Exhibit 21

LMC Marymoor

17611 NE 70th Street

Redmond, Washington

MARYMOOR

Preliminary Stormwater Report

Site Plan Entitlement – Final Prep

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KPFF Project No.1800077

February 2019

kpff

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Preliminary Stormwater Report

February 2019

Prepared for:

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1. Project Overview

This report analyzes storm drainage control measures for the proposed LMC Marymoor Multifamily Community. The project is subject to the Department of Ecology (Ecology) 2014 Stormwater Management Manual for Western Washington (SWMMWW), as amended by the City of Redmond (COR) Stormwater Technical Notebook.

The site is located at 17611 NE 70th Street in the City of Redmond, Washington. The parcel numbers for the site are 1225059229, 1225059095, and 1225059152. As shown in the Vicinity Map, Figure 1, the property is generally bounded by private properties on the south, 176th Avenue NE on the west, NE 70th Street on the north, and the East Lake Sammamish Trail to the east.

At approximately 5 acres with an existing impervious surface coverage in excess of 35%, the project is classified as a **Redevelopment** per the SWMMWW and as a **Large Project** per the Stormwater Technical Notebook. Previously zoned as an industrial site, the existing conditions consist of several small buildings, material stockpiles and storage areas, and parking for various classes of vehicles. Currently, all stormwater is infiltrated on site. Stormwater that lands in the right-of-way (ROW) adjacent to the project site either pools at a series of abandoned catch basins until it evaporates or it runs farther downstream until it reaches Marymoor Park.

The project proposes to construct a mixed used, multifamily residential building that includes ground floor commercial space and structured parking below grade. The project is a phased development that will be entitled under a Master Planned Development (MPD) permit and Site Plan Entitlement (SPE). Onsite stormwater will be treated using bioretention and routed to infiltration chambers outside the building footprint. ROW stormwater will be treated using a combination of bioretention planters and water quality treatment structures (Filterra or similar). Overflows from these facilities will be routed to infiltration drywells located under the sidewalk.

Figure 1: Vicinity Map

2. Existing Conditions Summary

The 5.0 acre project site is located in the Marymoor Design District. The present use is industrial. The site is generally flat and slopes gently towards the south property line. There, the grade drops steeply down to existing grade on the neighboring property.

The Marymoor Design District has a rudimentary storm system with no natural outfall and scattered disconnect segments of stormwater infrastructure. Currently, all onsite stormwater is infiltrated into the existing subgrade. ROW stormwater adjacent to the site is directed to catch basins that are either plugged or disconnected. There are no known off site areas that contribute stormwater to the site.

According to the project Geotechnical Report, most of the surficial soils on site consist of thin layers of gravel 6 to 12-inches thick. One exception to that appears to be at the southeast corner, which contain an isolated pocket of fill material. Beneath the surficial soils, the entire site is underlain by Qyal Younger Alluvium, which consists of layers of sand, silt and clay.

The majority of the Marymoor Design District is located in a Critical Aquifer Recharge Area (CARA), which is an Environmentally Critical Area (ECA) as defined by the City of Redmond (COR). The site is located in Wellhead Protection Zone 3, which has a five year travel time to City water supply wells. According to the project Geotechnical Report, groundwater levels in the alluvium subgrade vary seasonally from 29.7 to 37.6, which is due in part to fluctuations in precipitation and groundwater withdrawals at City well points.

For existing conditions, refer to the Existing Conditions figure in Appendix A.

3. Offsite Analysis Report

Per SWMMWW Volume 1, Chapter 1.6 and Section 2.6 of the Stormwater Technical Notebook, projects that discharge stormwater offsite are required to perform an offsite analysis. The site currently does not discharge stormwater offsite and no new discharge points are proposed. Therefore, an offsite analysis is not required or provided.

4. Minimum Requirements

Minimum requirements for redevelopment projects are outlined in Volume 1, Chapter 2, Figure 1-2.4.2 of the SWMMWW. Figure1-2.4.2 is annotated below, indicating that this project exceeds the requirement thresholds for **Minimum Requirements 1-9**.

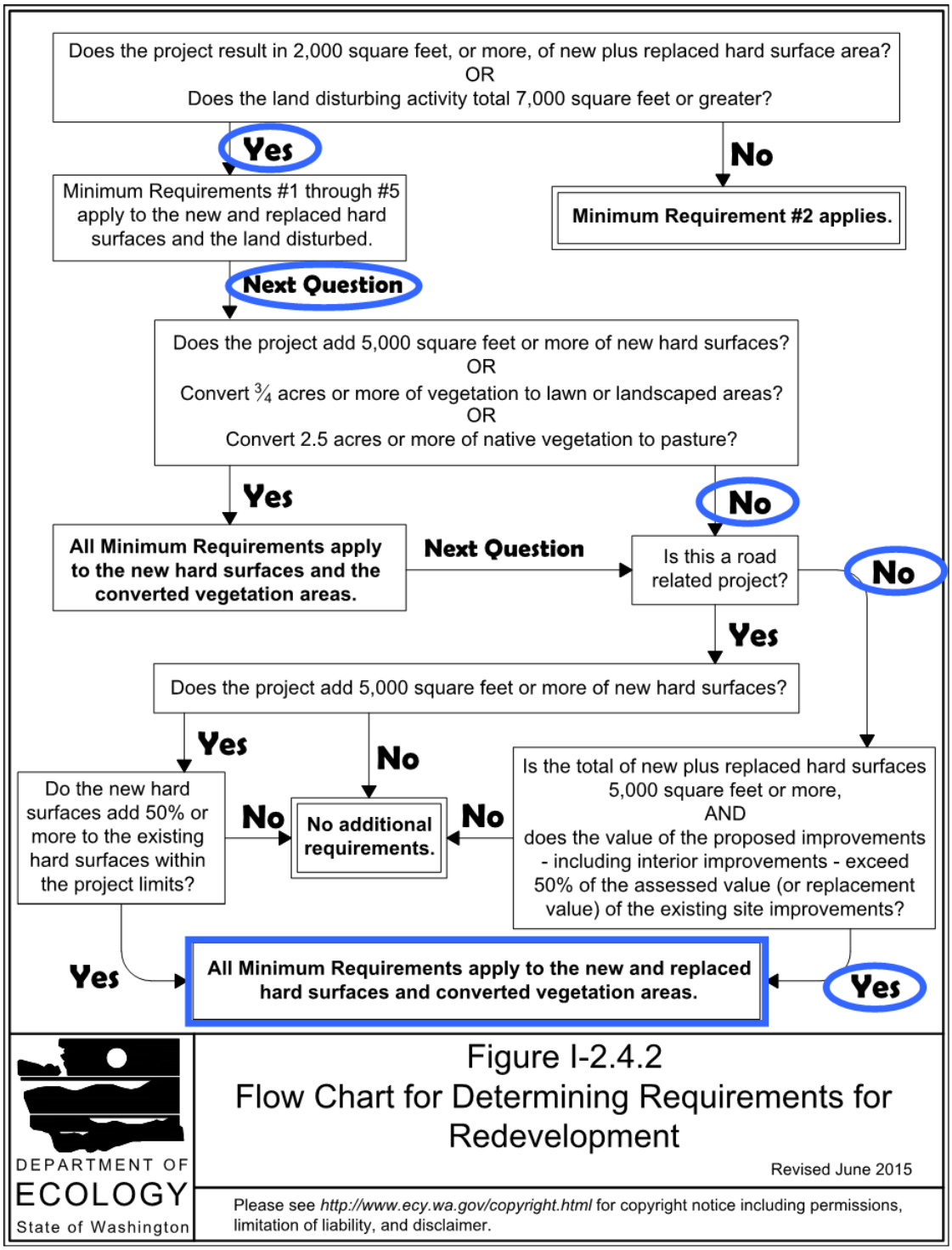

Figure 2: SWMMWW Figure 1-2.4.2, Annotated

MR NO. 1 – PREPARATION OF STORMWATER SITE PLANS

This report constitutes the preliminary project stormwater site plan as defined by Volume 1, Chapter 1-3.1 of the SWMMWW.

