000  0.009876
0.127778  0.015220  0.000642  0.000000  0.009876
0.133333  0.015220  0.000670  0.000000  0.009876
0.138889  0.015220  0.000698  0.000000  0.009876
0.144444  0.015220  0.000726  0.000000  0.009876
0.150000  0.015220  0.000753  0.000000  0.009876
0.155556  0.015220  0.000781  0.000000  0.009876
0.161111  0.015220  0.000809  0.000000  0.009876
0.166667  0.015220  0.000837  0.000000  0.009876
0.172222  0.015220  0.000865  0.000000  0.009876
0.177778  0.015220  0.000893  0.000000  0.009876
0.183333  0.015220  0.000921  0.000000  0.009876
0.188889  0.015220  0.000949  0.000000  0.009876
0.194444  0.015220  0.000977  0.000000  0.009876
0.200000  0.015220  0.001005  0.000000  0.009876
0.205556  0.015220  0.001032  0.000000  0.009876
0.211111  0.015220  0.001060  0.000000  0.009876
0.216667  0.015220  0.001088  0.000000  0.009876
0.222222  0.015220  0.001116  0.000000  0.009876
0.227778  0.015220  0.001144  0.000000  0.009876
0.233333  0.015220  0.001172  0.000000  0.009876
0.238889  0.015220  0.001200  0.000000  0.009876
0.244444  0.015220  0.001228  0.000000  0.009876
0.250000  0.015220  0.001256  0.000000  0.009876
0.255556  0.015220  0.001284  0.000000  0.009876
0.261111  0.015220  0.001311  0.000000  0.009876
```

```
  0.266667  0.015220  0.001339  0.000000  0.009876
  0.272222  0.015220  0.001367  0.000000  0.009876
  0.277778  0.015220  0.001395  0.000000  0.009876
  0.283333  0.015220  0.001423  0.000000  0.009876
  0.288889  0.015220  0.001451  0.000000  0.009876
  0.294444  0.015220  0.001479  0.000000  0.009876
  0.300000  0.015220  0.001507  0.000000  0.009876
  0.305556  0.015220  0.001535  0.000000  0.009876
  0.311111  0.015220  0.001563  0.000000  0.009876
  0.316667  0.015220  0.001591  0.000000  0.009876
  0.322222  0.015220  0.001618  0.000000  0.009876
  0.327778  0.015220  0.001646  0.000000  0.009876
  0.333333  0.015220  0.001674  0.000000  0.009876
  0.338889  0.015220  0.001702  0.000000  0.009876
  0.344444  0.015220  0.001730  0.000000  0.009876
  0.350000  0.015220  0.001758  0.000000  0.009876
  0.355556  0.015220  0.001786  0.000000  0.009876
  0.361111  0.015220  0.001814  0.000000  0.009876
  0.366667  0.015220  0.001842  0.000000  0.009876
  0.372222  0.015220  0.001870  0.000000  0.009876
  0.377778  0.015220  0.001897  0.000000  0.009876
  0.383333  0.015220  0.001925  0.000000  0.009876
  0.388889  0.015220  0.001953  0.000000  0.009876
  0.394444  0.015220  0.001981  0.000000  0.009876
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  0.405556  0.015220  0.002037  0.000000  0.009876
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  0.422222  0.015220  0.002121  0.000000  0.009876
  0.427778  0.015220  0.002149  0.000000  0.009876
  0.433333  0.015220  0.002177  0.000000  0.009876
  0.438889  0.015220  0.002204  0.000000  0.009876
  0.444444  0.015220  0.002232  0.000000  0.009876
  0.450000  0.015220  0.002260  0.000000  0.009876
  0.455556  0.015220  0.002288  0.000000  0.009876
  0.461111  0.015220  0.002316  0.000000  0.009876
  0.466667  0.015220  0.002344  0.000000  0.009876
  0.472222  0.015220  0.002372  0.000000  0.009876
  0.477778  0.015220  0.002400  0.000000  0.009876
  0.483333  0.015220  0.002428  0.000000  0.009876
  0.488889  0.015220  0.002456  0.000000  0.009876
  0.494444  0.015220  0.002483  0.000000  0.009876
  0.500000  0.015220  0.002511  0.000000  0.009876
  END FTABLE  2
END FTABLES

EXT SOURCES
<-Volume-> <Member> SsysSgap<--Mult-->Tran <-Target vols> <-Grp> <-Member->  ***
<Name>   # <Name> # tem strg<-factor->strg <Name>   #   #        <Name> # #  ***
