1st Review
PRCCP20230970
July 2023

OPERATIONS & MAINTENANCE MANUAL

East Town Crossing

1001 Shaw Road, Puyallup, WA 98732

6/29/2023

Prior to Occupancy, submit a DRAFT version of the City's Stormwater Management Facilities Agreement with an O&M manual using the maintenance activities described in the City's Stormwater Site Management Plan. The agreement shall be recorded with the Pierce County Auditors Office. [O&M Manual; Pg 1 of 25]

Provide R-Tank O&M information. [O&M Manual; Pg 1 of 25]

Project Address
1001 Shaw Road
Puyallup, WA 98732

Owner
East Town Crossing LLC
Contact: Greg Helle

Prepared By:
Will McInnis
McInnis Engineering
202 East 34th Street
Tacoma WA, 98404
(253) 414-1992

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1.0 Maintenance and Source Control Manual Section 1 – Project Description

The project address is 1001 Shaw Road, Puyallup, WA 98372. Parcel Numbers 0420264021, 0420264053, 0420264053, 0420351066, 0420351030, 0420351029, 0420351026. The parcels total 10.36 acres and they are zoned for CG and RM-20.

In existing conditions, the land is grassy with a network of existing dirt/gravel access roads. It also houses a stormwater pond serving the nearby Absher Construction office complex.

The project will include a commercial area containing 2 commercial buildings, and 5 multifamily buildings totaling 120 units.

Catch basins, a piped conveyance system, Rtanks, and a Contech Modular Wetlands will mitigate stormwater on site. These features should be maintained.

Flow Control

The proposed project will utilize an Rtanks to provide detention and a Contech Modular Wetlands system to provide water quality. Storm water will flow from the parking areas and road network to the catch basins and into the Rtanks. Once the water has been detained appropriately it will be released to the Modular Wetlands system before entering a storm drainage ditch in the frontage of Pioneer.

The proposed project improvements consist of approximately 5.13 acres of new hard surfaces. The project will result in coverage of 50% of the project area being covered by impervious surfaces. Per the 2019 Stormwater Management Manual for Western Washington, this project must comply with all minimum requirements.

Conveyance System

The conveyance system consists of catch basins that will flow water through a storm pipe and into the Rtanks.

Downstream Analysis

The Rtanks will provide detention and the Modular Wetlands system will provide water quality.

2.0 Maintenance and Source Control Manual Section 2 – Maintenance Importance and Intent

The importance of maintenance for the proper functioning of stormwater control facilities cannot be over-emphasized. A substantial portion of failures (clogging of filters, resuspension of sediments, loss of storage capacity, etc.) are due to inadequate maintenance. Stormwater BMP maintenance is essential to ensure that BMPs function as intended throughout their life cycle.

The fundamental goals of maintenance activities are to ensure the entire flow regime and treatment train designed for this site continue to fully function. For this site these include:

- Maintain designed stormwater infiltration capacity

- Maintain designed stormwater detention/retention volume
- Maintain ability of storm facility to attenuate flow rates
- Maintain ability to safely convey design stormwater flows
- Maintain ability to treat stormwater runoff quality
- Preserve soil and plant health, as well as stormwater flow contactwith plant and soil systems
- Clearly identify systems so they can be protected
- Keep maintenance costs low
- Prevent large-scale or expensive stormwater system failures
- Prevent water quality violations or damage to downstream properties

The intent of this section and manual is to pass on to the responsible party(s) all the information critical to understand the design of the system, risks and considerations for proper use, suggestions for maintenance frequencies, and cost so that realistic budgets can be established.

3.0 Maintenance and Source Control Manual Section 3 – Responsible Parties

The property owner will be responsible for the maintenance of the BMPs on site.

4.0 Maintenance and Source Control Manual Section 4 – Facilities Requiring Maintenance

- Rtanks
- Contech Modular Wetland
- Catch Basins
- Drain Pipes
- Trees
- Landscaping

5.0 Maintenance and Source Control Manual Section 5 – Maintenance Instructions

The parties responsible for maintenance must review and apply the maintenance requirements contained herein. These maintenance instructions outline conditions for determining if maintenance actions are required, as identified through inspection. However, they are not intended to be measures of the facility's required condition at all times between inspections. Exceedance of these conditions at any time between inspections or maintenance activity does not automatically constitute a violation of these standards. However, based upon inspection observations, the inspection and maintenance presented in the checklists shall be adjusted to minimize the length of time that a facility is in a condition that requires maintenance action. For facilities not owned and maintained by the city, a log of maintenance activity that indicates what actions were taken must be

kept on site and be available for inspection by the city. See Attachment A – Maintenance Checklist.

6.0 Maintenance and Source Control Manual Section 6 – Vegetation Maintenance

The property owner will have a responsibility to maintain the vegetated flowpath for all proposed dispersion trenches if applicable. All flowpath areas shall be maintained per maintenance checklist provided and must consist of either undisturbed native landscape, or well-established lawn, landscape, groundcover over soils that meets the preservation and amendment BMP requirements.

7.0 Maintenance and Source Control Manual Section 7 – Pollution Source Control Measures

The plans provided with this report will be followed in the field to reduce the potential for pollution. It is anticipated that the only source of pollution generated on site will be from the minimal disturbance of soils which will be controlled by following the provided SWPPP and TESC plan.

8.0 Maintenance and Source Control Manual Section 8 – Annual Cost of Maintenance

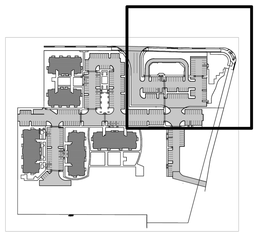
Maintenance costs for stormwater management facilities shall be determined by the property owner.

Figure 1: Map of Project Area

EAST TOWN CROSSING

STORM PLAN I

SEC. 26,35/ TWP. 20 N./ RGE. 4 E., W.M.