MR NO. 2 – CONSTRUCTION STORMWATER POLLUTION PREVENTION PLAN (SWPPP)

The project includes more than 2,000 square feet of new plus replaced hard surface area and will disturb more than 7,000 square feet of land disturbing activity. Therefore, per Section 2.5.2 of the Stormwater Technical Notebook the project must prepare a Construction SWPPP and Temporary Erosions and Sediment Control (TESC) plans. Refer to Section 6 of this report for a site specific discussion of construction stormwater pollution prevention requirements.

MR NO. 3 – SOURCE CONTROL OF POLLUTION

Per section 2.5.3 of the Stormwater Technical Notebook, all applicable and recommended source control BMPs as described in Volume 6 of the SWMMWW are required. Additional pollutant specific BMPs that may be required are:

- S411 BMPs for Landscaping and Lawn/ Vegetation Management
- S417 BMPs for Maintenance of Stormwater Drainage and Treatment Systems
- S424 BMPs for Roof/ Building Drains at Manufacturing and Commercial Buildings
- S433 BMPs for Pools, Spas, Hot Tubs, and Fountains

Required BMPs will be designed and documented as a part of the COR Coordinated Civil Review (CCR) process.

MR NO.4 – PRESERVATION OF NATURAL DRAINAGE SYSTEMS AND OUTFALLS

The site is comprised of a self contained on-site basin and an offsite ROW basin. Both basins rely on infiltration of stormwater. There are no downstream outfalls. The project matches existing drainage patterns by fully infiltrating project runoff.

MR NO. 5 – ON-SITE STORMWATER MANAGEMENT

Per Appendix B of the Stormwater Technical Notebook, the project is located within the Marymoor-100% Infiltration area. According to Section 2.5.5.2 of the Stormwater Technical Notebook, projects within this area do not need to demonstrate compliance with Minimum Requirement 5 because they will exceed the intent of Minimum Requirement 5 by infiltrating 100% of their runoff. Refer to the Low Impact Development discussion in Section 6 of this report for a description of how infiltration requirements are being met.

MR NO.6 – RUNOFF TREATMENT

Per Section 2.5.3 of the Stormwater Technical Notebook, the Marymoor Design District has highly infiltrative soils and is outside Wellhead Protection Zones that prohibit infiltration of runoff from pollution generating hard surfaces. However the proposed development is a mixed use commercial residential

project within a quarter mile of a fresh water body with an existing aquatic life use. Therefore, per SWMMWW Volume 5, Chapter 2.1, the project must meet the requirement of Enhanced Water Quality Treatment prior to infiltrating. Refer to the Water Quality System discussion in Section 5 of this report for a description of how water quality treatment requirements are being met.

MR NO.7 – FLOW CONTROL

Per Appendix D of the Stormwater Technical Notebook, the project must infiltrate 100% of site stormwater to meet flow control requirements. Refer to the Flow Control System discussion in Section 5 for a description of how flow control requirements are being met.

MR NO. 8 – WETLANDS PROTECTION

This site does not discharge to a wetland or its buffer and there are no wetlands in the vicinity, therefore wetland protection is not required.

MR NO. 9 – OPERATION AND MAINTENANCE MANUAL

An Operation and Maintenance Manual for the stormwater infrastructure will be provided through the CCR process.

5. Permanent Stormwater Control Plan

EXISTING SITE HYDOLOGY

Summary

The existing site surfaces are predominantly graveled, with few paved surfaces and roofs to generate significant storm runoff. Though gravel is not considered softscape, it provides substantial depression storage, allowing water to pool and infiltrate into the underlying alluvium. Refer to Table 1 and the Existing Conditions Exhibit in Appendix A for existing surface areas.

Table 1: Existing Surface Areas

Land Cover	Total Area
ROW Paved PGIS	0.39 acres
Onsite Paved PGIS	1.41 acres
Gravel PGIS	3.24 acres
Roof NGIS	0.40 acres
Total	**5.43 acres**

DEVELOPED SITE HYDROLOGY

Summary

The proposed hydrology approximately matches existing right of way and on-site basins. In addition, impervious area coverage is reduced through the addition of streetscape planting and on-site landscape improvements. Further, the proposed conditions improve upon existing on-site and ROW hydrology by providing a control means of infiltration through the use of infiltration chambers and drywells. Refer to Table 2 and the Proposed Conditions Exhibit in Appendix A for proposed surface areas.

Table 2: Proposed Surface Areas

Land Cover	Total Area
ROW PGIS	0.75 acres
ROW NPGIS	0.43 acres
ROW Pervious	0.14 acres
Onsite PGIS	0.14 acres
Onsite NPGIS	1.06 acres
Onsite Roof	2.26 acres
Onsite Pervious	0.63 acres
Pools	0.02 acres
Total	**5.43 acres**

Performance Standards and Goals

Per the SWMMWW and the Stormwater Technical Notebook, the following performance standards and goals apply to this project:

- ***Runoff Generation***
  - MGS Flood continuous modeling software was used to generate runoff for LID, flow control, and water quality calculations. The assumptions for the model are as follows:
    - Puget 40 East Time Series
    - 5 minute computational time step
    - Hard surfaces modeled as impervious
    - Landscape areas modeled as till-grass
- ***LID and Flow Control***
  - 100% Infiltration
- ***Water Quality***
  - Enhanced Water Quality

Low Impact Development Features

Site Assessment

Per Section 8.7.5 of the Stormwater Technical Notebook, all projects that trigger Minimum Requirement 1 are required to include a LID Site Assessment as a part of the stormwater site plan. The following documents, required for the LID Site Assessment, are included with this report or under separate cover:

- Survey meeting all the requirements of Volume 1, Chapter 3.1 of SWMMWW (included as a base in the exhibits in Appendix A and in the plan set included with this submittal).
- Geotechnical reports (refer to the Special Report and Studies discussion in Section 7 of this report)

The following documents are not included in this report:

- Critical Areas Report: The project is located in Wellhead Protection Zone 3.
- Flood Hazard Report: This site is not located in a flood plain.