WDM      2 PREC     ENGL    1              PERLND   1 999 EXTNL  PREC
WDM      2 PREC     ENGL    1              IMPLND   1 999 EXTNL  PREC
WDM      1 EVAP     ENGL    1              PERLND   1 999 EXTNL  PETINP
WDM      1 EVAP     ENGL    1              IMPLND   1 999 EXTNL  PETINP
WDM      1 EVAP     ENGL    1              RCHRES   1     EXTNL  POTEV
WDM      1 EVAP     ENGL    1              RCHRES   2     EXTNL  POTEV

END EXT SOURCES

EXT TARGETS
<-Volume-> <-Grp> <-Member-><--Mult-->Tran <-Volume-> <Member> Tsys Tgap Amd ***
<Name>   #        <Name> # #<-factor->strg <Name>   # <Name>    tem strg strg***
RCHRES   3 HYDR   RO     1 1        1      WDM   1000 FLOW     ENGL      REPL
RCHRES   3 HYDR   O      1 1        1      WDM   1001 FLOW     ENGL      REPL
RCHRES   3 HYDR   O      2 1        1      WDM   1002 FLOW     ENGL      REPL
RCHRES   3 HYDR   STAGE  1 1        1      WDM   1003 STAG     ENGL      REPL
COPY     1 OUTPUT MEAN   1 1     48.4      WDM    701 FLOW     ENGL      REPL
COPY   501 OUTPUT MEAN   1 1     48.4      WDM    801 FLOW     ENGL      REPL
RCHRES   1 HYDR   RO     1 1        1      WDM   1004 FLOW     ENGL      REPL
RCHRES   1 HYDR   O      1 1        1      WDM   1005 FLOW     ENGL      REPL
RCHRES   1 HYDR   O      2 1        1      WDM   1006 FLOW     ENGL      REPL
```

```
RCHRES   1 HYDR   STAGE  1 1        1      WDM   1007 STAG     ENGL      REPL
RCHRES   2 HYDR   RO     1 1        1      WDM   1008 FLOW     ENGL      REPL
RCHRES   2 HYDR   O      1 1        1      WDM   1009 FLOW     ENGL      REPL
RCHRES   2 HYDR   O      2 1        1      WDM   1010 FLOW     ENGL      REPL
RCHRES   2 HYDR   STAGE  1 1        1      WDM   1011 STAG     ENGL      REPL
END EXT TARGETS

MASS-LINK
<Volume>   <-Grp> <-Member-><--Mult-->     <Target>       <-Grp> <-Member->***
<Name>            <Name> # #<-factor->     <Name>                <Name> # #***
  MASS-LINK        5
IMPLND     IWATER SURO       0.083333      RCHRES         INFLOW IVOL
  END MASS-LINK    5

  MASS-LINK       15
IMPLND     IWATER SURO       0.083333      COPY           INPUT  MEAN
  END MASS-LINK   15

  MASS-LINK       17
RCHRES     OFLOW  OVOL   1                 COPY           INPUT  MEAN
  END MASS-LINK   17


END MASS-LINK

END RUN
```

Predeveloped HSPF Message File

Mitigated HSPF Message File

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APPENDIX D

Infiltration Testing Report

Puyallup High School Portables

711, 721 & 701 West Main
Puyallup, WA

Prepared for
Puyallup School District
c/o Studio Meng Strazzara
2001 Western Ave, Suite 200
Seattle, WA 98121
206.587.3797

Prepared by
JMJ TEAM
905 Main St, Suite 200
Sumner, WA 98390
206.596.2020
Justin Jones, PE

April 5, 2024

JMJTEAM

PROJECT ENGINEER'S CERTIFICATION

I hereby certify that this Infiltration Testing Report for Puyallup High School Portables has been prepared by me or under my supervision and meets minimum standards of the Department of Ecology Stormwater Management Manual for Western Washington.

____

Justin Jones, PE

04-05-24

TABLE OF CONTENTS

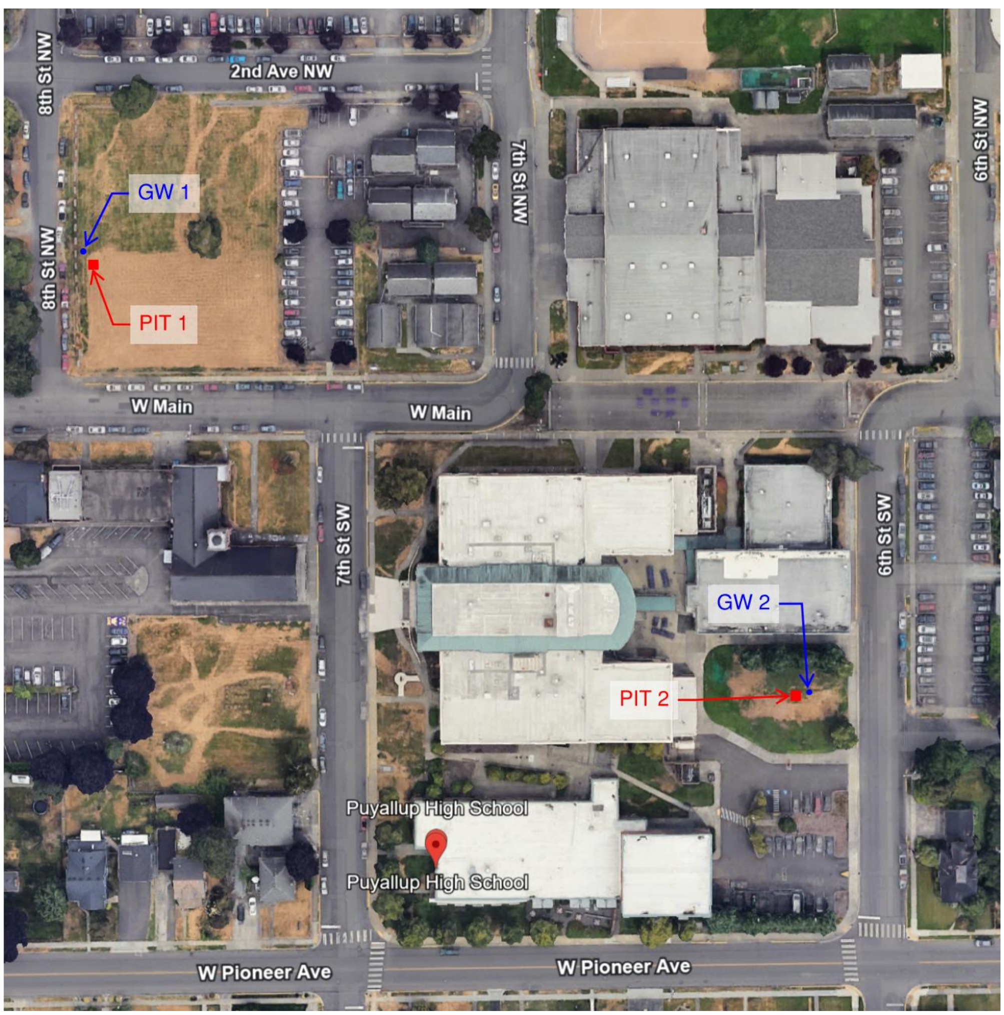
SUMMARY

This report details the results of infiltration testing for use in the stormwater system design of Puyallup High School Portables located within Puyallup, WA. Two (2) Small-Scale Pilot Infiltration Tests (PIT) were conducted on site to determine the onsite stormwater infiltration rate. The test holes were excavated and backfilled by a licensed contractor and the PIT was completed in accordance with the Department of Ecology (ECY) Stormwater Management Manual for Western Washington (Stormwater Manual).