KEY MAP

CONVEYANCE SYSTEM

RTANKS

CONTECH MODULAR WETLANDS WATER QUALITY SYSTEM

SEE PROFILE 1/C18

RAISED CROSSWALK

1/C28 RTANK 1 SEE DETAIL

MATCH LINE SEE SHEET C9

CONNECT TO R-TANK IE = 69.34'

SDMH Type 2
RIM:75.90
IE = 68.00 24" (CPEP S)
IE = 68.00 24" (CPEP N)

96LF of 24" CPEP @ 0.00%

SDMH Type 2
RIM:75.00
IE = 68.00 24" (CPEP S)
IE = 68.00 24" (CPEP N)

127LF of 24" CPEP @ 0.00%

76LF of 24" CPEP @ 0.00%

CONTROL MANHOLE
RIM:74,79
IE = 68.00 24" (CPEP S)
IE = 68.00 24" (CPEP W)

41LF of 12" CPEP @ 0.00%

SDCB Type 1
RIM:69.23
IE = 68.00 12" (CPEP S)
IE = 68.00 12" (CPEP N)

5LF of 12" CPEP @ 0.00%

38LF of 12" CPEP @ 0.00%

10LF of 12" CPEP @ 0.00%

SDCB Type 1
RIM:73.20
IE = 70.26 12" (CPEP W)

MATCH LINE SEE SHEET C10

SEE PROFILE 4/C18

SDCB Type 1
RIM:73.36
IE = 70.36 12" (CPEP E)

89LF of 12" CPEP @ 1.00%

SDCB Type 1
RIM:73.20
IE = 69.37 12" (CPEP W)
IE = 69.37 12" (CPEP E)
IE = 69.37 12" (CPEP N)

12LF of 12" CPEP @ 1.00%

CONNECT TO R-TANK IE = 69.25'

13LF of 12" CPEP @ 1.00%

SDCB Type 1
RIM:73.00
IE = 69.47 12" (CPEP W)
IE = 69.47 12" (CPEP E)

SDCB Type 1
RIM:73.30
IE = 69.29 12" (CPEP E)

13LF of 12" CPEP @ 1.00%

CONNECT TO R-TANK IE = 69.17'

SDCB Type 1
RIM:73.27
IE = 70.27 12" (CPEP E)

90LF of 12" CPEP @ 1.00%

43LF of 12" CPEP @ 1.00%

72LF of 12" CPEP @ 1.00%

146LF of 12" CPEP @ 1.00%

SEE PROFILE 2/C18

SEE PROFILE 3/C18

RAISED CROSSWALK

SDCB Type 1
RIM:73.00
IE = 70.52 12" (CPEP E)

SDCB Type 1
RIM:73.20
IE = 69.80 12" (CPEP S)
IE = 69.80 12" (CPEP W)
IE = 69.80 12" (CPEP E)

OUTLET @61.78'
CONNECT TO EXISTING MH.
SEE SOUNDVIEW PLANS

57LF of 12" CPEP @ 0.30%

INLET IE = 62.20'

84LF of 12" CPEP @ 0.30%

MODULAR WETLAND SEE DETAIL 1/C27

FLOW CONTROL MANHOLE SEE DETAIL 4/C22

INLET IE = 64.00'

FLOW CONTROL MANHOLE SEE DETAIL 4/C22

0 20 40 Feet

TOPOGRAPHIC NOTE

THE EXISTING CULTURAL AND TOPOGRAPHICAL DATA SHOWN ON THESE DRAWINGS HAS BEEN PREPARED, IN PART, BASED UPON INFORMATION FURNISHED BY OTHERS. WHILE THIS INFORMATION IS BELIEVED TO BE RELIABLE, MCINNIS ENGINEERING CANNOT ENSURE ACCURACY AND THUS IS NOT RESPONSIBLE FOR THE ACCURACY OF THAT INFORMATION OR FOR ANY ERRORS OR OMISSIONS WHICH MAY HAVE BEEN INCORPORATED INTO THESE DRAWINGS AS A RESULT.

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TRENCH NOTES

IF WORKERS ENTER ANY TRENCH OR OTHER EXCAVATION FOUR OR MORE FEET IN DEPTH THAT DOES NOT MEET THE OPEN PIT REQUIREMENTS OF WSDOT SECTION 2-09.3(3)8, IT SHALL BE SHORED AND CRIBBED. THE CONTRACTOR IS ALONE RESPONSIBLE FOR WORKER SAFETY. ALL TRENCH SAFETY SYSTEMS SHALL MEET THE REQUIREMENTS OF THE WASHINGTON INDUSTRIAL SAFETY AND HEALTH ACT, CHAPTER 49.17 RCW.

CALL BEFORE YOU DIG
1-800-424-5555 OR 811

APPROVED

BY _____
CITY OF PUYALLUP
DEVELOPMENT ENGINEERING

DATE _____

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PUYALLUP, WA 98372

JEFFREY W. McINNIS
STATE OF WASHINGTON
37399
REGISTERED PROFESSIONAL ENGINEER
6/2/23

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J. MCINNIS	1:40
DRAWN	CHECKED
W. MCINNIS	CHCK
DATE	APPROVED
6/2/23	APRD

SHEET 7 OF 46

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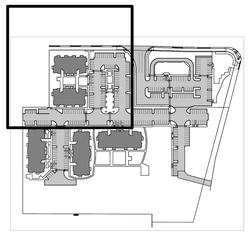
EAST TOWN CROSSING

