

MEMO

To: Brian Church (DEQ)

From: Jill Betts, R.G.

Date: December 22, 2024

SUBJECT: M Carter Commons (MCC) Development
PPA Consent Order, Exhibit C Scope of Work, Item 8: Future Stormwater Management
3715-3717 N Interstate Ave, Portland, OR 97227

Enclosed is the *Private Stormwater Report*¹ (Report) for the MCC development that documents the management of stormwater on the property. Stormwater sheet flow from the impervious areas on the property (i.e., roof and walkways) will be collected in catch basins and discharged to two 25-foot deep drywells at the northeast corner of the property. The drywells are located outside and below the fill area on the southern third of the property. The Report documents the pervious and impervious areas on the property, the stormwater conveyance system details including maps and engineering plans, an operations and maintenance plan, and a preliminary infiltration memo.

Please reach out to Jill Betts with any questions.

cc:

Jeff Schatz, DEQ

Lorenzo Danielson, DEQ

Mary Bradshaw, Northwest Housing Alternatives

Carson Bowler, Law Office of Carson Bowler

Attachments:

Stormwater Management Facilities, Private Stormwater Report, M Carter Commons, by Humber Design Group, Inc., dated April 1, 2024

¹ *Stormwater Management Facilities, Private Stormwater Report, M Carter Commons*, by Humber Design Group, Inc., dated April 1, 2024.

Stormwater Management Facilities

Private Stormwater Report

M Carter Commons

HDG Job #: SAL003

Prepared For: Northwest Housing Alternatives
and Urban League of Portland

Prepared By:



**Humber
Design
Group, Inc.**

110 SE Main St. Suite 200
Portland, OR 97214
(P) 503 946 6690

I hereby certify that this Stormwater Management Report for the M Carter Commons project has been prepared by me or under my supervision and meets minimum standards of City of Portland, NOAA and normal standards of engineering practice.

I hereby acknowledge and agree that the jurisdiction does not and will not assume liability for the sufficiency, suitability, or performance of drainage facilities designed by me.

Date: April 1, 2024



RENEWAL DATE 6/30/2024

Table of Contents

Project Overview and Description	2
Vicinity Map	3
Methodology	4
Analysis	5
Engineering Conclusions	7

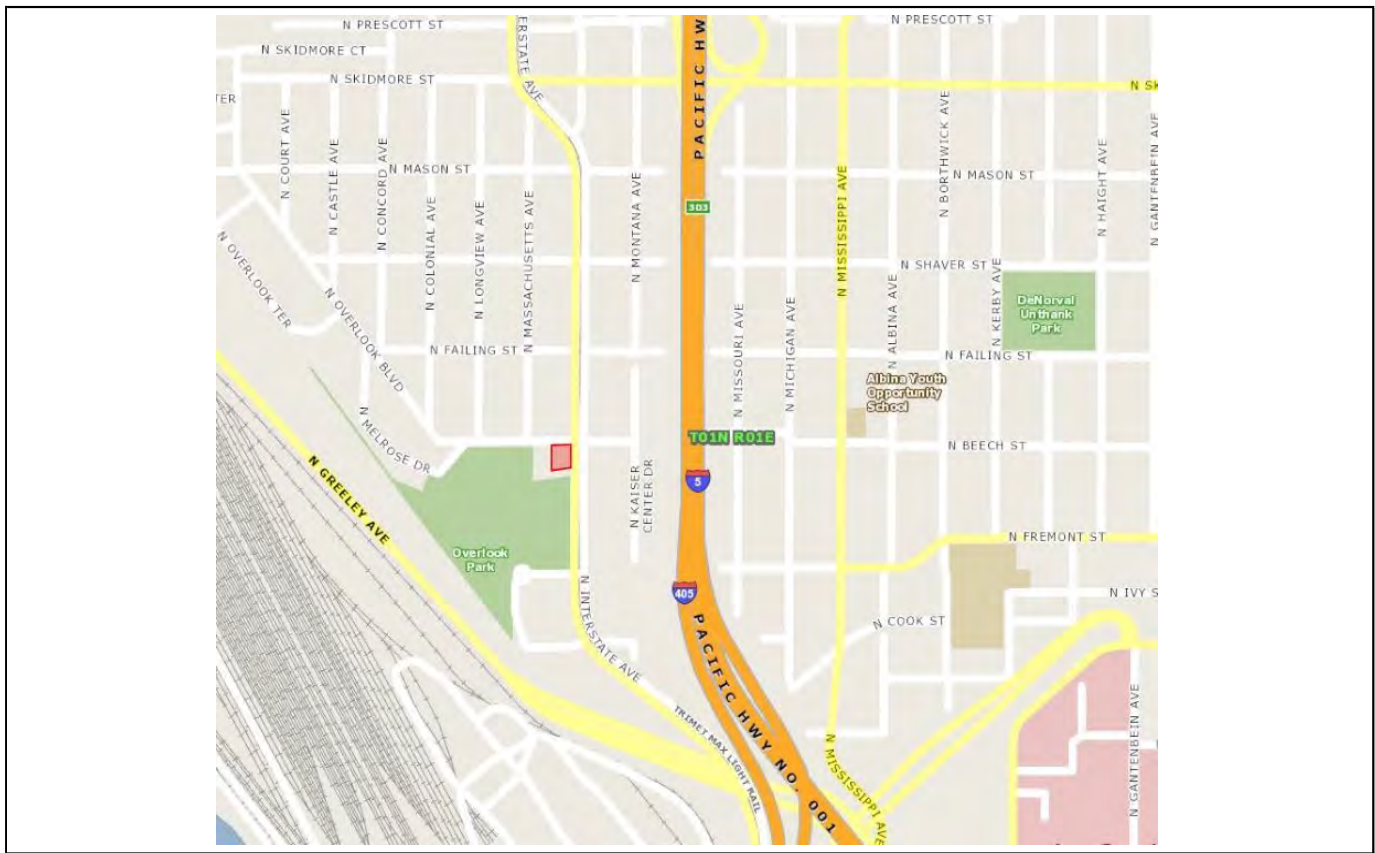
APPENDICES

Appendix A Stormwater Facility Details / Exhibits	A
Utility Plan	
Pre-Developed Catchment Map	
Post-Developed Catchment Map	
Stormwater Details	
Appendix B Support Calculations	B
HydroCAD Report - Drywell	
Appendix C Operations and Maintenance Plan	C
Operations and Maintenance Form	
Operations and Maintenance Site Plan	
Operations and Maintenance Report	
Operations and Maintenance Details	
Appendix D Additional Forms & Associated Reports	D
Preliminary Infiltration Memo by Central Geotechnical Services	
BES Correspondence	

Project Overview and Description

Location of Project	3715-3717 N Interstate Avenue
Site Area/Acreage	0.31 AC
Proposed Impervious Area	10,461 SF
Nearest Cross Street	North Overlook Boulevard
Property Zoning	RM3 Residential Multi-dwelling
Existing Conditions	The site consists of a 2,910 sf single story commercial building with an asphalt parking lot and retaining walls along the western property line.
Proposed Development	The project is a 6-story affordable, multifamily housing development for Northwest Housing Alternatives and Urban League of Portland. The building consists of 63 studio and 1-bedroom units as well as community rooms, activity rooms, bike storage and a centralized laundry facility.
Watershed Description	Willamette River
Subwatershed	Beech - Essex - Wheeler
R#	R231865
Tax Map	1N1E22CC
Tax Lot	13500
Flood Zone	N/A
Permits Required	Building Permit Public Works Permit

Vicinity Map



Site Location

Methodology

Existing Drainage

The stormwater runoff from the existing site is currently captured within catch basins with the stormwater being conveyed to the combination sewer system in N Interstate Avenue. It is our understanding that there are no water quality or flow control facilities on site.

Infiltration Results

Infiltration testing was performed by Central Geotechnical on 11/1/2023. Tests were performed at 5' bgs and at 25' bgs. At 5' bgs the infiltration rate was 3.2" per hour and at 25' bgs the rate was tested at 10" per hour. Both rates listed are unfactored. A factor of safety of 2 will be used for design. See geotechnical engineer memo in Appendix D.

PRIVATE Proposed Stormwater Management Techniques

Private site stormwater management will fall under the 2020 SWMM and NOAA requirements. Stormwater runoff from the proposed impervious area will be managed by a private drywell system sized to completely infiltrate the 10-year storm event.

PUBLIC Proposed Stormwater Management Techniques

New improvements along Overlook, Interstate, and the public alley to the south of the project site will create or replace greater than 500sf of impervious; therefore stormwater management will be required. This area will be managed through a Staff Reviewed Special Circumstance (SRSC).

Discharge Point

Infiltration

Stormwater Hierarchy Justification

The proposed development will meet level 1 of the discharge hierarchy.

Analysis

Computational Method Used HydroCAD models of a SBUH Type 1A Storm was used to calculate the stormwater management facility sizes for the catchment areas. See attached calculations. Below is a summary of the results.

Hydrologic Soil Group B

Table 1 – Curve Numbers

Predeveloped Pervious CN	79
Predeveloped Impervious CN	98
Post-Developed Pervious CN	79
Post-Developed Impervious CN	98

Table 2 – Design Storms

WQ Storm	0.83 inches
2-year	2.40 inches
10-year	3.40 inches
25-year	3.80 inches
100-year	4.40 inches

Table 3 – Time of Concentration

Predeveloped TOC	5 min
Post-Developed TOC	5 min

Stormwater Management Narrative Private:
Per both BES and NOAA requirements, all runoff generated from the 10-year storm event will be treated and infiltrated on site via a private drywell system. There are (2) 25' deep drywells proposed. The drywells will have perforation depths of 15'. Surface runoff from impervious areas that do not include roof area will be pretreated via trapped catch basins.

Public:
Right-of-way improvements along N Overlook, N Interstate, and the public alley to the south of the project site will result in new or replaced impervious area. BES and HUD have both approved the management of this area through a fee-in-lieu through an SRSC. All pollutant generating impervious area in the right-of-way is collected and routed to the existing combined sewer located in N Interstate. This combined sewer has been confirmed by BES to route to the Swan Island Pump Station, then pumped to the Columbia Blvd wastewater treatment plant. This treatment plant meets a much higher treatment standard than a Greenstreet Facility. Please see email correspondence with BES in Appendix D.

Table 4 – Catchment Areas and Facility Table

Catchment/ Facility ID	Source (roof, road, etc.)	Treatment Area (sf)	Ownership (private/ public)	Facility Type/ Function	Facility Size
A	Roof and Plaza	10,758	Private	Drywell	(2) 48" dia x 25' deep
B	Hardscape	5,040	Public	Combined Sewer	12" CS PVC

Engineering Conclusions

The preceding methodologies and calculations presented indicate compliance with the current jurisdictional stormwater management codes and requirements. A summarized breakdown is presented below:

Water Quality

The proposed development will meet the provisions for water quality per the 2020 Portland Stormwater Management Manual.

Water Quantity

The proposed development will meet the provisions for water quantity per the 2020 Portland Stormwater Management Manual.

Downstream / Upstream Impacts

There are no upstream or downstream impacts created by this proposed development.

100 year storm

The 100 year storm will be safely conveyed away from structures and will overflow to public combo sewer in N Interstate Avenue.

Appendix A

Stormwater Facility Details / Exhibits

Utility Plan

Pre-Developed Catchment Map

Post-Developed Catchment Map

Stormwater Details

WATER BACKFLOW NOTES

1. PREMISES-ISOLATION BACKFLOW PROTECTION REQUIRED BY WATER QUALITY BACKFLOW (WQBP) REVIEW (503-823-7480). WATER BUREAU BACKFLOW ASSEMBLY INSTALLATION REQUIREMENTS: WWW.PORTLANDOREGON.GOV/WATER/BACKFLOWINSTALLATION REQUIREMENTS TITLE 21.12.320, 28.08.020 AND/OR OAR 333-061-0070, 333-061-0071

PLAN APPROVED FOR CONSTRUCTION: ERRORS AND OMISSIONS EXCEPTED.

DOMESTIC WATER SERVICE: BACKFLOW PREVENTION ASSEMBLIES MUST CONFORM TO EPA LEAD FREE REQUIREMENTS.

REDUCED PRESSURE BACKFLOW ASSEMBLY (RPBA) REQUIRED.

ASSEMBLIES APPROVED TO BE INSTALLED INSIDE BUILDINGS OR STRUCTURES:

INSTALLATIONS MUST BE LOCATED AT THE WATER RISER FOR SLAB-ON-GRADE CONSTRUCTION, OR ON THE HORIZONTAL PIPE PENETRATION INTO THE BUILDING FOR SUB-GRADE ENTRY. ASSEMBLIES MUST BE INSTALLED ON CENTERLINE OF THE CITY WATER SERVICE AS IT RUNS PERPENDICULAR FROM THE RIGHT-OF-WAY.

RISER MUST BE INSTALLED AT 12" FROM THE PROPERTY FRONTAGE FOUNDATION WALL TO THE CENTERLINE OF THE PIPE RISER.

ASSEMBLIES IN HORIZONTAL CONFIGURATIONS ARE TO BE INSTALLED AT THE SERVICE PENETRATION. HORIZONTAL ASSEMBLY INSTALLATIONS MAY BE TURNED AT 90-DEGREES TO RUN PARALLEL WITH BUILDING FRONTAGE. ELBOWS PROVIDED FOR THIS TYPE OF INSTALLATION ARE TO BE LOCATED ON THE SERVICE PIPE 4" AFTER PIPE PENETRATION. WHERE APPLICABLE, FOUNDATIONS AND/OR FOOTINGS MUST BE ENGINEERED TO ACCOMMODATE THE RISER LOCATION. WHEN REQUIRED, WATER PIPING MUST BE SLEEVED APPROPRIATELY. PIPING MUST BE SLEEVED COMPLIANT WITH FIRE CODE NFPA 13 - 9.3.4 AND/OR PLUMBING CODE 313.9.

IF SERVICE ENTERS BUILDING AT LESS THAN 1-FOOT AFF THE ASSEMBLY MUST BE RAISED TO BE AT A MINIMUM OF 1-FOOT AFF MEASURED TO BOTTOM OF ASSEMBLY BODY. ANY ADDITIONAL PIPING TO ACCOMMODATE FOR A SHUTOFF VALVE, WYE STRAINER OR RELIEF-VALVE DRAIN MAY REQUIRE SLEEVING BEFORE THE ASSEMBLY. INSTALLED ARBITRARY PIPING PRIOR TO AN ASSEMBLY MAY REQUIRE THAT THE ASSEMBLY BE RELOCATED AND/OR BE SLEEVED. SERVICES ENTERING GREATER THAN 5-FEET AFF REQUIRE AN OR-OSHA PLATFORM AND THE ASSEMBLY INSTALLED AT SERVICE ENTRY LEVEL AFF. SEE WATER BUREAU BACKFLOW ASSEMBLY INSTALLATION REQUIREMENT PAGE 1, ITEM 1 FOR OTHER CRITICAL ASSEMBLY AND RISER REQUIREMENTS.

