Economic Development Division
City of Bend
mupte@bendoregon.gov
710 NW Wall Street, Bend OR 97703

This submittal form is to be completed as part of your Multiple Unit Property Tax Exemption (MUPTE) application with the City of Bend. *Download this form before completing fillable fields*, then upload with your application through the Online Permit Center at www.bendoregon.gov/permitcenter.

MUPTE PUBLIC BENEFITS CHECKLIST

Use the following checklist to identify which public benefits you plan to utilize to meet the public benefit requirements of the MUPTE program as defined in Bend Code 12.35.025 and further explained in the MUPTE Program Guidelines. **Projects must provide a minimum of three public benefits including at least one priority public benefit.**

Priority Public Benefits (must select at least one)

- ☐ 10% of units deed-restricted as Affordable Housing
- ■ 30% of units deed-restricted as Middle Income Housing
- ☐ Childcare Facilities
- ☐ Open Space and Publicly Accessible Park or Plaza Space
  - ☐ Please confirm that you have a letter from Bend Park and Recreation District included in your application.
- ☐ High Standard of Energy Efficiency/Green Building Features (if yes, please select which pathway)
  - ☐ Energy Trust New Buildings Path to Net Zero
  - ☐ LEED Platinum
  - ☐ Earth Advantage Platinum or higher

Additional Public Benefits

☐ Energy Efficiency/Green Building Features (if yes, select which pathway)
- ☐ Energy Trust of Oregon New Building Whole Building
- ☐ Energy Trust Multifamily Market Solutions Best
- ☐ Earth Advantage Silver or higher
- ☐ LEED Silver or higher
- ☐ Solar installation that will supply some of the building's energy using solar

☐ Transit Supportive Amenities
- ☐ Please confirm you have a letter from Cascade East Transit to include in your application.

☐ Mobility Supportive Amenities

☐ Ground floor commercial (more than 35% of the ground floor as commercial uses)

☑ Stormwater
- ☐ Confirm that you have submitted stormwater credit program application form as part of your application

☐ Environmental Remediation
- ☐ Confirm that you have submitted documentation of recent site clean up efforts and current DEQ status of site.

☐ Public Facilities
Please provide a short description of proposed public facility:

☐ Enhanced Landscaping
- ☐ Please confirm that you have submitted landscape plan as part of site plan
- ☐ Please confirm that you have submitted a proposed water budget as part of your application

☑ Electric Vehicle (EV) charging

☐ Wrapped Parking Structure

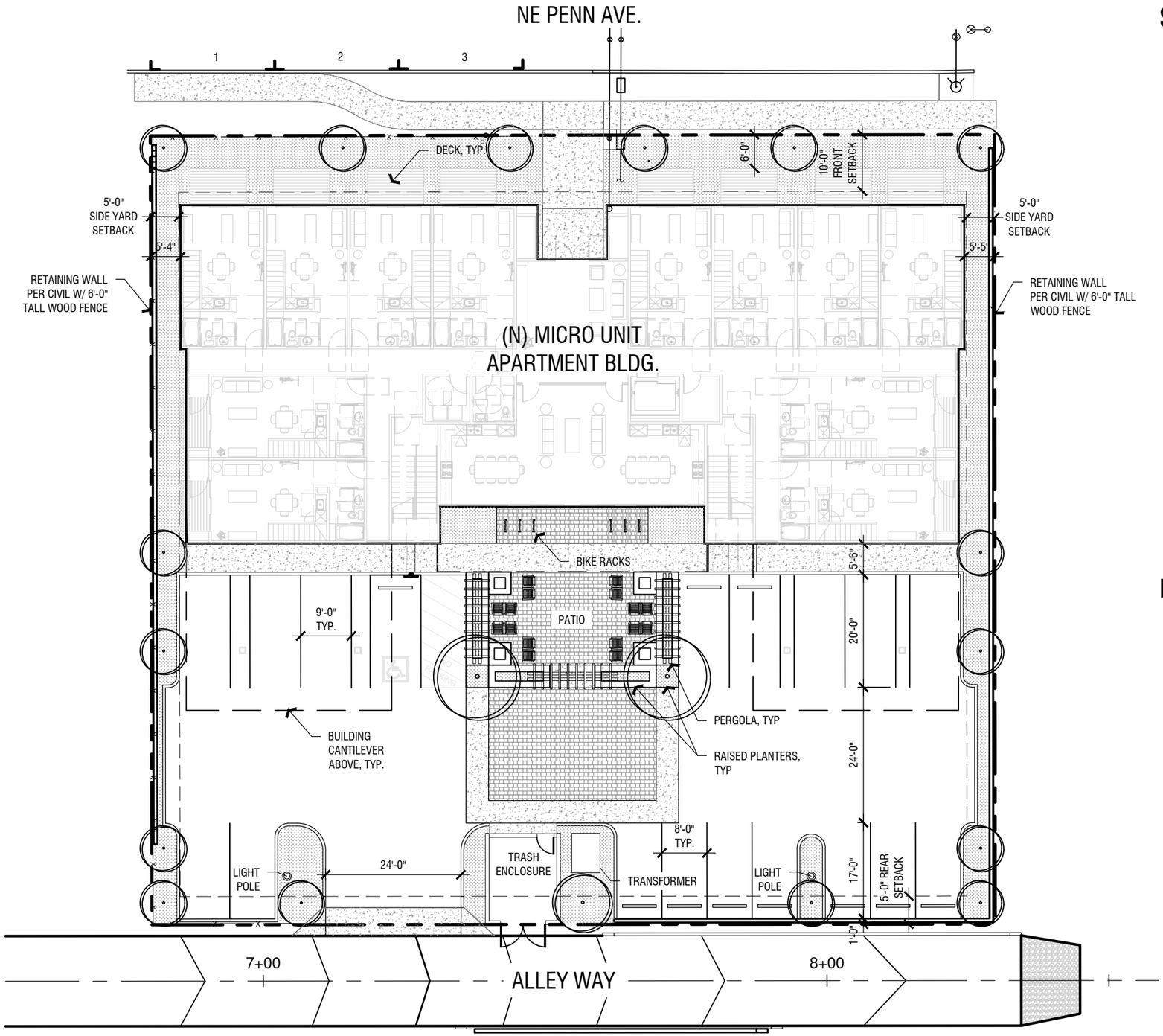
☐ Other Public Benefit (must be authorized by City Council)
If using this, please provide a description of the proposed public benefit:

Accommodation Information for People with Disabilities
To obtain this information in an alternate format such as Braille, large print, electronic formats, etc. please contact Development services at development@bendoregon.gov, 541-388-5580; Relay Users Dial 7-1-1.

PROJECT DESCRIPTION:

The project site is located at 445 NE Penn Ave. and is an approved high density residential zoned lot. The project proposes (1) 3 story, 43,485 sf building of (40) micro housing units. Thirty percent (12 units) will be designated middle income housing and rented at 30 percent of 120 percent AMI. We are planning the project provides (3) community rooms and a gym of approximately 260 sf and a rooftop deck of approximately 4,349 sf. (18) parking spaces will be provided on site and will serve the tenant and common area uses of the project. There are (5) covered parking spaces, prioritizing ADU and 6 EV parking spaces.

Existing use displacement – the property is currently raw land with no buildings, so there is no residential displacement.



SITE PLAN LEGEND

CONCRETE

LANDSCAPING AREA

PAVERS

PARKING CALCULATIONS

PARKING REQUIRED

USE	UNIT COUNT (OR SF)	PARKING FACTOR	PARKING SPACES
RESIDENTIAL	MICRO UNIT	40	0.5	20
(PER 3.3.300 (B))	REDUCTION FROM ON-STREET PKG.			3
	REQ. TOTAL			17
	PROVIDED TOTAL			**18**

ADA STND SPACES	*REQUIRED*	1	*PROVIDED*	1
ADA VAN SPACES	*REQUIRED*	1	*PROVIDED*	1
COMPACT SPACES (PER 3.8.200.I.4)	*ALLOWED*	50% (9 SPACES)	*PROVIDED*	9 SPACES
BIKE PARKING	*REQUIRED*	40 SPACES (1/UNIT)	*PROVIDED*	1/UNIT + 12 COMMON **52 SPACES TOTAL**

FIRST FLOOR PLAN

N

0 10 20 40

SCALE: 1" = 20'-0" @ 11X17

TENOVER

539 Marsh Street
San Luis Obispo, CA

805.541.1010
info@tenoverstudio.com

PENN AVE. MICRO UNIT APARTMENTS

BEND, OR
DATE: 04/28/21

CITY OF BEND

January 18, 2023

LOCATION
710 NW Wall Street
Downtown Bend

MAILING ADDRESS
PO Box 431
Bend, OR 97709

PHONE
(541) 388-5505
Relay Users Dial 7-1-1

FAX
(541) 385-6676

WEB
bendoregon.gov

Allison Platt
Business Advocate
Economic Development Department
710 NW Wall St.
Bend, OR 97702

Allison,

A letter from the City of Bend Private Development Engineering Department has been requested from the Hiatus Development Team to complete an application for a Multiple Unit Property Tax Exemption, MUPTE, application. The requirement for MUPTE is to provide information that the proposed development can be served by water and sewer services, Bend Code 12.35.020(f).

The Hiatus development group proposed to construct 40 micro-units of housing on tax lot 171233BB00200. A land use decision was issued under PLSPR20210456 with conditions to upsize the existing 2-inch water main located within NE Penn Street to an 8-inch water main and improve the alley to provide access to the development.

The infrastructure improvements are permitted under permit number PRINF202108539. These improvements will mitigate the under sized water main and increase access providing the necessary infrastructure to serve the development.

Sincerely,

Jill Clough
Engineering Associate
Private Development Engineering
jclough@bendoregon.gov

Accommodation Information for People with Disabilities
To obtain this information in an alternate format such as Braille, large print, electronic formats, etc. please contact Jill Clough at **jclough@bendoregon.gov** or [telephone # (541)388-5539; Relay Users Dial 7-1-1.

CITY OF BEND

February 13, 2023

LOCATION
710 NW Wall Street
Downtown Bend

MAILING ADDRESS
PO Box 431
Bend, OR 97709

PHONE
(541) 388-5505
Relay Users Dial 7-1-1

FAX
(541) 385-6676

WEB
bendoregon.gov

Jesse Russell
Hiatus Homes
Address

Jesse,

This letter is intended to satisfy your application requirements for the City of Bend's Multiple Unit Property Tax Exemption (MUPTE) Program in order to qualify for the Middle-Income Public Benefit. This letter does not certify that you have provided a proof of a deed restriction nor certify that you have met the income qualification that will be needed in order to verify the exemption, if approved.