The PIT process evaluates the infiltration within a 12 SF area by first measuring the rate of water required to maintain a constant water elevation of approximately 12-inches in the test pit, and second by measuring the drawdown rate of the water within the test pit. The drawdown is done using a data logger.

The field data is then analyzed, and a factor of safety is applied to determine the stormwater design infiltration rate. Below is a summary of the results.

Test Pit and Ground Water Monitoring Location



Summary of Results

Per the PIT, the site soil is suitable for stormwater infiltration. Soil evaluations were not taken as the designed stormwater BMP is not intended to treat pollution generating surfaces.

Testing	Test PIT	Results	ECY Threshold
Ground Water	Pit Depth	4.0-feet	N/A
	Test Hole 1 Groundwater Level	Ground Water Observed at 4.0'	N/A
	Test Hole 2 Groundwater Level	Ground Water Observed at 3.5' Depth	N/A
Infiltration Rate	Infiltration Rate Factor of Safety	0.45	N/A
	Test Hole 1 Infiltration Rates	Uncorrected: 1.43 inches per hour	≥ 0.3 inches per hour
		Design: 0.64 Inches per hour	
	Test Hole 2 Infiltration Rates	Uncorrected: 4.42 inches per hour	≥ 0.3 inches per hour
		Design: 1.99 inches per hour	
Water Quality	Test Hole 1 Lab Analysis	CEC Value: N/A	≥ 5.0 milliequivalents CEC/100g
		Organic Content: N/A	≥ 1.0%
	Test Hole 2 Lab Analysis	CEC Value: N/A	≥ 5.0 milliequivalents CEC/100g
		Organic Content: N/A	≥ 1.0%

INFILTRATION TEST PROCEDURES

Below is the process taken for the Small-Scale PIT:

- ☐ Identify PIT locations based on the site survey of existing buildings and utilities as well as the potential locations of infiltration facilities based on the preliminary site plan.
- ☐ Obtain public and private utility locates. Prior to the PIT utility locates will be called to ensure there are no utilities present in the PIT locations.
- ☐ Excavation of PIT holes (approximately 3-feet x 4-feet x 2-feet deep). A 3-feet x 4-feet x 2-feet tall wood box is inserted into the test hole to ensure that the bottom surface area is exactly 12 SF. The box is backfilled to the top edge to ensure stability and infiltration only through the bottom of the test hole for the duration of the PIT.
- ☐ A soil sample is collected from the bottom of the hole to test treatment capability. A lab tests the cation exchange rate and organic matter content of soils. Lab results confirm if the soil is suitable for treatment based on Stormwater Manual criteria.
- ☐ A float system with a water hose connection is set into the center of the test hole. The float system is equipped with a leveling plate, a measuring ruler for visual inspection of water levels and a perforated pipe housing for the data collector.
- ☐ Using water transfer tanks or hose spigot as available, the test hole is filled to a 12-inch water depth that is maintained. The presoak period ensures that the soil has been fully saturated before conducting the PIT. A 1-hour stabilization test is performed after the presoak period to confirm soil stabilization. If the test yields 4 constant gallon per minute (GPM) readings that are conducted every 15-minutes, the stabilization of the soil is confirmed.
- ☐ A 1-hour GPM test is conducted per the Stormwater Manual. Using a water meter accurate to the nearest tenth of a gallon, a GPM flow rate is recorded every 15-minutes while the water level is maintained at a 12-inch depth. An infiltration rate (in/hr) can be determined using the GPM flow rate and the 12 SF bottom surface area of the hole.
- ☐ A drawdown test is performed per Stormwater Manual to determine the drawdown infiltration capability of the soil. A CRS451V (Pressure Transducer) is placed into the test hole and set to take pressure (PSI) readings every 10-minutes. The water source is shut off, and the pressure transducer will measure water drawdown for a 2-hour period. At the end of the period the sensors are removed from the test hole, the data is collected using a PC interface module and the HydroSci program to communicate with the sensor to retrieve the data.
- ☐ The wood box and the float system are removed from the test hole.
- ☐ The test hole is then over excavated to confirm there is no ground water mounding.
- ☐ The test pit then gets backfilled and restored to prior state of excavation.