ASSEMBLY MUST BE AT 12" ABOVE FINISHED GRADE AND/OR ABOVE 100 YEAR FLOOD PLAN, WHICHEVER IS GREATER.

INSTALLATION IN AN APPROVED INSULATED OUTDOOR ENCLOSURE.

INSTALLATION OF A PREMISE-ISOLATION BACKFLOW ASSEMBLY WILL CREATE A CLOSED SYSTEM AND MAY RESULT IN PROBLEMS ASSOCIATED WITH THERMAL EXPANSION. INSTALLER RESPONSIBLE FOR MAKING PROVISIONS FOR THERMAL EXPANSION.

2. PREMISES-ISOLATION BACKFLOW PROTECTION REQUIRED BY WATER QUALITY BACKFLOW (WQBP) REVIEW (503-823-7480). WATER BUREAU BACKFLOW ASSEMBLY INSTALLATION REQUIREMENTS: WWW.PORTLANDOREGON.GOV/WATER/BACKFLOWINSTALLATION REQUIREMENTS TITLE 21.12.320, 28.08.020 AND/OR OAR 333-061-0070, 333-061-0071

PLAN APPROVED FOR CONSTRUCTION: ERRORS AND OMISSIONS EXCEPTED.

FIRE SPRINKLER WATER SERVICE: IT IS UNLAWFUL TO USE A DEDICATED FIRE SPRINKLER WATER SUPPLY FOR PURPOSES OTHER THAN FIRE SUPPRESSION AND CODE REQUIRED SYSTEM TESTING.

REDUCED PRESSURE DETECTOR ASSEMBLY (RPDA) REQUIRED.

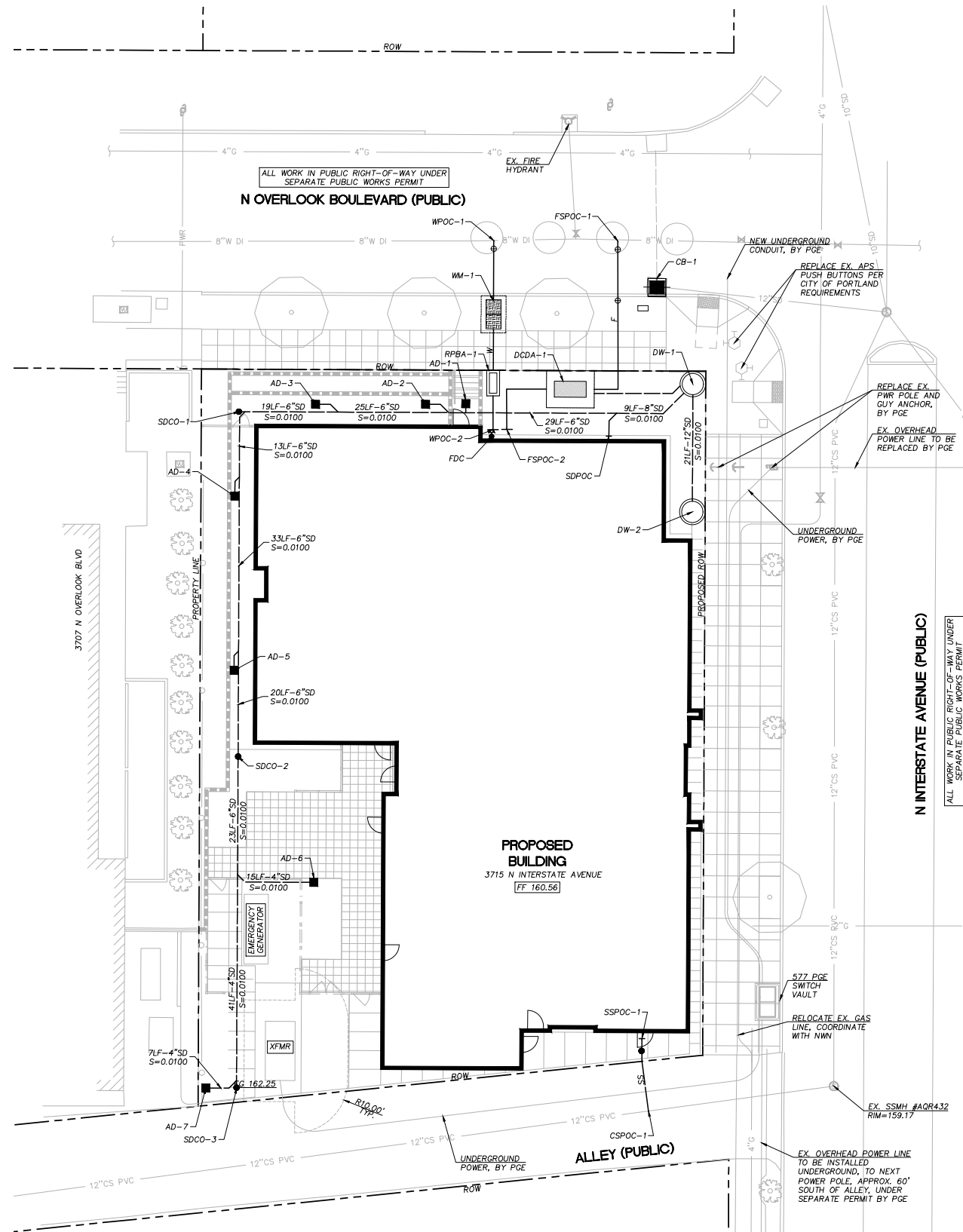
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UTILITY PLAN
SCALE: 1"=10'

WATER SCHEDULE

ITEM	DESCRIPTION	REFERENCE
WM-1	WATER METER, INSTALL 3" METER BY PORTLAND WATER BUREAU. APPLICANT MUST CONTACT PWB AT DEVRE@PORTLANDOREGON.GOV TO REQUEST INSTALLATION. CONTRACTOR CONNECT TO THE SHORT STUB-OUT ON THE BACK SIDE OF THE METER BOX.	
FSPOC-1	INSTALL X" FIRE SERVICE BY PORTLAND WATER BUREAU. APPLICANT MUST CONTACT PWB AT DEVRE@PORTLANDOREGON.GOV TO REQUEST INSTALLATION. CONTRACTOR CONNECT TO THE SHORT STUB-OUT ON THE BACK SIDE OF CURB GATE VALVE.	
RPBA-1	PREMISES ISOLATION (PI) REDUCED PRESSURE BACKFLOW ASSEMBLY, SIZE=3" TO BE INSTALLED IN ABOVE GROUND HEATED ENCLOSURE ON NEW WATER LINE SERVICE PER WATER BUREAU REQUIREMENTS. 110V/1PH POWER SUPPLY PER ELECTRICAL.	DTL 1/C401
DCDA-1	6" DOUBLE CHECK DETECTOR ASSEMBLY WITH PRECAST VAULT AND SUMP PUMP. 110V/1PH POWER SUPPLY PER ELECTRICAL. DISCHARGE TO 17LF OF 2" SCH. 40 PVC PIPE INTO ADJACENT DRYWELL.	DTL 5/C401
WPOC-1	WATER POINT OF CONNECTION, ALL WATER RELATED WORK WITHIN ROW TO BE PERFORMED BY PWB	
WPOC-2	WATER POINT OF CONNECTION, ALL WATER RELATED WORK WITHIN ROW TO BE PERFORMED BY PWB	
FSPOC-2	6" FIRE SPRINKLER WATER POINT OF CONNECTION, SEE PLUMBING DRAWINGS	
FDC	FIRE DEPARTMENT CONNECTION, MOUNTED TO BUILDING FACE	

SANITARY SEWER SCHEDULE

ITEM	DESCRIPTION	REFERENCE
CSPOC-1	COMBINATION SEWER POINT OF CONNECTION, CONNECT TO EX. 12" COMBO SEWER PIPE, CONTRACTOR TO V.I.F. ASSUMED IE=151.61	
SSPOC-1	SANITARY SEWER CONNECTION, SIZE=6", IE=153.00', FOR BUILDING SEWER SEE PLUMBING	
SSCO	SANITARY SEWER CLEANOUT AT ROW LINE, SIZE=6", IE=152.75', FOR BUILDING SEWER SEE PLUMBING	DTL 2/1

SHEET LEGEND

ITEM	DESCRIPTION
SD	STORM DRAIN
SS	SANITARY SEWER
W	DOMESTIC WATER
F	FIRE SERVICE
[Symbol]	DOUBLE CHECK VALVE ASSEMBLY (DCVA)
[Symbol]	DOUBLE CHECK DETECTOR ASSEMBLY (DCDA)
[Symbol]	FIRE DEPARTMENT CONNECTION (FDC)
[Symbol]	CLEANOUT (CO)

SHEET NOTES

1. ALL DOMESTIC WATER AND FIRE PROTECTION WORK IN THE PUBLIC RIGHT OF WAY BY PORTLAND WATER BUREAU AT OWNER'S EXPENSE. CONTRACTOR TO COORDINATE WORK WITH PORTLAND WATER BUREAU.

STORM SEWER SCHEDULE

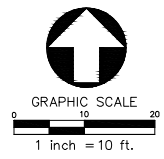
ITEM	DESCRIPTION	REFERENCE
SDPOC	STORMWATER POINT OF CONNECTION TO BUILDING SEWER, IE=153.00'	
DW-1	DRYWELL RIM=161.94 IE IN (8"W)=154.83 IE IN (2"W)=159.94 IE OUT (12"S)=154.75 TOP OF PERF. SECTION=151.94 TOTAL DEPTH=25'	DTL 6/C401
DW-2	DRYWELL RIM=161.45 IE IN (12"S)=154.55 TOP OF PERF. SECTION=151.45 BOTTOM=136.45 TOTAL DEPTH=25'	DTL 6/C401
AD-1	AREA DRAIN RIM=160.56 IE=155.26	DTL 4/C401
AD-2	AREA DRAIN RIM=159.87 IE=155.33	DTL 4/C401
AD-3	AREA DRAIN RIM=159.85 IE=155.54	DTL 4/C401
AD-4	AREA DRAIN RIM=160.08 IE=155.83	DTL 4/C401
AD-5	AREA DRAIN RIM=160.08 IE=156.13	DTL 4/C401
AD-6	AREA DRAIN RIM=160.26 IE=156.69	DTL 4/C401
AD-7	AREA DRAIN RIM=159.57 IE=157.00	DTL 4/C401
CB-1	CATCH BASIN, REPLACE EX. INLET WITH CG-2 INLET RIM=161.57 IE=157.57	SEE PWP
SDCO-1	STORM CLEANOUT TO GRADE IE=155.68	DTL 2/C401
SDCO-2	STORM CLEANOUT TO GRADE IE=156.33	DTL 2/C401
SDCO-3	STORM CLEANOUT TO GRADE IE=156.95	DTL 2/C401

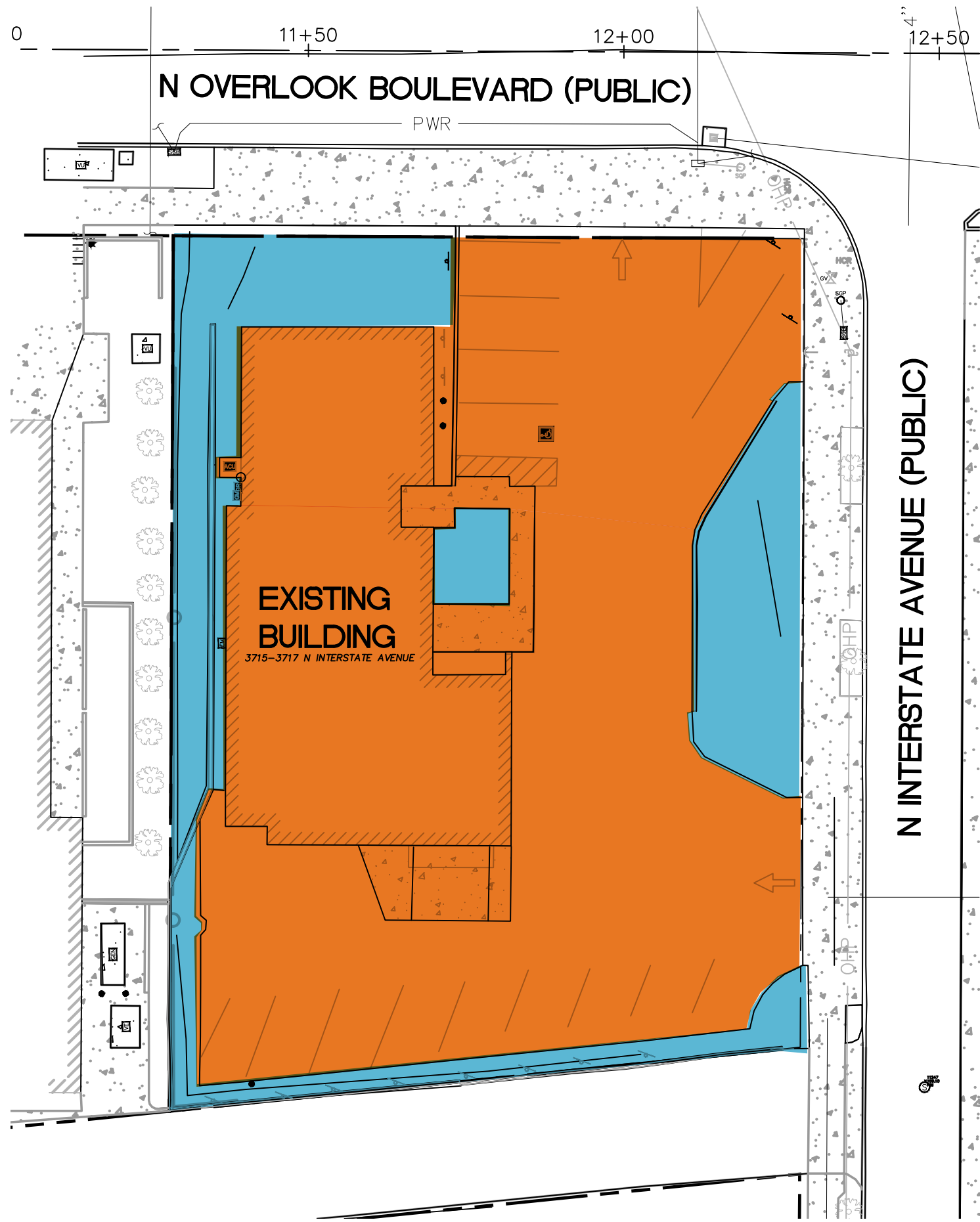
REVISIONS:

