



**B A R G H A U S E N**

# **OPERATIONS AND MAINTENANCE MANUAL**

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## **Fortress - Puyallup**

240 15<sup>th</sup> Street SE  
Puyallup, Washington 98372

Prepared for:  
CREF3 Puyallup, LLC  
11611 San Vicente Blvd, 10<sup>th</sup> Floor  
Los Angeles, CA 90049

**July 27, 2023**  
Our Job No. 22085

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## **1.0 STORMWATER OPERATIONS AND MAINTENANCE SUMMARY**

The proposed Fortress - Puyallup project is located on a 7.84-acre site located in the City of Puyallup, Washington. The project address is 240 15<sup>th</sup> Street SE, Puyallup, WA 98372 with the parcel numbers being 0420274126, 7845000161, and 7845000170. The site is located northwest of the intersection of 15<sup>th</sup> Street SE and East Pioneer Way.

The site has a drainage system that needs periodic maintenance in order to function properly. This report describes the storm drainage system and delineates operation and maintenance responsibilities and requirements for the site.

The design of the drainage facilities discussed in this manual can be found in the Fortress – Puyallup project construction drawings and stormwater site plan on file with the City of Puyallup.

The site is approximately 7.84 acres in size. The purpose of this manual is to address maintenance of stormwater facilities installed with the Fortress - Puyallup project. These facilities are intended to detain and treat the runoff from the graded site. The developed runoff from the west portion of the site will be collected and conveyed to both water quality and detention vaults prior to discharge into the public stormwater system draining to East Main Street. The east part of the site will be collected and discharged through a water quality vault to the 15th Street SE system that drains to a wetland.

## **2.0 PLAN GOAL**

The specific purpose of the storm water facilities is to minimize pollution that is typically associated with modern development. Stormwater runoff contains pollutants harmful to humans and aquatic life. The majority of pollution is generated by motor vehicles and lawn / landscape maintenance.

## **3.0 MAINTENANCE AND OPERATIONAL RESPONSIBILITIES**

Owners/Tenants have the following Operations and Maintenance responsibilities, which include:

- I. Inspection and maintenance of all on-site drainage facility components (catch basins, fencing, storm manholes, pipes, vaults, and ponds) at least twice annually:
  - A. Remove accumulated sediment and debris from all pipes, structures, ponds and vaults (any debris and/or sediment collected shall be disposed of in accordance with applicable State and Federal requirements).
  - B. Inspect and repair any damage, including; cracks, unsealed joints and pipes that deviate from their design shape
  - C. Maintain access points including manhole hole lids, grates and ladders
  - D. Debris and leaves shall be removed from catch basin grates
  - E. Control structures shall be kept in good repair and ensure that the outlet orifice is unobstructed
  - F. General site surroundings:
    - 1) Maintaining good housekeeping practices on the site will reduce the amount of trash, debris, and sediment that reaches the storm system.

- 2) The owner, tenants and anyone doing landscaping on the property must be careful to avoid introducing landscape fertilizer to receiving waters or groundwater.

The operation and maintenance of all stormwater facilities shall be completed pursuant to the standards and requirements of the 2019 Stormwater Management Manual for Western Washington and any additional manufacturer's guidance. Additional information is included in the following pages for reference.

#### **4.0 REPORTING**

The above maintenance activities will be documented each year and kept in a log book. Maintenance logs shall be made available to the City of Puyallup upon request. This manual and the logs should be kept on-site, preferably in an office belonging to the person tasked with ensuring the system is function as intended. This manual shall be transferred to the new property owner if the property is sold.

#### **5.0 RESPONSIBLE PARTY/ORGANIZATION**

Fortress Investment Group, Inc.  
11611 San Vicente Blvd, 10<sup>th</sup> Floor  
Los Angeles, CA 90049

**INSPECTION/MAINTENANCE CHECKLIST**

The items in this checklist will be inspected at least twice per year and maintenance performed as necessary. Refer to the Maintenance Standards included in this manual for a detailed list of inspection tasks and descriptions of when maintenance is required to be performed.

STRUCTURE/ FACILITY	DATE OF INSPECTION MAINTENANCE			
	Maintenance Standard(s)	RESULTS/ MAINTENANCE	DATE	COMMENTS
Detention Vault	Sediment/Debris Damage Outlet Riser Access Riser	Inspection Results		
		Maintenance Done		
WQ#1 Biopod	Sediment/Debris Damage Grate	Inspection Results		
		Maintenance Done		
WQ#2 Biopod	Sediment/Debris Damage Grate	Inspection Results		
		Maintenance Done		
Catch basins and piping	Sediment/Debris Damage Grate	Inspection Results		
		Maintenance Done		
General Site	Landscaping Trash Fertilizer Use	Inspection Results		
		Maintenance Done		

I hereby certify that the above noted inspections and maintenance was performed in accordance with the approved Operations and Maintenance Manual for the Fortress - Puyallup project, Puyallup, Washington.

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Signature

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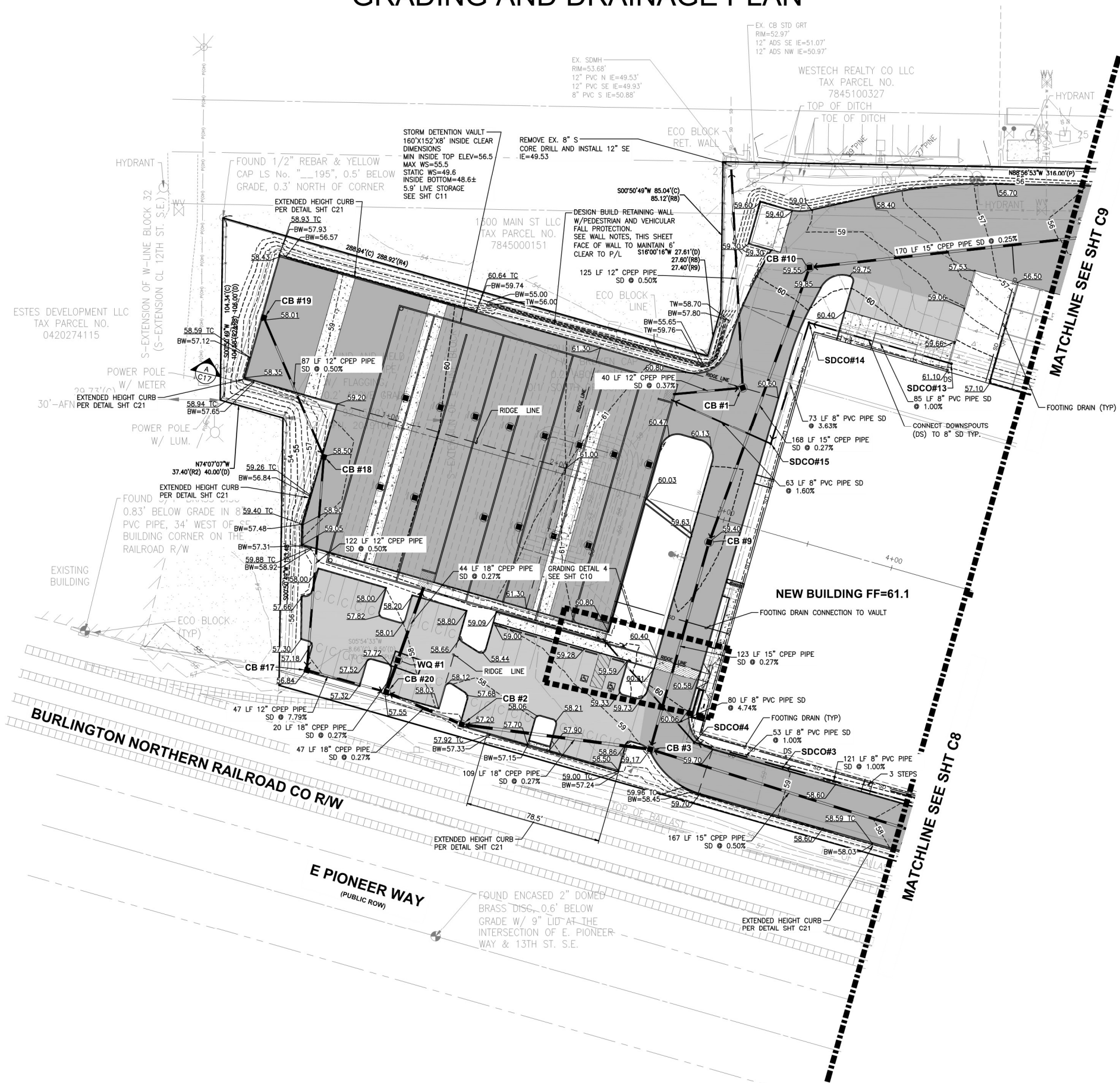
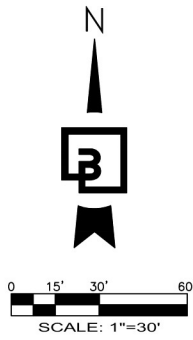
Date

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Title



PORTION OF SE QUARTER OF SEC 27, TWN 20 N, RGE. 4 E, W.M.  
CITY OF PUYALLUP, PIERCE COUNTY, WASHINGTON  
**GRADING AND DRAINAGE PLAN**



**WALL NOTES:**

- PROPOSED WALL IS DESIGN/BUILD BY THE CONTRACTOR (OR PER STRUCTURAL DRAWINGS) AND IS SHOWN CONCEPTUALLY.
1. WALL DESIGN NEEDS TO BE SUBMITTED TO THE OWNER AND THE ENGINEER/CITY FOR REVIEW AND APPROVAL.
  2. WALL DESIGNS OVER 4- FEET HIGH REQUIRE A SEPARATE BUILDING PERMIT AND ENGINEERING DESIGN.
  3. WALLS OVER 30-INCHES HIGH, WHERE TOP OF WALL IS ADJACENT TO PEDESTRIAN OR VEHICULAR PATHWAY(S), NEED TO INCLUDE PEDESTRIAN AND/OR VEHICULAR FALL PROTECTION. THE FALL PROTECTION SHALL BE DESIGNED, PERMITTED, PROVIDED BY, AND INSTALLED BY CONTRACTOR.
  4. THE DIMENSIONS SHOWN ON THE PLAN ARE THE BASIS OF WALL PLACEMENT. DIMENSIONS ARE SHOWN TO THE FACE OF WALL AT THE EXPOSED GRADE. CONTRACTOR SHALL USE A CURRENT CAD FILE FROM BARGHAUSEN CONSULTING ENGINEERS, INC. TO STAKE THE FACE OF WALL LOCATION.
  5. THE TYPE OF WALL CHOSEN WILL DETERMINE THE WALL WIDTH, BATTER, AND IF GEGRID IS NECESSARY.
  6. THE WALL HEIGHT SHOWN ON THE PLANS IS AN ESTIMATED MAXIMUM HEIGHT. TOP OF WALL ELEVATIONS PROVIDED ARE TO THE TOP OF EXPOSED FACE OF WALL, NOT INCLUDING ANY PEDESTRIAN OR VEHICULAR BARRIER IF NECESSARY. BOTTOM OF WALL ELEVATIONS PROVIDED ARE TO THE BOTTOM OF THE EXPOSED FACE OF WALL (AND NOT TO WALL FOOTING). THE WALL ELEVATIONS PROVIDED ON THE PLANS ARE PROVIDED AT UNIFORM LOCATIONS AND DO NOT NECESSARILY REPRESENT ALL OF THE WALL ELEVATION CHANGES. WALL PROFILES ARE REQUIRED TO BE PART OF THE DESIGN/BUILD OR STRUCTURAL DESIGN PLANS. WALL PROFILES MAY RESULT IN HIGHER OVERALL WALL HEIGHTS.
  7. COORDINATION BETWEEN WALL DESIGN AND THE CONSTRUCTION DRAWINGS NEEDS TO OCCUR PRIOR TO CONSTRUCTION TO CONFIRM WALL LOCATION IN PLAN VIEW, DRAINAGE REQUIREMENTS, ETC.