LID Requirements

The process for determining minimum LID requirements is outlined in SWMMWW Volume 1, Chapter 2, Figure 1-2.5.1. This figure is annotated below, indicating that this project is required to evaluate BMPs for proposed surfaces using the BMP hierarchy outlined in List #2. Refer to Table 3 for the BMP list.

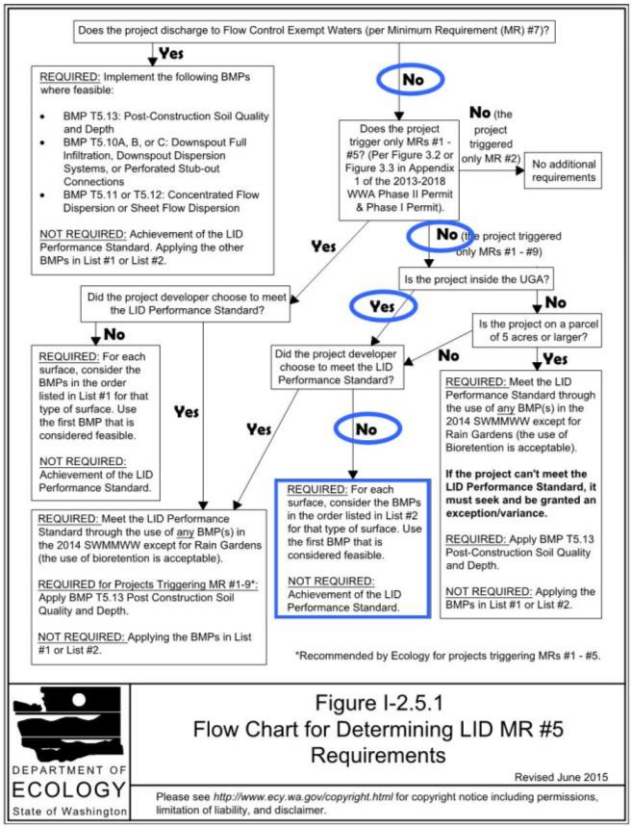

Figure 3: SWMMWW Figure 1-2.5.1, Annotated

Table 3: SWMMWW LID List 2

LIST #2: ON-SITE STORMWATER MANAGEMENT BMPS	
List Order Hierarchy	**Required BMP**
Lawn and Landscape Areas	
1	Post-Construction Soil Quality and Depth
Roofs	
1	Full Dispersion or Downspout Full Infiltration
2	Bioretention
3	Downspout Dispersion
4	Perforated Stub-out Connections
Other Hard Surfaces	
1	Full Dispersion
2	Permeable Pavement
3	Bioretention
4	Sheet Flow Dispersion or Concentrated Flow Dispersion

Feasibility and Implementation

The feasibility study of List #2 BMPs included added considerations to account for the full infiltration requirements outlined in Section 2.5.5.2 and Appendix B of the Stormwater Technical Notebook. The project evaluated horizontal setbacks from buildings, structures, storage tanks, and property lines. In addition, the project considered vertical setbacks from seasonal high water and any highly variable or hydraulically restrictive soil zones that may impact infiltration capabilities described in the project Geotechnical Report.

According to the Geotechnical Report, the site soils have a measured infiltration capacity of 85 inches per hour. This value exceeds the maximum allowable design infiltration rate of 20 inches per hour indicated in Section 2.9.3.9 of the Stormwater Technical Notebook, therefore a long term design infiltrations rate of 20 inches per hour was used in calculations. The Geotechnical Report also includes updated information on groundwater elevations, recommending a design seasonal high groundwater elevation of 37.6 feet. All infiltrating facilities are required to maintain at least three feet of separation from the seasonal high groundwater level. In addition, mounding analyses are required for all facilities situated less than 5 feet above the seasonal high groundwater elevation.

The additional infiltration criteria narrowed the feasible BMPs in List #2 down to infiltrating BMPs only. From this limited list, the project proposes to implement soil amendments for the restoration of all off-structure landscape areas to meet the requirements for post-construction soil quality and depth. In addition, the project proposes to manage all roof surfaces onsite using infiltrating BMPs to meet requirement for downspout full infiltration. The project also proposes to employ bioretention in conjunction with other infiltrating BMPs to manage other hard surfaces onsite and in the ROW

On-Site Stormwater Management

Onsite stormwater will be managed though the use of downspout full infiltration. The stormwater will be routed to infiltration chambers at the southeast corner of the property. Preliminary modeling results indicate that an estimated infiltration chamber system volume of 8,504 cubic feet would be required to infiltrate 100% of onsite stormwater. Refer to the Proposed Conditions Exhibit in Appendix A for onsite basins and to Appendix C for preliminary modeling results.

The project is currently proposing an infiltration chamber system that provides approximately 9,000 cubic feet of storage, covering approximately 4,500 square feet. The bottom of the facility is situated five feet above the seasonally high groundwater elevation as documented in the project Geotechnical Report, rendering a mounding analysis unnecessary at this time. As the onsite stormwater design progresses, the facility configuration and elevations may change. If the groundwater separation decreases as the design develops, a mounding analysis will be performed on the infiltration chambers to confirm that the system will have no adverse impacts to the groundwater table or adjacent structures. Refer to the Civil Utility Sheets in Appendix B for the preliminary facility location, as well as documentation of horizontal and vertical setbacks.

Right of Way Stormwater Management

ROW stormwater will be managed though the use of infiltrating bioretention, drywells, and infiltration chambers. Stormwater will be routed to bioretention facilities and water quality treatment structures (Filterra or similar) situated in the ROW. Bioretention facilities will be used for both water quality treatment and infiltration of stormwater, while water quality structures will only be used for treatment. Underdrains and overflows from bioretention facilities and outlets from water quality treatment structures will be routed drywells and infiltration chambers. The bottom of these infiltrating facilities will be situated at least three feet above the seasonal high groundwater level.

The project is currently proposing a ROW drainage system comprised of seven dedicated infiltrating facilities served by separate stormwater basins. These facilities and their basins may be reconfigured, combined, or divided as the stormwater design progresses. Refer to the Proposed Conditions Exhibit in Appendix A for ROW basins, to the Civil Utility Sheets in Appendix B for preliminary facility locations, and to Appendix C for preliminary modeling results.

Flow Control System

The Marymoor Design District has little-to-no conveyance infrastructure and no stormwater outfalls. Therefore, as indicated in Appendix D of the Stormwater Technical Notebook, the project will be required to infiltrate 100% of stormwater to meet flow control requirements. This will result in a net-zero offsite flow, preventing erosion of downstream properties. Refer to the Low Impact Development Section of this report for a discussion of the infiltration design.

Water Quality System

Per SWMMWW Volume 5, Chapter 2.1, the project is required to provide Enhanced Water Quality Treatment prior to infiltrating stormwater. Enhanced treatment BMPs are outlined in SWMMWW Volume 5, Chapter 3.4. Given the industrial nature of the surrounding area and the confined spaced available for siting water quality facilities, applicable stormwater treatment BMPs are limited to bioretention facilities and approved emerging technologies (i.e. Filterra or similar). The project will implement bioretention and water quality treatment structures in the ROW to provide treatment prior to being sent to the infiltration drywells. Onsite, runoff from pollution generating surfaces will be routed though bioretention facilities before the sent to the infiltration chambers. Refer to the Low Impact Development section of this report for a discussion of the onsite and ROW infiltration design.