The City of Bend Housing Department has met with you and your team and understands that you plan to construct 40 micro-units at 455 NE Penn Avenue. We also understand that you plan to deed restrict 12 units that would be as Middle-Income units that would be available to community members making 120% Area Median Income or less if approved for the MUPTE program. Deed restricting 12 units satisfied the 30% or more of unit requirement to qualify for the MUPTE Program.

We have verified that your project proforma, as submitted with your MUPTE application, includes rental rates that are consistent with current estimates of eligible levels for people making 120% Area Median Income in Deschutes County. Based on the information that we have today, we believe your project will satisfy the requirements of the MUPTE Program Middle Income Priority Public Benefit requirement.

Sincerely,

Lynne McConnell

Lynne McConnell
Housing Director, City of Bend

Accommodation Information for People with Disabilities
To obtain this information in an alternate format such as Braille, large print, electronic formats, etc. please contact Allison Platt at **aplatt@bendoregon.gov** or 541-322-6394; Relay Users Dial 7-1-1.

CITY OF BEND

March 6, 2023

LOCATION
710 NW Wall Street
Downtown Bend

MAILING ADDRESS
PO Box 431
Bend, OR 97709

PHONE
(541) 388-5505
Relay Users Dial 7-1-1

FAX
(541) 385-6676

WEB
bendoregon.gov

Ryan Andrews
Managing Partner, CFO
Hiatus Homes

Penn Avenue Micro Apartment Project – 445 NE Penn Avenue, Bend Dear Mr.

Dear Mr. Andrews:

We received your Storm Water Utility Service Charge Credit Application on 1/31/2023. After reviewing your credit application, we have determined it to be consistent with the requirements of the Stormwater Credit Program (to manage the 100-year storm event onsite), which satisfies the conditions of the MUPTE Program.

Should you have questions about MUPTE program please contact Allison Platt at (541) 322-6394.

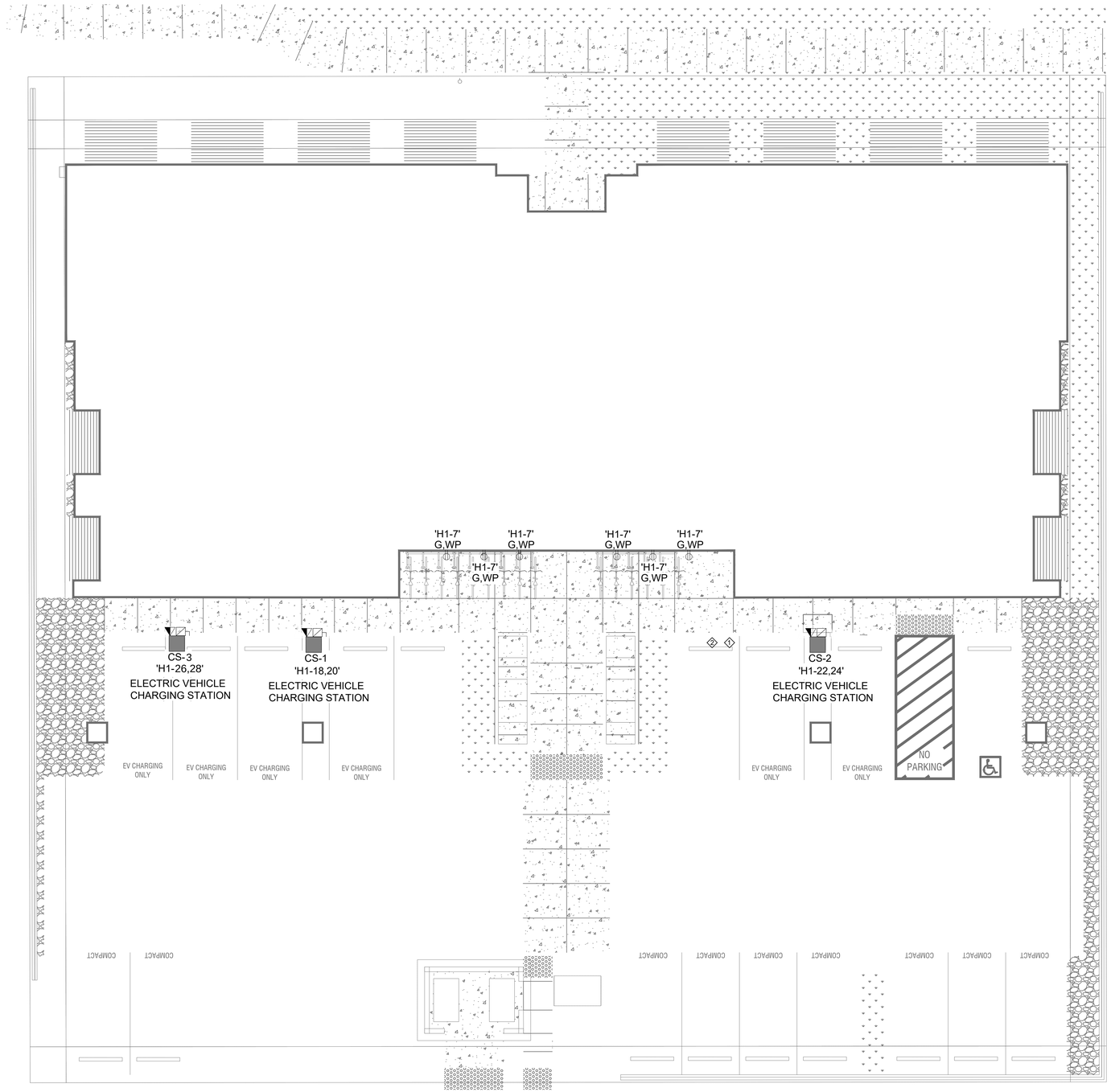
Sincerely,

David Buchanan,

Stormwater Program Analyst

City of Bend Utility Department

Accommodation Information for People with Disabilities
To obtain this information in an alternate format such as Braille, large print, electronic formats, etc. please contact David Buchanan at dbuchanana@bendoregon.gov or (541) 693-2176; Relay Users Dial 7-1-1.



GENERAL ELECTRICAL NOTES

1	ALL WIRING TO COMPLY WITH 2020 NEC
2	CIRCUIT LABELS DENOTED WITH ('PNL-CKT'). IE '2A-1'.
3	THE TOP OF ALL RECEPTACLE OUTLET BOXES AT 18" AFF U.N.O.
4	EC TO PERFORM A BOX WALK WITH OWNER PRIOR TO INSTALLING CONDUIT AND WIRING OF ALL OUTLETS AND JUNCTION BOXES.

ELECTRICAL KEY NOTES

1	INCOMING POWER COMPANY CONDUITS. REFERENCE CIVIL DRAWINGS. COORDINATE WITH LOCAL POWER COMPANY AND SITE WORK CONTRACTOR.
2	INCOMING TELCO COMPANY CONDUITS. REFERENCE CIVIL DRAWINGS. COORDINATE WITH LOCAL POWER COMPANY AND SITE WORK CONTRACTOR.

1 SITE - POWER PLAN

SCALE: 1/8" = 1'-0"

N

REGISTERED PROFESSIONAL ENGINEER
18638PE
OREGON
July 10, 1998
ROGER SHANE WHITAKER
EXPIRES: 06/30/24

Solera
Engineering Consulting
320 SW Century Drive,
Suite 405-151
Bend, Oregon 97702
(541) 640-9146
RSWHITAKER@GMAIL.COM

BID SET 221219

PENN AVE. MICRO UNIT APARTMENTS

445 NE PENN AVE. BEND, OR 97701

DRAWN BY: RSW

DATE	SUBMITTAL
04/13/2022	PERMIT SUBMITTAL 1
05/27/2022	60% CD SET
07/15/2022	PERMIT SET
12/09/22	CITY COMMENTS
12/20/22	100% CD SET

POWER PLAN

E2.5

CITY OF BEND
COMMUNITY AND
ECONOMIC DEVELOPMENT

Application #: PRTX202300065

City of Bend
710 NW Wall Street
Bend, OR 97701

February 13, 2023
Jesse Russell
740 NE 3rd St 3-314
Bend, OR 97703

Dear Mr. Russell,

Thank you for your application to the City of Bend's Multiple Unit Property Tax Exemption (MUPTE) Program for 40-unit project located at 445 NE Penn Avenue. We are contacting you to inform you that the City of Bend has deemed your MUPTE application Complete.

Your application will be reviewed and a decision on your application will be made by Friday August 11, 2023 however our intent is to complete your review sooner. We understand that you plan to utilize the following public benefits to qualify for the program: Middle Income Housing, EV charging, Stormwater. In an initial review of your application staff noted that the current documentation submitted is insufficient to qualify for the stormwater public benefit. To receive a staff recommendation for approval, please submit documentation from the engineer certifying the onsite drywells are designed and will be tested for the 100-year storm event.

You should hear from Allison Platt, aplatt@bendoregon.gov, regarding the following over the next several months:

- A summary of your independent financial reviews
- Schedule the review(s) of your application with City Council and relevant taxing district agency staff or boards
- Public comments received on your application
- Staff review and recommendation regarding your application

Best,

Allison Platt

Allison Platt, City of Bend

KNOW LEDGE
ENGINEERING | CONSULTING

TECHNICAL MEMORANDUM

DATE: March 3, 2023

TO: David Buchanan, City of Bend Utility Department

FROM: Adam Erlandson, PE

RE: Penn Avenue Micro Apartment Project – 445 NE Penn Avenue, Bend OR

This memorandum is intended to supplement the previously submitted Penn Avenue Micro Apartment Stormwater Design Report and Private Site Improvement Plans to demonstrate that the stormwater system has been designed to capture and retain the 100-year stormwater design event.

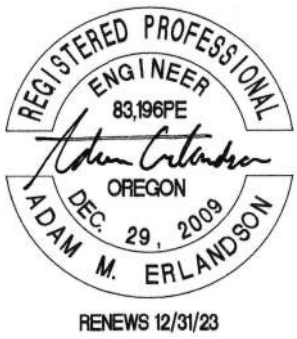
The attached HydroCAD analysis demonstrates the proposed stormwater management system design is intended to fully manage the 100-year stormwater design event. As shown on the attached updated analysis, the stormwater management systems have been designed to have the appropriate storage volume to fully retain and dispose of the 100-year storm event, as demonstrated with no secondary (overflow) runoff calculated to leave the subject property site during the 100-year storm event.