DATE DESCRIPTION
SHEET TITLE:
UTILITY PLAN

DRAWN BY: SY
CHECKED BY: AS
DATE: 04.01.24

SHEET:
C300

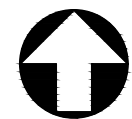




PRIVATE
 IMPERVIOUS AREA: 9,659 SF

PERVIOUS AREA: 3,057 SF

TOTAL LOT AREA: 12,716 SF



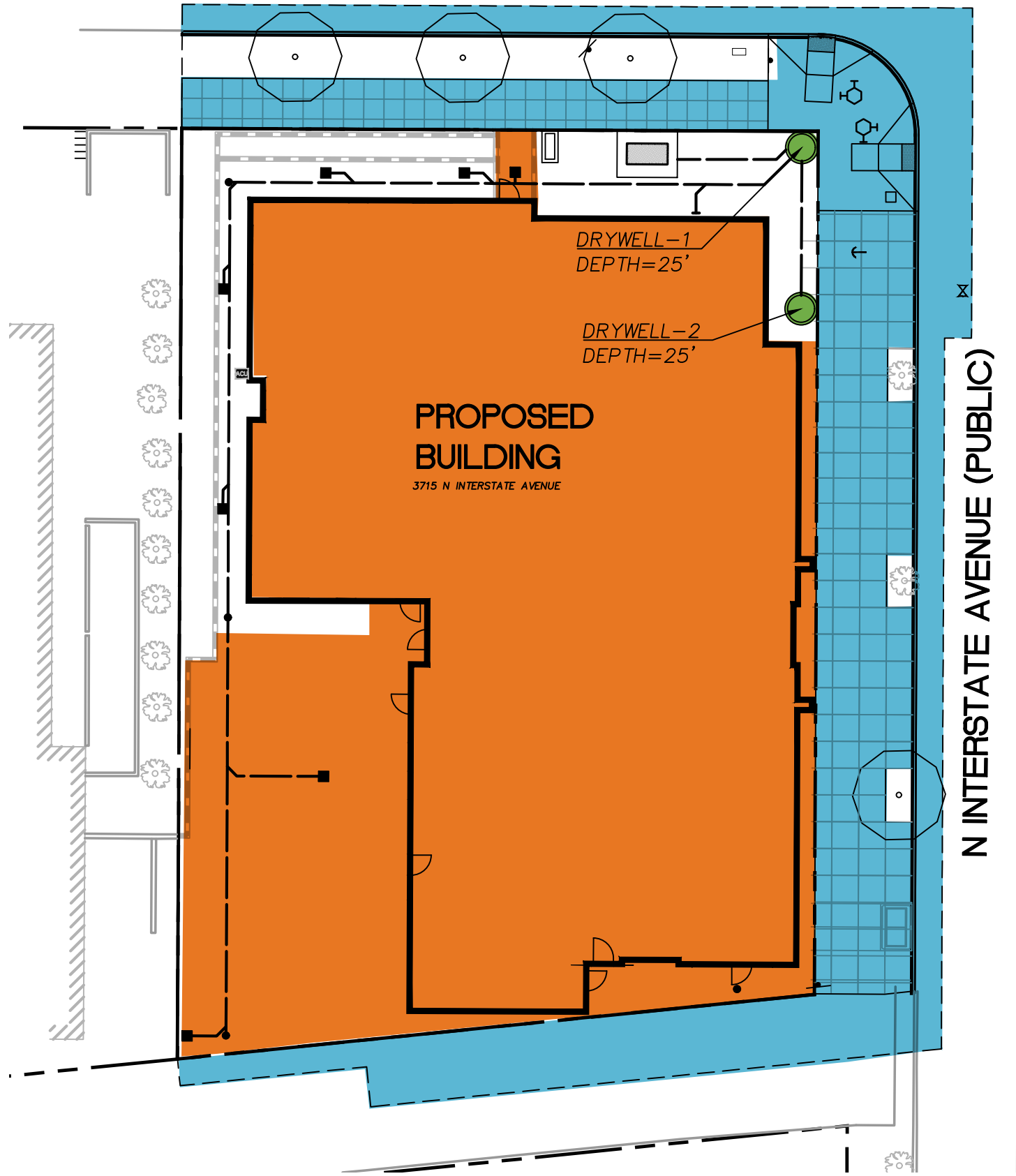
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**PRE DEVELOPED
 CATCHMENT MAP**
 3801 N INTERSTATE AVE

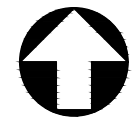
PROJECT NO.:	SAL003
DRAWN BY:	STY
DESIGN BY:	AKS
REVIEWED BY:	AKS
DATE:	03/19/2024



N OVERLOOK BOULEVARD (PUBLIC)




- PRIVATE**
IMPERVIOUS AREA: 10,758 SF
- PUBLIC**
IMPERVIOUS AREA: 5,040 SF



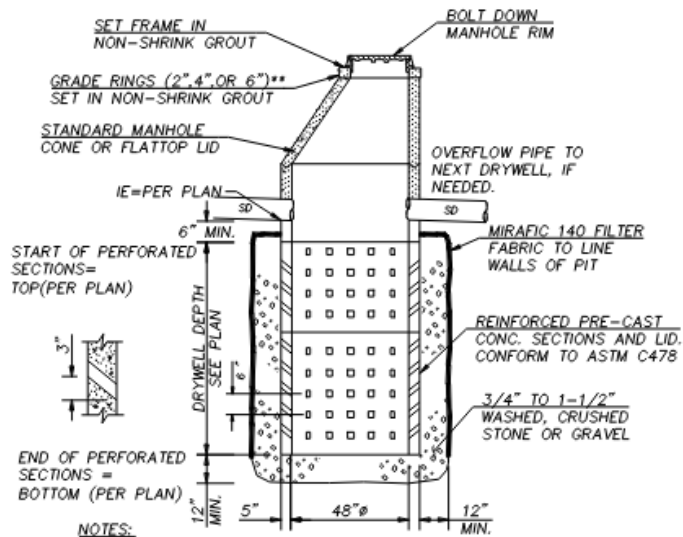
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0 40 80
1 inch = 40 ft.

**POST DEVELOPED
CATCHMENT MAP**
3801 N INTERSTATE AVE

PROJECT NO.: SAL003 DRAWN BY: STY DESIGN BY: AKS REVIEWED BY: AKS DATE: 03/19/2024	 Humber Design Group, Inc. <small>Civil Engineering • 503.946.6690 • hdgpd.com</small>
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DRYWELL TESTING INFORMATION		
DRYWELL	DESIGN RATE (GPM)	ESTIMATED WATER VOLUME (GALLONS)
DRYWELL 1	18	810
DRYWELL 2	18	810
TOTAL SYSTEM	36	1620

* DESIGN RATE INCLUDES A FACTOR OF SAFETY APPLIED.



NOTES:

1. BES STORMWATER INSPECTION REQUIRED AT TIME OF CONSTRUCTION. SEE GREEN BES INSPECTION CARD TO SCHEDULE. CONTACT AUTOMATED INSPECTION REQUEST (IVR) SYSTEM AT 503-823-7000 AND REQUEST INSPECTION #487 BES ONSITE STORMWATER FACILITY EVAL - OR - YOU MAY ALSO CONTACT BES OFFICE DIRECTLY AT 503-823-2059.

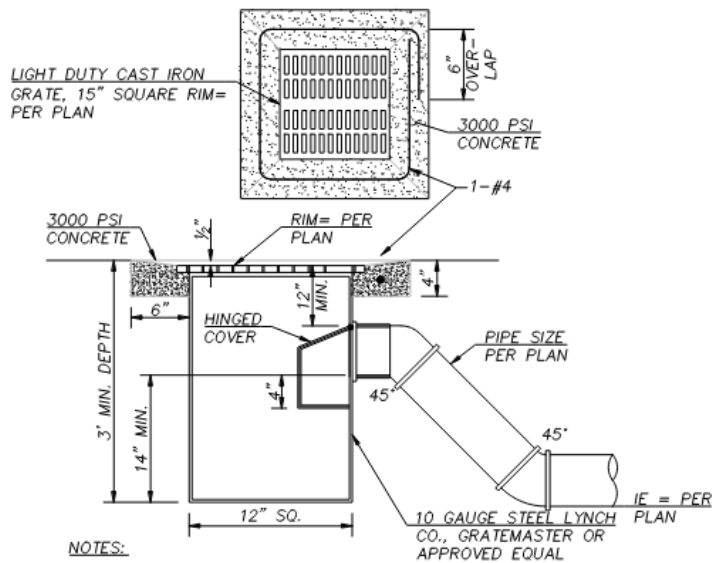
DRYWELL

NTS

DRYWELL TESTING NOTES

1. DRYWELL(S) SHALL HAVE THE CAPACITY TO DISPOSE OF STORMWATER AT THE RATE LISTED BELOW IN TABLE.
2. DRYWELL(S) SHALL BE TESTED AFTER CONSTRUCTION OF THE DRYWELL STRUCTURE (INCLUDING DRAIN ROCK AND PERIMETER BACKFILL) BUT PRIOR TO THE CONSTRUCTION OF THE TOP SLAB AND FINISH BACKFILL.
3. TESTING MUST BE COMPLETED BY A COMPANY CAPABLE OF PERFORMING DRYWELL TEST SUCH AS LISTED BELOW, OR APPROVED OTHER.

NTA CONTRACTING, INC.
COB 80682
CONTACT : JASON ASHE
JASHE@JAI-NTA.COM
(503)793-1037
4. NOTIFY CIVIL AND GEOTECHNICAL ENGINEERS 7 DAYS PRIOR TO TESTING AND PROVIDE WRITTEN PLAN FOR TESTING INCLUDING WATER SOURCE.
6. CONTRACTOR SHALL CONTACT CITY OF PORTLAND WATER BUREAU OR APPLICABLE WATER DISTRICT TO ARRANGE FOR DRYWELL TEST WATER SUPPLY. CONTRACTOR SHALL BEAR RESPONSIBILITY FOR SECURING ALL NECESSARY PERMITS, AUTHORIZATION AND ANY FEES. IF NO WATER SUPPLY AVAILABLE, WATER TRUCK(S) MUST BE USED.
8. CONTRACTOR SHALL ARRANGE FOR THE PROVISION OF ALL DRYWELL TESTING EQUIPMENT, INCLUDING BUT NOT LIMITED TO FLOW METER READING IN GPM, PIPING, AND TRAFFIC CONTROL.
9. CLEAN WATER SHALL BE PROVIDED TO TEST DRYWELLS, AS APPROVED. INTRODUCTION OF SEDIMENT MAY RESULT IN FAILURE OF THE DRYWELL CAPACITY TEST.
10. FILL DRYWELL ABOVE PERFORATED SECTIONS, SHUT OFF WATER, AND RECORD HEIGHT OF WATER EVERY 5 MINUTES DURING DRAWDOWN. IF DRYWELL WILL NOT FILL UP, MAINTAIN A CONSTANT FLOW RATE EQUAL TO THE DESIGN RATE FOR A MINIMUM OF 45 MIN. IF REDUCTION OF DRYWELLS IS DESIRED, CONTACT ENGINEER FOR PROCEDURE.
11. SHOULD DRYWELL(S) FAIL TO TEST AT THE MINIMUM DESIGN RATE, ADDITIONAL DRYWELLS MAY BE CONSTRUCTED, AS APPROVED, IN ORDER TO ACHIEVE THE REQUIRED MINIMUM DISPOSAL RATE. ALTERNATIVE DRYWELL LOCATIONS AND/OR ADDITIONAL DRYWELLS IN PIPED SERIES MUST BE PRE-APPROVED AND IDENTIFIED ON THE CONSTRUCTION DRAWINGS.

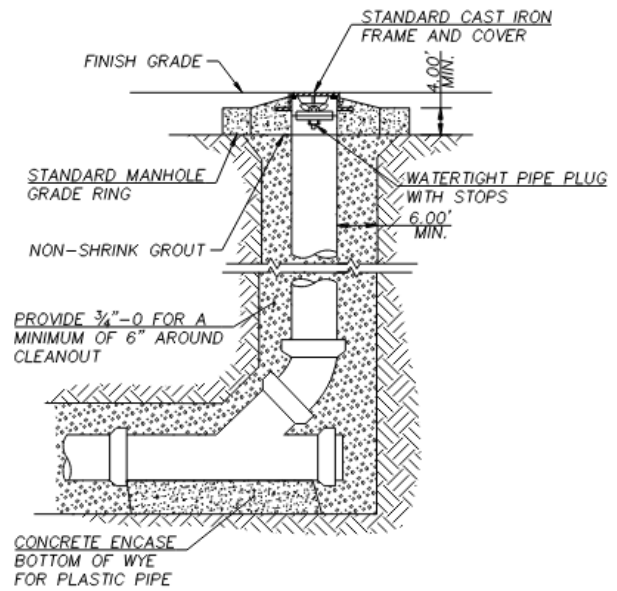


NOTES:

1. ALL STEEL WELDED CONSTRUCTION. COATED
2. INSIDE AND OUT WITH ASPHALTUM PAINT. TRAP
3. TO INCLUDE CLEANOUT.
4. AREA DRAIN GRATE TO MEET ALL ADA REQUIREMENTS

TRAPPED AREA DRAIN

NTS



NOTE:

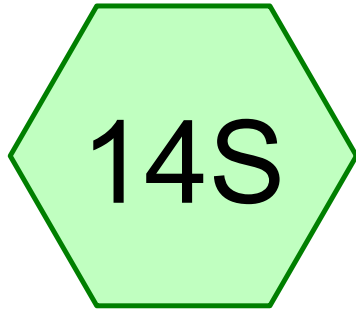
1. CONCRETE ENCASE ENTIRE WYE SECTION AND 45° BEND FOR CONCRETE PIPE.