FINDINGS AND RECOMMENDATIONS

Groundwater Conditions

The Stormwater Manual specifies minimum separations between the seasonal high groundwater elevation and the bottom of the infiltration facility based on different best management practices (BMP):

- **Downspout Infiltration:** 1-foot
- **Permeable Pavement:** 1-foot
- **Infiltration Gallery:** 1-foot
- **Bioretention:** 3-foot

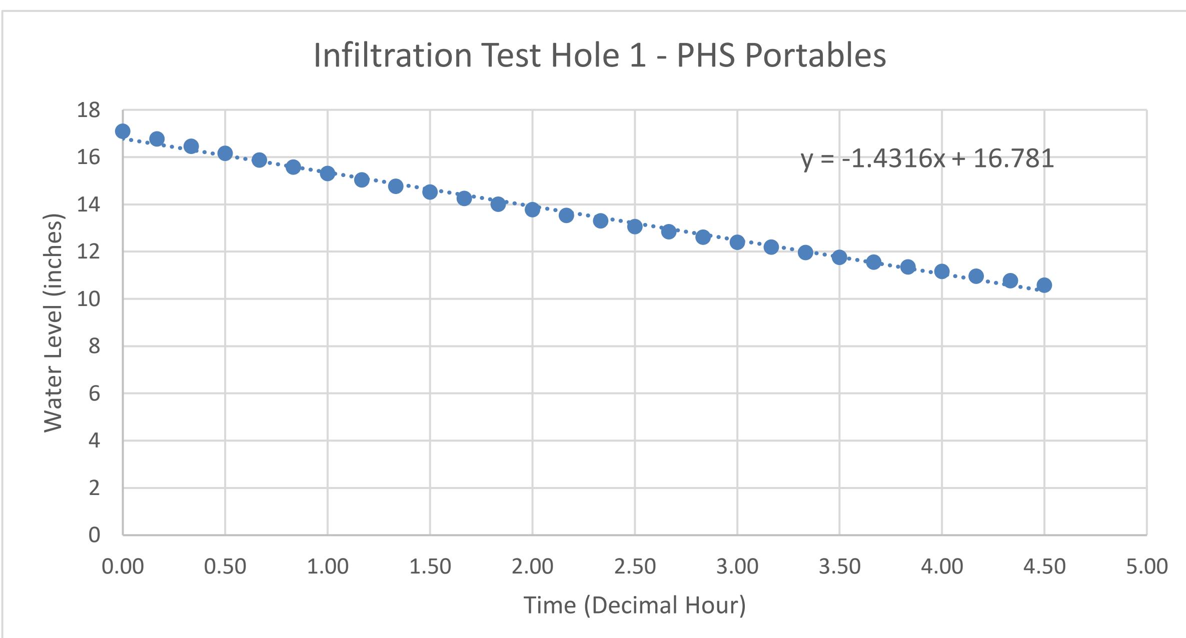
Groundwater was monitored throughout the wet season. The known seasonal high groundwater level for Test Hole-1 was determined to be 4.0' below the existing grade of 42.1'. The known seasonal high groundwater level for Test Hole-2 was determined to be 3.55' below the existing grade of 41.6'. With known groundwater conditions for each test hole, there is adequate spacing between groundwater and BMPs. An overflow should be installed with BMP in case of large storm events.

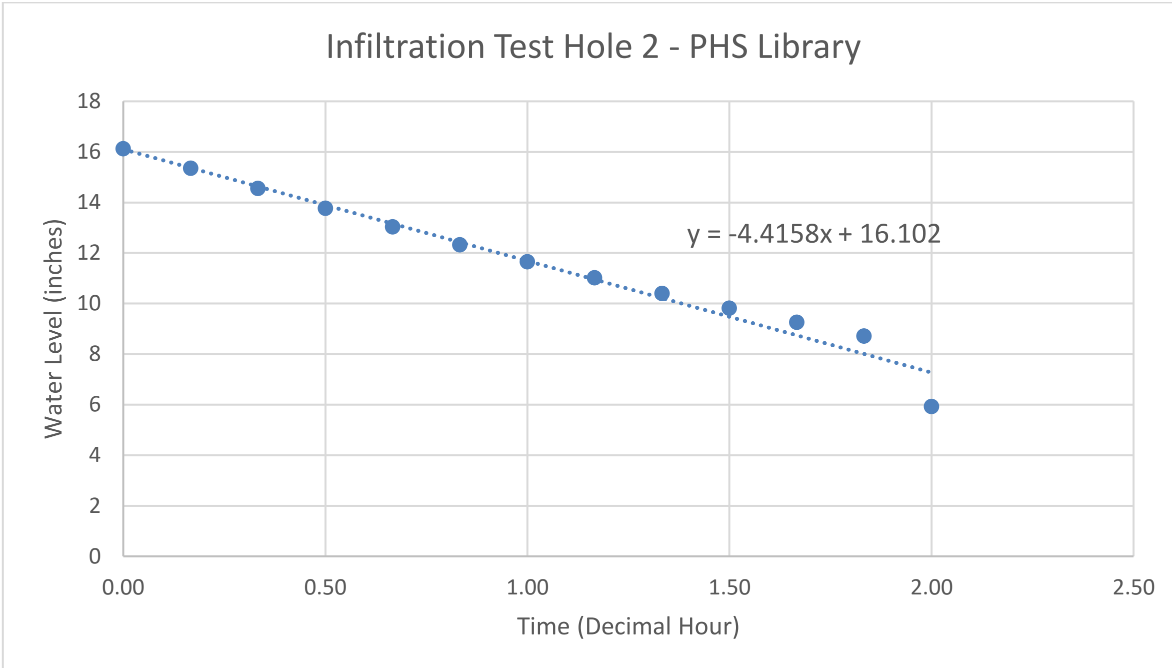
Field Measured Infiltration Rate

The infiltration rate was collected using two methods during the PIT. The first method is to measure the gallons per minute flow rate required to maintain a constant water level in the test pit. The average of the flow rate measurements taken over an hour timeframe.

The second method is to measure the drawdown rate of the test pit. Measurements were taken both visually and with a data logger. The average of the drawdown measurements resulted in the following infiltration rates:

- Test Hole 1: 1.43 inches per hour
- Test Hole 2: 4.42 inches per hour





Design Infiltration Rate

Per the Stormwater Manual a minimum design infiltration rate of 0.3 inches per hour is required for onsite infiltration. The design infiltration rate takes the field measured infiltration rate and applies a factor of safety based on three correction factors. The three corrections are based on site variability, test method, and degree of influent control (See Appendix D).