Conveyance System Analysis and Design

The proposed onsite drainage system is minimal. The majority of the site is over the garage structure, which means that drainage picked up on site will be routed through internal plumbing. The point of

connection for the onsite storm system is at the southeast corner of the building. From there, the stormwater is routed a short distance via a 18-inch storm line to the proposed infiltration chambers off structure. Refer to the Low Impact Development section of this report for a discussion of the onsite infiltration design.

The ROW drainage system consists of a series of bioretention facilities and water quality treatment structures routed to infiltration drywells. Roadway and sidewalk grading is used to route stormwater to the inlets of the bioretention and water quality facilities. From there, underdrains and overflows from the bioretention and outlets from the water quality treatment structures are routed to infiltration facilities. Refer to the Low Impact Development section of this report for a discussion of the ROW infiltration design.

Pipe sizes and layout were selected based on required full flow capacities and minimum slopes necessary to achieve 3 feet per second full flow velocity. These design parameters represent the baseline assumptions used to layout the conveyance system. In instances site constraints impacted baseline design, conveyance elements were analyzed on a case by case basis. A uniform flow analysis of the proposed conveyance system as described in the 2016 King County Surface Water Design Manual will be performed as a part of the CCR process. Backwater analyses will not be necessary as there are no downstream systems that could impact hydraulic grades lines.

6. Construction Stormwater Pollution Prevention Plan

This project will require coverage under Ecology Construction Stormwater General Permit because the total disturbed area is greater than 1 acre. The NOI will be prepared and submitted to Ecology, and SWPPP approval will be received from the City prior to any land-disturbing activities. The SWPPP and accompanying TESC plan sheets for this project will be prepared as a part of the CCR process. The design will implement adequately sized best management practices (BMPs) to meet construction stormwater pollution prevention requirements. These BMPs will include the following elements:

1. Mark Clearing Limits and Environmentally Critical Areas (ECAs).
2. Retain Top Layer.
3. Establish Construction Access.
4. Protect Downstream Properties and Receiving Waters.
5. Prevent Erosion and Sediment Transport from Site.
6. Prevent Erosion and Sediment Transport from Site by Vehicles.
7. Stabilize Soils.
8. Protect Slopes.
9. Protect Storm Drains.
10. Stabilize Channels and Outlets.
11. Control Pollutants, including sediment, waste, chemicals, petroleum products, fertilizers, pesticides, and runoff affected by pH-modifying activities.
12. Control Dewatering, including flow rates and quality.
13. Maintain BMPs.

14. Inspect BMPs.
15. Execute and Update Construction Stormwater and Erosion Control Plan.
16. Minimize Open Trenches.
17. Phase the Project.
18. Install Flow Control and Water Quality Facilities.
19. Protect Stormwater BMPs.

7. Special Reports and Studies

The following reports are included under a separate cover as a part of this submittal:

"Geotechnical Report, LMC Marymoor, 17611 Northeast 70th Street, Redmond, Washington" *PanGEO, Inc*, August, 2018.

8. Other Permits

There are no other permits associated with the LMC Marymoor Project at this time.

9. Operations and Maintenance Manual

An Operations and Maintenance Manual will be prepared for this site and will be included in the Final report to be submitted as part of the COR Coordinated Civil Review.

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Appendix A

1. Existing Conditions
2. Proposed Conditions

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Exhibit 21

EXISTING LAND COVER AREAS			
BASIN	BASIN NAME	AREA (SF)	AREA (AC)
	EXISTING ROW PAVED PGIS	16,864	0.39
	EXISTING ONSITE PAVED PGIS	61,455	1.41
	EXISTING GRAVEL PGIS	140,929	3.24
	EXISTING ROOF	17,316	0.40
	TOTAL	236,563	5.43

NORTH

0 40 80 160

1 inch = 80 feet

Project Title: LMC MARYMOOR	Drawing Title: EXHIBIT 1: EXISTING CONDITIONS EXHIBIT	ASI/RFI/CSK Number	
		Drawing Reference	Scale: 1" = 80'
Client: ENCORE ARCHITECTS	kpff 1601 5th Avenue, Suite 1600 Seattle, WA 98101 206.622.5822 www.kpff.com	Date: 2018-7-26	Drawn/Ck'd By: KFR/JSF

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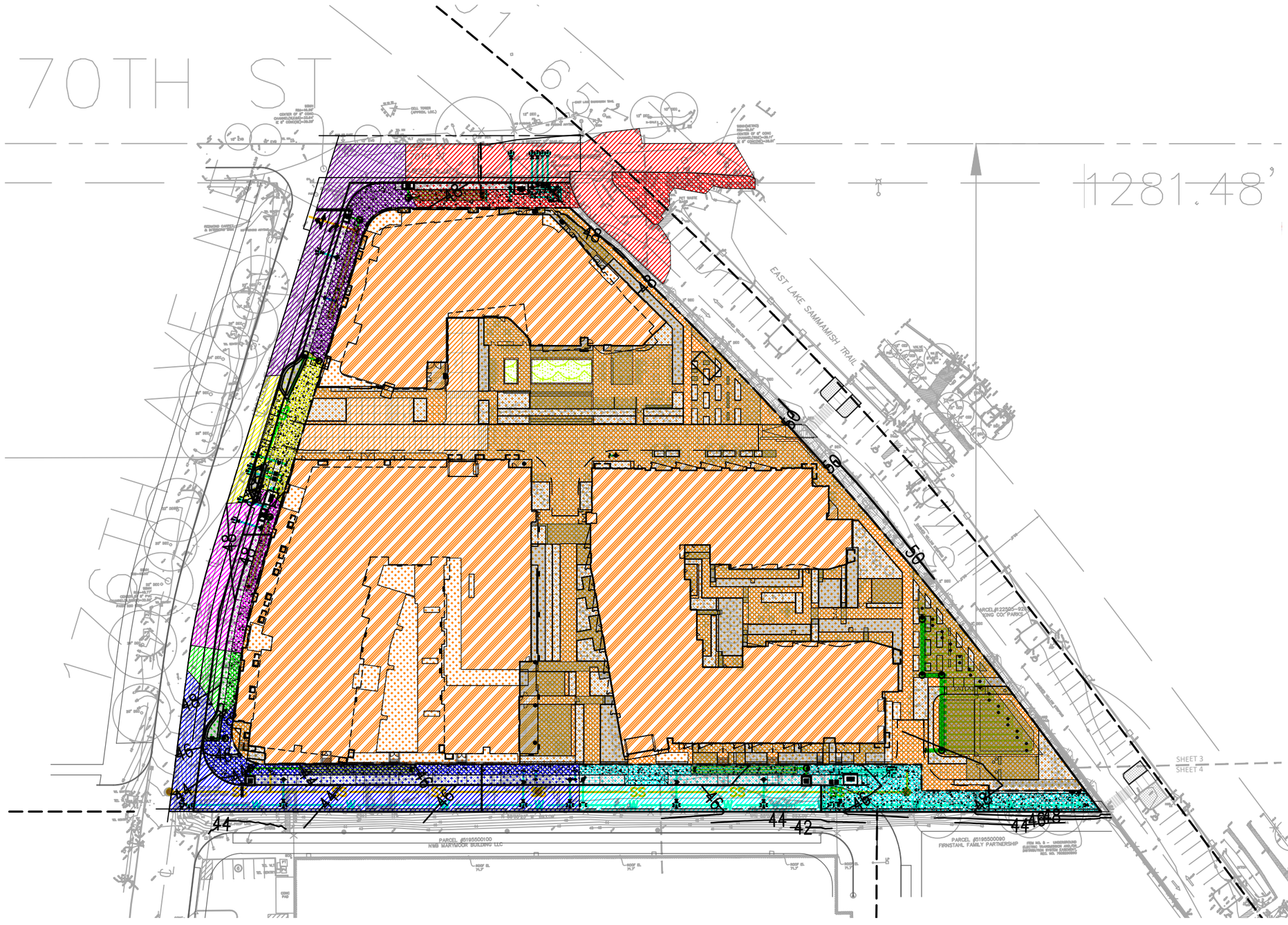
Exhibit 21