CATCH BASINS	
CB #1, TYPE 2-54" W/CONTROL STRUCTURE RIM=60.67 IE=50.16 (12" W) IE=50.16 (12" N)	
CB #2, TYPE 2-48" W/STANDARD GRATE RIM=57.22 IE=50.40 (18" E) IE=50.40 (18" NW)	
CB #3, TYPE 2-48" W/STANDARD GRATE RIM=59.17 IE=50.69 (15" N) IE=53.10 (15" E) IE=50.69 (18" W)	
CB #9, TYPE 2-48" W/STANDARD GRATE RIM=59.40 IE=51.02 (15" N) IE=51.02 (15" S)	
CB #10, TYPE 2-48" W/STANDARD GRATE RIM=59.55 IE=51.47 (15" E) IE=51.47 (15" S)	
CB #17, TYPE 1, W/STANDARD GRATE RIM=56.86 IE=53.95 (12" N) IE=53.95 (12" E)	
CB #18, TYPE 1, W/STANDARD GRATE RIM=58.52 IE=54.56 (12" NW) IE=54.56 (12" S)	
CB #19, TYPE 1, W/STANDARD GRATE RIM=58.03 IE=55.00 (12" SE)	
CB #20, TYPE 2-48" W/STANDARD GRATE RIM=57.56 IE=50.27 (18" SE) IE=50.27 (12" W) IE=50.27 (18" N)	
SDCO#3, RIM=59.49 IE=54.80 (8" E) IE=54.80 (8" W)	
SDCO#4, RIM=59.61 IE=54.27 (8" E) IE=54.27 (8" NW)	
SDCO#13, RIM=60.85 IE=58.50 (8" W)	
SDCO#14, RIM=60.39 IE=57.65 (8" E) IE=57.65 (8" S)	
SDCO#15, RIM=60.75 IE=55.00 (8" N) IE=55.00 (8" NW)	
WQ #1, BPU-816B RIM=57.80 IE=50.22 (18" S) IE=49.72 (18" N)	

**APPROVED**

BY \_\_\_\_\_  
CITY OF PUYALLUP  
DEVELOPMENT ENGINEERING

DATE \_\_\_\_\_

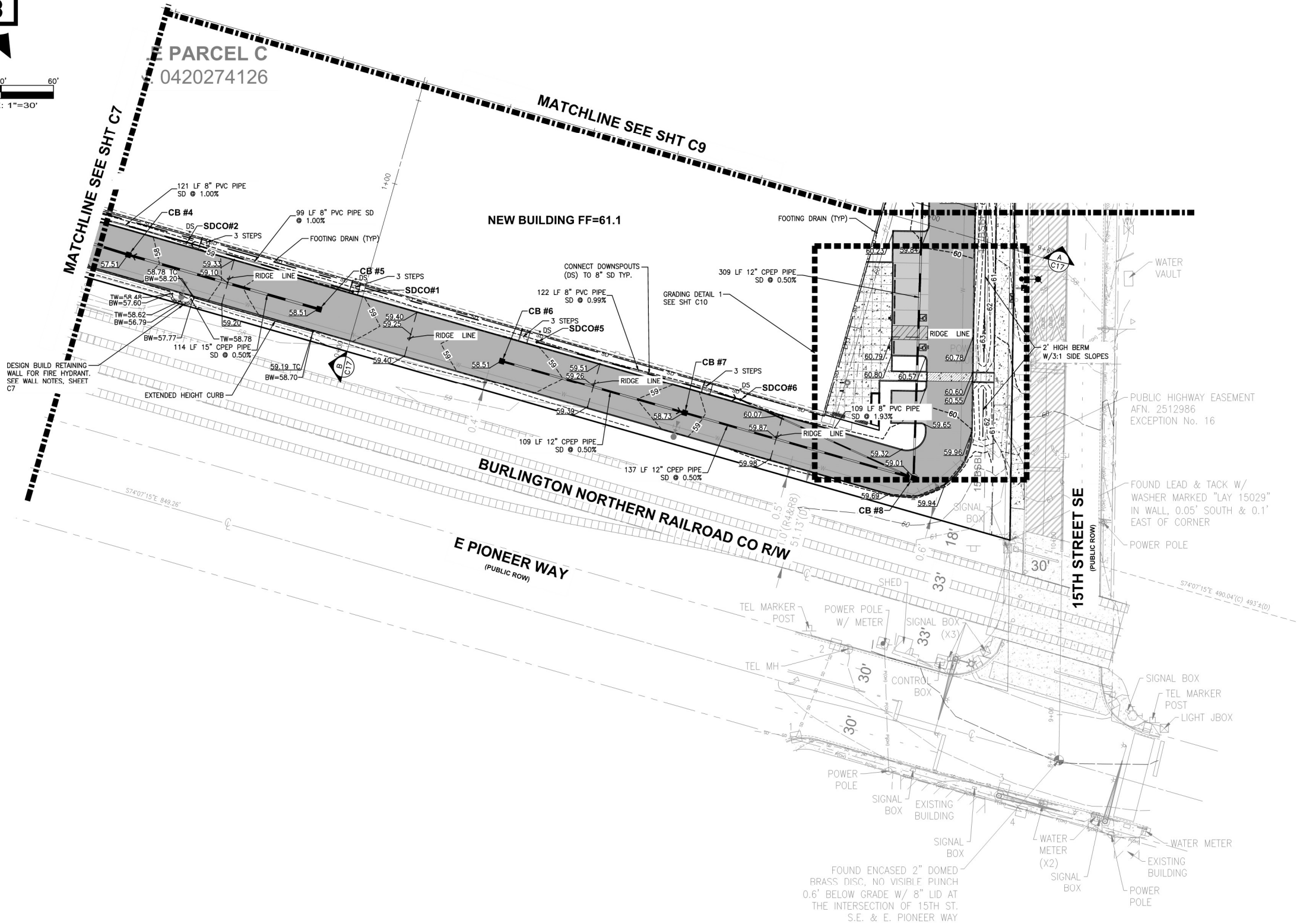
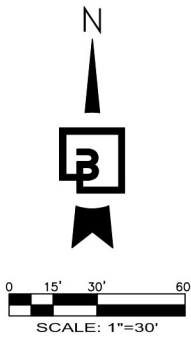
NOTE: THIS APPROVAL IS VOID AFTER 180 DAYS FROM APPROVAL DATE.  
THE CITY WILL NOT BE RESPONSIBLE FOR ERRORS AND/OR OMISSIONS ON THESE PLANS.  
FIELD CONDITIONS MAY DICTATE CHANGES TO THESE PLANS AS DETERMINED BY THE DEVELOPMENT ENGINEERING MANAGER.



Know what's below.  
Call before you dig.  
Dial 811

Revision		Title: <b>GRADING AND DRAINAGE PLAN</b>		For: <b>CREF3 PUYALLUP OWNER LLC 11611 SAN VICENTE BLVD 10TH FLOOR LOS ANGELES, CA 90049</b>	
No.	Date	By	Ckd.	Appr.	
Scale:		Horizontal 1"=30' Vertical N/A			
Designed	DL	Drawn	RDC	Checked	DL
Approved	JGH	Date	6/23/23		
Job Number <b>22085</b>		Sheet <b>C7</b>		of <b>26</b>	
<b>Barghausen Consulting Engineers, Inc.</b> 18215 72nd Avenue South Kent, WA 98032 425.251.6222 <a href="http://barghausen.com">barghausen.com</a>					

PORTION OF SE QUARTER OF SEC 27, TWN 20 N, RGE. 4 E, W.M.  
CITY OF PUYALLUP, PIERCE COUNTY, WASHINGTON  
**GRADING AND DRAINAGE PLAN**



CATCH BASINS	
CB #4, TYPE 1, W/STANDARD GRATE RIM=57.50 IE=53.93 (15" E) IE=53.93 (15" W)	
CB #5, TYPE 1, W/STANDARD GRATE RIM=58.50 IE=54.50 (15" W)	
CB #6, TYPE 1, W/STANDARD GRATE RIM=58.50 IE=54.50 (12" E)	
CB #7, TYPE 1, W/STANDARD GRATE RIM=58.73 IE=53.95 (12" W) IE=53.95 (12" E)	
CB #8, TYPE 2-48" W/STANDARD GRATE RIM=59.00 IE=53.27 (12" W) IE=55.50 (8" NW) IE=53.27 (12" N)	
SDCO#1, RIM=59.34 IE=57.00 (8" W)	
SDCO#2, RIM=59.40 IE=56.01 (8" E) IE=56.01 (8" W)	
SDCO#5, RIM=59.67 IE=58.80 (8" E)	
SDCO#6, RIM=60.01 IE=57.60 (8" W) IE=57.60 (8" SE)	

