

# PRELIMINARY STORMWATER MANAGEMENT REPORT

*FOR*

**DEARBORN MULTIFAMILY**

at

797 Dearborn Ave N,  
Keizer, OR 97303

July 24<sup>th</sup>, 2025



PREPARED BY:

**7 OAKS ENGINEERING, INC.**

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## **I. PURPOSE OF REPORT**

This report describes the proposed private onsite improvements compliance with the City of Keizer's Design Standards (February 2023) – Chapter 400.

## **II. PROJECT DESCRIPTION**

The site is 797 Dearborn Ave N in Keizer. To the east and west, there is private property that is adjacent to Dearborn Ave N. To the south of the site is Dearborn Ave N. To the north of the site there is private property adjacent to James St NE.

### **A. EXISTING CONDITION**

On the existing site, currently there are two buildings, and one shed on the property. The site currently has some trees along the west portion of the property. One tree is located north of the building on the south side of the property. To the southwest of the property there is an existing 12" pvc storm drain main in Dearborn ave.

The site has a gentle slope from the southeast to the middle of the north side of the property. The property also has a gentle slope from the northwest to the same low point on the property.

### **GEOTECHNICAL FINDINGS:**

Infiltration testing was completed by GeoPacific on July 9<sup>th</sup>, Project No. 25-6832, and the following results were concluded;

Exploration ID	Depth (ft)	Soil Type	Infiltration Rate (in/hr)
HA-1	5.0	SILT (ML)	0.0
HA-1	8.0	Silty SAND (SM)	1.4

No Groundwater was encountered onsite. Groundwater was estimated to be 13 to 20 feet.

### **B. PROPOSED CONDITION**

The proposed development includes an existing single-family residence and garage, a new ADU, and a new single-family residence. A proposed access easement will be located on the property to provide access to the new single-family residence.

The proposed site will need to alter the natural drainage pattern slightly to direct runoff and sheet flow towards the proposed stormwater planter. The stormwater planter has been sized to fully infiltrate the entire 100-year storm event, and a small 5' drywell will be

placed under the stormwater planter to ensure infiltration can occur in the layer at 8.0 below grade.

An secondary overflow drain has been provided at the stormwater planter, in the event a rain event exceeds 100-year storm event. The secondary overflow will be piped directly to the existing storm drain in Dearborn Avenue. No offsite run-on is anticipated and will have no negative impacts downstream.

Additionally, the proposed roof runoff from the single-family residence and proposed ADU will be piped directly to the proposed drywells, utilizing the simplified stormwater method. In the event a rain event exceeds 100-year storm event a proposed secondary overflow will be provided and connect to the existing storm drain main in Dearborn Avenue.

### **III. METHODOLOGY**

The City of Keizer's Design Standards (February 2023) – Chapter 400 were implemented for the design of the onsite stormwater system, as follows:

Projects greater than 5,000 square feet of new or replaced impervious surface are required to meet the full requirements for treatment, flow control, and retention of stormwater as provided below. This proposed project exceeds this new or replaced 5,000 square feet of impervious area.

#### **Stormwater Treatment**

The entire WQE will be required to retain and treat and shall conform to NPDES, TMDL and WPCF requirements and reduce the discharge of the listed pollutants to the Waters of the State. All treatment facilities will be designed to utilize the GSI to the MEF.

#### **Stormwater Retention**

The hierarchy to be followed in determining project specific applicable facility retention requirements based on the Design Infiltration Rates for the site or the Point of Connection as follows;

**1. Design Infiltration Rate greater than 2 inches per hour:**

The project facility shall retain and treat the entire WQE. The project facility shall retain all stormwater runoff up to and including the 100-year design storm event with no release allowed.

**2. Project is in an Unserved Stormwater Area (regardless of design infiltration rate):**

The project facility shall retain and treat the entire WQE. The project facility shall retain all stormwater runoff from design storm events up to and including the 100-year design storm event with no release allowed.

**3. Design Infiltration Rate between 0.75 inches and 2 inches per hour:**

The facility shall retain and treat the entire WQE. In addition, the facility shall retain stormwater runoff for the 5-year, 10-year, 25-year design storm events with an allowable release rate up to the predeveloped 5-year design storm event. Runoff for the 50-year and 100-year design storm events shall be retained with an allowable release rate up to the predeveloped 25-year design storm event.

