SW Herman Road Vehicle Storage Facility
Tualatin, Oregon

Preliminary Stormwater Report

Date: June 2025

Client:
AMK Herman, LLC
16350 NW Belt Road
Yamhill, OR 97148

Engineering Contact:
Paul Sellke, PE, GE
(503) 563-6151 | pauls@aks-eng.com

Prepared By: Morgan Masley, EI

Engineering Firm:
AKS Engineering & Forestry, LLC
12965 SW Herman Road, Suite 100
Tualatin, OR 97062

AKS Job Number: 7949-01

ENGINEERING & FORESTRY

www.aks-eng.com

Contents

Tables

Figures

Appendices

Preliminary Stormwater Report
SW HERMAN ROAD VEHICLE STORAGE FACILITY
TUALATIN, OREGON

1.0 Purpose of Report

The purpose of this report is to analyze the effects the proposed development will have on the existing and proposed stormwater conveyance system; document the criteria, methodology, and informational sources used to design the proposed stormwater system; and present the results of the preliminary hydraulic analysis.

2.0 Project Location/Description

The subject site is located adjacent to 19990 SW Cipole Road and is a ±1.44-acre plot of land in Tualatin, Oregon, Tax Lot 700 (Washington County Assessor's Map 2S121DC).

This development will include the creation of a commercial vehicle storage facility with the associated landscaped areas and utilities. Underground detention and treatment will be constructed to manage on-site stormwater runoff.

3.0 Regulatory Design Criteria

3.1. Stormwater Quantity

Per the 2019 Clean Water Services (CWS) *Design & Construction Standards* (R&O 19-5, as Amended by R&O 19-22) Section 4.02, Water Quantity Control Requirements for Conveyance Capacity, on-site detention for conveyance capacity of the 25-year storm event is required when any of the following conditions exist:

1. *There is an identified downstream deficiency and the District or City determines that detention rather than conveyance system enlargement is the more effective solution.*
2. *There is an identified regional detention site within the boundary of the development.*
3. *Water quantity facilities are required by District-adopted watershed management plans or adopted subbasin master plans.*

The proposed project does not meet any of the conditions listed above; therefore, the project is not required to meet stormwater quantity requirements. However, the stormwater facility has been designed to meet CWS hydromodification requirements and results in the detention of flows from the post-developed site's 25-year storm event to the level of flows from the predeveloped site's 25-year storm event.

3.2. Stormwater Hydromodification

Per CWS *Design & Construction Standards* Section 4.03, Hydromodification Approach Requirements, stormwater hydromodification is required unless the project meets any of the following criteria:

1. *The project results in the addition and/or modification of less than 12,000 square feet of impervious surface.*
2. *The project is located in an area with a District-approved subbasin strategy with an identified regional stormwater management approach for hydromodification.*

Per listed criteria in CWS *Design & Construction Standards* Table 4-2, Hydromodification Approach Project Category Table, the project is identified as Category 2. Therefore, the project will meet CWS hydromodification requirements by providing a peak flow–matching stormwater facility using the criteria established within CWS *Design & Construction Standards* Section 4.08.6.

3.3. Stormwater Quality

Stormwater quality management for this project will be provided by a proprietary mechanical treatment device. Proprietary treatment systems are allowed per CWS Section 4.04.3 and are designed to comply with CWS Section 4.07.8.

4.0 Design Methodology

The Santa Barbara Urban Hydrograph (SBUH) method was used to analyze stormwater runoff from the site. This method uses the Soil Conservation Service (SCS) Type 1A 24-hour design storm. HydroCAD 10.00-22 computer software aided in the analysis. Representative runoff curve numbers (CN) were obtained from the 1986 Natural Resources Conservation Service (NRCS) Technical Release 55 (TR-55), *Urban Hydrology for Small Watersheds,* and are included in Appendix E.

5.0 Design Parameters

5.1. Design Storms

Per CWS *Design & Construction Standards* Section 4.08.2, Storm Events Used in Design, the following rainfall intensities and durations were used in analyzing the proposed stormwater facility:

Table 5-1: Rainfall Intensities

Recurrence Interval (Years)	Storm Period (Hours)	Total Precipitation Depth (Inches)
WQ*	4	0.36
2	24	2.50
5	24	3.10
10	24	3.45
25	24	3.90

** WQ recurrence interval refers to the water quality storm.*

5.2. Pre-Developed Site Conditions

5.2.1. Site Topography

Existing on-site grades generally vary from ±0.7 to ±5 percent, with a high point elevation of ±144 feet located at the south property line and a low point elevation of ±138 feet located at the northwest property corner. The site slopes from the south property line to a low point in the northwest corner of the site.

5.2.2. Land Use

The existing site consists of an undeveloped grass field.

5.3. Soil Type

The soil beneath the project site and associated drainage basins is classified as Hillsboro loam, according to the NRCS Soil Survey for Washington County. The following table outlines the Hydrologic Soil Group rating for each soil type:

Table 5-2: Hydrologic Soil Groupings

NRCS Map Unit Identification	NRCS Soil Classification	Hydrologic Soil Group Rating
21B	Hillsboro loam, 3 to 7 percent slopes	B

Further information on this soil type is included in the NRCS Soil Resource Report located in Appendix D of this report.

5.4. Post-Developed Site Conditions

5.4.1. Site Topography

The on-site slopes will be modified with minor cuts and fills to accommodate the construction of a new vehicle storage facility.

5.4.2. Land Use

The site's land use will consist of commercial vehicle storage with the construction of a new commercial storage facility, drive lanes, and spaces. A planned second phase consists of the addition and construction of canopy-covered RV and vehicle storage buildings.

5.4.3. Post-Developed Site Parameters

Appendix B provides the HydroCAD reports and input parameters that were generated for the analyzed storm events with respect to the drainage basins contributing to the subdivision. These reports include all parameters used to model site hydrology (e.g. impervious and pervious areas, time of concentration, etc.).

5.4.4. Description of Off-Site Contributing Basins

The existing lot to the south (Tax Lot 900 of Washington County Assessor's Map 1S121DC) drains onto the subject site. This lot consists of multiple buildings, associated driveways, parking, and landscaping.

6.0 Stormwater Analyses

6.1. Proposed Stormwater Conduit Sizing and Inlet Spacing

To properly convey stormwater runoff, the proposed on-site area drains have been spaced to properly convey stormwater runoff. The proposed storm pipes will be sized using Manning's equation to convey the peak flows of the 25-year storm event, meeting CWS *Design & Construction Standards* Section 5.06.1, Pipe Size.

6.2. Proposed Stormwater Quality Control Facility

A proprietary mechanical treatment device will be incorporated into the project and designed per CWS *Design & Construction Standards* Section 4.07.8 to provide water quality treatment for runoff from impervious areas created by the proposed project.

The water quality flow (WQF) will be routed through the proprietary mechanical treatment device, which will provide water quality treatment per CWS *Design & Construction Standards* Section 4.07.8. Detailed calculations and checks against CWS criteria are included in Appendix C.

6.3. Stormwater Hydromodification Management

The proposed project will generate approximately 47,900 square feet of impervious area and is therefore classified as a large project. Per the CWS online Hydromodification Planning Tool, the subject site is located within a developed area, and the site's runoff flows through a series of stormwater mains, outfalling to an existing wetland, through unnamed tributaries, before discharging into the Tualatin River

with a low hydromodification risk level. Based on these parameters and CWS *Design & Construction Standards* Table 4-2, the project is classified as a Category 2 Hydromodification Approach.

Per the Category 2 requirements of CWS *Design & Construction Standards* Section 4.03.5, the subject site will provide a combination of infiltration facility and peak flow–matching detention, using design criteria listed in Sections 4.08.5 and 4.08.6 for the development of underground detention chambers and a proprietary mechanical treatment device. Specifically, flows from the subject site's post-developed 2-, 5-, and 10-year storm events will not exceed the site's flows from the predeveloped 50 percent of 2-, 5-, and 10-year storm events.

6.4. Stormwater Quantity Control Facility Design

The proposed project provides stormwater quantity management for the commercial development by using underground detention chambers designed per CWS and City of Tualatin standards. The following table outlines how the underground detention chamber's outflow will limit the site development's post-developed peak flows to less than the allowable pre-developed peak flows for each storm event and meet CWS requirements, as outlined in the Stormwater Quantity and Stormwater Hydromodification Management sections of this report.

Table 6-1: Pre- and Post-Developed Flows

Recurrence Interval (Years)	Peak Pre-Developed Flows (Cubic Feet per Second)	Peak Post-Developed Flows (Cubic Feet per Second)	Peak Flow Increase or (Decrease) (Cubic Feet per Second)
2	0.10 (50% of 2-year = 0.05)	0.05*	(0.05)
5	0.21	0.17	(0.04)
10	0.28	0.27	(0.01)
25	0.39	0.38	(0.01)

** Peak post-developed flow for 2-year storm event is less than or equal to 50 percent of 2-year peak pre-developed flow.*

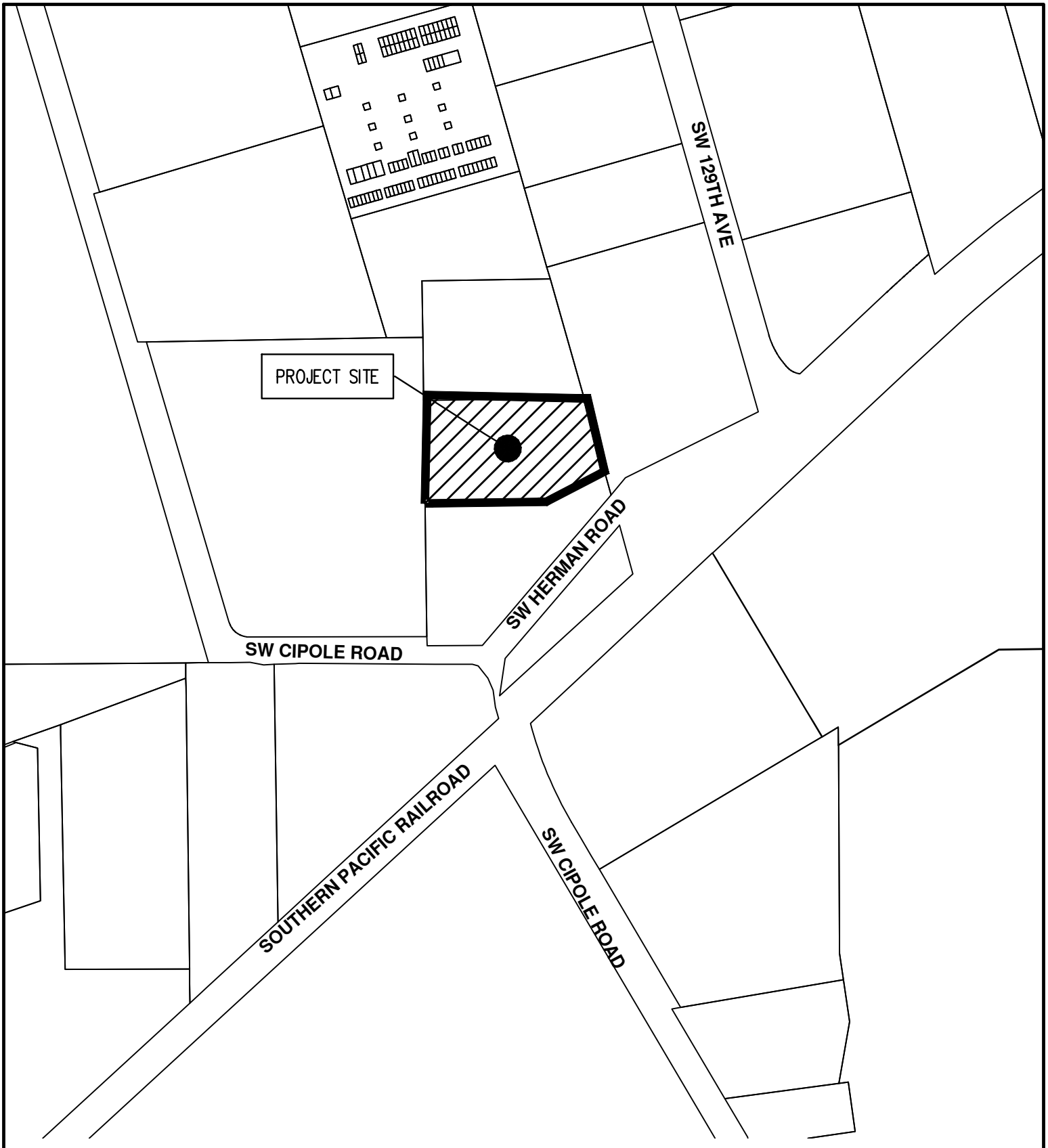
The proposed underground stormwater chambers have sufficient capacity to detain the commercial development's post-developed flows to the level of pre-developed flows, meeting the requirements established by the CWS *Design & Construction Standards*.

6.5. Downstream Analysis

Per CWS standards and City of Tualatin requirements, a downstream analysis of the existing stormwater system has been performed and no downstream deficiencies have been identified. Since the proposed development will provide stormwater detention up to the 25-year storm event, only a visual investigation of the downstream system is required.

Historically, the proposed site drains to the northwest corner of the site before draining through a series of storm utilities and unnamed tributaries before ultimately ending up in the Tualatin River.

A visual investigation of the downstream system has been performed to a distance of ¼ mile from the site. The investigation determined that there are no observable downstream obstructions or failures in the drainage system.



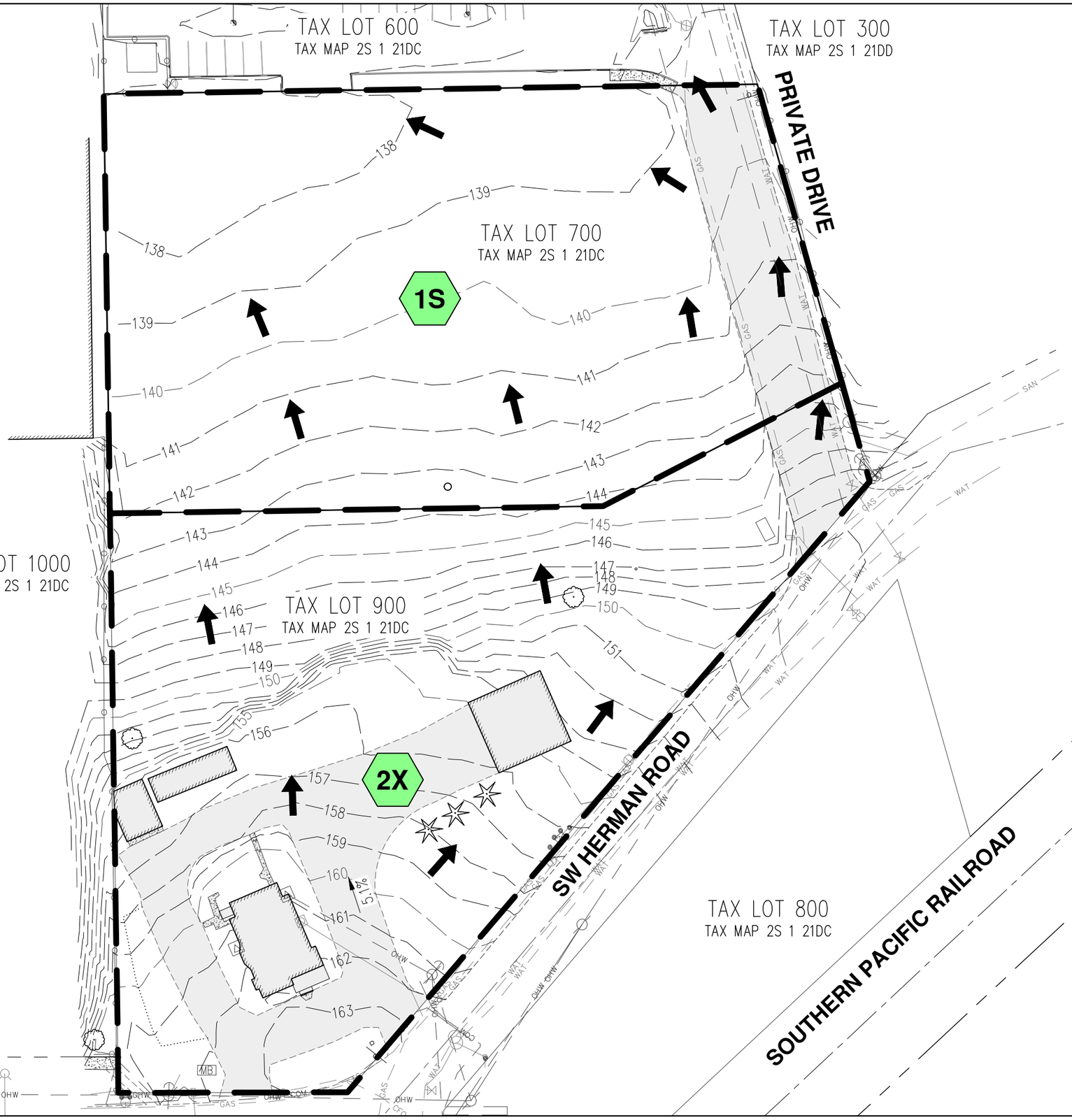
DATE: 6/19/2025

VICINITY MAP
SW HERMAN ROAD VEHICLE STORAGE FACILITY

FIGURE 1

AKS ENGINEERING & FORESTRY, LLC
12965 SW HERMAN RD, STE 100
TUALATIN, OR 97062
503.563.6151 WWW.AKS-ENG.COM

DRWN: MBM
CHKD: PS
AKS JOB: 7949-01



LEGEND

- PROJECT DRAINAGE BASIN — 1S
- OFFSITE DRAINAGE BASIN — 2X
- DIRECTION OF FLOW
- BASIN BOUNDARY
- EXISTING CONTOUR (1 FOOT) — 144
- EXISTING CONTOUR (5 FOOT) — 145
- IMPERVIOUS AREA (AC PAVEMENT)

N

SCALE: 1"= 50 FEET

50 0 10 25 50

ORIGINAL PAGE SIZE: 11" x 17"

