RECEIVED
12/19/2025
CITY OF MONROE

Park Place Townhomes

Preliminary Drainage Report

Presented to: City of Monroe

Park Place Townhomes

Preliminary Drainage Report

Prepared for

Horizon View Holdings, Inc.

Contact: Daniel Wick

6443 NE 181st St, Suite C

Kenmore, WA 98028

(206) 900-2626

Prepared by

Noah Friedman

Approved by

Cooper Danby, PE

December 2025 ***Job No: 25-0077***

Table of Contents

Appendices

Figures

SECTION 1: PROJECT OVERVIEW

The proposed Park Place Townhomes project is an approximately 2.78-acre site. The proposed project is a single-family residential townhome development on two parcel's located on parcels #27061100100100, #27060200408500, and addressed at 16311 177th Ave SE, Monroe WA 98272. The project proposes to construct 55 townhome units and site amenities. Road A and B is proposed to serve all lots onsite right-of-way. Standard access drives along with associated private and public utilities are proposed to serve project development. Frontage improvements along 177th Ave SE consisting of sidewalk improvements to City standards are proposed. See the Vicinity Map in Appendix 1 for visual representation of the subject property.

Existing Site

The parcel #27061100100100 and #27060200408500 are currently two occupied commercial mixed use general lots with driveway access on the north and south end of the lots onto 177th Ave SE, the southern lot contains main dwelling and accessory buildings on the property. Existing ground cover is a combination of a dirt and gravel parking lot.

The proposed development will exist within the bounds of a single stormwater threshold discharge basin as all site runoff from developed surfaces meets within ¼ mile from the project site downstream. A Critical Areas Report was prepared by Wetland Resources, Inc. (WRI) dated October 21, 2025. No wetlands were found to be on the site. A wetland and Type F Water were identified to be located south of the project site. A buffer extends onto the southern edge of the site from this wetland, and no construction is proposed within that buffer.

A Geotechnical Report has been prepared by Nelson Geotechnical Associates, Inc. dated September, 2025 on the site. Please reference the geotechnical report for detailed soils information. They did not observe any indication of landslide hazards on the project site. Site grades are largely flat with a man-made berm located along the property's southern edge. Site soils were found to be conducive to infiltration with rates of 7.3 in/hr, which is planned for this project.

Proposed Development

The proposed single-family residential townhome project will construct 55 single family townhome lots and site amenities. Standard access drives along with associated private and public utilities are proposed to serve project development. Frontage improvements consisting of full frontage improvements along 177th Ave SE are proposed.

Proposed Drainage System

This project is designed to comply with the 2019 Department of Ecology Stormwater Manual for Western Washington (2019 DOE SWMWW) as well as the City of Monroe and Surface Water Engineering Standards (SWES). Stormwater will be infiltrated on site via two proposed infiltration galleries to be located in the middle and southwestern parts of the development.

Prior to infiltration, a StormFilter water quality treatment unit will be used to treat stormwater runoff to water quality treatment requirements. Onsite development including frontage improvements will disturb 2.82 AC that will be fully infiltrated by the infiltration galleries onsite. This area is considered to be within the Onsite Basin for stormwater modeling.

Proposed new pollution generating impervious surfaces (PGIS) will exceed the 5,000 SF threshold and thus basic water quality treatment will be provided via a water quality treatment structure that treats stormwater runoff prior to infiltration. StormFilter water quality treatment units are proposed for this purpose. See Section 4.0 for additional discussion regarding proposed stormwater management and water quality treatment measures.

Erosion/Sedimentation Control

Erosion control measures that will be utilized during construction will include a combination of silt fence, storm drain inlet protection, interceptor swales, and sediment ponds. See Section 2.0 for discussion of how SWPP Elements are addressed.

Minimum Requirements

Per the 2019 DOE Manual, Minimum Requirements 1-9 apply to the proposed development.

Minimum Requirement #1: Preparation of Stormwater Site Plans

This report along with the construction plans satisfies the minimum requirement.

Minimum Requirement #2: Construction Stormwater Pollution Prevention
See Section 2 of this Report for the SWPPP BMP Elements, and the SWPP (submitted as a separate document) for a complete discussion of erosion control BMP's and their use specific to the site.

Minimum Requirement #3: Source of Pollution
Permanent source control BMPs are not applicable for the subject site since the associated activities for the new residence do not fall within the types of facilities listed within Volume IV of the DOE Manual (Residential developments are not required to implement source control BMP's). BMPs for erosion and sedimentation control will be specified in the Construction Plans and the CSWPP.

Minimum Requirement #4: Preservation of Natural Drainage Systems and Outfalls
Flow from the site will preserve its natural drainage pattern to a large offsite wetland complex to the southeast. The wetland is a former side channel of the Skykomish River, which it is tributary to.

Minimum Requirement #5: On-Site Stormwater Management
The project proposes BMP T5.13 soils to be underlain within all pervious areas that are disturbed by development. Site soils were found to be conducive to infiltration, which is proposed for this site. Please see Section 4.5 for additional discussion of Onsite Stormwater Management and Low Impact Development BMP feasibility.

Minimum Requirement #6: Runoff Treatment
As the project will exceed the 5,000 SF threshold of new/replaced PGIS, the project is required to provide basic water quality treatment. StormFilter water quality treatment units will be installed upstream of the infiltration galleries to meet this requirement.

Minimum Requirement #7: Flow Control
The project will exceed the 10,000 SF new/replaced impervious threshold and is required to provide flow control. Two infiltration galleries, placed in the western edge and the southwest corner of the site are proposed for this purpose. All developed site areas will fully infiltrate 100%. Please see Section 4.0 for additional flow control modeling and parameters for infiltration sizing.

Minimum Requirement #8: Wetlands Protection
No wetland areas on site. A critical area was identified south of the site, with a buffer encroaching onto the site. No development will occur within the delineated wetland buffer. Hydroperiod analysis was not deemed necessary per the critical areas study.

Minimum Requirement #9: Operation and Maintenance
See Operations and Maintenance in Section 6 of this report.

SECTION 2: TEMPORARY EROSION AND SEDIMENT CONTROL DESIGN

SWPPP Design Elements

A Construction Stormwater Pollution Prevention Plan (SWPPP) will be provided prior to construction. Construction SWPPP Elements #1 through #13 are addressed below.

Element #1 – Mark Clearing Limits

All clearing limits will be delineated with high visibility plastic fence and/or silt fence. See sheets ER-01 of the construction plans for locations and details.

Element #2 – Establish Construction Access

Stabilized construction accesses will be installed as shown on the preliminary plans. See sheets ER-01 and ER-02 of the construction plans for locations and details.

Element #3 – Control Flow Rates

Detention of construction period runoff will be provided by means of sediment ponds on the site. See sheets ER-01 of the construction plans for location and details for flow and sediment control BMP's.

Element #4 – Install Sediment Controls

Silt fence, catch basin protection, and the temporary sediment pond will be utilized to contain sediments within the project's clearing limits. See sheets ER-01 and ER-02 of the construction plans for locations and details.

Element #5 – Stabilize Soils

Exposed soils will be stabilized as specified in the Grading and Erosion Control Notes with temporary and permanent seeding, mulching, and plastic covering. See sheet ER-02 of the construction plans for notes.

Element #6 – Protect Slopes

Slopes are steep on the subject site. Slopes shall be protected as specified under Element #5.

Element #7 – Protect Drain Inlets

Storm drain inlet protection will be utilized to contain sediments within the project's clearing limits. See sheets ER-01 and ER-02 of the construction plans for locations and details.

Element #8 – Stabilize Channels and Outlets

Temporary channels shall be stabilized with check dams. See sheets ER-01 and ER-02 of the construction plans for locations and details.

Element #9 – Control Pollutants

Pollutants shall be controlled as specified in Volume IV of the 2019 DOE Manual—Source Control BMPs to address potential sources of pollution which may exacerbate possible soil/groundwater contamination identified onsite.

Element #10 – Control De-Watering

There will be no de-watering as a part of this project. See sheet ER-02 of the construction plans for notes.

Element #11 – Maintain BMPs

Maintenance of the BMPs is specified within the Construction Sequence and Grading and Erosion Control Notes. See sheets ER-01 and ER-02 of the construction plans for the Construction Sequence and notes.

Element #12: Manage the Project

The Grading and Erosion Control Notes specify seasonal work limitations. Maintenance of the BMPs is specified within the Construction Sequence and Grading and Erosion Control Notes. See sheets ER-01 and ER-02 of the construction plans for the Construction Sequence and notes.

Element #13: Protect on-site stormwater management BMPs

On-site stormwater management BMPs used for runoff from roofs and other hard surfaces are unnecessary as infiltration is proposed.

SECTION 3: DOWNSTREAM ANALYSIS

Task 1. Study Area Definition and Maps

Snohomish County Bare Earth LiDAR, survey, and 2022 aerial photography were the best topographical references available for the area containing the site. The limits of the downstream analysis extend roughly 0.25 miles beyond the subject property's natural discharge location.

Task 2. Resource Review

All of the resources below have been reviewed for existing and potential issues near the project site:

Adopted Basin Plans
No Adopted Basin Plans were located that include the project site.

Drainage Basin
This site is in the Snohomish basin, within the Lower Mainstem Skykomish subbasin, within the Skykomish watershed. No discharge will be added from the proposed development as all flows from the site will be infiltrated onsite.

Floodplain / Floodway (FEMA) maps
Per FEMA Floodplain map #53061C1376G the subject property is not within a floodplain.

Critical Areas Map
There are no critical areas or wetlands onsite.

Drainage Complaints
No relevant issues were identified near the proposed site.

Road Drainage Problems
No issues were identified near the proposed site.

Soil Survey
Site soils are classified as Sultan Silt Loam (0 to 2 percent slopes) which is classified as Hydrologic Soil Group C.

Wetland Inventory Maps
No wetlands on site.

Migrating River Studies
Migrating River Studies are not considered applicable to the proposed development.

Section 303d List of Polluted Waters
Washington State Department of Ecology's Water Quality Assessment for Washington does not contain a listing for any water source within 0.25 miles from the project site.

Water Quality Problems
No category 5 listings for unnamed stream.

Stormwater Compliance Plans
Not applicable to the proposed project.

Task 3. Field Inspection/Downstream Analysis
On September 11th, 2025, a Downstream Analysis was performed at the site. The weather consisted of 55ºF, and cloudy skies. The following observations were verified during the visit.

The subject property areas consist primarily of flat slopes covered in vegetation, grass, gravel and an existing commercial building.

One flow path has been identified leaving the southwest corner of the project site. Water sheet flows off site to existing catch basins along 177th Ave SE (Image 1 and 2). Flows are then conveyed south along 177th Ave SE (Image 3 and 4). Existing storm structures carry flows and then turn east and outfall into the creek along 177th Ave SE a tributary to the Skykomish River downstream (Image 5 and 6) past the ¼ mile boundary of this analysis. See Figure 3.0, "Downstream Analysis Map" in Appendix 3 for a visual representation of current discharge.

Task 4. Drainage System Description and Problem Descriptions
Based on the information available and all the resources available including visual inspection of the downstream flow path to the ¼-mile boundary, the outfall structure of the drainage network located within 177th Ave SE is prone to backwater when the Skykomish River water level rises significantly. This is due to the relatively low elevation of the roadway in comparison to the drainage system outfall. This project will not add any additional flows to this drainage system as all flows are to be infiltrated on site.

Task 5. Mitigation of Existing or Potential Drainage Problems
The issue of the 177th Ave SE drainage infrastructure backwatering doesn't require mitigation as the proposed project will infiltrate site runoff within native soil onsite. As such, surface flows from the site entering the public drainage system can be discounted, lessening the burden on the existing infrastructure.

SECTION 4: DETENTION AND WATER QUALITY TREATMENT DESIGN

4.1 Predeveloped Site Hydrology

The pre-developed and developed conditions were modeled in WWHM for the purpose of peak flow determination for direct discharge. Based on the site location, the WWHM used the Everett Gage with a Precipitation Scale factor of 1.200. The site has been divided into Basin A and Basin B for infiltration sizing purposes, though the site sits within a single TDA. For visual representation of the listed basins, see Figure 4.0, "Predeveloped Hydrology Map".

Basin A:

The predeveloped condition applied to Basin A results in a forested land cover condition. The values as modeled in WWHM are as follows:

Table 1: Predeveloped Conditions: Basin A

Basin A	
Ground Cover	Area (acre)
Forest, Flat	1.12
Total	**1.12**

Upstream Pavement Basin

In the predeveloped condition, existing road area that will be collected to the site is accounted for via the Upstream Pavement Basin. This basin has paved ground cover in the predeveloped state. The Upstream Pavement Basin is accounted for in modeling for Basin A. The values as modeled in WWHM are as follows:

Table 2: Predeveloped Conditions: Upstream Pavement Basin

Upstream Pavement Basin	
Ground Cover	Area (acre)
Roads, Flat	0.15
Total	**0.15**

Frontage Basin

In the predeveloped condition, frontage area that will be collected to the site is accounted for via the Frontage Basin. This basin has the forested ground cover condition in the predeveloped state. The Frontage Basin is accounted for in modeling for Basin A. The values as modeled in WWHM are as follows:

Table 3: Predeveloped Conditions: Frontage Basin

Frontage Basin	
Ground Cover	Area (acre)
Forest, Flat	0.12
Total	**0.12**

Bypass Basin

Road area that cannot be collected to the site is accounted for via the Bypass Basin. This basin has the forested ground cover condition in the predeveloped state. The Bypass Basin is accounted for in modeling for Basin A. The values as modeled in WWHM are as follows:

Table 4: Predeveloped Conditions: Bypass Basin

Bypass Basin	
Ground Cover	Area (acre)
Roads, Flat	0.03
Total	**0.03**

Basin B:
The predeveloped condition applied to Basin B results in a forested land cover condition. The values as modeled in WWHM are as follows:

Table 5: Predeveloped Conditions: Basin B

Basin B	
Ground Cover	Area (acre)
Forest, Flat	1.38
Total	**1.38**

4.2 Developed Site Hydrology
In the developed condition, the proposed townhome project will construct 55 lots and site amenities. Access Drives A and B will be constructed to facilitate access to the site from 177th Ave SE. Private and public utilities are proposed to serve project development. Frontage improvements along 177th Ave SE are proposed.

In compliance with the City of Monroe SWES and the 2019 DOE Manual, all runoff from onsite developed/disturbed surfaces will be collected, treated, and discharged directly to existing/historic flow paths or will bypass detention and be mitigated within the proposed flow control system.

Basin A:
The developed Basin A is 1.12 acres and includes the western portion of the developed site within its boundaries. See developed hydrology map in Appendix 4.2 for basin delineation. In the developed condition, Basin A has been modeled using WWHM with the following areas and ground cover designations:

Table 6: Developed Conditions: Basin A

Basin A	
Ground Cover	Area (acre)
Roof, flat	0.42
Driveway, Flat	0.29
Sidewalks, Flat	0.05
Pasture, Flat	0.24
Roads, Moderate	0.12
Total	**1.12**

Upstream Pavement Basin:
The Upstream Pavement Basin consists of existing pavement that flows toward the frontage of the site and thus must be collected. The Upstream Pavement Basin is accounted for in modeling for Basin A. In the developed condition the Upstream Pavement Basin has been modeled using WWHM with the following areas and ground cover designations:

Table 7: Developed Conditions: Upstream Pavement Basin

Upstream Pavement Basin	
Ground Cover	Area (acre)
Roads, Flat	0.15
Total	**0.15**

Frontage Basin:

The developed Frontage Basin is 0.15 acres and includes the proposed frontage improvements within its boundaries. The Frontage Basin is accounted for in modeling for Basin A. In the developed condition, the Frontage Basin has been modeled using WWHM with the following areas and ground cover designations:

Table 8: Developed Conditions: Frontage Basin

Frontage Basin	
Ground Cover	Area (acre)
Sidewalks, Flat	0.05
Pasture, Flat	0.05
Roads, Moderate	0.02
Total	**0.12**

Bypass Basin:

The developed Bypass Basin is 0.03 acres and includes the proposed frontage improvements that cannot be collected due to topography. The Bypass Basin is accounted for in modeling for Basin A. In the developed condition, the Bypass Basin has been modeled using WWHM with the following areas and ground cover designations:

Table 9: Developed Conditions: Bypass Basin

Bypass Basin	
Ground Cover	Area (acre)
Sidewalks, Flat	0.01
Pasture, Flat	0.01
Roads, Moderate	0.01
Total	**0.03**

Basin B:

The developed Basin B is 1.38 acres and includes the eastern portion of the developed site within its boundaries. See developed hydrology map in Appendix 4.2 for basin delineation. In the developed condition, Basin B has been modeled using WWHM with the following areas and ground cover designations:

Table 10: Developed Conditions: Basin B

Basin B	
Ground Cover	Area (acre)
Roof, flat	0.51
Driveway, Flat	0.34
Sidewalks, Flat	0.13
Pasture, Flat	0.18
Roads, Flat	0.22
Total	**1.38**

4.3 Infiltration Facility Design

Infiltration Facility A

The proposed Infiltration Facility A detains and infiltrates storm water runoff from Basin A into the native soil. The facility is located on the western edge of the site. Flows from Basin A are collected and conveyed to the infiltration facility via a proposed network of catch basins and storm water conveyance pipes. Detailed WWHM output is provided in Appendix 4. A summary of the detailed statistics and inputs used for modeling the system in WWHM2012 can be found below.

Table 11: Infiltration Facility A Summary

Infiltration Facility A	
Bottom Length	*50'*
Bottom Width	*32'*
Calculated Area	*1,600 sf*
Calculated Volume	*8,800 cf*
Layer Thickness	*5.5'*
Void Space	0.4
Infiltration Rate	7.3 in/hr

Infiltration Facility B

The proposed Infiltration Facility A detains and infiltrates storm water runoff from Basin B into the native soil. The facility is located on the southwestern corner of the site. Flows from Basin B are collected and conveyed to the infiltration facility via a proposed network of catch basins and storm water conveyance pipes. Detailed WWHM output is provided in Appendix 4. A summary of the detailed statistics and inputs used for modeling the system in WWHM2012 can be found below.

Table 12: Infiltration Facility B Summary

Infiltration Facility B	
Bottom Length	*70'*
Bottom Width	*30'*
Calculated Area	*2,100 sf*
Calculated Volume	*10,500 cf*
Layer Thickness	*5.0'*
Void Space	0.4
Infiltration Rate	7.3 in/hr

4.4 Water Quality Treatment

Water Quality Treatment will be evaluated prior to civil submittal.

4.5 Onsite Stormwater Management

The project choosed to implement List #2 to evaluate low impact design. The following BMP's below are assessed for implementation:

Lawn and Landscaped Areas:

1. *Post-Construction Soil Quality and Depth*
    - BMP T5.13 soils will be applied to all permeable and landscaped areas in developed condition.
        i. **Conclusion: Feasible**

Roofs:

1. *Downspout Full Infiltration per BMP T5.10A or Downspout Full Dispersion per BMP T5.30*
    - Full infiltration is planned for the site per BMP T7.20.

i. **Conclusion: Feasible**

Other Hard Surfaces:

1. *Full Dispersion per BMP T5.30*
   - Not considered as full infiltration is planned for the site per BMP T7.20.

     i. **Conclusion: Not Considered**

2. *BMP T5.15 Permeable Pavement*
   - Not considered as full infiltration is planned for the site per BMP T7.20, and infiltration needs can be met without permeable pavement.

     i. **Conclusion: Not Considered**

3. *Bioretention*
   - Not considered as full infiltration is planned for the site per BMP T7.20.

     ii. **Conclusion: Not Considered**

4. *Sheet Flow Dispersion or Concentrated Flow Dispersion in accordance with BMP T5.12 or BMP T5.11*
   - Not considered as full infiltration is planned for the site per BMP T7.20.

     iii. **Conclusion: Not Considered**

SECTION 5: CONVEYANCE DESIGN

The stormwater conveyance system is comprised of a network of open/closed grate catch basins, buried pipe, two infiltration facilities and StormFilter water quality units. Catch basins have been located such that each section of storm drainage pipe may adequately convey associated tributary area flows.

A fully prepared conveyance capacity analysis of the proposed pipes onsite will be prepared at a future submittal.

SECTION 6: OPERATIONS AND MAINTENANCE MANUAL

The proposed storm drainage system consists of buried pipes, catch basins, two infiltration facilities, and StormFilter water quality treatment structures. These facilities will require periodic maintenance and inspection. Inspection and maintenance procedures are contained on the following pages.