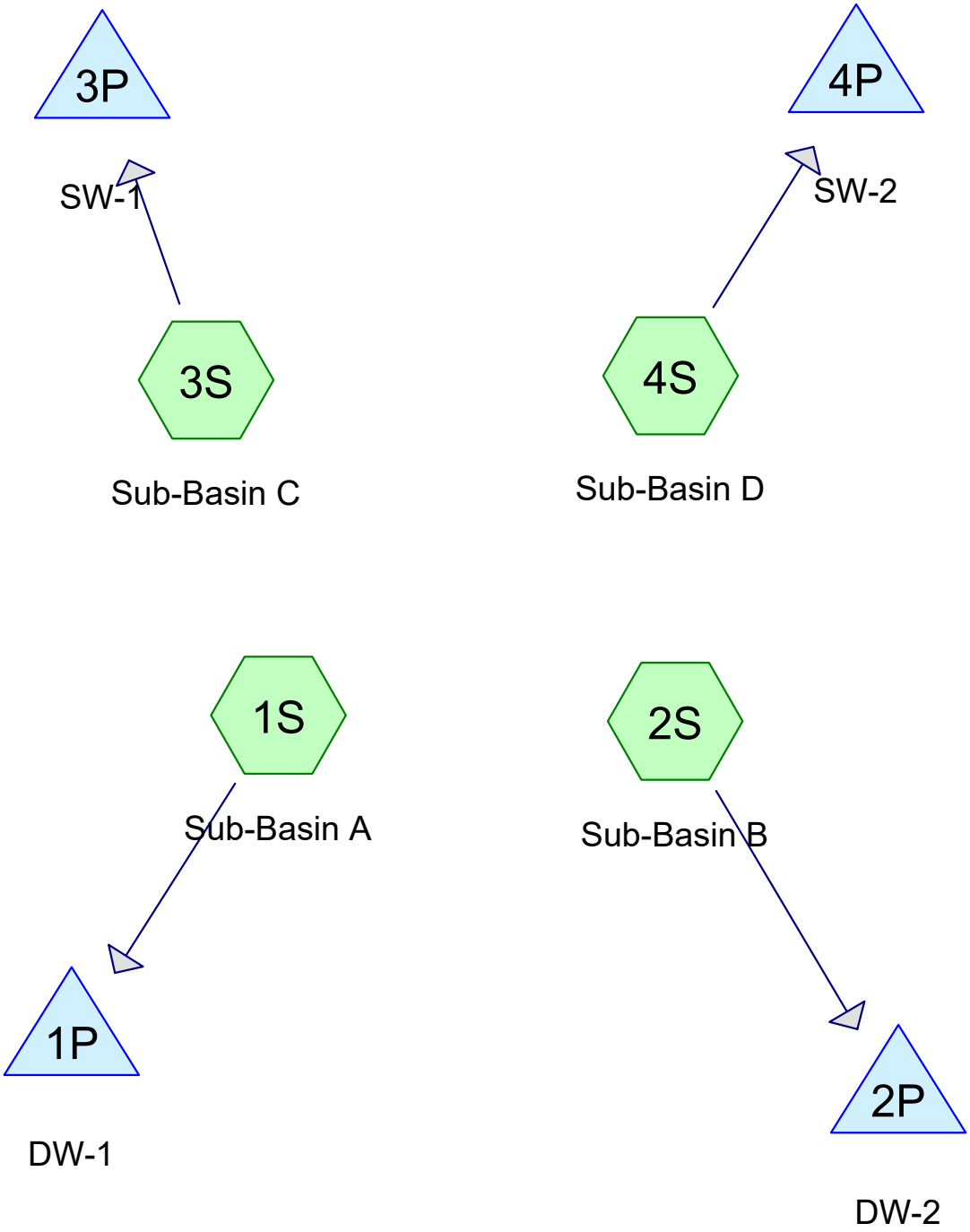
The attached revised Construction Plans (Sheet C302 - Overall Drainage Plan & Sheet C400 – Civil Details) have also been updated to include the modified performance testing criteria that will be implemented during the site construction period to verify the actual infiltration rates of the proposed stormwater management facilities meet or exceed the assumptions within the analysis.

If you have any questions on this, please feel free to contact me directly.

Respectfully,

Adam Erlandson, PE
541.728.6347
adam@kl-engineering.com





Subcat Reach Pond Link

Routing Diagram for Penn Micro Unit
Prepared by Know Ledge Engineering LLC, Printed 2/28/2023

Time span=0.00-72.00 hrs, dt=0.05 hrs, 1441 points
Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv.
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment1S: Sub-Basin A Runoff Area=7,880 sf 100.00% Impervious Runoff Depth=2.77"
Tc=6.0 min CN=0/98 Runoff=0.39 cfs 1,818 cf

Subcatchment2S: Sub-Basin B Runoff Area=8,400 sf 100.00% Impervious Runoff Depth=2.77"
Tc=6.0 min CN=0/98 Runoff=0.41 cfs 1,938 cf

Subcatchment3S: Sub-Basin C Runoff Area=2,230 sf 80.72% Impervious Runoff Depth=2.46"
Tc=6.0 min CN=79/98 Runoff=0.10 cfs 458 cf

Subcatchment4S: Sub-Basin D Runoff Area=2,030 sf 78.82% Impervious Runoff Depth=2.43"
Tc=6.0 min CN=79/98 Runoff=0.09 cfs 412 cf

Pond 1P: DW-1 Peak Elev=106.55' Storage=622 cf Inflow=0.39 cfs 1,818 cf
Discarded=0.02 cfs 1,818 cf Secondary=0.00 cfs 0 cf Outflow=0.02 cfs 1,818 cf

Pond 2P: DW-2 Peak Elev=107.26' Storage=690 cf Inflow=0.41 cfs 1,938 cf
Discarded=0.02 cfs 1,938 cf Secondary=0.00 cfs 0 cf Outflow=0.02 cfs 1,938 cf

Pond 3P: SW-1 Peak Elev=598.55' Storage=198 cf Inflow=0.10 cfs 458 cf
Discarded=0.00 cfs 458 cf Primary=0.00 cfs 0 cf Outflow=0.00 cfs 458 cf

Pond 4P: SW-2 Peak Elev=598.94' Storage=165 cf Inflow=0.09 cfs 412 cf
Outflow=0.00 cfs 412 cf

Total Runoff Area = 20,540 sf Runoff Volume = 4,625 cf Average Runoff Depth = 2.70"
4.19% Pervious = 860 sf 95.81% Impervious = 19,680 sf

Summary for Subcatchment 1S: Sub-Basin A

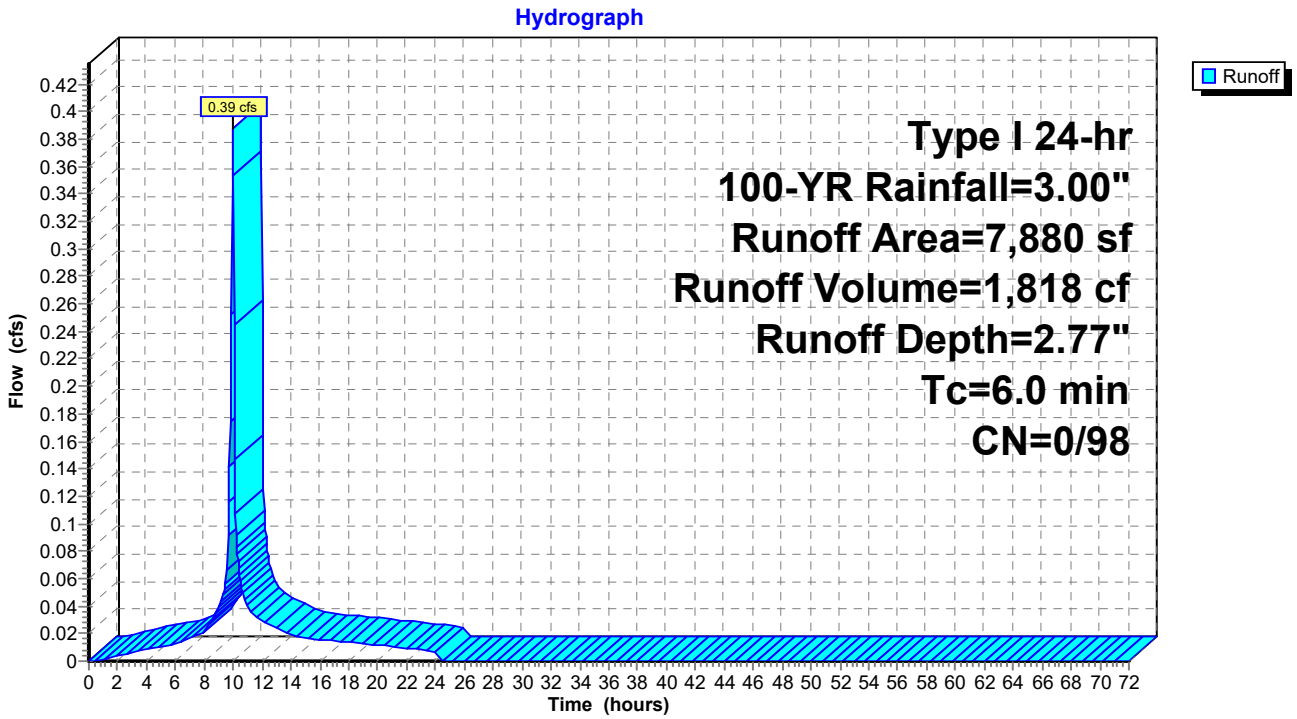
Runoff = 0.39 cfs @ 9.95 hrs, Volume= 1,818 cf, Depth= 2.77"
Routed to Pond 1P : DW-1

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type I 24-hr 100-YR Rainfall=3.00"

Area (sf)	CN	Description
7,880	98	Paved parking, HSG A
7,880	98	100.00% Impervious Area