DATE: 6/19/2025

PRE-DEVELOPED CATCHMENT MAP

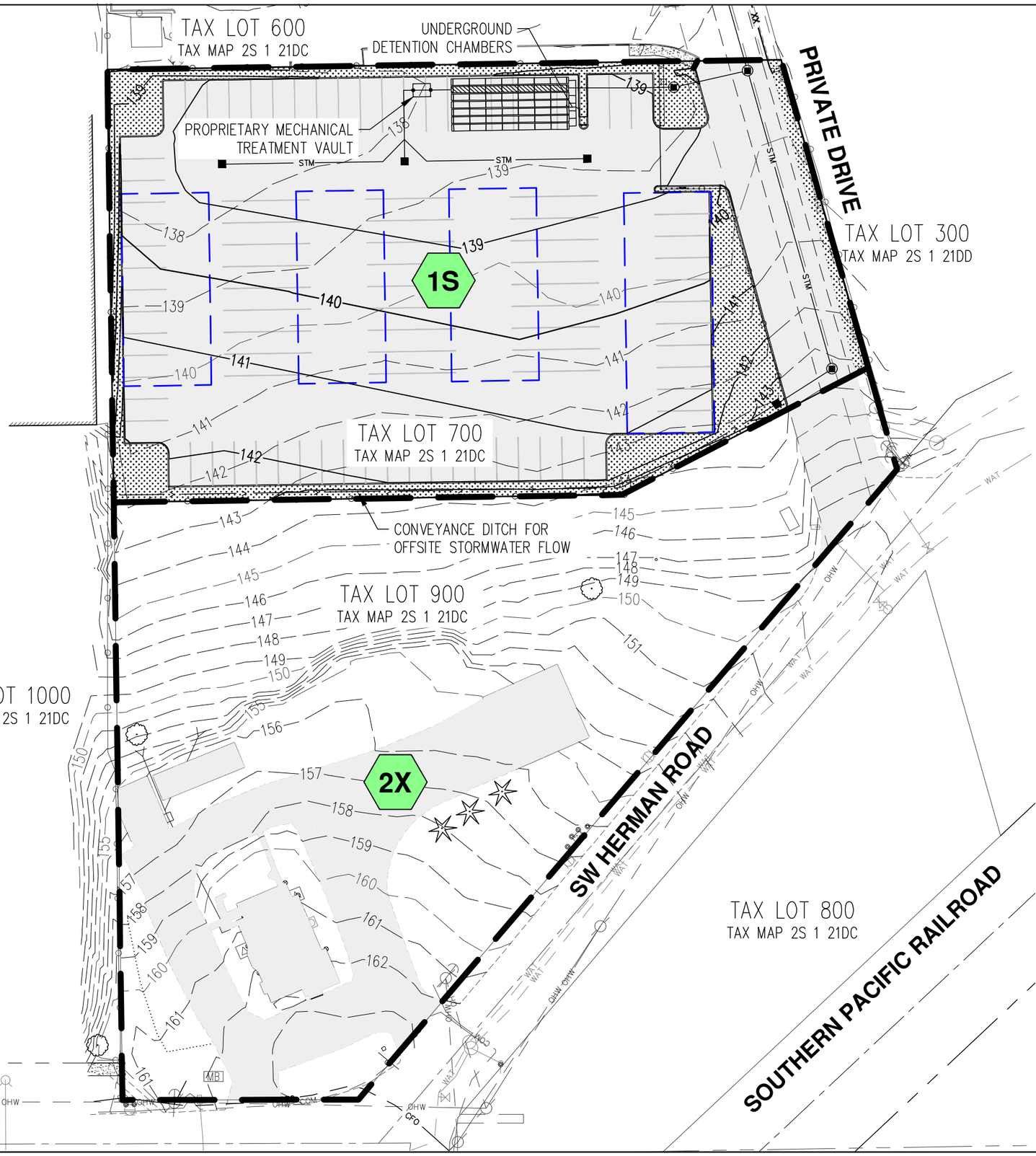
SW HERMAN ROAD VEHICLE STORAGE FACILITY

FIGURE 2

AKS ENGINEERING & FORESTRY, LLC
12965 SW HERMAN RD, STE 100
TUALATIN, OR 97062
503.563.6151 WWW.AKS-ENG.COM

DRWN: MBM
CHKD: PS
AKS JOB: 7949-01

DWG: 7949-01 PRE-DEV | 2



LEGEND

- OFFSITE DRAINAGE BASIN — 2X
- PROJECT DRAINAGE BASIN — 1S
- DIRECTION OF FLOW
- BASIN BOUNDARY
- EXISTING CONTOUR (1 FOOT) — 144
- EXISTING CONTOUR (5 FOOT) — 145
- FINISHED GRADE CONTOUR (1 FOOT) — 144
- FINISHED GRADE CONTOUR (5 FOOT) — 145
- CONCEPT PHASE 2 BUILDING FOOTPRINT
- IMPERVIOUS AREA (AC PAVEMENT)

N

SCALE: 1"= 50 FEET

50 0 10 25 50

ORIGINAL PAGE SIZE: 11" x 17"

DATE: 6/19/2025

POST-DEVELOPED CATCHMENT MAP

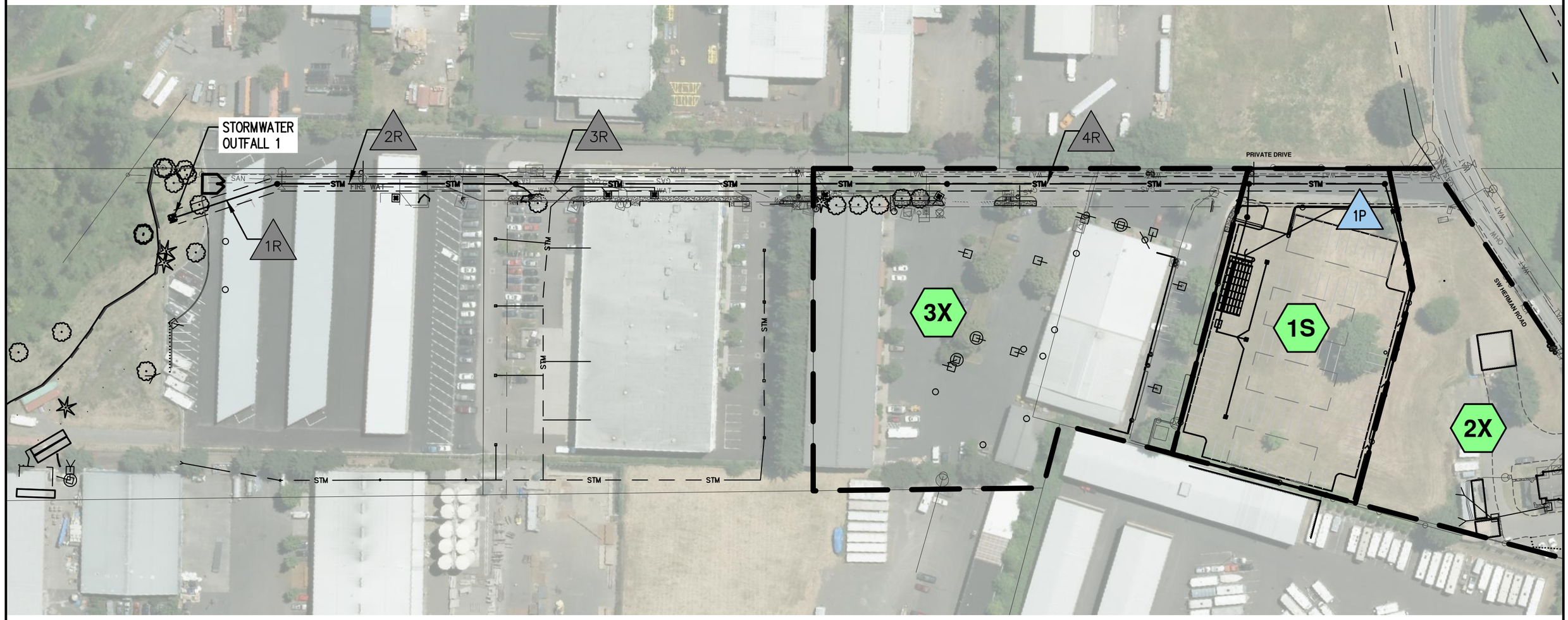
SW HERMAN ROAD VEHICLE STORAGE FACILITY

FIGURE 3

AKS ENGINEERING & FORESTRY, LLC
12965 SW HERMAN RD, STE 100
TUALATIN, OR 97062
503.563.6151 WWW.AKS-ENG.COM

DRWN: MBM
CHKD: PS
AKS JOB: 7949-01

DWG: 7949-01 POST-DEV | 3



LEGEND

OFFSITE DRAINAGE BASINS — 2X, 3X

PROJECT DRAINAGE BASIN — 2S

STORMWATER FACILITY — 1P

PROPOSED STORM MAIN — 1R

BASIN BOUNDARY

N

SCALE: 1"=100 FEET

100 0 20 50 100

ORIGINAL PAGE SIZE: 11" x 17"

DATE: 6/19/2025

OFF-SITE STORMWATER MAIN EXTENSION MAP

SW HERMAN ROAD VEHICLE STORAGE FACILITY

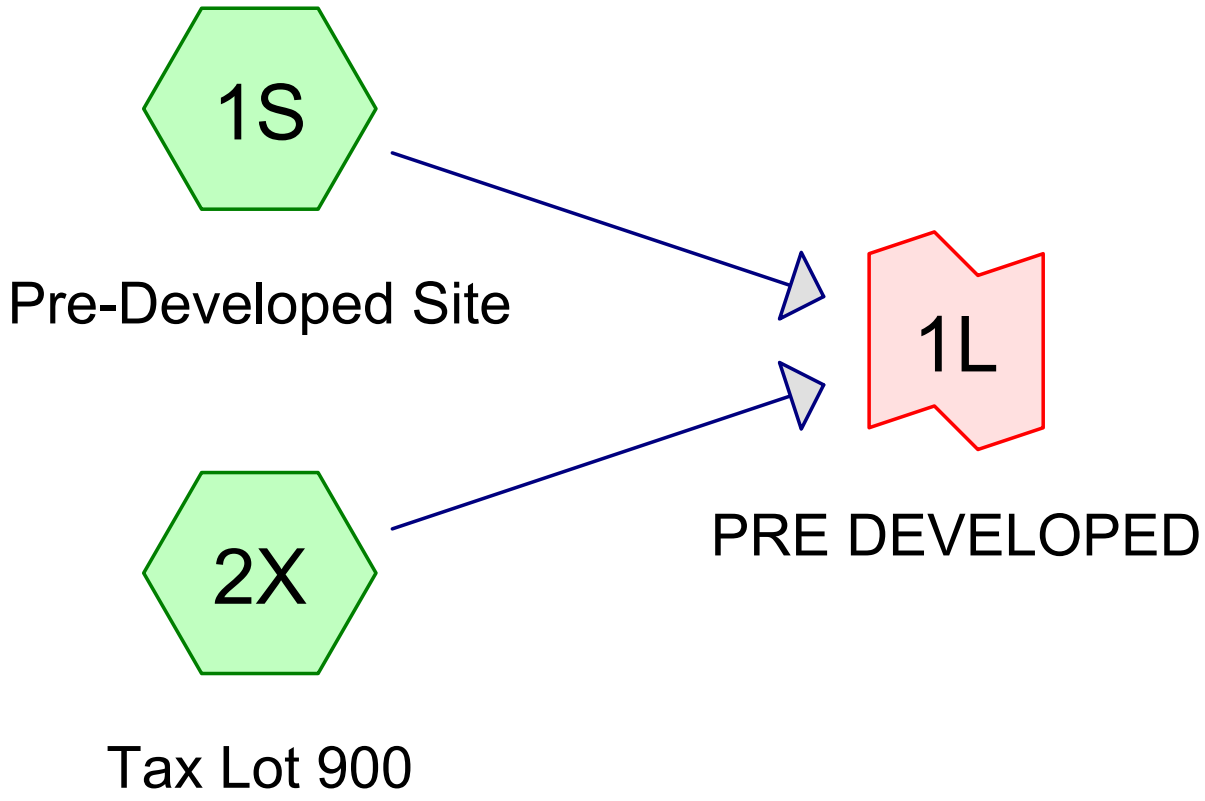
FIGURE 4

AKS ENGINEERING & FORESTRY, LLC
12965 SW HERMAN RD, STE 100
TUALATIN, OR 97062
503.563.6151 WWW.AKS-ENG.COM

DRWN: MBM
CHKD: PS
AKS JOB: 7949-01

DWG: 7949-01 STORM EXTENSION | 4

Appendix A: HydroCAD Reports



Subcat Reach Pond Link

Routing Diagram for 7949-01 Pre-Dev Storm Facility Routing
Prepared by AKS Engineering and Forestry , Printed 6/19/2025

Time span=0.00-24.00 hrs, dt=0.01 hrs, 2401 points
Runoff by SBUH method, Split Pervious/Imperv.
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment1S: Pre-DevelopedSite Runoff Area=62,666 sf 8.61% Impervious Runoff Depth>0.58"
Flow Length=268' Tc=7.5 min CN=69/98 Runoff=0.10 cfs 0.069 af

Subcatchment2X: Tax Lot 900 Runoff Area=66,451 sf 26.43% Impervious Runoff Depth>0.74"
Flow Length=279' Tc=7.0 min CN=61/98 Runoff=0.23 cfs 0.094 af

Link 1L: PRE DEVELOPED Inflow=0.32 cfs 0.163 af
Primary=0.32 cfs 0.163 af

Total Runoff Area = 2.964 ac Runoff Volume = 0.163 af Average Runoff Depth = 0.66"
82.22% Pervious = 2.437 ac 17.78% Impervious = 0.527 ac

Time span=0.00-24.00 hrs, dt=0.01 hrs, 2401 points
Runoff by SBUH method, Split Pervious/Imperv.
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment1S: Pre-DevelopedSite Runoff Area=62,666 sf 8.61% Impervious Runoff Depth>0.90"
Flow Length=268' Tc=7.5 min CN=69/98 Runoff=0.21 cfs 0.108 af

Subcatchment2X: Tax Lot 900 Runoff Area=66,451 sf 26.43% Impervious Runoff Depth>1.05"
Flow Length=279' Tc=7.0 min CN=61/98 Runoff=0.29 cfs 0.134 af

Link 1L: PRE DEVELOPED Inflow=0.49 cfs 0.242 af
Primary=0.49 cfs 0.242 af

Total Runoff Area = 2.964 ac Runoff Volume = 0.242 af Average Runoff Depth = 0.98"
82.22% Pervious = 2.437 ac 17.78% Impervious = 0.527 ac

Time span=0.00-24.00 hrs, dt=0.01 hrs, 2401 points
Runoff by SBUH method, Split Pervious/Imperv.
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment1S: Pre-DevelopedSite Runoff Area=62,666 sf 8.61% Impervious Runoff Depth>1.12"
Flow Length=268' Tc=7.5 min CN=69/98 Runoff=0.28 cfs 0.134 af

Subcatchment2X: Tax Lot 900 Runoff Area=66,451 sf 26.43% Impervious Runoff Depth>1.25"
Flow Length=279' Tc=7.0 min CN=61/98 Runoff=0.34 cfs 0.159 af

Link 1L: PRE DEVELOPED Inflow=0.62 cfs 0.293 af
Primary=0.62 cfs 0.293 af

Total Runoff Area = 2.964 ac Runoff Volume = 0.293 af Average Runoff Depth = 1.19"
82.22% Pervious = 2.437 ac 17.78% Impervious = 0.527 ac

Time span=0.00-24.00 hrs, dt=0.01 hrs, 2401 points
Runoff by SBUH method, Split Pervious/Imperv.
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment1S: Pre-DevelopedSite Runoff Area=62,666 sf 8.61% Impervious Runoff Depth>1.41"
Flow Length=268' Tc=7.5 min CN=69/98 Runoff=0.39 cfs 0.169 af

Subcatchment2X: Tax Lot 900 Runoff Area=66,451 sf 26.43% Impervious Runoff Depth>1.52"
Flow Length=279' Tc=7.0 min CN=61/98 Runoff=0.44 cfs 0.194 af

Link 1L: PRE DEVELOPED Inflow=0.82 cfs 0.363 af
Primary=0.82 cfs 0.363 af

Total Runoff Area = 2.964 ac Runoff Volume = 0.363 af Average Runoff Depth = 1.47"
82.22% Pervious = 2.437 ac 17.78% Impervious = 0.527 ac

Summary for Subcatchment 1S: Pre-Developed Site

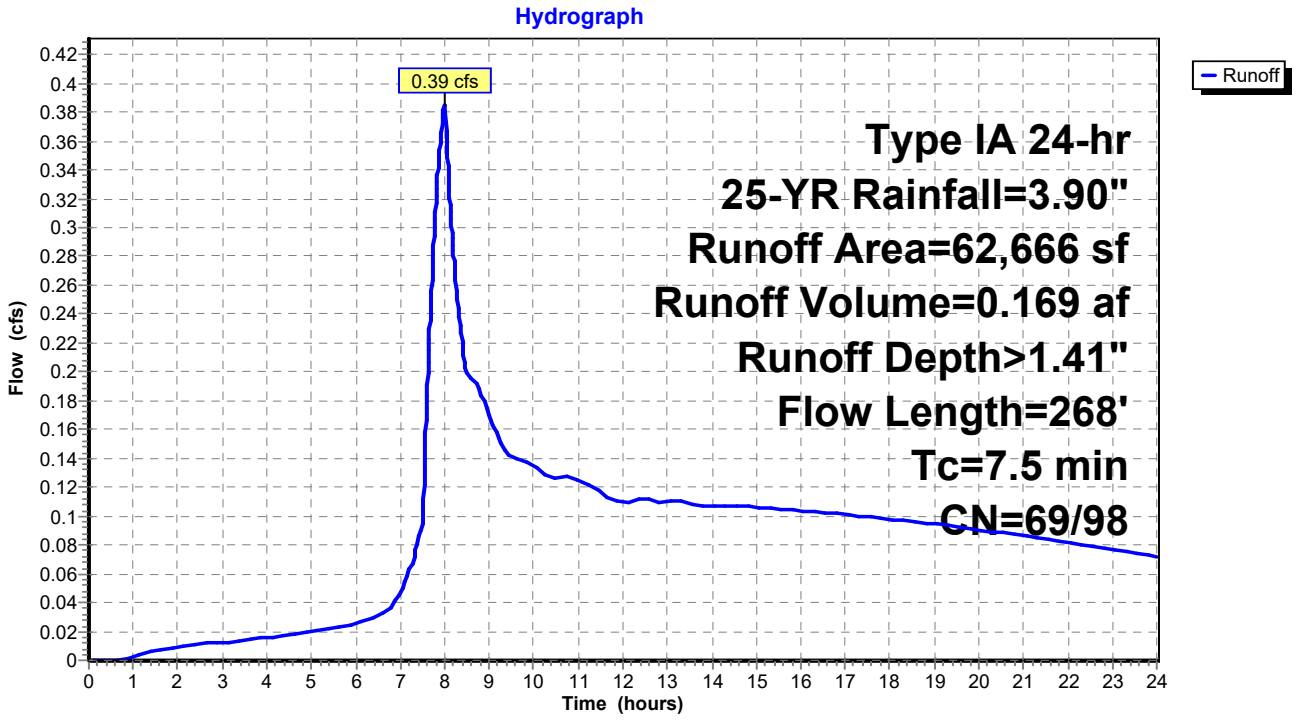
Runoff = 0.39 cfs @ 8.00 hrs, Volume= 0.169 af, Depth> 1.41"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type IA 24-hr 25-YR Rainfall=3.90"