SECTION 7: SPECIAL REPORTS AND STUDIES

The following studies were conducted in preparation of this Report:

- Geotechnical Engineering Evaluation, 177th Ave SE Residential Development, Nelson Geotechnical Associates, Inc., September 2, 2025

- Critical Area Study, Park Place 16311 177th Ave SE Monroe, WA, Wetland Resources, Inc., October 21, 2025

Appendix 1: Project Overview

1. Vicinity Map
2. Existing Conditions Map
3. Proposed Development Map

SE 1/4, SE 1/4, SEC 2, T27N, R6E, WM, SNOHOMISH COUNTY, WASHINGTON

PARK PLACE TOWNHOMES

PRELIMINARY PLANS

MONROE, WASHINGTON

LEGEND AND ABBREVIATIONS

EXISTING SYMBOLS	DESCRIPTION
	EXISTING CORNER MONUMENT AS NOTED
	QUARTER SECTION TIE
	SECTION TIE
	LIGHT POLE
	GUY ANCHOR
	POWER METER
	GUY POLE
	CATCH BASIN
	STORM MANHOLE
	YARD DRAIN
	SEWER MANHOLE
	SEWER CLEANOUT
	FIRE HYDRANT
	WATER METER
	WATER POST INDICATOR VALVE
	WATER VALVE
	BOLLARD
	LIGHT STANDARD
	MAILBOX
	UTILITY MARKER
	METAL COVER
	SIGN

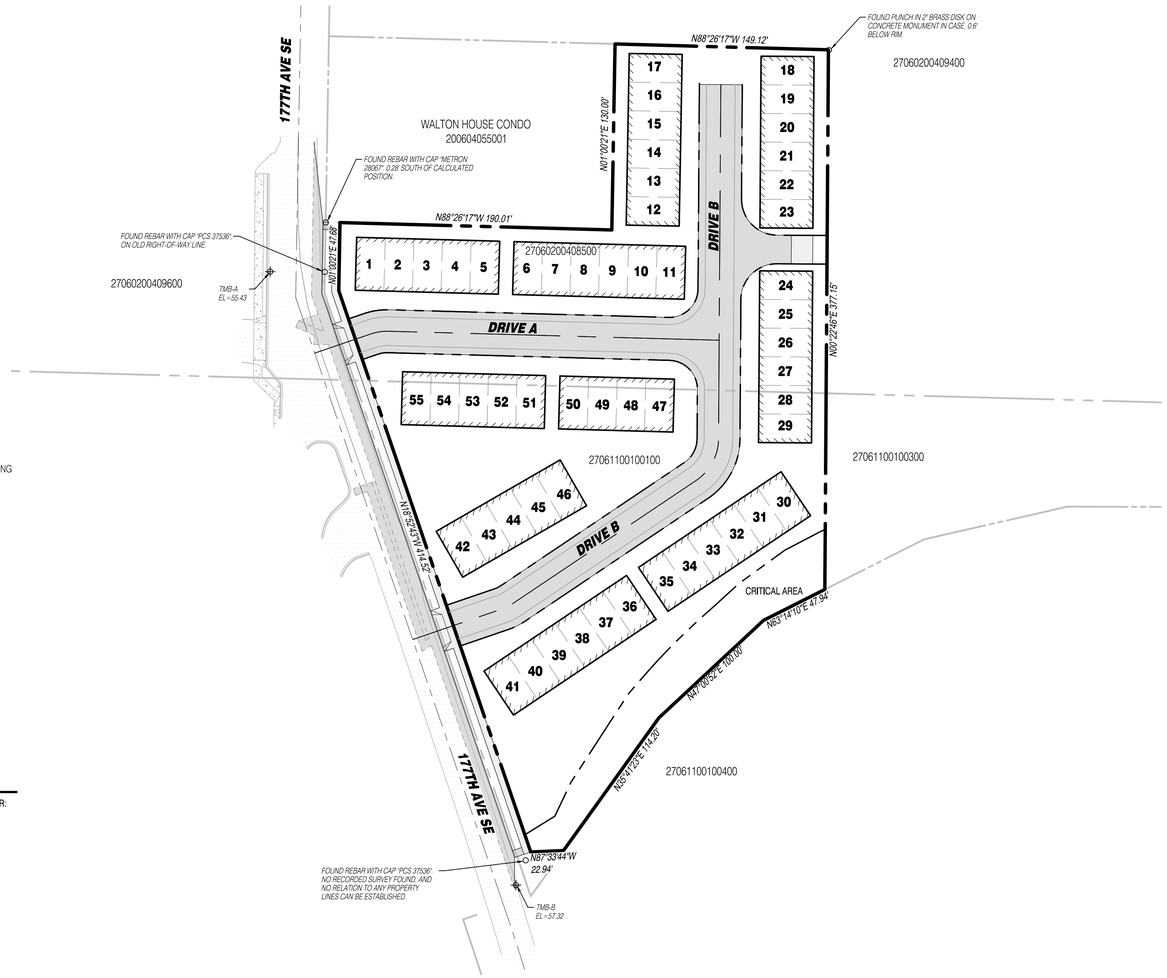
ABBREVIATIONS	
SS	SANITARY SEWER
IE	INVERT ELEVATION
INV	INVERT ELEVATION
OHP	OVERHEAD POWER LINE
TPM	TELEPHONE PAINT MARK
SDMH	STORM DRAIN MANHOLE
PVC	POLYVINYL CHLORIDE
CPEP	CORRUGATED POLYETHYLENE PIPE
CONC	CONCRETE

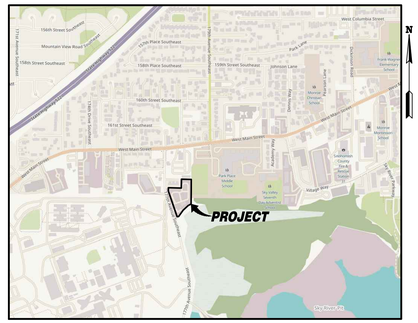
PROPOSED STORM SYMBOLS	
SYMBOL	DESCRIPTION
	SD CAP
	TYPE 1 CATCH BASIN, GRATED LID
	TYPE 1 CATCH BASIN, SOLID LID
	TYPE 2 CATCH BASIN, GRATED LID
	TYPE 2 CATCH BASIN, SOLID LID
	BEEHIVE MANHOLE COVER
	SQUARE YARD DRAIN
	ROUND YARD DRAIN
	STORM CLEAN OUT
	STORM PIPE

PROPOSED SEWER SYMBOLS	
SYMBOL	DESCRIPTION
	SEWER CAP
	SEWER CLEANOUT
	SEWER MANHOLE
	SEWER PIPE

PROPOSED WATER SYMBOLS	
SYMBOL	DESCRIPTION
	WATER CAP
	CONCRETE THRUST BLOCKING
	11.25° BEND
	22.5° BEND
	45° BEND
	90° BEND
	VALVE
	HYDRANT ASSEMBLY
	BLOW-OFF VALVE
	REDUCER
	AIR-VAC ASSEMBLY
	WATER METER
	WATER PIPE

PROPOSED SURVEY SYMBOLS	
SYMBOL	DESCRIPTION
	SURVEY MONUMENT IN PROPOSED ROAD





VICINITY MAP
SCALE: NOT TO SCALE

SURVEY INFORMATION

LEGAL DESCRIPTION

THAT PORTION OF THE SOUTHEAST QUARTER OF THE SOUTHEAST QUARTER OF SECTION 2 AND THE NORTHEAST QUARTER OF THE NORTHEAST QUARTER (AKA GOVERNMENT LOT 1) OF SECTION 11, TOWNSHIP 27 NORTH, RANGE 6 EAST W.M. DESCRIBED AS FOLLOWS:

COMMENCING AT THE SOUTHEAST CORNER OF SAID SECTION 2;
THENCE SOUTH 89° 58'43" WEST ALONG THE SOUTH LINE OF SAID SUBDIVISION FOR 599.90 FEET TO THE EAST MARGIN OF REFORMATORY ROAD;
THENCE NORTH 20° 27'28" WEST ALONG SAID EAST MARGIN FOR 64.70 FEET;
THENCE NORTH 8° 34'20" WEST ALONG SAID MARGIN FOR 49.38 FEET TO THE TRUE POINT OF BEGINNING;
THENCE NORTH 89° 58'43" EAST PARALLEL TO THE SOUTH LINE OF SAID PORTION OF SECTION 2 FOR 200.00 FEET;
THENCE NORTH 0° 34'20" WEST FOR 130.00 FEET;
THENCE NORTH 89° 58'43" EAST FOR 149.27 FEET;
THENCE SOUTH 1° 11'51" EAST PARALLEL TO THE EAST LINE OF SAID PORTION OF SECTION 2 FOR 377.15 FEET TO THE NORTH BANK OF THE OLD CHANNEL OF THE SKYKOMISH RIVER AS LOCATED BY W.E. CRANE AND ASSOC.;
THENCE SOUTH 61° 39'33" WEST ALONG SAID NORTH BANK LINE FOR 47.94 FEET;
THENCE SOUTH 45° 26'15" WEST FOR 100.00 FEET;
THENCE SOUTH 34° 06'46" WEST FOR 153.47 FEET TO THE EAST MARGIN OF REFORMATORY ROAD;
THENCE NORTH 20° 27'20" WEST ALONG SAID EAST MARGIN FOR 445.66 FEET;
THENCE NORTH 0° 34'20" WEST FOR 49.38 FEET TO THE TRUE POINT OF BEGINNING.
EXCEPT THAT PORTION CONVEYED TO SNOHOMISH COUNTY FOR RIGHT OF WAY BY DEED RECORDED UNDER AUDITOR'S FILE NO. 8704230378.

SITUATE IN THE COUNTY OF SNOHOMISH, STATE OF WASHINGTON

HORIZONTAL DATUM

WASHINGTON STATE PLANE COORDINATE SYSTEM - NORTH ZONE NAD83/2011 (2010.00 EPOCH) PER GNSS OBSERVATIONS UTILIZING CORRECTIONS FROM THE WASHINGTON STATE REFERENCE NETWORK (WSRN)

VERTICAL DATUM

NAVD 88 (PER GNSS OBSERVATIONS UTILIZING CORRECTIONS FROM THE WSRN)

BENCHMARKS

TBM-A
SET MAG NAIL IN ASPHALT ON THE WEST SIDE OF 177TH AVE SE, 2.1' EAST OF THE FACE OF CURB AND ±69' SOUTH OF THE NORTH END CURB.

ELEVATION=55.43

TBM-B
SET MAG NAIL ±0.3' WEST OF THE EAST EDGE ASPHALT PAVING FOR 177TH AVE SE. ±102' SOUTH OF A UTILITY POLE AND ±254' SOUTH OF THE SOUTHEAST CORNER DRIVEWAY FOR MONROE CORRECTIONAL COMPLEX.

ELEVATION=57.32

NOTES

1. A 5" ELECTRONIC TOTAL STATION WAS USED FOR THIS FIELD TRAVERSE SURVEY. ALL EQUIPMENT HAS BEEN MAINTAINED IN ACCORDANCE WITH THE MANUFACTURER'S GUIDELINES. ACCURACY MEETS OR EXCEEDS W.A.C. 332-130-090.
2. ALL TITLE INFORMATION SHOWN ON THIS SURVEY WAS EXTRACTED FROM CHICAGO TITLE COMPANY COMMITMENT NUMBER 620157236, AMENDMENT 1, DATED MAY 29, 2025. ATWELL, LLC HAS CONDUCTED NO INDEPENDENT TITLE RESEARCH, AND HAS RELIED WHOLLY ON THE TITLE COMPANY'S REPRESENTATIONS OF THE TITLE'S CONDITION TO PREPARE THIS SURVEY AND QUALIFIES THE MAP'S ACCURACY AND COMPLETENESS TO THAT EXTENT.
3. THE INFORMATION DEPICTED ON THIS MAP REPRESENTS THE RESULTS OF A SURVEY MADE ON THE DATE INDICATED AND CAN ONLY BE CONSIDERED AS INDICATING THE GENERAL CONDITION EXISTING AT THAT TIME. ALL CONTROL INDICATED AS "FOUND" WAS RECOVERED FOR THIS PROJECT ON AUGUST 2025, UNLESS OTHERWISE NOTED.
4. PROPERTY AREA = 121,280± SQUARE FEET.
5. ALL DISTANCES ARE IN U.S. SURVEY FEET AND REPRESENT GROUND MEASUREMENTS.
6. UNDERGROUND UTILITIES WERE LOCATED BASED ON SURFACE EVIDENCE CLEARLY VISIBLE TO THE FIELD SURVEY CREW. CONNECTING PIPES ARE DRAWN AS STRAIGHT LINES BETWEEN STRUCTURES. SUPPLEMENTAL INFORMATION MAY HAVE BEEN USED TO DEPICT THE UNDERGROUND UTILITIES SHOWN ON THIS SURVEY, SUCH AS PAINT MARKS, SAW CUTS, OR RECORD DRAWING INFORMATION OBTAINED FROM FRANCHISE UTILITIES, PUBLIC UTILITY COMPANIES, AND PUBLIC GIS INFORMATION. ATWELL LLC MAKES NO CLAIM TO THE ACCURACY OF INFORMATION PROVIDED BY OTHERS OR OF UNDERGROUND PIPES, CABLES, STRUCTURES OR OTHER UTILITIES. THE EXACT LOCATION, SIZE, AND ELEVATION OF ALL UNDERGROUND UTILITIES WHICH ARE CRITICAL TO THE DESIGN MUST BE POTHOLED AND VERIFIED BY THE CLIENT.
7. TREE SIZES AND SPECIES WERE DETERMINED TO THE BEST OF OUR ABILITY. ATWELL, LLC DOES NOT WARRANT THE ACCURACY OF THE SIZE AND SPECIES OF ANY TREES SHOWN HEREON, ALL TREE SIZES SHOULD BE VERIFIED BY A TRAINED ARBORIST.
8. 177TH/REFORMATORY ROAD 20' RIGHT-OF-WAY ORIGINALLY ESTABLISHED BY PETITION FOR FORKS RD AND PATTISON FERRY RD IN VOLUME 2 OF THE COUNTY COMMISSIONERS JOURNAL AT PAGES 313-314 AND 331-335.

RESTRICTIONS OF RECORD

9. SUBJECT TO EASEMENT(S) GRANTED TO PUBLIC UTILITY DISTRICT NO. 1 OF SNOHOMISH CO. AND WEST COAST TELEPHONE FOR ELECTRIC TRANSMISSION AND/OR TELECOM. DISTRIBUTION LINES UNDER AUDITOR'S FILE NUMBER 1998476. NOT PLOTTED. THIS EASEMENT IS FOR AN ANCHOR THAT IS LOCATED ON THE SOUTH SIDE OF W MAIN ST.
9. SUBJECT TO EASEMENT(S) GRANTED TO THE CITY OF MONROE FOR SEWER LINES AND RIGHTS INCIDENTAL THERETO, AS GRANTED IN A DOCUMENT UNDER AUDITORS FILE NUMBER 7603040210.
10. SUBJECT TO COVENANTS, CONDITIONS, RESTRICTIONS, RECITALS, RESERVATIONS, EASEMENTS, EASEMENT PROVISIONS, ENCROACHMENTS, DEDICATIONS, BUILDING SETBACK LINES, NOTES, STATEMENTS, AND OTHER MATTERS, IF ANY, BUT OMITTING ANY COVENANTS OR RESTRICTIONS, IF ANY, INCLUDING BUT NOT LIMITED TO THOSE BASED UPON RACE, COLOR, RELIGION, SEX, SEXUAL ORIENTATION, FAMILIAL STATUS, MARITAL STATUS, DISABILITY, HANDICAP, NATIONAL ORIGIN, ANCESTRY, OR SOURCE OF INCOME, AS SET FORTH IN APPLICABLE STATE OR FEDERAL LAWS, EXCEPT TO THE EXTENT THAT SAID COVENANT OR RESTRICTION IS PERMITTED BY APPLICABLE LAW, AS SET FORTH ON SURVEY UNDER AUDITORS FILE NUMBER 7607190275.
11. SUBJECT TO COVENANTS, CONDITIONS, RESTRICTIONS, RECITALS, RESERVATIONS, EASEMENTS, EASEMENT PROVISIONS, ENCROACHMENTS, DEDICATIONS, BUILDING SETBACK LINES, NOTES, STATEMENTS, AND OTHER MATTERS, IF ANY, BUT OMITTING ANY COVENANTS OR RESTRICTIONS, IF ANY, INCLUDING BUT NOT LIMITED TO THOSE BASED UPON RACE, COLOR, RELIGION, SEX, SEXUAL ORIENTATION, FAMILIAL STATUS, MARITAL STATUS, DISABILITY, HANDICAP, NATIONAL ORIGIN, ANCESTRY, OR SOURCE OF INCOME, AS SET FORTH IN APPLICABLE STATE OR FEDERAL LAWS, EXCEPT TO THE EXTENT THAT SAID COVENANT OR RESTRICTION IS PERMITTED BY APPLICABLE LAW, AS SET FORTH ON SURVEY UNDER AUDITOR'S FILE NUMBER 9001315003.
12. SUBJECT TO COVENANTS, CONDITIONS, RESTRICTIONS, RECITALS, RESERVATIONS EASEMENTS, EASEMENT PROVISIONS, ENCROACHMENTS, DEDICATIONS, BUILDING SETBACK LINES, NOTES, STATEMENTS, AND OTHER MATTERS, IF ANY, BUT OMITTING ANY COVENANTS OR RESTRICTIONS, IF ANY, INCLUDING BUT NOT LIMITED TO THOSE BASED UPON RACE, COLOR, RELIGION, SEX, SEXUAL ORIENTATION, FAMILIAL STATUS, MARITAL STATUS, DISABILITY, HANDICAP, NATIONAL ORIGIN, ANCESTRY, OR SOURCE OF INCOME, AS SET FORTH IN APPLICABLE STATE OR FEDERAL LAWS, EXCEPT TO THE EXTENT THAT SAID COVENANT OR RESTRICTION IS PERMITTED BY APPLICABLE LAW, AS SET FORTH ON SURVEY OF WALTON HOUSE CONDO UNDER AUDITORS FILE NUMBER 200604055001.

CONTACT LIST

DEVELOPER:
HORIZON VIEW HOLDINGS, INC
6443 NE 181ST ST, SUITE C
KENMORE, WA 98028
CONTACT: DANIEL WICK
PHONE: (206) 930-2626
EMAIL: horizonviewhomes@gmail.com

CIVIL ENGINEER:
SOLID GROUND ENGINEERING
8105 166TH AVE NE
REDMOND, WA 98052
CONTACT: COOPER DANBY, PE
PHONE: (206) 446-3932
EMAIL: cdanby@solidgroundpnw.com

GEOTECHNICAL ENGINEER:
COMPANY NAME
ADDRESS LINE 1
ADDRESS LINE
CONTACT: NAME
PHONE: (***) ***-****
EMAIL: *****@*******.com

SURVEYOR:
ATWELL, LLC
PO BOX 289
WOODINVILLE, WA 98072
CONTACT: CHRISTOPHER SHANE BARNES
PHONE: (425) 486-1252
EMAIL: *****@*******.com

LANDSCAPE ARCHITECT:
COMPANY NAME
ADDRESS LINE 1
ADDRESS LINE
CONTACT: NAME
PHONE: (***) ***-****
EMAIL: *****@*******.com

WETLAND BIOLOGIST:
COMPANY NAME
ADDRESS LINE 1
ADDRESS LINE
CONTACT: NAME
PHONE: (***) ***-****
EMAIL: *****@*******.com

EARTHWORK QUANTITIES

STRIPPING:	----- CY	
CUT:	----- CY	
FILL:	----- CY	
NET:	----- CY (CUT/FILL)	
DISTURBED AREA:	-------- SF	(-.-- AC)

THE ABOVE QUANTITIES ARE FOR PERMITTING PURPOSES. CONTRACTOR TO VERIFY.

SOIL TYPE AND VEGETATIVE COVER

SOILS: ---
VEGETATIVE COVER: ---

PROJECT INFORMATION

TAX PARCELS:	27061100100100, 27060200408500
SITE ADDRESS:	16311 177TH AVE SE, MONROE WA 98272
SITE AREA:	121,280 SF (2.78 AC)
PROPOSED ZONING:	MIXED USE - GENERAL (MG)
PROPOSED LAND USE:	TH CONDO UNITS
PROPOSED LOTS:	55 LOTS
BUILDING SETBACKS:	10' FRONT 5' SIDE 10' REAR
WATER:	CITY OF MONROE WATER SYSTEM
SEWER:	CITY OF MONROE SEWER SERVICE
POWER:	SNOHOMISH COUNTY PUD
GAS:	PUGET SOUND ENERGY
TELEPHONE:	ZIPLY
CABLE:	COMCAST
SCHOOL DISTRICT:	MONROE SCHOOL DISTRICT
FIRE DISTRICT:	SNOHOMISH REGIONAL FIRE & RESCUE STA 31

TABLE OF CONTENTS

SURVEY DISCLAIMER

THE TOPOGRAPHIC SURVEY WAS PERFORMED BY ATWELL, LLC. SOLID GROUND ENGINEERING ASSUMES NO LIABILITY AS TO THE ACCURACY AND COMPLETENESS OF THIS DATA. ANY DISCREPANCIES FOUND BETWEEN WHAT IS SHOWN ON THE PLANS AND WHAT IS NOTED IN THE FIELD SHOULD BE BROUGHT IMMEDIATELY TO THE ATTENTION OF THE ENGINEER.

UTILITY NOTE

THE CONTRACTOR SHALL VERIFY THE LOCATION OF ALL EXISTING UTILITIES PRIOR TO ANY CONSTRUCTION. AGENCIES INVOLVED SHALL BE NOTIFIED WITHIN A REASONABLE TIME PRIOR TO THE START OF CONSTRUCTION.

811
SAFETY IS IN YOUR HANDS.
EVERY DIG. EVERY TIME.

ENGINEER'S STAMP
CHRISTOPHER JAMES CAMERON DANBY
STATE OF WASHINGTON
23000413
REGISTERED
PROFESSIONAL ENGINEER

REVISIONS

#	DESCRIPTION	DATE

SGE
Solid Ground Engineering
8105 166th Ave NE
Redmond, WA 98052

COVER SHEET

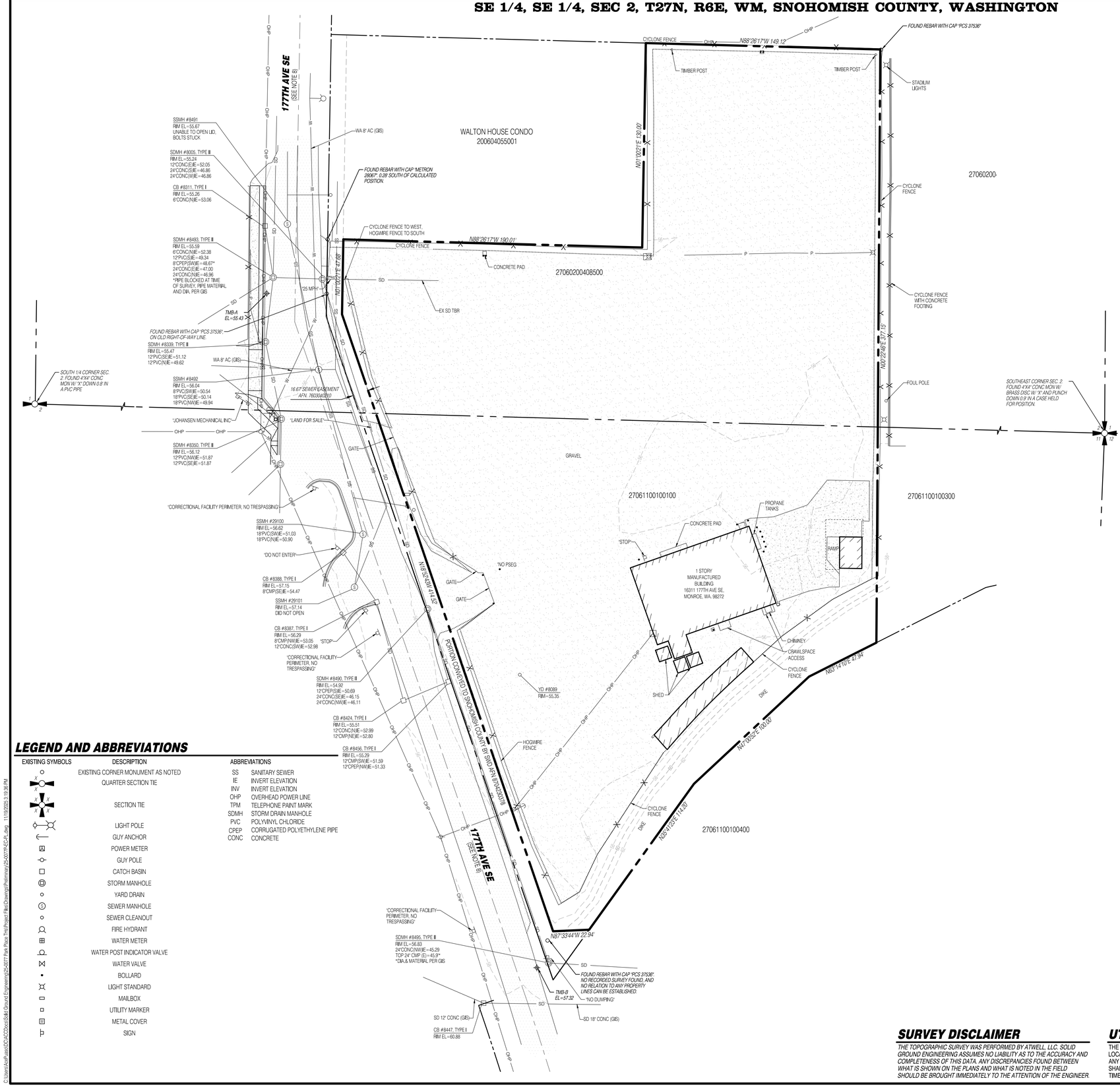
HORIZON VIEW HOLDINGS, INC
PARK PLACE TOWNHOMES
MONROE, WASHINGTON

DRAWN BY:	KMA
CHECKED BY:	CJD
DATE:	9-29-25
JURISDICTION:	CITY OF MONROE
JOB NUMBER:	25-0077

CS-01
1 OF 8

C:\Users\AcePuser2\DCADCDocs\Solid Ground Engineering\25-0077 Park Place Th's\Project Files\Drawings\Preliminary\25-0077P-CS-PL.dwg 11/19/2025 3:19:30 PM