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BY \_\_\_\_\_  
CITY OF PUYALLUP  
DEVELOPMENT ENGINEERING

DATE \_\_\_\_\_

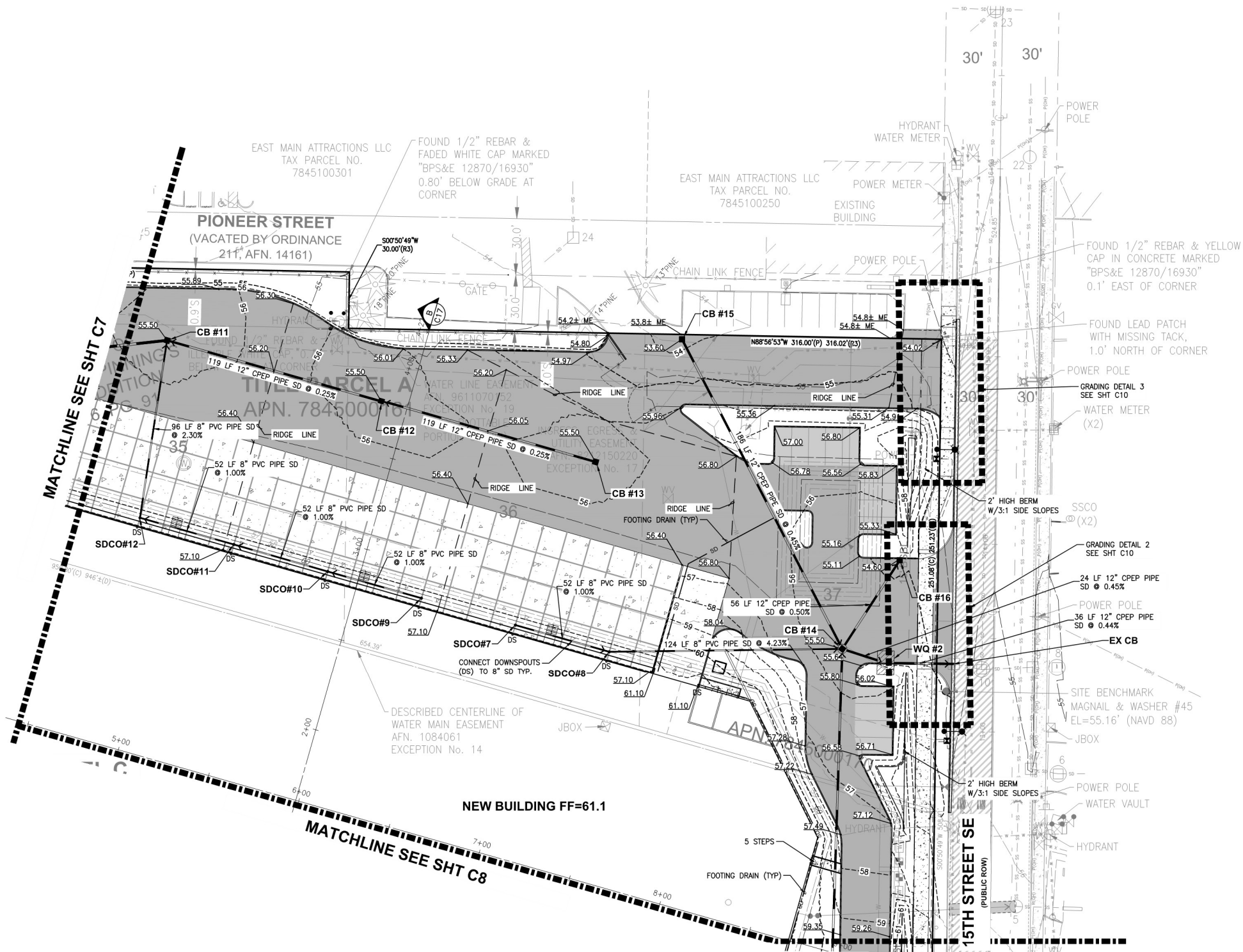
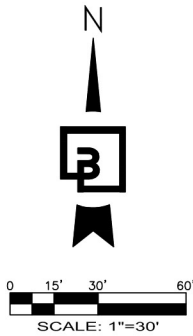
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For: <b>CREF3 PUYALLUP OWNER LLC 11611 SAN VICENTE BLVD 10TH FLOOR LOS ANGELES, CA 90049</b>			
Scale: Horizontal 1"=30' Vertical N/A		Professional Engineer Seal: JASON GUY HUBBARD, No. 38950, State of Washington, Registered Professional Engineer, 7/27/2023	
Designed: DL	Drawn: RDC	Checked: DL	Approved: JGH
Date: 5/23/23			
<b>Barghausen Consulting Engineers, Inc.</b> 18215 72nd Avenue South Kent, WA 98032 425.251.6222 <a href="http://barghausen.com">barghausen.com</a>		<b>Job Number: 22085</b> <b>Sheet: C8 of 26</b>	

PORTION OF SE QUARTER OF SEC 27, TWN 20 N, RGE. 4 E, W.M.  
CITY OF PUYALLUP, PIERCE COUNTY, WASHINGTON  
**GRADING AND DRAINAGE PLAN**



CATCH BASINS	
CB #11, TYPE 1, W/STANDARD GRATE	
RIM=55.50	
IE=51.90 (12" E)	
IE=51.90 (8" S)	
IE=51.90 (15" W)	
CB #12, TYPE 1, W/STANDARD GRATE	
RIM=55.50	
IE=52.20 (12" E)	
IE=52.20 (12" W)	
CB #13, TYPE 1, W/STANDARD GRATE	
RIM=55.50	
IE=52.50 (12" W)	
CB #14, TYPE 2-48" W/STANDARD GRATE	
RIM=55.50	
IE=51.73 (12" S)	
IE=49.77 (12" NW)	
IE=50.00 (8" W)	
IE=49.77 (12" E)	
IE=51.35 (12" NE)	
CB #15, TYPE 1, W/STANDARD GRATE	
RIM=53.60	
IE=50.60 (12" SE)	
CB #16, TYPE 1, W/STANDARD GRATE	
RIM=54.64	
IE=51.63 (12" SW)	
EX CB,	
RIM=54.63	
IE=49.00 (12" W)	
SDCO#7,	
RIM=57.05	
IE=55.78 (8" E)	
SDCO#8,	
RIM=57.05	
IE=55.26 (8" W)	
IE=55.26 (8" E)	
SDCO#9,	
RIM=57.05	
IE=55.66 (8" W)	
SDCO#10,	
RIM=57.05	
IE=55.14 (8" E)	
IE=55.14 (8" W)	
SDCO#11,	
RIM=57.05	
IE=54.62 (8" E)	
IE=54.62 (8" W)	
SDCO#12,	
RIM=57.05	
IE=54.10 (8" E)	
IE=54.10 (8" N)	
WQ #2, 6X12IB	
RIM=55.43	
IE=49.66 (12" W)	
IE=49.16 (12" E)	

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BY \_\_\_\_\_  
CITY OF PUYALLUP  
DEVELOPMENT ENGINEERING

DATE \_\_\_\_\_

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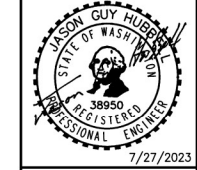
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No.	Date	By	Appr.
For: <b>CREF3 PUYALLUP OWNER LLC</b> <b>11611 SAN VICENTE BLVD</b> <b>10TH FLOOR</b> <b>LOS ANGELES, CA 90049</b>			
Scale: Horizontal 1"=30' Vertical N/A			
Designed _____ Drawn _____ Checked _____ Approved _____ Date 6/23/23			
<b>Barghausen Consulting Engineers, Inc.</b> 18215 72nd Avenue South Kent, WA 98032 425.251.6222 <a href="http://barghausen.com">barghausen.com</a>			
Job Number <b>22085</b>	Sheet <b>C9</b>	of <b>26</b>	

VAULT DETAILS

Revision  
Title:  
Vault Details  
Fortress - Puyallup

For:  
CREF3 PUYALLUP OWNER LLC  
11611 SAN VICENTE BLVD  
10TH FLOOR  
LOS ANGELES, CA 90049



Scale:  
Horizontal 1"=10'  
Vertical N/A  
Designed DL  
Drawn RDC  
Checked DL  
Approved JGH  
Date 6/23/23

Barghausen Consulting Engineers, Inc.

18215 72nd Avenue South  
Kent, WA 98032  
425.251.6222

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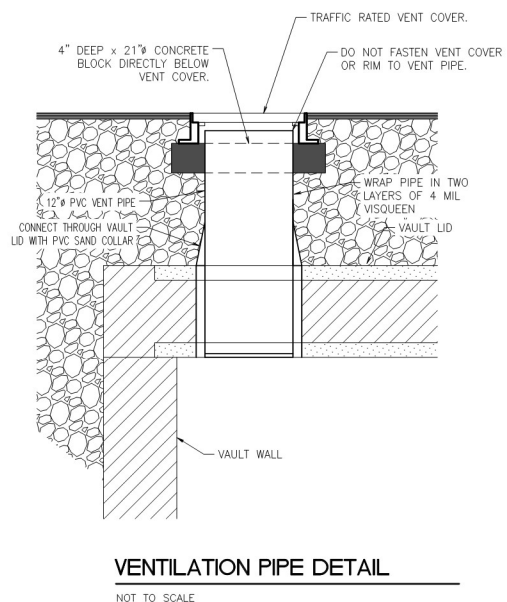
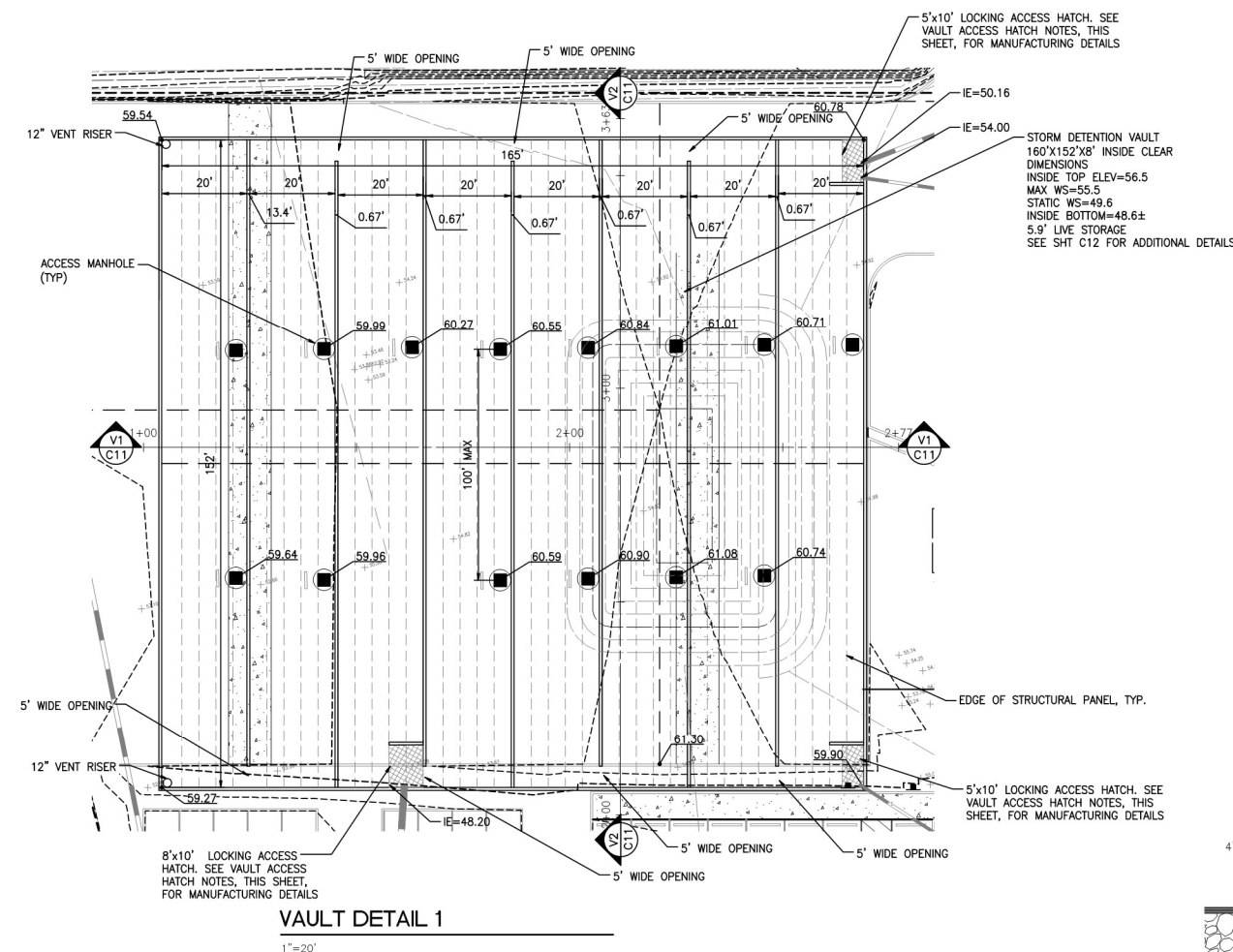
22085