CLEAN OUT

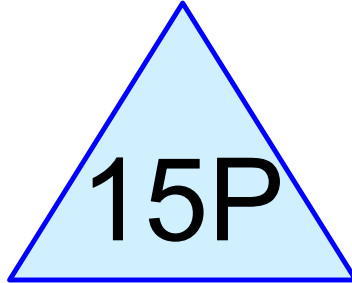
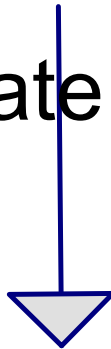
NTS

Appendix B

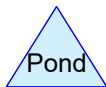
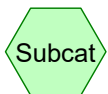
Support Calculations
HydroCAD Report - Drywell



Private Site



Drywell



MCC - HUD stormwater

Prepared by HP Inc.

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Page 2

Area Listing (selected nodes)

Area (sq-ft)	CN	Description (subcatchment-numbers)
10,758	98	Private Site (14S)
10,758	98	TOTAL AREA

MCC - HUD stormwater

Type IA 24-hr 1/2 2 year storm Rainfall=1.20"

Prepared by HP Inc.

Printed 3/19/2024

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Page 5

Time span=0.00-24.00 hrs, dt=0.05 hrs, 481 points

Runoff by SBUH method, Split Pervious/Imperv.

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

Subcatchment 14S: Private Site

Runoff Area=10,758 sf 100.00% Impervious Runoff Depth>0.98"

Tc=5.0 min CN=0/98 Runoff=0.06 cfs 882 cf

Pond 15P: Drywell

Peak Elev=104.61' Storage=187 cf Inflow=0.06 cfs 882 cf

Outflow=0.02 cfs 830 cf

Total Runoff Area = 10,758 sf Runoff Volume = 882 cf Average Runoff Depth = 0.98"
0.00% Pervious = 0 sf 100.00% Impervious = 10,758 sf

Summary for Subcatchment 14S: Private Site

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

Runoff = 0.06 cfs @ 7.91 hrs, Volume= 882 cf, Depth> 0.98"

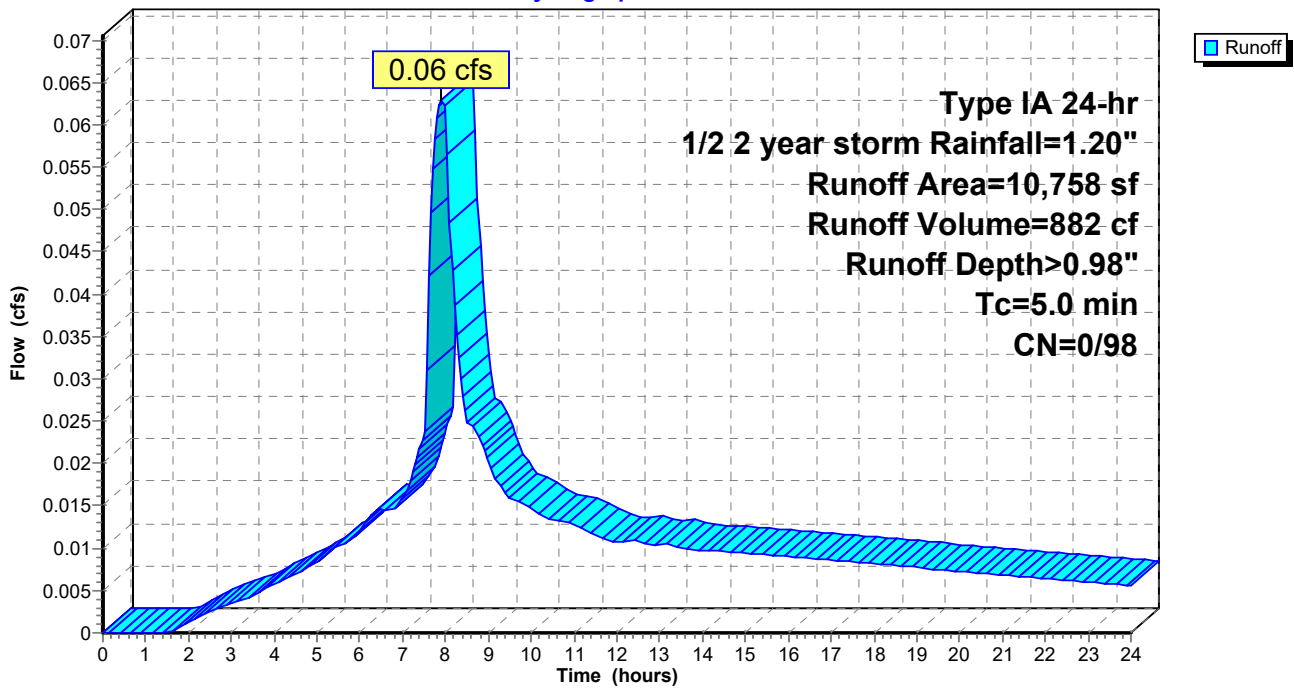
Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
 Type IA 24-hr 1/2 2 year storm Rainfall=1.20"

Area (sf)	CN	Description
* 10,758	98	Private Site
10,758	98	100.00% Impervious Area

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

Subcatchment 14S: Private Site

Hydrograph



Summary for Pond 15P: Drywell

Inflow Area = 10,758 sf, 100.00% Impervious, Inflow Depth > 0.98" for 1/2 2 year storm event
 Inflow = 0.06 cfs @ 7.91 hrs, Volume= 882 cf
 Outflow = 0.02 cfs @ 8.75 hrs, Volume= 830 cf, Atten= 63%, Lag= 50.0 min
 Discarded = 0.02 cfs @ 8.75 hrs, Volume= 830 cf

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
 Peak Elev= 104.61' @ 8.75 hrs Surf.Area= 77 sf Storage= 187 cf

Plug-Flow detention time= 128.5 min calculated for 828 cf (94% of inflow)
 Center-of-Mass det. time= 86.8 min (789.5 - 702.7)

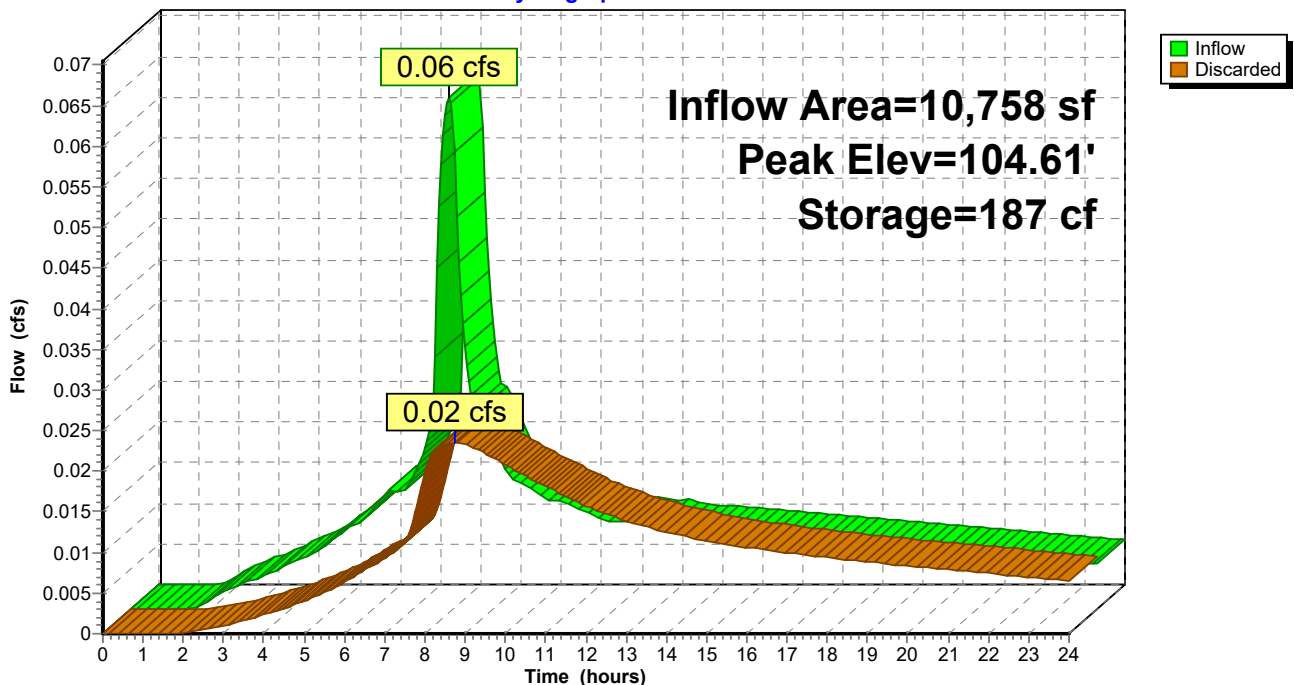
Volume	Invert	Avail.Storage	Storage Description
#1	100.00'	628 cf	4.00'D x 25.00'H Vertical Cone/Cylinder x 2 Inside #2
#2	100.00'	389 cf	7.00'D x 25.00'H Vertical Cone/Cylinder x 2
			1,924 cf Overall - 628 cf Embedded = 1,296 cf x 30.0% Voids
			1,017 cf Total Available Storage

Device	Routing	Invert	Outlet Devices
#1	Discarded	100.00'	5.000 in/hr Exfiltration over Wetted area from 100.00' - 115.00' Excluded Wetted area = 77 sf

Discarded OutFlow Max=0.02 cfs @ 8.75 hrs HW=104.61' (Free Discharge)
 ↳ 1=Exfiltration (Exfiltration Controls 0.02 cfs)

Pond 15P: Drywell

Hydrograph



MCC - HUD stormwater

Type IA 24-hr 2 year storm Rainfall=2.40"

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Page 5

Time span=0.00-24.00 hrs, dt=0.05 hrs, 481 points

Runoff by SBUH method, Split Pervious/Imperv.

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

Subcatchment 14S: Private Site

Runoff Area=10,758 sf 100.00% Impervious Runoff Depth>2.17"

Tc=5.0 min CN=0/98 Runoff=0.14 cfs 1,943 cf

Pond 15P: Drywell

Peak Elev=110.29' Storage=418 cf Inflow=0.14 cfs 1,943 cf

Outflow=0.05 cfs 1,837 cf

Total Runoff Area = 10,758 sf Runoff Volume = 1,943 cf Average Runoff Depth = 2.17"
0.00% Pervious = 0 sf 100.00% Impervious = 10,758 sf

Summary for Subcatchment 14S: Private Site

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

Runoff = 0.14 cfs @ 7.90 hrs, Volume= 1,943 cf, Depth> 2.17"

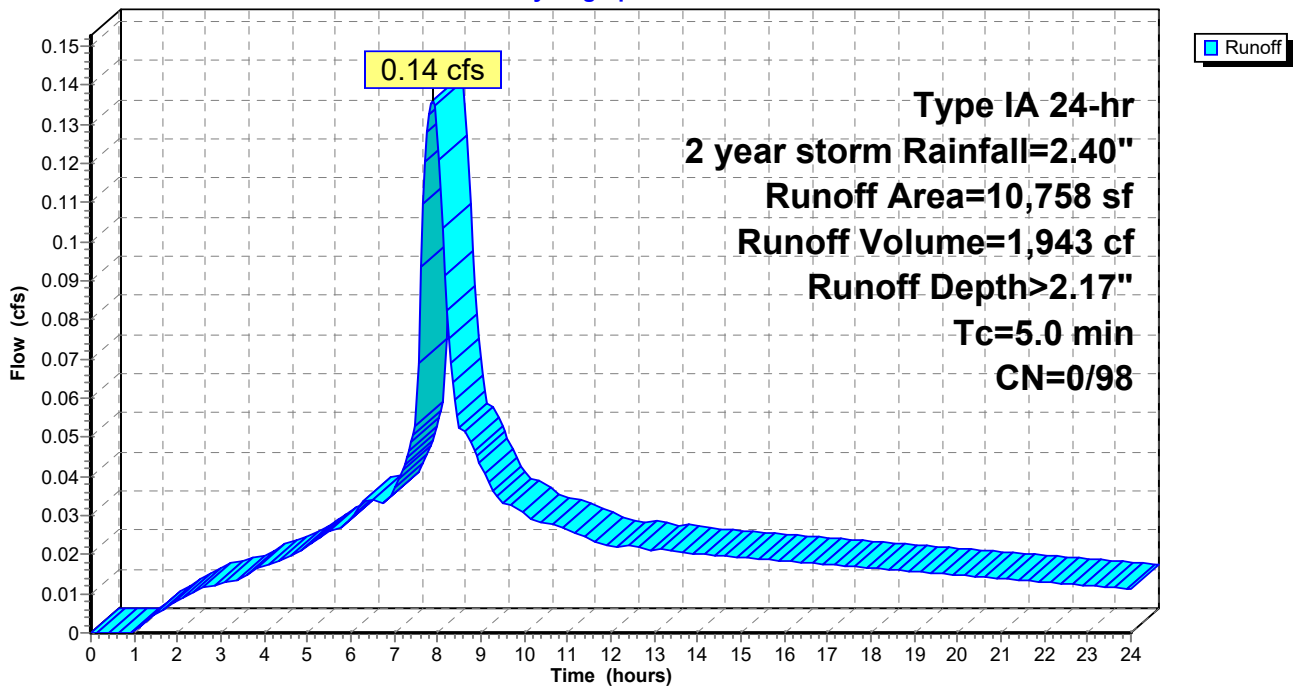
Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
 Type IA 24-hr 2 year storm Rainfall=2.40"

	Area (sf)	CN	Description
*	10,758	98	Private Site
	10,758	98	100.00% Impervious Area

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

Subcatchment 14S: Private Site

Hydrograph



Summary for Pond 15P: Drywell

Inflow Area = 10,758 sf, 100.00% Impervious, Inflow Depth > 2.17" for 2 year storm event
 Inflow = 0.14 cfs @ 7.90 hrs, Volume= 1,943 cf
 Outflow = 0.05 cfs @ 8.52 hrs, Volume= 1,837 cf, Atten= 62%, Lag= 37.0 min
 Discarded = 0.05 cfs @ 8.52 hrs, Volume= 1,837 cf

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
 Peak Elev= 110.29' @ 8.52 hrs Surf.Area= 77 sf Storage= 418 cf

Plug-Flow detention time= 128.9 min calculated for 1,833 cf (94% of inflow)
 Center-of-Mass det. time= 88.9 min (762.7 - 673.8)