**4. Design Infiltration Rate less than 0.75 inches per hour:**

The facility shall retain and treat the entire WQE to the MEF. The facility shall also retain stormwater runoff for the 5-year, 10-year, 25-year, 50-year, and 100-year design storm events, not allowing any increase in runoff for all storm events listed.

**5. "Critical Basin" Point of Connection (regardless of design infiltration rate):**

The facility shall retain and treat the entire WQE to the MEF. The facility shall also retain stormwater runoff for the 2-year, 5-year, 10-year, 25- year, 50-year, and 100-year design storm events, not allowing any increase in runoff all storm events listed.

The site is located within a "critical basin" designated area, therefore Item 5 compliance will be required.

**Flow Control Requirements:**

To meet the requirement to retain all stormwater runoff to the MEF, certain sites may need to include flow control to be implemented as part of the design. In other situations, it simply benefits the overall system to provide flow control prior treatment or retention systems.

## IV. CALCULATIONS

The development will be designed in accordance with the Design Standards in Division 004, Appendix D. The Santa Barbara Urban Hydrograph (SBUH) method will be the selected methodology used in the computer program HydroCAD Version 10.20. The following parameters were inputted.

Storm Type: Type 1A Rainfall Distribution  
Soil Group: Group C

### Curve Number:

CURVE NUMBERS	
Pre-Development	CN
Range, Grassland, Fair	79

CURVE NUMBERS	
Post-Development	CN
Grass Cover, Fair	74
Pervious Paving*	88

\* Pervious Paving was assumed, CN of 88 per ASCE.

### Rainfall Depth:

Return Interval	Peak 24-Hour Rainfall
Water Quality Storm Event	1.38 inches
2-YR Storm Event	2.20 inches
5-YR Storm Event	2.70 inches
10-YR Storm Event	3.20 inches
25-YR Storm Event	3.60 inches
50-YR Storm Event	4.10 inches
100-YR Storm Event	4.40 inches