Sheet

C11

26

of



- VAULT NOTES:**
1. VENTILATION PIPES (MIN. 12" DIAMETER OR EQUIVALENT) SHALL BE PROVIDED IN ALL CORNERS OF THE VAULT TO ALLOW FOR VENTILATION PRIOR TO ENTRY OF MAINTENANCE PERSONNEL INTO VAULT. VENTILATION PIPES ENTER THROUGH THE VAULT LID. PROVIDE LOCKING LIDS FLUSH WITH FINISH GRADE USING CLEANOUT.
  2. WHERE PIPES ENTER AND LEAVE THE VAULT BELOW THE DESIGNED MAX WATER SURFACE, THEY SHALL BE SEALED USING A NON-POROUS, NON-SHRINKING GROUT.
  3. ACCESS LOCATIONS, VAULT DESIGN AND WALL OPENINGS ARE PER THE STRUCTURAL DRAWING AND THE LOCATIONS ARE SHOWN FOR REFERENCE ONLY..
  4. INSTALL CONFINED SPACE PLACARD AT ALL ACCESS POINTS TO THE VAULT.

- VAULT ACCESS HATCH NOTES:**
1. PROVIDE H-20 (MIN) TRAFFIC RATED 5'X10' LOCKING, PERSONAL 2-DOOR SOLID ACCESS HATCH.
  2. FRAME AND HATCH COVER SHALL BE DESIGNED FOR 150 PSF LIVE LOAD.
  3. A SPRING-ASSISTED LIFT WITH HOLD-OPEN FEATURE TORSION BARS SHALL BE INSTALLED. AUTOMATIC HOLD-OPEN ARM WITH GRIP HANDLE RELEASE SHALL BE ADDED.
  4. POLYPROPYLENE RUNGS OR LADDER SHALL BE INSTALLED EXTENDING FROM THE HATCH TO THE BOTTOM OF THE VAULT.
  5. A LADDER-UP MECHANISM SHALL BE INSTALLED CENTERED OVER THE RUNGS OR LADDER BELOW THE HATCH.
  6. ALL HARDWARE SHALL BE ZINC-COATED.

- VAULT ACCESS OPENINGS NOTES:**
1. IN ADDITION TO THE HATCHES SHOWN, VAULT ACCESS OPENINGS MUST BE PROVIDED SUCH THAT NO LOCATION WITHIN THE VAULT IS MORE THAN 50 FEET FROM AN ACCESS OPENING. ACCESS TO EACH "V" ON THE VAULT FLOOR MUST BE PROVIDED.
  2. ACCESS OPENINGS MUST HAVE ROUND, SOLID LOCKING LIDS, OR 3 FOOT SQUARE, LOCKING DIAMOND PLATE COVERS.

DETENTION VAULT DATA:	
MIN INSIDE TOP OF VAULT ELEV=	56.5
MAX W.S. ELEV=	55.5
STATIC W.S. ELEV=	49.6
SEE THIS SHEET AND C12 FOR DETAILS.	
DETENTION VAULT:	
LIVE STORAGE VOLUME REQUIRED=	143,488 C.F.
LIVE STORAGE VOLUME PROVIDED=	143,488 C.F.
AS-BUILT DETENTION VOLUME CONSTRUCTED=	C.F.

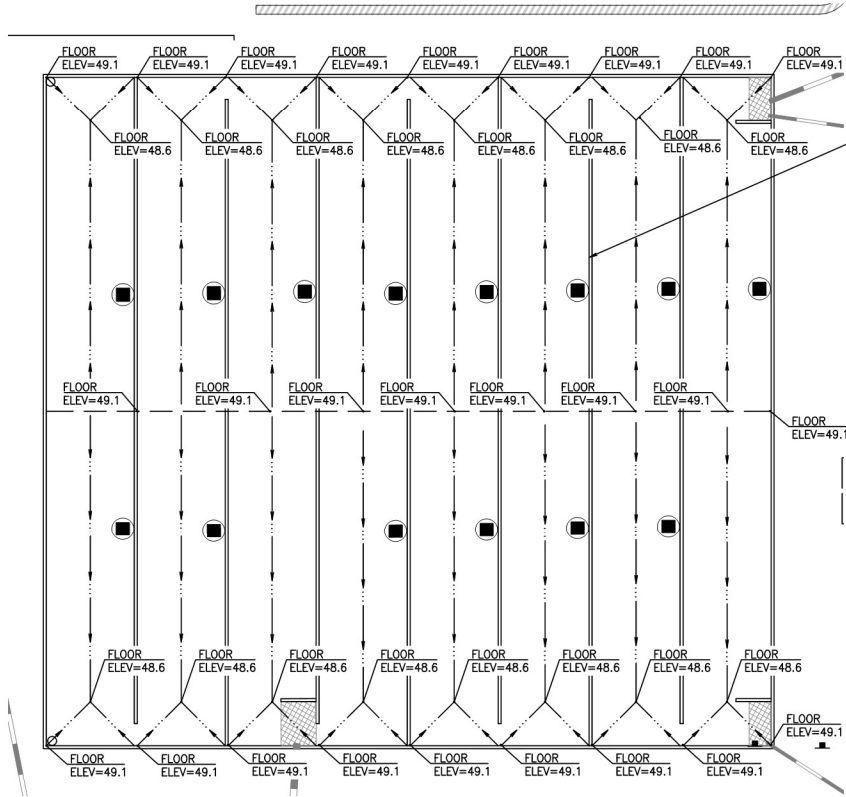
APPROVED  
BY  
CITY OF PUYALLUP  
DEVELOPMENT ENGINEERING  
DATE  
NOTE: THIS APPROVAL IS VOID AFTER 180 DAYS FROM APPROVAL DATE.  
THE CITY WILL NOT BE RESPONSIBLE FOR ERRORS AND/OR OMISSIONS ON THESE PLANS.  
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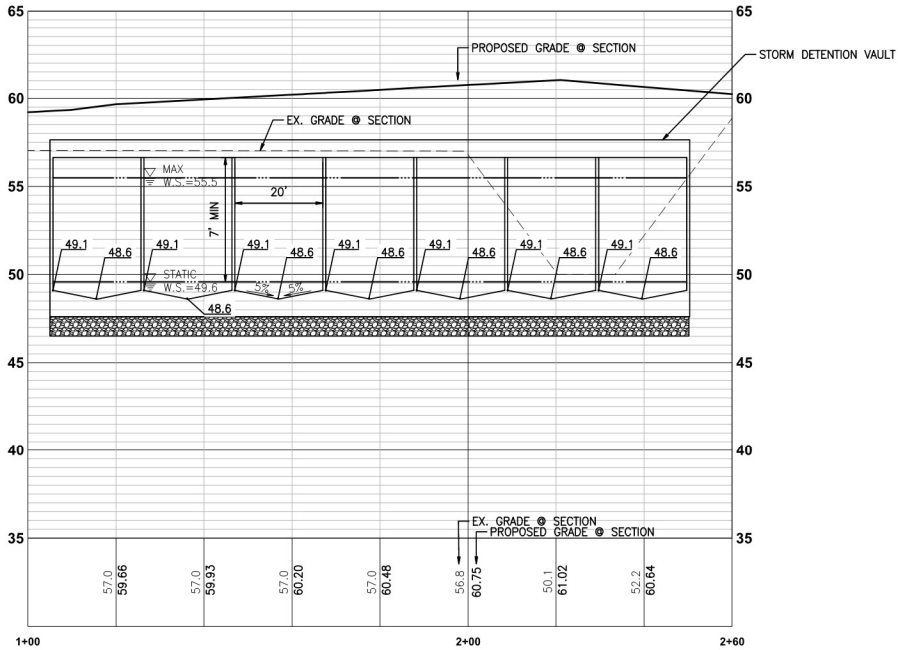
VAULT DETAILS



STORM DETENTION VAULT  
160'X152'X8' INSIDE CLEAR  
DIMENSIONS  
INSIDE TOP ELEV=56.5  
MAX WS=55.5  
STATIC WS=49.6  
INSIDE BOTTOM=48.6±  
5.9' LIVE STORAGE

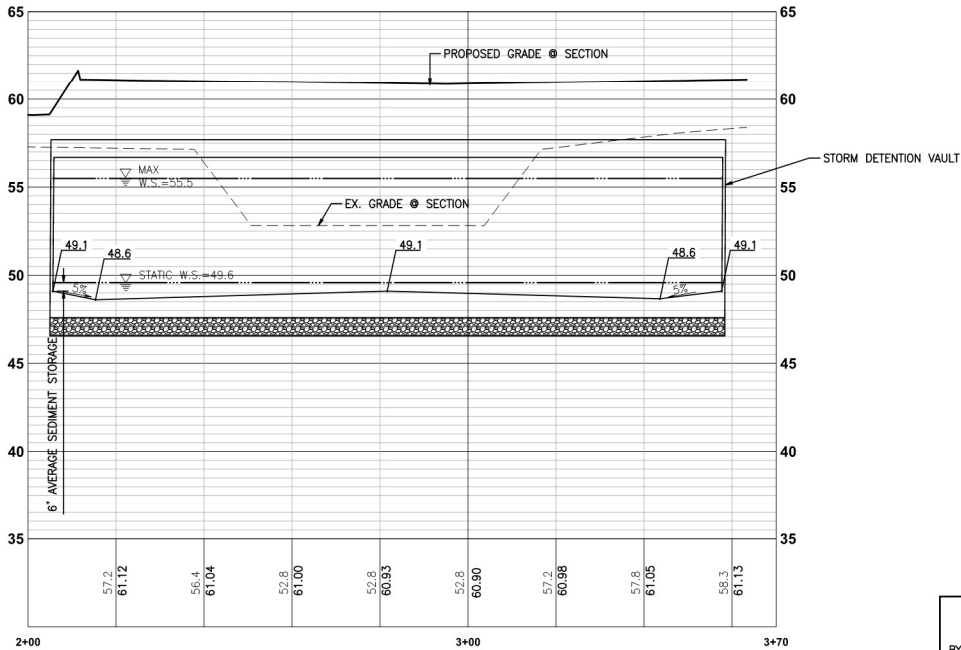
STORM VAULT FLOOR PLAN

1"=20'