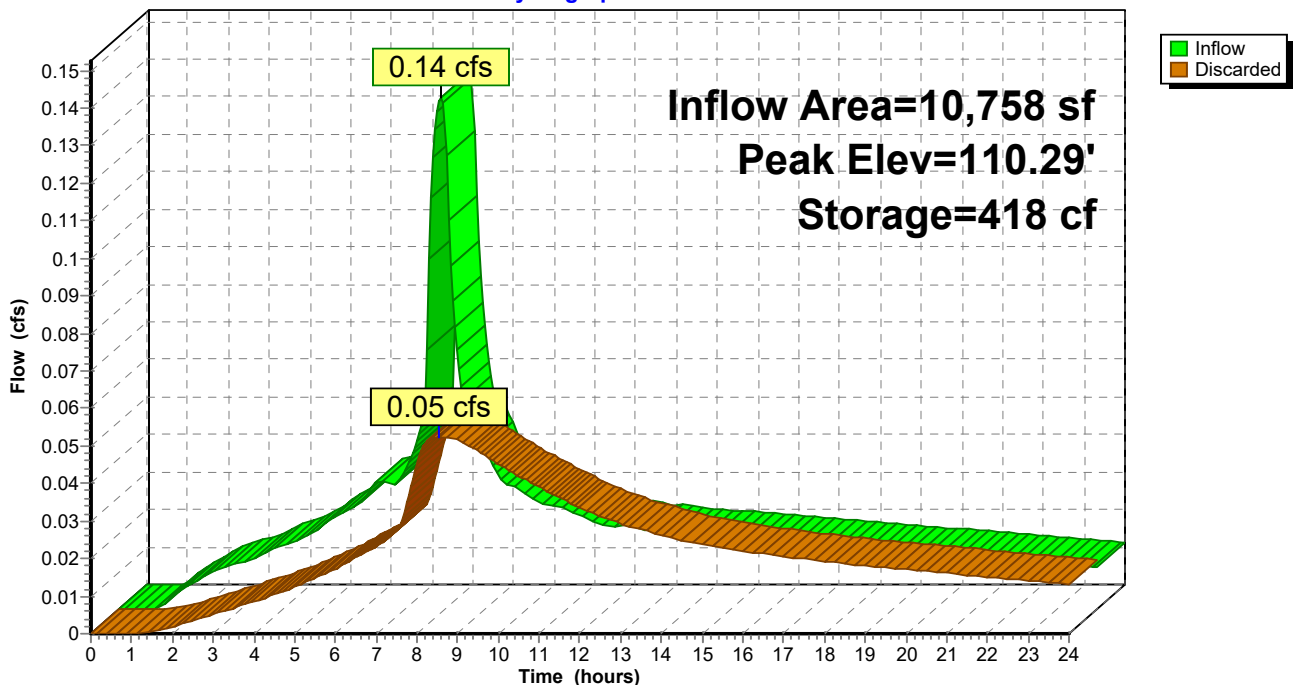
Volume	Invert	Avail.Storage	Storage Description
#1	100.00'	628 cf	4.00'D x 25.00'H Vertical Cone/Cylinder x 2 Inside #2
#2	100.00'	389 cf	7.00'D x 25.00'H Vertical Cone/Cylinder x 2
			1,924 cf Overall - 628 cf Embedded = 1,296 cf x 30.0% Voids
			1,017 cf Total Available Storage

Device	Routing	Invert	Outlet Devices
#1	Discarded	100.00'	5.000 in/hr Exfiltration over Wetted area from 100.00' - 115.00' Excluded Wetted area = 77 sf

Discarded OutFlow Max=0.05 cfs @ 8.52 hrs HW=110.28' (Free Discharge)
 ↳ 1=Exfiltration (Exfiltration Controls 0.05 cfs)

Pond 15P: Drywell

Hydrograph



MCC - HUD stormwater

Type IA 24-hr 5 year storm Rainfall=2.90"

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Time span=0.00-24.00 hrs, dt=0.05 hrs, 481 points

Runoff by SBUH method, Split Pervious/Imperv.

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

Subcatchment 14S: Private Site

Runoff Area=10,758 sf 100.00% Impervious Runoff Depth>2.66"

Tc=5.0 min CN=0/98 Runoff=0.17 cfs 2,388 cf

Pond 15P: Drywell

Peak Elev=112.64' Storage=514 cf Inflow=0.17 cfs 2,388 cf

Outflow=0.06 cfs 2,260 cf

Total Runoff Area = 10,758 sf Runoff Volume = 2,388 cf Average Runoff Depth = 2.66"
0.00% Pervious = 0 sf 100.00% Impervious = 10,758 sf

Summary for Subcatchment 14S: Private Site

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

Runoff = 0.17 cfs @ 7.90 hrs, Volume= 2,388 cf, Depth> 2.66"

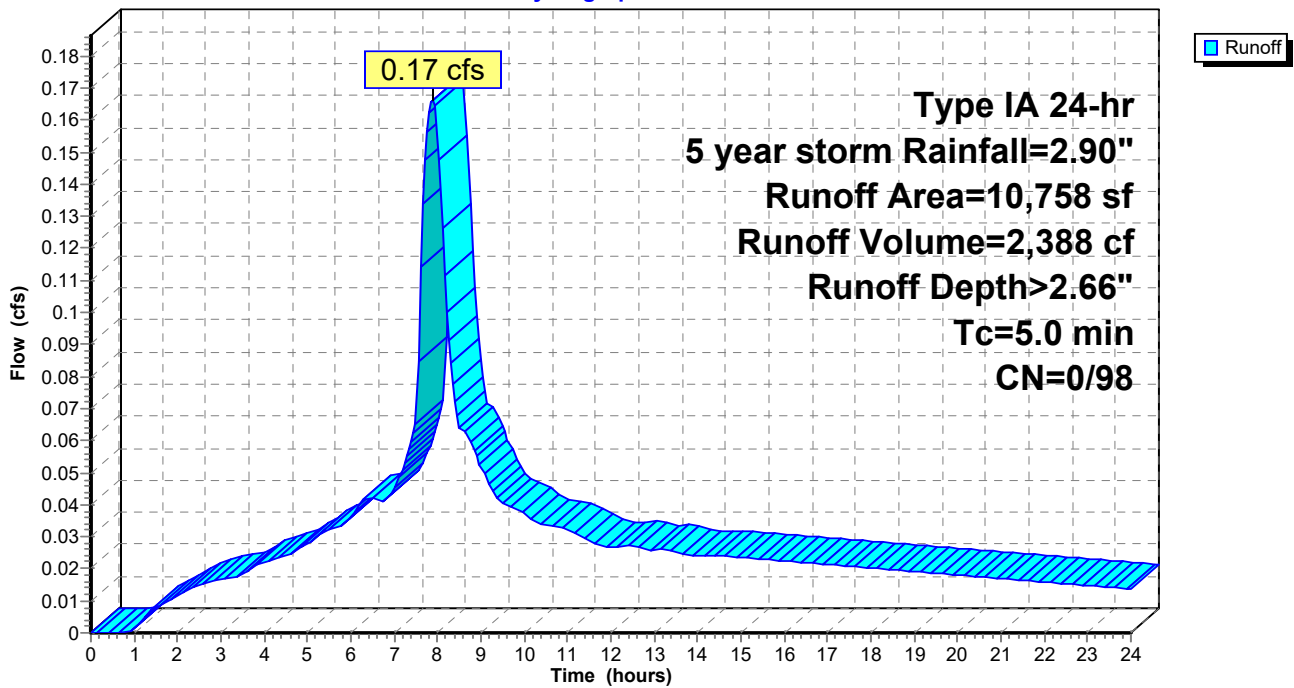
Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
 Type IA 24-hr 5 year storm Rainfall=2.90"

	Area (sf)	CN	Description
*	10,758	98	Private Site
	10,758	98	100.00% Impervious Area

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

Subcatchment 14S: Private Site

Hydrograph



Summary for Pond 15P: Drywell

Inflow Area = 10,758 sf, 100.00% Impervious, Inflow Depth > 2.66" for 5 year storm event
 Inflow = 0.17 cfs @ 7.90 hrs, Volume= 2,388 cf
 Outflow = 0.06 cfs @ 8.50 hrs, Volume= 2,260 cf, Atten= 61%, Lag= 36.4 min
 Discarded = 0.06 cfs @ 8.50 hrs, Volume= 2,260 cf

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
 Peak Elev= 112.64' @ 8.50 hrs Surf.Area= 77 sf Storage= 514 cf

Plug-Flow detention time= 129.0 min calculated for 2,260 cf (95% of inflow)
 Center-of-Mass det. time= 89.2 min (757.1 - 667.9)

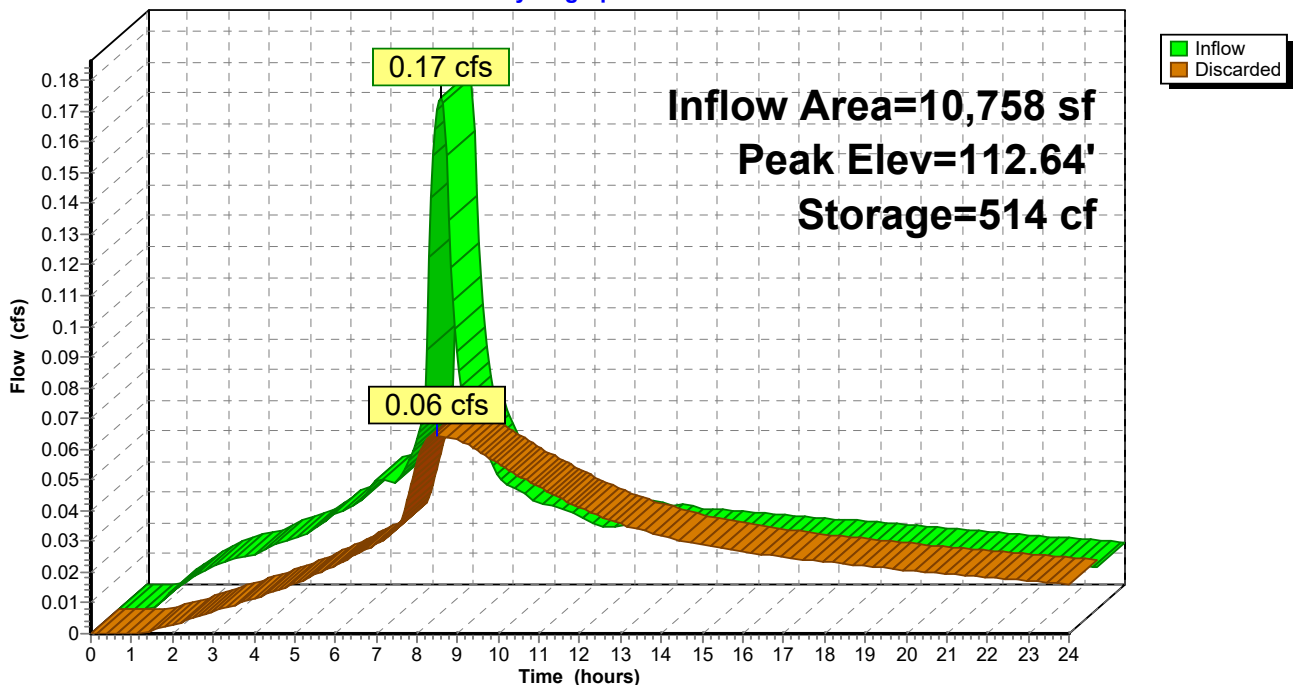
Volume	Invert	Avail.Storage	Storage Description
#1	100.00'	628 cf	4.00'D x 25.00'H Vertical Cone/Cylinder x 2 Inside #2
#2	100.00'	389 cf	7.00'D x 25.00'H Vertical Cone/Cylinder x 2
			1,924 cf Overall - 628 cf Embedded = 1,296 cf x 30.0% Voids
		1,017 cf	Total Available Storage

Device	Routing	Invert	Outlet Devices
#1	Discarded	100.00'	5.000 in/hr Exfiltration over Wetted area from 100.00' - 115.00' Excluded Wetted area = 77 sf

Discarded OutFlow Max=0.06 cfs @ 8.50 hrs HW=112.64' (Free Discharge)
 ↳ 1=Exfiltration (Exfiltration Controls 0.06 cfs)

Pond 15P: Drywell

Hydrograph



MCC - HUD stormwater

Type IA 24-hr 10 year storm Rainfall=3.40"

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Page 5

Time span=0.00-24.00 hrs, dt=0.05 hrs, 481 points

Runoff by SBUH method, Split Pervious/Imperv.