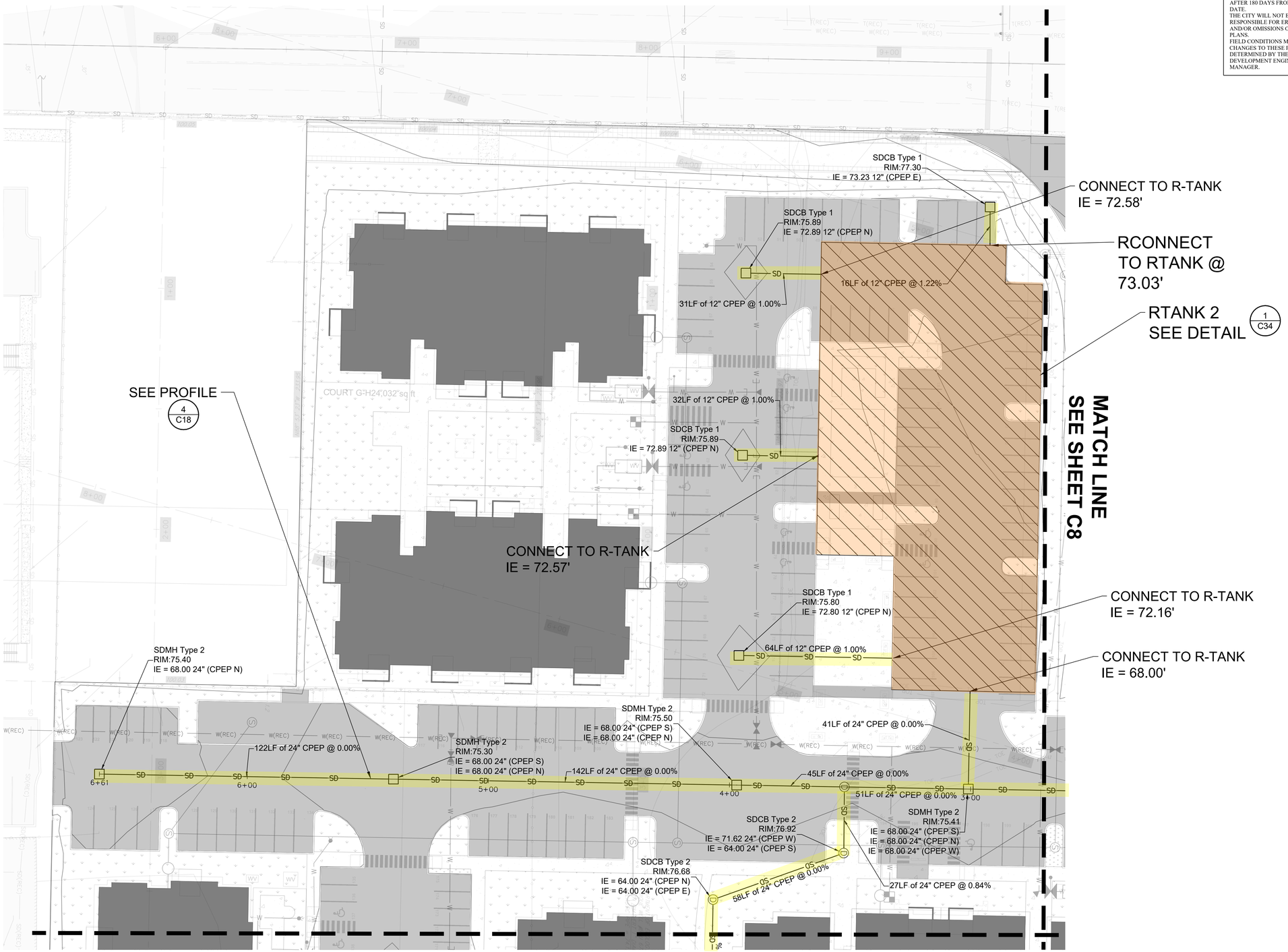
STORM PLAN II

SEC. 26,35/ TWP. 20 N./ RGE. 4 E., W.M.



KEY MAP

- CONVEYANCE SYSTEM
- RTANKS
- CONTECH MODULAR WETLANDS WATER QUALITY SYSTEM



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EAST TOWN CROSSING

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STATE OF WASHINGTON
37399
REGISTERED
PROFESSIONAL ENGINEER
6/2/23

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8 OF 46

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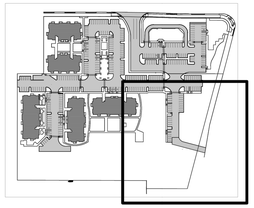
EAST TOWN CROSSING

STORM PLAN III

SEC. 26,35/ TWP. 20 N./ RGE. 4 E., W.M.



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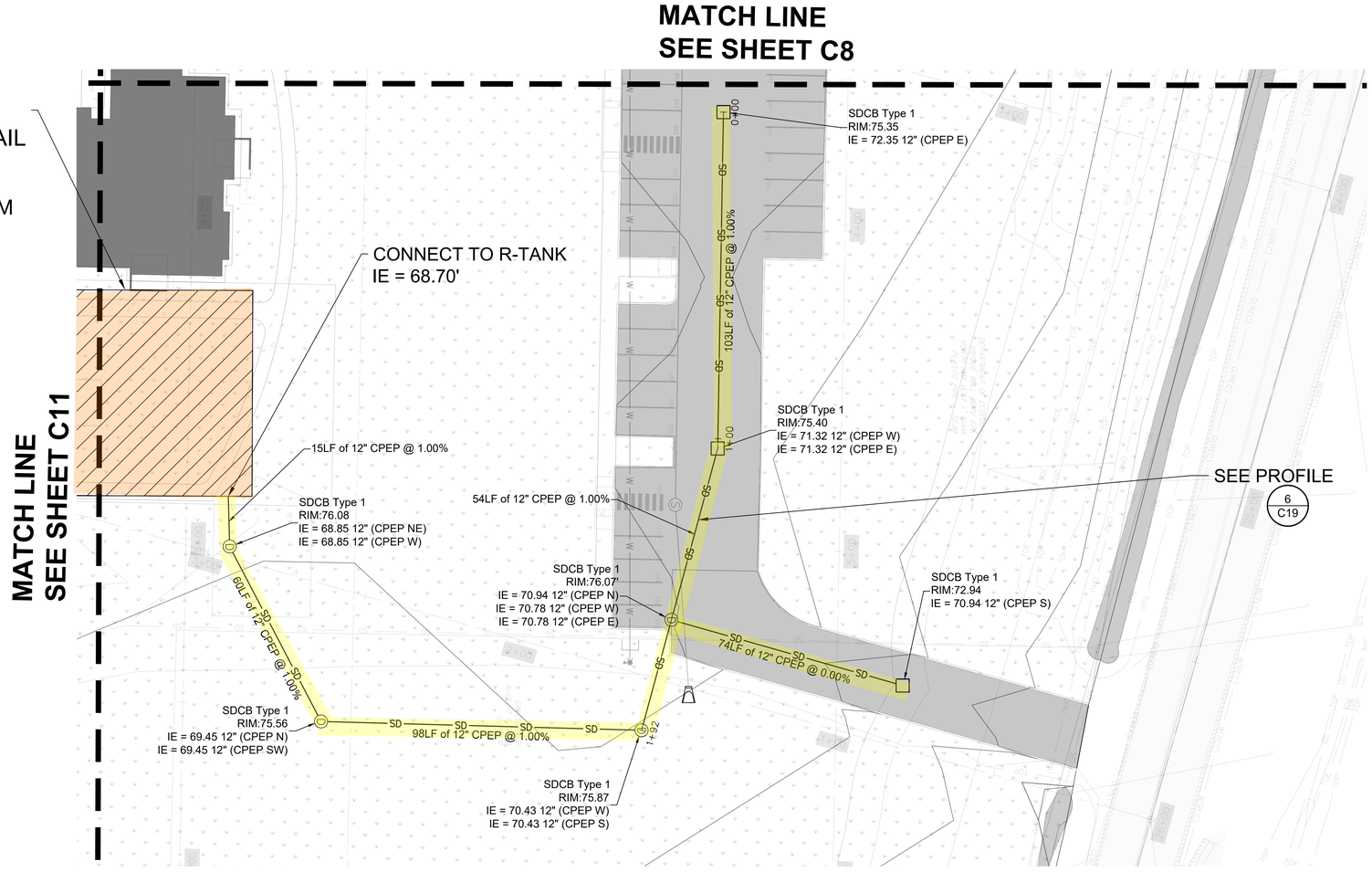