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

Subcatchment 1S: Sub-Basin A



Summary for Subcatchment 2S: Sub-Basin B

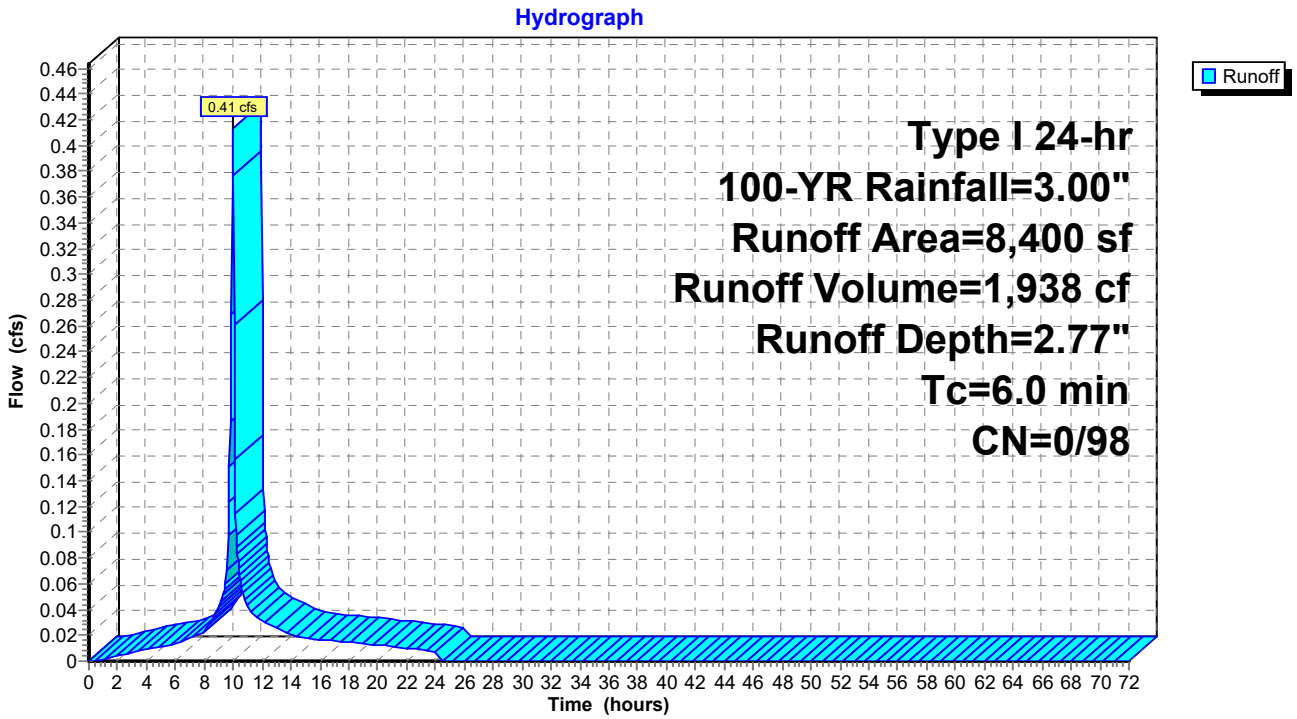
Runoff = 0.41 cfs @ 9.95 hrs, Volume= 1,938 cf, Depth= 2.77"
Routed to Pond 2P : DW-2

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type I 24-hr 100-YR Rainfall=3.00"

Area (sf)	CN	Description
8,400	98	Paved parking, HSG A
8,400	98	100.00% Impervious Area

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

Subcatchment 2S: Sub-Basin B



Summary for Subcatchment 3S: Sub-Basin C

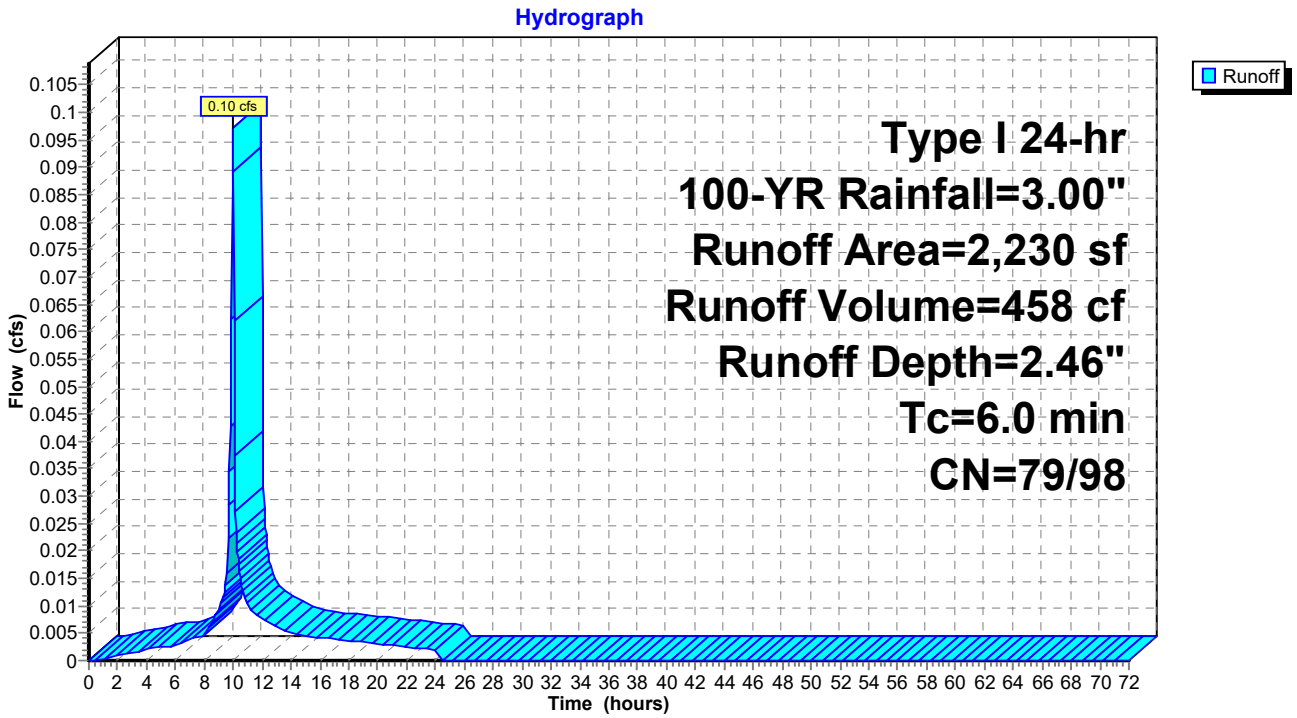
Runoff = 0.10 cfs @ 9.95 hrs, Volume= 458 cf, Depth= 2.46"
Routed to Pond 3P : SW-1

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type I 24-hr 100-YR Rainfall=3.00"

Area (sf)	CN	Description
430	79	<50% Grass cover, Poor, HSG B
1,800	98	Unconnected roofs, HSG A
2,230	94	Weighted Average
430	79	19.28% Pervious Area
1,800	98	80.72% Impervious Area

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

Subcatchment 3S: Sub-Basin C



Summary for Subcatchment 4S: Sub-Basin D

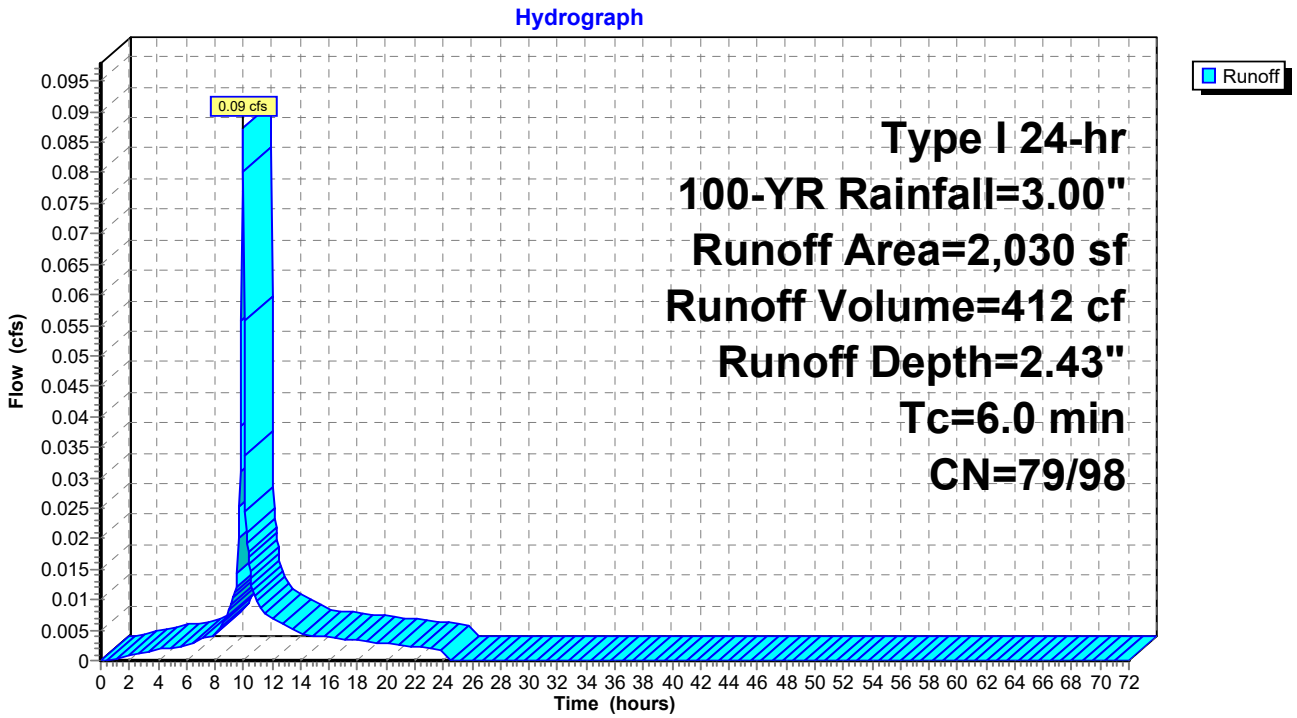
Runoff = 0.09 cfs @ 9.95 hrs, Volume= 412 cf, Depth= 2.43"
Routed to Pond 4P : SW-2

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type I 24-hr 100-YR Rainfall=3.00"

Area (sf)	CN	Description
430	79	<50% Grass cover, Poor, HSG B
1,600	98	Unconnected roofs, HSG A
2,030	94	Weighted Average
430	79	21.18% Pervious Area
1,600	98	78.82% Impervious Area

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

Subcatchment 4S: Sub-Basin D



Summary for Pond 1P: DW-1

Inflow Area = 7,880 sf,100.00% Impervious, Inflow Depth = 2.77" for 100-YR event
Inflow = 0.39 cfs @ 9.95 hrs, Volume= 1,818 cf
Outflow = 0.02 cfs @ 8.40 hrs, Volume= 1,818 cf, Atten= 94%, Lag= 0.0 min
Discarded = 0.02 cfs @ 8.40 hrs, Volume= 1,818 cf
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Peak Elev= 106.55' @ 13.05 hrs Surf.Area= 255 sf Storage= 622 cf

Plug-Flow detention time= 239.8 min calculated for 1,817 cf (100% of inflow)
Center-of-Mass det. time= 239.8 min (945.0 - 705.2)

Volume	Invert	Avail.Storage	Storage Description
#1	100.00'	659 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc) 2,040 cf Overall - 157 cf Embedded = 1,883 cf x 35.0% Voids
#2	100.00'	101 cf	**4.00'D x 8.00'H Vertical Cone/Cylinder** Inside #1 157 cf Overall - 6.0" Wall Thickness = 101 cf
#3	108.00'	50 cf	**4.00'D x 4.00'H Vertical Cone/Cylinder** Impervious
		810 cf	Total Available Storage