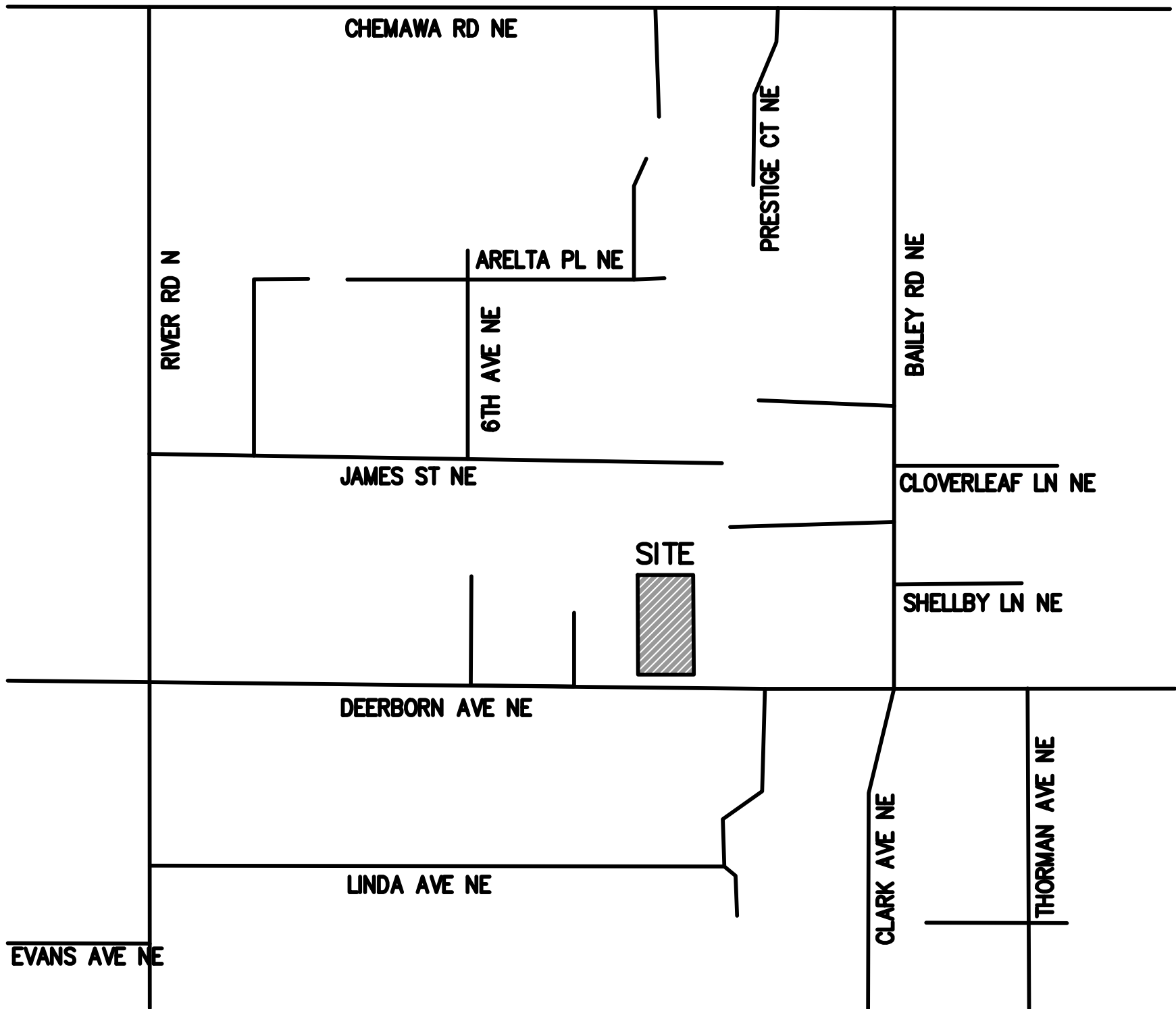
V. SUMMARY

In conclusion, the

PRE VS. POST CONSTRUCTION FLOW RATES		
FACILITY ID	PEAK FLOW RATE (CFS)	PEAK FLOW RATE (CFS)
Project Site	100-Year Pre	100-Year Post
A	0.1	0

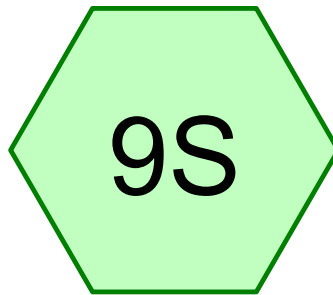
CATCHMENT AND FACILITY TABLE							
CATCHMENT/ FACILITY ID	TOTAL AREA (SF)/(AC.)	IMPERVIOUS AREA (SF)	PERVIOUS AREA (SF)	OWNERSHIP (PRIVATE/ PUBLIC)	FACILITY TYPE	TOP OF FACILITY SURFACE AREA (SQ.FT)	BOTTOM INFILTRATION SURFACE AREA (SQ.FT)
A	4650	4650	0.00	Private	FILTRATION PLANTER W/ DRYWELL	730	730

## **APPENDIX A – MAPS**

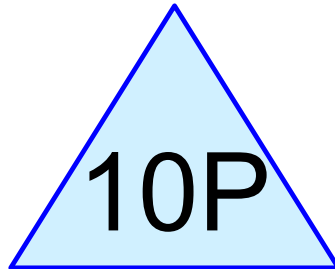


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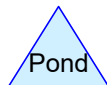
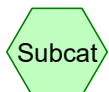
## APPENDIX B – CALCULATIONS



A



Rain Garden - A



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### Rainfall Events Listing (selected events)

Event#	Event Name	Storm Type	Curve	Mode	Duration (hours)	B/B	Depth (inches)	AMC
1	100-Yr	Type IA 24-hr		Default	24.00	1	4.40	2

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### Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
0.096	98	(9S)
<b>0.096</b>	<b>98</b>	<b>TOTAL AREA</b>

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### Soil Listing (all nodes)

Area (acres)	Soil Group	Subcatchment Numbers
0.000	HSG A	
0.000	HSG B	
0.000	HSG C	
0.000	HSG D	
0.096	Other	9S
<b>0.096</b>		<b>TOTAL AREA</b>