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0 20 40 Feet

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DATE 6/2/23	APPROVED APRD

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C-9

EAST TOWN CROSSING

STORM PLAN IV

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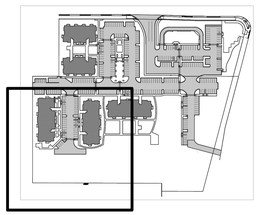

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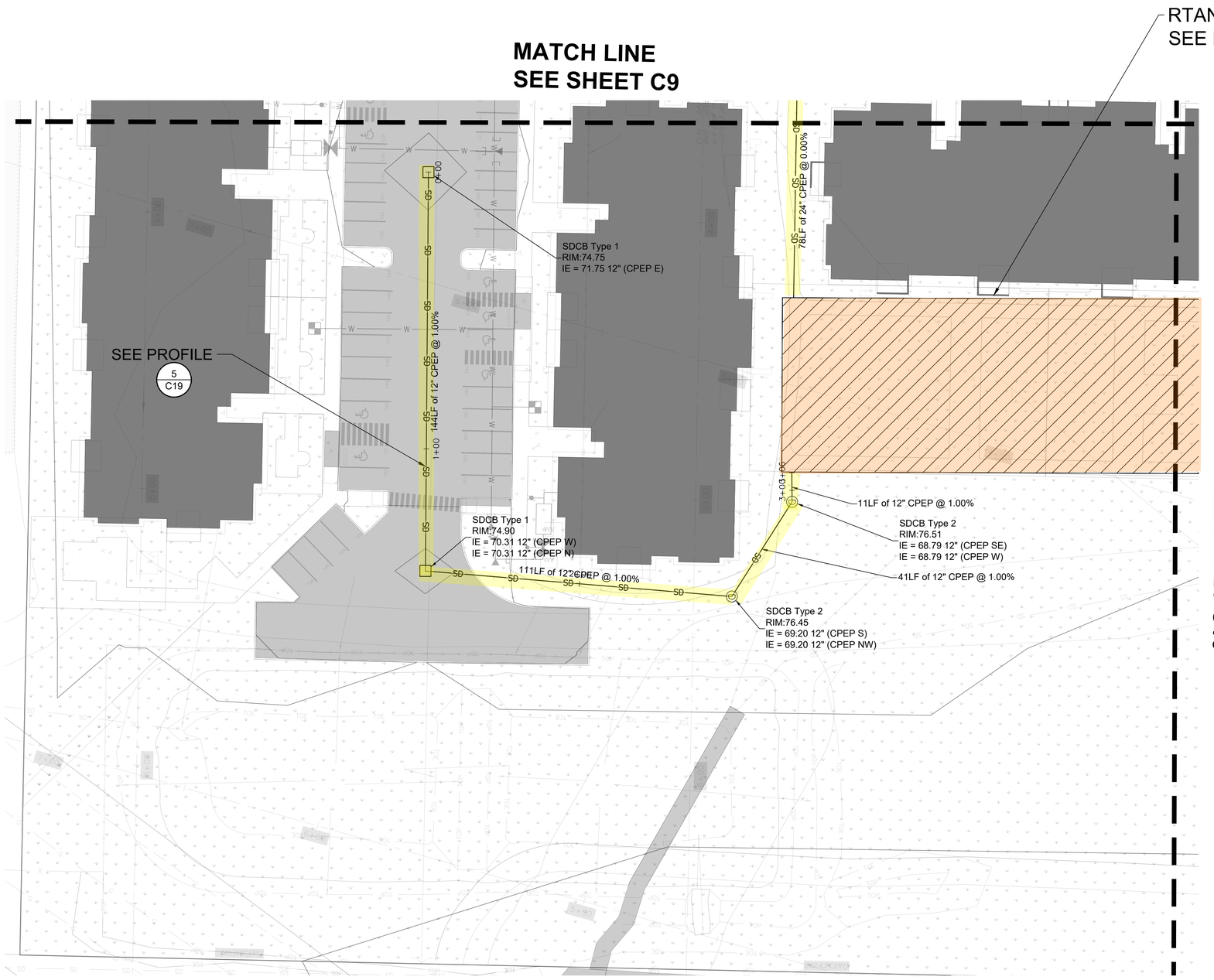

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10 OF 46

C-10

Appendix A – Maintenance Checklists

#3 – Maintenance Checklist for Closed Detention Systems (Tanks/Vaults):

Drainage System Feature	Defect or Problem	Condition 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. Remove blockage or replace air vent if damaged.
Storage Area	Debris and Sediment	Accumulated sediment depth exceeds 10 percent of the diameter of the storage area for one-half length of storage vault or any point depth exceeds 15 percent of diameter.	All sediment and debris removed from storage area.
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.
Storage Area	Tank Pipe Bent Out of Shape	Any part of tank/pipe is bent out of shape more than 10 percent of its design shape. (Review required by engineer to determine structural stability.)	Tank/pipe repaired or replaced to design.
Storage Area	Vault Structure Includes Cracks in Wall, Bottom, Damage to Frame and/or Top Slab	Cracks wider than one-half 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.	Vault replaced or repaired to design specifications and is structurally sound.
Storage Area	Vault Structure Includes Cracks in Wall, Bottom, Damage to Frame and/or Top Slab	Cracks wider than one-half inch at the joint of any inlet/outlet pipe or any evidence of soil particles entering the vault through the walls.	No cracks more than one-fourth inch wide at the joint of the inlet/outlet pipe. No water or soil entering vault through joints or walls.
Crest Gauge	Crest Gauge Missing/Broken	Crest gauge is not functioning properly, has been vandalized, or is missing.	Crest gauge present and functioning. *Repair/replace crest gauge if missing or broken.*
Manhole	Cover Not in Place	Cover is missing or only partially in place. Any open manhole requires maintenance.	Manhole access cover/ lid is in place and secure.
Manhole	Locking Mechanism Not Working	Mechanism cannot be opened by one maintenance person with proper tools. Bolts into frame have less than one-half inch of thread (may not apply to self-locking lids).	Mechanism opens with proper tools.
Manhole	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.
Manhole	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.