Area (sf)	CN	Description
57,271	69	50-75% Grass cover, Fair, HSG B
5,395	98	Paved parking, HSG B
62,666	71	Weighted Average
57,271		91.39% Pervious Area
5,395		8.61% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.7	50	0.0450	0.23		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.90"
3.8	218	0.0190	0.96		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
7.5	268	Total			

Subcatchment 1S: Pre-Developed Site



Summary for Subcatchment 2X: Tax Lot 900

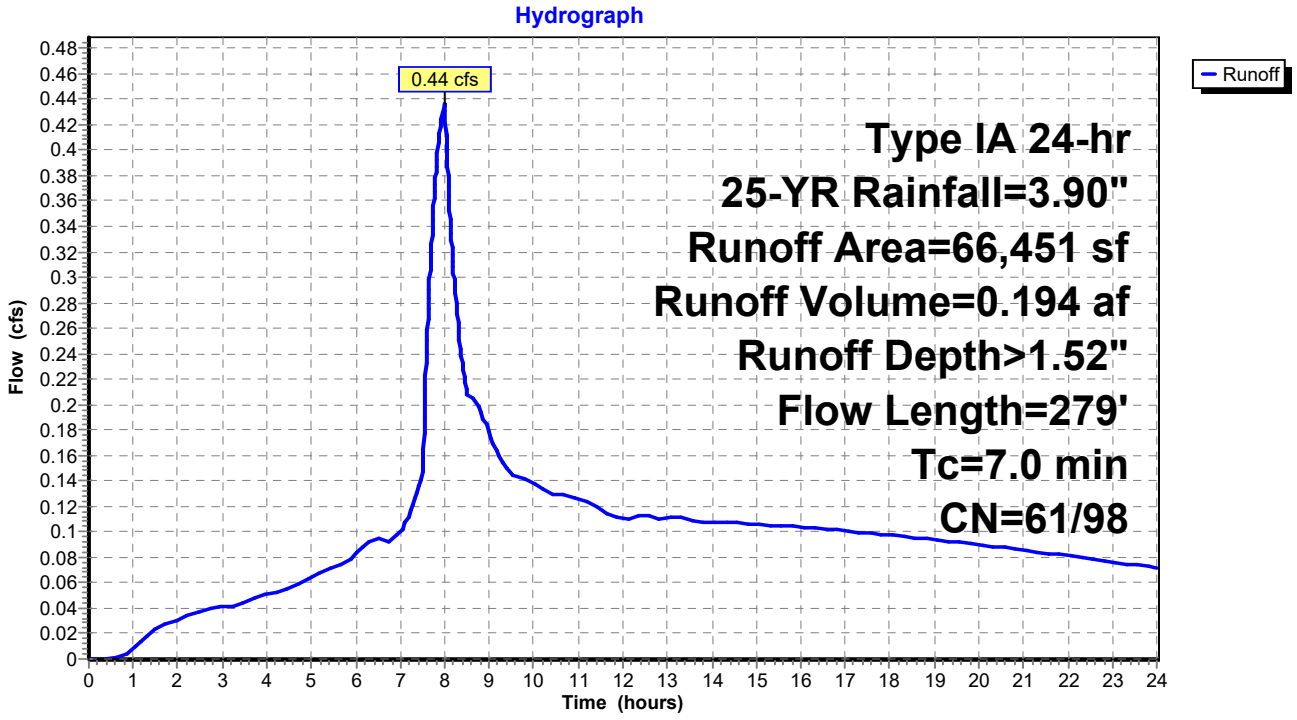
Runoff = 0.44 cfs @ 8.00 hrs, Volume= 0.194 af, Depth> 1.52"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type IA 24-hr 25-YR Rainfall=3.90"

Area (sf)	CN	Description
48,885	61	>75% Grass cover, Good, HSG B
17,566	98	Paved parking, HSG B
66,451	71	Weighted Average
48,885		73.57% Pervious Area
17,566		26.43% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.8	50	0.0230	0.17		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.90"
1.7	160	0.0530	1.61		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
0.0	11	0.4940	4.92		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
0.5	58	0.0900	2.10		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
7.0	279	Total			

Subcatchment 2X: Tax Lot 900

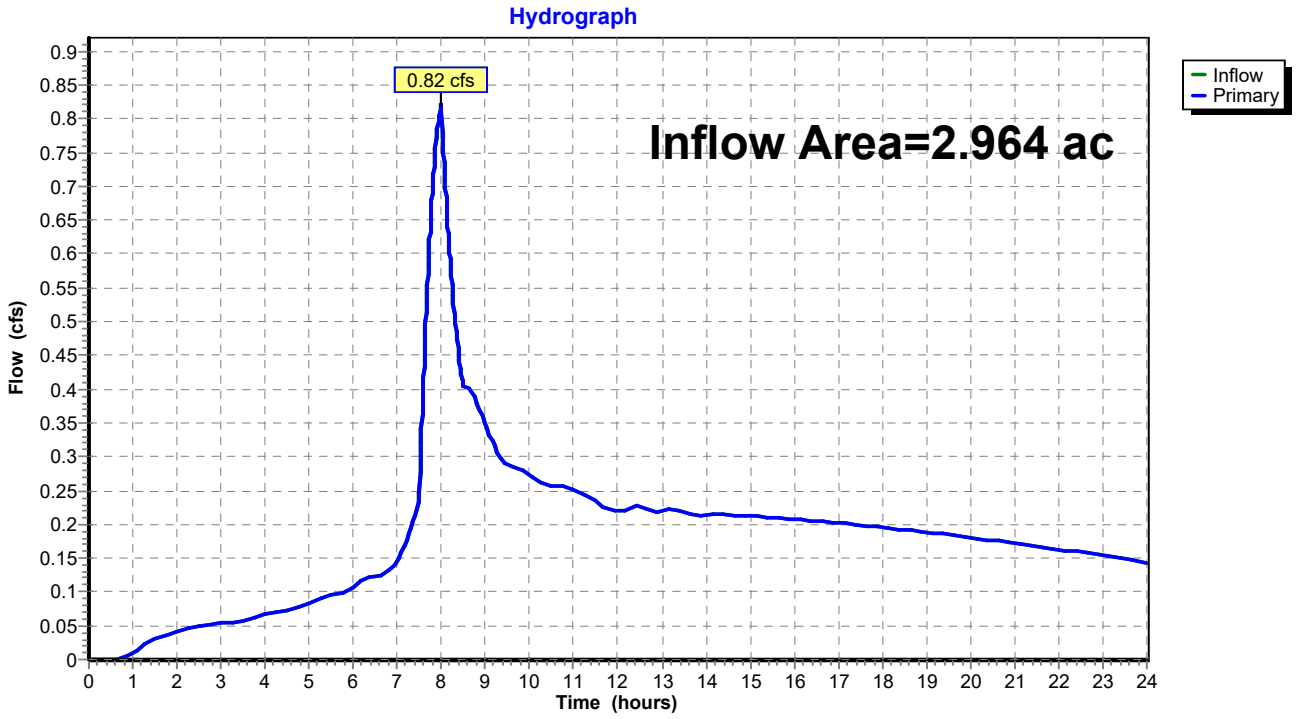


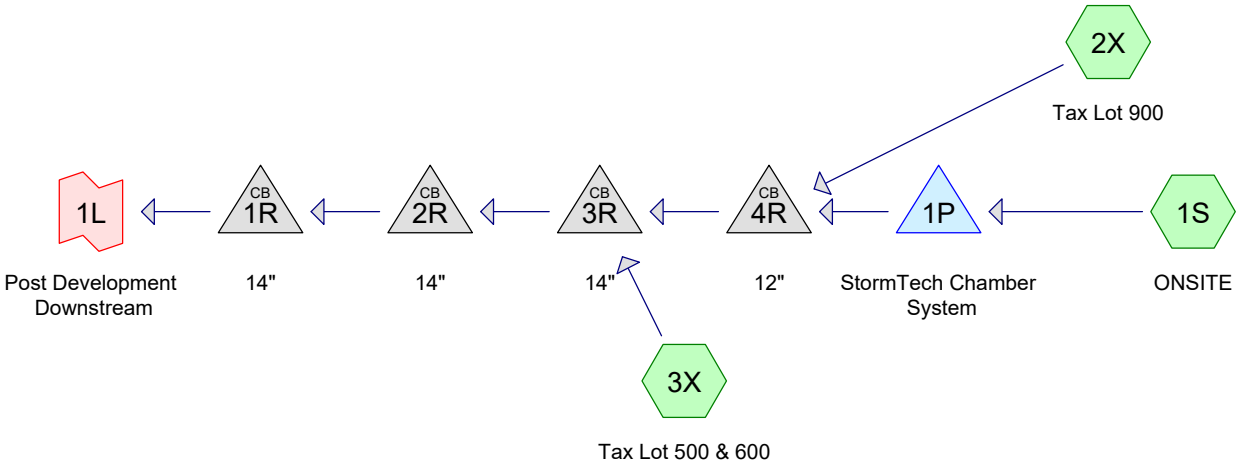
Summary for Link 1L: PRE DEVELOPED

Inflow Area = 2.964 ac, 17.78% Impervious, Inflow Depth > 1.47" for 25-YR event
Inflow = 0.82 cfs @ 8.00 hrs, Volume= 0.363 af
Primary = 0.82 cfs @ 8.00 hrs, Volume= 0.363 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs

Link 1L: PRE DEVELOPED





Subcat Reach Pond Link

Routing Diagram for 7949-01 Post-Dev Storm Facility Routing
Prepared by AKS Engineering and Forestry , Printed 6/19/2025

Time span=0.00-24.00 hrs, dt=0.01 hrs, 2401 points
Runoff by SBUH method, Split Pervious/Imperv.
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment1S: ONSITE Runoff Area=62,666 sf 84.02% Impervious Runoff Depth>1.94"
Tc=5.0 min CN=61/98 Runoff=0.70 cfs 0.232 af

Subcatchment2X: Tax Lot 900 Runoff Area=66,451 sf 26.43% Impervious Runoff Depth>0.74"
Tc=5.0 min CN=61/98 Runoff=0.23 cfs 0.094 af

Subcatchment3X: Tax Lot 500 & 600 Runoff Area=130,463 sf 94.63% Impervious Runoff Depth>2.16"
Tc=0.0 min CN=61/98 Runoff=1.67 cfs 0.539 af

Pond 1P: StormTech Chamber System Peak Elev=132.85' Storage=886 cf Inflow=0.70 cfs 0.232 af
Discarded=0.25 cfs 0.224 af Primary=0.05 cfs 0.008 af Outflow=0.30 cfs 0.232 af

Pond 1R: 14" Peak Elev=125.62' Inflow=1.91 cfs 0.641 af
14.0" Round Culvert n=0.013 L=111.0' S=0.0040 '/' Outflow=1.91 cfs 0.641 af

Pond 2R: 14" Peak Elev=127.42' Inflow=1.91 cfs 0.641 af
16.0" Round Culvert n=0.013 L=249.0' S=0.0070 '/' Outflow=1.91 cfs 0.641 af

Pond 3R: 14" Peak Elev=130.79' Inflow=1.91 cfs 0.641 af
14.0" Round Culvert n=0.013 L=450.0' S=0.0070 '/' Outflow=1.91 cfs 0.641 af

Pond 4R: 12" Peak Elev=131.86' Inflow=0.27 cfs 0.102 af
12.0" Round Culvert n=0.013 L=315.0' S=0.0040 '/' Outflow=0.27 cfs 0.102 af

Link 1L: Post Development Downstream Inflow=1.91 cfs 0.641 af
Primary=1.91 cfs 0.641 af

Total Runoff Area = 5.959 ac Runoff Volume = 0.865 af Average Runoff Depth = 1.74"
25.39% Pervious = 1.513 ac 74.61% Impervious = 4.446 ac

Time span=0.00-24.00 hrs, dt=0.01 hrs, 2401 points
Runoff by SBUH method, Split Pervious/Imperv.
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment1S: ONSITE Runoff Area=62,666 sf 84.02% Impervious Runoff Depth>2.47"
Tc=5.0 min CN=61/98 Runoff=0.87 cfs 0.296 af

Subcatchment2X: Tax Lot 900 Runoff Area=66,451 sf 26.43% Impervious Runoff Depth>1.05"
Tc=5.0 min CN=61/98 Runoff=0.29 cfs 0.134 af

Subcatchment3X: Tax Lot 500 & 600 Runoff Area=130,463 sf 94.63% Impervious Runoff Depth>2.74"
Tc=0.0 min CN=61/98 Runoff=2.09 cfs 0.683 af

Pond 1P: StormTech Chamber System Peak Elev=133.25' Storage=1,256 cf Inflow=0.87 cfs 0.296 af
Discarded=0.26 cfs 0.276 af Primary=0.17 cfs 0.020 af Outflow=0.43 cfs 0.296 af

Pond 1R: 14" Peak Elev=125.76' Inflow=2.41 cfs 0.837 af
14.0" Round Culvert n=0.013 L=111.0' S=0.0040 '/' Outflow=2.41 cfs 0.837 af

Pond 2R: 14" Peak Elev=127.52' Inflow=2.41 cfs 0.837 af
16.0" Round Culvert n=0.013 L=249.0' S=0.0070 '/' Outflow=2.41 cfs 0.837 af

Pond 3R: 14" Peak Elev=130.90' Inflow=2.41 cfs 0.837 af
14.0" Round Culvert n=0.013 L=450.0' S=0.0070 '/' Outflow=2.41 cfs 0.837 af

Pond 4R: 12" Peak Elev=131.91' Inflow=0.34 cfs 0.154 af
12.0" Round Culvert n=0.013 L=315.0' S=0.0040 '/' Outflow=0.34 cfs 0.154 af

Link 1L: Post Development Downstream Inflow=2.41 cfs 0.837 af
Primary=2.41 cfs 0.837 af

Total Runoff Area = 5.959 ac Runoff Volume = 1.113 af Average Runoff Depth = 2.24"
25.39% Pervious = 1.513 ac 74.61% Impervious = 4.446 ac

Time span=0.00-24.00 hrs, dt=0.01 hrs, 2401 points
Runoff by SBUH method, Split Pervious/Imperv.
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment1S: ONSITE Runoff Area=62,666 sf 84.02% Impervious Runoff Depth>2.79"
Tc=5.0 min CN=61/98 Runoff=0.98 cfs 0.334 af

Subcatchment2X: Tax Lot 900 Runoff Area=66,451 sf 26.43% Impervious Runoff Depth>1.25"
Tc=5.0 min CN=61/98 Runoff=0.35 cfs 0.159 af

Subcatchment3X: Tax Lot 500 & 600 Runoff Area=130,463 sf 94.63% Impervious Runoff Depth>3.07"
Tc=0.0 min CN=61/98 Runoff=2.33 cfs 0.767 af

Pond 1P: StormTech Chamber System Peak Elev=133.49' Storage=1,452 cf Inflow=0.98 cfs 0.334 af
Discarded=0.26 cfs 0.301 af Primary=0.27 cfs 0.032 af Outflow=0.53 cfs 0.334 af

Pond 1R: 14" Peak Elev=125.84' Inflow=2.70 cfs 0.959 af
14.0" Round Culvert n=0.013 L=111.0' S=0.0040 '/' Outflow=2.70 cfs 0.959 af

Pond 2R: 14" Peak Elev=127.58' Inflow=2.70 cfs 0.959 af
16.0" Round Culvert n=0.013 L=249.0' S=0.0070 '/' Outflow=2.70 cfs 0.959 af

Pond 3R: 14" Peak Elev=130.96' Inflow=2.70 cfs 0.959 af
14.0" Round Culvert n=0.013 L=450.0' S=0.0070 '/' Outflow=2.70 cfs 0.959 af

Pond 4R: 12" Peak Elev=132.01' Inflow=0.54 cfs 0.192 af
12.0" Round Culvert n=0.013 L=315.0' S=0.0040 '/' Outflow=0.54 cfs 0.192 af

Link 1L: Post Development Downstream Inflow=2.70 cfs 0.959 af
Primary=2.70 cfs 0.959 af

Total Runoff Area = 5.959 ac Runoff Volume = 1.260 af Average Runoff Depth = 2.54"
25.39% Pervious = 1.513 ac 74.61% Impervious = 4.446 ac

Time span=0.00-24.00 hrs, dt=0.01 hrs, 2401 points
Runoff by SBUH method, Split Pervious/Imperv.
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment1S: ONSITE Runoff Area=62,666 sf 84.02% Impervious Runoff Depth>3.20"
Tc=5.0 min CN=61/98 Runoff=1.12 cfs 0.383 af