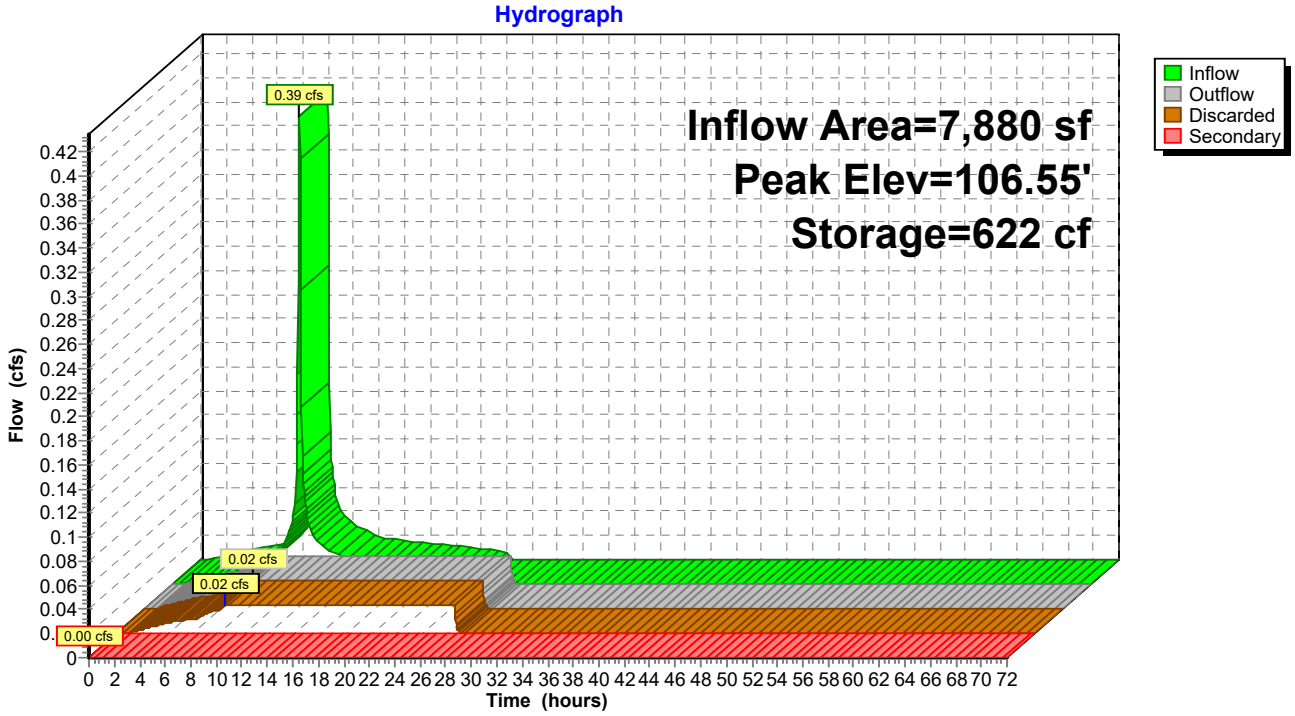
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
100.00	255	0	0
108.00	255	2,040	2,040

Device	Routing	Invert	Outlet Devices
#1	Discarded	100.00'	**4.000 in/hr Exfiltration over Surface area**
#2	Secondary	110.00'	**8.0" Round Culvert** L= 10.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 110.00' / 109.90' S= 0.0100 '/' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 0.35 sf

Discarded OutFlow Max=0.02 cfs @ 8.40 hrs HW=100.12' (Free Discharge)
↑—**1=Exfiltration** (Exfiltration Controls 0.02 cfs)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=100.00' (Free Discharge)
↑—**2=Culvert** (Controls 0.00 cfs)

Pond 1P: DW-1


Hydrograph
Inflow Area=7,880 sf
Peak Elev=106.55'
Storage=622 cf
0.39 cfs
0.02 cfs
0.02 cfs
0.00 cfs
Inflow
Outflow
Discarded
Secondary
Flow (cfs)
Time (hours)

Summary for Pond 2P: DW-2

Inflow Area = 8,400 sf,100.00% Impervious, Inflow Depth = 2.77" for 100-YR event
Inflow = 0.41 cfs @ 9.95 hrs, Volume= 1,938 cf
Outflow = 0.02 cfs @ 8.30 hrs, Volume= 1,938 cf, Atten= 94%, Lag= 0.0 min
Discarded = 0.02 cfs @ 8.30 hrs, Volume= 1,938 cf
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Peak Elev= 107.26' @ 13.32 hrs Surf.Area= 255 sf Storage= 690 cf

Plug-Flow detention time= 270.6 min calculated for 1,938 cf (100% of inflow)
Center-of-Mass det. time= 270.6 min (975.8 - 705.2)

Volume	Invert	Avail.Storage	Storage Description
#1	100.00'	659 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc) 2,040 cf Overall - 157 cf Embedded = 1,883 cf x 35.0% Voids
#2	100.00'	101 cf	**4.00'D x 8.00'H Vertical Cone/Cylinder** Inside #1 157 cf Overall - 6.0" Wall Thickness = 101 cf
#3	108.00'	50 cf	**4.00'D x 4.00'H Vertical Cone/Cylinder** Impervious
		810 cf	Total Available Storage

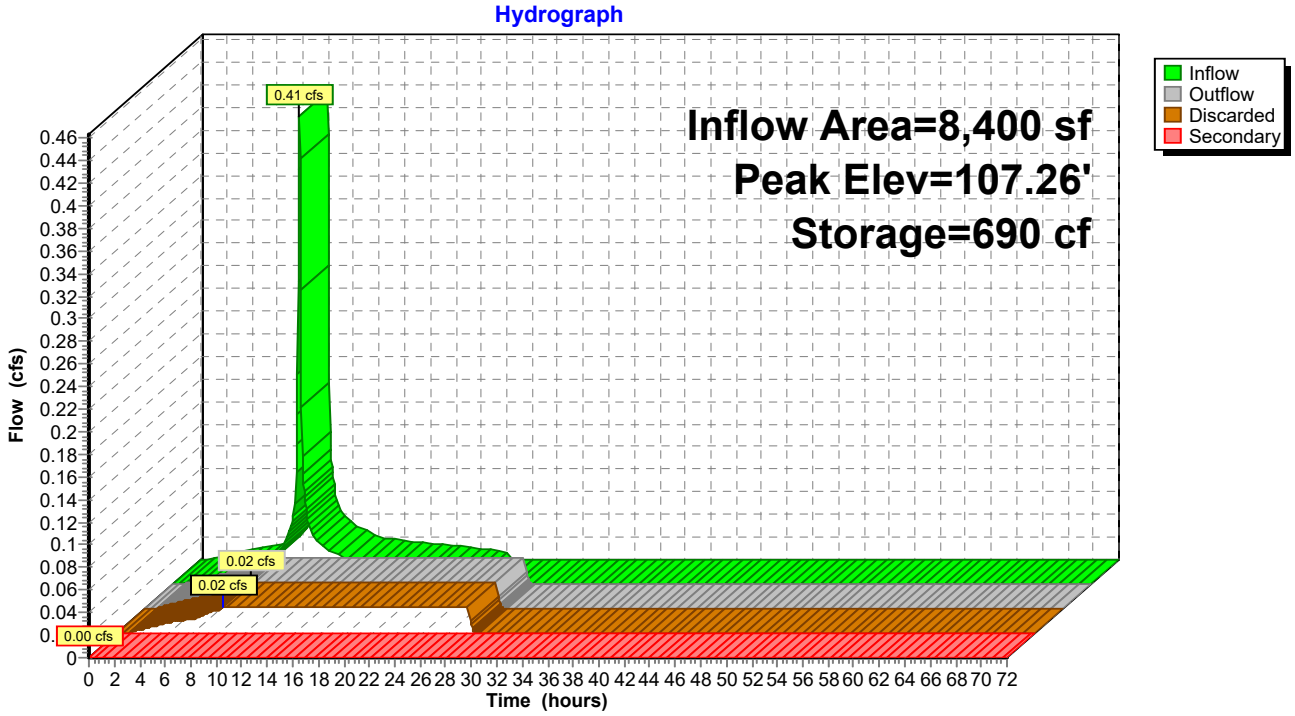
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
100.00	255	0	0
108.00	255	2,040	2,040

Device	Routing	Invert	Outlet Devices
#1	Discarded	100.00'	**4.000 in/hr Exfiltration over Surface area**
#2	Secondary	110.00'	**8.0" Round Culvert** L= 10.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 110.00' / 109.90' S= 0.0100 '/' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 0.35 sf

Discarded OutFlow Max=0.02 cfs @ 8.30 hrs HW=100.12' (Free Discharge)
↑**1=Exfiltration** (Exfiltration Controls 0.02 cfs)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=100.00' (Free Discharge)
↑**2=Culvert** (Controls 0.00 cfs)

Pond 2P: DW-2


Hydrograph
Inflow Area=8,400 sf
Peak Elev=107.26'
Storage=690 cf
0.41 cfs
0.02 cfs
0.02 cfs
0.00 cfs
Inflow
Outflow
Discarded
Secondary
Flow (cfs)
Time (hours)

Summary for Pond 3P: SW-1

Inflow Area = 2,230 sf, 80.72% Impervious, Inflow Depth = 2.46" for 100-YR event
Inflow = 0.10 cfs @ 9.95 hrs, Volume= 458 cf
Outflow = 0.00 cfs @ 7.60 hrs, Volume= 458 cf, Atten= 96%, Lag= 0.0 min
Discarded = 0.00 cfs @ 7.60 hrs, Volume= 458 cf
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Peak Elev= 598.55' @ 16.57 hrs Surf.Area= 101 sf Storage= 198 cf

Plug-Flow detention time= 479.2 min calculated for 458 cf (100% of inflow)
Center-of-Mass det. time= 479.1 min (1,196.7 - 717.5)

Volume	Invert	Avail.Storage	Storage Description
#1	594.60'	210 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