If you are unsure whether a problem exists, contact a professional engineer.

Tanks and vaults are a confined space. Visual inspections should be performed aboveground. If entry is required, it should be performed by qualified personnel.

#5 – Maintenance Checklist for Catch Basins:

Drainage System Feature	Defect or Problem	Condition When Maintenance Is Needed	Results Expected When Maintenance Is Performed
General	"Dump no pollutants" (or similar) stencil or stamp not visible	Stencil or stamp should be visible and easily read.	Warning signs (e.g., "Dump No Waste-Drains to Stream" or "Only rain down the drain"/ "Puget Sound starts here") painted or embossed on or adjacent to all storm drain inlets.
General	Trash and Debris	Trash or debris which is located immediately in front of the catch basin opening or is blocking inlet capacity by more than 10 percent.	No trash or debris located immediately in front of catch basin or on grate opening.
General	Trash and Debris	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 6 inches clearance from the debris surface to the invert of the lowest pipe.	No trash or debris in the catch basin.
General	Trash and Debris	Trash or debris in any inlet or outlet pipe blocking more than one-third of its height.	Inlet and outlet pipes free of trash or debris.
General	Trash and Debris	Dead animals or vegetation that could generate odors that could cause complaints or dangerous gases (e.g., methane).	No dead animals or vegetation present within the catch basin.
General	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.
General	Structure Damage to Frame and/or Top Slab	Top slab has holes larger than 2 square inches or cracks wider than one-fourth inch.	No holes and cracks in the top slab allowing material to run into the basin.
General	Structure Damage to Frame and/or Top Slab	Frame not sitting flush on top slab, i.e., separation of more than three-fourth inch of the frame from the top slab. Frame not securely attached.	Frame is sitting flush on the riser rings or top slab and firmly attached.
General	Fractures or Cracks in Basin Walls/ Bottom	Maintenance person judges that structure is unsound.	Basin replaced or repaired to design standards.
General	Fractures or Cracks in Basin Walls/ Bottom	Grout fillet has separated or cracked wider than one-half-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.	Pipe is regrouted and secure at basin wall.
General	Settlement/ Misalignment	If failure of basin has created a safety, function, or design problem.	Basin replaced or repaired to design standards.
General	Vegetation	Vegetation growing across and blocking more than 10 percent of the basin opening.	No vegetation blocking opening to basin.

#5 – Maintenance Checklist for Catch Basins:

Drainage System Feature	Defect or Problem	Condition When Maintenance Is Needed	Results Expected When Maintenance Is Performed
General	Vegetation	Vegetation growing in inlet/outlet pipe joints that is more than 6 inches tall and less than 6 inches apart.	No vegetation or root growth present.
General	Contamination and Pollution	Any evidence of oil, gasoline, contaminants or other pollutants.	No contaminants or pollutants present. *(Coordinate removal/cleanup with Pierce County Surface Water Management 253-798-2725 and/or Dept. of Ecology Spill Response 800-424-8802.)*
Catch Basin Cover	Cover Not in Place	Cover is missing or only partially in place. Any open catch basin requires maintenance.	Catch basin cover is in place and secured.
Catch Basin Cover	Locking Mechanism Not Working	Mechanism cannot be opened by one maintenance person with proper tools. Bolts into frame have less than one-half-inch of thread.	Mechanism opens with proper tools.
Catch Basin Cover	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.
Grates	Grate Opening Unsafe	Grate with opening wider than seven-eighths of an inch.	Grate opening meets design standards.
Grates	Trash and Debris	Trash and debris that is blocking more than 20 percent of grate surface inletting capacity.	Grate free of trash and debris.
Grates	Damaged or Missing	Grate missing or broken member(s) of the grate.	Grate is in place and meets design standards.

If you are unsure whether a problem exists, contact a professional engineer.

#20 – Maintenance Checklist for Grounds (Landscaping):

Drainage System Feature	Defect or Problem	Condition When Maintenance Is Needed	Results Expected When Maintenance Is Performed
General	Weeds (nonpoisonous)	Weeds growing in more than 20 percent of the landscaped area (trees and shrubs only). Any evidence of noxious weeds as defined in the Pierce County Noxious Weeds List.	Weeds present in less than 5 percent of the landscaped area.
General	Insect Hazard	Any presence of poison ivy or other poisonous vegetation or insect nests.	No poisonous vegetation or insect nests present in landscaped area.
General	Trash or Litter	See Detention Ponds (Checklist #1).	See Detention Ponds (Checklist #1).
General	Erosion of Ground Surface	Noticeable rills are seen in landscaped areas.	Causes of erosion are identified and steps taken to slow down/spread out the water. Eroded areas are filled, contoured, and seeded.
Trees and shrubs	Damage	Limbs or parts of trees or shrubs that are split or broken which affect more than 25 percent of the total foliage of the tree or shrub.	Trim trees/shrubs to restore shape. Replace trees/shrubs with severe damage.
Trees and shrubs	Damage	Trees or shrubs that have been blown down or knocked over.	Tree replanted, inspected for injury to stem or roots. Replace if severely damaged.
Trees and shrubs	Damage	Trees or shrubs which are not adequately supported or are leaning over, causing exposure of the roots.	Stakes and rubber-coated ties placed around young trees/shrubs for support.