Subcatchment2X: Tax Lot 900 Runoff Area=66,451 sf 26.43% Impervious Runoff Depth>1.53"
Tc=5.0 min CN=61/98 Runoff=0.44 cfs 0.194 af

Subcatchment3X: Tax Lot 500 & 600 Runoff Area=130,463 sf 94.63% Impervious Runoff Depth>3.51"
Tc=0.0 min CN=61/98 Runoff=2.66 cfs 0.876 af

Pond 1P: StormTech Chamber System Peak Elev=133.93' Storage=1,715 cf Inflow=1.12 cfs 0.383 af
Discarded=0.27 cfs 0.333 af Primary=0.38 cfs 0.050 af Outflow=0.65 cfs 0.383 af

Pond 1R: 14" Peak Elev=125.99' Inflow=3.24 cfs 1.120 af
14.0" Round Culvert n=0.013 L=111.0' S=0.0040 '/' Outflow=3.24 cfs 1.120 af

Pond 2R: 14" Peak Elev=127.70' Inflow=3.24 cfs 1.120 af
16.0" Round Culvert n=0.013 L=249.0' S=0.0070 '/' Outflow=3.24 cfs 1.120 af

Pond 3R: 14" Peak Elev=131.08' Inflow=3.24 cfs 1.120 af
14.0" Round Culvert n=0.013 L=450.0' S=0.0070 '/' Outflow=3.24 cfs 1.120 af

Pond 4R: 12" Peak Elev=132.11' Inflow=0.76 cfs 0.244 af
12.0" Round Culvert n=0.013 L=315.0' S=0.0040 '/' Outflow=0.76 cfs 0.244 af

Link 1L: Post Development Downstream Inflow=3.24 cfs 1.120 af
Primary=3.24 cfs 1.120 af

Total Runoff Area = 5.959 ac Runoff Volume = 1.453 af Average Runoff Depth = 2.93"
25.39% Pervious = 1.513 ac 74.61% Impervious = 4.446 ac

Summary for Subcatchment 1S: ONSITE

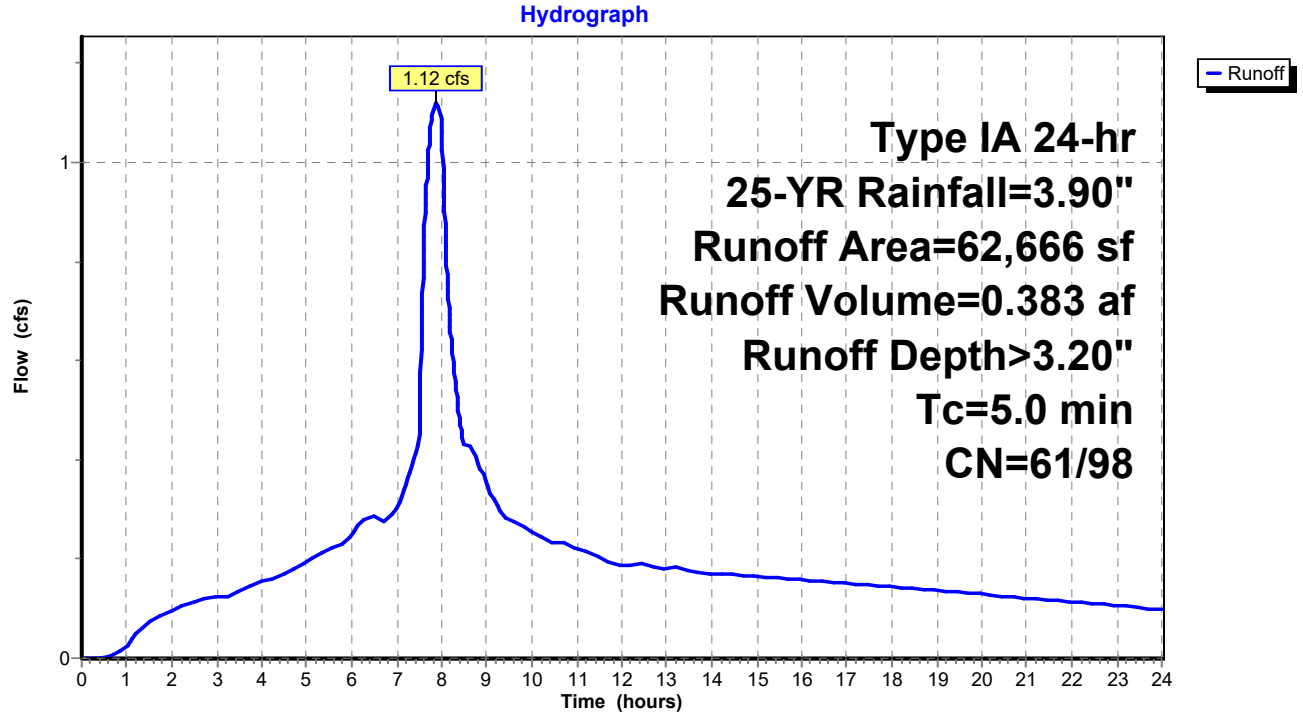
Runoff = 1.12 cfs @ 7.89 hrs, Volume= 0.383 af, Depth> 3.20"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type IA 24-hr 25-YR Rainfall=3.90"

Area (sf)	CN	Description
52,655	98	Paved parking, HSG B
10,011	61	>75% Grass cover, Good, HSG B
62,666	92	Weighted Average
10,011		15.98% Pervious Area
52,655		84.02% Impervious Area

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

Subcatchment 1S: ONSITE



Summary for Subcatchment 2X: Tax Lot 900

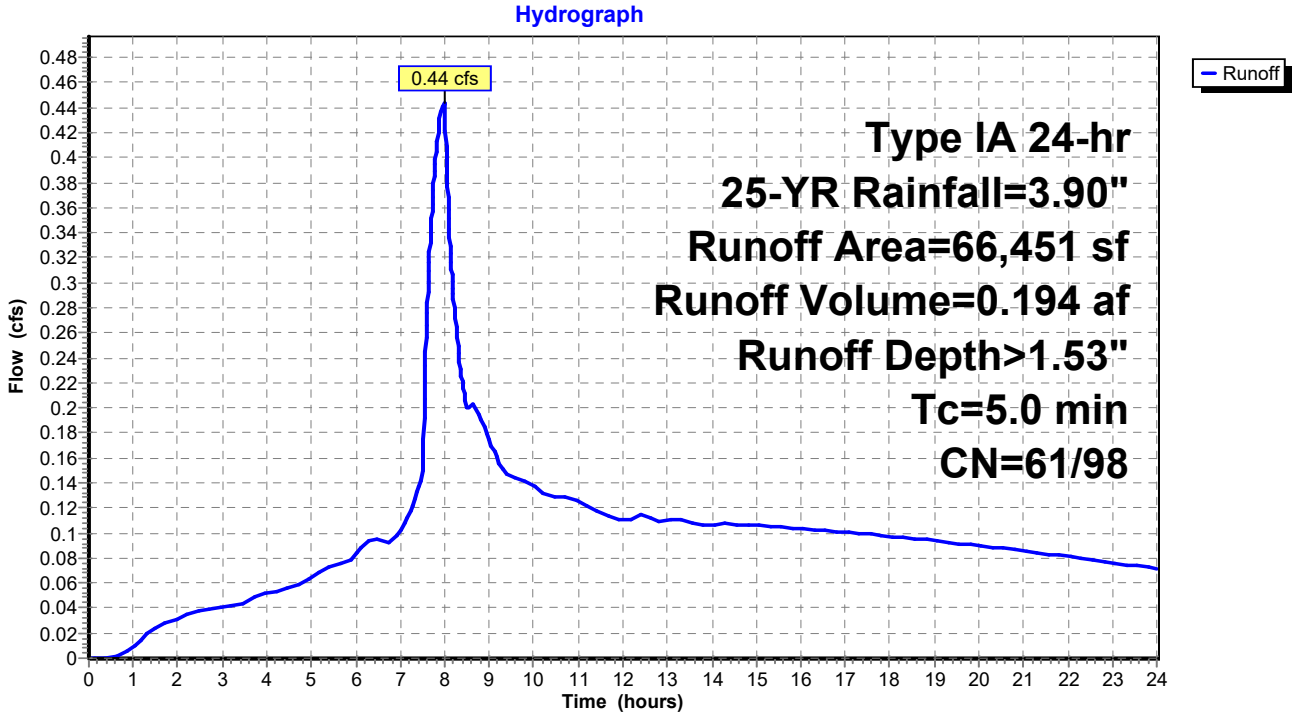
Runoff = 0.44 cfs @ 7.98 hrs, Volume= 0.194 af, Depth> 1.53"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type IA 24-hr 25-YR Rainfall=3.90"

Area (sf)	CN	Description
17,566	98	Paved parking, HSG B
48,885	61	>75% Grass cover, Good, HSG B
66,451	71	Weighted Average
48,885		73.57% Pervious Area
17,566		26.43% Impervious Area

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

Subcatchment 2X: Tax Lot 900



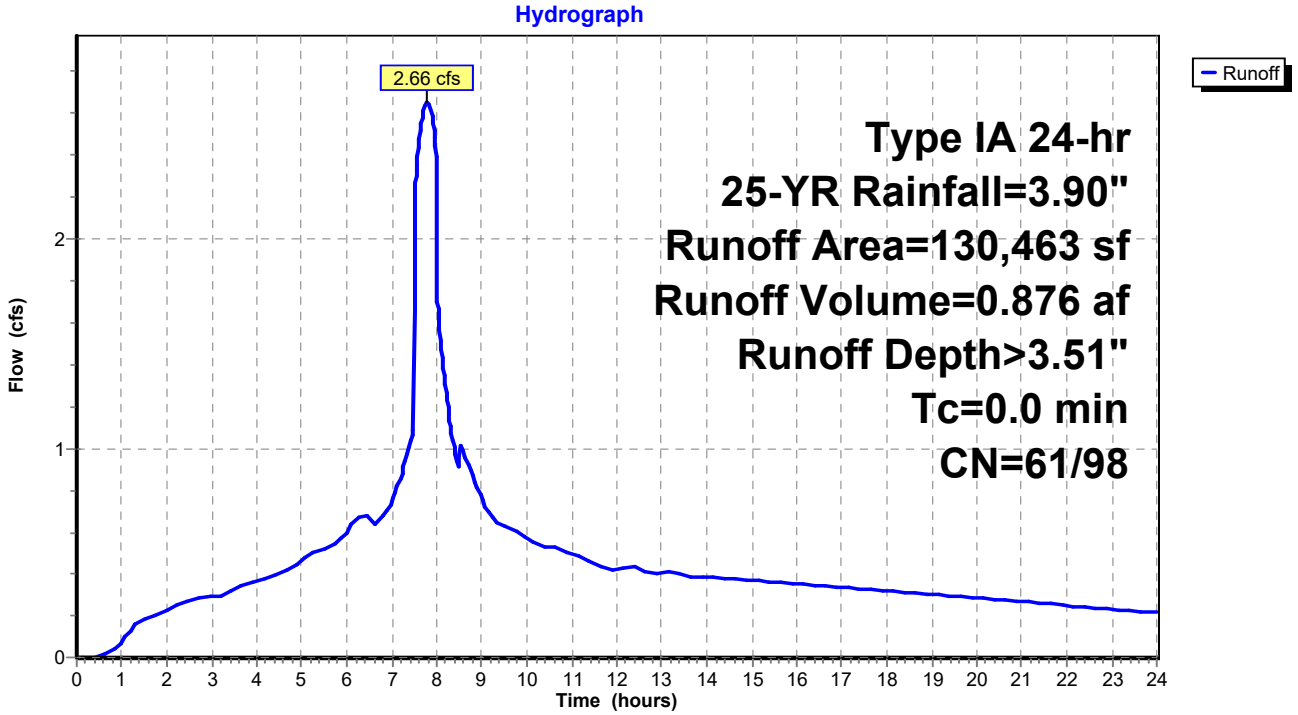
Summary for Subcatchment 3X: Tax Lot 500 & 600

Runoff = 2.66 cfs @ 7.79 hrs, Volume= 0.876 af, Depth> 3.51"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type IA 24-hr 25-YR Rainfall=3.90"

	Area (sf)	CN	Description
	81,458	98	Paved parking, HSG B
*	42,005	98	Building
	7,000	61	>75% Grass cover, Good, HSG B
	130,463	96	Weighted Average
	7,000		5.37% Pervious Area
	123,463		94.63% Impervious Area

Subcatchment 3X: Tax Lot 500 & 600



Summary for Pond 1P: StormTech Chamber System

Inflow Area = 1.439 ac, 84.02% Impervious, Inflow Depth > 3.20" for 25-YR event
Inflow = 1.12 cfs @ 7.89 hrs, Volume= 0.383 af
Outflow = 0.65 cfs @ 8.20 hrs, Volume= 0.383 af, Atten= 42%, Lag= 19.1 min
Discarded = 0.27 cfs @ 8.20 hrs, Volume= 0.333 af
Primary = 0.38 cfs @ 8.20 hrs, Volume= 0.050 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Peak Elev= 133.93' @ 8.20 hrs Surf.Area= 1,317 sf Storage= 1,715 cf
Flood Elev= 137.00' Surf.Area= 1,317 sf Storage= 2,365 cf

Plug-Flow detention time= 21.2 min calculated for 0.383 af (100% of inflow)
Center-of-Mass det. time= 21.1 min (690.1 - 669.0)

Volume	Invert	Avail.Storage	Storage Description
#1A	131.50'	1,643 cf	**24.83'W x 53.04'L x 3.67'H Field A** 4,830 cf Overall - 722 cf Embedded = 4,107 cf x 40.0% Voids
#2A	132.50'	722 cf	**ADS_StormTech SC-310 +Cap** x 49 Inside #1 Effective Size= 28.9"W x 16.0"H => 2.07 sf x 7.12'L = 14.7 cf Overall Size= 34.0"W x 16.0"H x 7.56'L with 0.44' Overlap 7 Rows of 7 Chambers
		2,365 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Device 2	135.00'	**4.0' long (Profile 17) MH Wier** Head (feet) 0.49 0.98 1.48 1.97 2.46 2.95 Coef. (English) 2.84 3.13 3.26 3.30 3.31 3.31
#2	Primary	132.11'	**10.0" Round Culvert** L= 34.7' Ke= 0.500 Inlet / Outlet Invert= 132.11' / 131.76' S= 0.0101 '/' Cc= 0.900 n= 0.013, Flow Area= 0.55 sf
#3	Device 2	132.11'	**1.5" Vert. Detention Orifice** C= 0.620
#4	Device 2	133.00'	**3.5" Vert. Secondary Detention Orifice** C= 0.620
#5	Discarded	131.50'	**7.000 in/hr Infiltration over Wetted area** Phase-In= 0.01'

Discarded OutFlow Max=0.27 cfs @ 8.20 hrs HW=133.93' (Free Discharge)
└**5=Infiltration** (Exfiltration Controls 0.27 cfs)

Primary OutFlow Max=0.38 cfs @ 8.20 hrs HW=133.93' TW=132.04' (Dynamic Tailwater)
└**2=Culvert** (Passes 0.38 cfs of 2.98 cfs potential flow)
  ├**1=MH Wier** (Controls 0.00 cfs)
  ├**3=Detention Orifice** (Orifice Controls 0.08 cfs @ 6.60 fps)
  └**4=Secondary Detention Orifice** (Orifice Controls 0.29 cfs @ 4.41 fps)

Pond 1P: StormTech Chamber System - Chamber Wizard Field A

Chamber Model = ADS_StormTechSC-310 +Cap (ADS StormTech®SC-310 with cap length)
Effective Size= 28.9"W x 16.0"H => 2.07 sf x 7.12'L = 14.7 cf
Overall Size= 34.0"W x 16.0"H x 7.56'L with 0.44' Overlap

34.0" Wide + 6.0" Spacing = 40.0" C-C Row Spacing

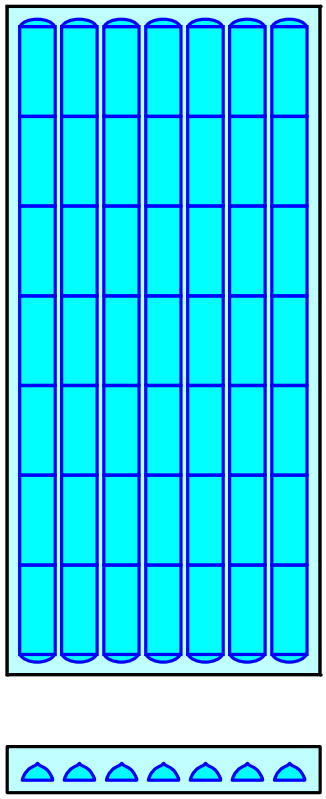
7 Chambers/Row x 7.12' Long +0.60' Cap Length x 2 = 51.04' Row Length +12.0" End Stone x 2 = 53.04' Base Length
7 Rows x 34.0" Wide + 6.0" Spacing x 6 + 12.0" Side Stone x 2 = 24.83' Base Width
12.0" Base + 16.0" Chamber Height + 16.0" Cover = 3.67' Field Height