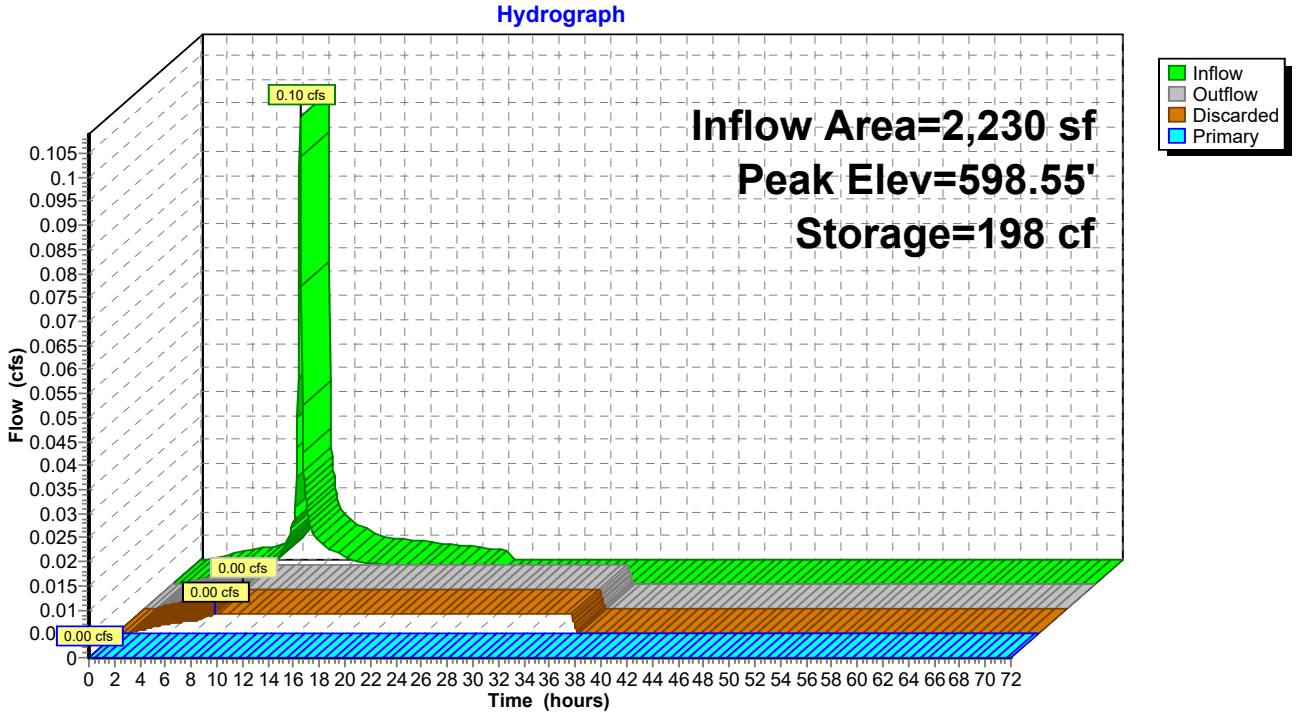
Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
594.60	10	0.0	0	0
594.70	175	35.0	3	3
597.20	175	35.0	153	156
597.25	1	0.0	0	156
598.20	37	100.0	18	174
598.65	120	100.0	35	210

Device	Routing	Invert	Outlet Devices
#1	Discarded	594.60'	**1.000 in/hr Exfiltration over Horizontal area**
#2	Primary	598.60'	**2.0' long x 2.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 Coef. (English) 2.54 2.61 2.61 2.60 2.66 2.70 2.77 2.89 2.88 2.85 3.07 3.20 3.32

Discarded OutFlow Max=0.00 cfs @ 7.60 hrs HW=594.70' (Free Discharge)
↑—**1=Exfiltration** (Exfiltration Controls 0.00 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=594.60' (Free Discharge)
↑—**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond 3P: SW-1


Hydrograph
Inflow Area=2,230 sf
Peak Elev=598.55'
Storage=198 cf
Inflow
Outflow
Discarded
Primary
0.10 cfs
0.00 cfs
0.00 cfs
0.00 cfs
Flow (cfs)
0.105
0.1
0.095
0.09
0.085
0.08
0.075
0.07
0.065
0.06
0.055
0.05
0.045
0.04
0.035
0.03
0.025
0.02
0.015
0.01
0.0
0
0 2 4 6 8 10 12 14 16 18 20 22 24 26 28 30 32 34 36 38 40 42 44 46 48 50 52 54 56 58 60 62 64 66 68 70 72
Time (hours)

Summary for Pond 4P: SW-2

Inflow Area = 2,030 sf, 78.82% Impervious, Inflow Depth = 2.43" for 100-YR event
Inflow = 0.09 cfs @ 9.95 hrs, Volume= 412 cf
Outflow = 0.00 cfs @ 8.15 hrs, Volume= 412 cf, Atten= 95%, Lag= 0.0 min
Discarded = 0.00 cfs @ 8.15 hrs, Volume= 412 cf

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Peak Elev= 598.94' @ 15.01 hrs Surf.Area= 51 sf Storage= 165 cf

Plug-Flow detention time= 399.0 min calculated for 412 cf (100% of inflow)
Center-of-Mass det. time= 399.0 min (1,117.9 - 718.9)

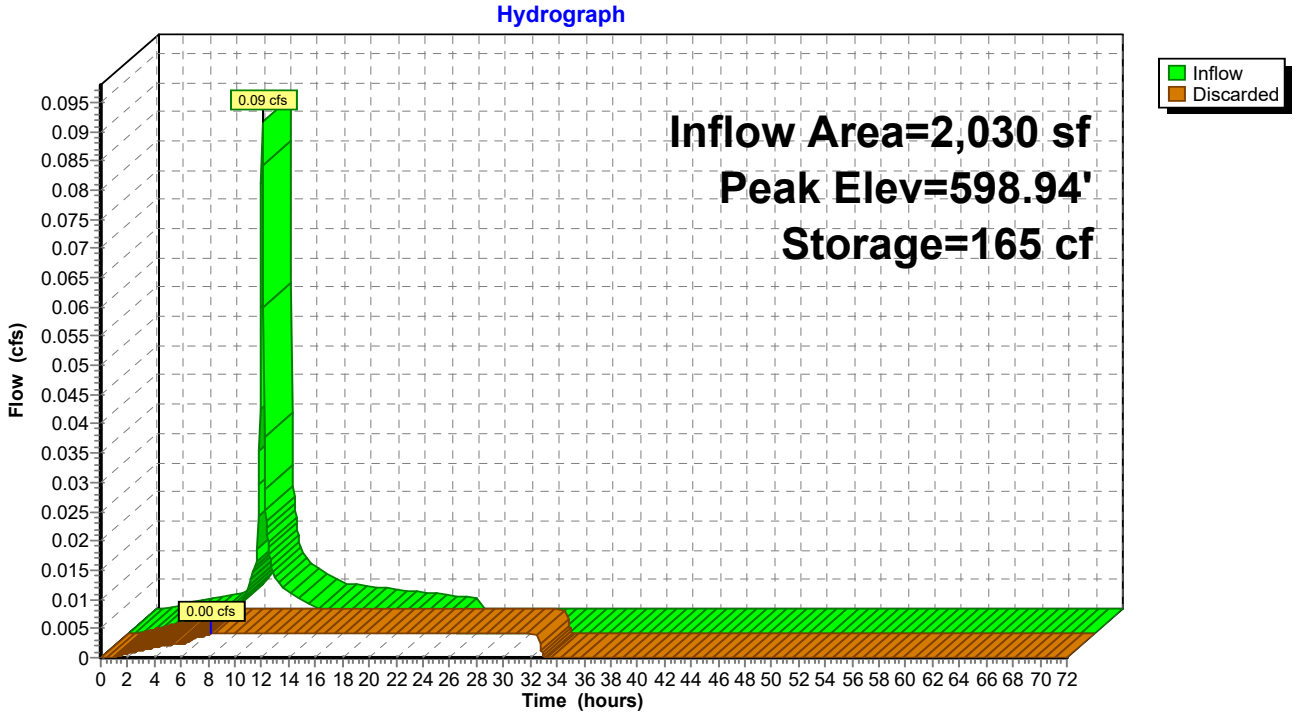
Volume	Invert	Avail.Storage	Storage Description
#1	595.25'	221 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

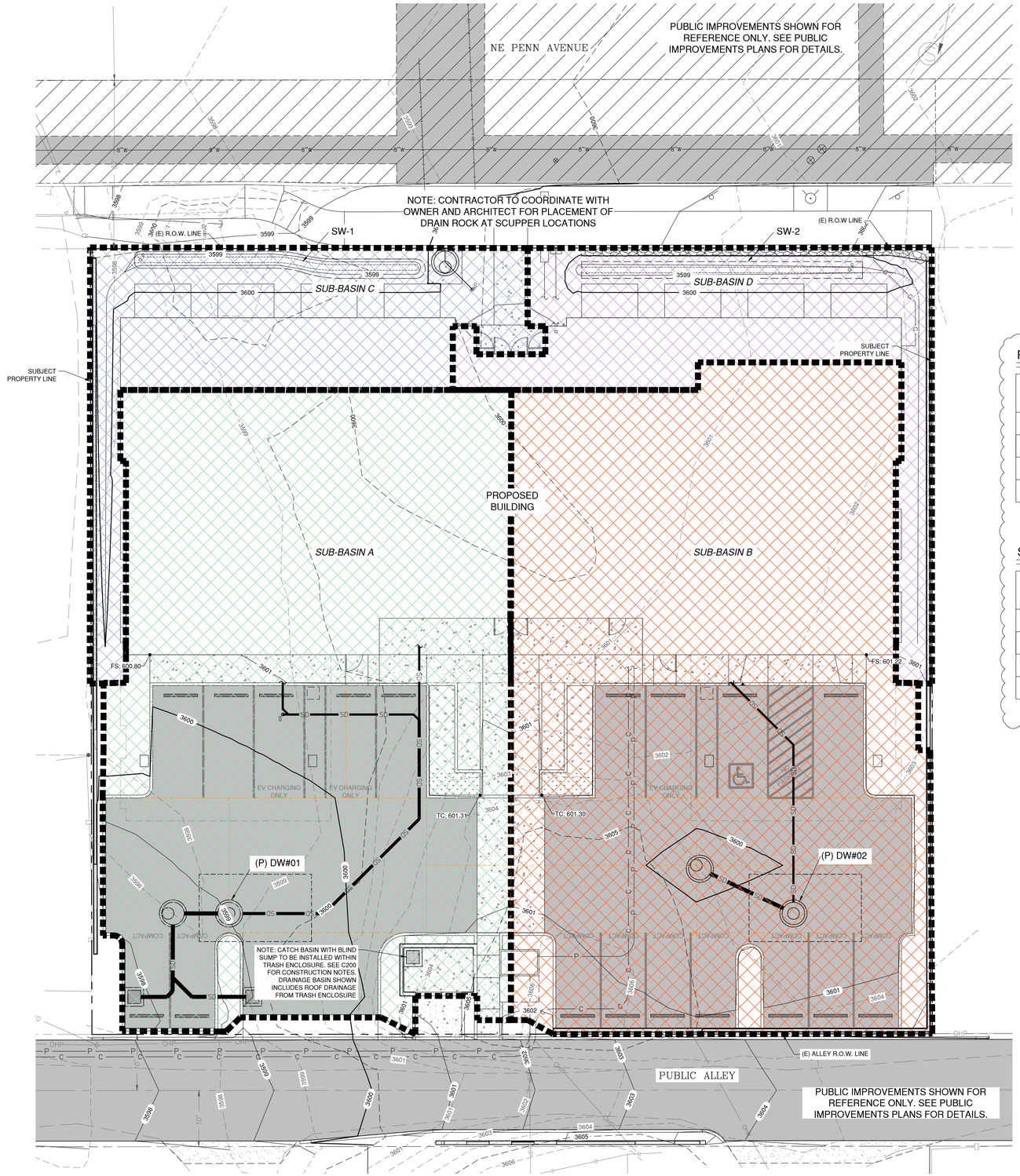
Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
595.25	10	0.0	0	0
595.30	175	35.0	2	2
597.80	175	35.0	153	155
597.85	1	0.0	0	155
598.80	12	100.0	6	161
598.90	40	100.0	3	164
599.40	190	100.0	58	221