#22 – Maintenance Checklist for Conveyance Systems (Pipes and Ditches):

Drainage System Feature	Defect or Problem	Condition When Maintenance Is Needed	Results Expected When Maintenance Is Performed
Pipes	Sediment & Debris	Accumulated sediment that exceeds 20 percent of the diameter of the pipe.	Pipe cleaned of all sediment and debris.
Pipes	Vegetation	Vegetation that reduces free movement of water though pipes.	Vegetation does not impede free movement of water through pipes. *Prohibit use of sand and sealant application and protect from construction runoff.*
Pipes	Damaged (Rusted, Bent or Crushed)	Protective coating is damaged: rust is causing more than 50 percent deterioration to any part of pipe.	Pipe repaired or replaced.
Pipes	Damaged (Rusted, Bent or Crushed)	Any dent that significantly impedes flow (i.e. decreases the cross section area of pipe by more than 20 percent).	Pipe repaired or replaced.
Pipes	Damaged (Rusted, Bent or Crushed)	Pipe has major cracks or tears allowing groundwater leakage.	Pipe repaired or replaced.
Open Ditches	Trash & Debris	Dumping of yard wastes such as grass clippings and branches. Unsightly accumulation of non-degradable materials such as glass, plastic, metal, foam, and coated paper.	No trash or debris present. Trash and debris removed and disposed of as prescribed by the County.
Open Ditches	Sediment Buildup	Accumulated sediment that exceeds 20 percent of the design depth.	Ditch cleaned of all sediment and debris so that it matches design.
Open Ditches	Vegetation	Vegetation (e.g. weedy shrubs or saplings) that reduces free movements of water through ditches.	Water flows freely though ditches. Grassy vegetation should be left alone.
Open Ditches	Erosion Damage to Slopes	Erosion damage over 2 inches deep where cause of damage is still present or where there is potential for continued erosion.	No erosion damage present. Slopes stabilized using appropriate erosion control measure(s); e.g., rock reinforcement, planting of grass, compaction.
Open Ditches	Erosion Damage to Slopes	Any erosion observed on a compacted berm embankment.	*If erosion is occurring on compacted berms a professional engineer should be consulted to resolve source of erosion.*
Open Ditches	Rock Lining Out of Place or Missing (If Applicable)	Native soil is exposed beneath the rock lining.	Rocks replaced to design standards.

If you are unsure whether a problem exists, contact a professional engineer.

#35 – Maintenance Checklist for Trees:

Drainage System Feature	Defect or Problem	Condition When Maintenance Is Needed	Results Expected When Maintenance Is Performed
Tree	Excess or unhealthy growth	Health of tree at risk, or tree in conflict with other infrastructure.	Tree pruned according to industry standards to promote tree health and longevity.
Tree	NA	Young tree (i.e., within first three years).	Tree provided with supplemental irrigation and fertilization (as needed) during first three growing seasons.
Tree	NA	Evidence of pest activity affecting tree health.	Pest management activities implemented to reduce or eliminate pest activity, and to restore tree health.
Tree	Dead or Declining	Dead, damaged or declining.	Tree is replaced per planting plan or acceptable substitute.
Tree	Dead or Declining	Dead, damaged or declining.	Tree is replaced per planting plan or acceptable substitute.

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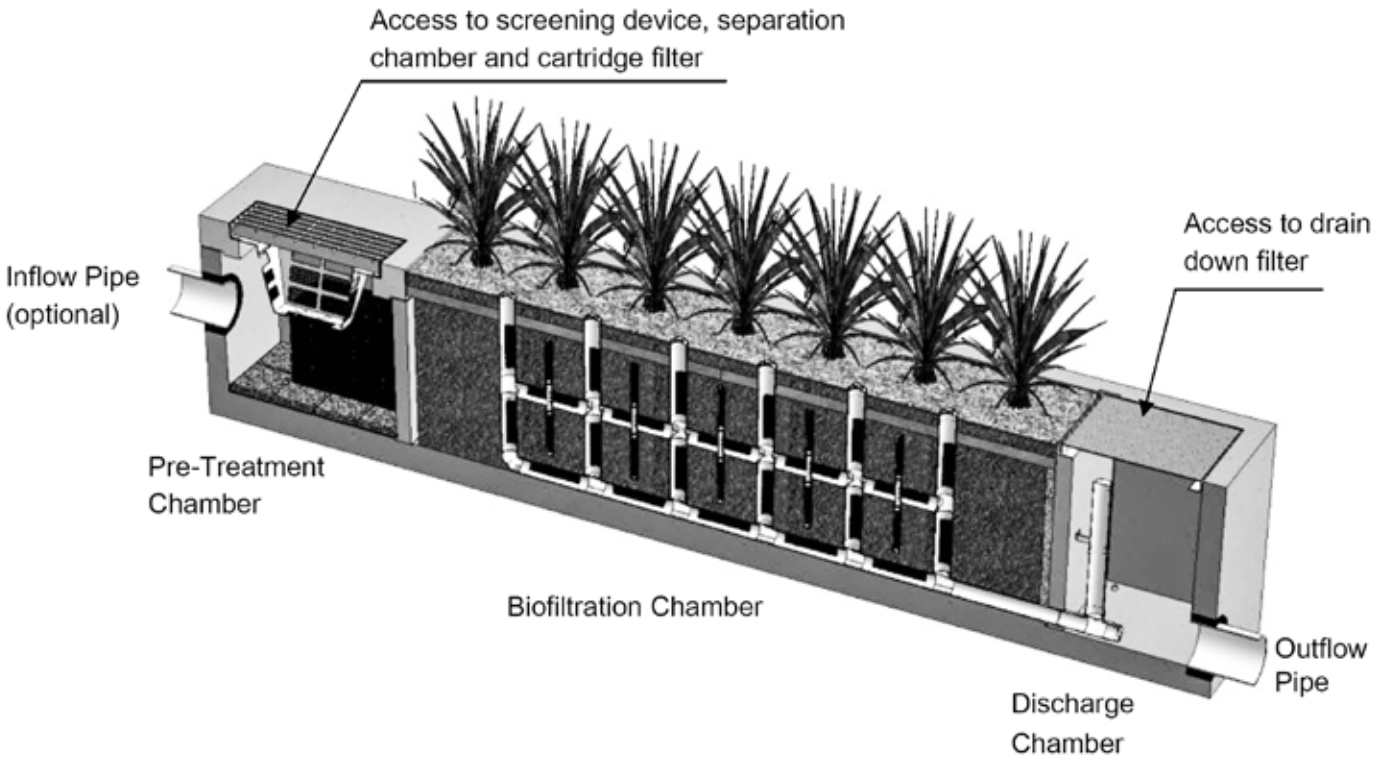
Modular Wetlands® Linear
Operation & Maintenance Manual