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### Ground Covers (all nodes)

HSG-A (acres)	HSG-B (acres)	HSG-C (acres)	HSG-D (acres)	Other (acres)	Total (acres)	Ground Cover	Subcatchment Numbers
0.000	0.000	0.000	0.000	0.096	0.096		9S
<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.096</b>	<b>0.096</b>	<b>TOTAL AREA</b>	

**00386 - POST-Development***Type IA 24-hr 100-Yr Rainfall=4.40"*

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Time span=0.10-72.00 hrs, dt=0.05 hrs, 1439 points

Runoff by SBUH method, Split Pervious/Imperv.

Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

**Subcatchment9S: A**

Runoff Area=4,200 sf 100.00% Impervious Runoff Depth=4.16"

Tc=5.0 min CN=0/98 Runoff=0.10 cfs 0.033 af

**Pond 10P: Rain Garden - A**

Peak Elev=104.78' Storage=1,457 cf Inflow=0.10 cfs 0.033 af

Outflow=0.00 cfs 0.000 af

**Total Runoff Area = 0.096 ac Runoff Volume = 0.033 af Average Runoff Depth = 4.16"**  
**0.00% Pervious = 0.000 ac 100.00% Impervious = 0.096 ac**

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Type IA 24-hr 100-Yr Rainfall=4.40"

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Summary for Subcatchment 9S: A

[49] Hint:  $T_c < 2dt$  may require smaller  $dt$

Runoff = 0.10 cfs @ 7.90 hrs, Volume= 0.033 af, Depth= 4.16"  
Routed to Pond 10P : Rain Garden - A

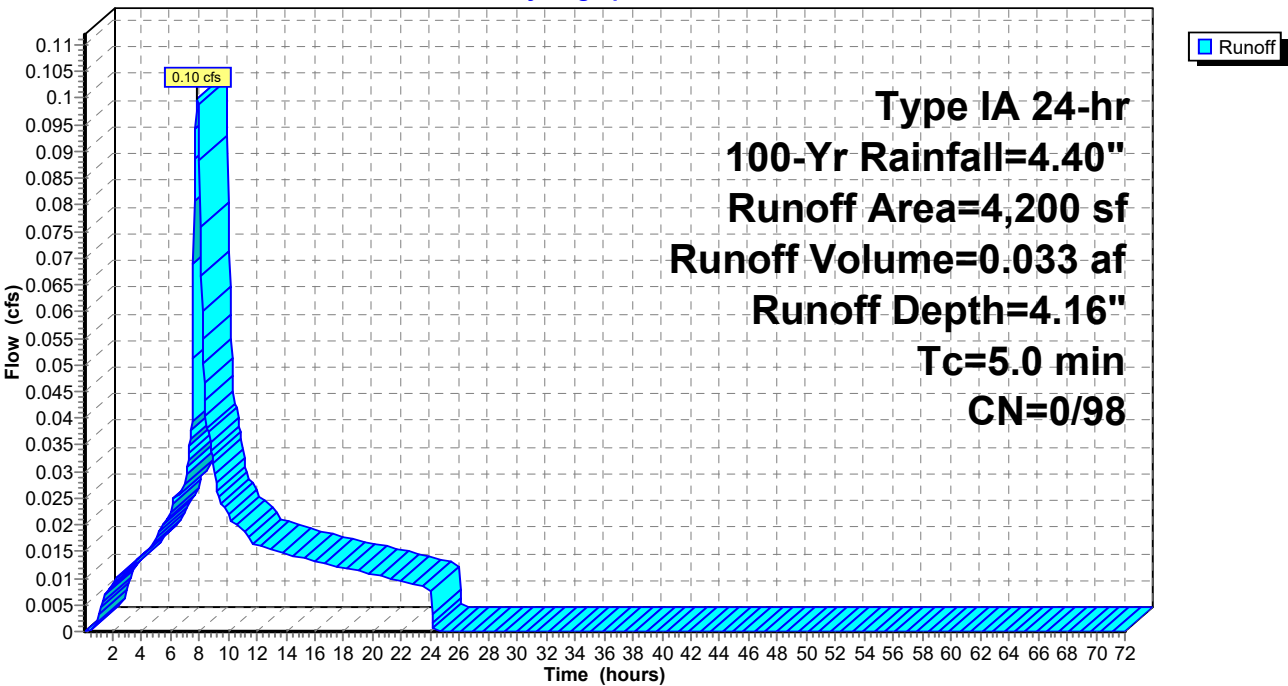
Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.10-72.00 hrs,  $dt=0.05$  hrs  
Type IA 24-hr 100-Yr Rainfall=4.40"