SE 1/4, SE 1/4, SEC 2, T27N, R6E, WM, SNOHOMISH COUNTY, WASHINGTON



LEGEND AND ABBREVIATIONS

EXISTING SYMBOLS	DESCRIPTION
○	EXISTING CORNER MONUMENT AS NOTED
	QUARTER SECTION TIE
	SECTION TIE
	LIGHT POLE
	GUY ANCHOR
	POWER METER
	GUY POLE
	CATCH BASIN
	STORM MANHOLE
	YARD DRAIN
S	SEWER MANHOLE
	SEWER CLEANOUT
	FIRE HYDRANT
	WATER METER
	WATER POST INDICATOR VALVE
	WATER VALVE
	BOLLARD
	LIGHT STANDARD
	MAILBOX
	UTILITY MARKER
M	METAL COVER
	SIGN

ABBREVIATIONS	
SS	SANITARY SEWER
IE	INVERT ELEVATION
INV	INVERT ELEVATION
OHP	OVERHEAD POWER LINE
TPM	TELEPHONE PAINT MARK
SDMH	STORM DRAIN MANHOLE
PVC	POLYVINYL CHLORIDE
CPEP	CORRUGATED POLYETHYLENE PIPE
CONC	CONCRETE

SURVEY INFORMATION

LEGAL DESCRIPTION

THAT PORTION OF THE SOUTHEAST QUARTER OF THE SOUTHEAST QUARTER OF SECTION 2 AND THE NORTHEAST QUARTER OF THE NORTHEAST QUARTER (AKA GOVERNMENT LOT 1) OF SECTION 11, TOWNSHIP 27 NORTH, RANGE 6 EAST W.M. DESCRIBED AS FOLLOWS:

COMMENCING AT THE SOUTHEAST CORNER OF SAID SECTION 2;
THENCE SOUTH 89° 58'43" WEST ALONG THE SOUTH LINE OF SAID SUBDIVISION FOR 599.90 FEET TO THE EAST MARGIN OF REFORMATORY ROAD;
THENCE NORTH 20° 27'28" WEST ALONG SAID EAST MARGIN FOR 64.70 FEET;
THENCE NORTH 8° 34'20" WEST ALONG SAID MARGIN FOR 49.38 FEET TO THE TRUE POINT OF BEGINNING;
THENCE NORTH 89° 58'43" EAST PARALLEL TO THE SOUTH LINE OF SAID PORTION OF SECTION 2 FOR 200.00 FEET;
THENCE NORTH 0° 34'20" WEST FOR 130.00 FEET;
THENCE NORTH 89° 58'43" EAST FOR 149.27 FEET;
THENCE SOUTH 1° 11'51" EAST PARALLEL TO THE EAST LINE OF SAID PORTION OF SECTION 2 FOR 377.15 FEET TO THE NORTH BANK OF THE OLD CHANNEL OF THE SKYKOMISH RIVER AS LOCATED BY W.E. CRANE AND ASSOC;
THENCE SOUTH 61° 39'33" WEST ALONG SAID NORTH BANK LINE FOR 47.94 FEET;
THENCE SOUTH 45° 26'15" WEST FOR 100.00 FEET;
THENCE SOUTH 34° 06'46" WEST FOR 153.47 FEET TO THE EAST MARGIN OF REFORMATORY ROAD;
THENCE NORTH 20° 27'20" WEST ALONG SAID EAST MARGIN FOR 445.66 FEET;
THENCE NORTH 0° 34'20" WEST FOR 49.38 FEET TO THE TRUE POINT OF BEGINNING.
EXCEPT THAT PORTION CONVEYED TO SNOHOMISH COUNTY FOR RIGHT OF WAY BY DEED RECORDED UNDER AUDITOR'S FILE NO. 8704230378.

SITUATE IN THE COUNTY OF SNOHOMISH, STATE OF WASHINGTON

HORIZONTAL DATUM

WASHINGTON STATE PLANE COORDINATE SYSTEM - NORTH ZONE NAD83/2011 (2010.00 EPOCH) PER GNSS OBSERVATIONS UTILIZING CORRECTIONS FROM THE WASHINGTON STATE REFERENCE NETWORK (WSRN)

VERTICAL DATUM

NAVD 88 (PER GNSS OBSERVATIONS UTILIZING CORRECTIONS FROM THE WSRN)

BENCHMARKS

TBM-A
SET MAG NAIL IN ASPHALT ON THE WEST SIDE OF 177TH AVE SE, 2.1' EAST OF THE FACE OF CURB AND ±69' SOUTH OF THE NORTH END CURB.

ELEVATION=55.43

TBM-B
SET MAG NAIL ±0.3' WEST OF THE EAST EDGE ASPHALT PAVING FOR 177TH AVE SE, ±102' SOUTH OF A UTILITY POLE AND ±254' SOUTH OF THE SOUTHEAST CORNER DRIVEWAY FOR MONROE CORRECTIONAL COMPLEX.

ELEVATION=57.32

NOTES

1. A 5" ELECTRONIC TOTAL STATION WAS USED FOR THIS FIELD TRAVERSE SURVEY. ALL EQUIPMENT HAS BEEN MAINTAINED IN ACCORDANCE WITH THE MANUFACTURER'S GUIDELINES. ACCURACY MEETS OR EXCEEDS W.A.C. 332-130-090.
2. ALL TITLE INFORMATION SHOWN ON THIS SURVEY WAS EXTRACTED FROM CHICAGO TITLE COMPANY COMMITMENT NUMBER 500157236, AMENDMENT 1, DATED MAY 29, 2025. ATWELL, LLC HAS CONDUCTED NO INDEPENDENT TITLE RESEARCH, AND HAS RELIED WHOLLY ON THE TITLE COMPANY'S REPRESENTATIONS OF THE TITLE'S CONDITION TO PREPARE THIS SURVEY AND QUALIFIES THE MAP'S ACCURACY AND COMPLETENESS TO THAT EXTENT.
3. THE INFORMATION DEPICTED ON THIS MAP REPRESENTS THE RESULTS OF A SURVEY MADE ON THE DATE INDICATED AND CAN ONLY BE CONSIDERED AS INDICATING THE GENERAL CONDITION EXISTING AT THAT TIME. ALL CONTROL INDICATED AS 'FOUND' WAS RECOVERED FOR THIS PROJECT ON AUGUST 2025, UNLESS OTHERWISE NOTED.
4. PROPERTY AREA = 121,280± SQUARE FEET.
5. ALL DISTANCES ARE IN U.S. SURVEY FEET AND REPRESENT GROUND MEASUREMENTS.
6. UNDERGROUND UTILITIES WERE LOCATED BASED ON SURFACE EVIDENCE CLEARLY VISIBLE TO THE FIELD SURVEY CREW. CONNECTING PIPES ARE DRAWN AS STRAIGHT LINES BETWEEN STRUCTURES. SUPPLEMENTAL INFORMATION MAY HAVE BEEN USED TO DEPICT THE UNDERGROUND UTILITIES SHOWN ON THIS SURVEY, SUCH AS PAINT MARKS, SAW CUTS, OR RECORD DRAWING INFORMATION OBTAINED FROM FRANCHISE UTILITIES, PUBLIC UTILITY COMPANIES, AND PUBLIC GIS INFORMATION. ATWELL LLC MAKES NO CLAIM TO THE ACCURACY OF INFORMATION PROVIDED BY OTHERS OR OF UNDERGROUND PIPES, CABLES, STRUCTURES OR OTHER UTILITIES. THE EXACT LOCATION, SIZE, AND ELEVATION OF ALL UNDERGROUND UTILITIES WHICH ARE CRITICAL TO THE DESIGN MUST BE POTHOLED AND VERIFIED BY THE CLIENT.
7. TREE SIZES AND SPECIES WERE DETERMINED TO THE BEST OF OUR ABILITY. ATWELL, LLC DOES NOT WARRANT THE ACCURACY OF THE SIZE AND SPECIES OF ANY TREES SHOWN HEREON, ALL TREE SIZES SHOULD BE VERIFIED BY A TRAINED ARBORIST.
8. 177TH/REFORMATORY ROAD 20' RIGHT-OF-WAY ORIGINALLY ESTABLISHED BY PETITION FOR FORKS RD AND PATTISON FERRY RD IN VOLUME 2 OF THE COUNTY COMMISSIONERS JOURNAL AT PAGES 313-314 AND 331-335.

RESTRICTIONS OF RECORD

9. SUBJECT TO EASEMENT(S) GRANTED TO PUBLIC UTILITY DISTRICT NO. 1 OF SNOHOMISH CO. AND WEST COAST TELEPHONE FOR ELECTRIC TRANSMISSION AND/OR TELECOM, DISTRIBUTION LINES UNDER AUDITOR'S FILE NUMBER 1998476. NOT PLOTTED. THIS EASEMENT IS FOR AN ANCHOR THAT IS LOCATED ON THE SOUTH SIDE OF W MAIN ST.
9. SUBJECT TO EASEMENT(S) GRANTED TO THE CITY OF MONROE FOR SEWER LINES AND RIGHTS INCIDENTAL THERETO, AS GRANTED IN A DOCUMENT UNDER AUDITOR'S FILE NUMBER 7603040210.
10. SUBJECT TO COVENANTS, CONDITIONS, RESTRICTIONS, RECITALS, RESERVATIONS, EASEMENTS, EASEMENT PROVISIONS, ENCROACHMENTS, DEDICATIONS, BUILDING SETBACK LINES, NOTES, STATEMENTS, AND OTHER MATTERS, IF ANY, BUT OMITTING ANY COVENANTS OR RESTRICTIONS, IF ANY, INCLUDING BUT NOT LIMITED TO THOSE BASED UPON RACE, COLOR, RELIGION, SEX, SEXUAL ORIENTATION, FAMILIAL STATUS, MARITAL STATUS, DISABILITY, HANDICAP, NATIONAL ORIGIN, ANCESTRY, OR SOURCE OF INCOME, AS SET FORTH IN APPLICABLE STATE OR FEDERAL LAWS, EXCEPT TO THE EXTENT THAT SAID COVENANT OR RESTRICTION IS PERMITTED BY APPLICABLE LAW, AS SET FORTH ON SURVEY UNDER AUDITOR'S FILE NUMBER 7607190275.
11. SUBJECT TO COVENANTS, CONDITIONS, RESTRICTIONS, RECITALS, RESERVATIONS, EASEMENTS, EASEMENT PROVISIONS, ENCROACHMENTS, DEDICATIONS, BUILDING SETBACK LINES, NOTES, STATEMENTS, AND OTHER MATTERS, IF ANY, BUT OMITTING ANY COVENANTS OR RESTRICTIONS, IF ANY, INCLUDING BUT NOT LIMITED TO THOSE BASED UPON RACE, COLOR, RELIGION, SEX, SEXUAL ORIENTATION, FAMILIAL STATUS, MARITAL STATUS, DISABILITY, HANDICAP, NATIONAL ORIGIN, ANCESTRY, OR SOURCE OF INCOME, AS SET FORTH IN APPLICABLE STATE OR FEDERAL LAWS, EXCEPT TO THE EXTENT THAT SAID COVENANT OR RESTRICTION IS PERMITTED BY APPLICABLE LAW, AS SET FORTH ON SURVEY UNDER AUDITORS FILE NUMBER 9001315003.
12. SUBJECT TO COVENANTS, CONDITIONS, RESTRICTIONS, RECITALS, RESERVATIONS EASEMENTS, EASEMENT PROVISIONS, ENCROACHMENTS, DEDICATIONS, BUILDING SETBACK LINES, NOTES, STATEMENTS, AND OTHER MATTERS, IF ANY, BUT OMITTING ANY COVENANTS OR RESTRICTIONS, IF ANY, INCLUDING BUT NOT LIMITED TO THOSE BASED UPON RACE, COLOR, RELIGION, SEX, SEXUAL ORIENTATION, FAMILIAL STATUS, MARITAL STATUS, DISABILITY, HANDICAP, NATIONAL ORIGIN, ANCESTRY, OR SOURCE OF INCOME, AS SET FORTH IN APPLICABLE STATE OR FEDERAL LAWS, EXCEPT TO THE EXTENT THAT SAID COVENANT OR RESTRICTION IS PERMITTED BY APPLICABLE LAW, AS SET FORTH ON SURVEY OF WALTON HOUSE CONDO UNDER AUDITOR'S FILE NUMBER 200604055001.

SURVEY DISCLAIMER

THE TOPOGRAPHIC SURVEY WAS PERFORMED BY ATWELL, LLC. SOLID GROUND ENGINEERING ASSUMES NO LIABILITY AS TO THE ACCURACY AND COMPLETENESS OF THIS DATA. ANY DISCREPANCIES FOUND BETWEEN WHAT IS SHOWN ON THE PLANS AND WHAT IS NOTED IN THE FIELD SHOULD BE BROUGHT IMMEDIATELY TO THE ATTENTION OF THE ENGINEER.

UTILITY NOTE

THE CONTRACTOR SHALL VERIFY THE LOCATION OF ALL EXISTING UTILITIES PRIOR TO ANY CONSTRUCTION. AGENCIES INVOLVED SHALL BE NOTIFIED WITHIN A REASONABLE TIME PRIOR TO THE START OF CONSTRUCTION.

811 SAFETY IS IN YOUR HANDS. EVERY DIG. EVERY TIME.

ENGINEER'S STAMP

REVISIONS

#	DESCRIPTION	DATE

Solid Ground Engineering
8105 156th Ave NE
Redmond, WA 98052

EXISTING CONDITIONS MAP

HORIZON VIEW HOLDINGS, INC

PARK PLACE TOWNHOMES

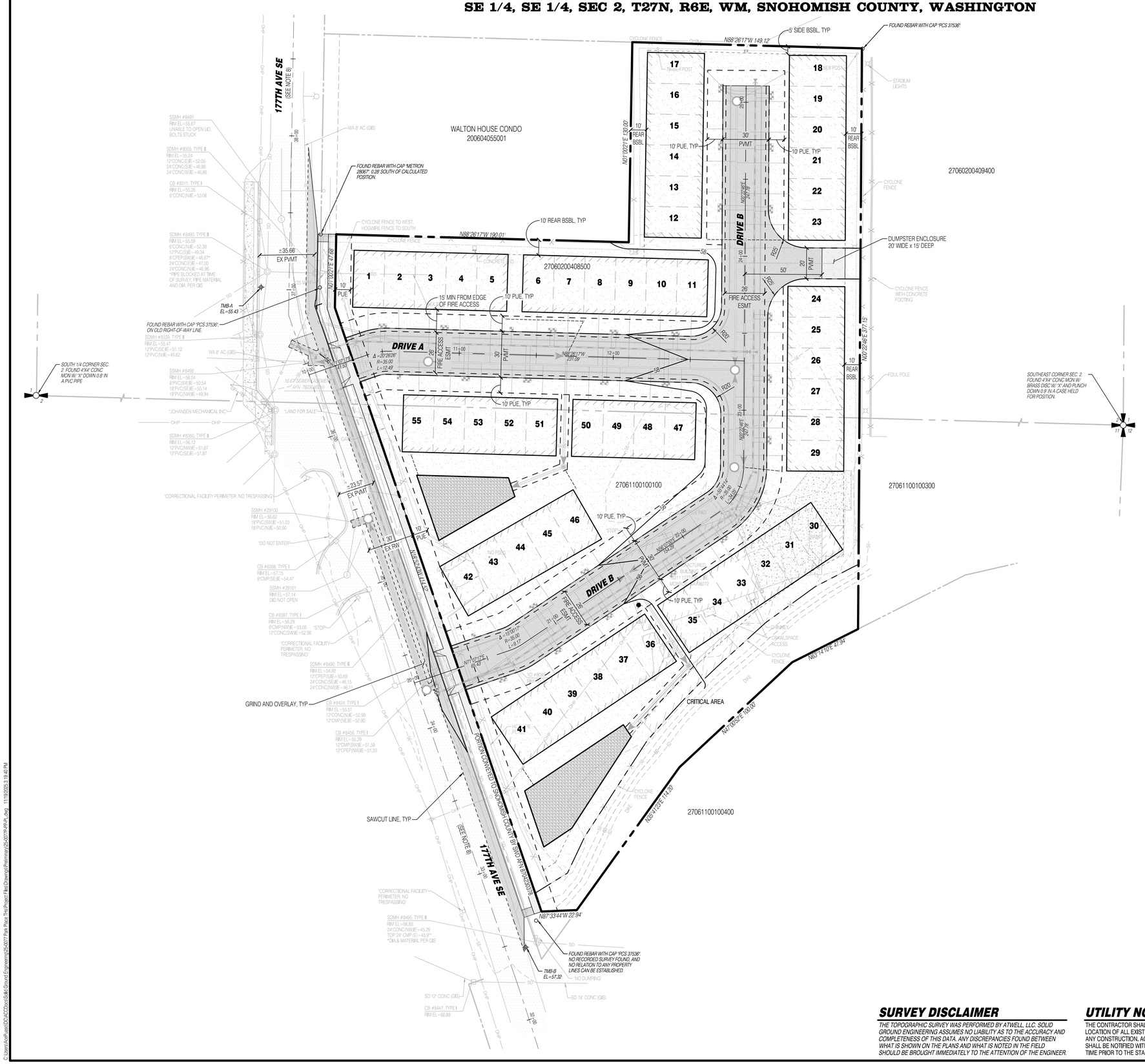
MONROE, WASHINGTON

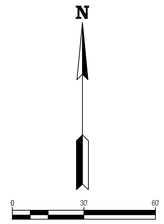
DRAWN BY:	KMA
CHECKED BY:	CJD
DATE:	9-29-25
JURISDICTION:	CITY OF MONROE
JOB NUMBER:	25-0077

EC-01
2 OF 8

C:\Users\AcctPulse\DCACDocs\S&M Ground Engineering\25-0077 Park Place TH\Project Files\Drawings\Preliminary\25-0077R-EC-P.dwg 11/19/2025 3:19:36 PM

SE 1/4, SE 1/4, SEC 2, T27N, R6E, WM, SNOHOMISH COUNTY, WASHINGTON





LEGEND

SYMBOLS	DESCRIPTION
	REMOVABLE BOLLARD
	'NO PARKING' SIGN UNLESS OTHERWISE NOTED
	RETAINING WALL
	ROCKERY WALL
	ASPHALT PAVEMENT
	ASPHALT GRIND AND OVERLAY
	CONCRETE PAVEMENT
	FALL PROTECTION FENCING
	STORM MAIN PIPE
	SEWER MAIN PIPE
	WATER MAIN PIPE
	DRAIN PIPE
	FRENCH DRAIN
	FIRE HYDRANT
	WATER METER
	WATER CAP
	SEWER MANHOLE
	SEWER CLEANOUT
	SEWER CAP
	TYPE 1 CATCH BASIN W/ SOLID LID
	TYPE 1 CATCH BASIN W/ OPEN GRATE
	TYPE 2 CATCH BASIN, SOLID LID
	TYPE 2 CATCH BASIN W/ OPEN GRATE
	TYPE 2 CATCH BASIN W/ BEEHIVE GRATE
	STORM CLEAN OUT
	STORM CAP

PROJECT INFORMATION

TAX PARCELS:	27061100100100, 27060200408500
SITE ADDRESS:	16311 177TH AVE SE, MONROE WA 98272
SITE AREA:	121,280 SF (2.78 AC)
PROPOSED ZONING:	MIXED USE - GENERAL (MG)
PROPOSED LAND USE:	TH CONDO UNITS
PROPOSED LOTS:	55 LOTS
BUILDING SETBACKS:	10' FRONT 5' SIDE 10' REAR
WATER:	CITY OF MONROE WATER SYSTEM
SEWER:	CITY OF MONROE SEWER SERVICE
POWER:	SNOHOMISH COUNTY PUD
GAS:	PUGET SOUND ENERGY
TELEPHONE:	ZIPLY
CABLE:	COMCAST
SCHOOL DISTRICT:	MONROE SCHOOL DISTRICT
FIRE DISTRICT:	SNOHOMISH REGIONAL FIRE & RESCUE STA 31

SURVEY DISCLAIMER

THE TOPOGRAPHIC SURVEY WAS PERFORMED BY ATWELL, LLC. SOLID GROUND ENGINEERING ASSUMES NO LIABILITY AS TO THE ACCURACY AND COMPLETENESS OF THIS DATA. ANY DISCREPANCIES FOUND BETWEEN WHAT IS SHOWN ON THE PLANS AND WHAT IS NOTED IN THE FIELD SHOULD BE BROUGHT IMMEDIATELY TO THE ATTENTION OF THE ENGINEER.

UTILITY NOTE

THE CONTRACTOR SHALL VERIFY THE LOCATION OF ALL EXISTING UTILITIES PRIOR TO ANY CONSTRUCTION. AGENCIES INVOLVED SHALL BE NOTIFIED WITHIN A REASONABLE TIME PRIOR TO THE START OF CONSTRUCTION.