VAULT SECTION VI-VI

1"=20' HORIZ, 1"=5' VERT



VAULT SECTION V2-V2

1"=20' HORIZ, 1"=5' VERT

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BY CITY OF PUYALLUP  
DEVELOPMENT ENGINEERING

DATE

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VAULT DETAILS

Title:

CREF3 PUYALLUP OWNER LLC  
11611 SAN VICENTE BLVD  
10TH FLOOR  
LOS ANGELES, CA 90049

For:



7/27/2023

Scale:

Horizontal

1"=10'

Vertical

N/A

Designed

Drawn

Checked

Approved

Date

6/23/23

Barghausen  
Consulting Engineers, Inc.  
18215 72nd Avenue South  
Kent, WA 98032  
425.251.6222

barghausen.com



Job Number

22085

Sheet

C12

26

PORTION OF SE QUARTER OF SEC 27, TWN 20 N, RGE. 4 E, W.M.  
CITY OF PUYALLUP, PIERCE COUNTY, WASHINGTON  
**CONSTRUCTION NOTES AND DETAILS**

**BLOCK AND GRAVEL FILTER**

**FILTER FABRIC FENCE**

**STRAW BALE BARRIER**

**CITY OF PUYALLUP**  
DEVELOPMENT ENGINEERING and PUBLIC WORKS DEPARTMENTS

**STORM DRAIN BARRIERS**

DESIGNED BY	CHECKED BY	APPROVED BY	REVIEWED BY	CITY STANDARD
LINDA LANSING	LINDA LANSING	XXXX	XXXX	02.03.05

**CONDITIONS WHERE PRACTICE APPLIES**

- BLOCK AND GRAVEL FILTER - APPLICABLE FOR AREAS GREATER THAN 5% SLOPE.
- FILTER FABRIC FENCE - APPLICABLE WHERE THE INLET DRAINS A RELATIVELY SMALL (ONE ACRE OR LESS) AND FLAT AREA (LESS THAN 5% SLOPE).
- STRAW BALE BARRIER - APPLICABLE WHERE INLET DRAINS A RELATIVELY FLAT DISTURBED AREA (LESS THAN 5% SLOPE) IN WHICH SHEET FLOW (NOT EXCEEDING 0.5 FT/SEC.) OCCURS. BARRIERS OF THIS TYPE SHOULD NOT BE PLACED AROUND INLETS RECEIVING CONCENTRATED FLOWS SUCH AS THOSE ALONG MAJOR STREETS AND HIGHWAYS.

**1. BLOCK AND GRAVEL FILTER - INSTALLATION PROCEDURE**

- PLACE WIRE MESH OVER THE DROP INLET SO THAT THE WIRE EXTENDS A MINIMUM OF ONE FOOT BEYOND EACH SIDE OF THE INLET STRUCTURE. USE WIRE SCREEN WITH 1/2-INCH OPENINGS. IF MORE THAN ONE STRIP OF MESH IS NECESSARY, OVERLAP THE STRIPS. PLACE FILTER FABRIC\* OVER WIRE MESH.
- PLACE CONCRETE BLOCKS LENGTHWISE ON THEIR SIDES IN A SINGLE ROW AROUND THE PERIMETER OF THE INLET, SO THAT THE OPEN ENDS FACE OUTWARD, NOT UPWARD. THE ENDS OF ADJACENT BLOCKS SHOULD ABUT. THE HEIGHT OF THE BARRIER CAN BE VARIED, DEPENDING ON DESIGN NEEDS, BY STACKING COMBINATIONS OF BLOCKS THAT ARE 4-INCH, 8-INCH AND 12-INCH WIDE. THE ROW OF BLOCKS SHOULD BE AT LEAST 12-INCHES BUT NO GREATER THAN 24-INCHES HIGH.
- PLACE WIRE SCREEN OVER THE OVERSIDE VERTICAL FACE (OPEN END) OF THE CONCRETE BLOCKS TO PREVENT STONES FROM BEING WASHED THROUGH THE BLOCKS. USE WIRE SCREEN WITH 1/2-INCH OPENINGS.
- PILE STONES AGAINST THE WIRE MESH TO THE TOP OF THE BLOCKS. USE 3/4" MINUS WASHED GRAVEL.

**2. FILTER FABRIC FENCE - INSTALLATION PROCEDURE**

- PLACE 2-INCH BY 2-INCH WOODEN STAKES AROUND THE PERIMETER OF THE INLET A MAXIMUM OF 3 FEET APART AND DRIVE THEM AT LEAST 8-INCHES INTO THE GROUND. THE STAKES MUST BE AT LEAST 3 FEET LONG.
- EXCAVATE A TRENCH APPROXIMATELY 8-INCHES WIDE AND 12-INCHES DEEP AROUND THE OUTSIDE PERIMETER OF THE STAKES.
- STAPLE THE FILTER FABRIC\* TO THE WOODEN STAKES SO THAT 32-INCHES OF THE FABRIC EXTENDS AND CAN BE FORMED INTO THE TRENCH, AND USE HEAVY-DUTY WIRE STAPLES AT LEAST 1/2-INCHES LONG.
- BACKFILL THE TRENCH WITH 3/4-INCH MINUS WASHED GRAVEL ALL THE WAY AROUND.

**3. STRAW BALE BARRIER - INSTALLATION PROCEDURE**

- EXCAVATE A 4-INCH DEEP TRENCH AROUND THE INLET. MAKE THE TRENCH AS WIDE AS A STRAW BALE.
- ORIENT STRAW BALES WITH THE BINDINGS AROUND THE SIDES OF THE BALES RATHER THAN OVER AND UNDER THE BALES.
- PLACE BALES LENGTHWISE AROUND THE INLET AND PRESS THE ENDS OF ADJACENT BALES SECURELY IN PLACE.
- DRIVE TWO 2-INCH BY 2-INCH STAKES THROUGH EACH BALE TO ANCHOR THE BALE SECURELY IN PLACE.
- BACKFILL THE EXCAVATED SOIL AND COMPACT IT AGAINST THE BALE.
- WEDGE LOOSE STRAW BETWEEN BALES TO PREVENT WATER FROM FLOWING BETWEEN BALES.

\* MIRAFI 140-N OR EQUIVALENT

**CITY OF PUYALLUP**  
DEVELOPMENT ENGINEERING and PUBLIC WORKS DEPARTMENTS

**STORM DRAIN BARRIERS NOTES**

DESIGNED BY	CHECKED BY	APPROVED BY	REVIEWED BY	CITY STANDARD
LINDA LANSING	LINDA LANSING	XXXX	XXXX	02.03.06

**NOTE:**

- GEOTEXTILE MIRAFI 500 X OR APPROVED EQUAL SHALL BE PLACED UNDER THE ENTIRETY OF THE TEMPORARY ENTRANCE.
- ADDITIONAL ROCK SHALL BE ADDED PERIODICALLY TO MAINTAIN PROPER FUNCTION OF THE PAD.
- IF THE PAD DOES NOT ADEQUATELY REMOVE THE MUD FROM THE VEHICLE'S WHEELS, THE WHEELS SHALL BE HOSED OFF BEFORE THE VEHICLE ENTERS A PAVED STREET. THE WASHING SHALL BE DONE ON AN AREA COVERED WITH CRUSHED ROCK AND WASH WATER SHALL DRAIN TO A SEDIMENT RETENTION FACILITY OR THROUGH A SILT FENCE.

**CITY OF PUYALLUP**  
DEVELOPMENT ENGINEERING and PUBLIC WORKS DEPARTMENTS

**TEMPORARY CONSTRUCTION ENTRANCE**

DESIGNED BY	CHECKED BY	APPROVED BY	REVIEWED BY	CITY STANDARD
PHIL BARNHARTMAN	LINDA LANSING	XXXX	XXXX	05.01.01

**NOTES:**

- SILT FENCE SHALL BE INSTALLED ON CONTOUR OTHER INSTALLATIONS ARE NOT EXCEPTABLE.
- \*FILTER FABRIC TO BE DETERMINED BY DESIGN ENGINEER

**TYPICAL CROSS SECTION**

**ELEVATION**

**CITY OF PUYALLUP**  
DEVELOPMENT ENGINEERING and PUBLIC WORKS DEPARTMENTS

**SILTATION FENCE**

DESIGNED BY	CHECKED BY	APPROVED BY	REVIEWED BY	CITY STANDARD
LINDA LANSING	LINDA LANSING	XXXX	XXXX	02.03.02

**SECTION A-A**

**CITY OF PUYALLUP**  
DEVELOPMENT ENGINEERING and PUBLIC WORKS DEPARTMENTS

**BARRIER WITH GRAVEL OUTLET**

DESIGNED BY	CHECKED BY	APPROVED BY	REVIEWED BY	CITY STANDARD
LINDA LANSING	LINDA LANSING	XXXX	XXXX	02.03.04

**TOP VIEW**

**PIPE SUPPORT**

**CITY OF PUYALLUP**  
DEVELOPMENT ENGINEERING and PUBLIC WORKS DEPARTMENTS

**FLOW CONTROL MANHOLE WITH FLAT TOP**

DESIGNED BY	CHECKED BY	APPROVED BY	REVIEWED BY	CITY STANDARD
LINDA LANSING	LINDA LANSING	XXXX	XXXX	02.01.07

**SDMH #1 CONTROL STRUCTURE TYPE 2-54'**

SCALE: 1"=2'

**CITY OF PUYALLUP**  
DEVELOPMENT ENGINEERING and PUBLIC WORKS DEPARTMENTS

**NOTCH WEIR**

**PLAN VIEW**

SCALE: 1"=2'

**APPROVED**

BY: CITY OF PUYALLUP DEVELOPMENT ENGINEERING

DATE: \_\_\_\_\_

**NOTE:** THIS APPROVAL IS VOID AFTER 180 DAYS FROM APPROVAL DATE. THE CITY WILL NOT BE RESPONSIBLE FOR ERRORS AND/OR OMISSIONS ON THESE PLANS. FIELD CONDITIONS MAY DICTATE CHANGES TO THESE PLANS AS DETERMINED BY THE DEVELOPMENT ENGINEERING MANAGER.