Issue	Partial Correction Factor
Site variability and number of locations tested	CF_v = 0.33 to 1.0
Test Method	
• Large-scale PIT • Small-scale PIT • Other small-scale (e.g. Double ring, falling head) • Grain Size Method	CF_t = 0.75 = 0.50 = 0.40 = 0.40
Degree of influent control to prevent siltation and bio-buildup	CF_m = 0.9

Total Correction Factor, $CF_T = CF_v \times CF_t \times CF_m$

Per the Stormwater Manual, a site variability correction of 1 is used. A correction of 0.5 for the small-scale PIT and 0.9 for the degree of influent are also used. A total correction factor of 0.45 is applied to the measured infiltration rate yielding a recommended design infiltration rates as follows:

- Test Hole 1: 0.64 inches per hour
- Test Hole 2: 1.99 inches per hour

Treatment Suitability

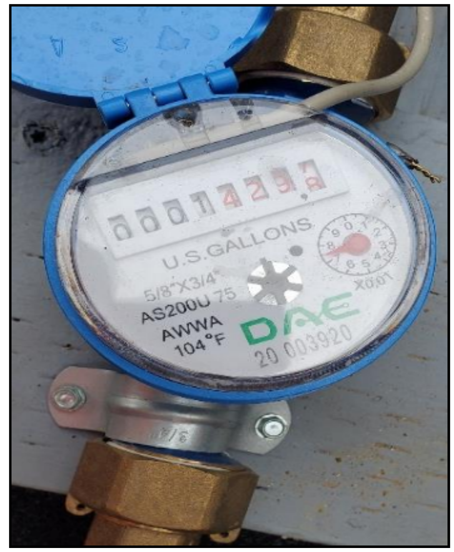
Per the Stormwater Manual the soils that stormwater is infiltrated into may be used for treatment of pollution generating surfaces if the soil meets specific requirements. Otherwise, a treatment layer is required to treat pollution generating surfaces. The treatment threshold of the infiltrated soil per the Stormwater Manual is a Cation Exchange Capacity greater than or equal to 5 milliequivalents CEC/100g and a minimum of 1.0% organic content.

This project does not propose to manage pollution generating hard surfaces runoff through an infiltration facility; therefore, soil treatment suitability was not evaluated.

TEST PIT PHOTO DOCUMENTATION – TEST HOLE 1

3-feet x 4-feet x 2-feet PIT

Pre-Soak PIT



1-Hour GPM Test

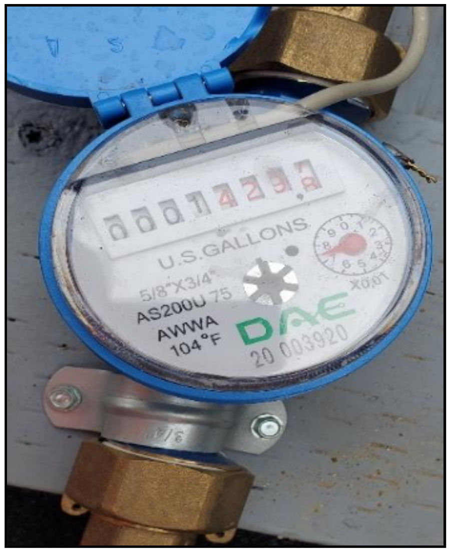
Completed Drawdown

Overexcavate to Verify
Groundwater Mounding

Backfill and Install
Groundwater Monitoring

TEST PIT PHOTO DOCUMENTATION – TEST HOLE 2

3-feet x 4-feet x 2-feet PIT
and Pre-Soak



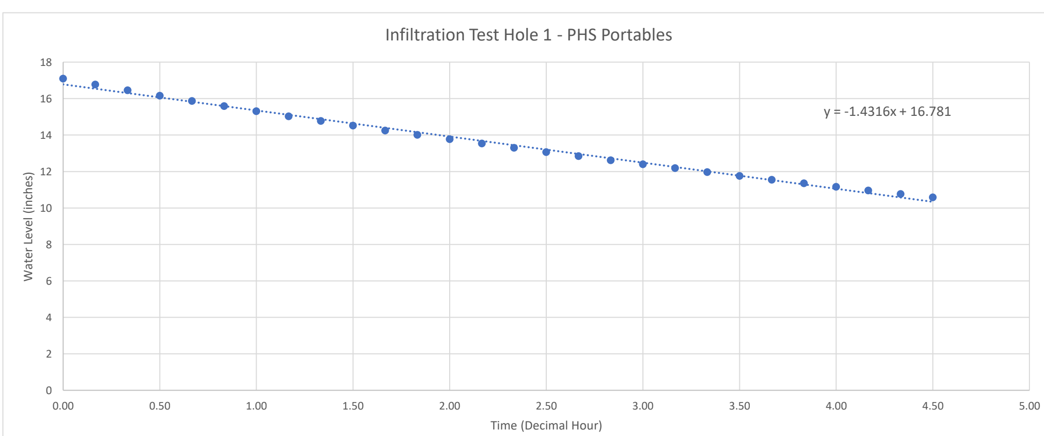
1-Hour GPM Test

Overexcavate to Verify
Groundwater Mounding

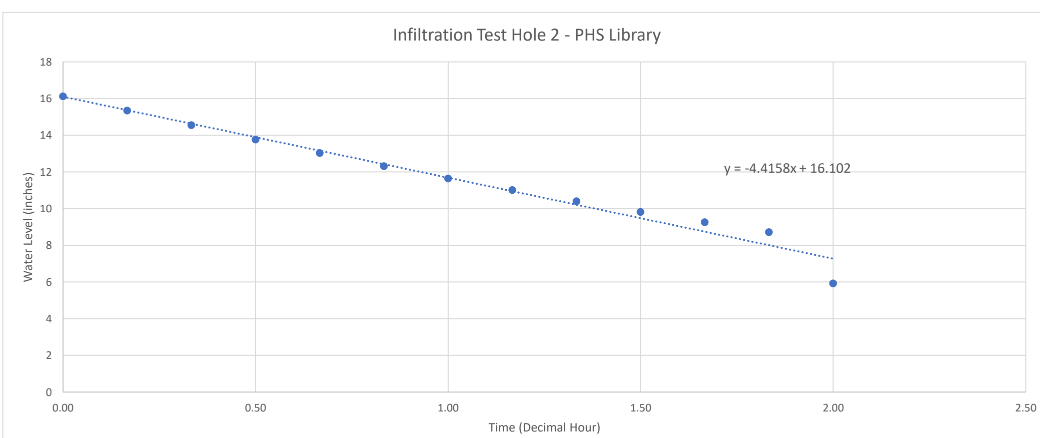
Backfill and Install
Groundwater Monitoring

APPENDIX A

Project Location:	PHS Portables			3506 Initial Meter Reading				
Date of Test:		2/10/2024	Test start					
Test Pit Dimensions:		Width (feet)	3	Length (feet)	4	Depth (inches)	24	
Presoak:	12:00PM Start Pre soak	4hrs at 12-inch water column						
Weather Conditions:	Clear	50° F						
Infiltration Test:								
		Water Column Maintained (inches):	12					
		Gallons Per Inch:	7.48					
		Time(Minutes)	**Volume (gallons)**	**Flow Rate (GPM)**			**Flow (Gallons)**	**Infiltration Rate (in/hr)**
				Meter Start	Meter End	Flow (Gallons)		
4:05 PM Start		0		3581.9	3582.1	0.2	0.2	
		15		3584.7	3584.9	0.3	3.1	
		30		3587.9	3588.2	0.3	6.3	
		45		3591.0	3591.3	0.3	9.4	
		60		3594.2	3594.8	0.6	12.9	**1.7**
Drawdown Test (Sensor):								
Sensor Name:		JMJ 01 (**CRS451V Sensors from Campbell Scientic**)						
Time (Decimal Hours)	**Record Measurement Interval**	**Time Stamp**	**Record #**	**Reading (PSI)**	**Level (in)**			
0.0000	0	4:05 PM	0	0.61668	17.0943696			
0.1667	10	4:15 PM	1	0.605066	16.77242952			
0.3333	20	4:25 PM	2	0.593788	16.45980336			
0.5000	30	4:35 PM	3	0.582971	16.15995612			
0.6667	40	4:45 PM	4	0.572547	15.87100284			
0.8333	50	4:55 PM	5	0.562265	15.5859858			
1.0000	60	5:05 PM	6	0.552374	15.31180728			
1.1667	70	5:15 PM	7	0.542279	15.03197388			
1.3333	80	5:25 PM	8	0.532924	14.77265328			
1.5000	90	5:35 PM	9	0.52373	14.5177956			
1.6667	100	5:45 PM	10	0.514174	14.25290328			
1.8333	110	5:55 PM	11	0.505343	14.00810796			
2.0000	120	6:05 PM	12	0.497038	13.77789336			
2.1667	130	6:15 PM	13	0.488469	13.54036068			
2.3333	140	6:25 PM	14	0.479748	13.29861456			
2.5000	150	6:35 PM	15	0.471365	13.0662378			
2.6667	160	6:45 PM	16	0.463378	12.84483816			
2.8333	170	6:55 PM	17	0.455239	12.61922508			
3.0000	180	7:05 PM	18	0.447283	12.39868476			
3.1667	190	7:15 PM	19	0.439696	12.18837312			