811 SAFETY IS IN YOUR HANDS. EVERY DIG. EVERY TIME.

ENGINEER'S STAMP

CHRISTOPHER TODD CAMERON BOARD — STATE OF WASHINGTON — 21600413 — REGISTERED PROFESSIONAL ENGINEER

REVISIONS

#	DATE	DESCRIPTION

Solid Ground Engineering
8105 156th Ave NE
Redmond, WA 98052

PRELIMINARY PLAT MAP

HORIZON VIEW HOLDINGS, INC

PARK PLACE TOWNHOMES

MONROE, WASHINGTON

DRAWN BY:	KMA
CHECKED BY:	CJD
DATE:	9-29-25
JURISDICTION:	CITY OF MONROE
JOB NUMBER:	25-0077

PP-01

3 OF 8

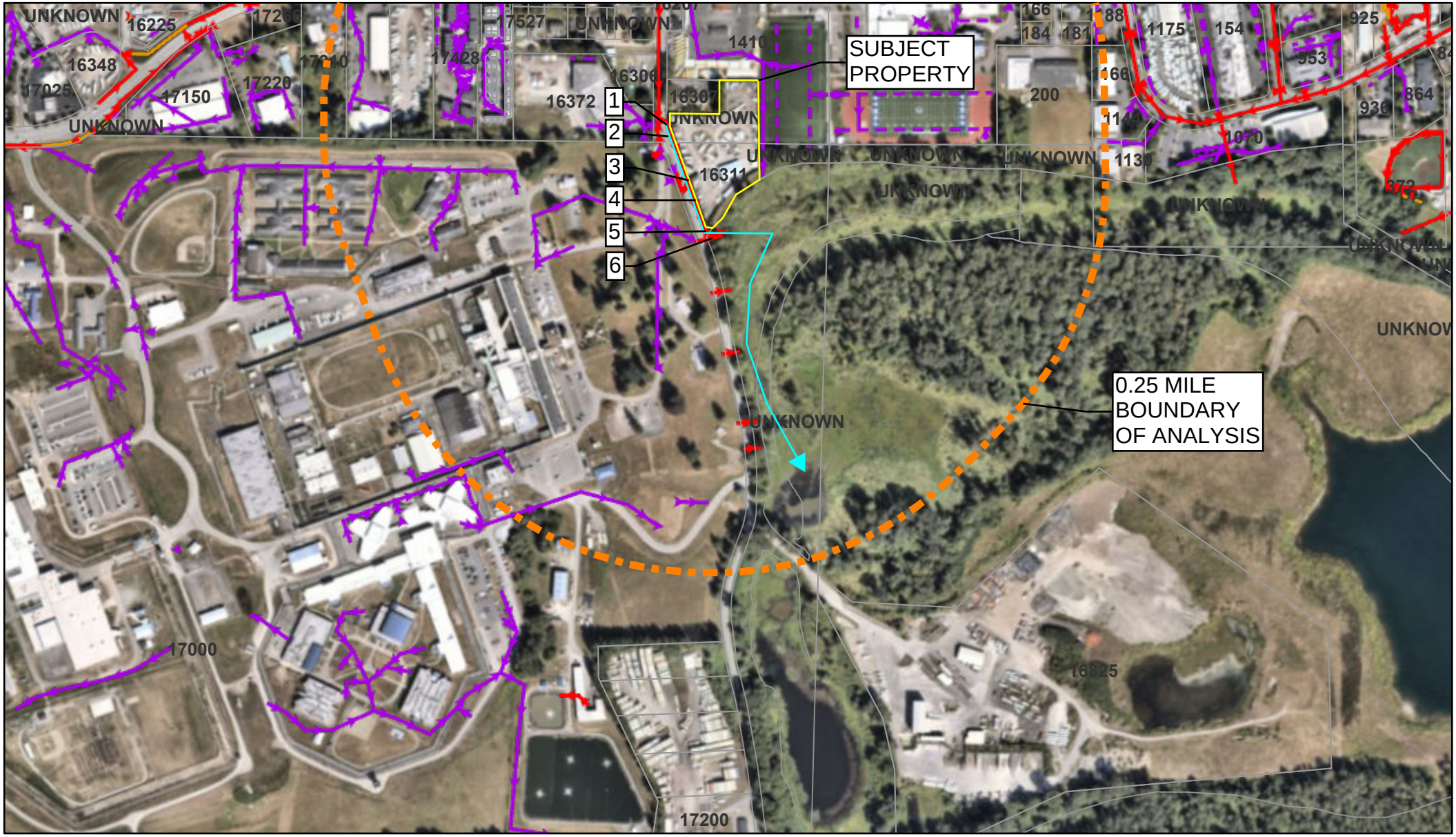
Appendix 2: Temporary Erosion and Sediment Control Design

1. TESC Plans

Appendix 3: Downstream Analysis

1. Downstream Analysis Map
2. Downstream Analysis Site Visit Pictures
3. USDA Soils Map & Description

Park Place Downstream Map



12/1/2025, 12:09:35 PM

Snohomish County Parcels - Parcels

Monroe City Limits

Private Main

Main

Public Main

Main

Private Infiltration Systems

Infiltration

Private Bioswales

Bioswale

Public Ditches

Ditch

1:9,028

0 275 550 1,100 ft

0 85 170 340 m

Everett Community College, Bureau of Land Management, Esri Canada, Esri, HERE, Garmin, INCREMENT P, Intermap, USGS, METI/NASA, EPA, USDA, City of Monroe

ArcGIS Web AppBuilder

Downstream Analysis Photographs

Image 1: Catch basin along 177th Ave SE at the north end of the site

Image 2: View facing south along property frontage on 177th Ave SE

Image 3: Existing catch basin along 177th Ave SE frontage at the existing site entrance

Image 4: Existing catch basin along 177th Ave SE frontage

Image 5: Existing storm structure along 177th Ave SE frontage prior to outfall

Image 6: Outfall into wetland area south of the site

Soil Map—Snohomish County Area, Washington

Map Scale: 1:1,030 if printed on A portrait (8.5" x 11") sheet.

N

Meters: 0 15 30 60 90

Feet: 0 50 100 200 300

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 10N WGS84

MAP LEGEND

Area of Interest (AOI)

- Area of Interest (AOI)

Soils

- Soil Map Unit Polygons
- Soil Map Unit Lines
- Soil Map Unit Points

Special Point Features

- Blowout
- Borrow Pit
- Clay Spot
- Closed Depression
- Gravel Pit
- Gravelly Spot
- Landfill
- Lava Flow
- Marsh or swamp
- Mine or Quarry
- Miscellaneous Water
- Perennial Water
- Rock Outcrop
- Saline Spot
- Sandy Spot
- Severely Eroded Spot
- Sinkhole
- Slide or Slip
- Sodic Spot
- Spoil Area
- Stony Spot
- Very Stony Spot
- Wet Spot
- Other
- Special Line Features

Water Features

- Streams and Canals

Transportation

- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background

- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Snohomish County Area, Washington
Survey Area Data: Version 26, Aug 27, 2024

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Aug 6, 2022—Sep 8, 2022

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

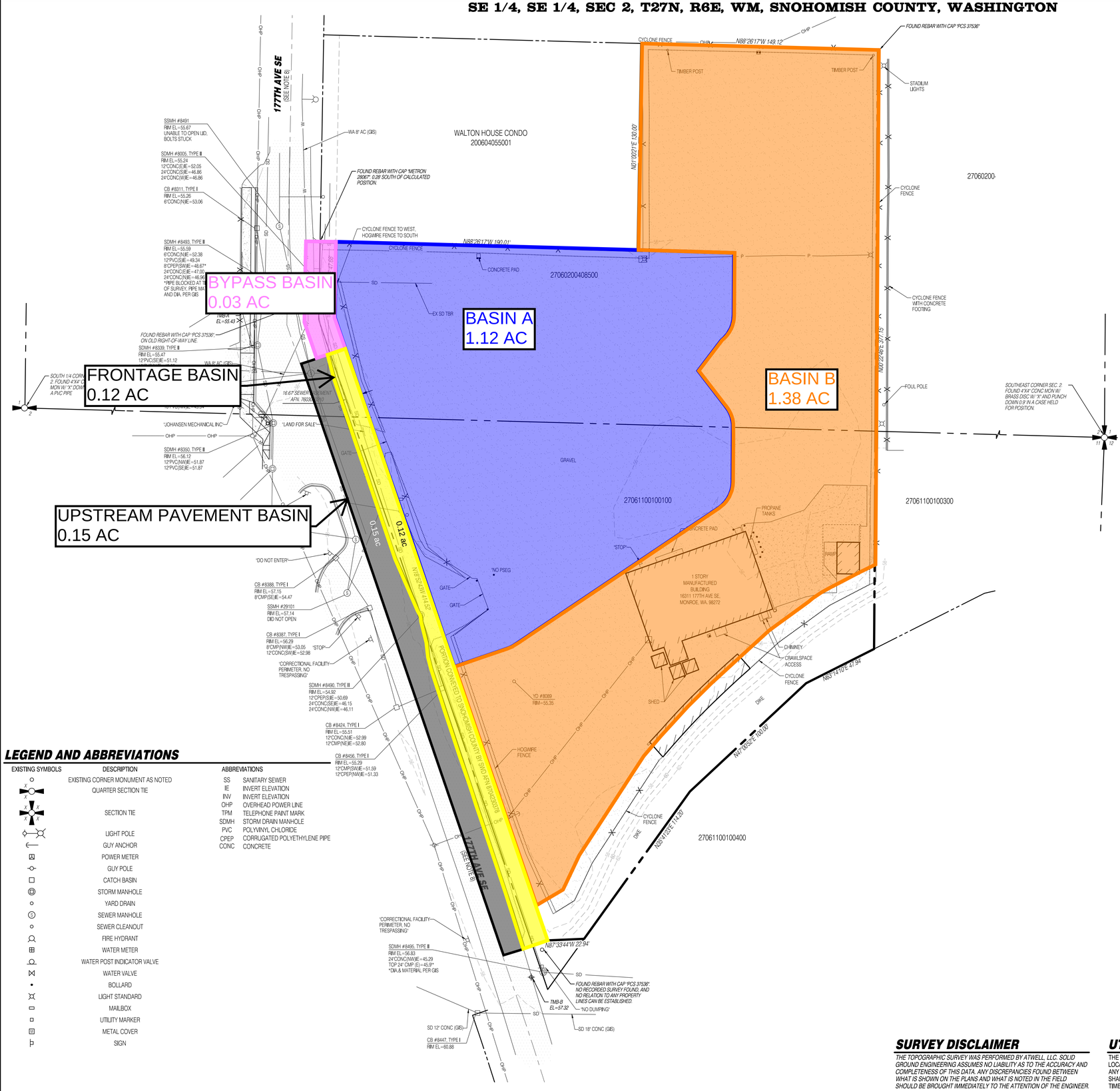
Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
66	Sultan silt loam	2.7	100.0%
Totals for Area of Interest		**2.7**	**100.0%**

Appendix 4: Detention and Water Quality Design Analysis

1. Predeveloped Hydrology Map
2. Developed Hydrology Map
3. WWHM2012 Output – Infiltration Facility A
4. WWHM2012 Output – Infiltration Facility B

SE 1/4, SE 1/4, SEC 2, T27N, R6E, WM, SNOHOMISH COUNTY, WASHINGTON



LEGEND AND ABBREVIATIONS

EXISTING SYMBOLS	DESCRIPTION
○	EXISTING CORNER MONUMENT AS NOTED
	QUARTER SECTION TIE
	SECTION TIE
	LIGHT POLE
	GUY ANCHOR
	POWER METER
	GUY POLE
	CATCH BASIN
	STORM MANHOLE
	YARD DRAIN
	SEWER MANHOLE
	SEWER CLEANOUT
	FIRE HYDRANT
	WATER METER
	WATER POST INDICATOR VALVE
	WATER VALVE
	BOLLARD
	LIGHT STANDARD
	MAILBOX
	UTILITY MARKER
	METAL COVER
	SIGN

ABBREVIATIONS	
SS	SANITARY SEWER
IE	INVERT ELEVATION
INV	INVERT ELEVATION
OHP	OVERHEAD POWER LINE
TPM	TELEPHONE PAINT MARK
SDMH	STORM DRAIN MANHOLE
PVC	POLYVINYL CHLORIDE
CPEP	CORRUGATED POLYETHYLENE PIPE
CONC	CONCRETE

N

0 30 60

SURVEY INFORMATION

LEGAL DESCRIPTION

THAT PORTION OF THE SOUTHEAST QUARTER OF THE SOUTHEAST QUARTER OF SECTION 2 AND THE NORTHEAST QUARTER OF THE NORTHEAST QUARTER (AKA GOVERNMENT LOT 1) OF SECTION 11, TOWNSHIP 27 NORTH, RANGE 6 EAST W.M. DESCRIBED AS FOLLOWS:

COMMENCING AT THE SOUTHEAST CORNER OF SAID SECTION 2;
THENCE SOUTH 89° 58'43" WEST ALONG THE SOUTH LINE OF SAID SUBDIVISION FOR 599.90 FEET TO THE EAST MARGIN OF REFORMATORY ROAD;
THENCE NORTH 20° 27'28" WEST ALONG SAID EAST MARGIN FOR 64.70 FEET;
THENCE NORTH 8° 34'20" WEST ALONG SAID MARGIN FOR 49.38 FEET TO THE TRUE POINT OF BEGINNING;
THENCE NORTH 89° 58'43" EAST PARALLEL TO THE SOUTH LINE OF SAID PORTION OF SECTION 2 FOR 200.00 FEET;
THENCE NORTH 0° 34'20" WEST FOR 130.00 FEET;
THENCE NORTH 89° 58'43" EAST FOR 149.27 FEET;
THENCE SOUTH 1° 11'51" EAST PARALLEL TO THE EAST LINE OF SAID PORTION OF SECTION 2 FOR 377.15 FEET TO THE NORTH BANK OF THE OLD CHANNEL OF THE SKYKOMISH RIVER AS LOCATED BY W.E. CRANE AND ASSOC;
THENCE SOUTH 61° 39'33" WEST ALONG SAID NORTH BANK LINE FOR 47.94 FEET;
THENCE SOUTH 45° 26'15" WEST FOR 100.00 FEET;
THENCE SOUTH 34° 06'46" WEST FOR 153.47 FEET TO THE EAST MARGIN OF REFORMATORY ROAD;
THENCE NORTH 20° 27'20" WEST ALONG SAID EAST MARGIN FOR 445.66 FEET;
THENCE NORTH 0° 34'20" WEST FOR 49.38 FEET TO THE TRUE POINT OF BEGINNING.
EXCEPT THAT PORTION CONVEYED TO SNOHOMISH COUNTY FOR RIGHT OF WAY BY DEED RECORDED UNDER AUDITOR'S FILE NO. 8704230378.

SITUATE IN THE COUNTY OF SNOHOMISH, STATE OF WASHINGTON

HORIZONTAL DATUM

WASHINGTON STATE PLANE COORDINATE SYSTEM - NORTH ZONE NAD83/2011 (2010.00 EPOCH) PER GNSS OBSERVATIONS UTILIZING CORRECTIONS FROM THE WASHINGTON STATE REFERENCE NETWORK (WSRN)

VERTICAL DATUM

NAVD 88 (PER GNSS OBSERVATIONS UTILIZING CORRECTIONS FROM THE WSRN)

BENCHMARKS

TBM-A
SET MAG NAIL IN ASPHALT ON THE WEST SIDE OF 177TH AVE SE, 2.1' EAST OF THE FACE OF CURB AND ±69' SOUTH OF THE NORTH END CURB.

ELEVATION=55.43

TBM-B
SET MAG NAIL ±0.3' WEST OF THE EAST EDGE ASPHALT PAVING FOR 177TH AVE SE, ±102' SOUTH OF A UTILITY POLE AND ±254' SOUTH OF THE SOUTHEAST CORNER DRIVEWAY FOR MONROE CORRECTIONAL COMPLEX.

ELEVATION=57.32

NOTES

1. A 5" ELECTRONIC TOTAL STATION WAS USED FOR THIS FIELD TRAVERSE SURVEY. ALL EQUIPMENT HAS BEEN MAINTAINED IN ACCORDANCE WITH THE MANUFACTURER'S GUIDELINES. ACCURACY MEETS OR EXCEEDS W.A.C. 332-130-090.
2. ALL TITLE INFORMATION SHOWN ON THIS SURVEY WAS EXTRACTED FROM CHICAGO TITLE COMPANY COMMITMENT NUMBER 500157236, AMENDMENT 1, DATED MAY 29, 2025. ATWELL, LLC HAS CONDUCTED NO INDEPENDENT TITLE RESEARCH, AND HAS RELIED WHOLLY ON THE TITLE COMPANY'S REPRESENTATIONS OF THE TITLE'S CONDITION TO PREPARE THIS SURVEY AND QUALIFIES THE MAP'S ACCURACY AND COMPLETENESS TO THAT EXTENT.
3. THE INFORMATION DEPICTED ON THIS MAP REPRESENTS THE RESULTS OF A SURVEY MADE ON THE DATE INDICATED AND CAN ONLY BE CONSIDERED AS INDICATING THE GENERAL CONDITION EXISTING AT THAT TIME. ALL CONTROL INDICATED AS 'FOUND' WAS RECOVERED FOR THIS PROJECT ON AUGUST 2025, UNLESS OTHERWISE NOTED.
4. PROPERTY AREA = 121,280± SQUARE FEET.
5. ALL DISTANCES ARE IN U.S. SURVEY FEET AND REPRESENT GROUND MEASUREMENTS.
6. UNDERGROUND UTILITIES WERE LOCATED BASED ON SURFACE EVIDENCE CLEARLY VISIBLE TO THE FIELD SURVEY CREW. CONNECTING PIPES ARE DRAWN AS STRAIGHT LINES BETWEEN STRUCTURES. SUPPLEMENTAL INFORMATION MAY HAVE BEEN USED TO DEPICT THE UNDERGROUND UTILITIES SHOWN ON THIS SURVEY, SUCH AS PAINT MARKS, SAW CUTS, OR RECORD DRAWING INFORMATION OBTAINED FROM FRANCHISE UTILITIES, PUBLIC UTILITY COMPANIES, AND PUBLIC GIS INFORMATION. ATWELL LLC MAKES NO CLAIM TO THE ACCURACY OF INFORMATION PROVIDED BY OTHERS OR OF UNDERGROUND PIPES, CABLES, STRUCTURES OR OTHER UTILITIES. THE EXACT LOCATION, SIZE, AND ELEVATION OF ALL UNDERGROUND UTILITIES WHICH ARE CRITICAL TO THE DESIGN MUST BE POTHOLED AND VERIFIED BY THE CLIENT.
7. TREE SIZES AND SPECIES WERE DETERMINED TO THE BEST OF OUR ABILITY. ATWELL, LLC DOES NOT WARRANT THE ACCURACY OF THE SIZE AND SPECIES OF ANY TREES SHOWN HEREON, ALL TREE SIZES SHOULD BE VERIFIED BY A TRAINED ARBORIST.
8. 177TH/REFORMATORY ROAD 30' RIGHT-OF-WAY ORIGINALLY ESTABLISHED BY PETITION FOR FORKS RD AND PATTISON FERRY RD IN VOLUME 2 OF THE COUNTY COMMISSIONERS JOURNAL AT PAGES 313-314 AND 331-335.

RESTRICTIONS OF RECORD

9. SUBJECT TO EASEMENT(S) GRANTED TO PUBLIC UTILITY DISTRICT NO. 1 OF SNOHOMISH CO. AND WEST COAST TELEPHONE FOR ELECTRIC TRANSMISSION AND/OR TELECOM, DISTRIBUTION LINES UNDER AUDITORS FILE NUMBER 1998476. NOT PLOTTED. THIS EASEMENT IS FOR AN ANCHOR THAT IS LOCATED ON THE SOUTH SIDE OF W MAIN ST.
9. SUBJECT TO EASEMENT(S) GRANTED TO THE CITY OF MONROE FOR SEWER LINES AND RIGHTS INCIDENTAL THERETO, AS GRANTED IN A DOCUMENT UNDER AUDITOR'S FILE NUMBER 7603040210.
10. SUBJECT TO COVENANTS, CONDITIONS, RESTRICTIONS, RECITALS, RESERVATIONS, EASEMENTS, EASEMENT PROVISIONS, ENCROACHMENTS, DEDICATIONS, BUILDING SETBACK LINES, NOTES, STATEMENTS, AND OTHER MATTERS, IF ANY, BUT OMITTING ANY COVENANTS OR RESTRICTIONS, IF ANY, INCLUDING BUT NOT LIMITED TO THOSE BASED UPON RACE, COLOR, RELIGION, SEX, SEXUAL ORIENTATION, FAMILIAL STATUS, MARITAL STATUS, DISABILITY, HANDICAP, NATIONAL ORIGIN, ANCESTRY, OR SOURCE OF INCOME, AS SET FORTH IN APPLICABLE STATE OR FEDERAL LAWS, EXCEPT TO THE EXTENT THAT SAID COVENANT OR RESTRICTION IS PERMITTED BY APPLICABLE LAW, AS SET FORTH ON SURVEY UNDER AUDITORS FILE NUMBER 7607190275.
11. SUBJECT TO COVENANTS, CONDITIONS, RESTRICTIONS, RECITALS, RESERVATIONS, EASEMENTS, EASEMENT PROVISIONS, ENCROACHMENTS, DEDICATIONS, BUILDING SETBACK LINES, NOTES, STATEMENTS, AND OTHER MATTERS, IF ANY, BUT OMITTING ANY COVENANTS OR RESTRICTIONS, IF ANY, INCLUDING BUT NOT LIMITED TO THOSE BASED UPON RACE, COLOR, RELIGION, SEX, SEXUAL ORIENTATION, FAMILIAL STATUS, MARITAL STATUS, DISABILITY, HANDICAP, NATIONAL ORIGIN, ANCESTRY, OR SOURCE OF INCOME, AS SET FORTH IN APPLICABLE STATE OR FEDERAL LAWS, EXCEPT TO THE EXTENT THAT SAID COVENANT OR RESTRICTION IS PERMITTED BY APPLICABLE LAW, AS SET FORTH ON SURVEY UNDER AUDITORS FILE NUMBER 9001315003.
12. SUBJECT TO COVENANTS, CONDITIONS, RESTRICTIONS, RECITALS, RESERVATIONS EASEMENTS, EASEMENT PROVISIONS, ENCROACHMENTS, DEDICATIONS, BUILDING SETBACK LINES, NOTES, STATEMENTS, AND OTHER MATTERS, IF ANY, BUT OMITTING ANY COVENANTS OR RESTRICTIONS, IF ANY, INCLUDING BUT NOT LIMITED TO THOSE BASED UPON RACE, COLOR, RELIGION, SEX, SEXUAL ORIENTATION, FAMILIAL STATUS, MARITAL STATUS, DISABILITY, HANDICAP, NATIONAL ORIGIN, ANCESTRY, OR SOURCE OF INCOME, AS SET FORTH IN APPLICABLE STATE OR FEDERAL LAWS, EXCEPT TO THE EXTENT THAT SAID COVENANT OR RESTRICTION IS PERMITTED BY APPLICABLE LAW, AS SET FORTH ON SURVEY OF WALTON HOUSE CONDO UNDER AUDITOR'S FILE NUMBER 200604055001.

SURVEY DISCLAIMER

THE TOPOGRAPHIC SURVEY WAS PERFORMED BY ATWELL, LLC. SOLID GROUND ENGINEERING ASSUMES NO LIABILITY AS TO THE ACCURACY AND COMPLETENESS OF THIS DATA. ANY DISCREPANCIES FOUND BETWEEN WHAT IS SHOWN ON THE PLANS AND WHAT IS NOTED IN THE FIELD SHOULD BE BROUGHT IMMEDIATELY TO THE ATTENTION OF THE ENGINEER.