**CONSTRUCTION NOTES AND DETAILS**

**For:**

**CREF3 PUYALLUP OWNER LLC**  
11611 SAN VICENTE BLVD  
10TH FLOOR  
LOS ANGELES, CA 90049

**Barghausen Consulting Engineers, Inc.**  
18215 72nd Avenue South  
Kent, WA 98032  
425.251.6222 [barghausen.com](http://barghausen.com)

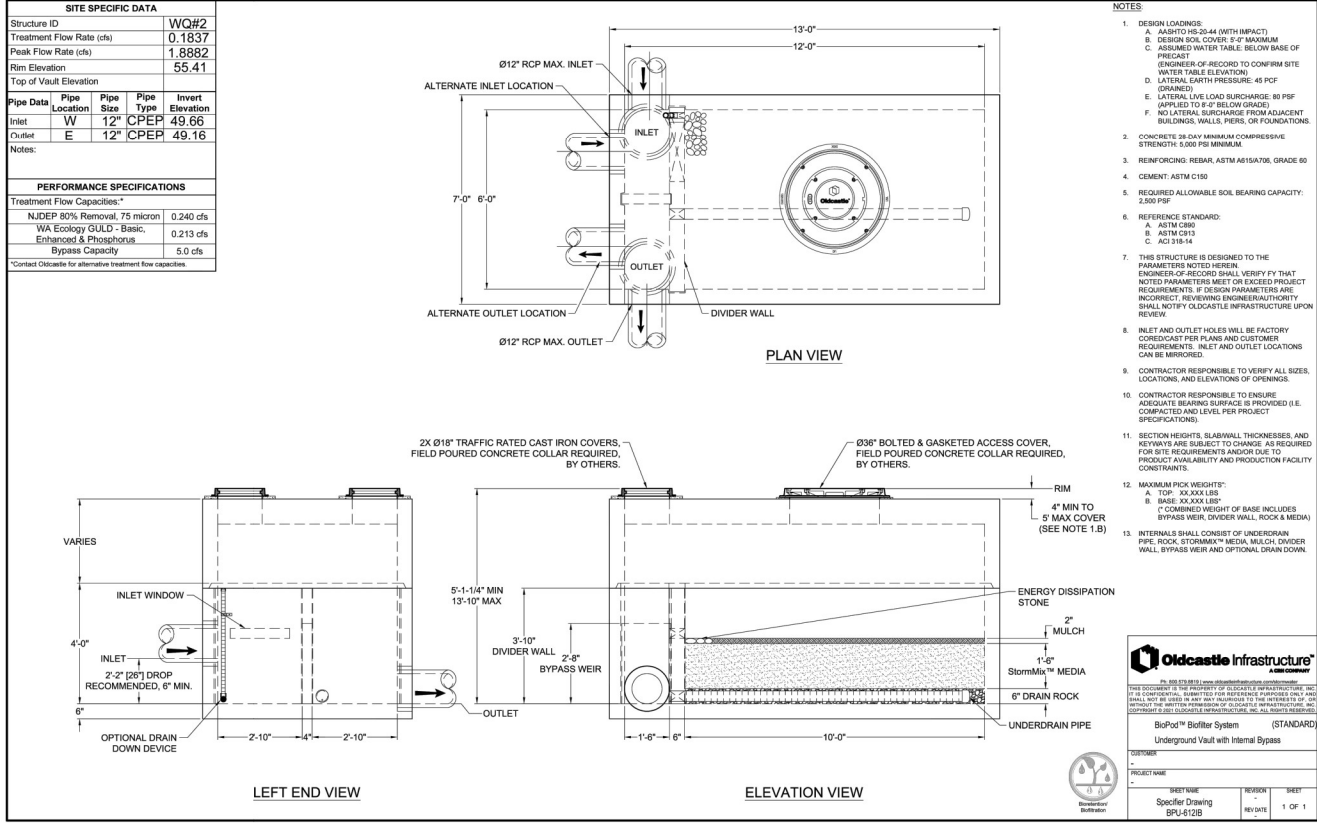
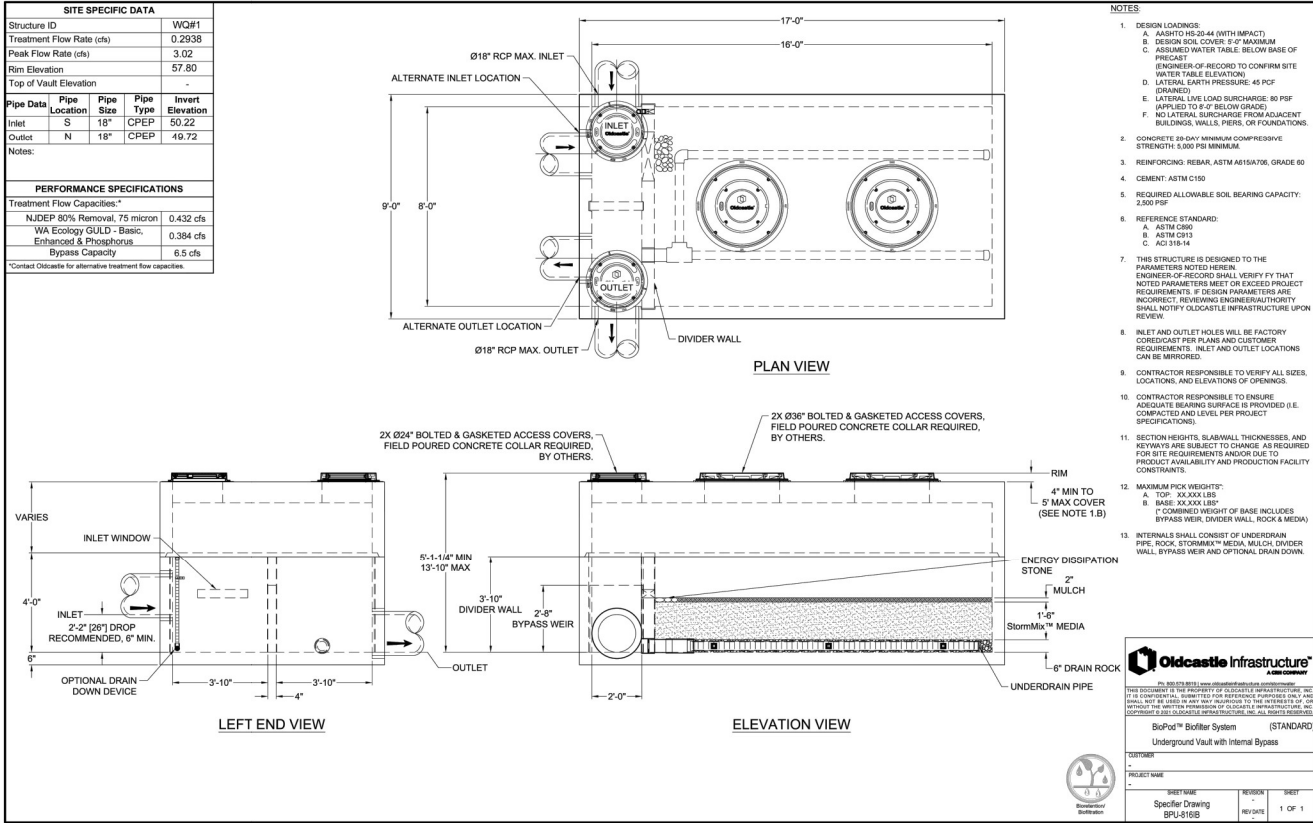
**Job Number** 22085 **Sheet** C18 of 26

**Scale:** Horizontal 1"=20' Vertical 1"=20'

**Designed** DL **Drawn** RDC **Checked** DL **Approved** JGH **Date** 5/23/23

**Professional Engineer** JASON GUY HUBBARD  
STATE OF WASHINGTON  
38950  
7/27/2023

# CONSTRUCTION DETAILS



Revision

Appr.

Ckd.

By

Date

No.

Title:

CONSTRUCTION DETAILS

FORTRESS - PUYALLUP

For: CREF3 PUYALLUP OWNER LLC  
11611 SAN VICENTE BLVD  
10TH FLOOR  
LOS ANGELES, CA 90049

For:



7/27/2023

Scale:

Horizontal

NA

Vertical

N/A

Designed

Drawn

Checked

Approved

Date

Barghausen Consulting Engineers, Inc.  
18215 72nd Avenue South  
Kent, WA 98032  
425.251.6222

barghausen.com



Job Number

22085

Sheet

C20

26

APPROVED

BY CITY OF PUYALLUP  
DEVELOPMENT ENGINEERING

DATE

NOTE: THIS APPROVAL IS VOID AFTER 180 DAYS FROM APPROVAL DATE.  
THE CITY WILL NOT BE RESPONSIBLE FOR ERRORS AND/OR OMISSIONS ON THESE PLANS.  
FIELD CONDITIONS MAY DICTATE CHANGES TO THESE PLANS AS DETERMINED BY THE DEVELOPMENT ENGINEERING MANAGER.



**Table V-A.2: Maintenance Standards - Infiltration (continued)**

Maintenance Component	Defect	Conditions When Maintenance Is Needed	Results Expected When Maintenance Is Performed
		(A percolation test pit or test of facility indicates facility is only working at 90% of its designed capabilities. Test every 2 to 5 years. If two inches or more sediment is present, remove).	
Filter Bags (if applicable)	Filled with Sediment and Debris	Sediment and debris fill bag more than 1/2 full.	Filter bag is replaced or system is redesigned.
Rock Filters	Sediment and Debris	By visual inspection, little or no water flows through filter during heavy rain storms.	Gravel in rock filter is replaced.
Side Slopes of Pond	Erosion	See <a href="#">Table V-A.1: Maintenance Standards - Detention Ponds</a>	See <a href="#">Table V-A.1: Maintenance Standards - Detention Ponds</a>
Emergency Overflow Spillway and Berms over 4 feet in height.	Tree Growth	See <a href="#">Table V-A.1: Maintenance Standards - Detention Ponds</a>	See <a href="#">Table V-A.1: Maintenance Standards - Detention Ponds</a>
	Piping	See <a href="#">Table V-A.1: Maintenance Standards - Detention Ponds</a>	See <a href="#">Table V-A.1: Maintenance Standards - Detention Ponds</a>
Emergency Overflow Spillway	Rock Missing	See <a href="#">Table V-A.1: Maintenance Standards - Detention Ponds</a>	See <a href="#">Table V-A.1: Maintenance Standards - Detention Ponds</a>
	Erosion	See <a href="#">Table V-A.1: Maintenance Standards - Detention Ponds</a>	See <a href="#">Table V-A.1: Maintenance Standards - Detention Ponds</a>
Pre-settling Ponds and Vaults	Facility or sump filled with Sediment and/or debris	6" or designed sediment trap depth of sediment.	Sediment is removed.