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

Subcatchment 14S: Private Site

Runoff Area=10,758 sf 100.00% Impervious Runoff Depth>3.16"

Tc=5.0 min CN=0/98 Runoff=0.20 cfs 2,834 cf

Pond 15P: Drywell

Peak Elev=114.99' Storage=610 cf Inflow=0.20 cfs 2,834 cf

Outflow=0.08 cfs 2,683 cf

Total Runoff Area = 10,758 sf Runoff Volume = 2,834 cf Average Runoff Depth = 3.16"
0.00% Pervious = 0 sf 100.00% Impervious = 10,758 sf

Summary for Subcatchment 14S: Private Site

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

Runoff = 0.20 cfs @ 7.90 hrs, Volume= 2,834 cf, Depth> 3.16"

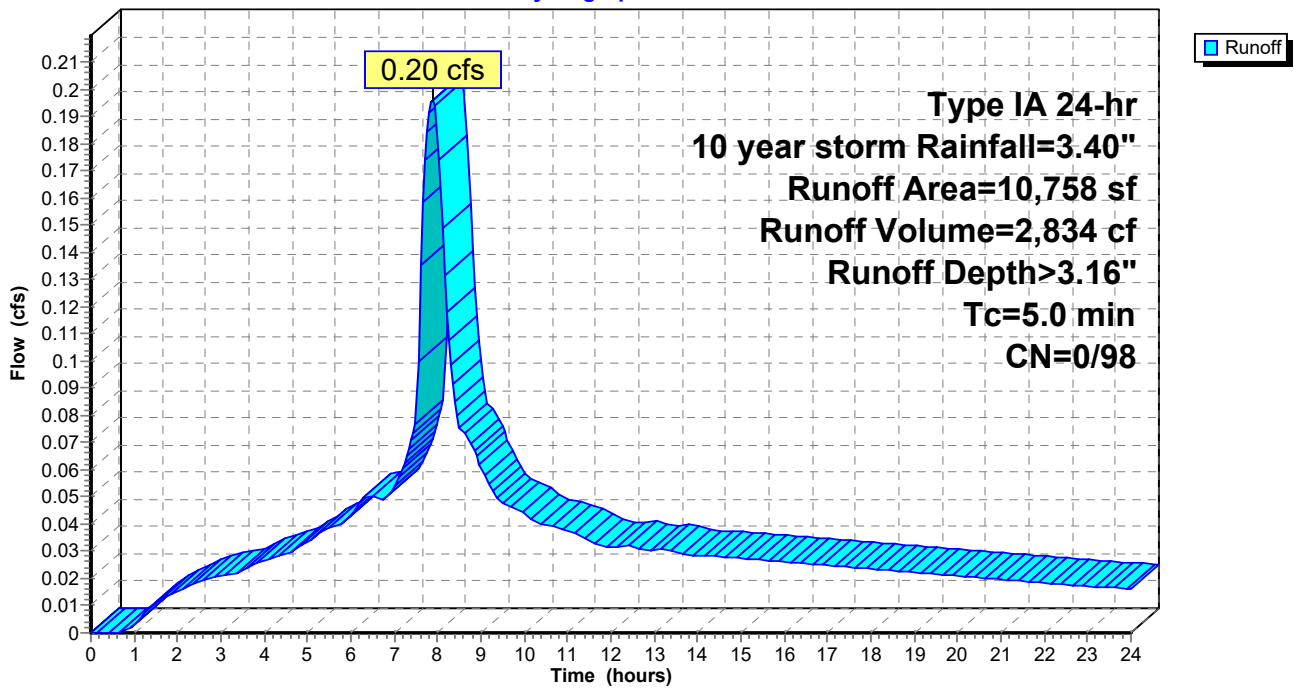
Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
 Type IA 24-hr 10 year storm Rainfall=3.40"

Area (sf)	CN	Description
* 10,758	98	Private Site
10,758	98	100.00% Impervious Area

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

Subcatchment 14S: Private Site

Hydrograph



Summary for Pond 15P: Drywell

Inflow Area = 10,758 sf, 100.00% Impervious, Inflow Depth > 3.16" for 10 year storm event
 Inflow = 0.20 cfs @ 7.90 hrs, Volume= 2,834 cf
 Outflow = 0.08 cfs @ 8.50 hrs, Volume= 2,683 cf, Atten= 61%, Lag= 35.9 min
 Discarded = 0.08 cfs @ 8.50 hrs, Volume= 2,683 cf

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
 Peak Elev= 114.99' @ 8.50 hrs Surf.Area= 77 sf Storage= 610 cf

Plug-Flow detention time= 129.0 min calculated for 2,678 cf (94% of inflow)
 Center-of-Mass det. time= 89.5 min (752.9 - 663.5)

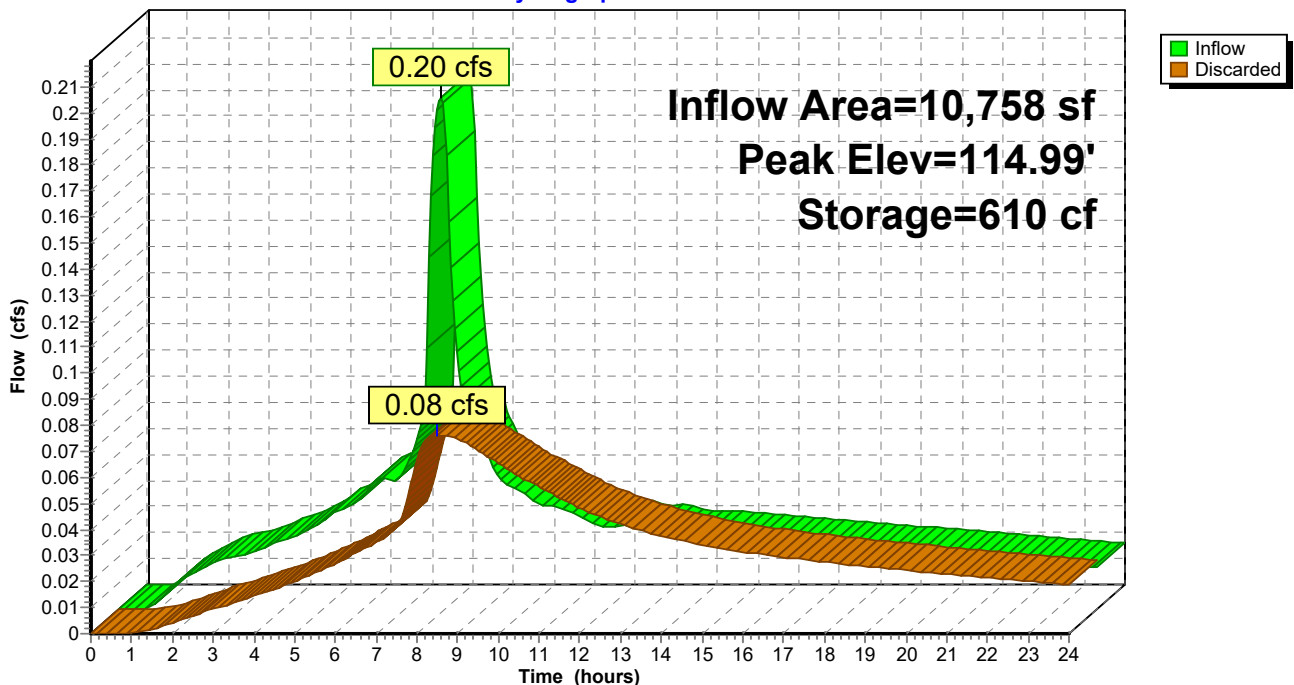
Volume	Invert	Avail.Storage	Storage Description
#1	100.00'	628 cf	4.00'D x 25.00'H Vertical Cone/Cylinder x 2 Inside #2
#2	100.00'	389 cf	7.00'D x 25.00'H Vertical Cone/Cylinder x 2
			1,924 cf Overall - 628 cf Embedded = 1,296 cf x 30.0% Voids
			1,017 cf Total Available Storage

Device	Routing	Invert	Outlet Devices
#1	Discarded	100.00'	5.000 in/hr Exfiltration over Wetted area from 100.00' - 115.00' Excluded Wetted area = 77 sf

Discarded OutFlow Max=0.08 cfs @ 8.50 hrs HW=114.99' (Free Discharge)
 ↳ 1=Exfiltration (Exfiltration Controls 0.08 cfs)

Pond 15P: Drywell

Hydrograph



Appendix C

Operations and Maintenance Plan

Operations and Maintenance Form

Operations and Maintenance Site Plan

Operations and Maintenance Report

Operations and Maintenance Details



CITY OF PORTLAND
Stormwater
Management
Manual

FORM 2

OPERATIONS & MAINTENANCE FORM

PRIVATE STORMWATER MANAGEMENT FACILITIES

This O&M Form supercedes document number _____

(for official county use only)

PROJECT NAME _____

PERMIT INFORMATION

Permit # _____

Permit Submittal Date _____

SITE INFORMATION *(include all parcels)*

R# (6 Digits) _____

Site Address _____

City / State / Zip _____

Preparation Date: _____

OWNER INFORMATION (ALL LEGAL OWNERS)

Name (1) _____

Name (2) _____

Address *(Mailing)* _____

City / State / Zip _____

O&M PREPARER INFORMATION

Name _____

Address *(Mailing)* _____

City / State / Zip _____

Phone *(area code required)* _____

Email _____

Site Legal Description:

Responsible Party for Maintenance *(check one)*

Homeowners Association Property Owner

Property Management Company Tenant

Other (describe) _____
(not Contractor or Consultant)

Contact Information for Responsible Party

Contact Name _____

Contact Organization _____

Phone *(area code required)* _____

Email: _____

Maintenance Practices and Schedule

These operation and maintenance practices are required in accordance with Portland City Code, Chapter 17.38.

The requirements are based on the current version of the *City of Portland Stormwater Management Manual* on the date of permit submittal.

For the **Simplified Approach**, please attach the current O&M Specifications for each facility type from the *Stormwater Management Manual*, Chapter 3.3.1.

For the **Presumptive and Performance Approaches**, please attach the approved, site specific O&M Plan per the *Stormwater Management Manual*, Chapter 3.3.2.

OPERATIONS & MAINTENANCE FORM

PRIVATE STORMWATER MANAGEMENT FACILITIES

SITE PLAN

Provide a site plan sketch in the area provided below, or attach a scaled site plan to this submittal that includes all of the information required as shown in Appendix D6 on page D.6-1, in Operations & Maintenance Form Instructions, Site Plan.

STEP 1 – COMPLETE THE FOLLOWING TABLE

Stormwater Facility Type (Chapter 2)	Stormwater Facility Size (sf)	Drainage is from Roof or Lot?	Impervious Area Treated (sf)	Discharge Point
Totals				

Maintaining the stormwater management facility or facilities listed above shown on the following (or attached) site plan is a required condition of building permit approval for the identified property. Property owners are required to operate and maintain facilities in accordance with the O&M plan on file with the City of Portland. This requirement is binding on all current and future owners of the property. Failure to comply with the O&M plan can trigger an enforcement action, including penalties. The O&M plan may be modified by written consent of current owners and written approval of the Bureau of Environmental Services.

STEP 2 – REQUIRED SITE PLAN

(insert or draw here, or attach separate sheet)

I Have Attached a Site Plan

OPERATIONS & MAINTENANCE FORM

PRIVATE STORMWATER MANAGEMENT FACILITIES

SIGNATURE AND ACKNOWLEDGEMENT

By signing below, the owner accepts and agrees to the terms and conditions contained in this O&M Form and in any document executed by filer and recorded with it. The owner further acknowledges that this documentation has been prepared on their behalf and that they are responsible for the quality and completeness of the O&M Plan. Any failure to comply with the terms of these plans may result in enforcement actions by BES requiring the property owner to restore the stormwater facilities to a functional state as approved under original requirements.

The owner also accepts that the City requires property owners to submit and record, with the County, complete and accurate O&Ms enforceable under City Code 17.38 and that substantial changes to the O&M require City approval prior to County recording. A revised O&M must state that it supersedes a previous O&M (with cited county document number; See Page 1).

THIS PAGE MUST BE SIGNED IN THE PRESENCE OF A NOTARY.

Property Owner or Authorized Representative (1) Signature

Property Owner or Authorized Representative (2) Signature

NOTARY SIGNATURE AND STAMP

INDIVIDUAL Acknowledgement

This acknowledgement is intended for property owned by individuals or trusts.

STATE of OREGON county of: _____

This instrument was acknowledged
before me on: *(date)* _____

By: *(owner 1)* _____

By: *(owner 2)* _____

Notary Signature _____

My Commission Expires _____

Notary Seal:

OR CORPORATE Acknowledgement

This acknowledgement is intended for corporation, government agencies, school districts, or other formal entities

STATE of OREGON county of: _____

This instrument was acknowledged
before me on: *(date)* _____

By: *(representative)* _____

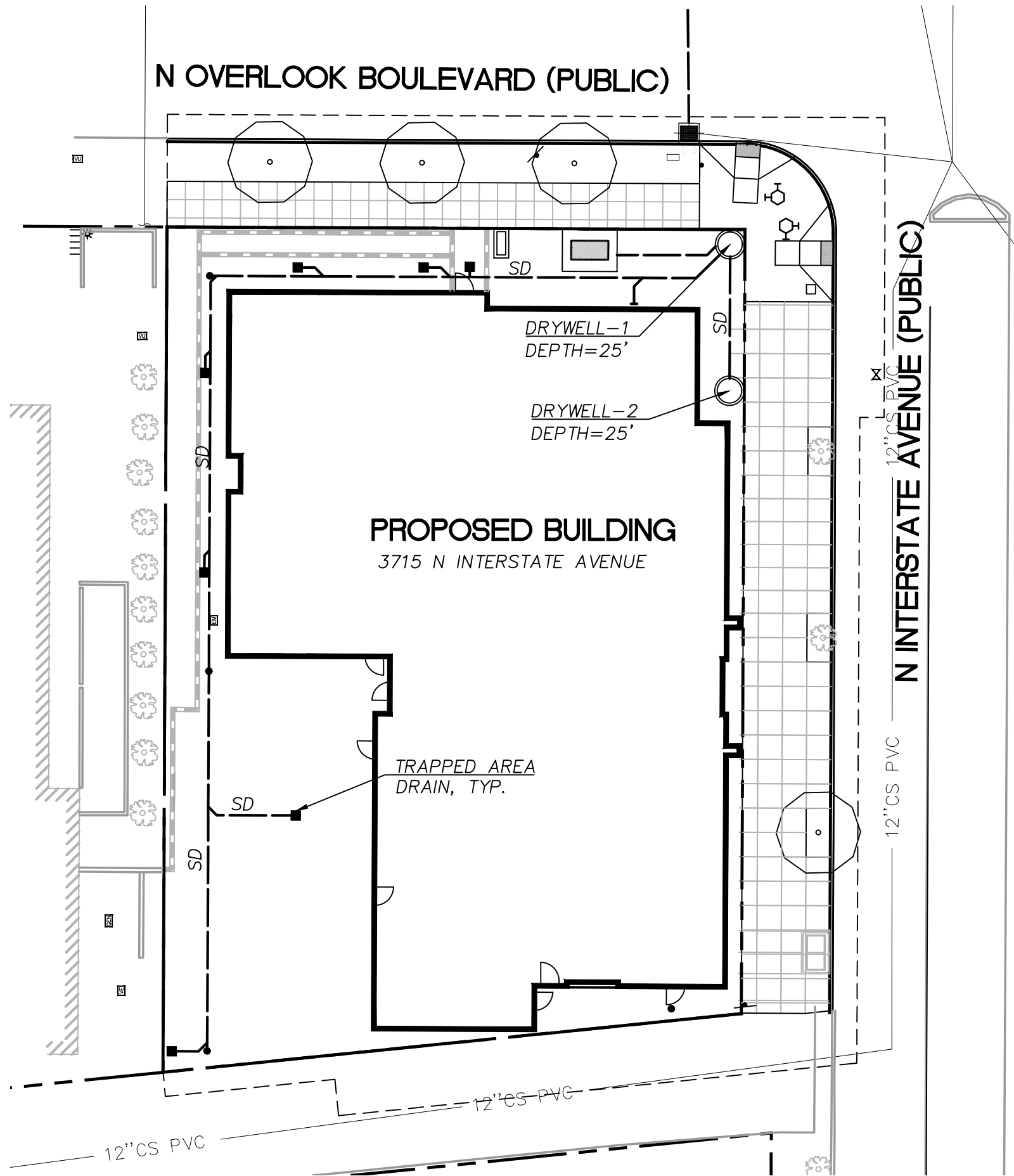
As: *(Title)* _____

Of: *(Corporation)* _____

Notary Signature _____

My Commission Expires _____

Notary Seal:



GRAPHIC SCALE
 0 40 80
 1 inch = 40 ft.