3.3333	200	7:25 PM	20	0.431804	11.96960688			
3.5000	210	7:35 PM	21	0.424222	11.75943384			
3.6667	220	7:45 PM	22	0.416743	11.55211596			
3.8333	230	7:55 PM	23	0.409753	11.35835316			
4.0000	240	8:05 PM	24	0.4027	11.162844			
4.1667	250	8:15 PM	25	0.395456	10.96204032			
4.3333	260	8:25 PM	26	0.388569	10.77113268			
4.5000	270	8:35 PM	27	0.381685	10.5803082			
						Average Infiltration Rate:	**1.43**	
						Factor of Safety:	**0.45**	
						Design Infiltration Rate:	**0.64**	



Project Location:	PHS Library			4502 Initial Meter Reading					
Date of Test:		2/10/2024	Test start						
Test Pit Dimensions:		Width (feet)	3	Length (feet)	4	Depth (inches)	24		
Presoak:	12:00PM Start Pre soak	4hrs at 12-inch water column							
Weather Conditions:	Clear	50° F							
Infiltration Test:									
		Water Column Maintained (inches):	12						
		Gallons Per Inch:	7.48						
		Time(Minutes)	**Volume (gallons)**	**Flow Rate (GPM)**				**Flow (Gallons)**	**Infiltration Rate (in/hr)**
				Meter Start	Meter End	Flow (Gallons)			
4:15 PM Start		0		4702.0	4702.8	0.8	0.8		
		15		4711.5	4712.2	0.7	10.2		
		30		4721.7	4722.4	0.7	20.4		
		45		4732.2	4732.9	0.7	30.9		
		60		4742.9	4743.7	0.8	41.6	**5.6**	
Drawdown Test (Sensor):									
Sensor Name:		JMJ 02 (**CRS451V Sensors from Campbell Scientic**)							
Time (Decimal Hours)	**Record Measurement Interval**	**Time Stamp**	**Record #**	**Reading (PSI)**	**Level (in)**				
0.0000	0	4:05 PM	0	0.5816216	16.12255075				
0.1667	10	4:15 PM	1	0.5537774	15.35070953				
0.3333	20	4:25 PM	2	0.5248642	14.54923562				
0.5000	30	4:35 PM	3	0.4966844	13.76809157				
0.6667	40	4:45 PM	4	0.4701035	13.03126902				
0.8333	50	4:55 PM	5	0.4443737	12.31803896				
1.0000	60	5:05 PM	6	0.4201141	11.64556285				
1.1667	70	5:15 PM	7	0.3973055	11.01330846				
1.3333	80	5:25 PM	8	0.3752191	10.40107345				
1.5000	90	5:35 PM	9	0.3541772	9.817791984				
1.6667	100	5:45 PM	10	0.334096	9.26114112				
1.8333	110	5:55 PM	11	0.3144749	8.717244228				
2.0000	120	6:05 PM	12	0.2135902	5.920720344				
						Average Infiltration Rate:	**4.42**		
						Factor of Safety:	**0.45**		
						Design Infiltration Rate:	**1.99**		



Puyallup School District
PHS Portables
Ground Water Monitoring Log

#	Location	Date	Groud Water Depth (Ft)
1	#1 - PHS Proposed Portable	1/12/2024	4.5'
2	#1 - PHS Proposed Portable	1/26/2024	4.3'
3	#1 - PHS Proposed Portable	2/10/2024	4.2'
4	#1 - PHS Proposed Portable	2/16/2024	4.0'
5	#1 - PHS Proposed Portable	3/1/2024	4.3'
6	#1 - PHS Proposed Portable	3/14/2024	4.0'
7	#1 - PHS Proposed Portable	3/25/2024	4.8'
8	#1 - PHS Proposed Portable	4/5/2024	5.1'
1	#2 - PHS Library	1/12/2024	4.3'
2	#2 - PHS Library	1/26/2024	4.1'
3	#2 - PHS Library	2/10/2024	3.6'
4	#2 - PHS Library	2/16/2024	3.5'
5	#2 - PHS Library	3/1/2024	3.8'
6	#2 - PHS Library	3/14/2024	3.7'
7	#2 - PHS Library	3/25/2024	4.0'
8	#2 - PHS Library	4/5/2024	3.8'

APPENDIX B

PRODUCT

CRS451V

Stainless-Steel Vented Stand-Alone Pressure Transducer

Pressure Transducer Combined with a Recorder

High resolution and accuracy

Overview

The CRS451V consists of a submersible water-level and water-temperature sensor with its own time clock and memory to store the collected data—in a compact stainless-steel case. This data logging capability frees users to place the sensor in remote sites and let it collect data for long periods. HydroSci software is included and elegantly supports test setup, data retrieval, and data display. Long battery life and rugged construction mean you can trust the CRS451V to collect important data. Low cost and ease of use make it a good choice in a variety of applications. The CRS456V is the same as this, but with a titanium case.

Benefits and Features

- Sensors and data-collection features in one instrument case
- Rugged stainless-steel case protects piezoresistive sensor
- Quality construction ensures product reliability