**Table V-A.3: Maintenance Standards - Closed Detention Systems (Tanks/Vaults)**

Maintenance Component	Defect	Conditions When Maintenance is Needed	Results Expected When Maintenance is Performed
Storage Area	Plugged Air Vents	One-half of the cross section of a vent is blocked at any point or the vent is damaged.	Vents open and functioning.
	Debris and Sediment	Accumulated sediment depth exceeds 10% of the diameter of the storage area for 1/2 length of storage vault or any point depth exceeds 15% of diameter. (Example: 72-inch storage tank would require cleaning when sediment reaches depth of 7 inches for more than 1/2 length of tank.)	All sediment and debris removed from storage area.
	Joints Between Tank/Pipe Section	Any openings or voids allowing material to be transported into facility. (Will require engineering analysis to determine structural stability).	All joint between tank/pipe sections are sealed.
	Tank Pipe Bent Out of Shape	Any part of tank/pipe is bent out of shape more than 10% of its design shape. (Review required by engineer to determine structural stability).	Tank/pipe repaired or replaced to design.
	Vault Structure Includes Cracks in Wall, Bottom, Damage to Frame and/or Top Slab	Cracks wider than 1/2-inch and any evidence of soil particles entering the structure through the cracks, or maintenance/inspection personnel determines that the vault is not structurally sound.  Cracks wider than 1/2-inch at the joint of any inlet/outlet pipe or any evidence of soil particles entering the vault through the walls.	Vault replaced or repaired to design specifications and is structurally sound.  No cracks more than 1/4-inch wide at the joint of the inlet/outlet pipe.



**Table V-A.3: Maintenance Standards - Closed Detention Systems (Tanks/Vaults) (continued)**

Maintenance Component	Defect	Conditions When Maintenance is Needed	Results Expected When Maintenance is Performed
Manhole	Cover Not in Place	Cover is missing or only partially in place. Any open manhole requires maintenance.	Manhole is closed.
	Locking Mechanism Not Working	Mechanism cannot be opened by one maintenance person with proper tools. Bolts into frame have less than 1/2 inch of thread (may not apply to self-locking lids).	Mechanism opens with proper tools.
	Cover Difficult to Remove	One maintenance person cannot remove lid after applying normal lifting pressure. Intent is to keep cover from sealing off access to maintenance.	Cover can be removed and reinstalled by one maintenance person.
	Ladder Rungs Unsafe	Ladder is unsafe due to missing rungs, misalignment, not securely attached to structure wall, rust, or cracks.	Ladder meets design standards. Allows maintenance person safe access.
Catch Basins	See <a href="#">Table V-A.5: Maintenance Standards - Catch Basins</a>	See <a href="#">Table V-A.5: Maintenance Standards - Catch Basins</a>	See <a href="#">Table V-A.5: Maintenance Standards - Catch Basins</a>

**Table V-A.4: Maintenance Standards - Control Structure/Flow Restrictor**

Maintenance Component	Defect	Condition When Maintenance is Needed	Results Expected When Maintenance is Performed
General	Trash and Debris (Includes Sediment)	Material exceeds 25% of sump depth or 1 foot below orifice plate.	Control structure orifice is not blocked. All trash and debris removed.
	Structural Damage	Structure is not securely attached to manhole wall. Structure is not in upright position (allow up to 10% from plumb). Connections to outlet pipe are not watertight and show signs of rust. Any holes - other than designed holes - in the structure.	Structure securely attached to wall and outlet pipe. Structure in correct position. Connections to outlet pipe are water tight; structure repaired or replaced and works as designed. Structure has no holes other than designed holes.
Cleanout Gate	Damaged or Missing	Cleanout gate is not watertight or is missing. Gate cannot be moved up and down by one maintenance person. Chain/rod leading to gate is missing or damaged. Gate is rusted over 50% of its surface area.	Gate is watertight and works as designed. Gate moves up and down easily and is watertight. Chain is in place and works as designed. Gate is repaired or replaced to meet design standards.
Orifice Plate	Damaged or Missing	Control device is not working properly due to missing, out of place, or bent orifice plate.	Plate is in place and works as designed.
	Obstructions	Any trash, debris, sediment, or vegetation blocking the plate.	Plate is free of all obstructions and works as designed.
Overflow Pipe	Obstructions	Any trash or debris blocking (or having the potential of blocking) the overflow pipe.	Pipe is free of all obstructions and works as designed.
Manhole	See <a href="#">Table V-A.3: Maintenance Standards - Closed Detention Systems (Tanks/Vaults)</a>	See <a href="#">Table V-A.3: Maintenance Standards - Closed Detention Systems (Tanks/Vaults)</a>	See <a href="#">Table V-A.3: Maintenance Standards - Closed Detention Systems (Tanks/Vaults)</a>
Catch Basin	See <a href="#">Table V-A.5: Maintenance Standards - Catch Basins</a>	See <a href="#">Table V-A.5: Maintenance Standards - Catch Basins</a>	See <a href="#">Table V-A.5: Maintenance Standards - Catch Basins</a>

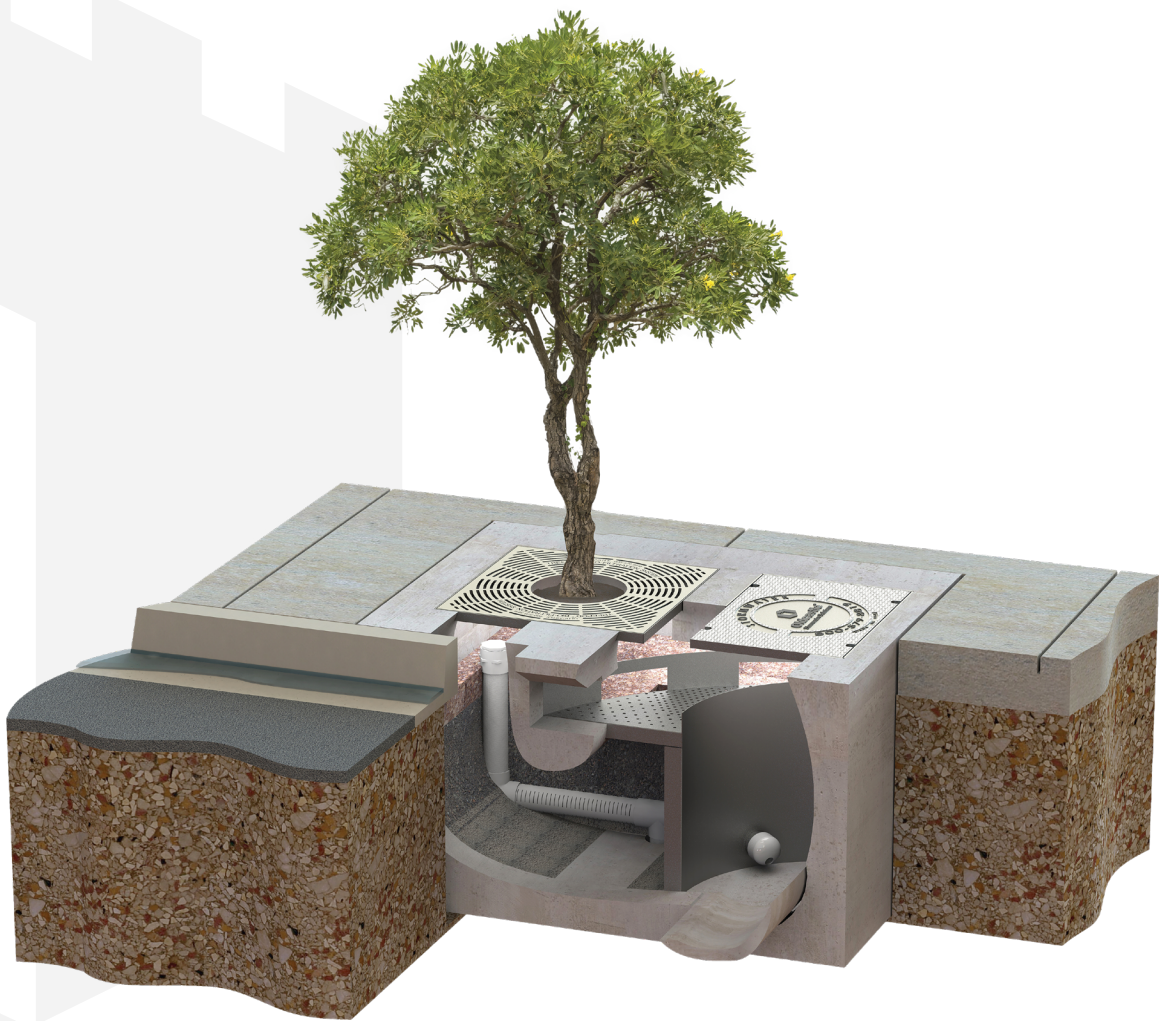
**Table V-A.5: Maintenance Standards - Catch Basins**

Maintenance Component	Defect	Conditions When Maintenance is Needed	Results Expected When Maintenance is performed
General	Trash & Debris	Trash or debris which is located immediately in front of the catch basin opening or is blocking inletting capacity of the basin by more than 10%. Trash or debris (in the basin) that exceeds 60 percent of the sump depth as measured from the bottom of basin to invert of the lowest pipe into or out of the basin, but in no case less than a minimum of six inches clearance from the debris surface to the invert of the lowest pipe. Trash or debris in any inlet or outlet pipe blocking more than 1/3 of its height. Dead animals or vegetation that could generate odors that could cause complaints or dangerous gases (e.g., methane).	No Trash or debris located immediately in front of catch basin or on grate opening. No trash or debris in the catch basin. Inlet and outlet pipes free of trash or debris. No dead animals or vegetation present within the catch basin.
	Sediment	Sediment (in the basin) that exceeds 60 percent of the sump depth as measured from the bottom of basin to invert of the lowest pipe into or out of the basin, but in no case less than a minimum of 6 inches clearance from the sediment surface to the invert of the lowest pipe.	No sediment in the catch basin
	Structure Damage to Frame and/or Top Slab	Top slab has holes larger than 2 square inches or cracks wider than 1/4 inch. (Intent is to make sure no material is running into basin). Frame not sitting flush on top slab, i.e., separation of more than 3/4 inch of the frame from the top slab. Frame not securely attached	Top slab is free of holes and cracks. Frame is sitting flush on the riser rings or top slab and firmly attached.
	Fractures or Cracks in Basin Walls/ Bottom	Maintenance person judges that structure is unsound. Grout fillet has separated or cracked wider than 1/2 inch and longer than 1 foot at the joint of any inlet/outlet pipe or any evidence of soil particles entering catch basin through cracks.	Basin replaced or repaired to design standards. Pipe is regouted and secure at basin wall.
	Settlement/ Mis-alignment	If failure of basin has created a safety, function, or design problem.	Basin replaced or repaired to design standards.
	Vegetation	Vegetation growing across and blocking more than 10% of the basin opening. Vegetation growing in inlet/outlet pipe joints that is more than six inches tall and less than six inches apart.	No vegetation blocking opening to basin. No vegetation or root growth present.
	Contamination and Pollution	See <a href="#">Table V-A.1: Maintenance Standards - Detention Ponds</a>	No pollution present.
Catch Basin Cover	Cover Not in Place	Cover is missing or only partially in place. Any open catch basin requires maintenance.	Cover/grate is in place, meets design standards, and is secured
	Locking Mechanism Not Working	Mechanism cannot be opened by one maintenance person with proper tools. Bolts into frame have less than 1/2 inch of thread.	Mechanism opens with proper tools.
	Cover Difficult to Remove	One maintenance person cannot remove lid after applying normal lifting pressure. (Intent is keep cover from sealing off access to maintenance.)	Cover can be removed by one maintenance person.
Ladder	Ladder Rungs Unsafe	Ladder is unsafe due to missing rungs, not securely attached to basin wall, misalignment, rust, cracks, or sharp edges.	Ladder meets design standards and allows maintenance person safe access.
Metal Grates (If Applicable)	Grate opening Unsafe	Grate with opening wider than 7/8 inch.	Grate opening meets design standards.
	Trash and Debris	Trash and debris that is blocking more than 20% of grate surface inletting capacity.	Grate free of trash and debris.
	Damaged or Missing.	Grate missing or broken member(s) of the grate.	Grate is in place, meets the design standards, and is installed and aligned with the flow path.