MODULAR WETLANDS®

Maintenance Summary

- Remove Trash from Screening Device – average maintenance interval is 6 to 12 months.
  - *(5 minute average service time).*
- Remove Sediment from Separation Chamber – average maintenance interval is 12 to 24 months.
  - *(10 minute average service time).*
- Replace Cartridge Filter Media – average maintenance interval 12 to 24 months.
  - *(10-15 minute per cartridge average service time).*
- Replace Drain Down Filter Media – average maintenance interval is 12 to 24 months.
  - *(5 minute average service time).*
- Trim Vegetation – average maintenance interval is 6 to 12 months.
  - *(Service time varies).*



System Diagram

Maintenance Procedures

Screening Device

1. Remove grate or manhole cover to gain access to the screening device in the Pre- Treatment Chamber. Vault type units do not have screening device. Maintenance can be performed without entry.
2. Remove all pollutants collected by the screening device. Removal can be done manually or with the use of a vacuum truck.
3. Screening device can easily be removed from the Pre-Treatment Chamber to gain access to separation chamber and media filters below. Replace grate or manhole cover when completed.

Separation Chamber

1. Perform maintenance procedures of screening device listed above before maintaining the separation chamber.
2. With a pressure washer, spray down pollutants accumulated on walls and cartridge filters.
3. Vacuum out Separation Chamber and remove all accumulated pollutants. Replace screening device, grate or manhole cover when completed.

Cartridge Filters

1. Perform maintenance procedures on screening device and separation chamber before maintaining cartridge filters.
2. Enter separation chamber.
3. Unscrew the two bolts holding the lid on each cartridge filter and remove lid.
4. Remove each of 4 to 8 media cages holding the media in place.
5. Spray down the cartridge filter to remove any accumulated pollutants.
6. Vacuum out old media and accumulated pollutants.
7. Reinstall media cages and fill with new media from manufacturer or outside supplier. Manufacturer will provide specification of media and sources to purchase.
8. Replace the lid and tighten down bolts. Replace screening device, grate or manhole cover when completed.

Drain Down Filter

1. Remove hatch or manhole cover over discharge chamber and enter chamber. Entry into chambers may require confined space training based on state and local regulations.
2. Unlock and lift drain down filter housing and remove old media block. Replace with new media block. Lower drain down filter housing and lock into place.
3. Exit chamber and replace hatch or manhole cover.

Maintenance Notes

1. Following maintenance and/or inspection, it is recommended the maintenance operator prepare a maintenance/ inspection record. The record should include any maintenance activities performed, amount and description of debris collected, and condition of the system and its various filter mechanisms.
2. The owner should keep maintenance/inspection record(s) for a minimum of five years from the date of maintenance. These records should be made available to the governing municipality for inspection upon request at any time.
3. Transport all debris, trash, organics and sediments to approved facility for disposal in accordance with local and state requirements.
4. Entry into chambers may require confined space training based on state and local regulations.
5. No fertilizer shall be used in the Biofiltration Chamber.
6. Irrigation should be provided as recommended by manufacturer and/or landscape architect. Amount of irrigation required is dependent on plant species. Some plants may require irrigation.

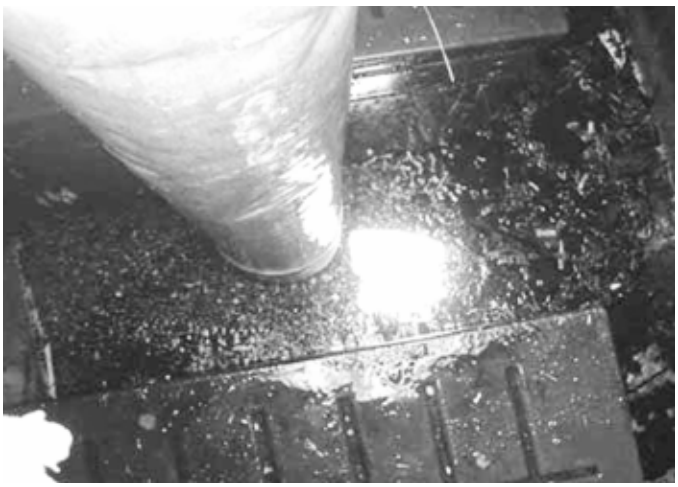
Maintenance Procedure Illustration

Screening Device

The screening device is located directly under the manhole or grate over the Pre-Treatment Chamber. It's mounted directly underneath for easy access and cleaning. Device can be cleaned by hand or with a vacuum truck.

Separation Chamber

The separation chamber is located directly beneath the screening device. It can be quickly cleaned using a vacuum truck or by hand. A pressure washer is useful to assist in the cleaning process.



Cartridge Filters

The cartridge filters are located in the Pre-Treatment chamber connected to the wall adjacent to the biofiltration chamber. The cartridges have removable tops to access the individual media filters. Once the cartridge is open media can be easily removed and replaced by hand or a vacuum truck.

Drain Down Filter

The drain down filter is located in the Discharge Chamber. The drain filter unlocks from the wall mount and hinges up. Remove filter block and replace with new block.

Trim Vegetation

Vegetation should be maintained in the same manner as surrounding vegetation and trimmed as needed. No fertilizer shall be used on the plants. Irrigation per the recommendation of the manufacturer and or landscape architect. Different types of vegetation requires different amounts of irrigation.

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Inspection Report
Modular Wetlands Linear

Project Name _____

Project Address _____
(city) (Zip Code)

Owner / Management Company _____

Contact _____ Phone ( ) –

For Office Use Only
(Reviewed By)
(Date)
Office personnel to complete section to the left.