49 Chambers x 14.7 cf = 722.4 cf Chamber Storage

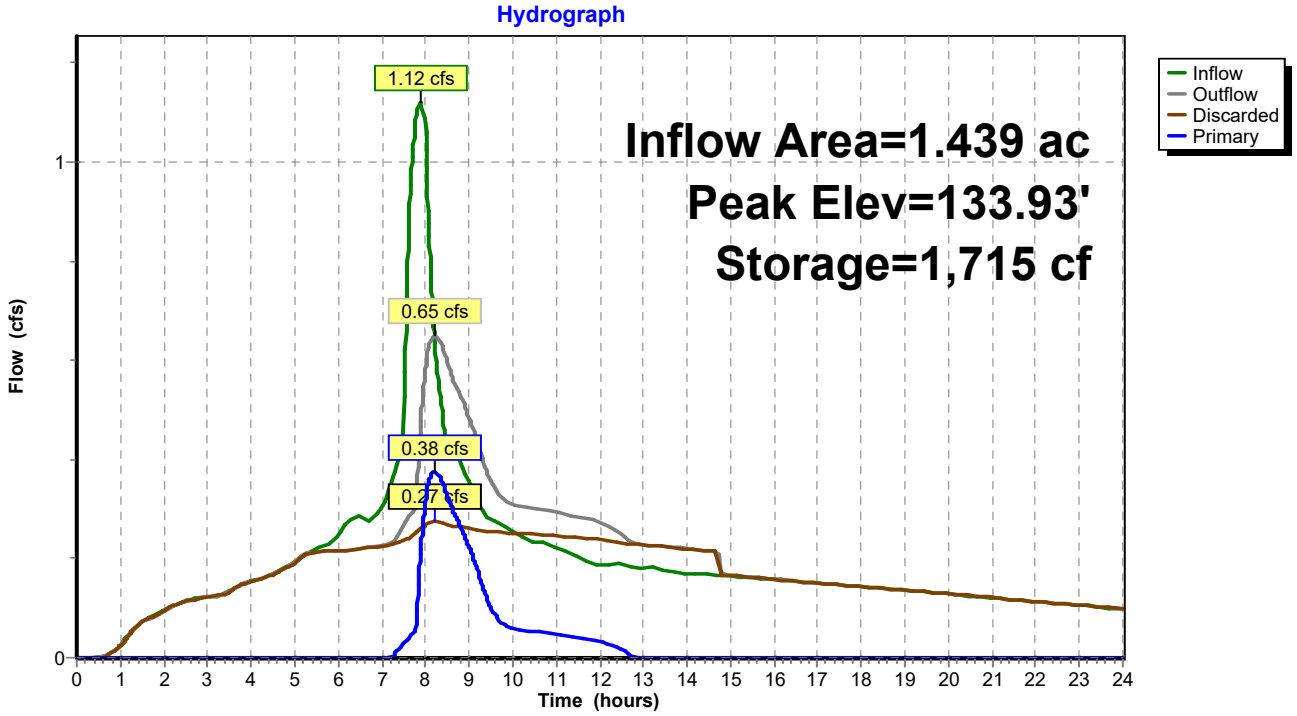
4,829.6 cf Field - 722.4 cf Chambers = 4,107.2 cf Stone x 40.0% Voids = 1,642.9 cf Stone Storage

Chamber Storage + Stone Storage = 2,365.2 cf = 0.054 af
Overall Storage Efficiency = 49.0%
Overall System Size = 53.04' x 24.83' x 3.67'

49 Chambers
178.9 cy Field
152.1 cy Stone



Pond 1P: StormTech Chamber System



Summary for Pond 1R: 14"

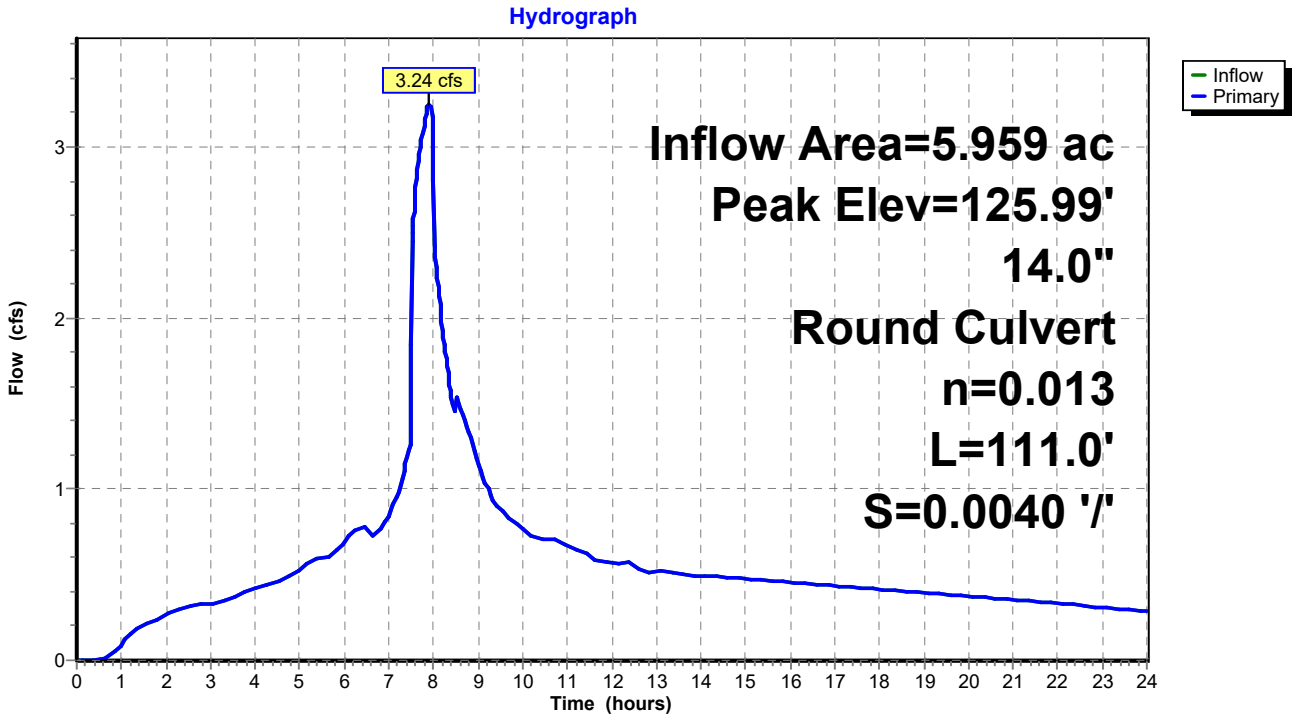
Inflow Area = 5.959 ac, 74.61% Impervious, Inflow Depth > 2.26" for 25-YR event
Inflow = 3.24 cfs @ 7.89 hrs, Volume= 1.120 af
Outflow = 3.24 cfs @ 7.89 hrs, Volume= 1.120 af, Atten= 0%, Lag= 0.0 min
Primary = 3.24 cfs @ 7.89 hrs, Volume= 1.120 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Peak Elev= 125.99' @ 7.89 hrs
Flood Elev= 127.79'

Device	Routing	Invert	Outlet Devices
#1	Primary	124.77'	**14.0" Round Culvert** L= 111.0' Ke= 0.500 Inlet / Outlet Invert= 124.77' / 124.33' S= 0.0040 '/' Cc= 0.900 n= 0.013, Flow Area= 1.07 sf

Primary OutFlow Max=3.24 cfs @ 7.89 hrs HW=125.99' TW=0.00' (Dynamic Tailwater)
└**1=Culvert** (Barrel Controls 3.24 cfs @ 3.61 fps)

Pond 1R: 14"



Summary for Pond 2R: 14"

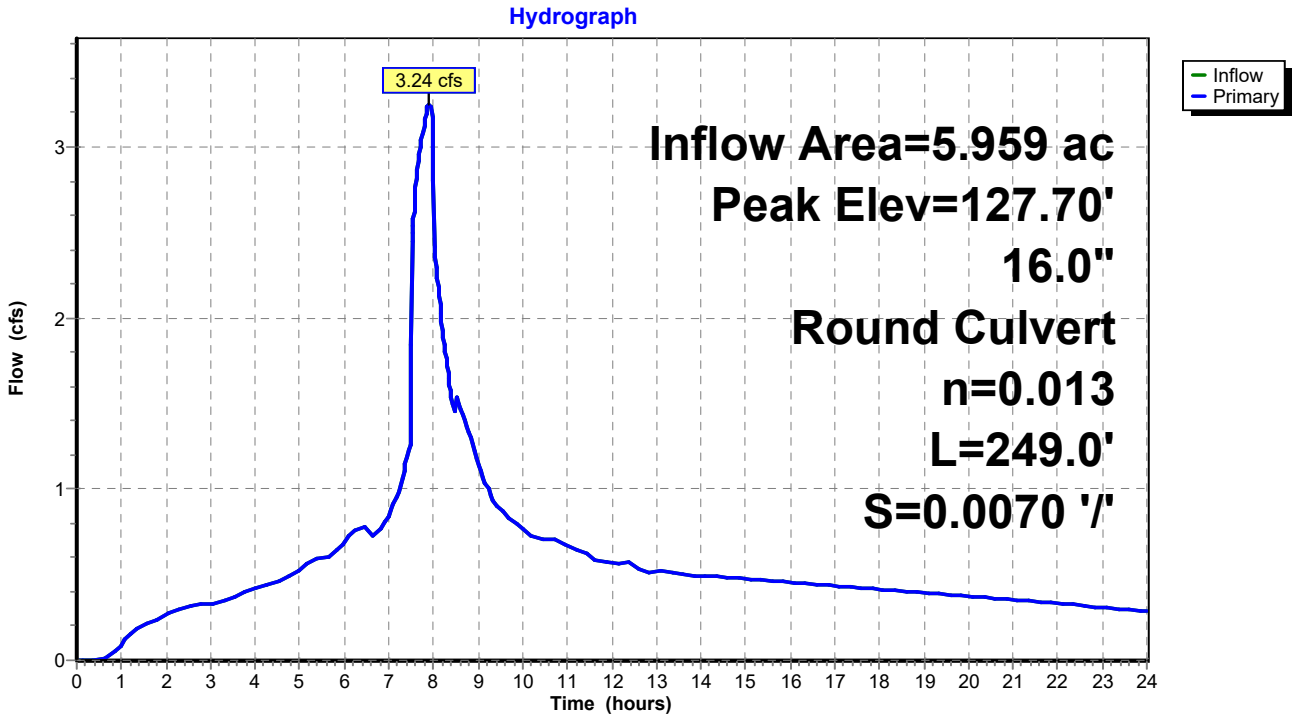
Inflow Area = 5.959 ac, 74.61% Impervious, Inflow Depth > 2.26" for 25-YR event
Inflow = 3.24 cfs @ 7.89 hrs, Volume= 1.120 af
Outflow = 3.24 cfs @ 7.89 hrs, Volume= 1.120 af, Atten= 0%, Lag= 0.0 min
Primary = 3.24 cfs @ 7.89 hrs, Volume= 1.120 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Peak Elev= 127.70' @ 7.90 hrs
Flood Elev= 130.87'

Device	Routing	Invert	Outlet Devices
#1	Primary	126.72'	**16.0" Round Culvert** L= 249.0' Ke= 0.500 Inlet / Outlet Invert= 126.72' / 124.97' S= 0.0070 '/' Cc= 0.900 n= 0.013, Flow Area= 1.40 sf

Primary OutFlow Max=3.24 cfs @ 7.89 hrs HW=127.70' TW=125.99' (Dynamic Tailwater)
└**1=Culvert** (Outlet Controls 3.24 cfs @ 4.13 fps)

Pond 2R: 14"



Summary for Pond 3R: 14"

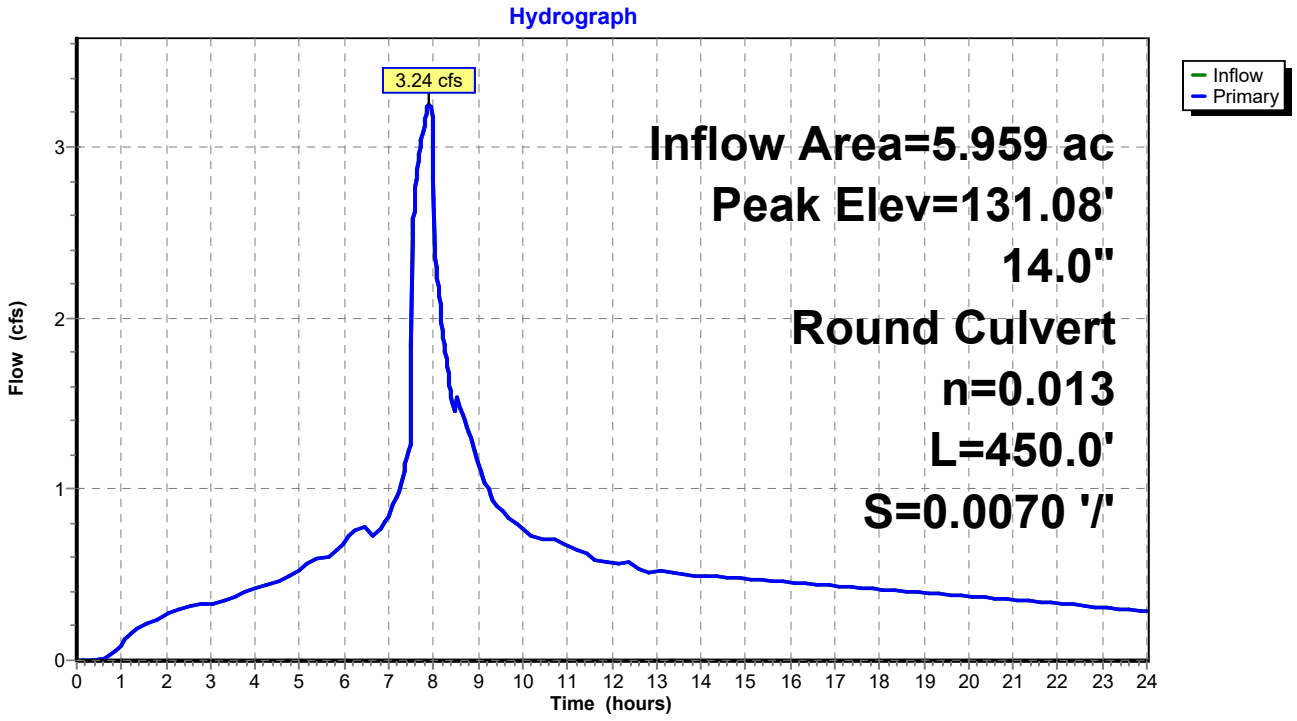
Inflow Area = 5.959 ac, 74.61% Impervious, Inflow Depth > 2.26" for 25-YR event
Inflow = 3.24 cfs @ 7.89 hrs, Volume= 1.120 af
Outflow = 3.24 cfs @ 7.89 hrs, Volume= 1.120 af, Atten= 0%, Lag= 0.0 min
Primary = 3.24 cfs @ 7.89 hrs, Volume= 1.120 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Peak Elev= 131.08' @ 7.90 hrs
Flood Elev= 136.37'

Device	Routing	Invert	Outlet Devices
#1	Primary	130.07'	**14.0" Round Culvert** L= 450.0' Ke= 0.500 Inlet / Outlet Invert= 130.07' / 126.92' S= 0.0070 '/' Cc= 0.900 n= 0.013, Flow Area= 1.07 sf

Primary OutFlow Max=3.24 cfs @ 7.89 hrs HW=131.08' TW=127.70' (Dynamic Tailwater)
1=Culvert (Outlet Controls 3.24 cfs @ 4.44 fps)

Pond 3R: 14"



Summary for Pond 4R: 12"

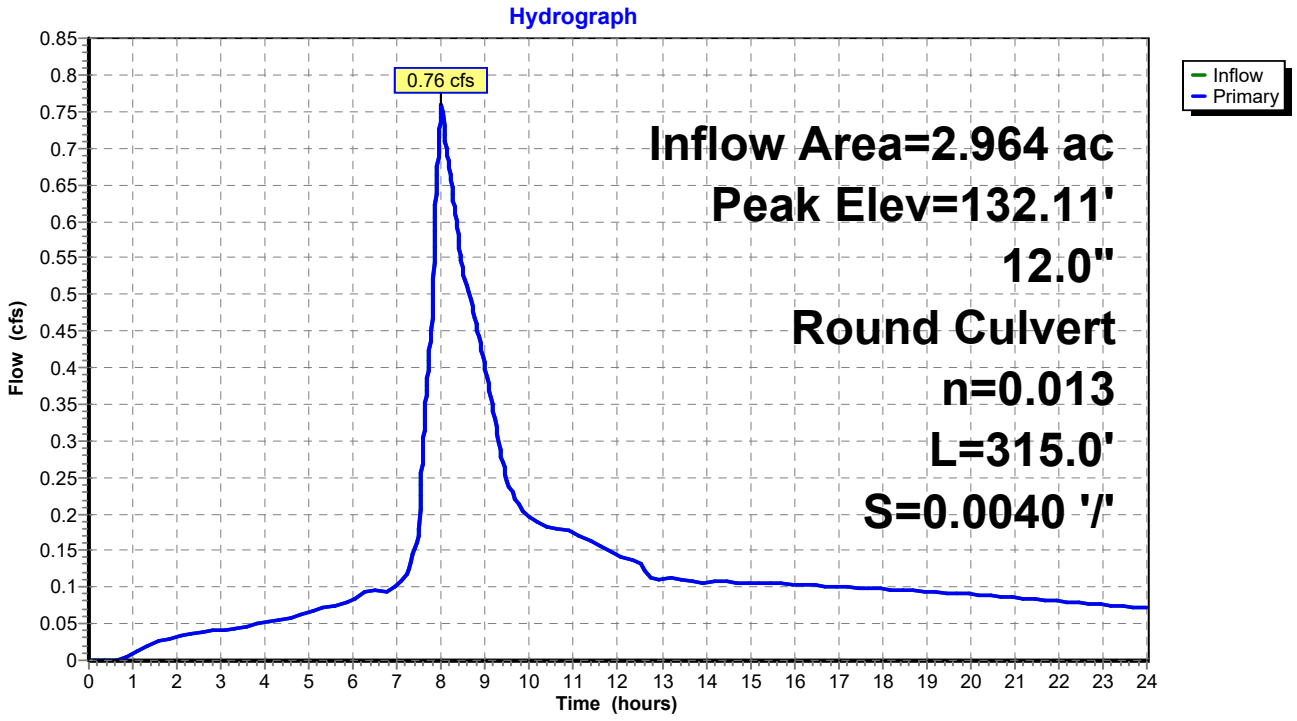
Inflow Area = 2.964 ac, 54.39% Impervious, Inflow Depth > 0.99" for 25-YR event
Inflow = 0.76 cfs @ 8.00 hrs, Volume= 0.244 af
Outflow = 0.76 cfs @ 8.00 hrs, Volume= 0.244 af, Atten= 0%, Lag= 0.0 min
Primary = 0.76 cfs @ 8.00 hrs, Volume= 0.244 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Peak Elev= 132.11' @ 8.00 hrs
Flood Elev= 139.58'