# BIOPOD™ SYSTEM

with StormMix™ Media

## Inspection & Maintenance Guide



**Oldcastle** Infrastructure™  
A CRH COMPANY

# **BIOPOD™ BIOFILTER WITH STORMMIX™ BIOFILTRATION MEDIA**

## **DESCRIPTION**

The BioPod™ Biofilter System (BioPod) is a storm water biofiltration treatment system used to remove pollutants from storm water runoff. Impervious surfaces and other urban and suburban landscapes generate a variety of contaminants that can enter storm water and pollute downstream receiving waters unless treatment is provided. The BioPod system uses proprietary StormMix™ biofiltration media to capture and retain pollutants including total suspended solids (TSS), metals, nutrients, gross solids, trash and debris as well as petroleum hydrocarbons.

## **FUNCTION**

The BioPod system uses engineered, high-flow rate filter media to remove storm water pollutants, allowing for a smaller footprint than conventional bioretention systems. Contained within a compact precast concrete vault, the BioPod system consists of a biofiltration chamber and an optional integrated high-flow bypass. The biofiltration chamber is filled with horizontal layers of aggregate, biofiltration media and mulch. Storm water passes vertically down through the mulch and biofiltration media for treatment. The mulch provides pretreatment by retaining most of the solids or sediment. The biofiltration media provides further treatment by retaining finer sediment and dissolved pollutants. The aggregate allows the media bed to drain evenly for discharge through an underdrain pipe or by infiltration.

## **INSPECTION & MAINTENANCE OVERVIEW**

State and local regulations require all storm water management systems to be inspected on a regular basis and maintained as necessary to ensure performance and protect downstream receiving waters. Without maintenance, excessive pollutant buildup can limit system performance by reducing the operating capacity of the system and increasing the potential for scouring of pollutants during periods of high flow.

Some configurations of the BioPod may require periodic irrigation to establish and maintain vegetation. Vegetation will typically become established about two years after planting. Irrigation requirements are ultimately dependent on climate, rainfall and the type of vegetation selected.

## **INSPECTION & MAINTENANCE FREQUENCY**

Periodic inspection is essential for consistent system performance and is easily completed. Inspection is typically conducted a minimum of twice per year, but since pollutant transport and deposition varies from site to site, a site-specific maintenance frequency should be established during the first two or three years of operation.



## INSPECTION EQUIPMENT

The following equipment is helpful when conducting BioPod inspections:

- | Recording device (pen and paper form, voice recorder, iPad, etc.)
- | Suitable clothing (appropriate footwear, gloves, hardhat, safety glasses, etc.)
- | PPE as required for entry
- | Traffic control equipment (cones, barricades, signage, flagging, etc.)
- | Manhole hook or pry bar
- | Flashlight
- | Tape measure
- | Socket

## INSPECTION PROCEDURES

BioPod inspections are visual and are conducted without entering the unit. To complete an inspection, safety measures including traffic control should be deployed before the access covers or tree grates are removed. Once the covers have been removed, the following items should be checked and recorded (see form provided on page 6) to determine whether maintenance is required:

- | If the BioPod unit is equipped with an internal bypass, inspect the inlet rack (or inlet chamber on underground units) and outlet chamber and note whether there are any broken or missing parts. In the unlikely event that internal parts are broken or missing, contact Oldcastle Storm water at (800) 579-8819 to determine appropriate corrective action.
- | Note whether the curb inlet, inlet pipe, or inlet rack is blocked or obstructed.
- | If the unit is equipped with an internal bypass, observe, quantify and record the accumulation of trash and debris in the inlet rack or inlet chamber. The significance of accumulated trash and debris is a matter of judgment. Often, much of the trash and debris may be removed manually at the time of inspection if a separate maintenance visit is not yet warranted.
- | If it has not rained within the past 24 hours, note whether standing water is observed in the biofiltration chamber.
- | Finally, observe, quantify and record presence of invasive vegetation and the amount of trash and debris and sediment load in the biofiltration chamber. Erosion of the mulch and biofiltration media bed should also be recorded. Often, much of the invasive vegetation and trash and debris may be removed manually at the time of inspection if a separate maintenance visit is not yet warranted. Sediment load may be rated light, medium or heavy depending on the conditions. Loading characteristics may be determined as follows:
  - **Light sediment load** – sediment is difficult to distinguish among the mulch fibers at the top of the mulch layer; the mulch appears almost new.
  - **Medium sediment load** – sediment accumulation is apparent and may be concentrated in some areas; probing the mulch layer reveals lighter sediment loads under the top 1" of mulch.
  - **Heavy sediment load** – sediment is readily apparent across the entire top of the mulch layer; individual mulch fibers are difficult to distinguish; probing the mulch layer reveals heavy sediment load under the top 1" of mulch.

## MAINTENANCE INDICATORS

Maintenance should be scheduled if any of the following conditions are identified during inspection:

- | The concrete structure is damaged or the tree grate or access cover is damaged or missing
- | The inlet obstructed
- | Standing water is observed in the biofiltration chamber more than 24 hours after a rainfall event (use discretion if the BioPod is located downstream of a storage system that attenuates flow)
- | Trash and debris in the inlet rack cannot be easily removed at the time of inspection
- | Trash and debris, invasive vegetation or sediment load in the biofiltration chamber is heavy or excessive erosion has occurred

## MAINTENANCE EQUIPMENT

The following equipment is helpful when conducting BioPod maintenance:

- |   |                             |
|---|-----------------------------|
| Suitable clothing (appropriate footwear, gloves, hardhat, safety glasses, etc.) | Rake, hoe, shovel and broom |
| PPE as required for entry   | Bucket                      |
| Traffic control equipment (cones, barricades, signage, flagging, etc.)          | Pruners                     |
| Manhole hook or pry bar   | Vacuum truck (optional)     |
| Flashlight  | Socket                      |
| Tape measure  |                             |

## MAINTENANCE PROCEDURES

Maintenance should be conducted during dry weather when no flows are entering the system. In most cases, maintenance may be conducted without entering. Entry may be required to maintain BioPod Underground units, depending on system depth. Once safety measures such as traffic control are deployed, the access covers may be removed and the following activities may be conducted to complete maintenance:

- | Remove all trash and debris from the curb inlet and inlet rack manually or by using a vacuum truck as required.
- | Remove all trash and debris and invasive vegetation from the biofiltration chamber manually or by using a vacuum truck as required.
- | If the sediment load is medium or light but erosion of the biofiltration media bed is evident, redistribute the mulch with a rake or replace missing mulch as appropriate. If erosion persists, rocks may be placed in the eroded area to help dissipate energy and prevent recurring erosion.
- | If the sediment load is heavy, remove the mulch layer using a hoe, rake, shovel and bucket, or by using a vacuum truck as required. If the sediment load is particularly heavy, inspect the surface of the biofiltration media once the mulch has been removed. If the media appears clogged with sediment, remove and replace one or two inches of biofiltration media prior to replacing the mulch\* layer.
- | Prune vegetation as appropriate and replace damaged or dead plants as required.
- | Replace the tree grate and/or access covers and sweep the area around the BioPod to leave the site clean.
- | All material removed from the BioPod during maintenance must be disposed of in accordance with local environmental regulations. In most cases, the material may be handled in the same manner as disposal of material removed from sumped catch basins or manholes.





\* Natural, shredded hardwood mulch should be used in the BioPod. Timely replacement of the mulch layer according to the maintenance indicators described above should protect the biofiltration media below the mulch layer from clogging due to sediment accumulation. However, whenever the mulch is replaced, the BioPod should be visited 24 hours after the next major storm event to ensure that there is no standing water in the biofiltration chamber. Standing water indicates that the biofiltration media below the mulch layer is clogged and must be replaced. Please contact Oldcastle Infrastructure at (800) 579-8819 to purchase the proprietary StormMix™ biofiltration media.



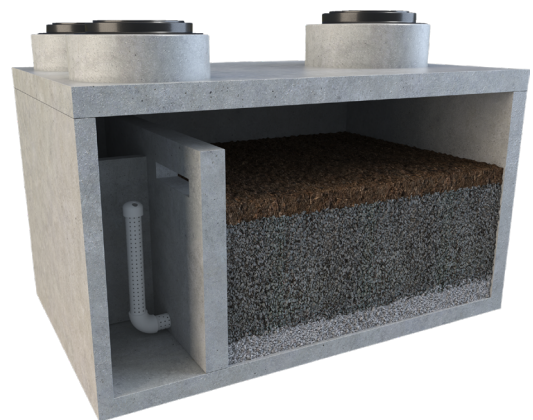
**BIOPOD TREE**



**BIOPOD SURFACE**



**BIOPOD PLANTER**



**BIOPOD UNDERGROUND**

# BIOPOD INSPECTION & MAINTENANCE LOG

BioPod Model \_\_\_\_\_ Inspection Date \_\_\_\_\_

Location \_\_\_\_\_

*Condition of Internal Components*

*NOTES:*

☐ **GOOD**    ☐ **DAMAGED**    ☐ **MISSING**

*Curb Inlet or Inlet Rack Blocked*

*NOTES:*

☐ **YES**    ☐ **NO**

*Standing Water in Biofiltration Chamber*

*NOTES:*

☐ **YES**    ☐ **NO**

*Trash and Debris in Inlet Rack*

*NOTES:*

☐ **YES**    ☐ **NO**

*Trash and Debris in Biofiltration Chamber*

*NOTES:*

☐ **YES**    ☐ **NO**

*Invasive Vegetation in Biofiltration Chamber*

*NOTES:*

☐ **YES**    ☐ **NO**

*Sediment in Biofiltration Chamber*

*NOTES:*

☐ **LIGHT**    ☐ **MEDIUM**    ☐ **HEAVY**

*Erosion in Biofiltration Chamber*

*NOTES:*

☐ **YES**    ☐ **NO**

*Maintenance Requirements*

☐ **YES - Schedule Maintenance**    ☐ **NO - Schedule Re-Inspection**



## This image shows a single page of white paper with horizontal blue or grey ruling lines. The lines are evenly spaced and run across the width of the page, leaving small margins at the top and bottom. There are no vertical margin lines, text, or other markings on the page.