Device	Routing	Invert	Outlet Devices
#1	Discarded	595.25'	**1.000 in/hr Exfiltration over Horizontal area**

Discarded OutFlow Max=0.00 cfs @ 8.15 hrs HW=595.30' (Free Discharge)
↑**1=Exfiltration** (Exfiltration Controls 0.00 cfs)

Pond 4P: SW-2


Hydrograph
Inflow Area=2,030 sf
Peak Elev=598.94'
Storage=165 cf
0.09 cfs
0.00 cfs
Inflow
Discarded
Flow (cfs)
Time (hours)
0 0.005 0.01 0.015 0.02 0.025 0.03 0.035 0.04 0.045 0.05 0.055 0.06 0.065 0.07 0.075 0.08 0.085 0.09 0.095
0 2 4 6 8 10 12 14 16 18 20 22 24 26 28 30 32 34 36 38 40 42 44 46 48 50 52 54 56 58 60 62 64 66 68 70 72



OVERALL DRAINAGE PLAN

SCALE: 1"= 10'

0 5' 10' 20'

SCALE: 1" = 10'

N

PROPOSED STORMWATER MANAGEMENT DESIGN SUMMARY:

SUB-BASIN AREA DESIGNATION	SUB-BASIN AREA (SF)	WEIGHTED NRCS CURVE NUMBER	25-YEAR PEAK FLOW RATE (CFS)	25-YEAR RUNOFF VOLUME (CF)	25-YEAR STORAGE VOLUME REQUIRED (CF)	FACILITY ID	MIN. DRAIN ROCK (CY)	STORAGE VOLUME PROVIDED (CF)	MINIMUM PERFORMANCE TESTING REQUIREMENT
A	7,880	98	0.32	1,491	453	DW#01	75	810	SEE TABLE BELOW FOR 100-YEAR STORM TESTING CRITERIA
B	8,400	98	0.34	1,590	504	DW#02	75	810	
C	2,230	94 (98/79)	0.08	371	142	SW-1	17	210	
D	2,030	94 (98/79)	0.07	333	118	SW-2	17	221	

SUPPLEMENTAL 100-YEAR STORMWATER MANAGEMENT DESIGN AND TESTING SUMMARY:

SUB-BASIN AREA DESIGNATION	SUB-BASIN AREA (SF)	WEIGHTED NRCS CURVE NUMBER	100-YEAR PEAK FLOW RATE (CFS)	100-YEAR RUNOFF VOLUME (CF)	100-YEAR STORAGE VOLUME REQUIRED (CF)	FACILITY ID	MIN. DRAIN ROCK (CY)	STORAGE VOLUME PROVIDED (CF)	MINIMUM PERFORMANCE TESTING REQUIREMENT
A	7,880	98	0.39	1,818	622	DW#01	75	810	10,000 GAL IN 60 MINUTES SEE DRYWELL TESTING PROCEDURE
B	8,400	98	0.41	1,938	690	DW#02	75	810	10,000 GAL IN 60 MINUTES SEE DRYWELL TESTING PROCEDURE
C	2,230	94 (98/79)	0.10	458	198	SW-1	17	210	SWALE FLOOD TEST PER THE CENTRAL OREGON STORMWATER MANUAL (COSM) APPENDIX 4E
D	2,030	94 (98/79)	0.09	412	165	SW-2	17	221	SWALE FLOOD TEST PER THE CENTRAL OREGON STORMWATER MANUAL (COSM) APPENDIX 4E

DRYWELL CONSTRUCTION AND TESTING NOTES:

1. THE CONTRACTOR SHALL BLAST AND EXCAVATE THE PROPOSED DRYWELLS AND NOTIFY THE ENGINEER OF RECORD AT LEAST 48 HOURS PRIOR TO THE PLACEMENT OF DRAIN ROCK, FABRIC, OR DRYWELL STRUCTURE TO OBSERVE, DOCUMENT, AND CONDUCT PRELIMINARY DRAINAGE FLOW TEST UTILIZING A MIN. 2,000 GALLON WATER TRUCK TO ENSURE THAT DRYWELL EXCAVATIONS DRAIN AND FUNCTION IN GENERAL ACCORDANCE WITH THE DESIGN PRIOR TO THE INSTALLATION OF ANY OTHER UTILITIES. PENDING THE RESULTS OF THE PRELIMINARY FLOW TEST, THE DRYWELL EXCAVATION LIMITS MAY NEED TO BE MODIFIED AS DIRECTED BY THE ENGINEER.
2. THE CONTRACTOR SHALL PROVIDE ALL TOOLS, EQUIPMENT, WATER, AND LABOR TO PERFORM THE PRELIMINARY AND FINAL DRYWELL TESTS.
3. SEE STORMWATER DESIGN MEMORANDUM FOR NOTES AND DETAILS NOT SHOWN ON THIS PLAN.
4. GENERAL DRYWELL EXCAVATION PARAMETERS*:
   - 75 CY: 255 SF FOOTPRINT, 13-FOOT MIN. DEPTH
   - 125 CY: 440 SF FOOTPRINT, 13-FOOT MIN. DEPTH

   * EXCAVATION DOES NOT NEED TO BE CENTERED ON THE DRYWELL STRUCTURE.
5. DRYWELLS SHALL NOT BE USED FOR STORMWATER MANAGEMENT DURING ACTIVE SITE WORK CONSTRUCTION AND THE CONTRACTOR SHALL INSTALL TEMPORARY PLUGS OR OWNER'S REP APPROVED ALTERNATIVE MEASURE TO ENSURE THAT SEDIMENT LADEN WATER DOES NOT ENTER STORMWATER MANAGEMENT DEVICES. UPON FINAL PAVING AND FINAL ACCEPTANCE, THE CONTRACTOR SHALL ENSURE THAT ANY ACCUMULATED SEDIMENT IS REMOVED FROM THE DRYWELLS SEDIMENTATION MANHOLES, STORM PIPES, AND CATCH BASINS AND TEMPORARY PLUGS ARE REMOVED.

PRIVATE DRYWELL FACILITY TESTING PROCEDURE:

1. INSTALL THE DRYWELL PER THE APPROVED PLANS, SPECIFICATIONS AND APPLICABLE CONSTRUCTION GUIDELINES. THE EOR SHALL WITNESS THE CONSTRUCTION OF THESE FACILITIES TO ENSURE THAT THE DRAIN ROCK QUANTITY IS BEING PLACED, DRAIN ROCK HAS SUFFICIENT VOIDS, AND THE CONSTRUCTION IS PER THESE PLANS. PICTURES SHALL BE TAKEN AND PROVIDED WITH THE EOR'S CERTIFICATION.
2. INSPECT DRYWELL PRIOR TO TESTING, MAKING SURE THE DRYWELL IS CLEAN AND FREE OF SEDIMENTS.
3. FIELD CHECK THE ACCURACY OF THE FLOW METER BY FILLING UP A SUITABLE CONTAINER WITH KNOWN VOLUME; FOR EXAMPLE A CALIBRATED 55-GALLON BARREL.
4. INTRODUCE CLEAN WATER INTO THE DRYWELL AND MONITOR USING AN IN-LINE FLOW METER.
   - 4.1. IF THE DRYWELL TOTAL INFLOW DESIGN VOLUME IS 10,000 GALLONS (1,336 CF) OR LESS, PLACE THE DESIGN VOLUME IN THE DRYWELL WITHIN A 1 HOUR PERIOD AND VERIFY THAT THE WATER EITHER DISAPPEARS IMMEDIATELY OR DOCUMENT THE STANDING WATER PER THE COSM APPENDIX 4B, FULL SCALE DRYWELL TEST METHOD
   - 4.2. IF THE DRYWELL TOTAL INFLOW DESIGN VOLUME IS MORE THAN 10,000 GALLONS, PLACE AN INITIAL 10,000 GALLONS (1,336 CF) INTO THE DRYWELL WITHIN 1 HOUR.
     - 4.2.1. IF ANY STANDING WATER IS PRESENT AT THE END OF THE 10,000-GALLON TEST, THEN INTRODUCE THE REMAINING 100-YEAR DESIGN INFLOW VOLUME (NOTED IN TABLE ABOVE) WITHIN 1 HOUR OF ADDITIONAL TESTING COMMENCEMENT.
5. UPON COMPLETION OF THE PERFORMANCE TESTING PERIOD, DISCONTINUE FLOW AND RECORD THE WATER LEVEL OF THE DRYWELL AT INTERVALS NO MORE THAN 5 MINUTES IN LENGTH FOR A 30-MINUTE TIME PERIOD. VERIFY THE DRYWELL HAS COMPLETELY DRAINED WITHIN 72 HOURS.

SWALE FLOOD TEST TESTING PROCEDURES:

1. INTRODUCE CLEAN WATER INTO THE SWALE BY DIRECTING THE WATER (VIA HOSE FROM A HYDRANT OR OTHER CLEAN WATER SOURCE) ALONG THE CURB AND GUTTER UPSTREAM OF THE SWALE INLET.
2. RAISE THE WATER LEVEL IN THE SWALE UNTIL IT REACHES 6 INCHES IN DEPTH AND NOTE THE TIME; THIS IS THE BEGINNING OF THE FLOOD TEST.
3. IF THE SWALE IS DRAINING RAPIDLY, THE PROGRESS IS OBSERVED, AND WHEN THE SWALE IS EMPTY, THE TIME IS DOCUMENTED, AND THE FLOOD TEST HAS ENDED.
4. IF THE SWALE IS NOT DRAINING, MEASURE THE DEPTH OF WATER CURRENTLY IN THE SWALE, DOCUMENTING THE TIME, AND RETURN TO THE SWALE SITE AT A LATER TIME IN ORDER TO VERIFY THAT THE SWALE HAS COMPLETELY DRAINED WITHIN 72 HOURS.