O+M SITE PLAN
 3801 N INTERSTATE AVE

PROJECT NO.:	SAL003
DRAWN BY:	STY
DESIGN BY:	AKS
REVIEWED BY:	AKS
DATE:	03/19/2024

Humber Design Group, Inc.
 Civil Engineering • 503.946.6690 • hdgpd.com

Stormwater Management Facilities

Private Operations & Maintenance Plan

M Carter Commons

Prepared By:



**Humber
Design
Group, Inc.**

110 SE Main St. Suite 200
Portland, OR 97214
(P) 503 946 6690

Date: April 1, 2024

Site O&M Responsible Party

This facility is to be maintained by property owner Northwest Housing Alternatives and Urban League of Portland. Northwest Housing Alternatives and Urban League of Portland contact is Mary Bradshaw, Senior

Onsite Stormwater System Description

The proposed development includes 10,758 SF of new impervious area. Per both BES and NOAA requirements, all runoff generated from the 10-year storm event will be treated and infiltrated on site via a private drywell system. There are (2) 25' deep drywells proposed. The drywells will have perforation depths of 15'. Surface runoff from impervious areas that do not include roof area will be pretreated via trapped catch basins.

Infiltration Testing Results

Infiltration testing was performed by Central Geotechnical on 11/1/2023. Tests were performed at 5' bgs and at 25' bgs. At 5' bgs the infiltration rate was 3.2" per hour and at 25' bgs the rate was tested at 10" per hour. Both rates listed are unfactored. A factor of safety of 2 will be used for design. See geotechnical engineer memo in Appendix D.

Table 1 - Facility Description Table

Facility Name	Type	Facility Size (sf)	Source	Impervious Area Managed (sf)	Discharge Point
Drywell	Drywell	(2) 48" dia x 25' deep	Roof & walkways	10,758	Infiltration

Inspection & Maintenance Schedule

All stormwater facilities must be inspected at least:

First two years: Quarterly

Thereafter: Twice a year

After major rainfall events: Within 48 hours of major rainfall events (more than 1 inch of rain over a 24-hour period)

Inspection & Stormwater Maintenance Prodecures

The following items shall be inspected and maintained as stated.

Overflow Drains, Area Drains, and Piped Storm System	<p>Sediment shall be removed biannually.</p> <p>Debris shall be removed from inlets and outlets quarterly.</p> <p>Quarterly inspection for clogging shall be performed.</p> <p>Grates shall be tamper-proof.</p> <p>Repair/seal cracks. Replace when repair is insufficient.</p>
Drywell and Soakage Trenches	<p>Clean gutters, rain drains, and silt traps twice a year.</p> <p>Repair/seal cracks. Replace when repair is insufficient.</p> <p>Prevent large root systems from damaging subsurface structural components.</p> <p>Remove sediment and debris from all accessible components to prevent ponding.</p> <p>Ponding/lack of infiltration may require decommissioning and replacement. Consult with the City prior to subgrade work.</p>
Vectors	<p>Stormwater facilities shall not harbor mosquito larvae or rats that pose a threat to public health or that undermine the facility structure. Monitor standing water for small wiggling sticks perpendicular to the water's surface. Note holes/burrows in and around facilities. Call Multnomah County Vector Control at 503-988-3464 for immediate assistance to eradicate vectors. Record the time/date, weather, and site conditions when vector activity is observed.</p>
Best Management Practices (BMPs)	<p>BMPs prevent pollutants from mixing with stormwater. Typical nonstructural control measures include raking and removing leaves, street sweeping, vacuum sweeping, and limited and controlled application of pesticides, herbicides, and fertilizers.</p>
Spill Prevention	<p>Spill prevention measures shall be exercised when handling substances that can contaminate stormwater. Virtually all sites, including residential and commercial, present dangers from spills. It is important to exercise caution when handling substances that can contaminate stormwater. Activities that pose the chance of hazardous material spills shall not take place near collection facilities.</p> <ul style="list-style-type: none">• The proper authority and the property owner shall be contacted immediately if a spill is observed.• A spill kit shall be kept near spill-prone operations and refreshed annually.• Employees shall be trained on spill control measures.• Shut-off valves shall be tested quarterly.• Releases of pollutants shall be corrected within 12 hours.
Access	<p>Access shall be maintained for all facilities so O&M can be performed as regularly scheduled.</p>

Inspection & Maintenance Logs

The facility owner shall keep a log to record all inspection and maintenance activities (see Sample Log). Record date, description, and contractor (if applicable) for all inspections and any maintenance or repairs performed. Keep work orders and invoices on file and make available upon request of the city inspector.

- Inspection Log** Record the date and the personnel who conducted the site inspection. Record the infiltration rate if water continues to pond longer than 48 hours after storm event, a description of any and all spills and vector issues, sediment & oil depth, the percentage of vegetation coverage (desirable and undesirable), and the condition of the system components every quarter for the first 2 years of operation and twice a year after a major storm event thereafter.
- Pollution Prevention** All sites shall implement BMPs to prevent hazardous wastes, litter, or excessive oil and sediment from contaminating stormwater. Contact Spill Prevention & Citizen Response at 503-823-7180 for immediate assistance with responding to spills. Record time/date, weather, and site conditions if site activities are found to contaminate stormwater.
- Vectors**
(mosquitoes and rodents) Stormwater facilities shall not harbor mosquito larvae or rats that pose a threat to public health or that undermine the facility structure. Monitor standing water for small wiggling sticks perpendicular to the water's surface. Note holes/burrows in and around facilities. Call Multnomah County Vector Control at 503-988-3464 for immediate assistance with eradicating vectors. Record time/date, weather, and site conditions when vector activity is observed.
- Depth of Sediment & Oil** Take and record measurement at catch basins, conveyance systems, inlets, outlets and within the facility itself. Compare to capacity thresholds defined in the *Stormwater Management Manual* Section 3.2.4, Summary of Thresholds for Maintenance, or the site-specific O&M Plan.
- Percent Vegetation Coverage** Record percent cover of desirable, dead, and invasive vegetation.
- Condition of Structural Components** Record type and size of missing or broken components (i.e. width of cracks and/or extent of settling.)
- Maintenance** Record date, description, and contractor (if applicable) for all structural repairs, landscape maintenance, and facility cleanout activities.

Sample Log Form

Date: _____	Time: _____	Initial: _____
Work performed by: _____		
Work performed: _____		
Details: _____		

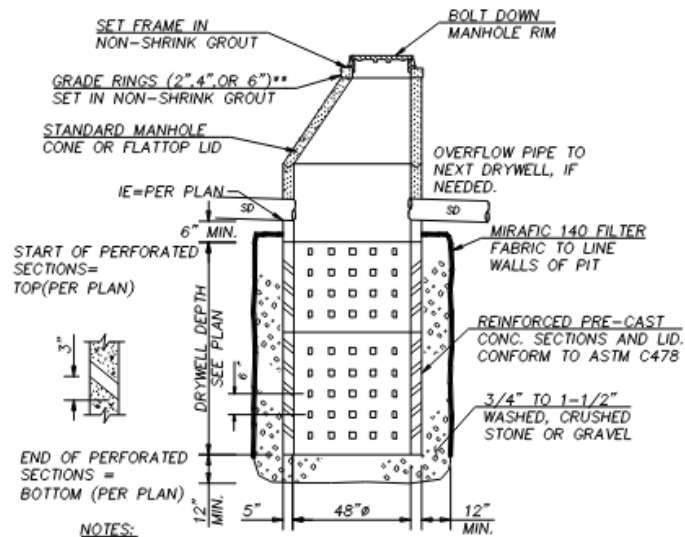
Date: _____	Time: _____	Initial: _____
Work performed by: _____		
Work performed: _____		
Details: _____		

Date: _____	Time: _____	Initial: _____
Work performed by: _____		
Work performed: _____		
Details: _____		

Date: _____	Time: _____	Initial: _____
Work performed by: _____		
Work performed: _____		
Details: _____		

DRYWELL TESTING INFORMATION		
DRYWELL	DESIGN RATE (GPM)	ESTIMATED WATER VOLUME (GALLONS)
DRYWELL 1	18	810
DRYWELL 2	18	810
TOTAL SYSTEM	36	1620

* DESIGN RATE INCLUDES A FACTOR OF SAFETY APPLIED.



NOTES:

1. BES STORMWATER INSPECTION REQUIRED AT TIME OF CONSTRUCTION. SEE GREEN BES INSPECTION CARD TO SCHEDULE. CONTACT AUTOMATED INSPECTION REQUEST (IVR) SYSTEM AT 503-823-7000 AND REQUEST INSPECTION #487 BES ONSITE STORMWATER FACILITY EVAL - OR - YOU MAY ALSO CONTACT BES OFFICE DIRECTLY AT 503-823-2059.

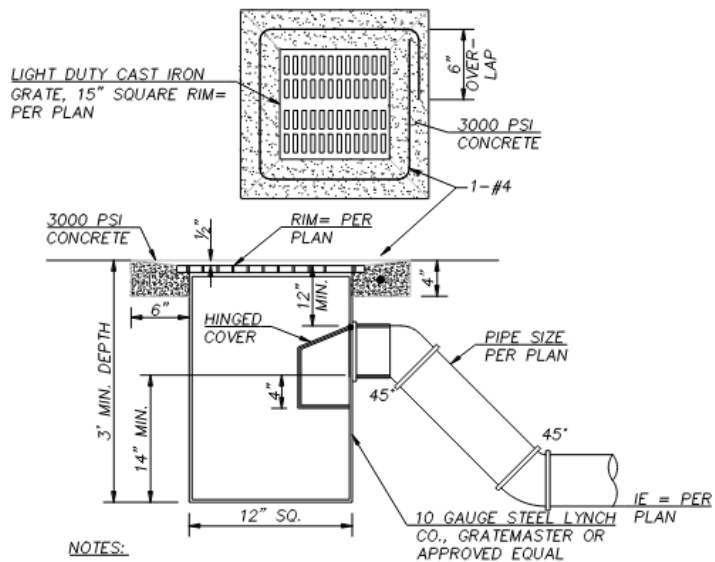
DRYWELL

NTS

DRYWELL TESTING NOTES

1. DRYWELL(S) SHALL HAVE THE CAPACITY TO DISPOSE OF STORMWATER AT THE RATE LISTED BELOW IN TABLE.
2. DRYWELL(S) SHALL BE TESTED AFTER CONSTRUCTION OF THE DRYWELL STRUCTURE (INCLUDING DRAIN ROCK AND PERIMETER BACKFILL) BUT PRIOR TO THE CONSTRUCTION OF THE TOP SLAB AND FINISH BACKFILL.
3. TESTING MUST BE COMPLETED BY A COMPANY CAPABLE OF PERFORMING DRYWELL TEST SUCH AS LISTED BELOW, OR APPROVED OTHER.

NTA CONTRACTING, INC.
COB 80682
CONTACT : JASON ASHE
JASHE@JAI-NTA.COM
(503)793-1037
4. NOTIFY CIVIL AND GEOTECHNICAL ENGINEERS 7 DAYS PRIOR TO TESTING AND PROVIDE WRITTEN PLAN FOR TESTING INCLUDING WATER SOURCE.
6. CONTRACTOR SHALL CONTACT CITY OF PORTLAND WATER BUREAU OR APPLICABLE WATER DISTRICT TO ARRANGE FOR DRYWELL TEST WATER SUPPLY. CONTRACTOR SHALL BEAR RESPONSIBILITY FOR SECURING ALL NECESSARY PERMITS, AUTHORIZATION AND ANY FEES. IF NO WATER SUPPLY AVAILABLE, WATER TRUCK(S) MUST BE USED.
8. CONTRACTOR SHALL ARRANGE FOR THE PROVISION OF ALL DRYWELL TESTING EQUIPMENT, INCLUDING BUT NOT LIMITED TO FLOW METER READING IN GPM, PIPING, AND TRAFFIC CONTROL.
9. CLEAN WATER SHALL BE PROVIDED TO TEST DRYWELLS, AS APPROVED. INTRODUCTION OF SEDIMENT MAY RESULT IN FAILURE OF THE DRYWELL CAPACITY TEST.
10. FILL DRYWELL ABOVE PERFORATED SECTIONS, SHUT OFF WATER, AND RECORD HEIGHT OF WATER EVERY 5 MINUTES DURING DRAWDOWN. IF DRYWELL WILL NOT FILL UP, MAINTAIN A CONSTANT FLOW RATE EQUAL TO THE DESIGN RATE FOR A MINIMUM OF 45 MIN. IF REDUCTION OF DRYWELLS IS DESIRED, CONTACT ENGINEER FOR PROCEDURE.
11. SHOULD DRYWELL(S) FAIL TO TEST AT THE MINIMUM DESIGN RATE, ADDITIONAL DRYWELLS MAY BE CONSTRUCTED, AS APPROVED, IN ORDER TO ACHIEVE THE REQUIRED MINIMUM DISPOSAL RATE. ALTERNATIVE DRYWELL LOCATIONS AND/OR ADDITIONAL DRYWELLS IN PIPED SERIES MUST BE PRE-APPROVED AND IDENTIFIED ON THE CONSTRUCTION DRAWINGS.