UTILITY NOTE

THE CONTRACTOR SHALL VERIFY THE LOCATION OF ALL EXISTING UTILITIES PRIOR TO ANY CONSTRUCTION. AGENCIES INVOLVED SHALL BE NOTIFIED WITHIN A REASONABLE TIME PRIOR TO THE START OF CONSTRUCTION.

811 SAFETY IS IN YOUR HANDS. EVERY DIG. EVERY TIME.

ENGINEER'S STAMP

REVISIONS

#	DESCRIPTION	DATE

Solid Ground Engineering
8105 156th Ave NE
Redmond, WA 98052

EXISTING CONDITIONS MAP

HORIZON VIEW HOLDINGS, INC

PARK PLACE TOWNHOMES

MONROE, WASHINGTON

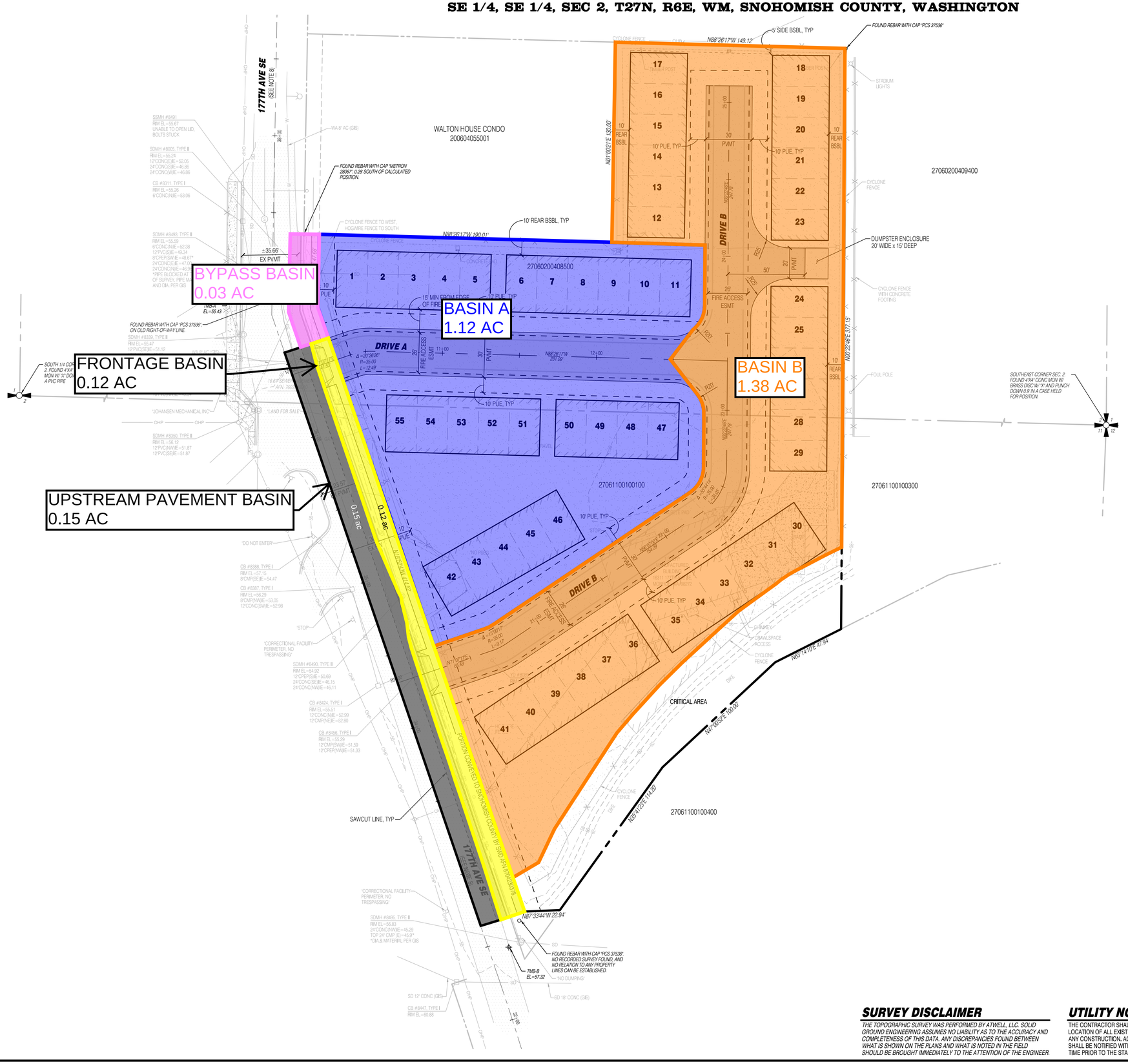
DRAWN BY:	KMA
CHECKED BY:	CJD
DATE:	9-29-25
JURISDICTION:	CITY OF MONROE
JOB NUMBER:	25-0077

EC-01

2 OF 8

C:\Users\AcePuter\DCACDocs\Solid Ground Engineering\25-0077 Park Place TH's\Project Files\Drawings\Preliminary\25-0077P-EC-PL.dwg 11/19/2025 3:19:36 PM

SE 1/4, SE 1/4, SEC 2, T27N, R6E, WM, SNOHOMISH COUNTY, WASHINGTON



LEGEND

SYMBOLS	DESCRIPTION
	REMOVABLE BOLLARD
	'NO PARKING' SIGN UNLESS OTHERWISE NOTED
	RETAINING WALL
	ROCKERY WALL
	ASPHALT PAVEMENT
	ASPHALT GRIND AND OVERLAY
	CONCRETE PAVEMENT
	FALL PROTECTION FENCING

PROJECT INFORMATION

TAX PARCELS:	27061100100100, 27060200408500
SITE ADDRESS:	16311 177TH AVE SE, MONROE WA 98272
SITE AREA:	121,280 SF (2.78 AC)
PROPOSED ZONING:	MIXED USE - GENERAL (MG)
PROPOSED LAND USE:	TH CONDO UNITS
PROPOSED LOTS:	55 LOTS
BUILDING SETBACKS:	10' FRONT 5' SIDE 10' REAR
WATER:	CITY OF MONROE WATER SYSTEM
SEWER:	CITY OF MONROE SEWER SERVICE
POWER:	SNOHOMISH COUNTY PUD
GAS:	PUGET SOUND ENERGY
TELEPHONE:	ZIPLY
CABLE:	COMCAST
SCHOOL DISTRICT:	MONROE SCHOOL DISTRICT
FIRE DISTRICT:	SNOHOMISH REGIONAL FIRE & RESCUE STA 31

SURVEY DISCLAIMER

THE TOPOGRAPHIC SURVEY WAS PERFORMED BY ATWELL, LLC. SOLID GROUND ENGINEERING ASSUMES NO LIABILITY AS TO THE ACCURACY AND COMPLETENESS OF THIS DATA. ANY DISCREPANCIES FOUND BETWEEN WHAT IS SHOWN ON THE PLANS AND WHAT IS NOTED IN THE FIELD SHOULD BE BROUGHT IMMEDIATELY TO THE ATTENTION OF THE ENGINEER.

UTILITY NOTE

THE CONTRACTOR SHALL VERIFY THE LOCATION OF ALL EXISTING UTILITIES PRIOR TO ANY CONSTRUCTION. AGENCIES INVOLVED SHALL BE NOTIFIED WITHIN A REASONABLE TIME PRIOR TO THE START OF CONSTRUCTION.

811 SAFETY IS IN YOUR HANDS. EVERY DIG. EVERY TIME.

TIMOTHY TORIE CAMERON BOARD — STATE OF WASHINGTON — 21600415 — REGISTERED PROFESSIONAL ENGINEER

ENGINEER'S STAMP

REVISIONS

#	DESCRIPTION	DATE

Solid Ground Engineering
8105 156th Ave NE
Redmond, WA 98052

PRELIMINARY PLAT MAP

HORIZON VIEW HOLDINGS, INC

PARK PLACE TOWNHOMES

MONROE, WASHINGTON

DRAWN BY:	KMA
CHECKED BY:	CJD
DATE:	9-29-25
JURISDICTION:	CITY OF MONROE
JOB NUMBER:	25-0077

PP-01

3 OF 8

C:\Users\jaymarner\DCACDocs\Solid Ground Engineering\25-0077 Park Place Tri\Project Files\Drawing\Preliminary\25-0077P-PP-PL.dwg 10/15/2025 9:25:15 AM

WWHM2012

PROJECT REPORT

INFILTRATION FACILITY A

General Model Information

WWHM2012 Project Name: Park Place A
Site Name:
Site Address:
City:

Report Date:	10/24/2025
Gage:	Everett
Data Start:	1948/10/01
Data End:	2009/09/30
Timestep:	15 Minute
Precip Scale:	1.200
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	1.12
Pervious Total	1.12
Impervious Land Use	acre
Impervious Total	0
Basin Total	1.12

Upstream Pavement

Bypass:	No
GroundWater:	No
Pervious Land Use	acre
Pervious Total	0
Impervious Land Use	acre
ROADS FLAT	0.15
Impervious Total	0.15
Basin Total	0.15

Frontage

Bypass:	No
GroundWater:	No
Pervious Land Use	acre
C, Forest, Flat	0.12
Pervious Total	0.12
Impervious Land Use	acre
Impervious Total	0
Basin Total	0.12

Bypass

Bypass:	No
GroundWater:	No
Pervious Land Use	acre
C, Forest, Flat	0.03
Pervious Total	0.03
Impervious Land Use	acre
Impervious Total	0
Basin Total	0.03

Mitigated Land Use

Basin 1

Bypass:	No
GroundWater:	No

Pervious Land Use	acre
C, Pasture, Flat	0.24
Pervious Total	0.24

Impervious Land Use	acre
ROADS FLAT	0.12
ROOF TOPS FLAT	0.42
DRIVEWAYS FLAT	0.29
SIDEWALKS FLAT	0.05
Impervious Total	0.88
Basin Total	1.12

Upstream Pavement

Bypass:	No
GroundWater:	No
Pervious Land Use	acre
Pervious Total	0
Impervious Land Use	acre
ROADS FLAT	0.15
Impervious Total	0.15
Basin Total	0.15

Frontage

Bypass:	No
GroundWater:	No

Pervious Land Use	acre
C, Pasture, Flat	0.05
Pervious Total	0.05

Impervious Land Use	acre
ROADS FLAT	0.02
SIDEWALKS FLAT	0.05
Impervious Total	0.07
Basin Total	0.12

Bypass

Bypass:	Yes
GroundWater:	No

Pervious Land Use	acre
C, Pasture, Flat	0.01
Pervious Total	0.01

Impervious Land Use	acre
ROADS FLAT	0.01
SIDEWALKS FLAT	0.01
Impervious Total	0.02
Basin Total	0.03

Routing Elements
Predeveloped Routing

Mitigated Routing

Gravel Trench Bed 1

Bottom Length:	50.00 ft.
Bottom Width:	32.00 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:	5.5
Pour Space of material for first layer:	0.4
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:	7.3
Infiltration safety factor:	1
Wetted surface area On	
Total Volume Infiltrated (ac-ft.):	234.769
Total Volume Through Riser (ac-ft.):	0.038
Total Volume Through Facility (ac-ft.):	234.808
Percent Infiltrated:	99.98
Total Precip Applied to Facility:	0
Total Evap From Facility:	0
Discharge Structure	
Riser Height:	4.5 ft.
Riser Diameter:	12 in.
Element Flows To:	
Outlet 1	Outlet 2

Gravel Trench Bed Hydraulic Table

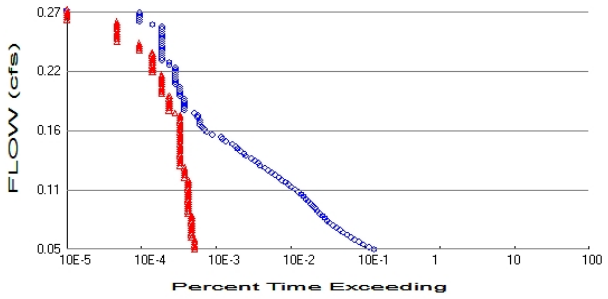
Stage(feet)	Area(ac.)	Volume(ac-ft.)	Discharge(cfs)	Infilt(cfs)
0.0000	0.036	0.000	0.000	0.000
0.0611	0.036	0.000	0.000	0.270
0.1222	0.036	0.001	0.000	0.270
0.1833	0.036	0.002	0.000	0.270
0.2444	0.036	0.003	0.000	0.270
0.3056	0.036	0.004	0.000	0.270
0.3667	0.036	0.005	0.000	0.270
0.4278	0.036	0.006	0.000	0.270
0.4889	0.036	0.007	0.000	0.270
0.5500	0.036	0.008	0.000	0.270
0.6111	0.036	0.009	0.000	0.270
0.6722	0.036	0.009	0.000	0.270
0.7333	0.036	0.010	0.000	0.270
0.7944	0.036	0.011	0.000	0.270
0.8556	0.036	0.012	0.000	0.270
0.9167	0.036	0.013	0.000	0.270
0.9778	0.036	0.014	0.000	0.270
1.0389	0.036	0.015	0.000	0.270
1.1000	0.036	0.016	0.000	0.270
1.1611	0.036	0.017	0.000	0.270
1.2222	0.036	0.018	0.000	0.270
1.2833	0.036	0.018	0.000	0.270
1.3444	0.036	0.019	0.000	0.270

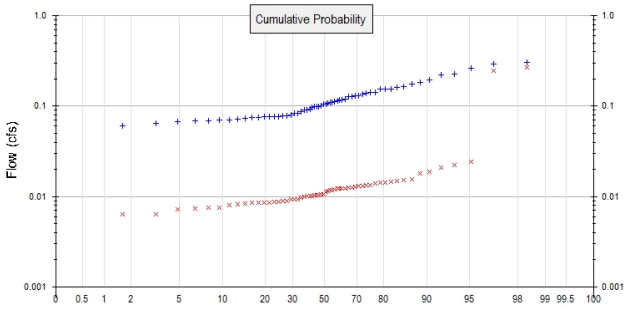
1.4056	0.036	0.020	0.000	0.270
1.4667	0.036	0.021	0.000	0.270
1.5278	0.036	0.022	0.000	0.270
1.5889	0.036	0.023	0.000	0.270
1.6500	0.036	0.024	0.000	0.270
1.7111	0.036	0.025	0.000	0.270
1.7722	0.036	0.026	0.000	0.270
1.8333	0.036	0.026	0.000	0.270
1.8944	0.036	0.027	0.000	0.270
1.9556	0.036	0.028	0.000	0.270
2.0167	0.036	0.029	0.000	0.270
2.0778	0.036	0.030	0.000	0.270
2.1389	0.036	0.031	0.000	0.270
2.2000	0.036	0.032	0.000	0.270
2.2611	0.036	0.033	0.000	0.270
2.3222	0.036	0.034	0.000	0.270
2.3833	0.036	0.035	0.000	0.270
2.4444	0.036	0.035	0.000	0.270
2.5056	0.036	0.036	0.000	0.270
2.5667	0.036	0.037	0.000	0.270
2.6278	0.036	0.038	0.000	0.270
2.6889	0.036	0.039	0.000	0.270
2.7500	0.036	0.040	0.000	0.270
2.8111	0.036	0.041	0.000	0.270
2.8722	0.036	0.042	0.000	0.270
2.9333	0.036	0.043	0.000	0.270
2.9944	0.036	0.044	0.000	0.270
3.0556	0.036	0.044	0.000	0.270
3.1167	0.036	0.045	0.000	0.270
3.1778	0.036	0.046	0.000	0.270
3.2389	0.036	0.047	0.000	0.270
3.3000	0.036	0.048	0.000	0.270
3.3611	0.036	0.049	0.000	0.270
3.4222	0.036	0.050	0.000	0.270
3.4833	0.036	0.051	0.000	0.270
3.5444	0.036	0.052	0.000	0.270
3.6056	0.036	0.053	0.000	0.270
3.6667	0.036	0.053	0.000	0.270
3.7278	0.036	0.054	0.000	0.270
3.7889	0.036	0.055	0.000	0.270
3.8500	0.036	0.056	0.000	0.270
3.9111	0.036	0.057	0.000	0.270
3.9722	0.036	0.058	0.000	0.270
4.0333	0.036	0.059	0.000	0.270
4.0944	0.036	0.060	0.000	0.270
4.1556	0.036	0.061	0.000	0.270
4.2167	0.036	0.062	0.000	0.270
4.2778	0.036	0.062	0.000	0.270
4.3389	0.036	0.063	0.000	0.270
4.4000	0.036	0.064	0.000	0.270
4.4611	0.036	0.065	0.000	0.270
4.5222	0.036	0.066	0.035	0.270
4.5833	0.036	0.067	0.254	0.270
4.6444	0.036	0.068	0.572	0.270
4.7056	0.036	0.069	0.942	0.270
4.7667	0.036	0.070	1.318	0.270
4.8278	0.036	0.070	1.656	0.270
4.8889	0.036	0.071	1.921	0.270

4.9500	0.036	0.072	2.101	0.270
5.0111	0.036	0.073	2.251	0.270
5.0722	0.036	0.074	2.382	0.270
5.1333	0.036	0.075	2.506	0.270
5.1944	0.036	0.076	2.624	0.270
5.2556	0.036	0.077	2.737	0.270
5.3167	0.036	0.078	2.846	0.270
5.3778	0.036	0.079	2.950	0.270
5.4389	0.036	0.079	3.051	0.270
5.5000	0.036	0.080	3.149	0.270

Analysis Results

POC 1





\+ Predeveloped x Mitigated

Predeveloped Landuse Totals for POC #1
Total Pervious Area: 1.27
Total Impervious Area: 0.15

Mitigated Landuse Totals for POC #1
Total Pervious Area: 0.3
Total Impervious Area: 1.12

Flow Frequency Method: Log Pearson Type III 17B

Flow Frequency Return Periods for Predeveloped. POC #1

Return Period	Flow(cfs)
2 year	0.105341
5 year	0.150255
10 year	0.184463
25 year	0.233081
50 year	0.273419
100 year	0.317467

Flow Frequency Return Periods for Mitigated. POC #1

Return Period	Flow(cfs)
2 year	0.011265
5 year	0.020112
10 year	0.028467
25 year	0.042703
50 year	0.056594
100 year	0.073899

Annual Peaks

Annual Peaks for Predeveloped and Mitigated. POC #1

Year	Predeveloped	Mitigated
1949	0.128	0.012
1950	0.135	0.013
1951	0.099	0.013
1952	0.098	0.010
1953	0.118	0.013
1954	0.260	0.018
1955	0.130	0.013
1956	0.084	0.006
1957	0.130	0.010
1958	0.223	0.245

1959	0.090	0.010
1960	0.106	0.010
1961	0.305	0.266
1962	0.101	0.012
1963	0.160	0.014
1964	0.084	0.008
1965	0.071	0.009
1966	0.071	0.009
1967	0.155	0.021
1968	0.111	0.011
1969	0.290	0.024
1970	0.076	0.009
1971	0.116	0.012
1972	0.128	0.016
1973	0.108	0.013
1974	0.155	0.015
1975	0.116	0.012
1976	0.069	0.008
1977	0.065	0.008
1978	0.076	0.006
1979	0.181	0.014
1980	0.093	0.009
1981	0.076	0.009
1982	0.079	0.009
1983	0.119	0.012
1984	0.088	0.011
1985	0.112	0.015
1986	0.195	0.015
1987	0.099	0.013
1988	0.091	0.010
1989	0.105	0.011
1990	0.078	0.008
1991	0.077	0.010
1992	0.097	0.010
1993	0.076	0.008
1994	0.068	0.009
1995	0.069	0.008
1996	0.138	0.012
1997	0.228	0.013
1998	0.110	0.014
1999	0.071	0.006
2000	0.166	0.022
2001	0.057	0.007
2002	0.061	0.007
2003	0.074	0.010
2004	0.140	0.019
2005	0.073	0.009
2006	0.174	0.012
2007	0.154	0.011
2008	0.143	0.009
2009	0.081	0.009

Ranked Annual Peaks

Ranked Annual Peaks for Predeveloped and Mitigated. POC #1

Rank	Predeveloped	Mitigated
1	0.3051	0.2665
2	0.2895	0.2450
3	0.2603	0.0240

4	0.2284	0.0221
5	0.2231	0.0207
6	0.1947	0.0188
7	0.1814	0.0181
8	0.1737	0.0155
9	0.1660	0.0151
10	0.1605	0.0150
11	0.1555	0.0146
12	0.1546	0.0143
13	0.1537	0.0143
14	0.1428	0.0139
15	0.1405	0.0133
16	0.1378	0.0132
17	0.1353	0.0132
18	0.1301	0.0131
19	0.1296	0.0129
20	0.1282	0.0126
21	0.1281	0.0126
22	0.1191	0.0122
23	0.1179	0.0122
24	0.1160	0.0122
25	0.1159	0.0122
26	0.1117	0.0120
27	0.1107	0.0117
28	0.1098	0.0117
29	0.1077	0.0114
30	0.1064	0.0112
31	0.1053	0.0106
32	0.1007	0.0105
33	0.0992	0.0103
34	0.0989	0.0102
35	0.0979	0.0102
36	0.0972	0.0102
37	0.0935	0.0102
38	0.0910	0.0100
39	0.0901	0.0099
40	0.0876	0.0097
41	0.0841	0.0093
42	0.0837	0.0093
43	0.0805	0.0093
44	0.0786	0.0090
45	0.0778	0.0089
46	0.0772	0.0088
47	0.0765	0.0086
48	0.0763	0.0086
49	0.0758	0.0086
50	0.0757	0.0086
51	0.0743	0.0085
52	0.0728	0.0084
53	0.0714	0.0083
54	0.0709	0.0079
55	0.0707	0.0076
56	0.0695	0.0076
57	0.0685	0.0074
58	0.0675	0.0072
59	0.0653	0.0064
60	0.0608	0.0063
61	0.0569	0.0058