PROPOSED LAND COVER AREA				
HATCH	BASIN	RECEIVING STORMWATER MANAGEMENT BMP	AREA (SF)	AREA (AC)
	ROW BASIN 100 PGIS	CHAMBER ARRAY 100	9,981	0.23
	ROW BASIN 100 NPGIS	CHAMBER ARRAY 100	3,727	0.09
	ROW BASIN 100 PGPS	CHAMBER ARRAY 100	553	0.01
	ROW BASIN 200 PGIS	CHAMBER ARRAY 200	5,068	0.12
	ROW BASIN 200 NPGIS	CHAMBER ARRAY 200	2,368	0.05
	ROW BASIN 200 PGPS	CHAMBER ARRAY 200	553	0.01
	ROW BASIN 300 PGIS	DRYWELL 300	1,256	0.03
	ROW BASIN 300 NPGIS	DRYWELL 300	2,279	0.05
	ROW BASIN 300 PGPS	DRYWELL 300	729	0.02
	ROW BASIN 400 PGIS	CHAMBER ARRAY 400	3,158	0.07
	ROW BASIN 400 NPGIS	CHAMBER ARRAY 400	969	0.02
	ROW BASIN 400 PGPS	CHAMBER ARRAY 400	514	0.01
	ROW BASIN 500 PGIS	DRYWELL 500	880	0.02
	ROW BASIN 500 NPGIS	DRYWELL 500	354	0.01
	ROW BASIN 500 PGPS	DRYWELL 500	433	0.01
	ROW BASIN 600 PGIS	CHAMBER ARRAY 600	8,241	0.19
	ROW BASIN 600 NPGIS	CHAMBER ARRAY 600	2,976	0.07
	ROW BASIN 600 PGPS	CHAMBER ARRAY 600	2,001	0.05
	ROW BASIN 700 PGIS	CHAMBER ARRAY 700	3,790	0.09
	ROW BASIN 700 NPGIS	CHAMBER ARRAY 700	6,195	0.14
	ROW BASIN 700 PGPS	CHAMBER ARRAY 700	1,520	0.03
	ONSITE BASIN 800 PGIS	CHAMBER ARRAY 800	6,200	0.14
	ONSITE BASIN 800 NPGIS	CHAMBER ARRAY 800	45995.83	1.06
	ONSITE BASIN 800 ROOF	CHAMBER ARRAY 800	98,422	2.26
	ONSITE BASIN 800 PERVIOUS	CHAMBER ARRAY 800	27,300	0.63
	POOL	SEWER	1,064	0.02
	ROW TOTAL		57,543	1.32
	ONSITE TOTAL		178,983	4.11
	TOTAL		236,526	5.43

NORTH

0 40 80 160

1 inch = 80 feet

Project Title: LMC MARYMOOR	Drawing Title: EXHIBIT 2: PROPOSED CONDITIONS EXHIBIT	ASI/RFI/CSK Number	
		Drawing Reference	Scale: 1" = 80'
Client: ENCORE ARCHITECTS	kpff 1601 5th Avenue, Suite 1600 Seattle, WA 98101 206.622.5822 www.kpff.com	Date: 2019-02-26	Drawn/Ck'd By: KFR/JSF

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Appendix B

1. Civil Utility Sheets

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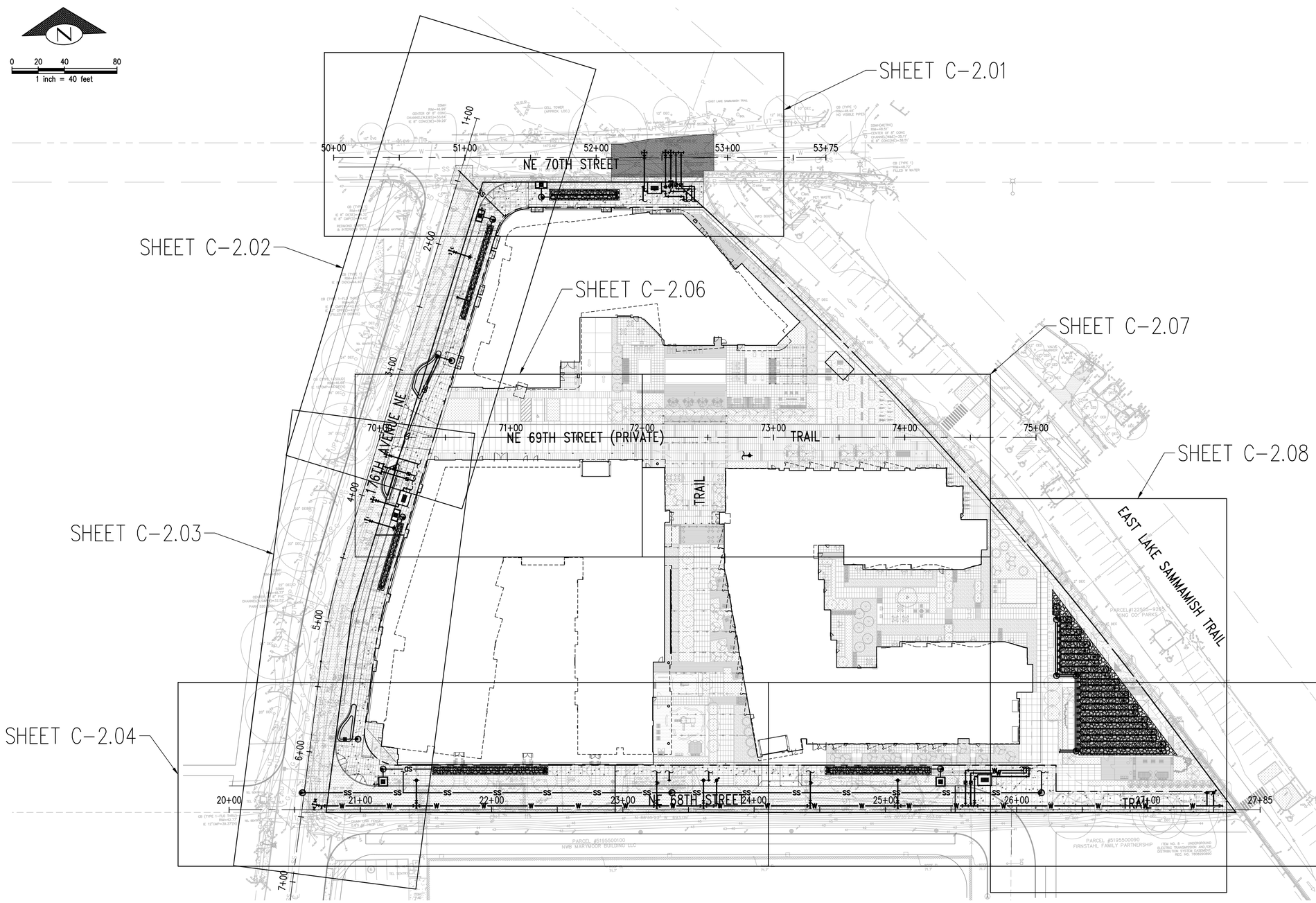