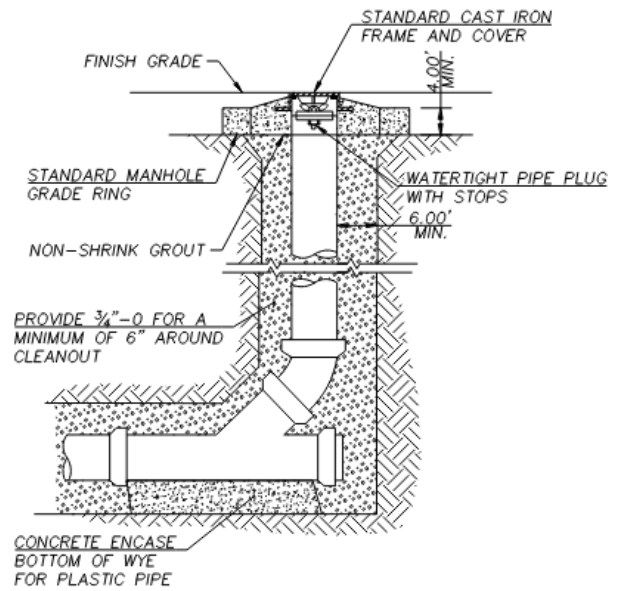


NOTES:

1. ALL STEEL WELDED CONSTRUCTION. COATED
2. INSIDE AND OUT WITH ASPHALTUM PAINT. TRAP
3. TO INCLUDE CLEANOUT.
4. AREA DRAIN GRATE TO MEET ALL ADA REQUIREMENTS

TRAPPED AREA DRAIN

NTS



NOTE:

1. CONCRETE ENCASE ENTIRE WYE SECTION AND 45° BEND FOR CONCRETE PIPE.

CLEAN OUT

NTS

Appendix D

Additional Forms & Associated Reports

Preliminary Infiltration Memo by Central
Geotechnical Services
BES Correspondence

November 1, 2023

PRELIMINARY INFILTRATION OBSERVATIONS AND CONCLUSIONS

**TO: Mary Bradshaw, Northwest Housing Alternatives
Allen Schmitz, Humber Design Group**

**RE: M. Carter Commons – Senior Housing Development
CGS Project No. NWA-1-01
3715 North Interstate Avenue
Portland, Oregon 97227**

Ms. Bradshaw:

We have completed the fieldwork portion of our geotechnical investigation for the M. Carter Commons Senior Housing Development project located at 3715 North Interstate Avenue in Portland, Oregon. At your request, we are providing the following memo with our preliminary infiltration test results.

It should be understood by the design team that the parameters provided in this memo are intended for preliminary design purposes only and they may be revised or adjusted based on laboratory test results, and engineering analysis. Our full geotechnical report will present the appropriate design parameters for the site.

Our field explorations included six (6) drilled borings to a depth of 25 to 46.5 feet and one (1) hand auger to a depth of 5 feet below the ground surface (bgs) performed in October of 2023. Infiltration testing was conducted in one drilled boring (B-4/INF-1) at a depth of 25 feet bgs and in one hand auger (INF-2) at a depth of 5 feet bgs on October 18 and 19, 2023. A site vicinity plan is attached as Figure 1 and the approximate exploration locations are shown on Figure 2.

1. In general, the subsurface conditions at the site generally consist of 2.5 to 20 feet of undocumented fill consisting primarily of silt and sand with traces of wood, plastic, metal and concrete fragments. The deeper fill was encountered in boring B-1, B-2 and B-3 located in the southern portion of the site. The fill is underlain by native sand with silt and gravel extending to the maximum depth explored of 46.5 feet bgs.
2. Groundwater was not observed in our hollow-stem auger explorations (B-4 and B-6) drilled to a maximum depth of 46.5 feet bgs on October 19, 2023.
3. We conducted two infiltration tests in general accordance with Section 2.3.2 Infiltration Testing of the 2020 City of Portland Stormwater Management Manual using the encased falling head test methodology at the approximate locations shown in Figure 2. Our general procedure included augering an approximately 7- to 10-inch diameter hole to insert a 6-inch diameter PVC pipe or 6.25-inch inner diameter hollow-stem-auger for the encased falling head procedure at approximate depths of 5.0 and 25.0 feet bgs.

The encased PVC pipe or auger was filled with clean water to approximately 12-inches above the soil at the bottom of the drilled hole. The initial fill of water did not drain into the soil within 10 minutes, so the water level was maintained, and the soil allowed to saturate for a minimum of 3 to 4 hours at the test locations. The levels were checked, and the PVC pipes were refilled to 12 inches above the soil in the bottom of the PVC pipe at the end of each hour. The drop-in water level was measured over a 1- to 3-hour period at each location. Field test results are summarized in the table below.

Table 1 – Preliminary Infiltration Results

Infiltration Test No.	Location	Depth (feet)	USCS Material Type	Field Measured Infiltration Drawdown Rate ¹ (in/hr)
INF-1	See Site Plan	25.0	SP-SM	10.0
INF-2	See Site Plan	5.0	SP-SM	3.2

Notes:

¹ Appropriate factors should be applied to the field-measured infiltration rate, based on the design methodology and specific system used.

USCS = Unified Soil Classification System

in/hr = inches per hour

The rates shown in Table 1 represent a field-measured infiltration drawdown rate. Field-measured rates represent a relatively short-term infiltration rate, and factors of safety have not been applied for the type of infiltration system being considered, or for variability that may be present across large areas in the on-site soil. In our opinion, and consistent with the state of practice, factors of safety and correction factors should be applied to this measured rate to reflect the localized area of testing relative to the field sizes.

Infiltration rates vary with location and tend to decrease over time due to siltation clogging, biological fouling; hence, an appropriate factor of safety (typically 2 or greater) should be applied to the recommended rate by the system designer to protect against siltation, fouling and soil variations. Incorporation of silt traps and pre-filter elements will extend the service life of the system. All systems should include overflow outlets that discharge potential overflow to a suitable dispersal area.

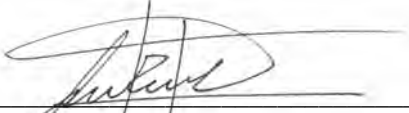


10240 SW Nimbus Avenue, Suite L6
Portland, Oregon 97223
503.616.9419
www.centralgeotech.com

Please feel free to call our office with questions regarding this memo.

Respectfully,

Central Geotechnical Services, LLC



Jose R. Serrano, P.E.
Project Engineer

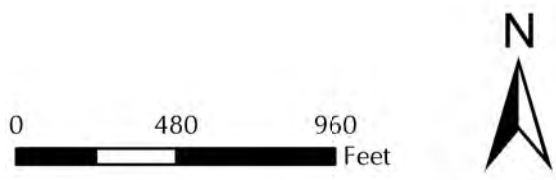
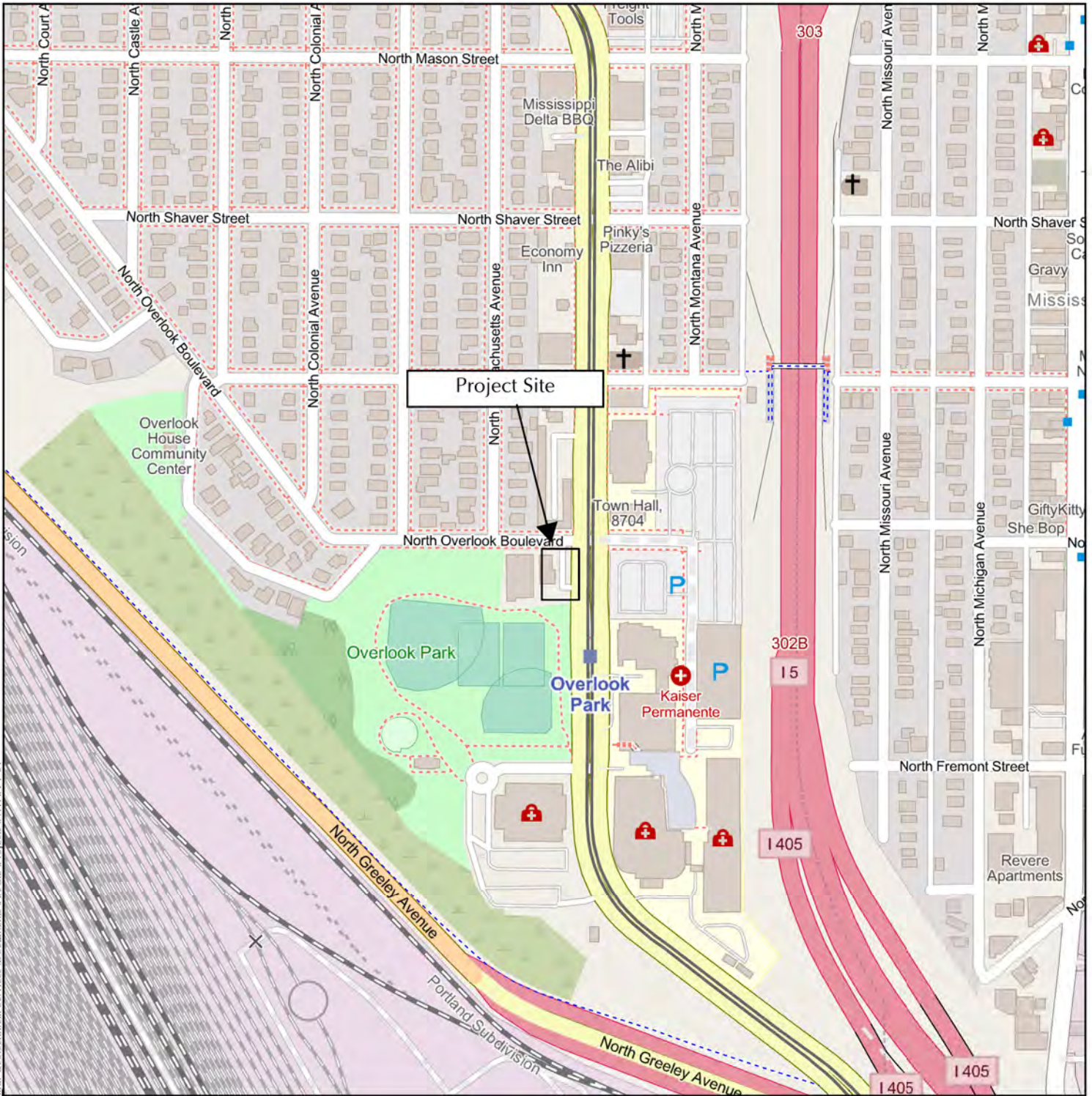


Kyle Warren
Project Manager

Attachments:

Figure 1 – Site Vicinity Map

Figure 2 – Site Plan Showing Exploration and Test Locations




NWA-1-01 M. Carter Senior Housing	
Project Vicinity	
	Figure-1

Map data © OpenStreetMap contributors, Microsoft, Facebook, Inc. and its affiliates, Esri Community Maps contributors, Map layer by Esri


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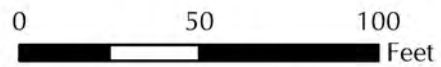
Legend

 Site Boundary

Exploration Designation and Approximate Location

 Boring

 Infiltration



Sources: Google

NWHA-1-01 M. Carter Senior Housing

Site Plan



Figure-2

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RE: Stormwater Management for N Interstate Ave ROW: 23-016363-EA



Krauter, Rodney <Rodney.Krauter@portlandoregon.gov>

To: Allen Schmitz; Cermak, Abigail

Cc: Nick Geiger

Reply

Reply All

Forward



Mon 11/13/2023 12:57 PM

3717 n interstate combined sewer route.pdf
1 MB

Hi Allen,

I can confirm that the stormwater runoff from this site will get routed to the swan island pump station, then pumped to the Columbia Blvd. wastewater treatment plant.

Thanks,
Rod

From: Allen Schmitz <allen.schmitz@hdgpd.com>

Sent: Monday, November 13, 2023 9:20 AM

To: Cermak, Abigail <Abigail.Cermak@portlandoregon.gov>

Cc: Krauter, Rodney <Rodney.Krauter@portlandoregon.gov>; Nick Geiger <nick.geiger@hdgpd.com>

Subject: RE: Stormwater Management for N Interstate Ave ROW: 23-016363-EA

Abigail,

In order to help verify that we are meeting HUD requirements, would it be possible for you to confirm that stormwater runoff from this specific site would be routed though the east side big pipe and then out to the Columbia water treatment facility?

Thanks,

Allen Schmitz P.E. LEED AP

Associate

D: 503.488.5711

Humber Design Group, Inc.

Urban Civil Engineering

110 SE Main Street, Suite 200, Portland, OR 97214

www.hdgpd.com

100 Best Companies in Oregon 2019 and 2020

100 Best Green Workplaces in Oregon 2019

City of Portland Sustainability at Work Silver Certified

From: Cermak, Abigail <Abigail.Cermak@portlandoregon.gov>
Sent: Wednesday, November 08, 2023 1:21 PM
To: Allen Schmitz <allen.schmitz@hdgpd.com>
Cc: Krauter, Rodney <Rodney.Krauter@portlandoregon.gov>
Subject: Stormwater Management for N Interstate Ave ROW: 23-016363-EA

Hi Allen,

Just wanted to let you know that Rod Krauter (the BES engineer who will most likely be reviewing the Public Works Permit plans for this project) and I discussed the stormwater management approach for N Interstate Ave. It was determined that BES would not be interested in having 4-ft wide public stormwater facilities here. As the sewer system in the area is a combined system, stormwater from the right-of-way is treated downstream at our Wastewater Treatment Plant. Here, we would be looking for detention only, not water quality. These smaller stormwater facilities are not very efficient and BES would prefer the applicant to pay the Offsite Stormwater Management Fee in lieu of building facilities. The fee will go toward building facilities elsewhere in the City where water quality is needed.

Please let me or Rod know if you have any questions about the above information.

Thank you,

Abigail Cermak
City Planner – Water Resources
BES Development Planning
(she/her)

Regular Work Hours: Monday -Thursday 8am to 6:30pm

The best way to reach me is via email and MS Teams. I also check my voicemail regularly and will get back to you as soon as possible.



City of Portland Bureau of Environmental Services
1900 SW 4th Avenue, Suite 5000, Portland, Oregon 97201
Phone: 503-823-7577 | Email: Abigail.Cermak@portlandoregon.gov
www.portlandoregon.gov/bes
[News](#) | [Twitter](#) | [Facebook](#)

This is the Default Map Title

SWAN ISLAND PUMP STATION,
to TREATMENT PLANT

3717 N INTERSTATE

- ### Legend
- Current Geocoded Address
 - Geocoded Address
 - Drainage Districts
 - FOG Facilities - Food Carts
 - Private MIP Stormwater Facilities
 - Streams
 - Open Channel
 - Ditch
 - Water Body
 - Stormwater Pipe
 - Stormwater Culvert
 - Combined
 - Stormwater/Sewer Pipe
 - BES - Non-Conforming Sewers Layers
 - NCS Proposed Points
 - NCS Proposed Lines
 - Main
 - Lateral
 - NCS Projects
 - AMANDA PS Folders
 - Closed -PS
 - Developing Alternatives-

The map is created from a subset of data from the City of Portland GIS database. The City makes no claims, no representations, and no warranties, express or implied, concerning the validity (express or implied), the reliability or the accuracy of the GIS data and GIS data products furnished by the City, including the implied validity of any uses of such data.