Duration Flows

The Facility PASSED

Flow(cfs)	Predev	Mit	Percentage	Pass/Fail
0.0527	2776	11	0	Pass
0.0549	2383	11	0	Pass
0.0571	2029	11	0	Pass
0.0594	1742	11	0	Pass
0.0616	1536	11	0	Pass
0.0638	1374	10	0	Pass
0.0660	1215	10	0	Pass
0.0683	1089	10	0	Pass
0.0705	979	10	1	Pass
0.0727	874	10	1	Pass
0.0750	794	10	1	Pass
0.0772	719	10	1	Pass
0.0794	650	10	1	Pass
0.0817	608	10	1	Pass
0.0839	568	10	1	Pass
0.0861	525	9	1	Pass
0.0883	491	9	1	Pass
0.0906	456	9	1	Pass
0.0928	426	9	2	Pass
0.0950	396	9	2	Pass
0.0973	366	9	2	Pass
0.0995	339	9	2	Pass
0.1017	316	9	2	Pass
0.1040	294	9	3	Pass
0.1062	269	9	3	Pass
0.1084	246	9	3	Pass
0.1106	220	9	4	Pass
0.1129	199	9	4	Pass
0.1151	182	9	4	Pass
0.1173	162	9	5	Pass
0.1196	148	8	5	Pass
0.1218	132	8	6	Pass
0.1240	119	8	6	Pass
0.1263	106	8	7	Pass
0.1285	96	8	8	Pass
0.1307	82	7	8	Pass
0.1329	78	7	8	Pass
0.1352	70	7	10	Pass
0.1374	63	7	11	Pass
0.1396	54	7	12	Pass
0.1419	51	7	13	Pass
0.1441	45	7	15	Pass
0.1463	41	7	17	Pass
0.1486	39	7	17	Pass
0.1508	35	7	20	Pass
0.1530	29	7	24	Pass
0.1552	26	7	26	Pass
0.1575	25	7	28	Pass
0.1597	19	7	36	Pass
0.1619	16	7	43	Pass
0.1642	15	7	46	Pass
0.1664	14	7	50	Pass
0.1686	13	7	53	Pass

0.1708	13	7	53	Pass
0.1731	13	7	53	Pass
0.1753	12	7	58	Pass
0.1775	12	7	58	Pass
0.1798	11	6	54	Pass
0.1820	8	5	62	Pass
0.1842	8	5	62	Pass
0.1865	8	5	62	Pass
0.1887	8	5	62	Pass
0.1909	8	5	62	Pass
0.1931	8	5	62	Pass
0.1954	7	5	71	Pass
0.1976	7	4	57	Pass
0.1998	7	4	57	Pass
0.2021	7	4	57	Pass
0.2043	7	4	57	Pass
0.2065	6	4	66	Pass
0.2088	6	4	66	Pass
0.2110	6	4	66	Pass
0.2132	6	4	66	Pass
0.2154	6	4	66	Pass
0.2177	6	3	50	Pass
0.2199	6	3	50	Pass
0.2221	6	3	50	Pass
0.2244	5	3	60	Pass
0.2266	5	3	60	Pass
0.2288	4	3	75	Pass
0.2311	4	3	75	Pass
0.2333	4	3	75	Pass
0.2355	4	3	75	Pass
0.2377	4	2	50	Pass
0.2400	4	2	50	Pass
0.2422	4	2	50	Pass
0.2444	4	2	50	Pass
0.2467	4	1	25	Pass
0.2489	4	1	25	Pass
0.2511	4	1	25	Pass
0.2534	4	1	25	Pass
0.2556	4	1	25	Pass
0.2578	4	1	25	Pass
0.2600	4	1	25	Pass
0.2623	3	1	33	Pass
0.2645	2	1	50	Pass
0.2667	2	0	0	Pass
0.2690	2	0	0	Pass
0.2712	2	0	0	Pass
0.2734	2	0	0	Pass

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	☐	213.67			☐	99.98			
Total Volume Infiltrated		213.67	0.00	0.00		99.98	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

```
RUN

GLOBAL
  WWHM4 model simulation
  START       1948 10 01        END    2009 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   Park Place A.wdm
MESSU       25   PrePark Place A.MES
            27   PrePark Place A.L61
            28   PrePark Place A.L62
            30   POCPark Place A1.dat
END FILES

OPN SEQUENCE
    INGRP               INDELT 00:15
      PERLND      10
      IMPLND       1
      COPY       501
      DISPLY       1
    END INGRP
END OPN SEQUENCE
DISPLY
  DISPLY-INFO1
    # -  #<----------Title---------->***TRAN PIVL DIG1 FIL1  PYR DIG2 FIL2 YRND
    1        Basin  1                  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            ***
   10     C, Forest, Flat         1    1    1    1   27    0
  END GEN-INFO
  *** Section PWATER***

  ACTIVITY
    <PLS > ************ Active Sections ****************************
    # -  # ATMP SNOW PWAT  SED  PST  PWG PQAL MSTL PEST NITR PHOS TRAC ***
   10         0    0    1    0    0    0    0    0    0    0    0    0
  END ACTIVITY

  PRINT-INFO
    <PLS > ***************** Print-flags **************************** PIVL  PYR
    # -  # ATMP SNOW PWAT  SED  PST  PWG PQAL MSTL PEST NITR PHOS TRAC  *********
   10         0    0    4    0    0    0    0    0    0    0    0    0    1    9
  END PRINT-INFO
```

```
  PWAT-PARM1
    <PLS >  PWATER variable monthly parameter value flags  ***
    # -  # CSNO RTOP UZFG  VCS  VUZ  VNN VIFW VIRC  VLE INFC  HWT ***
   10         0    0    0    0    0    0    0    0    0    0
  END PWAT-PARM1

  PWAT-PARM2
    <PLS >      PWATER input info: Part 2         ***
    # -  # ***FOREST      LZSN    INFILT      LSUR     SLSUR     KVARY     AGWRC
   10             0       4.5      0.08       400      0.05       0.5     0.996
  END PWAT-PARM2

  PWAT-PARM3
    <PLS >      PWATER input info: Part 3         ***
    # -  # ***PETMAX    PETMIN    INFEXP    INFILD    DEEPFR    BASETP    AGWETP
   10             0         0         2         2         0         0         0
  END PWAT-PARM3
  PWAT-PARM4
    <PLS >     PWATER input info: Part 4                              ***
    # -  #     CEPSC      UZSN      NSUR     INTFW       IRC     LZETP ***
   10            0.2       0.5      0.35         6       0.5       0.7
  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
   10             0         0         0          0       2.5          1         0
  END PWAT-STATE1

END PERLND

IMPLND
  GEN-INFO
    <PLS ><-------Name------->   Unit-systems   Printer ***
    # -  #                     User  t-series Engl Metr ***
                                     in  out           ***
    1      ROADS/FLAT              1    1    1   27    0
  END GEN-INFO
  *** Section IWATER***

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

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

  IWAT-PARM1
    <PLS >  IWATER variable monthly parameter value flags  ***
    # -  # CSNO RTOP  VRS  VNN RTLI     ***
    1         0    0    0    0    0
  END IWAT-PARM1

  IWAT-PARM2
    <PLS >      IWATER input info: Part 2         ***
    # -  # ***  LSUR     SLSUR      NSUR     RETSC
    1            400      0.01       0.1       0.1
  END IWAT-PARM2

  IWAT-PARM3
    <PLS >      IWATER input info: Part 3         ***
    # -  # ***PETMAX    PETMIN
    1             0         0
```

```
  END IWAT-PARM3

  IWAT-STATE1
    <PLS > *** Initial conditions at start of simulation
    # -  # ***  RETS      SURS
    1             0         0
  END IWAT-STATE1

END IMPLND

SCHEMATIC
<-Source->                  <--Area-->     <-Target->   MBLK   ***
<Name>   #                  <-factor->     <Name>   #   Tbl#   ***
Basin  1***
PERLND  10                        1.12     COPY   501     12
PERLND  10                        1.12     COPY   501     13
Upstream Pavement***
IMPLND   1                        0.15     COPY   501     15
Frontage***
PERLND  10                        0.12     COPY   501     12
PERLND  10                        0.12     COPY   501     13
Bypass***
PERLND  10                        0.03     COPY   501     12
PERLND  10                        0.03     COPY   501     13

******Routing******
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                                ***
  END GEN-INFO
  *** Section RCHRES***

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

  PRINT-INFO
    <PLS > ***************** Print-flags ****************** PIVL  PYR
    # -  # HYDR ADCA CONS HEAT  SED  GQL OXRX NUTR PLNK PHCB PIVL  PYR  *********
  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
             *  *  *  *    *  *  *  *  *       *  *  *  *  *         ***
  END HYDR-PARM1

  HYDR-PARM2
    # -  #    FTABNO       LEN     DELTH     STCOR        KS      DB50       ***
  <------><--------><--------><--------><--------><--------><-------->      ***
  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
  <------><-------->     <---><---><---><---><---> *** <---><---><---><---><--->
  END HYDR-INIT
END RCHRES

SPEC-ACTIONS
END SPEC-ACTIONS
FTABLES
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    1.2           PERLND   1 999 EXTNL  PREC
WDM      2 PREC     ENGL    1.2           IMPLND   1 999 EXTNL  PREC
WDM      1 EVAP     ENGL    0.76          PERLND   1 999 EXTNL  PETINP
WDM      1 EVAP     ENGL    0.76          IMPLND   1 999 EXTNL  PETINP

END EXT SOURCES

EXT TARGETS
<-Volume-> <-Grp> <-Member-><--Mult-->Tran <-Volume-> <Member> Tsys Tgap Amd ***
<Name>   #        <Name> # #<-factor->strg <Name>   # <Name>    tem strg strg***
COPY   501 OUTPUT MEAN   1 1     48.4      WDM    501 FLOW     ENGL      REPL
END EXT TARGETS

MASS-LINK
<Volume>   <-Grp> <-Member-><--Mult-->     <Target>       <-Grp> <-Member->***
<Name>            <Name> # #<-factor->     <Name>                <Name> # #***
  MASS-LINK       12
PERLND     PWATER SURO       0.083333      COPY           INPUT  MEAN
  END MASS-LINK   12

  MASS-LINK       13
PERLND     PWATER IFWO       0.083333      COPY           INPUT  MEAN
  END MASS-LINK   13

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


END MASS-LINK

END RUN
```

Mitigated UCI File

```
RUN

GLOBAL
  WWHM4 model simulation
  START       1948 10 01        END    2009 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   Park Place A.wdm
MESSU       25   MitPark Place A.MES
            27   MitPark Place A.L61
            28   MitPark Place A.L62
            30   POCPark Place A1.dat
END FILES

OPN SEQUENCE
    INGRP               INDELT 00:15
      PERLND      13
      IMPLND       1
      IMPLND       4
      IMPLND       5
      IMPLND       8
      RCHRES       1
      COPY         1
      COPY       501
      COPY       601
      DISPLY       1
    END INGRP
END OPN SEQUENCE
DISPLY
  DISPLY-INFO1
    # -  #<----------Title---------->***TRAN PIVL DIG1 FIL1  PYR DIG2 FIL2 YRND
    1        Gravel Trench Bed 1         MAX                    1    2   30    9
  END DISPLY-INFO1
END DISPLY
COPY
  TIMESERIES
    # -  #  NPT  NMN ***
    1         1    1
  501         1    1
  601         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            ***
   13     C, Pasture, Flat        1    1    1    1   27    0
  END GEN-INFO
  *** Section PWATER***

  ACTIVITY
    <PLS > ************ Active Sections ******************************
    # -  # ATMP SNOW PWAT  SED  PST  PWG PQAL MSTL PEST NITR PHOS TRAC ***
   13         0    0    1    0    0    0    0    0    0    0    0    0
```

```
  END ACTIVITY

  PRINT-INFO
    <PLS > ***************** Print-flags ***************************** PIVL  PYR
    # -  # ATMP SNOW PWAT  SED  PST  PWG PQAL MSTL PEST NITR PHOS TRAC  *********
   13         0    0    4    0    0    0    0    0    0    0    0    0    1    9
  END PRINT-INFO

  PWAT-PARM1
    <PLS >  PWATER variable monthly parameter value flags  ***
    # -  # CSNO RTOP UZFG  VCS  VUZ  VNN VIFW VIRC  VLE INFC  HWT ***
   13         0    0    0    0    0    0    0    0    0    0    0
  END PWAT-PARM1

  PWAT-PARM2
    <PLS >      PWATER input info: Part 2          ***
    # -  # ***FOREST      LZSN    INFILT      LSUR     SLSUR     KVARY     AGWRC
   13              0       4.5      0.06       400      0.05       0.5     0.996
  END PWAT-PARM2

  PWAT-PARM3
    <PLS >      PWATER input info: Part 3          ***
    # -  # ***PETMAX    PETMIN    INFEXP    INFILD    DEEPFR    BASETP    AGWETP
   13              0         0         2         2         0         0         0
  END PWAT-PARM3
  PWAT-PARM4
    <PLS >     PWATER input info: Part 4                                  ***
    # -  #     CEPSC      UZSN      NSUR     INTFW       IRC     LZETP ***
   13           0.15       0.4       0.3         6       0.5       0.4
  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
   13              0         0         0          0       2.5          1          0
  END PWAT-STATE1

END PERLND

IMPLND
  GEN-INFO
    <PLS ><-------Name------->   Unit-systems   Printer ***
    # -  #                     User  t-series Engl Metr ***
                                  in  out           ***
    1      ROADS/FLAT             1    1    1   27    0
    4      ROOF TOPS/FLAT         1    1    1   27    0
    5      DRIVEWAYS/FLAT         1    1    1   27    0
    8      SIDEWALKS/FLAT         1    1    1   27    0
  END GEN-INFO
  *** Section IWATER***

  ACTIVITY
    <PLS > ************* Active Sections ****************************
    # -  # ATMP SNOW IWAT  SLD  IWG IQAL   ***
    1         0    0    1    0    0    0
    4         0    0    1    0    0    0
    5         0    0    1    0    0    0
    8         0    0    1    0    0    0
  END ACTIVITY

  PRINT-INFO
    <ILS > ******** Print-flags ******** PIVL  PYR
    # -  # ATMP SNOW IWAT  SLD  IWG IQAL    *********
    1         0    0    4    0    0    4    1    9
    4         0    0    4    0    0    0    1    9
    5         0    0    4    0    0    0    1    9
    8         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     ***
    1         0    0    0    0    0
    4         0    0    0    0    0
    5         0    0    0    0    0
    8         0    0    0    0    0
  END IWAT-PARM1

  IWAT-PARM2
    <PLS >      IWATER input info: Part 2         ***
    # -  # ***  LSUR     SLSUR      NSUR     RETSC
    1            400      0.01       0.1       0.1
    4            400      0.01       0.1       0.1
    5            400      0.01       0.1       0.1
    8            400      0.01       0.1       0.1
  END IWAT-PARM2

  IWAT-PARM3
    <PLS >      IWATER input info: Part 3         ***
    # -  # ***PETMAX    PETMIN
    1              0         0
    4              0         0
    5              0         0
    8              0         0
  END IWAT-PARM3

  IWAT-STATE1
    <PLS > *** Initial conditions at start of simulation
    # -  # ***  RETS      SURS
    1              0         0
    4              0         0
    5              0         0
    8              0         0
  END IWAT-STATE1

END IMPLND

SCHEMATIC
<-Source->                 <--Area-->     <-Target->   MBLK    ***
<Name>   #                 <-factor->     <Name>   #   Tbl#    ***
Basin  1***
PERLND  13                       0.24     RCHRES   1      2
PERLND  13                       0.24     RCHRES   1      3
IMPLND   1                       0.12     RCHRES   1      5
IMPLND   4                       0.42     RCHRES   1      5
IMPLND   5                       0.29     RCHRES   1      5
IMPLND   8                       0.05     RCHRES   1      5
Upstream Pavement***
IMPLND   1                       0.15     RCHRES   1      5
Frontage***
PERLND  13                       0.05     RCHRES   1      2
PERLND  13                       0.05     RCHRES   1      3
IMPLND   1                       0.02     RCHRES   1      5
IMPLND   8                       0.05     RCHRES   1      5
Bypass***
PERLND  13                       0.01     COPY   501     12
PERLND  13                       0.01     COPY   601     12
PERLND  13                       0.01     COPY   501     13
PERLND  13                       0.01     COPY   601     13
IMPLND   1                       0.01     COPY   501     15
IMPLND   1                       0.01     COPY   601     15
IMPLND   8                       0.01     COPY   501     15
IMPLND   8                       0.01     COPY   601     15

******Routing******
PERLND  13                       0.24     COPY     1     12
IMPLND   1                       0.12     COPY     1     15
IMPLND   4                       0.42     COPY     1     15
IMPLND   5                       0.29     COPY     1     15
```

```
IMPLND   8                          0.05     COPY     1     15
PERLND  13                          0.24     COPY     1     13
IMPLND   1                          0.15     COPY     1     15
PERLND  13                          0.05     COPY     1     12
IMPLND   1                          0.02     COPY     1     15
IMPLND   8                          0.05     COPY     1     15
PERLND  13                          0.05     COPY     1     13
RCHRES   1                             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     Gravel Trench Be-006    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
  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
  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
  END HYDR-PARM1

  HYDR-PARM2
    # -  #    FTABNO       LEN     DELTH     STCOR        KS      DB50       ***
  <------><--------><--------><--------><--------><--------><--------><       ***
    1              1      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
  END HYDR-INIT
END RCHRES

SPEC-ACTIONS
END SPEC-ACTIONS
FTABLES
  FTABLE      1
   92    5
     Depth      Area    Volume  Outflow1  Outflow2  Velocity  Travel Time***
```

(ft)	(acres)	(acre-ft)	(cfs)	(cfs)	(ft/sec)	(Minutes)***
0.000000	0.036731	0.000000	0.000000	0.000000		
0.061111	0.036731	0.000898	0.000000	0.270370		
0.122222	0.036731	0.001796	0.000000	0.270370		
0.183333	0.036731	0.002694	0.000000	0.270370		
0.244444	0.036731	0.003591	0.000000	0.270370		
0.305556	0.036731	0.004489	0.000000	0.270370		
0.366667	0.036731	0.005387	0.000000	0.270370		
0.427778	0.036731	0.006285	0.000000	0.270370		
0.488889	0.036731	0.007183	0.000000	0.270370		
0.550000	0.036731	0.008081	0.000000	0.270370		
0.611111	0.036731	0.008979	0.000000	0.270370		
0.672222	0.036731	0.009877	0.000000	0.270370		
0.733333	0.036731	0.010774	0.000000	0.270370		
0.794444	0.036731	0.011672	0.000000	0.270370		
0.855556	0.036731	0.012570	0.000000	0.270370		
0.916667	0.036731	0.013468	0.000000	0.270370		
0.977778	0.036731	0.014366	0.000000	0.270370		
1.038889	0.036731	0.015264	0.000000	0.270370		
1.100000	0.036731	0.016162	0.000000	0.270370		
1.161111	0.036731	0.017059	0.000000	0.270370		
1.222222	0.036731	0.017957	0.000000	0.270370		
1.283333	0.036731	0.018855	0.000000	0.270370		
1.344444	0.036731	0.019753	0.000000	0.270370		
1.405556	0.036731	0.020651	0.000000	0.270370		
1.466667	0.036731	0.021549	0.000000	0.270370		
1.527778	0.036731	0.022447	0.000000	0.270370		
1.588889	0.036731	0.023345	0.000000	0.270370		
1.650000	0.036731	0.024242	0.000000	0.270370		
1.711111	0.036731	0.025140	0.000000	0.270370		
1.772222	0.036731	0.026038	0.000000	0.270370		
1.833333	0.036731	0.026936	0.000000	0.270370		
1.894444	0.036731	0.027834	0.000000	0.270370		
1.955556	0.036731	0.028732	0.000000	0.270370		
2.016667	0.036731	0.029630	0.000000	0.270370		
2.077778	0.036731	0.030527	0.000000	0.270370		
2.138889	0.036731	0.031425	0.000000	0.270370		
2.200000	0.036731	0.032323	0.000000	0.270370		
2.261111	0.036731	0.033221	0.000000	0.270370		
2.322222	0.036731	0.034119	0.000000	0.270370		
2.383333	0.036731	0.035017	0.000000	0.270370		
2.444444	0.036731	0.035915	0.000000	0.270370		
2.505556	0.036731	0.036813	0.000000	0.270370		
2.566667	0.036731	0.037710	0.000000	0.270370		
2.627778	0.036731	0.038608	0.000000	0.270370		
2.688889	0.036731	0.039506	0.000000	0.270370		
2.750000	0.036731	0.040404	0.000000	0.270370		
2.811111	0.036731	0.041302	0.000000	0.270370		
2.872222	0.036731	0.042200	0.000000	0.270370		
2.933333	0.036731	0.043098	0.000000	0.270370		
2.994444	0.036731	0.043996	0.000000	0.270370		
3.055556	0.036731	0.044893	0.000000	0.270370		
3.116667	0.036731	0.045791	0.000000	0.270370		
3.177778	0.036731	0.046689	0.000000	0.270370		
3.238889	0.036731	0.047587	0.000000	0.270370		
3.300000	0.036731	0.048485	0.000000	0.270370		
3.361111	0.036731	0.049383	0.000000	0.270370		
3.422222	0.036731	0.050281	0.000000	0.270370		
3.483333	0.036731	0.051178	0.000000	0.270370		
3.544444	0.036731	0.052076	0.000000	0.270370		
3.605556	0.036731	0.052974	0.000000	0.270370		
3.666667	0.036731	0.053872	0.000000	0.270370		
3.727778	0.036731	0.054770	0.000000	0.270370		
3.788889	0.036731	0.055668	0.000000	0.270370		
3.850000	0.036731	0.056566	0.000000	0.270370		
3.911111	0.036731	0.057464	0.000000	0.270370		
3.972222	0.036731	0.058361	0.000000	0.270370		
4.033333	0.036731	0.059259	0.000000	0.270370		
4.094444	0.036731	0.060157	0.000000	0.270370		
4.155556	0.036731	0.061055	0.000000	0.270370		

```
  4.216667  0.036731  0.061953  0.000000  0.270370
  4.277778  0.036731  0.062851  0.000000  0.270370
  4.338889  0.036731  0.063749  0.000000  0.270370
  4.400000  0.036731  0.064646  0.000000  0.270370
  4.461111  0.036731  0.065544  0.000000  0.270370
  4.522222  0.036731  0.066442  0.035147  0.270370
  4.583333  0.036731  0.067340  0.254292  0.270370
  4.644444  0.036731  0.068238  0.572643  0.270370
  4.705556  0.036731  0.069136  0.942221  0.270370
  4.766667  0.036731  0.070034  1.318080  0.270370
  4.827778  0.036731  0.070932  1.655969  0.270370
  4.888889  0.036731  0.071829  1.921105  0.270370
  4.950000  0.036731  0.072727  2.101488  0.270370
  5.011111  0.036731  0.073625  2.251735  0.270370
  5.072222  0.036731  0.074523  2.382549  0.270370
  5.133333  0.036731  0.075421  2.506546  0.270370
  5.194444  0.036731  0.076319  2.624692  0.270370
  5.255556  0.036731  0.077217  2.737743  0.270370
  5.316667  0.036731  0.078114  2.846308  0.270370
  5.377778  0.036731  0.079012  2.950882  0.270370
  5.438889  0.036731  0.079910  3.051874  0.270370
  5.500000  0.036731  0.080808  3.149630  0.270370
  5.561111  0.036731  0.083053  3.244442  0.270370
  END FTABLE  1
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    1.2             PERLND   1 999 EXTNL  PREC
WDM      2 PREC     ENGL    1.2             IMPLND   1 999 EXTNL  PREC
WDM      1 EVAP     ENGL    0.76            PERLND   1 999 EXTNL  PETINP
WDM      1 EVAP     ENGL    0.76            IMPLND   1 999 EXTNL  PETINP

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   1 HYDR   RO     1 1        1      WDM   1002 FLOW     ENGL      REPL
RCHRES   1 HYDR   O      1 1        1      WDM   1003 FLOW     ENGL      REPL
RCHRES   1 HYDR   O      2 1        1      WDM   1004 FLOW     ENGL      REPL
RCHRES   1 HYDR   STAGE  1 1        1      WDM   1005 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
COPY   601 OUTPUT MEAN   1 1     48.4      WDM    901 FLOW     ENGL      REPL
END EXT TARGETS

MASS-LINK
<Volume>   <-Grp> <-Member-><--Mult-->     <Target>       <-Grp> <-Member->***
<Name>           <Name> # #<-factor->     <Name>                <Name> # #***
  MASS-LINK        2
PERLND     PWATER SURO       0.083333      RCHRES         INFLOW IVOL
  END MASS-LINK    2

  MASS-LINK        3
PERLND     PWATER IFWO       0.083333      RCHRES         INFLOW IVOL
  END MASS-LINK    3

  MASS-LINK        5
IMPLND     IWATER SURO       0.083333      RCHRES         INFLOW IVOL
  END MASS-LINK    5

  MASS-LINK       12
PERLND     PWATER SURO       0.083333      COPY           INPUT  MEAN
  END MASS-LINK   12

  MASS-LINK       13
PERLND     PWATER IFWO       0.083333      COPY           INPUT  MEAN
  END MASS-LINK   13
```

```
  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
```

Disclaimer

Legal Notice

This program and accompanying documentation are provided 'as-is' without warranty of any kind. The entire risk regarding the performance and results of this program is assumed by End User. Clear Creek Solutions Inc. and the governmental licensee or sublicensees disclaim all warranties, either expressed or implied, including but not limited to implied warranties of program and accompanying documentation. In no event shall Clear Creek Solutions Inc. be liable for any damages whatsoever (including without limitation to damages for loss of business profits, loss of business information, business interruption, and the like) arising out of the use of, or inability to use this program even if Clear Creek Solutions Inc. or their authorized representatives have been advised of the possibility of such damages.