LEGEND:

- EXISTING PROPERTY LINE
- PROPOSED PROPERTY LINE
- CENTERLINE
- SD — STORM LINE
- SS — SEWER LINE
- W — WATER LINE
- FS — FIRE SERVICE LINE
- FILTERRA STRUCTURES
- AREA DRAIN
- CLEANOUT
- DRYWELL/SDMH
- SSMH
- HYDRANT
- FDC
- AIR RELIEF VALVE
- WATER FITTINGS
- WATER METER
- 810 LA VAULT

NOTES:

1. UTILITY LOCATES SHALL BE PERFORMED TO DETERMINE VERTICAL CLEARANCES BETWEEN EXISTING AND PROPOSED UTILITIES AND TO IDENTIFY POSSIBLE UTILITY CONFLICTS.
2. REFER TO C-4.00 FOR ONSITE AND OFFSITE BASIN AREAS.
3. SEWER MAIN IN 176TH AVENUE NE WILL BE UPSIZED TO 10" BY COR AS A PART OF REGIONAL PUMP STATION IMPROVEMENTS. NEW SEWER MAIN WILL EITHER MAINTAIN EXISTING IE'S OR DEEPEN THEM. PROJECT WILL COORDINATE WITH COR'S CONTRACTOR TO DETERMINE FINAL PIPE AND STRUCTURE INVERTS.
4. ROW UTLITIES IN HARDSCAPE SHALL HAVE NON-SKID LID.

NO.	DATE	BY	CHD.	APPR.	REVISION
1	8/13/18	KFR	JSF	JSF	PREP ROUND 1
2	10/18/18	KFR	JSF	JSF	PREP ROUND 2
3	12/21/18	KFR	JSF	JSF	PREP ROUND 3
4	01/14/19	KFR	JSF	JSF	DD PRICING SET
5	02/28/19	KFR	JSF	JSF	100% PREP SET

DRAWN BY JEP/RG
DESIGNED BY KFR
CHECKED BY JSF
APPROVED BY JSF
DATE 02/28/2019
J O B No. :1800077

CALL TWO BUSINESS DAYS BEFORE YOU DIG 1-800-424-5555

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JEREMY S. FABIUS STATE OF WASHINGTON 39847 REGISTERED PROFESSIONAL ENGINEER

LMC MARYMOOR
REDMOND, WA

UTILITIES & DRAINAGE PLAN

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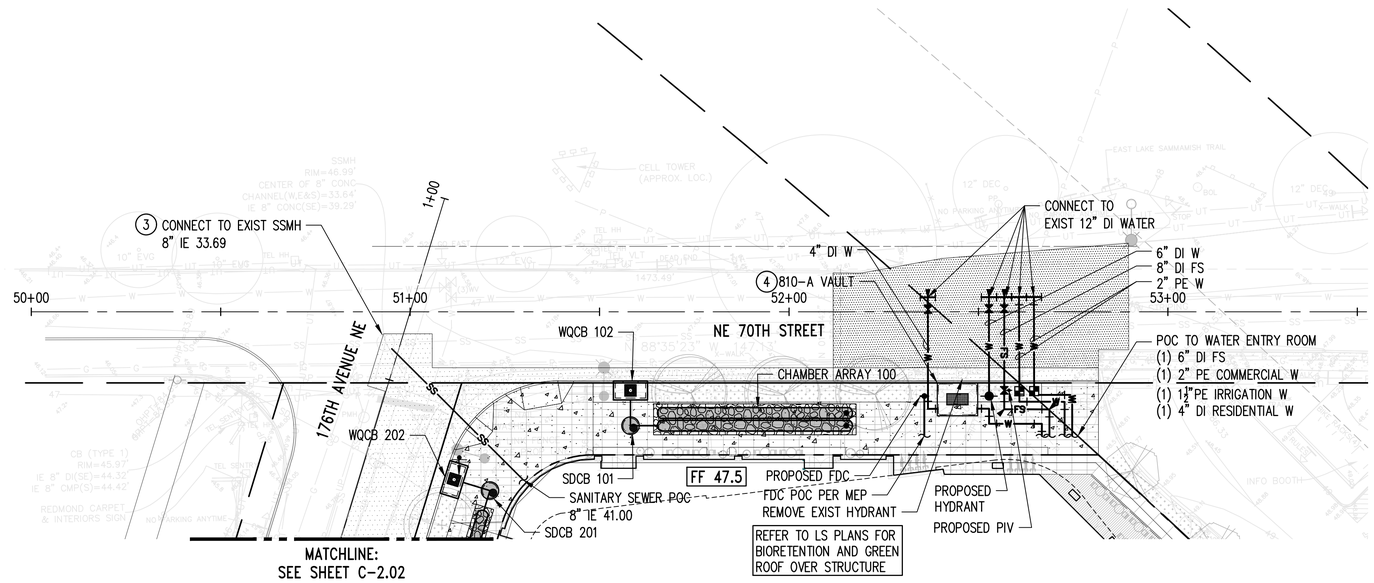
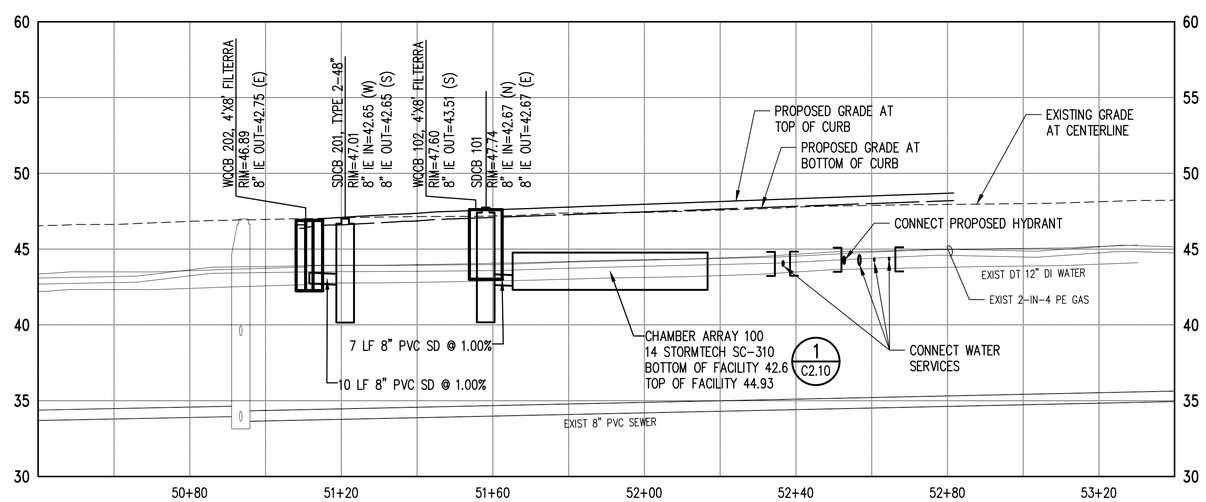
0 10 20 40