Device	Routing	Invert	Outlet Devices
#1	Primary	131.53'	**12.0" Round Culvert** L= 315.0' Ke= 0.500 Inlet / Outlet Invert= 131.53' / 130.27' S= 0.0040 '/' Cc= 0.900 n= 0.013, Flow Area= 0.79 sf

Primary OutFlow Max=0.78 cfs @ 8.00 hrs HW=132.11' TW=130.99' (Dynamic Tailwater)
1=Culvert (Outlet Controls 0.78 cfs @ 2.39 fps)

Pond 4R: 12"

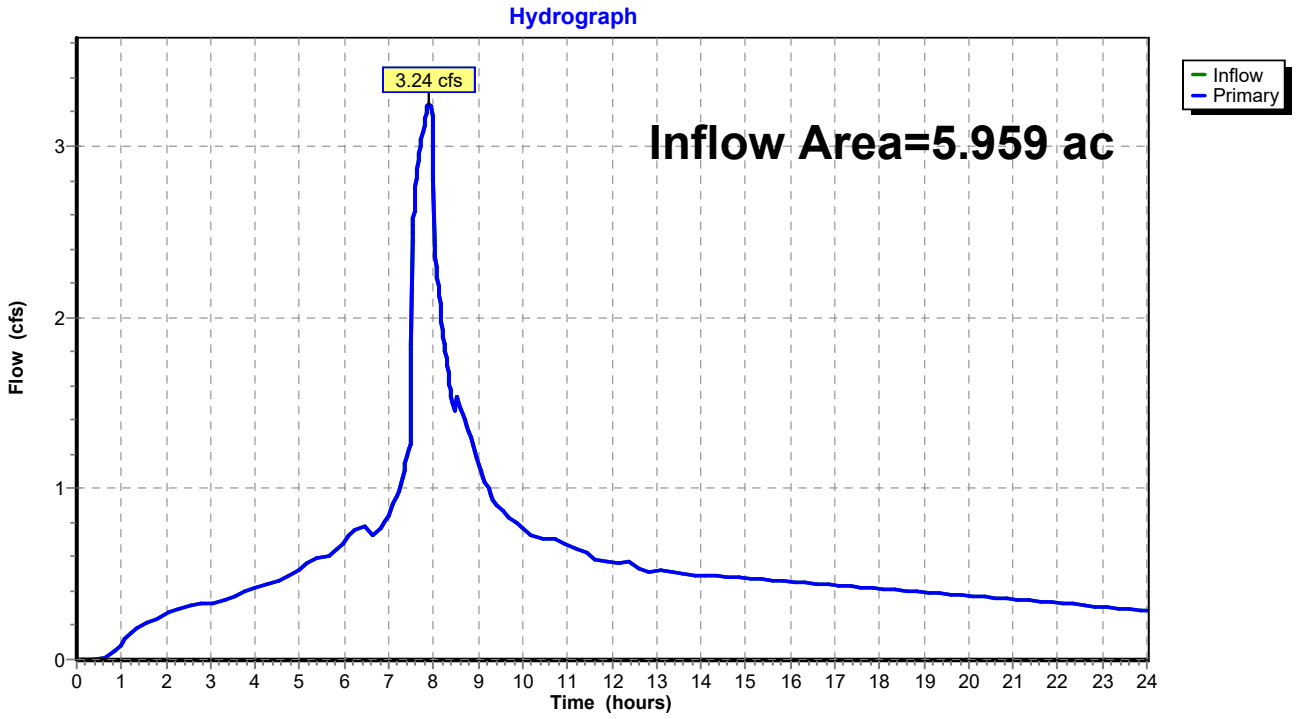


Summary for Link 1L: Post Development Downstream

Inflow Area = 5.959 ac, 74.61% Impervious, Inflow Depth > 2.26" for 25-YR event
Inflow = 3.24 cfs @ 7.89 hrs, Volume= 1.120 af
Primary = 3.24 cfs @ 7.89 hrs, Volume= 1.120 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs

Link 1L: Post Development Downstream



Appendix B: Stormwater Quality Calculations

STORMWATER QUALITY CALCULATIONS

Client: AMK Herman
Project: SW Herman Road Vehicle Storage Facility
AKS Job No.: 7949-01
Date: 6/19/2025
Done By: MBM
Checked By: PAS

IMPERVIOUS AREA

Total Site Area:	1.44	acres
Total Site Area:	62,666	square feet (sf)
Stormwater Facility & Landscaping (0% impervious):	0	sf
Residential Development (65% impervious):	0	sf
Road & Sidewalk (100% impervious):	52,655	sf
Total Impervious Area:	52,655	sf

WATER DESIGN QUALITY VOLUME (WQV)

(Per CWS 4.08.5a2 - R&O 19-05)

$$WQV = \frac{0.36\text{" X Area (ft)}}{12\text{" per ft}} = \mathbf{1580}\ \mathbf{cubic\ feet}$$

WATER QUALITY FLOW (WQF)

(Per CWS 4.08.5a3 - R&O 19-05)

$$WQF = \frac{WQV\ (sf)}{4*60*60} = \mathbf{0.11}\ \mathbf{cfs}$$

Appendix C: NRCS Soil Resource Report

United States Department of Agriculture

NRCS

Natural Resources Conservation Service

A product of the National Cooperative Soil Survey, a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local participants

Custom Soil Resource Report for Washington County, Oregon

April 15, 2025

Custom Soil Resource Report
Soil Map

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 1:20,000.

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

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

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

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

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

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

Soil Survey Area: Washington County, Oregon
Survey Area Data: Version 24, Aug 28, 2024

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

Date(s) aerial images were photographed: Mar 1, 2024—Jul 1, 2024

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
21B	Hillsboro loam, 3 to 7 percent slopes	1.7	100.0%
Totals for Area of Interest		**1.7**	**100.0%**

Map Unit Descriptions

The map units delineated on the detailed soil maps in a soil survey represent the soils or miscellaneous areas in the survey area. The map unit descriptions, along with the maps, can be used to determine the composition and properties of a unit.

A map unit delineation on a soil map represents an area dominated by one or more major kinds of soil or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural phenomena, and they have the characteristic variability of all natural phenomena. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of other taxonomic classes. Consequently, every map unit is made up of the soils or miscellaneous areas for which it is named and some minor components that belong to taxonomic classes other than those of the major soils.

Most minor soils have properties similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting, or similar, components. They may or may not be mentioned in a particular map unit description. Other minor components, however, have properties and behavioral characteristics divergent enough to affect use or to require different management. These are called contrasting, or dissimilar, components. They generally are in small areas and could not be mapped separately because of the scale used. Some small areas of strongly contrasting soils or miscellaneous areas are identified by a special symbol on the maps. If included in the database for a given area, the contrasting minor components are identified in the map unit descriptions along with some characteristics of each. A few areas of minor components may not have been observed, and consequently they are not mentioned in the descriptions, especially where the pattern was so complex that it was impractical to make enough observations to identify all the soils and miscellaneous areas on the landscape.

The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The objective of mapping is not to delineate pure taxonomic classes but rather to separate the landscape into landforms or landform segments that have similar use and management requirements. The delineation of such segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, however, onsite investigation is needed to define and locate the soils and miscellaneous areas.

An identifying symbol precedes the map unit name in the map unit descriptions. Each description includes general facts about the unit and gives important soil properties and qualities.

Soils that have profiles that are almost alike make up a *soil series*. Except for differences in texture of the surface layer, all the soils of a series have major horizons that are similar in composition, thickness, and arrangement.

Soils of one series can differ in texture of the surface layer, slope, stoniness, salinity, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases*. Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Alpha silt loam, 0 to 2 percent slopes, is a phase of the Alpha series.

Some map units are made up of two or more major soils or miscellaneous areas. These map units are complexes, associations, or undifferentiated groups.

A *complex* consists of two or more soils or miscellaneous areas in such an intricate pattern or in such small areas that they cannot be shown separately on the maps. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas. Alpha-Beta complex, 0 to 6 percent slopes, is an example.

An *association* is made up of two or more geographically associated soils or miscellaneous areas that are shown as one unit on the maps. Because of present or anticipated uses of the map units in the survey area, it was not considered practical or necessary to map the soils or miscellaneous areas separately. The pattern and relative proportion of the soils or miscellaneous areas are somewhat similar. Alpha-Beta association, 0 to 2 percent slopes, is an example.

An *undifferentiated group* is made up of two or more soils or miscellaneous areas that could be mapped individually but are mapped as one unit because similar interpretations can be made for use and management. The pattern and proportion of the soils or miscellaneous areas in a mapped area are not uniform. An area can be made up of only one of the major soils or miscellaneous areas, or it can be made up of all of them. Alpha and Beta soils, 0 to 2 percent slopes, is an example.

Some surveys include *miscellaneous areas*. Such areas have little or no soil material and support little or no vegetation. Rock outcrop is an example.

Washington County, Oregon

21B—Hillsboro loam, 3 to 7 percent slopes

Map Unit Setting

National map unit symbol: 21y6
Elevation: 160 to 240 feet
Mean annual precipitation: 40 to 50 inches
Mean annual air temperature: 52 to 54 degrees F
Frost-free period: 165 to 210 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Hillsboro and similar soils: 90 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Hillsboro

Setting

Landform: Terraces
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Silty and loamy old alluvium

Typical profile

H1 - 0 to 15 inches: loam
H2 - 15 to 48 inches: loam
H3 - 48 to 57 inches: fine sandy loam
H4 - 57 to 81 inches: fine sand

Properties and qualities

Slope: 3 to 7 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: High (about 10.6 inches)

Interpretive groups

Land capability classification (irrigated): 2e
Land capability classification (nonirrigated): 2e
Hydrologic Soil Group: B
Ecological site: R002XC008OR - Valley Terrace Group
Hydric soil rating: No

References

American Association of State Highway and Transportation Officials (AASHTO). 2004. Standard specifications for transportation materials and methods of sampling and testing. 24th edition.

American Society for Testing and Materials (ASTM). 2005. Standard classification of soils for engineering purposes. ASTM Standard D2487-00.

Cowardin, L.M., V. Carter, F.C. Golet, and E.T. LaRoe. 1979. Classification of wetlands and deep-water habitats of the United States. U.S. Fish and Wildlife Service FWS/OBS-79/31.

Federal Register. July 13, 1994. Changes in hydric soils of the United States.

Federal Register. September 18, 2002. Hydric soils of the United States.

Hurt, G.W., and L.M. Vasilas, editors. Version 6.0, 2006. Field indicators of hydric soils in the United States.

National Research Council. 1995. Wetlands: Characteristics and boundaries.

Soil Survey Division Staff. 1993. Soil survey manual. Soil Conservation Service. U.S. Department of Agriculture Handbook 18. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/soils/?cid=nrcs142p2_054262

Soil Survey Staff. 1999. Soil taxonomy: A basic system of soil classification for making and interpreting soil surveys. 2nd edition. Natural Resources Conservation Service, U.S. Department of Agriculture Handbook 436. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/soils/?cid=nrcs142p2_053577

Soil Survey Staff. 2010. Keys to soil taxonomy. 11th edition. U.S. Department of Agriculture, Natural Resources Conservation Service. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/soils/?cid=nrcs142p2_053580

Tiner, R.W., Jr. 1985. Wetlands of Delaware. U.S. Fish and Wildlife Service and Delaware Department of Natural Resources and Environmental Control, Wetlands Section.

United States Army Corps of Engineers, Environmental Laboratory. 1987. Corps of Engineers wetlands delineation manual. Waterways Experiment Station Technical Report Y-87-1.

United States Department of Agriculture, Natural Resources Conservation Service. National forestry manual. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/home/?cid=nrcs142p2_053374

United States Department of Agriculture, Natural Resources Conservation Service. National range and pasture handbook. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/landuse/rangepasture/?cid=stelprdb1043084

United States Department of Agriculture, Natural Resources Conservation Service. National soil survey handbook, title 430-VI. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/scientists/?cid=nrcs142p2_054242

United States Department of Agriculture, Natural Resources Conservation Service. 2006. Land resource regions and major land resource areas of the United States, the Caribbean, and the Pacific Basin. U.S. Department of Agriculture Handbook 296. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/soils/?cid=nrcs142p2_053624

United States Department of Agriculture, Soil Conservation Service. 1961. Land capability classification. U.S. Department of Agriculture Handbook 210. http://www.nrcs.usda.gov/Internet/FSE_DOCUMENTS/nrcs142p2_052290.pdf

Appendix D: Runoff Curve Numbers From TR-55

Table 2-2a Runoff curve numbers for urban areas [1/]

Cover description		Curve numbers for hydrologic soil group			
Cover type and hydrologic condition	Average percent impervious area [2/]	A	B	C	D
Fully developed urban areas (vegetation established)					
Open space (lawns, parks, golf courses, cemeteries, etc.) [3/]:					
Poor condition (grass cover < 50%)		68	79	86	89
Fair condition (grass cover 50% to 75%)		49	69	79	84
Good condition (grass cover > 75%)		39	61	74	80
Impervious areas:					
Paved parking lots, roofs, driveways, etc. (excluding right-of-way)		98	98	98	98
Streets and roads:					
Paved; curbs and storm sewers (excluding right-of-way)		98	98	98	98
Paved; open ditches (including right-of-way)		83	89	92	93
Gravel (including right-of-way)		76	85	89	91
Dirt (including right-of-way)		72	82	87	89
Western desert urban areas:					
Natural desert landscaping (pervious areas only) [4/]		63	77	85	88
Artificial desert landscaping (impervious weed barrier, desert shrub with 1- to 2-inch sand or gravel mulch and basin borders)		96	96	96	96
Urban districts:					
Commercial and business	85	89	92	94	95
Industrial	72	81	88	91	93
Residential districts by average lot size:					
1/8 acre or less (town houses)	65	77	85	90	92
1/4 acre	38	61	75	83	87
1/3 acre	30	57	72	81	86
1/2 acre	25	54	70	80	85
1 acre	20	51	68	79	84
2 acres	12	46	65	77	82
Developing urban areas					
Newly graded areas (pervious areas only, no vegetation) [5/]		77	86	91	94
Idle lands (CN's are determined using cover types similar to those in table 2-2c).					

1 Average runoff condition, and $I_a = 0.2S$.

2 The average percent impervious area shown was used to develop the composite CN's. Other assumptions are as follows: impervious areas are directly connected to the drainage system, impervious areas have a CN of 98, and pervious areas are considered equivalent to open space in good hydrologic condition. CN's for other combinations of conditions may be computed using figure 2-3 or 2-4.

3 CN's shown are equivalent to those of pasture. Composite CN's may be computed for other combinations of open space cover type.

4 Composite CN's for natural desert landscaping should be computed using figures 2-3 or 2-4 based on the impervious area percentage (CN = 98) and the pervious area CN. The pervious area CN's are assumed equivalent to desert shrub in poor hydrologic condition.

5 Composite CN's to use for the design of temporary measures during grading and construction should be computed using figure 2-3 or 2-4 based on the degree of development (impervious area percentage) and the CN's for the newly graded pervious areas.

Table 2-2b Runoff curve numbers for cultivated agricultural lands [1/]

Cover description			Curve numbers for hydrologic soil group			
Cover type	Treatment [2/]	Hydrologic condition [3/]	A	B	C	D
Fallow	Bare soil	—	77	86	91	94
	Crop residue cover (CR)	Poor	76	85	90	93
		Good	74	83	88	90
Row crops	Straight row (SR)	Poor	72	81	88	91
		Good	67	78	85	89
	SR + CR	Poor	71	80	87	90
		Good	64	75	82	85
	Contoured (C)	Poor	70	79	84	88
		Good	65	75	82	86
	C + CR	Poor	69	78	83	87
		Good	64	74	81	85
	Contoured & terraced (C&T)	Poor	66	74	80	82
		Good	62	71	78	81
	C&T+ CR	Poor	65	73	79	81
		Good	61	70	77	80
Small grain	SR	Poor	65	76	84	88
		Good	63	75	83	87
	SR + CR	Poor	64	75	83	86
		Good	60	72	80	84
	C	Poor	63	74	82	85
		Good	61	73	81	84
	C + CR	Poor	62	73	81	84
		Good	60	72	80	83
	C&T	Poor	61	72	79	82
		Good	59	70	78	81
	C&T+ CR	Poor	60	71	78	81
		Good	58	69	77	80
Close-seeded or broadcast legumes or rotation meadow	SR	Poor	66	77	85	89
		Good	58	72	81	85
	C	Poor	64	75	83	85
		Good	55	69	78	83
	C&T	Poor	63	73	80	83
		Good	51	67	76	80

[1] Average runoff condition, and I_a=0.2S

[2] Crop residue cover applies only if residue is on at least 5% of the surface throughout the year.

[3] Hydraulic condition is based on combination factors that affect infiltration and runoff, including (a) density and canopy of vegetative areas, (b) amount of year-round cover, (c) amount of grass or close-seeded legumes, (d) percent of residue cover on the land surface (good ≥ 20%), and (e) degree of surface roughness.

Poor: Factors impair infiltration and tend to increase runoff.

Good: Factors encourage average and better than average infiltration and tend to decrease runoff.

Table 2-2c Runoff curve numbers for other agricultural lands [1/]

Cover description		Curve numbers for hydrologic soil group			
Cover type	Hydrologic condition	A	B	C	D
Pasture, grassland, or range—continuous forage for grazing. [2/]	Poor	68	79	86	89
	Fair	49	69	79	84
	Good	39	61	74	80
Meadow—continuous grass, protected from grazing and generally mowed for hay.	—	30	58	71	78
Brush—brush-weed-grass mixture with brush the major element. [3/]	Poor	48	67	77	83
	Fair	35	56	70	77
	Good	30 [4/]	48	65	73
Woods—grass combination (orchard or tree farm). [5/]	Poor	57	73	82	86
	Fair	43	65	76	82
	Good	32	58	72	79
Woods. [6/]	Poor	45	66	77	83
	Fair	36	60	73	79
	Good	30 [4/]	55	70	77
Farmsteads—buildings, lanes, driveways, and surrounding lots.	—	59	74	82	86

1 Average runoff condition, and $I_a = 0.2S$.

2 *Poor:* <50%) ground cover or heavily grazed with no mulch.
Fair: 50 to 75% ground cover and not heavily grazed.
Good: > 75% ground cover and lightly or only occasionally grazed.