Clear Creek Solutions, Inc.
6200 Capitol Blvd. Ste F
Olympia, WA. 98501
Toll Free 1(866)943-0304
Local (360)943-0304

www.clearcreeksolutions.com

WWHM2012

PROJECT REPORT

INFILTRATION FACILITY B

General Model Information

WWHM2012 Project Name: Park Place B
Site Name:
Site Address:
City:

Report Date:	10/24/2025
Gage:	Everett
Data Start:	1948/10/01
Data End:	2009/09/30
Timestep:	15 Minute
Precip Scale:	1.200
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	1.38
Pervious Total	1.38
Impervious Land Use	acre
Impervious Total	0
Basin Total	1.38

Mitigated Land Use

Basin 1

Bypass:	No
GroundWater:	No

Pervious Land Use	acre
C, Pasture, Flat	0.18
Pervious Total	0.18

Impervious Land Use	acre
ROADS FLAT	0.22
ROOF TOPS FLAT	0.51
DRIVEWAYS FLAT	0.34
SIDEWALKS FLAT	0.13
Impervious Total	1.2
Basin Total	1.38

Routing Elements
Predeveloped Routing

Mitigated Routing

Gravel Trench Bed 1

Bottom Length:	70.00 ft.
Bottom Width:	30.00 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:	5
Pour Space of material for first layer:	0.4
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:	7.3
Infiltration safety factor:	1
Wetted surface area On	
Total Volume Infiltrated (ac-ft.):	245.825
Total Volume Through Riser (ac-ft.):	0.011
Total Volume Through Facility (ac-ft.):	245.836
Percent Infiltrated:	100
Total Precip Applied to Facility:	0
Total Evap From Facility:	0
Discharge Structure	
Riser Height:	4 ft.
Riser Diameter:	12 in.
Element Flows To:	
Outlet 1	Outlet 2

Gravel Trench Bed Hydraulic Table

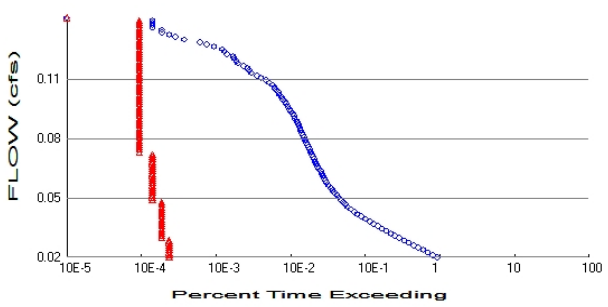
Stage(feet)	Area(ac.)	Volume(ac-ft.)	Discharge(cfs)	Infilt(cfs)
0.0000	0.048	0.000	0.000	0.000
0.0556	0.048	0.001	0.000	0.354
0.1111	0.048	0.002	0.000	0.354
0.1667	0.048	0.003	0.000	0.354
0.2222	0.048	0.004	0.000	0.354
0.2778	0.048	0.005	0.000	0.354
0.3333	0.048	0.006	0.000	0.354
0.3889	0.048	0.007	0.000	0.354
0.4444	0.048	0.008	0.000	0.354
0.5000	0.048	0.009	0.000	0.354
0.5556	0.048	0.010	0.000	0.354
0.6111	0.048	0.011	0.000	0.354
0.6667	0.048	0.012	0.000	0.354
0.7222	0.048	0.013	0.000	0.354
0.7778	0.048	0.015	0.000	0.354
0.8333	0.048	0.016	0.000	0.354
0.8889	0.048	0.017	0.000	0.354
0.9444	0.048	0.018	0.000	0.354
1.0000	0.048	0.019	0.000	0.354
1.0556	0.048	0.020	0.000	0.354
1.1111	0.048	0.021	0.000	0.354
1.1667	0.048	0.022	0.000	0.354
1.2222	0.048	0.023	0.000	0.354

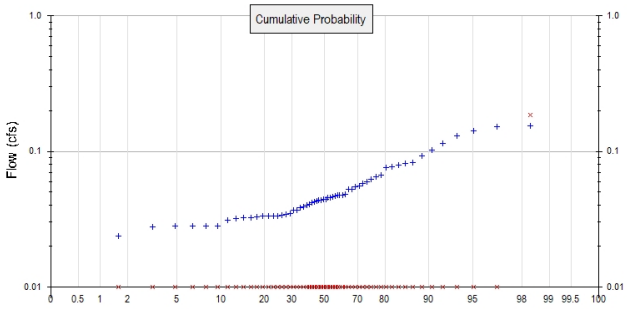
1.2778	0.048	0.024	0.000	0.354
1.3333	0.048	0.025	0.000	0.354
1.3889	0.048	0.026	0.000	0.354
1.4444	0.048	0.027	0.000	0.354
1.5000	0.048	0.028	0.000	0.354
1.5556	0.048	0.030	0.000	0.354
1.6111	0.048	0.031	0.000	0.354
1.6667	0.048	0.032	0.000	0.354
1.7222	0.048	0.033	0.000	0.354
1.7778	0.048	0.034	0.000	0.354
1.8333	0.048	0.035	0.000	0.354
1.8889	0.048	0.036	0.000	0.354
1.9444	0.048	0.037	0.000	0.354
2.0000	0.048	0.038	0.000	0.354
2.0556	0.048	0.039	0.000	0.354
2.1111	0.048	0.040	0.000	0.354
2.1667	0.048	0.041	0.000	0.354
2.2222	0.048	0.042	0.000	0.354
2.2778	0.048	0.043	0.000	0.354
2.3333	0.048	0.045	0.000	0.354
2.3889	0.048	0.046	0.000	0.354
2.4444	0.048	0.047	0.000	0.354
2.5000	0.048	0.048	0.000	0.354
2.5556	0.048	0.049	0.000	0.354
2.6111	0.048	0.050	0.000	0.354
2.6667	0.048	0.051	0.000	0.354
2.7222	0.048	0.052	0.000	0.354
2.7778	0.048	0.053	0.000	0.354
2.8333	0.048	0.054	0.000	0.354
2.8889	0.048	0.055	0.000	0.354
2.9444	0.048	0.056	0.000	0.354
3.0000	0.048	0.057	0.000	0.354
3.0556	0.048	0.058	0.000	0.354
3.1111	0.048	0.060	0.000	0.354
3.1667	0.048	0.061	0.000	0.354
3.2222	0.048	0.062	0.000	0.354
3.2778	0.048	0.063	0.000	0.354
3.3333	0.048	0.064	0.000	0.354
3.3889	0.048	0.065	0.000	0.354
3.4444	0.048	0.066	0.000	0.354
3.5000	0.048	0.067	0.000	0.354
3.5556	0.048	0.068	0.000	0.354
3.6111	0.048	0.069	0.000	0.354
3.6667	0.048	0.070	0.000	0.354
3.7222	0.048	0.071	0.000	0.354
3.7778	0.048	0.072	0.000	0.354
3.8333	0.048	0.073	0.000	0.354
3.8889	0.048	0.075	0.000	0.354
3.9444	0.048	0.076	0.000	0.354
4.0000	0.048	0.077	0.000	0.354
4.0556	0.048	0.078	0.138	0.354
4.1111	0.048	0.079	0.389	0.354
4.1667	0.048	0.080	0.703	0.354
4.2222	0.048	0.081	1.046	0.354
4.2778	0.048	0.082	1.383	0.354
4.3333	0.048	0.083	1.683	0.354
4.3889	0.048	0.084	1.921	0.354
4.4444	0.048	0.085	2.088	0.354

4.5000	0.048	0.086	2.203	0.354
4.5556	0.048	0.087	2.347	0.354
4.6111	0.048	0.088	2.462	0.354
4.6667	0.048	0.090	2.571	0.354
4.7222	0.048	0.091	2.676	0.354
4.7778	0.048	0.092	2.777	0.354
4.8333	0.048	0.093	2.875	0.354
4.8889	0.048	0.094	2.969	0.354
4.9444	0.048	0.095	3.060	0.354
5.0000	0.048	0.096	3.149	0.354

Analysis Results

POC 1





+ Predeveloped x Mitigated

Predeveloped Landuse Totals for POC #1
Total Pervious Area: 1.38
Total Impervious Area: 0

Mitigated Landuse Totals for POC #1
Total Pervious Area: 0.18
Total Impervious Area: 1.2

Flow Frequency Method: Log Pearson Type III 17B

Flow Frequency Return Periods for Predeveloped. POC #1

Return Period	Flow(cfs)
2 year	0.046369
5 year	0.071131
10 year	0.090228
25 year	0.117551
50 year	0.140307
100 year	0.165193

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
1949	0.046	0.000
1950	0.047	0.000
1951	0.042	0.000
1952	0.033	0.000
1953	0.028	0.000
1954	0.151	0.000
1955	0.060	0.000
1956	0.053	0.000
1957	0.065	0.000
1958	0.047	0.000

1959	0.047	0.000
1960	0.044	0.000
1961	0.082	0.186
1962	0.041	0.000
1963	0.067	0.000
1964	0.048	0.000
1965	0.040	0.000
1966	0.024	0.000
1967	0.048	0.000
1968	0.058	0.000
1969	0.141	0.000
1970	0.033	0.000
1971	0.053	0.000
1972	0.039	0.000
1973	0.037	0.000
1974	0.080	0.000
1975	0.032	0.000
1976	0.033	0.000
1977	0.028	0.000
1978	0.033	0.000
1979	0.093	0.000
1980	0.043	0.000
1981	0.034	0.000
1982	0.044	0.000
1983	0.075	0.000
1984	0.045	0.000
1985	0.055	0.000
1986	0.129	0.000
1987	0.062	0.000
1988	0.032	0.000
1989	0.033	0.000
1990	0.043	0.000
1991	0.045	0.000
1992	0.034	0.000
1993	0.028	0.000
1994	0.031	0.000
1995	0.045	0.000
1996	0.077	0.000
1997	0.154	0.000
1998	0.028	0.000
1999	0.037	0.000
2000	0.028	0.000
2001	0.011	0.000
2002	0.042	0.000
2003	0.033	0.000
2004	0.055	0.000
2005	0.039	0.000
2006	0.103	0.000
2007	0.081	0.000
2008	0.114	0.000
2009	0.035	0.000

Ranked Annual Peaks

Ranked Annual Peaks for Predeveloped and Mitigated. POC #1

Rank	Predeveloped	Mitigated
1	0.1536	0.1863
2	0.1515	0.0000
3	0.1413	0.0000

4	0.1295	0.0000
5	0.1142	0.0000
6	0.1028	0.0000
7	0.0928	0.0000
8	0.0824	0.0000
9	0.0813	0.0000
10	0.0795	0.0000
11	0.0772	0.0000
12	0.0753	0.0000
13	0.0670	0.0000
14	0.0653	0.0000
15	0.0618	0.0000
16	0.0597	0.0000
17	0.0581	0.0000
18	0.0555	0.0000
19	0.0551	0.0000
20	0.0527	0.0000
21	0.0526	0.0000
22	0.0482	0.0000
23	0.0478	0.0000
24	0.0474	0.0000
25	0.0472	0.0000
26	0.0468	0.0000
27	0.0463	0.0000
28	0.0455	0.0000
29	0.0453	0.0000
30	0.0445	0.0000
31	0.0442	0.0000
32	0.0436	0.0000
33	0.0435	0.0000
34	0.0432	0.0000
35	0.0423	0.0000
36	0.0421	0.0000
37	0.0407	0.0000
38	0.0403	0.0000
39	0.0388	0.0000
40	0.0386	0.0000
41	0.0369	0.0000
42	0.0367	0.0000
43	0.0348	0.0000
44	0.0341	0.0000
45	0.0339	0.0000
46	0.0334	0.0000
47	0.0333	0.0000
48	0.0333	0.0000
49	0.0333	0.0000
50	0.0330	0.0000
51	0.0326	0.0000
52	0.0324	0.0000
53	0.0320	0.0000
54	0.0309	0.0000
55	0.0283	0.0000
56	0.0281	0.0000
57	0.0281	0.0000
58	0.0280	0.0000
59	0.0277	0.0000
60	0.0236	0.0000
61	0.0111	0.0000

Duration Flows

The Facility PASSED

Flow(cfs)	Predev	Mit	Percentage	Pass/Fail
0.0232	19607	5	0	Pass
0.0244	16996	5	0	Pass
0.0256	14662	5	0	Pass
0.0267	12728	5	0	Pass
0.0279	10930	5	0	Pass
0.0291	9443	5	0	Pass
0.0303	8168	5	0	Pass
0.0315	7078	5	0	Pass
0.0326	6130	4	0	Pass
0.0338	5311	4	0	Pass
0.0350	4654	4	0	Pass
0.0362	4068	4	0	Pass
0.0374	3548	4	0	Pass
0.0386	3136	4	0	Pass
0.0397	2759	4	0	Pass
0.0409	2445	4	0	Pass
0.0421	2145	4	0	Pass
0.0433	1894	4	0	Pass
0.0445	1657	4	0	Pass
0.0457	1508	4	0	Pass
0.0468	1370	4	0	Pass
0.0480	1250	4	0	Pass
0.0492	1154	4	0	Pass
0.0504	1069	4	0	Pass
0.0516	1009	3	0	Pass
0.0528	948	3	0	Pass
0.0539	888	3	0	Pass
0.0551	825	3	0	Pass
0.0563	777	3	0	Pass
0.0575	733	3	0	Pass
0.0587	686	3	0	Pass
0.0599	648	3	0	Pass
0.0610	622	3	0	Pass
0.0622	602	3	0	Pass
0.0634	583	3	0	Pass
0.0646	561	3	0	Pass
0.0658	538	3	0	Pass
0.0670	507	3	0	Pass
0.0681	487	3	0	Pass
0.0693	473	3	0	Pass
0.0705	457	3	0	Pass
0.0717	440	3	0	Pass
0.0729	424	3	0	Pass
0.0741	409	3	0	Pass
0.0752	394	2	0	Pass
0.0764	380	2	0	Pass
0.0776	368	2	0	Pass
0.0788	353	2	0	Pass
0.0800	341	2	0	Pass
0.0812	333	2	0	Pass
0.0823	322	2	0	Pass
0.0835	313	2	0	Pass
0.0847	302	2	0	Pass

0.0859	293	2	0	Pass
0.0871	284	2	0	Pass
0.0883	276	2	0	Pass
0.0894	265	2	0	Pass
0.0906	257	2	0	Pass
0.0918	241	2	0	Pass
0.0930	234	2	0	Pass
0.0942	226	2	0	Pass
0.0954	212	2	0	Pass
0.0965	205	2	0	Pass
0.0977	195	2	1	Pass
0.0989	187	2	1	Pass
0.1001	177	2	1	Pass
0.1013	166	2	1	Pass
0.1024	160	2	1	Pass
0.1036	150	2	1	Pass
0.1048	146	2	1	Pass
0.1060	135	2	1	Pass
0.1072	129	2	1	Pass
0.1084	121	2	1	Pass
0.1095	111	2	1	Pass
0.1107	99	2	2	Pass
0.1119	85	2	2	Pass
0.1131	75	2	2	Pass
0.1143	63	2	3	Pass
0.1155	59	2	3	Pass
0.1166	56	2	3	Pass
0.1178	50	2	4	Pass
0.1190	42	2	4	Pass
0.1202	40	2	5	Pass
0.1214	37	2	5	Pass
0.1226	36	2	5	Pass
0.1237	30	2	6	Pass
0.1249	28	2	7	Pass
0.1261	26	2	7	Pass
0.1273	20	2	10	Pass
0.1285	16	2	12	Pass
0.1297	13	2	15	Pass
0.1308	8	2	25	Pass
0.1320	6	2	33	Pass
0.1332	5	2	40	Pass
0.1344	4	2	50	Pass
0.1356	4	2	50	Pass
0.1368	3	2	66	Pass
0.1379	3	2	66	Pass
0.1391	3	2	66	Pass
0.1403	3	2	66	Pass

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	☐	223.71			☐	100.00			
Total Volume Infiltrated		223.71	0.00	0.00		100.00	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.

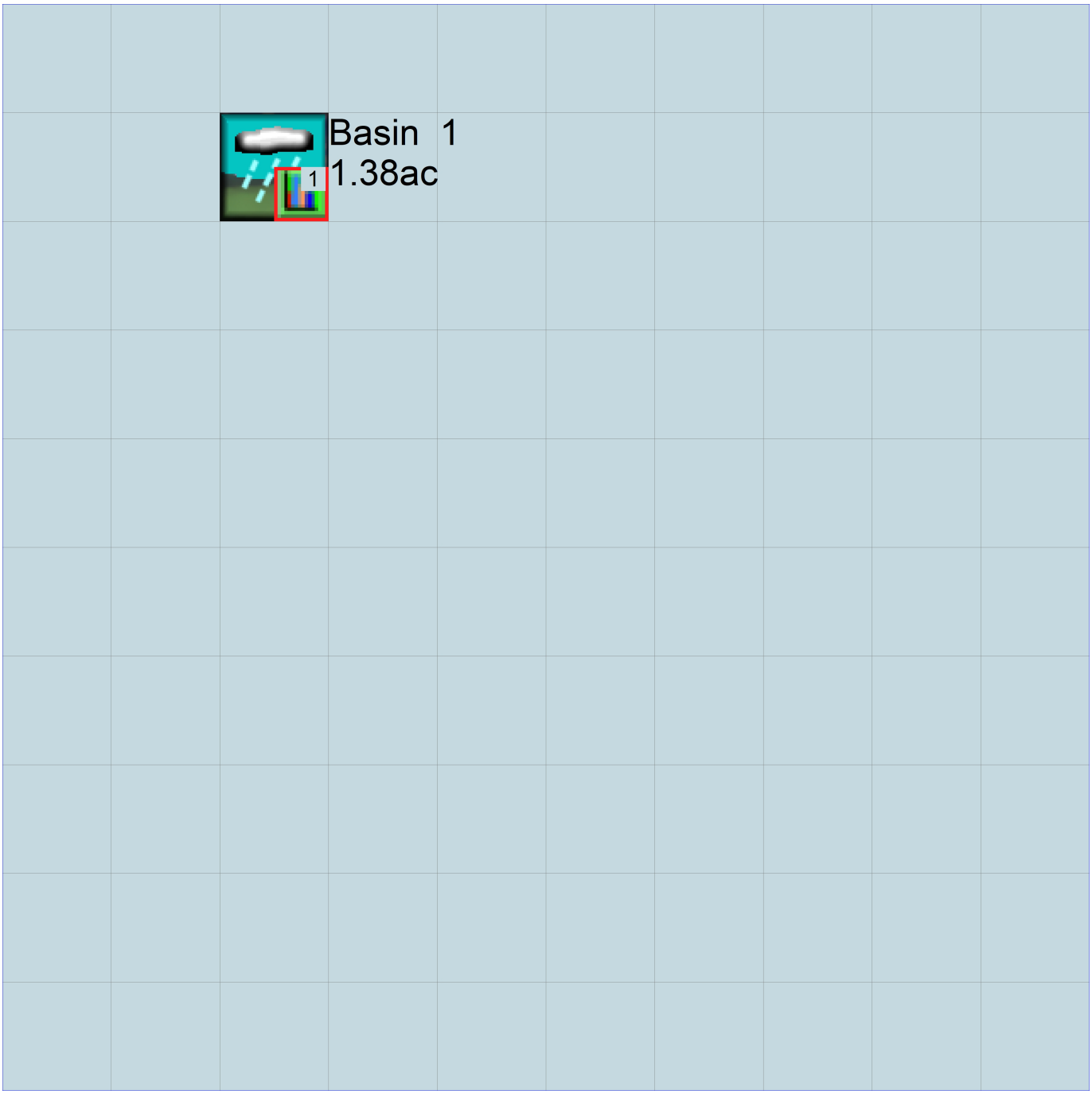
PERLND Changes

No PERLND changes have been made.