- Fully temperature-compensated
- Fast scan rate
- Large data-storage capacity
- Long battery life
- Easy-to-use software

Detailed Description

The CRS451V has several pressure range options.

HydroSci software is available for download. This software simplifies the process of configuring the CRS451V. Users can configure the CRS451V to monitor surface water, ground water, or a standard pump test.

HydroSci software will display the data in tabular or graphical formats.

Specifications

Venting	Vented	Measurement Time	< 1.0 s

APPENDIX C

INFILTRATION TEST

The Washington State Department of Ecology Stormwater Manual provides testing procedures and best practices, which are described below.

- Testing should occur between December 1 and April 1.
- The horizontal and vertical locations of the PIT shall be surveyed by a licensed land surveyor and accurately shown on the design drawings.
- Excavate the test pit to the estimated elevation of the proposed infiltration into the native soil. Note that for some proposed BMPs, such as and BMP T5.15: Per- meable Pavements, this will be below the proposed finished grade. If the native soils will have to meet a minimum subgrade compaction requirement (for example, the road subgrade if using BMP T5.15: Permeable Pavements), compact the native soil to that requirement prior to testing. Lay back the slopes sufficiently to avoid caving and erosion during the test. Altern- atively, consider shoring the sides of the test pit.
- The horizontal surface area of the bottom of the test pit should be approximately 100 square feet. Document the size and geometry of the test pit.
- Install a vertical measuring rod (long enough to measure the ponded water depth, minimum 5- ft. long) marked in half-inch increments in the center of the pit bottom.
- Use a rigid 6-inch diameter pipe with a splash plate on the bottom to convey water to the test pit and reduce side-wall erosion or excessive disturbance of the test pit bottom. Excessive erosion and bottom disturbance will result in clogging of the infiltration receptor and yield lower than actual infiltration rates.
- Add water to the pit at a rate that will maintain a water level between 6 and 12 inches above the bottom of the pit. A rotameter can be used to measure the flow rate into the pit.

The depth should not exceed the proposed maximum depth of water expected in the completed BMP. For infiltration BMPs serving large drainage areas, designs with multiple feet of standing water can have infiltration tests with greater than 1 foot of standing water.

- Every 15-30 min, record the cumulative volume and instantaneous flow rate in gallons per minute necessary to maintain the water level at the same point on the measuring rod.
- Keep adding water to the pit until one hour after the flow rate into the pit has stabilized (constant flow rate; a goal of 5% or less variation in the total flow) while maintaining the same pond water level. The total of the pre-soak time plus one hour after the flow rate has stabilized should be no less than 6 hours.
- After the flow rate has stabilized for at least one hour, turn off the water and record the rate of infiltration (the drop rate of the standing water) in inches per hour from the measuring rod data, until the pit is empty. Consider running this falling head phase of the test several times to estimate the dependency of the infiltration rate with head.
- At the conclusion of testing, over-excavate the pit to see if the test water is mounded on shallow restrictive layers or if it has continued to flow deep into the subsurface. The depth of excavation varies depending on soil type and depth to the hydraulic restricting layer, and is determined by the

engineer or certified soils professional. Mounding is an indication that a mounding analysis is necessary.