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OREGON
DEC. 29, 2009
ADAM M. ERLANDSON
RENEWS 12/31/23

NOT FOR CONSTRUCTION

PERMIT DOCUMENTS

PENN AVE. MICRO UNIT APARTMENTS

445 NE PENN AVE. BEND, OR 97701

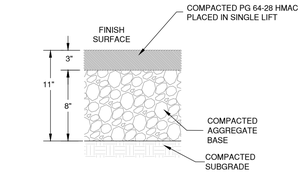
PROJ #:	2012-01
DRWN BY:	AE
CHKD BY:	AE

DATE	SUBMITTAL
220715	90% CD SET
221118	GRADING AND DRAINAGE
221212	PERMIT RE-SUBMITTAL 1
221219	BID SET
230202	GRADING AND DRAINAGE PERMIT RE-SUBMITTAL 1
230228	STORMWATER MANAGEMENT MOD △

OVERALL DRAINAGE PLAN

C302

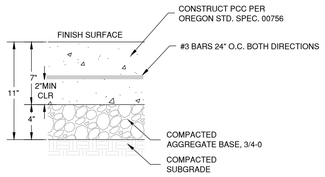
2/28/2023 2:06 PM BENAE Penn Micro- Private- Civil Sheets.dwg



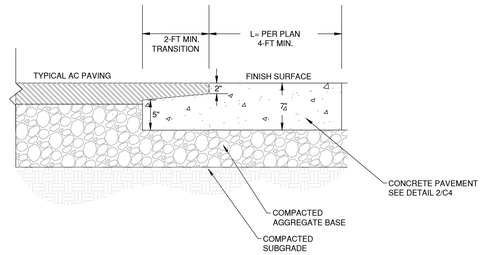
ASPHALT PAVEMENT SECTION — NTS — 1 / C400

CONCRETE PAVEMENT NOTES:

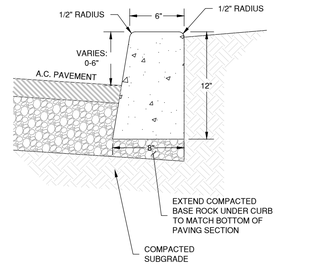
1. REFERENCE OR. STANDARD SPECS, SECTION 00756 FOR ADDITIONAL CONCRETE PAVEMENT DETAILS
2. CONCRETE SHALL BE HIGH STRENGTH AND HAVE MIN. COMPRESSIVE STRENGTH OF 4,000 PSI.
3. CONTRACTION JOINTS ARE REQUIRED AT MAXIMUM 10-FOOT INTERVALS OR AS SHOWN ON PLAN.



CONCRETE PAVEMENT SECTION — NTS — 2 / C400



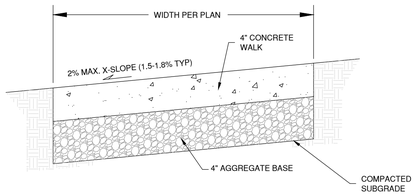
ASPHALT TO CONCRETE PAVEMENT TRANSITION — NTS — 3 / C400



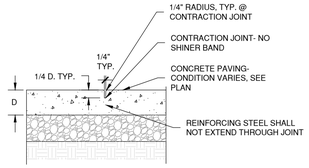
CONCRETE CURB DETAIL — NTS — 4 / C400

CONCRETE CURB AND SIDEWALK NOTES:

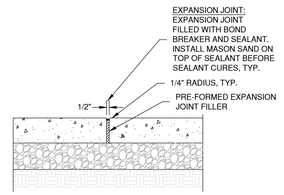
1. SEE OREGON STANDARD DRAWING RD700 FOR ADDITIONAL NOTES AND DETAILS.
2. CONCRETE SHALL BE HIGH STRENGTH, 4000 PSI MIN. COMPRESSIVE STRENGTH PER OREGON STD SPECIFICATION SECTION 00400 AND CONTAIN NO ADDITIVES TO CAUSE RAPID SETTING. 4% - 7% AIR ENTRAINMENT REQUIRED.
3. EXPANSION JOINTS ARE REQUIRED AT END OF RADII, DRIVEWAY APRONS, POINTS OF CURVATURE, CURB TRANSITIONS, AND SHALL HAVE NO GREATER THAN 150-FOOT MAXIMUM SPACING.
4. CONTRACTION JOINTS ARE REQUIRED AT 5-FOOT INTERVALS, WITH EXPANSION JOINTS SPACED NO GREATER THAN 25-FEET.
5. COMPACTED STATE SPEC AGGREGATE BASE ROCK SHALL EXTEND UNDER CURB AND MATCH THE BOTTOM OF OF THE STREET SECTION (3-IN MIN)
6. LIGHT BROOM FINISH ON EXPOSED FACES.



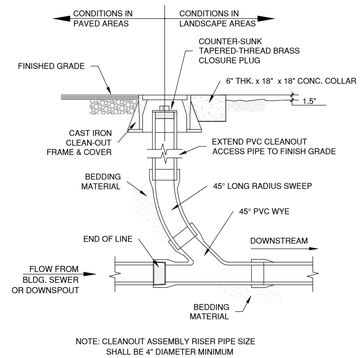
CONCRETE SIDEWALK DETAIL — NTS — 5 / C400



CONTRACTION JOINT DETAIL — NTS — 6 / C400

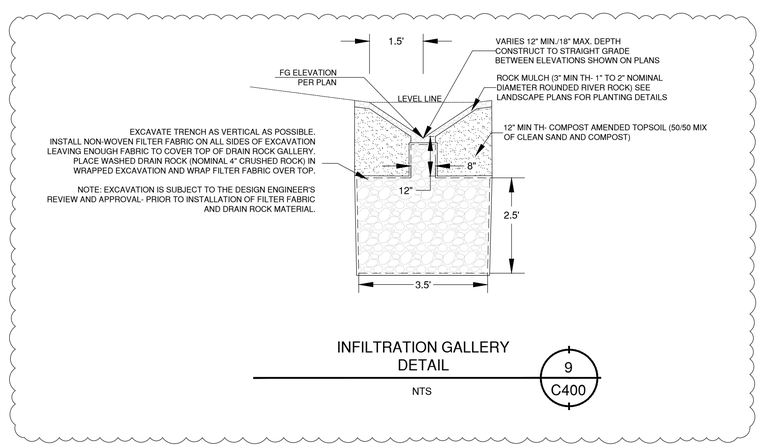


EXPANSION JOINT DETAIL — NTS — 7 / C400

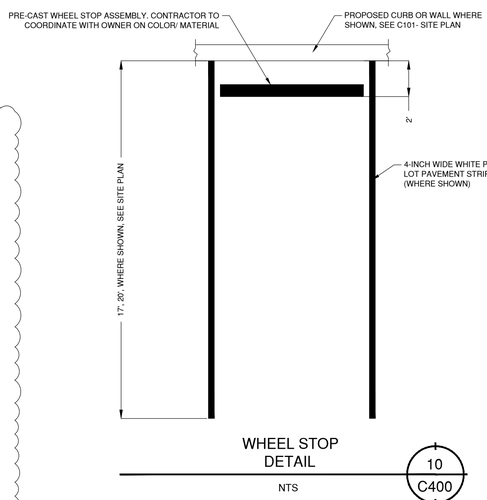


NOTE: CLEANOUT ASSEMBLY RISER PIPE SIZE SHALL BE 4" DIAMETER MINIMUM

SANITARY SEWER AND STORM DRAIN CLEANOUT ASSEMBLY DETAILS — NTS — 8 / C400



INFILTRATION GALLERY DETAIL — NTS — 9 / C400



WHEEL STOP DETAIL — NTS — 10 / C400

JOINT RESTRAINT TABLE

HORIZONTAL BENDS	MIN. RESTRAINED LENGTH (L_R)	PLAN VIEW
8" - 45°	11'	L_R, L_R
8" - 22.5°	6'	
8" - 11.25°	3'	

DEAD END	MIN. RESTRAINED LENGTH (L_R)	PLAN VIEW
8"	62'	L_R — DEAD END

REDUCER	MIN. RESTRAINED LENGTH (L_R)	PLAN VIEW
8" x 4"	45'	L_R, 8", 4"

VERTICAL BENDS	MIN. RESTRAINED LENGTH UPPER SIDE (L_U)	MIN. RESTRAINED LENGTH LOWER SIDE (L_L)*	PROFILE VIEW
8" - 45°	26'	7	L_U, L_U, L_L, L_L
8" - 22.5°	13'	4'	
8" - 11.25°	7'	2'	

TEE	MIN. LENGTH ALONG RUN (L_R)**	MIN. RESTRAINED LENGTH ALONG BRANCH (L_B)	PLAN VIEW
8" x 8"	4'	41'	L_R, L_R, L_B
8" x 6"	4'	19'	

NOTES:
* MIN. RESTRAINED LENGTH LOWER SIDE SHALL HAVE A MINIMUM 5-FEET COVER
**LENGTH ALONG RUN FROM TEE SHALL EXTEND THE MINIMUM SPECIFIED IN THE TABLE IN EACH DIRECTION FROM THE TEE AND SHALL BE SOLID PIPE WITHOUT JOINTS, FITTING, ETC.

RESTRAINED LENGTHS HAVE BEEN CALCULATED UTILIZING THE *EBAA IRON RESTRAINT LENGTH CALCULATOR V7.1.3* IN ACCORDANCE WITH CITY OF BEND DESIGN STANDARDS SECTION 5.1.8 UTILIZING THE FOLLOWING PARAMETERS:
SF: 2:1, TRENCH TYPE: 5, DEPTH OF BURY: 3-FEET, TEST PRESSURE: 150 PSI, SOIL TYPE: GM

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REGISTERED PROFESSIONAL ENGINEER 83,996PE OREGON DEC. 29, 2009 ADAM M. ERLANDSON
RENEWS 12/31/23

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PENN AVE. MICRO UNIT APARTMENTS

445 NE PENN AVE. BEND, OR 97701

PROJ #:	2012-01
DRWN BY:	AE
CHKD BY:	AE

DATE	SUBMITTAL
220715	90% CD SET
221118	GRADING AND DRAINAGE
221212	PERMIT RE-SUBMITTAL 1
221219	BID SET
230202	GRADING AND DRAINAGE PERMIT RE-SUBMITTAL 1
230228	STORMWATER MANAGEMENT MOD 1

CIVIL DETAILS

C400