	Area (sf)	CN	Description
*	4,200	98	
	4,200	98	100.00% Impervious Area

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

Subcatchment 9S: A

Hydrograph



**00386 - POST-Development**

Type IA 24-hr 100-Yr Rainfall=4.40"

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**Summary for Pond 10P: Rain Garden - A**

Inflow Area = 0.096 ac, 100.00% Impervious, Inflow Depth = 4.16" for 100-Yr event  
 Inflow = 0.10 cfs @ 7.90 hrs, Volume= 0.033 af  
 Outflow = 0.00 cfs @ 0.10 hrs, Volume= 0.000 af, Atten= 100%, Lag= 0.0 min  
 Discarded = 0.00 cfs @ 0.10 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.10-72.00 hrs, dt= 0.05 hrs  
 Peak Elev= 104.78' @ 26.20 hrs Surf.Area= 758 sf Storage= 1,457 cf

Plug-Flow detention time= (not calculated: initial storage exceeds outflow)

Center-of-Mass det. time= (not calculated: no outflow)

Volume	Invert	Avail.Storage	Storage Description
#1	100.00'	1,548 cf	<b>Custom Stage Data (Prismatic)</b> Listed below (Recalc)
#2	95.00'	70 cf	<b>Custom Stage Data (Prismatic)</b> Listed below
		1,618 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
100.00	730	0.0	0	0
101.50	730	30.0	329	329
101.83	730	0.0	0	329
103.33	730	0.0	0	329
104.83	730	100.0	1,095	1,424
105.00	730	100.0	124	1,548

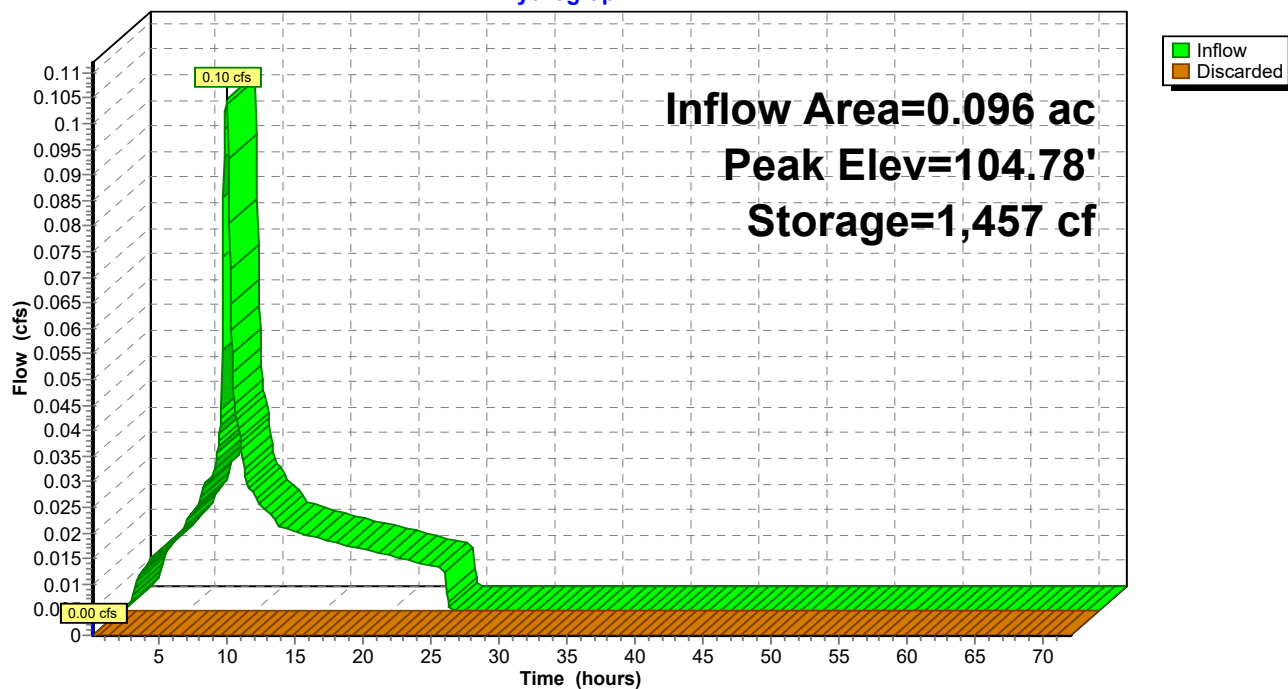
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
95.00	0	0	0
100.00	28	70	70