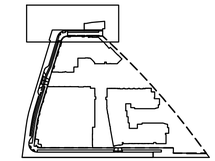
1 inch = 20 feet





NE 70TH STREET PROFILE

SCALE: H: 1" = 20' V: 1" = 5'



KEY MAP

LEGEND:

- EXISTING PROPERTY LINE
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- WATER METER
- 810 LA VAULT

NOTES:

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4. ROW UTILITIES IN HARDSCAPE SHALL HAVE NON-SKID LID.

NO.	DATE	BY	CHD.	APPR.	REVISION
1	8/13/18	KFR	JSF	JSF	PREP ROUND 1
2	10/18/18	KFR	JSF	JSF	PREP ROUND 2
3	12/21/18	KFR	JSF	JSF	PREP ROUND 3
4	01/14/19	KFR	JSF	JSF	DD PRICING SET
5	02/28/19	KFR	JSF	JSF	100% PREP SET

DRAWN BY JEP/RG | DESIGNED BY KFR
CHECKED BY JSF | APPROVED BY JSF
DATE 02/28/2019
JOB No. :1800077

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REDMOND, WA

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SHEET C-2.01

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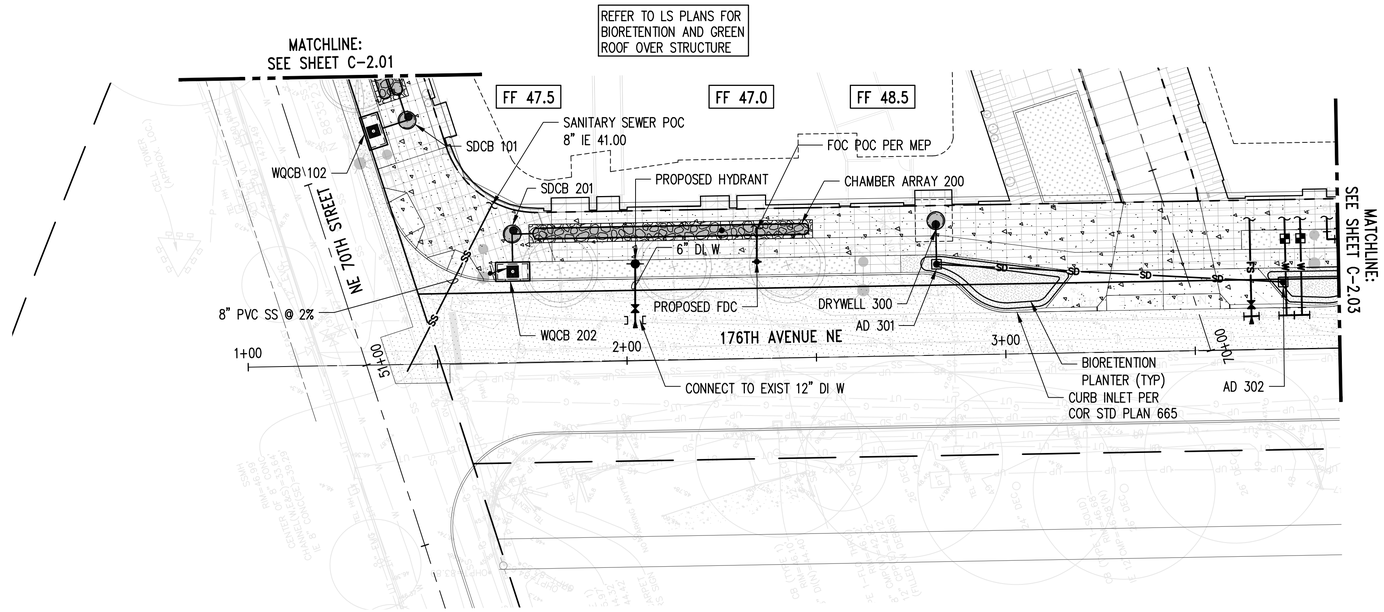
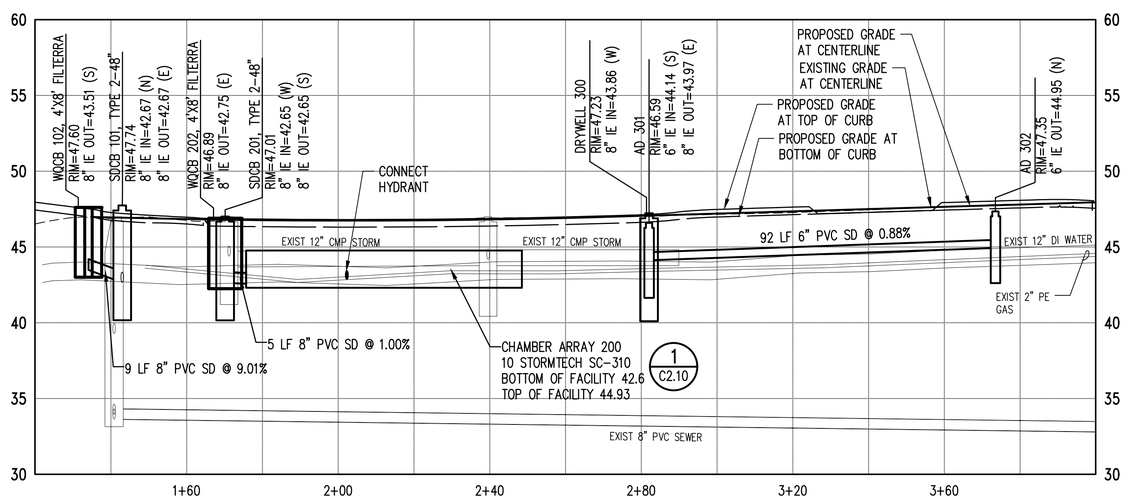
KyleA
Feb 27, 2019 - 2:21pm