DATA ANALYSIS

Calculate and record the initial K_{sat} rate in inches per hour in 30 minutes or one-hour increments until one hour after the flow has stabilized.

Use statistical/trend analysis to obtain the hourly flow rate when the flow stabilizes. This would be the lowest hourly flow rate. *Example:*

The area of the bottom of the test pit is 8.5-ft. by 11.5-ft. (97.75 sq. ft.).

Water flow rate was measured and recorded at intervals ranging from 15 to 30 minutes throughout the test. Between 400 minutes and 1,000 minutes the flow rate stabilized between 10 and 12.5 gal- lons per minute or 600 to 750 gallons per hour, or 80.2 to 100 ft^3 per hour. Dividing this rate by the surface area gives an initial K_{sat} of 9.8 to 12.3 inches per hour.

K_{sat} Determination Option 2: Small Scale Pilot Infiltration Test (PIT)

A small-scale PIT can be substituted for Ksat Determination Option 1: Large Scale Pilot Infiltration Test (PIT) in any of the following instances:

- The drainage area to the infiltration BMP is less than 1 acre.
- The testing is for BMP T7.30: Bioretention or BMP T5.15: Permeable Pavements that either serve small drainage areas and/or are widely dispersed throughout a project site.
- The site has a high infiltration rate (>4 in/hr), making a large scale PIT difficult, and the site geo- technical investigation suggests uniform subsurface characteristics.

INFILTRATION TEST

Use the same procedures described above in Ksat Determination Option 1: Large Scale Pilot Infiltra-tion Test (PIT), with the following changes:

- The horizontal surface area of the bottom of the test pit should be 12 to 32 square feet. It may be circular or rectangular. Document the size and geometry of the test pit.
- The rigid pipe with a splash plate used to convey water to the pit may be a 3-inch diameter pipe for pits on the smaller end of the recommended surface area, or a 4-inch pipe for pits on the larger end of the recommended surface area.
- Pre-soak period: Add water to the pit so that there is standing water for at least 6 hours. Maintain the pre-soak water level at least 12 inches above the bottom of the pit.
- At the end of the pre-soak period, add water to the pit at a rate that will maintain a 6-12 inch water level above the bottom of the pit over a full hour. The depth should not exceed the pro- posed

maximum depth of water expected in the completed facility.

- Every 15 minutes, record the cumulative volume and instantaneous flow rate in gallons per minute necessary to maintain the water level at the same point (between 6 inches and 1 foot) on the measuring rod. The specific depth should be the same as the maximum designed pond- ing depth (usually 6 – 12 inches).

After one hour, turn off the water and record the rate of infiltration (the drop rate of the standing water) in inches per hour from the measuring rod data, until the pit is empty.

- A self-logging pressure sensor may also be used to determine water depth and drain-down.
- At the conclusion of testing, over-excavate the pit to see if the test water is mounded on shallow restrictive layers or if it has continued to flow deep into the subsurface. The depth of excavation varies depending on soil type and depth to the hydraulic restricting layer, and is determined by the engineer or certified soils professional. The soils professional should judge whether a mounding analysis is necessary.

APPENDIX D

CALCULATED DESIGN INFILTRATION RATE:

Site variability and number of locations tested (CF_v) - The number of locations tested must be capable of producing a picture of the subsurface conditions that fully rep- resents the conditions throughout the proposed location of the infiltration BMP. The partial correction factor used for this issue depends on the level of uncertainty that adverse subsurface conditions may occur. If the range of uncertainty is low - for example, conditions are known to be uniform through previous exploration and site geological factors

- one pilot infiltration test (or grain size analysis location) may be adequate to justify a partial correction factor at the high end of the range.

If the level of uncertainty is high, a partial correction factor near the low end of the range may be appropriate. This might be the case where the site conditions are highly variable due to conditions such as a deposit of ancient landslide debris, or buried stream channels. In these cases, even with many explorations and several pilot infiltration tests (or several grain size test locations), the level of uncertainty may still be high.

A partial correction factor near the low end of the range could be assigned where conditions have a more typical variability, but few explorations and only one pilot infiltration test (or one grain size analysis location) is conducted. That is, the number of explorations and tests conducted do not match the degree of site variability anticipated.

- **Uncertainty of test method (CF_t)** accounts for uncertainties in the testing methods. For the full scale PIT method, CF_t = 0.75; for the small-scale PIT method, CF_t = 0.50; for smaller-scale infiltration tests such as the double-ring infiltrometer test, CF_t = 0.40; for grain size analysis, CF_t = 0.40. These values are intended to represent the difference in each test's ability to estimate the actual saturated hydraulic conductivity. The assumption is the larger the scale of the test, the more reliable the result.
- **Degree of influent control to prevent siltation and bio-buildup (CF_m)** Even with a pre-settling basin or a basic treatment BMP for pre-treatment, the soil's initial infiltration rate will gradually decline as more and more stormwater, with some amount of suspended material, passes through the soil profile. The maintenance schedule calls for removing sediment when the BMP is infiltrating at only 90% of its design capacity. Therefore, a correction factor, CF_m, of 0.9 is called for.

Table V-5.1: Correction Factors to be Used With In-Situ Saturated Hydraulic Conductivity Measurements to Estimate Design Rates

Issue	Partial Correction Factor
Site variability and number of locations tested	CF_v = 0.33 to 1.0
Test Method	
• Large-scale PIT • Small-scale PIT • Other small-scale (e.g. Double ring, falling head) • Grain Size Method	CF_t = 0.75 = 0.50 = 0.40 = 0.40
Degree of influent control to prevent siltation and bio-buildup	CF_m = 0.9

Total Correction Factor, $CF_T = CF_v \times CF_t \times CF_m$

Total Correction Factor, $CF_T = 1.0 \times 0.5 \times 0.9$

$$CF_T = 0.45$$