Device	Routing	Invert	Outlet Devices
#1	Discarded	97.00'	<b>0.600 in/hr Exfiltration over Surface area from 97.00' - 87.00'</b> Excluded Surface area = 11 sf

**Discarded OutFlow** Max=0.00 cfs @ 0.10 hrs HW=95.00' (Free Discharge)↑**1=Exfiltration** ( Controls 0.00 cfs)

## Pond 10P: Rain Garden - A

Hydrograph



## **APPENDIX C – PLANS**







## **APPENDIX D – GEOTECHNICAL REPORT**



**Real-World Geotechnical Solutions**  
**Investigation • Design • Construction Support**

July 9, 2025  
Project No. 25-6832

LIFT Architecture  
Matt Johnson  
1130 Liberty Street SE, Suite 230  
Keizer, OR 97302  
Phone: (503) 420-8520  
Email: matt@liftarchitecture.com

**SUBJECT: INFILTRATION TEST RESULTS**  
**797 DEARBORN AVENUE NE**  
**KEIZER, OREGON**

This letter presents the results of a geotechnical engineering study conducted by GeoPacific Engineering, Inc. (GeoPacific) for the above-referenced project. The purpose of our study was to conduct infiltration testing at the site and provide information to aid in the design of stormwater systems. On July 3, 2025, GeoPacific Engineering, Inc. (GeoPacific) logged one hand auger boring at the site. The approximate location of the hand auger boring is indicated on Figure 1. Design of the stormwater management systems is to be completed by others.

## **SOIL CONDITIONS**

In our hand auger boring, we encountered approximately 10 inches of Organic SILT (OL-ML) topsoil with fine roots throughout. Below the topsoil, we encountered stiff brown SILT (ML). The SILT (ML) graded to brown Silty SAND (SM) at approximately 7 feet bgs. The Silty SAND (SM) was medium dense and graded to very dense with depth. This soil type extended beyond the maximum depth of our hand auger boring (13 feet).

No groundwater or groundwater seepage was encountered at the time and location explored. Local well logs indicate that groundwater has been recorded at depths ranging from 5 to 20 feet bgs in the vicinity of the subject site.

## **INFILTRATION TESTING**

Soil infiltration testing was performed in hand auger boring HA-1 using the encased falling head testing method at 5 feet bgs and 8 feet bgs. The soils were presoaked prior to infiltration testing. During testing, we measured the water level to the nearest 0.01 foot (1/8 inch) from a fixed point

**Geotechnical Infiltration Test Results**  
**GeoPacific Project No. 25-6832, 797 Dearborn Avenue NE, Keizer, Oregon**

and the change in water level was recorded at regular intervals until three successive measurements showing a consistent infiltration rate were achieved. The infiltration results are presented in the table below. The infiltration rates have been reported without applying a factor of safety. Care should be taken when estimating infiltration capacity at the site.

<b>Exploration ID</b>	<b>Depth (ft)</b>	<b>Soil Type</b>	<b>Infiltration Rate (in/hr)</b>
HA-1	5.0	SILT (ML)	0.0
HA-1	8.0	Silty SAND (SM)	1.4

Groundwater is anticipated at depths of approximately 13 to 20 feet. Typically, at least 5 feet of separation distance should be maintained between the bottom of stormwater management facilities and groundwater levels, when infiltration is planned.