3 *Poor*: <50% ground cover.
Fair: 50 to 75% ground cover.
Good: >75% ground cover.

4 Actual curve number is less than 30; use CN = 30 for runoff computations.

5 CN's shown were computed for areas with 50% woods and 50% grass (pasture) cover. Other combinations of conditions may be computed from the CN's for woods and pasture.

6 *Poor:* Forest litter, small trees, and brush are destroyed by heavy grazing or regular burning.
Fair: Woods are grazed but not burned, and some forest litter covers the soil.
Good: Woods are protected from grazing, and litter and brush adequately cover the soil.

Table 2-2d Runoff curve numbers for arid and semiarid rangelands [1/]

Cover description		Curve numbers for hydrologic soil group			
Cover type	Hydrologic condition [2/]	A [3/]	B	C	D
Herbaceous—mixture of grass, weeds, and low-growing brush, with brush the minor element.	Poor		80	87	93
	Fair		71	81	89
	Good		62	74	85
Oak-aspen—mountain brush mixture of oak brush, aspen, mountain mahogany, bitter brush, maple, and other brush.	Poor		66	74	79
	Fair		48	57	63
	Good		30	41	48
Pinyon-juniper—pinyon, juniper, or both; grass understory.	Poor		75	85	89
	Fair		58	73	80
	Good		41	61	71
Sagebrush with grass understory.	Poor		67	80	85
	Fair		51	63	70
	Good		35	47	55
Desert shrub—major plants include saltbush, greasewood, creosotebush, blackbrush, bursage, palo verde, mesquite, and cactus.	Poor	63	77	85	88
	Fair	55	72	81	86
	Good	49	68	79	84

1 Average runoff condition, and I_a, = 0.2S. For range in humid regions, use table 2-2c.
2 Poor: <30% ground cover (litter, grass, and brush overstory).
Fair: 30 to 70% ground cover.
Good: > 70% ground cover.
3 Curve numbers for group A have been developed only for desert shrub.

Exhibit G: Service Provider Letters

FIRE CODE / LAND USE / BUILDING REVIEW APPLICATION

Tualatin Valley Fire & Rescue

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

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

REV 6-30-20

Project Information

Applicant Name: AMK Herman, LLC

Address: 16350 NW Belt Road, Yamhill OR 97184

Phone:

Email: jen_monty@hotmail.com

Site Address: Herman Rd

City: Tualatin OR

Map & Tax Lot #: Washington County Assessor's Map 2S 1 21DC Tax Lot 700

Business Name: AMK Storage

Land Use/Building Jurisdiction: City of Tualatin

Land Use/ Building Permit # TBD

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

Project Description

Phase 1 – On grade storage facility

Phase 2 – Addition of open-sided covered storage canopies

Permit/Review Type (check one):

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

For Fire Marshal's Office Use Only

TVFR Permit # 2025-0060

Permit Type: SLP - Tu/Th

Submittal Date: 4/21/2025

Assigned To: McLeod

Due Date: 4/25/2025

Fees Due: 0

Fees Paid: 0

Approval/Inspection Conditions

(For Fire Marshal's Office Use Only)

This section is for application approval only

M L — 4/25/2025

Fire Marshal or Designee — Date

Conditions:

See Attached Conditions: ☐ Yes ☐ No

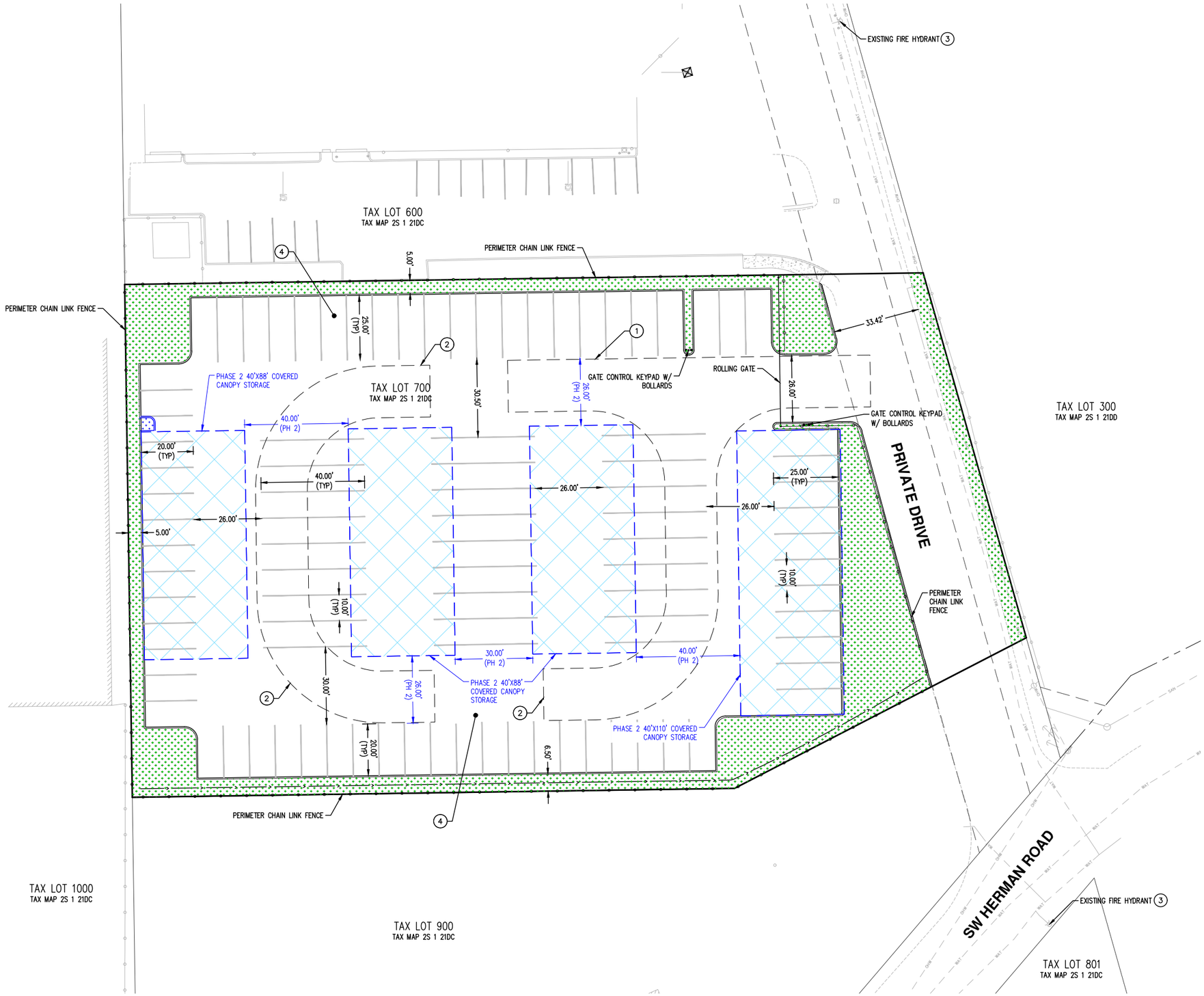
Site Inspection Required: ☐ Yes ☒ No

This section used when site inspection is required

Inspection Comments:

N/A

Final TVFR Approval Signature & Emp ID — Date



SITE SUMMARY

PHASE 1 CONCEPT

TOTAL PROVIDED UNCOVERED VEHICLE STORAGE SPACES:	91
UNCOVERED 10'X20':	34
UNCOVERED 10'X25':	33
UNCOVERED 10'X40':	24

PHASE 1 AREA

LANDSCAPE AREA:	9,432 SF
TOTAL AREA:	62,666 SF
LANDSCAPE AREA PERCENTAGE OF TOTAL:	15.1%
REQUIRED LANDSCAPE PERCENTAGE:	15%

PHASE 2 CONCEPT

TOTAL PROVIDED VEHICLE STORAGE SPACES:	80
CANOPY COVERED 10'X40':	34
UNCOVERED 10'X20':	24
UNCOVERED 10'X25':	22

PHASE 2 AREA

LANDSCAPE AREA:	9,403 SF
TOTAL AREA:	62,666 SF
LANDSCAPE AREA PERCENTAGE OF TOTAL:	15.0%
REQUIRED LANDSCAPE PERCENTAGE:	15%

SITE KEYED NOTES: (#)

1. FIRE TRUCK TURNAROUND
2. FIRE TRUCK TURN RADIUS (28' INNER RADIUS AND 48' OUTER RADIUS)
3. ALL PORTIONS OF PROPOSED BUILDINGS FOR PHASE 2 ARE WITHIN 400 FEET OF FIRE HYDRANT.
4. ALL PROPOSED AC PAVEMENT TO SUPPORT 12,500 POUND WHEEL LOAD AND 75,000 POUND GROSS LOAD

LEGEND

- PHASE 1 LANDSCAPE AREA
- PHASE 2 LANDSCAPE AREA
- PHASE 2 CANOPY COVERED STORAGE FOOTPRINT
- NEW AC PAVEMENT

N

SCALE: 1"=20 FEET

20 0 4 10 20

ORIGINAL PAGE SIZE: 22" x 34"

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

TVF&R Permit #2025-0060

AKS ENGINEERING & FORESTRY, LLC
12965 SW HERMAN RD, STE 100
TUALATIN, OR 97062
503.563.6151
WWW.AKS-ENG.COM

AKS ENGINEERING - SURVEYING - NATURAL RESOURCES
FORESTRY - PLANNING - LANDSCAPE ARCHITECTURE

AMK STORAGE

TUALATIN OREGON
TAX LOTS 700, 800, 801 AND 900 WASHINGTON COUNTY TAX MAP 2S 1 21DC

PRELIMINARY FIRE & LIFE SAFETY SITE PLAN

DESIGNED BY:	MBM
DRAWN BY:	MBM
MANAGED BY:	PS
CHECKED BY:	PS
DATE:	4/17/2025

REGISTERED PROFESSIONAL ENGINEER
OREGON
JULY 14, 2006
PAUL A. SELLKE
PRELIMINARY NOT FOR CONSTRUCTION
RENEWAL DATE: 6/30/26

REVISIONS

JOB NUMBER
7949-01

SHEET
FS-1

AKS DRAWING FILE: 7949 SITE-AMK TVFR.DWG | LAYOUT: LAYOUT

Clean Water Services
Our commitment is clear.

CWS File Number
23-000890

Service Provider Letter

This form and the attached conditions will serve as your Service Provider Letter in accordance with Clean Water Services Design and Construction Standards (R&O 19-5, as amended by R&O 19-22).

Jurisdiction:	City of Tualatin	**Review Type:**	Allowed Use
Site Address / Location:	19990 SW CIPOLE RD Tualatin, OR 97062	**SPL Issue Date:** **SPL Expiration Date:**	April 14, 2023 April 13, 2025

Applicant Information:		**Owner Information:**	
Name	PAT LARSON	Name	ALEX HURLEY
Company	CIPOLE PROPERTIES	Company	HERMAN RV STORAGE LLC
Address	19990 SW CIPOLE RD	Address	12995 SW HERMAN RD
	TUALATIN, OR 97062		TUALATIN, OR 97062
Phone/Fax		Phone/Fax	
E-mail:		E-mail:	

Tax lot ID	**Development Activity**
2S121DC00700	Commercial Development
2S121D000301	Off-site Improvements

Pre-Development Site Conditions:		**Post Development Site Conditions:**	
Sensitive Area Present:	☐ On-Site ☒ Off-Site	Sensitive Area Present:	☐ On-Site ☒ Off-Site
Vegetated Corridor Width:	50	Vegetated Corridor Width:	50
Vegetated Corridor Condition:	Marginal		

Enhancement of Remaining Vegetated Corridor Required: ☐ **Square Footage to be enhanced:**

Encroachments into Pre-Development Vegetated Corridor:

Type and location of Encroachment:	Square Footage:
Stormwater Pipe (Temporary Encroachment; Restoration Planting In-place Required)	282
Stormwater Outfall (Permanent Encroachment; No Mitigation Required)	66

Mitigation Requirements:

Type/Location	Sq. Ft./Ratio/Cost

☒ Conditions Attached ☒ Development Figures Attached (4) ☐ Planting Plan Attached ☐ Geotech Report Required

This Service Provider Letter does NOT eliminate the need to evaluate and protect water quality sensitive areas if they are subsequently discovered on your property.

In order to comply with Clean Water Services water quality protection requirements the project must comply with the following conditions:

1. No structures, development, construction activities, gardens, lawns, application of chemicals, uncontained areas of hazardous materials as defined by Oregon Department of Environmental Quality, pet wastes, dumping of materials of any kind, or other activities shall be permitted within the sensitive area or Vegetated Corridor which may negatively impact water quality, except those allowed in R&O 19-5, Chapter 3, as amended by R&O 19-22.
2. Prior to any site clearing, grading or construction the Vegetated Corridor and water quality sensitive areas shall be surveyed, staked, and temporarily fenced per approved plan. During construction the Vegetated Corridor shall remain fenced and undisturbed except as allowed by R&O 19-5, Section 3.06.1, as amended by R&O 19-22 and per approved plans.
3. **If there is any activity within the sensitive area, the applicant shall gain authorization for the project from the Oregon Department of State Lands (DSL) and US Army Corps of Engineers (USACE). The applicant shall provide Clean Water Services or its designee (appropriate city) with copies of all DSL and USACE project authorization permits. No wetland impacts proposed for this project.**
4. An approved Oregon Department of Forestry Notification is required for one or more trees harvested for sale, trade, or barter, on any non-federal lands within the State of Oregon.
5. Prior to any ground disturbing activities, an erosion control permit is required. Appropriate Best Management Practices (BMP's) for Erosion Control, in accordance with Clean Water Services' Erosion Prevention and Sediment Control Planning and Design Manual, shall be used prior to, during, and following earth disturbing activities.
6. Prior to construction, a Stormwater Connection Permit from Clean Water Services or its designee is required pursuant to Ordinance 27, Section 4.B.
7. Activities located within the 100-year floodplain shall comply with R&O 19-5, Section 5.10, as amended by R&O 19-22.
8. Removal of native, woody vegetation shall be limited to the greatest extent practicable.
9. The water quality swale and detention pond shall be planted with Clean Water Services approved native species, and designed to blend into the natural surroundings.
10. **Should final development plans differ significantly from those submitted for review by Clean Water Services, the applicant shall provide updated drawings, and if necessary, obtain a revised Service Provider Letter.**
11. **For off-site Vegetated Corridors up to 50 feet wide, the applicant shall restore all temporary impacts within the Vegetated Corridor to meet or exceed good corridor condition as defined in R&O 19-5, Section 3.14.2, Table 3-3, as amended by R&O 19-22.**
12. Prior to any site clearing, grading or construction, the applicant shall provide Clean Water Services with a Vegetated Corridor enhancement/restoration plan. Enhancement/restoration of the Vegetated Corridor shall be provided in accordance with R&O 19-5, Appendix A, as amended by R&O 19-22, and shall include planting specifications for all Vegetated Corridor, including any cleared areas larger than 25 square feet in Vegetated Corridor rated ""good.""
13. Prior to installation of plant materials, all invasive vegetation within the Vegetated Corridor shall be removed per methods described in Clean Water Services' Integrated Pest Management Plan, 2019. During removal of invasive vegetation care shall be taken to minimize impacts to existing native tree and shrub species.
14. Clean Water Services and/or City shall be notified 72 hours prior to the start and completion of enhancement/restoration activities. Enhancement/restoration activities shall comply with the guidelines provided in Planting Requirements (R&0 19-5, Appendix A, as amended by R&O 19-22).
15. **Maintenance and monitoring requirements shall comply with R&O 19-5, Section 2.12.2, as amended by R&O 19-22. If at any time during the warranty period the landscaping falls below the 80% survival level, the owner shall reinstall all deficient planting at the**

next appropriate planting opportunity and the two year maintenance period shall begin again from the date of replanting.