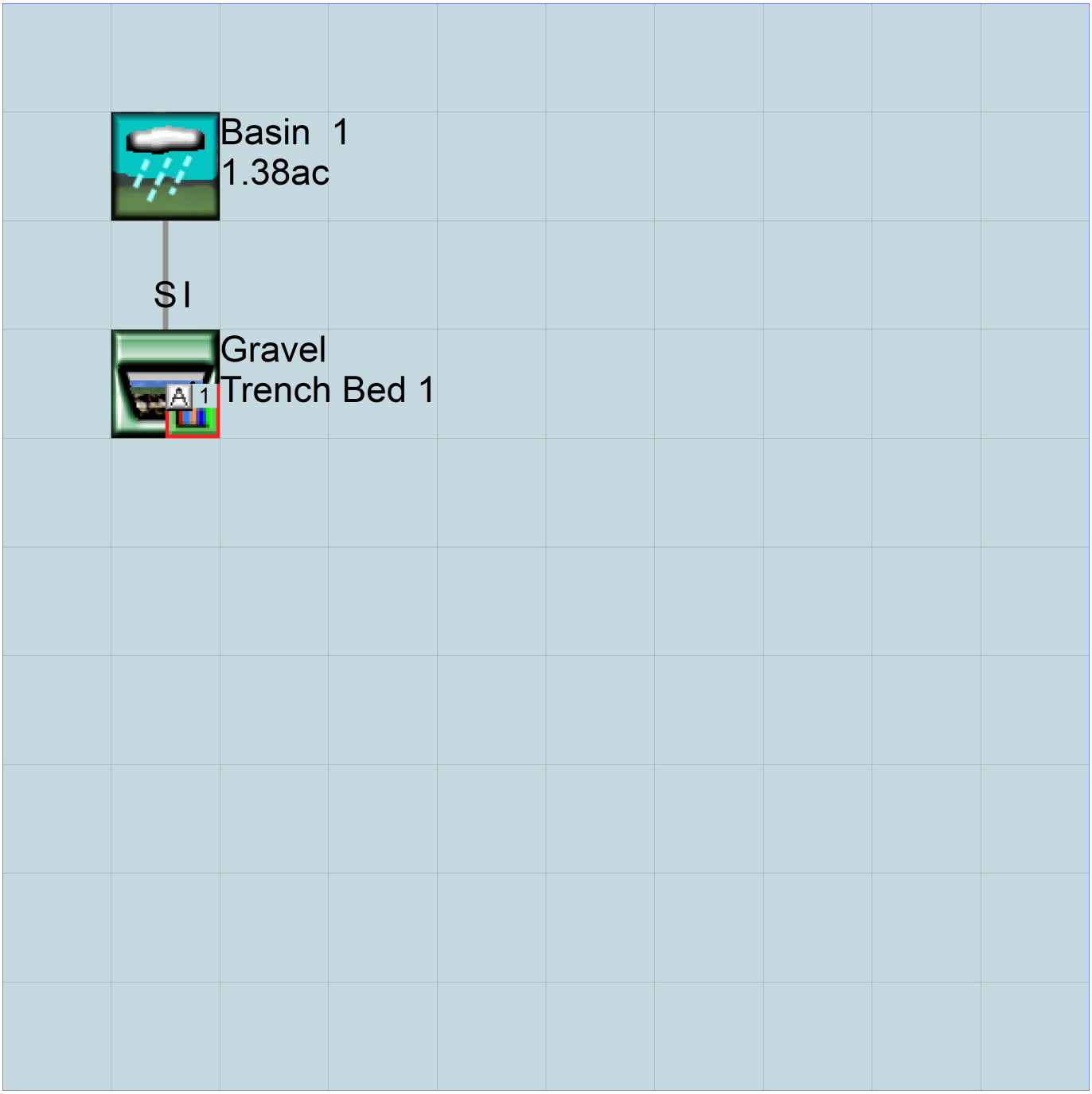
IMPLND Changes

No IMPLND changes have been made.

Appendix
Predeveloped Schematic



Mitigated Schematic



Predeveloped UCI File

```
RUN

GLOBAL
  WWHM4 model simulation
  START       1948 10 01        END    2009 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   Park Place B.wdm
MESSU       25   PrePark Place B.MES
            27   PrePark Place B.L61
            28   PrePark Place B.L62
            30   POCPark Place B1.dat
END FILES

OPN SEQUENCE
    INGRP               INDELT 00:15
      PERLND      10
      COPY       501
      DISPLY       1
    END INGRP
END OPN SEQUENCE
DISPLY
  DISPLY-INFO1
    # -  #<----------Title---------->***TRAN PIVL DIG1 FIL1  PYR DIG2 FIL2 YRND
    1        Basin  1                   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           ***
   10     C, Forest, Flat         1    1    1    1   27    0
  END GEN-INFO
  *** Section PWATER***

  ACTIVITY
    <PLS > ************ Active Sections ******************************
    # -  # ATMP SNOW PWAT  SED  PST  PWG PQAL MSTL PEST NITR PHOS TRAC ***
   10         0    0    1    0    0    0    0    0    0    0    0    0
  END ACTIVITY

  PRINT-INFO
    <PLS > ***************** Print-flags ***************************** PIVL  PYR
    # -  # ATMP SNOW PWAT  SED  PST  PWG PQAL MSTL PEST NITR PHOS TRAC  *********
   10         0    0    4    0    0    0    0    0    0    0    0    0    1    9
  END PRINT-INFO
```

```
  PWAT-PARM1
    <PLS >  PWATER variable monthly parameter value flags  ***
    # -  # CSNO RTOP UZFG  VCS  VUZ  VNN VIFW VIRC  VLE INFC  HWT ***
   10         0    0    0    0    0    0    0    0    0    0
  END PWAT-PARM1

  PWAT-PARM2
    <PLS >      PWATER input info: Part 2         ***
    # -  # ***FOREST      LZSN    INFILT      LSUR     SLSUR     KVARY     AGWRC
   10              0       4.5      0.08       400      0.05       0.5     0.996
  END PWAT-PARM2

  PWAT-PARM3
    <PLS >      PWATER input info: Part 3         ***
    # -  # ***PETMAX    PETMIN    INFEXP    INFILD    DEEPFR    BASETP    AGWETP
   10             0         0         2         2         0         0         0
  END PWAT-PARM3
  PWAT-PARM4
    <PLS >     PWATER input info: Part 4                              ***
    # -  #     CEPSC      UZSN      NSUR     INTFW       IRC     LZETP ***
   10          0.2       0.5      0.35         6       0.5       0.7
  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
   10             0         0         0          0       2.5          1         0
  END PWAT-STATE1

END PERLND

IMPLND
  GEN-INFO
    <PLS ><-------Name-------->  Unit-systems   Printer ***
    # -  #                     User  t-series Engl Metr ***
                                  in  out           ***
  END GEN-INFO
  *** Section IWATER***

  ACTIVITY
    <PLS > ************ Active Sections ******************************
    # -  # ATMP SNOW IWAT  SLD  IWG IQAL   ***
  END ACTIVITY

  PRINT-INFO
    <ILS > ******** Print-flags ******** PIVL  PYR
    # -  # ATMP SNOW IWAT  SLD  IWG IQAL    *********
  END PRINT-INFO

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

  IWAT-PARM2
    <PLS >      IWATER input info: Part 2         ***
    # -  # ***  LSUR     SLSUR      NSUR     RETSC
  END IWAT-PARM2

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

  IWAT-STATE1
    <PLS > *** Initial conditions at start of simulation
    # -  # ***  RETS      SURS
  END IWAT-STATE1
```

```
END IMPLND

SCHEMATIC
<-Source->                  <--Area-->     <-Target->   MBLK   ***
<Name>   #                  <-factor->     <Name>   #   Tbl#   ***
Basin  1***
PERLND  10                       1.38     COPY   501     12
PERLND  10                       1.38     COPY   501     13

******Routing******
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                               ***
  END GEN-INFO
  *** Section RCHRES***

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

  PRINT-INFO
    <PLS > ***************** Print-flags ******************* PIVL  PYR
    # -  # HYDR ADCA CONS HEAT  SED  GQL OXRX NUTR PLNK PHCB PIVL  PYR  *********
  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
             *  *  *  *    *  *  *  *  *      *  *  *  *  *        ***
  END HYDR-PARM1

  HYDR-PARM2
    # -  #    FTABNO       LEN     DELTH     STCOR        KS      DB50       ***
  <------><--------><--------><--------><--------><--------><--------><--------> ***
  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
  <------><-------->     <---><---><---><---><---> *** <---><---><---><---><--->
  END HYDR-INIT
END RCHRES

SPEC-ACTIONS
END SPEC-ACTIONS
FTABLES
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    1.2            PERLND   1 999 EXTNL  PREC
WDM      2 PREC     ENGL    1.2            IMPLND   1 999 EXTNL  PREC
```

```
WDM      1 EVAP     ENGL    0.76           PERLND   1 999 EXTNL  PETINP
WDM      1 EVAP     ENGL    0.76           IMPLND   1 999 EXTNL  PETINP

END EXT SOURCES

EXT TARGETS
<-Volume-> <-Grp> <-Member-><--Mult-->Tran <-Volume-> <Member> Tsys Tgap Amd ***
<Name>   #        <Name> # #<-factor->strg <Name>   # <Name>    tem strg strg***
COPY   501 OUTPUT MEAN   1 1     48.4      WDM    501 FLOW     ENGL      REPL
END EXT TARGETS

MASS-LINK
<Volume>   <-Grp> <-Member-><--Mult-->     <Target>       <-Grp> <-Member->***
<Name>            <Name> # #<-factor->     <Name>                <Name> # #***
  MASS-LINK       12
PERLND     PWATER SURO       0.083333      COPY           INPUT  MEAN
  END MASS-LINK   12

  MASS-LINK       13
PERLND     PWATER IFWO       0.083333      COPY           INPUT  MEAN
  END MASS-LINK   13


END MASS-LINK

END RUN
```

Mitigated UCI File

```
RUN

GLOBAL
  WWHM4 model simulation
  START       1948 10 01        END    2009 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   Park Place B.wdm
MESSU       25   MitPark Place B.MES
            27   MitPark Place B.L61
            28   MitPark Place B.L62
            30   POCPark Place B1.dat
END FILES

OPN SEQUENCE
    INGRP               INDELT 00:15
      PERLND      13
      IMPLND       1
      IMPLND       4
      IMPLND       5
      IMPLND       8
      RCHRES       1
      COPY         1
      COPY       501
      DISPLY       1
    END INGRP
END OPN SEQUENCE
DISPLY
  DISPLY-INFO1
    # -  #<----------Title---------->***TRAN PIVL DIG1 FIL1  PYR DIG2 FIL2 YRND
    1        Gravel Trench Bed 1         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           ***
   13     C, Pasture, Flat        1    1    1    1   27    0
  END GEN-INFO
  *** Section PWATER***

  ACTIVITY
    <PLS > ************ Active Sections ******************************
    # -  # ATMP SNOW PWAT  SED  PST  PWG PQAL MSTL PEST NITR PHOS TRAC ***
   13         0    0    1    0    0    0    0    0    0    0    0    0
  END ACTIVITY
```

```
  PRINT-INFO
    <PLS > ***************** Print-flags ***************************** PIVL  PYR
    # -  # ATMP SNOW PWAT  SED  PST  PWG PQAL MSTL PEST NITR PHOS TRAC  *********
   13         0    0    4    0    0    0    0    0    0    0    0    0    1    9
  END PRINT-INFO

  PWAT-PARM1
    <PLS >  PWATER variable monthly parameter value flags  ***
    # -  # CSNO RTOP UZFG  VCS  VUZ  VNN VIFW VIRC  VLE INFC  HWT ***
   13         0    0    0    0    0    0    0    0    0    0    0
  END PWAT-PARM1

  PWAT-PARM2
    <PLS >      PWATER input info: Part 2         ***
    # -  # ***FOREST      LZSN    INFILT      LSUR     SLSUR     KVARY     AGWRC
   13              0       4.5      0.06       400      0.05       0.5     0.996
  END PWAT-PARM2

  PWAT-PARM3
    <PLS >      PWATER input info: Part 3         ***
    # -  # ***PETMAX    PETMIN    INFEXP    INFILD    DEEPFR    BASETP    AGWETP
   13              0         0         2         2         0         0         0
  END PWAT-PARM3
  PWAT-PARM4
    <PLS >     PWATER input info: Part 4                                  ***
    # -  #     CEPSC      UZSN      NSUR     INTFW       IRC     LZETP ***
   13          0.15       0.4       0.3         6       0.5       0.4
  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
   13              0         0         0         0       2.5          1         0
  END PWAT-STATE1

END PERLND

IMPLND
  GEN-INFO
    <PLS ><-------Name------->   Unit-systems   Printer ***
    # -  #                     User  t-series Engl Metr ***
                                  in  out           ***
    1      ROADS/FLAT             1    1    1   27    0
    4      ROOF TOPS/FLAT         1    1    1   27    0
    5      DRIVEWAYS/FLAT         1    1    1   27    0
    8      SIDEWALKS/FLAT         1    1    1   27    0
  END GEN-INFO
  *** Section IWATER***

  ACTIVITY
    <PLS > ************ Active Sections ******************************
    # -  # ATMP SNOW IWAT  SLD  IWG IQAL   ***
    1         0    0    1    0    0    0
    4         0    0    1    0    0    0
    5         0    0    1    0    0    0
    8         0    0    1    0    0    0
  END ACTIVITY

  PRINT-INFO
    <ILS > ******** Print-flags ******** PIVL  PYR
    # -  # ATMP SNOW IWAT  SLD  IWG IQAL    *********
    1         0    0    4    0    0    4    1    9
    4         0    0    4    0    0    0    1    9
    5         0    0    4    0    0    0    1    9
    8         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     ***
    1         0    0    0    0    0
    4         0    0    0    0    0
    5         0    0    0    0    0
    8         0    0    0    0    0
  END IWAT-PARM1

  IWAT-PARM2
    <PLS >      IWATER input info: Part 2         ***
    # -  # ***  LSUR     SLSUR      NSUR     RETSC
    1            400      0.01       0.1       0.1
    4            400      0.01       0.1       0.1
    5            400      0.01       0.1       0.1
    8            400      0.01       0.1       0.1
  END IWAT-PARM2

  IWAT-PARM3
    <PLS >      IWATER input info: Part 3         ***
    # -  # ***PETMAX    PETMIN
    1              0         0
    4              0         0
    5              0         0
    8              0         0
  END IWAT-PARM3

  IWAT-STATE1
    <PLS > *** Initial conditions at start of simulation
    # -  # ***  RETS      SURS
    1              0         0
    4              0         0
    5              0         0
    8              0         0
  END IWAT-STATE1

END IMPLND

SCHEMATIC
<-Source->              <--Area-->     <-Target->   MBLK    ***
<Name>   #              <-factor->     <Name>   #   Tbl#    ***
Basin  1***
PERLND  13                      0.18     RCHRES   1      2
PERLND  13                      0.18     RCHRES   1      3
IMPLND   1                      0.22     RCHRES   1      5
IMPLND   4                      0.51     RCHRES   1      5
IMPLND   5                      0.34     RCHRES   1      5
IMPLND   8                      0.13     RCHRES   1      5

******Routing******
PERLND  13                      0.18     COPY     1     12
IMPLND   1                      0.22     COPY     1     15
IMPLND   4                      0.51     COPY     1     15
IMPLND   5                      0.34     COPY     1     15
IMPLND   8                      0.13     COPY     1     15
PERLND  13                      0.18     COPY     1     13
RCHRES   1                         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     Gravel Trench Be-006    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
  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
  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
  END HYDR-PARM1

  HYDR-PARM2
    # -  #    FTABNO       LEN      DELTH     STCOR        KS      DB50       ***
  <------><--------><--------><--------><--------><--------><--------><--------> ***
    1               1      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
  END HYDR-INIT
END RCHRES

SPEC-ACTIONS
END SPEC-ACTIONS
FTABLES
  FTABLE      1
   92    5
     Depth      Area    Volume  Outflow1  Outflow2  Velocity  Travel Time***
      (ft)   (acres) (acre-ft)   (cfs)     (cfs)   (ft/sec)    (Minutes)***
  0.000000  0.048209  0.000000  0.000000  0.000000
  0.055556  0.048209  0.001071  0.000000  0.354861
  0.111111  0.048209  0.002143  0.000000  0.354861
  0.166667  0.048209  0.003214  0.000000  0.354861
  0.222222  0.048209  0.004285  0.000000  0.354861
  0.277778  0.048209  0.005357  0.000000  0.354861
  0.333333  0.048209  0.006428  0.000000  0.354861
  0.388889  0.048209  0.007499  0.000000  0.354861
  0.444444  0.048209  0.008571  0.000000  0.354861
  0.500000  0.048209  0.009642  0.000000  0.354861
  0.555556  0.048209  0.010713  0.000000  0.354861
  0.611111  0.048209  0.011785  0.000000  0.354861
  0.666667  0.048209  0.012856  0.000000  0.354861
  0.722222  0.048209  0.013927  0.000000  0.354861
  0.777778  0.048209  0.014998  0.000000  0.354861
  0.833333  0.048209  0.016070  0.000000  0.354861
  0.888889  0.048209  0.017141  0.000000  0.354861
  0.944444  0.048209  0.018212  0.000000  0.354861
  1.000000  0.048209  0.019284  0.000000  0.354861
  1.055556  0.048209  0.020355  0.000000  0.354861
  1.111111  0.048209  0.021426  0.000000  0.354861
  1.166667  0.048209  0.022498  0.000000  0.354861
```

1.222222	0.048209	0.023569	0.000000	0.354861
1.277778	0.048209	0.024640	0.000000	0.354861
1.333333	0.048209	0.025712	0.000000	0.354861
1.388889	0.048209	0.026783	0.000000	0.354861
1.444444	0.048209	0.027854	0.000000	0.354861
1.500000	0.048209	0.028926	0.000000	0.354861
1.555556	0.048209	0.029997	0.000000	0.354861
1.611111	0.048209	0.031068	0.000000	0.354861
1.666667	0.048209	0.032140	0.000000	0.354861
1.722222	0.048209	0.033211	0.000000	0.354861
1.777778	0.048209	0.034282	0.000000	0.354861
1.833333	0.048209	0.035354	0.000000	0.354861
1.888889	0.048209	0.036425	0.000000	0.354861
1.944444	0.048209	0.037496	0.000000	0.354861
2.000000	0.048209	0.038567	0.000000	0.354861
2.055556	0.048209	0.039639	0.000000	0.354861
2.111111	0.048209	0.040710	0.000000	0.354861
2.166667	0.048209	0.041781	0.000000	0.354861
2.222222	0.048209	0.042853	0.000000	0.354861
2.277778	0.048209	0.043924	0.000000	0.354861
2.333333	0.048209	0.044995	0.000000	0.354861
2.388889	0.048209	0.046067	0.000000	0.354861
2.444444	0.048209	0.047138	0.000000	0.354861
2.500000	0.048209	0.048209	0.000000	0.354861
2.555556	0.048209	0.049281	0.000000	0.354861
2.611111	0.048209	0.050352	0.000000	0.354861
2.666667	0.048209	0.051423	0.000000	0.354861
2.722222	0.048209	0.052495	0.000000	0.354861
2.777778	0.048209	0.053566	0.000000	0.354861
2.833333	0.048209	0.054637	0.000000	0.354861
2.888889	0.048209	0.055709	0.000000	0.354861
2.944444	0.048209	0.056780	0.000000	0.354861
3.000000	0.048209	0.057851	0.000000	0.354861
3.055556	0.048209	0.058923	0.000000	0.354861
3.111111	0.048209	0.059994	0.000000	0.354861
3.166667	0.048209	0.061065	0.000000	0.354861
3.222222	0.048209	0.062137	0.000000	0.354861
3.277778	0.048209	0.063208	0.000000	0.354861
3.333333	0.048209	0.064279	0.000000	0.354861
3.388889	0.048209	0.065350	0.000000	0.354861
3.444444	0.048209	0.066422	0.000000	0.354861
3.500000	0.048209	0.067493	0.000000	0.354861
3.555556	0.048209	0.068564	0.000000	0.354861
3.611111	0.048209	0.069636	0.000000	0.354861
3.666667	0.048209	0.070707	0.000000	0.354861
3.722222	0.048209	0.071778	0.000000	0.354861
3.777778	0.048209	0.072850	0.000000	0.354861
3.833333	0.048209	0.073921	0.000000	0.354861
3.888889	0.048209	0.074992	0.000000	0.354861
3.944444	0.048209	0.076064	0.000000	0.354861
4.000000	0.048209	0.077135	0.000000	0.354861
4.055556	0.048209	0.078206	0.138729	0.354861
4.111111	0.048209	0.079278	0.389839	0.354861
4.166667	0.048209	0.080349	0.703432	0.354861
4.222222	0.048209	0.081420	1.046030	0.354861
4.277778	0.048209	0.082492	1.383552	0.354861
4.333333	0.048209	0.083563	1.683468	0.354861
4.388889	0.048209	0.084634	1.921105	0.354861
4.444444	0.048209	0.085706	2.088233	0.354861
4.500000	0.048209	0.086777	2.203335	0.354861
4.555556	0.048209	0.087848	2.347596	0.354861
4.611111	0.048209	0.088919	2.462179	0.354861
4.666667	0.048209	0.089991	2.571662	0.354861
4.722222	0.048209	0.091062	2.676671	0.354861
4.777778	0.048209	0.092133	2.777713	0.354861
4.833333	0.048209	0.093205	2.875206	0.354861
4.888889	0.048209	0.094276	2.969500	0.354861
4.944444	0.048209	0.095347	3.060890	0.354861
5.000000	0.048209	0.096419	3.149630	0.354861
5.055556	0.048209	0.099097	3.235937	0.354861

```
  END FTABLE  1
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    1.2           PERLND   1 999 EXTNL  PREC
WDM      2 PREC     ENGL    1.2           IMPLND   1 999 EXTNL  PREC
WDM      1 EVAP     ENGL    0.76          PERLND   1 999 EXTNL  PETINP
WDM      1 EVAP     ENGL    0.76          IMPLND   1 999 EXTNL  PETINP

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   1 HYDR   RO     1 1        1      WDM   1002 FLOW     ENGL      REPL
RCHRES   1 HYDR   O      1 1        1      WDM   1003 FLOW     ENGL      REPL
RCHRES   1 HYDR   O      2 1        1      WDM   1004 FLOW     ENGL      REPL
RCHRES   1 HYDR   STAGE  1 1        1      WDM   1005 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
END EXT TARGETS

MASS-LINK
<Volume>   <-Grp> <-Member-><--Mult-->    <Target>       <-Grp> <-Member->***
<Name>             <Name> # #<-factor->   <Name>                <Name> # #***
  MASS-LINK        2
PERLND     PWATER SURO       0.083333    RCHRES         INFLOW IVOL
  END MASS-LINK    2

  MASS-LINK        3
PERLND     PWATER IFWO       0.083333    RCHRES         INFLOW IVOL
  END MASS-LINK    3

  MASS-LINK        5
IMPLND     IWATER SURO       0.083333    RCHRES         INFLOW IVOL
  END MASS-LINK    5

  MASS-LINK       12
PERLND     PWATER SURO       0.083333    COPY           INPUT  MEAN
  END MASS-LINK   12

  MASS-LINK       13
PERLND     PWATER IFWO       0.083333    COPY           INPUT  MEAN
  END MASS-LINK   13

  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
```

Disclaimer

Legal Notice

Clear Creek Solutions, Inc.
6200 Capitol Blvd. Ste F
Olympia, WA. 98501
Toll Free 1(866)943-0304
Local (360)943-0304

www.clearcreeksolutions.com

Appendix 5: Conveyance Analysis

Nothing is necessary for this appendix at this time

Appendix 6: Operations and Maintenance Manual

1. Operations and Maintenance Manual