Stormwater management systems should be constructed as specified by the designer and/or in accordance with the applicable stormwater design codes. The infiltration rates presented in this report do not incorporate a factor of safety. All systems should include an adequate factor of safety. Stormwater exceeding soil infiltration and/or soil storage capacities will need to be directed in a controlled manner to a suitable surface discharge location, away from structures.

## **UNCERTAINTIES AND LIMITATIONS**

This scope of this study includes measuring infiltration rates only. Rates of infiltration that were affected by impermeable soils or groundwater seepage were not reported. This study did not include risk assessment for geologic hazards or flooding on the site. Environmental implications of stormwater disposal or ODEQ approval at this site are also beyond the scope of this report.

Infiltration test methods and procedures attempt to simulate the as-built conditions of the planned subsurface disposal system. However, due to natural variations in soil properties, actual infiltration rates may vary from the measured and/or recommended design rates. All systems should be constructed such that potential overflow is discharged in a controlled manner away from structures, and all systems should include an adequate factor of safety. Infiltration rates presented in this report should not be applied to inappropriate or complex hydrological models such as a closed basin without extensive further studies. This report presents infiltration test results only and should not be construed as an approval of a system design.

Please call if you have any questions or need further information.

Sincerely,

**GeoPacific Engineering, Inc.**

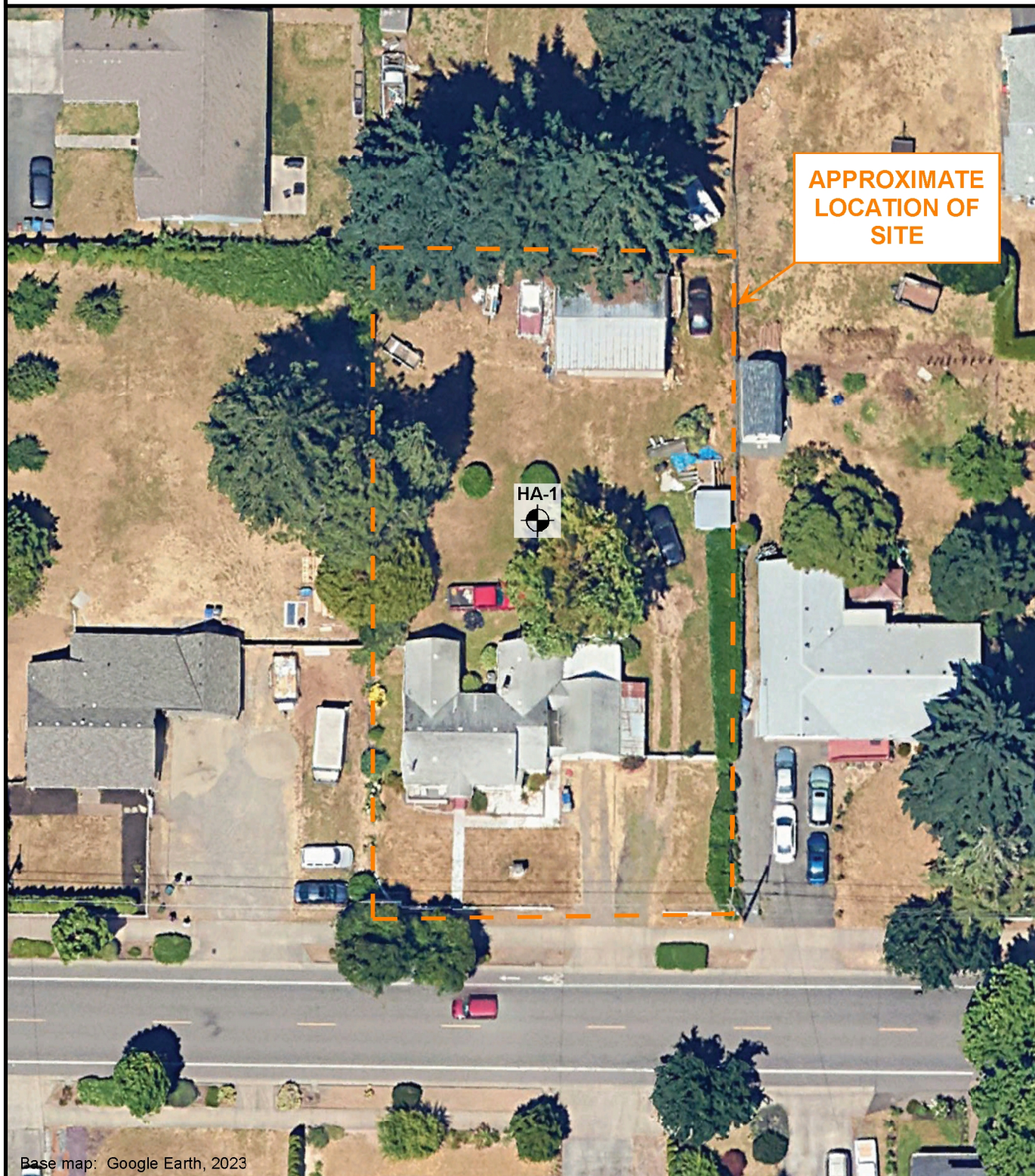


Alexandria B. Campbell, P.E.  
Staff Engineer

A handwritten signature in blue ink, reading "James D. Imbrie".

Reviewed By: James D. Imbrie, G.E., P.E.  
Principal Engineer

Attachments: Figure 1 – Site Aerial and Exploration Locations  
Hand Auger Log



**Legend**



HA-1  
Hand Auger Boring Designation and  
Approximate Location