16. **Performance assurances for the Vegetated Corridor shall comply with R&O 19-5, Section 2.07.2, Table 2-1 and Section 2.11, Table 2-2, as amended by R&O 19-22.**

FINAL PLANS

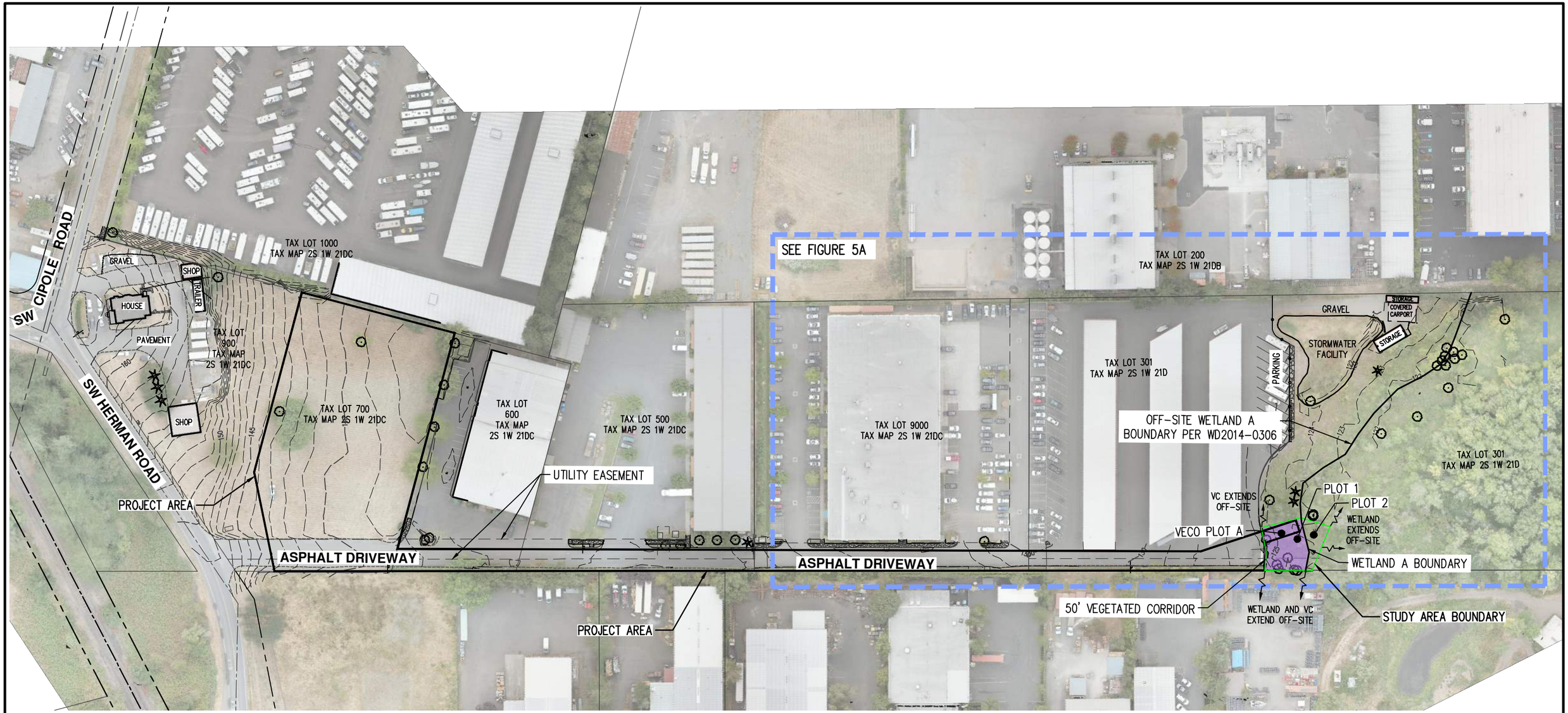
17. **Final construction plans shall include landscape plans.** In the details section of the plans, a description of the methods for removal and control of exotic species, location, distribution, condition and size of plantings, existing plants and trees to be preserved, and installation methods for plant materials is required. Plantings shall be tagged for dormant season identification and shall remain on plant material after planting for monitoring purposes.
18. **A Maintenance Plan shall be included on final plans** including methods, responsible party contact information, and dates (minimum two times per year, by June 1 and September 30).
19. **Final construction plans shall clearly depict the location and dimensions of the sensitive area and the Vegetated Corridor** (indicating good, marginal, or degraded condition). Sensitive area boundaries shall be marked in the field.
20. Protection of the Vegetated Corridors and associated sensitive areas shall be provided by the installation of permanent fencing and signage between the development and the outer limits of the Vegetated Corridors. Fencing and signage details to be included on final construction plans.

This Service Provider Letter is not valid unless CWS-approved site plan is attached.

Stacy Benjamin

Stacy Benjamin
Environmental Plan Review

Attachments (4)



AKS DRONE AERIAL SURVEY
(AUGUST 2021)

LEGEND (COLOR COPY):

TOTAL ON-SITE PEM/SLOPE WETLAND A AREA:
1,184 SF± (0.03 ACRES)

MARGINAL CONDITION VEGETATED CORRIDOR AREA:
3,063 SF± (0.07 ACRES)

WETLAND BOUNDARY SHOWN WAS DELINEATED BY AKS ENGINEERING & FORESTRY, LLC ON JANUARY 20, 2023. DATA PLOTS AND WETLAND BOUNDARY WERE LOCATED USING A TRIMBLE R10 HANDHELD GPS RECEIVER WITH SUB-METER ACCURACY.

1 FOOT INTERVAL GROUND CONTOURS, EXISTING CONDITIONS, PARTIAL TREE SURVEY OF TREES >6" DBH AND PROPERTY LINES DERIVED FROM AKS PROFESSIONAL LAND SURVEY WITH SUB-METER ACCURACY.

CWS FILE NO. 23-000890
Approved
Clean Water Services
FOR ENVIRONMENTAL REVIEW
By SNB Date 4/14/2023
SPL ATTACHMENT 1 OF 4

SCALE: 1"=120 FEET

120 0 24 60 120

ORIGINAL PAGE SIZE: 17"X11"

DATE: 03/08/2023

NATURAL RESOURCES EXISTING CONDITIONS

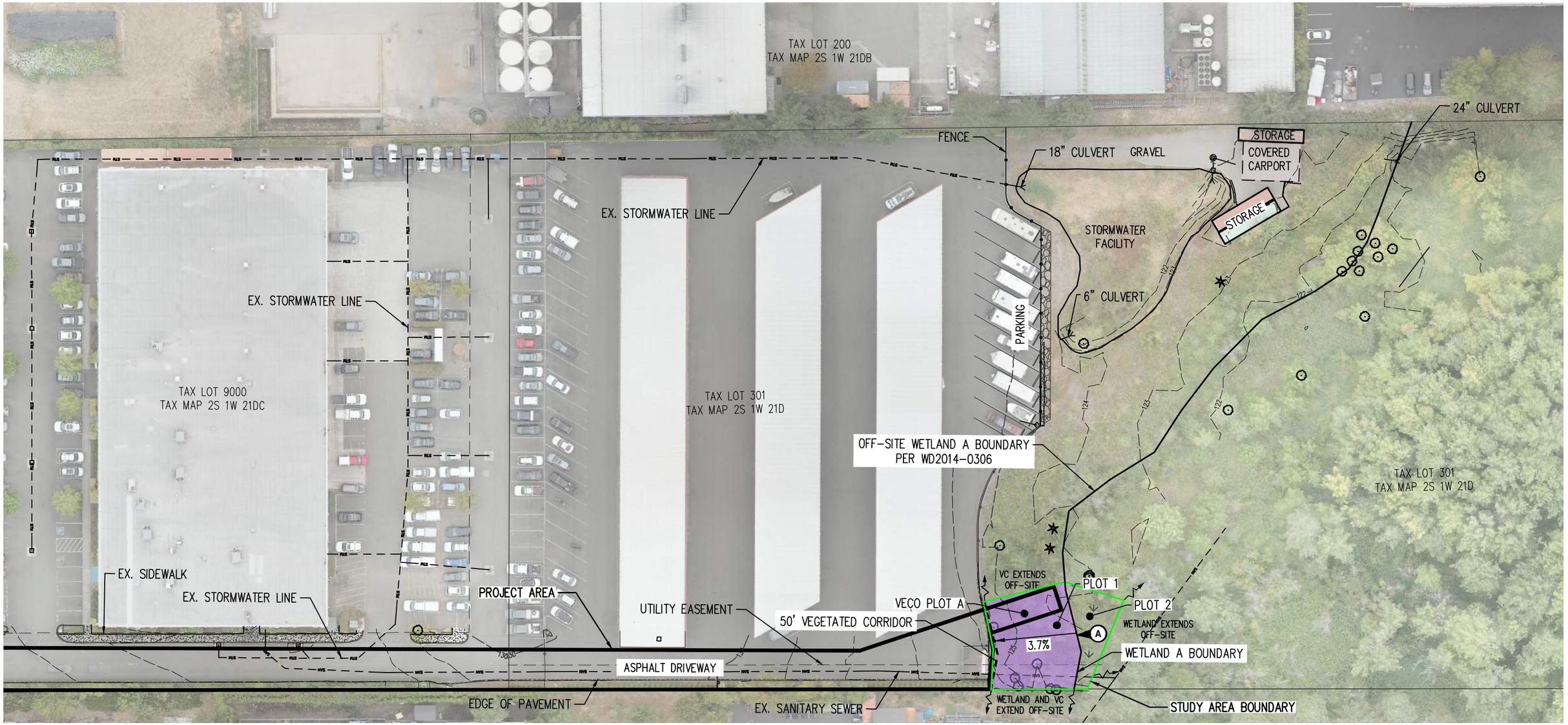
RAYBOURNS PLUMBING SITE ASSESSMENT REPORT

FIGURE 5

AKS ENGINEERING & FORESTRY, LLC
12965 SW HERMAN RD, STE 100
TUALATIN, OR 97062
503.563.6151 WWW.AKS-ENG.COM

DRWN: RAS
CHKD: SAR
AKS JOB: 7949

DWG: 7949 NRA EXCOND | FIGURE 5



LEGEND (COLOR COPY):

TOTAL ON-SITE PEM/SLOPE WETLAND A AREA: 1,184 SF± (0.03 ACRES)

MARGINAL CONDITION VEGETATED CORRIDOR AREA: 3,063 SF± (0.07 ACRES)

A — PHOTO POINT LOCATION AND ORIENTATION

WETLAND BOUNDARY SHOWN WAS DELINEATED BY AKS ENGINEERING & FORESTRY, LLC ON JANUARY 20, 2023. DATA PLOTS AND WETLAND BOUNDARY WERE LOCATED USING A TRIMBLE R10 HANDHELD GPS RECEIVER WITH SUB-METER ACCURACY.

1 FOOT INTERVAL GROUND CONTOURS, EXISTING CONDITIONS, PARTIAL TREE SURVEY OF TREES >6" DBH AND PROPERTY LINES DERIVED FROM AKS PROFESSIONAL LAND SURVEY WITH SUB-METER ACCURACY.

AKS DRONE AERIAL SURVEY
(AUGUST 2021)

CWS FILE NO. 23-000890
Approved
Clean Water Services
FOR ENVIRONMENTAL REVIEW
By SNB Date 4/14/2023
SPL ATTACHMENT 2 OF 4

SCALE: 1"= 60 FEET

60 0 12 30 60

ORIGINAL PAGE SIZE: 11" x 17"

DATE: 03/08/2023

NATURAL RESOURCES EXISTING CONDITIONS

RAYBOURNS PLUMBING SITE ASSESSMENT REPORT

FIGURE 5A

AKS ENGINEERING & FORESTRY, LLC
12965 SW HERMAN RD, STE 100
TUALATIN, OR 97062
503.563.6151 WWW.AKS-ENG.COM

DRWN: RAS
CHKD: SAR
AKS JOB: 7949

DWG: 7949 NRA EXCOND | FIGURE 5A

SW CIPOLE ROAD

SW HERMAN ROAD

GRAVEL

SHOP

TRAILER

HOUSE

PAVEMENT

SHOP

TAX LOT 900
TAX MAP
2S 1W 21DC

TAX LOT 1000
TAX MAP 2S 1W 21DC

PROPOSED PARKING

PROPOSED BUILDING

TAX LOT 700
TAX MAP 2S 1W 21DC

PROPOSED PARKING

PROJECT AREA

ASPHALT DRIVEWAY

TAX LOT
600
TAX MAP
2S 1W 21DC

TAX LOT 500
TAX MAP 2S 1W 21DC

STORMWATER
EASMENT

PROPOSED
STORMWATER
UTILITY LINE

SEE FIGURE 6A

TAX LOT 200
TAX MAP 2S 1W 21DB

TAX LOT 9000
TAX MAP 2S 1W 21DC

PROJECT AREA

ASPHALT DRIVEWAY

STORAGE
COVERED
CARPORT
GRAVEL
DRIVEWAY

STORMWATER
FACILITY

PARKING

TAX LOT 301
TAX MAP 2S 1W 21D

OFF-SITE WETLAND A BOUNDARY
PER WD2014-0306

STORMWATER OUTFALL
66 SF (ALLOWED USE
PER SECTION 3.05.6)

VC
EXTENDS
OFF-SITE

50' VEGETATED CORRIDOR

WETLAND
EXTENDS
OFF-SITE

WETLAND A BOUNDARY

TAX LOT 301
TAX MAP 2S 1W 21D

STORMWATER
EASMENT

WETLAND AND VC
EXTEND OFF-SITE

STUDY AREA BOUNDARY

LEGEND (COLOR COPY):

- TOTAL ON-SITE PEM/SLOPE WETLAND A AREA: 1,184 SF± (0.03 ACRES)
- VEGETATED CORRIDOR AREA TO REMAIN: 2,400 SF± (0.06 ACRES)
- VEGETATED CORRIDOR AREA TO BE ENHANCED: 315 SF±
- TEMPORARY VEGETATED CORRIDOR IMPACT AREA TO BE RESTORED TO GOOD CONDITION: 282 SF±
- PERMANENT VEGETATED CORRIDOR IMPACT AREA: 66 SF±
- PROPOSED STORMWATER UTILITY LINE

WETLAND BOUNDARY SHOWN WAS DELINEATED BY AKS ENGINEERING & FORESTRY, LLC ON JANUARY 20, 2023. DATA PLOTS AND WETLAND BOUNDARY WERE LOCATED USING A TRIMBLE R10 HANDHELD GPS RECEIVER WITH SUB-METER ACCURACY.

CWS FILE NO. 23-000890
Approved
Clean Water Services
FOR ENVIRONMENTAL REVIEW
By SNB Date 4/14/2023
SPL ATTACHMENT 3 OF 4

SCALE: 1"=120 FEET

120 0 24 60 120

ORIGINAL PAGE SIZE: 11" x17"

DATE: 03/08/2023

NATURAL RESOURCES SITE PLAN OVERVIEW

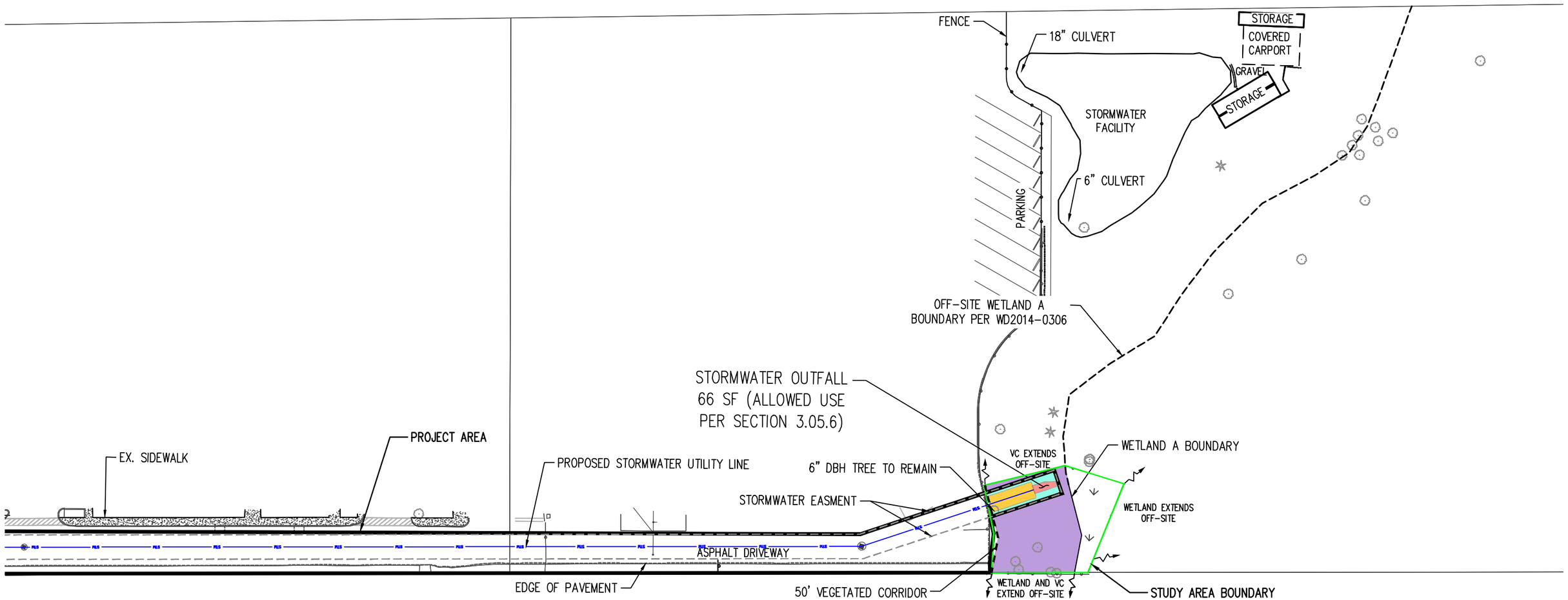
RAYBOURNS PLUMBING SITE ASSESSMENT REPORT

FIGURE 6

AKS ENGINEERING & FORESTRY, LLC
12965 SW HERMAN RD, STE 100
TUALATIN, OR 97062
503.563.6151 WWW.AKS-ENG.COM

DRWN: RAS
CHKD: SAR
AKS JOB: 7949

DWG: 7949 NRA SITE PLAN | FIGURE 6



LEGEND (COLOR COPY):

- TOTAL ON-SITE PEM/SLOPE WETLAND A AREA: 1,184 SF± (0.03 ACRES)
- VEGETATED CORRIDOR AREA TO REMAIN: 2,400 SF± (0.06 ACRES)
- VEGETATED CORRIDOR AREA TO BE ENHANCED: 315 SF±
- TEMPORARY VEGETATED CORRIDOR IMPACT AREA TO BE RESTORED TO GOOD CONDITION: 282 SF±
- PERMANENT VEGETATED CORRIDOR IMPACT AREA: 66 SF±
- PLS PROPOSED STORMWATER UTILITY LINE

WETLAND BOUNDARY SHOWN WAS DELINEATED BY AKS ENGINEERING & FORESTRY, LLC ON JANUARY 20, 2023. DATA PLOTS AND WETLAND BOUNDARY WERE LOCATED USING A TRIMBLE R10 HANDHELD GPS RECEIVER WITH SUB-METER ACCURACY.

CWS FILE NO. 23-000890
Approved
Clean Water Services
FOR ENVIRONMENTAL REVIEW
By SNB Date 4/14/2023
SPL ATTACHMENT 4 OF 4

SCALE: 1"= 60 FEET

60 0 12 30 60

ORIGINAL PAGE SIZE: 11" x 17"

N

DATE: 03/08/2023

NATURAL RESOURCES SITE PLAN

RAYBOURNS PLUMBING SITE ASSESSMENT REPORT

FIGURE **6A**

AKS ENGINEERING & FORESTRY, LLC
12965 SW HERMAN RD, STE 100
TUALATIN, OR 97062
503.563.6151 WWW.AKS-ENG.COM

DRWN: RAS
CHKD: SAR
AKS JOB: 7949

DWG: 7949 NRA SITE PLAN | FIGURE 6A