Inspector Name _____ Date ____/____/____ Time _____ AM / PM

Type of Inspection ☐ Routine ☐ Follow Up ☐ Complaint ☐ Storm Storm Event in Last 72-hours? ☐ No ☐ Yes

Weather Condition _____ Additional Notes _____

Inspection Checklist

Modular Wetland System Type (Curb, Grate or UG Vault): _____ Size (22', 14' or etc.): _____

Structural Integrity:	**Yes**	**No**	**Comments**
Damage to pre-treatment access cover (manhole cover/grate) or cannot be opened using normal lifting pressure?			
Damage to discharge chamber access cover (manhole cover/grate) or cannot be opened using normal lifting pressure?			
Does the MWS unit show signs of structural deterioration (cracks in the wall, damage to frame)?			
Is the inlet/outlet pipe or drain down pipe damaged or otherwise not functioning properly?			
Working Condition:			
Is there evidence of illicit discharge or excessive oil, grease, or other automobile fluids entering and clogging the unit?			
Is there standing water in inappropriate areas after a dry period?			
Is the filter insert (if applicable) at capacity and/or is there an accumulation of debris/trash on the shelf system?			
Does the depth of sediment/trash/debris suggest a blockage of the inflow pipe, bypass or cartridge filter? If yes, specify which one in the comments section. Note depth of accumulation in in pre-treatment chamber.			Depth:
Does the cartridge filter media need replacement in pre-treatment chamber and/or discharge chamber?			Chamber:
Any signs of improper functioning in the discharge chamber? Note issues in comments section.			
Other Inspection Items:			
Is there an accumulation of sediment/trash/debris in the wetland media (if applicable)?			
Is it evident that the plants are alive and healthy (if applicable)? Please note Plant Information below.			
Is there a septic or foul odor coming from inside the system?			

Waste:	**Yes**	**No**
Sediment / Silt / Clay		
Trash / Bags / Bottles		
Green Waste / Leaves / Foliage		

Recommended Maintenance	
No Cleaning Needed	
Schedule Maintenance as Planned	
Needs Immediate Maintenance	

Plant Information	
Damage to Plants	
Plant Replacement	
Plant Trimming	

Additional Notes: _____

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Cleaning and Maintenance Report
Modular Wetlands Linear

Project Name _____

Project Address _____
(city) (Zip Code)

Owner / Management Company _____

Contact _____ Phone ( ) –

Inspector Name _____ Date ____/____/____ Time _____ AM / PM

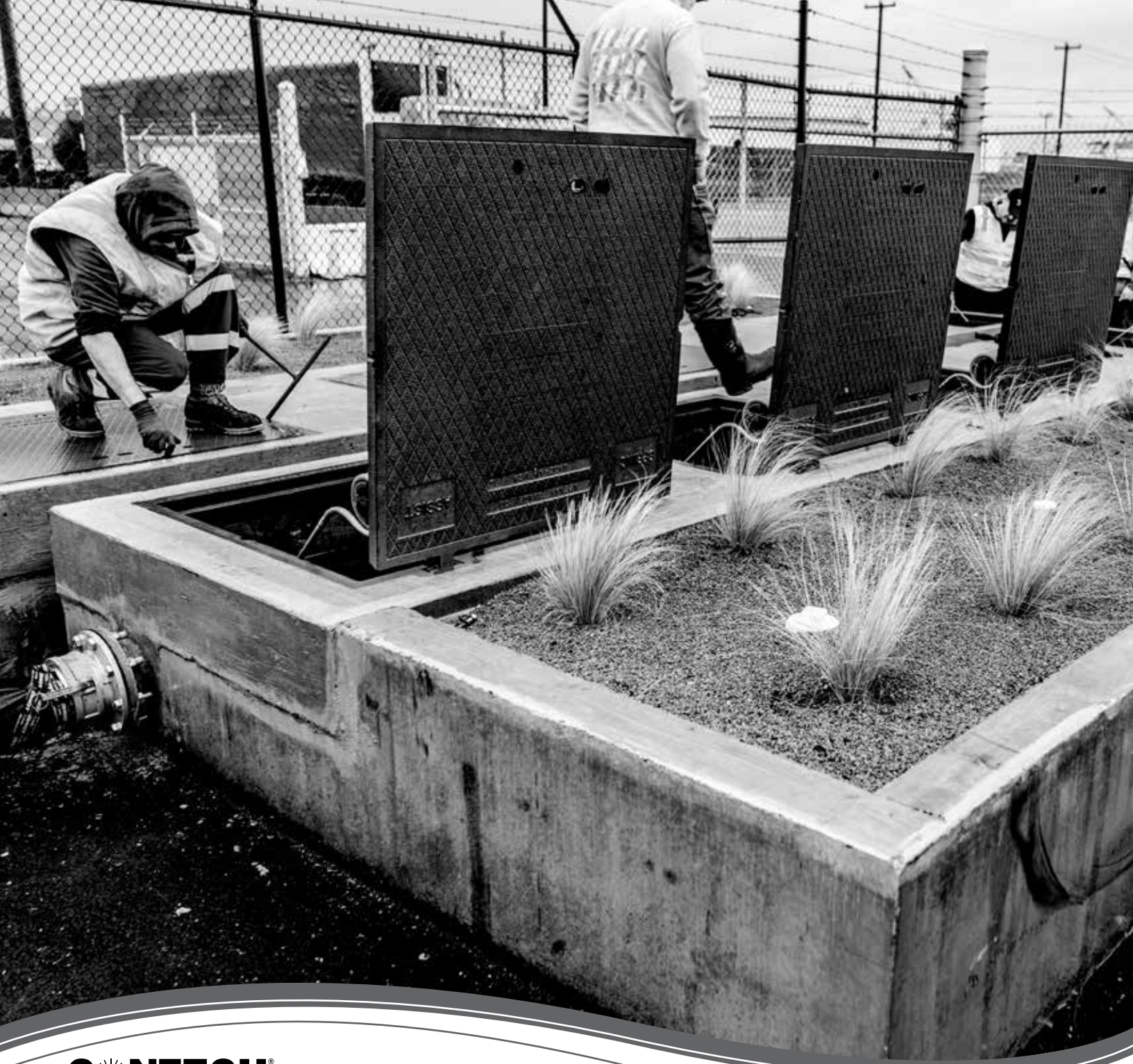
For Office Use Only
(Reviewed By)
(Date)
Office personnel to complete section to the left.

Type of Inspection ☐ Routine ☐ Follow Up ☐ Complaint ☐ Storm Storm Event in Last 72-hours? ☐ No ☐ Yes

Weather Condition _____ Additional Notes _____

Site Map #	GPS Coordinates of Insert	Manufacturer / Description / Sizing	Trash Accumulation	Foliage Accumulation	Sediment Accumulation	Total Debris Accumulation	Condition of Media 25/50/75/100 (will be changed @ 75%)	Operational Per Manufactures' Specifications (If not, why?)
	Lat: Long:	MWS Catch Basins						
		MWS Sedimentation Basin						
		Media Filter Condition						
		Plant Condition						
		Drain Down Media Condition						
		Discharge Chamber Condition						
		Drain Down Pipe Condition						
		Inlet and Outlet Pipe Condition						

Comments:



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