0 40

Approximate Scale: 1" = 40'

Date: 07/09/25  
Drawn by: ABC

Project: 797 Dearborn Avenue Infiltration  
Keizer, Oregon

Project No. 25-6832

FIGURE 1



14835 SW 72nd Avenue  
Portland, Oregon 97224  
Tel: (503) 598-8445

# HAND AUGER LOG

Project: 797 Dearborn Avenue Infiltration  
Keizer, Oregon

Project No. 25-6832

Boring No. **HA-1**

Depth (ft)	Sample Type	Moisture Content (%)	Water Bearing Zone	Material Description
1				Moderately Organic SILT (OL), brown, fine roots to 10 in., dry (Topsoil)
2				SILT (ML), brown, micaceous, stiff, damp (Native Soil)
3				Grades to moist
4				
5				Infiltration test conducted at 5 feet bgs. Infiltration rate measured as 0.0 in/hr
6				
7				Silty SAND (SM), brown, fine-grained, medium dense, moist (Native Soil)
8				Infiltration test conducted at 8 feet bgs. Infiltration rate measured as 1.4 in/hr
Boring log continues on next page				

## LEGEND



Bag Sample



Bucket Sample



Seepage



Water Bearing Zone

Equipment: Ratchet-Handled Auger  
Auger Diameter: 2.75 Inches  
Auger Head Type: Mud Auger

Date Excavated: 07/03/25  
Logged By: ABC  
Surface Elevation: 135 Feet  
Surface Conditions: Grass



14835 SW 72nd Avenue  
Portland, Oregon 97224  
Tel: (503) 598-8445

# HAND AUGER LOG

Project: 797 Dearborn Avenue Infiltration  
Keizer, Oregon

Project No. 25-6832

Boring No. **HA-1** cont.

Depth (ft)	Sample Type	Moisture Content (%)	Water Bearing Zone	Material Description
9				<i>Boring log continued from previous page</i> Silty SAND (SM), brown, fine-grained, medium dense, moist (Native Soil)  Grades to dense
10				
11				
12				Grades to very dense and very moist
13				Hand Auger Boring Terminated at 13 Feet No Groundwater Seepage Not Observed No Caving Observed
14				
15				
16				

## LEGEND



Bag Sample



Bucket Sample



Seepage



Water Bearing Zone

Equipment: Ratchet-Handled Auger  
Auger Diameter: 2.75 Inches  
Auger Head Type: Mud Auger

Date Excavated: 07/03/25  
Logged By: ABC  
Surface Elevation: 135 Feet  
Surface Conditions: Grass

# **APPENDIX E – OPERATION AND MAINTENANCE MANUAL**

O & M Report will be provided in Final Report