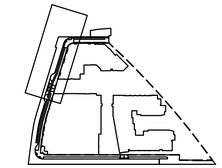
0 10 20 40
1 inch = 20 feet





176TH AVENUE NE PROFILE

SCALE: H: 1" = 20' V: 1" = 5'



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3	12/21/18	KFR	JSF	JSF	PREP ROUND 3
4	01/14/19	KFR	JSF	JSF	DD PRICING SET
5	02/28/19	KFR	JSF	JSF	100% PREP SET

DRAWN BY JEP/RG
DESIGNED BY KFR
CHECKED BY JSF
APPROVED BY JSF
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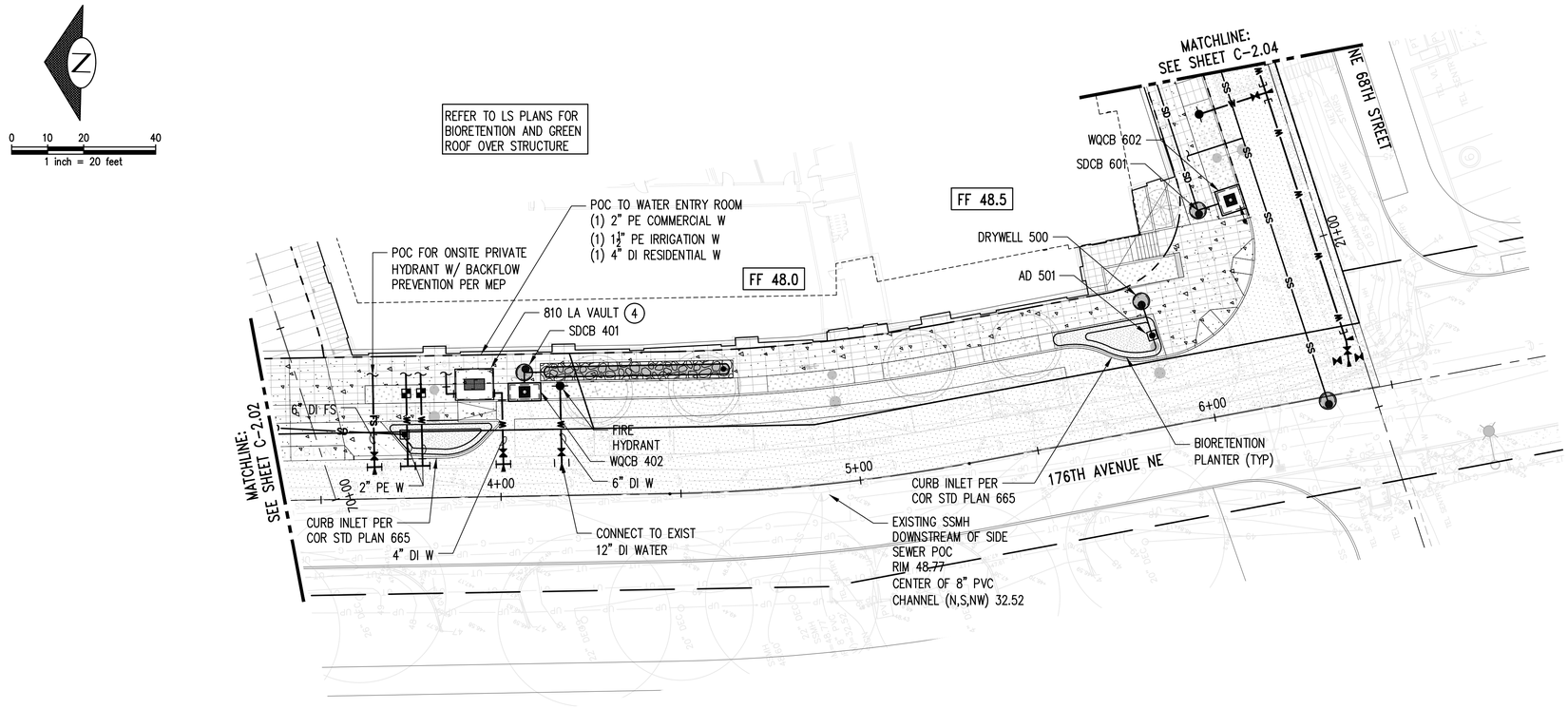
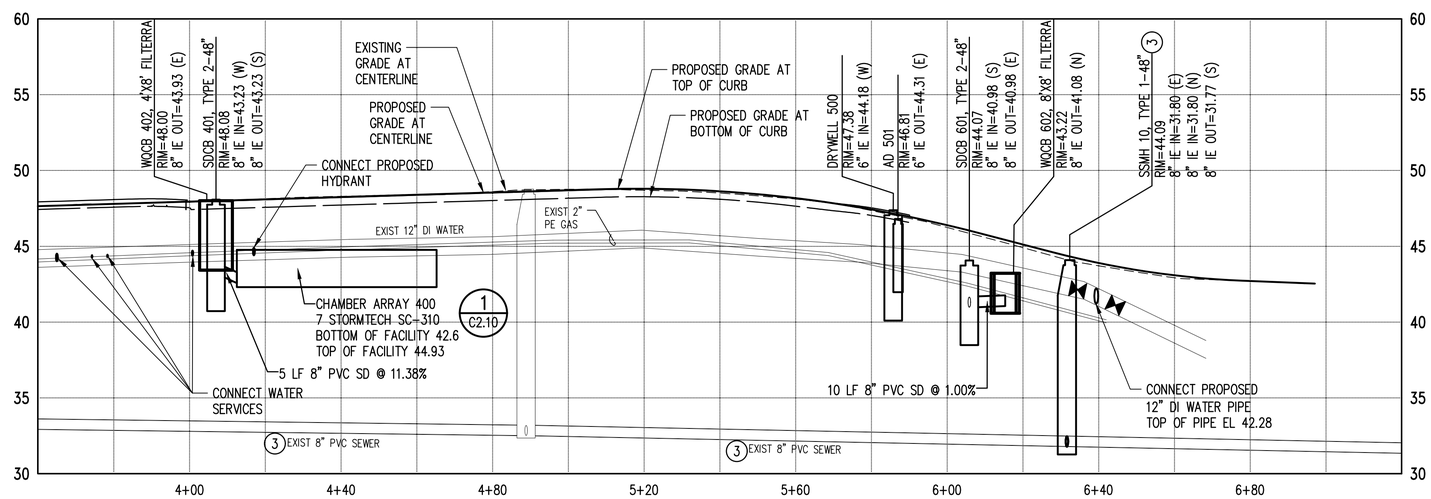
Feb 27, 2019 – 2:21pm KyleA \\kpff.com\Civil\1800001-1800999\1800077 Redmond Marymoor TOD\CADD\Design\W100-CIVIL-C2.1-UTIL.dwg





176TH AVENUE NE PROFILE

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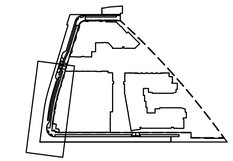

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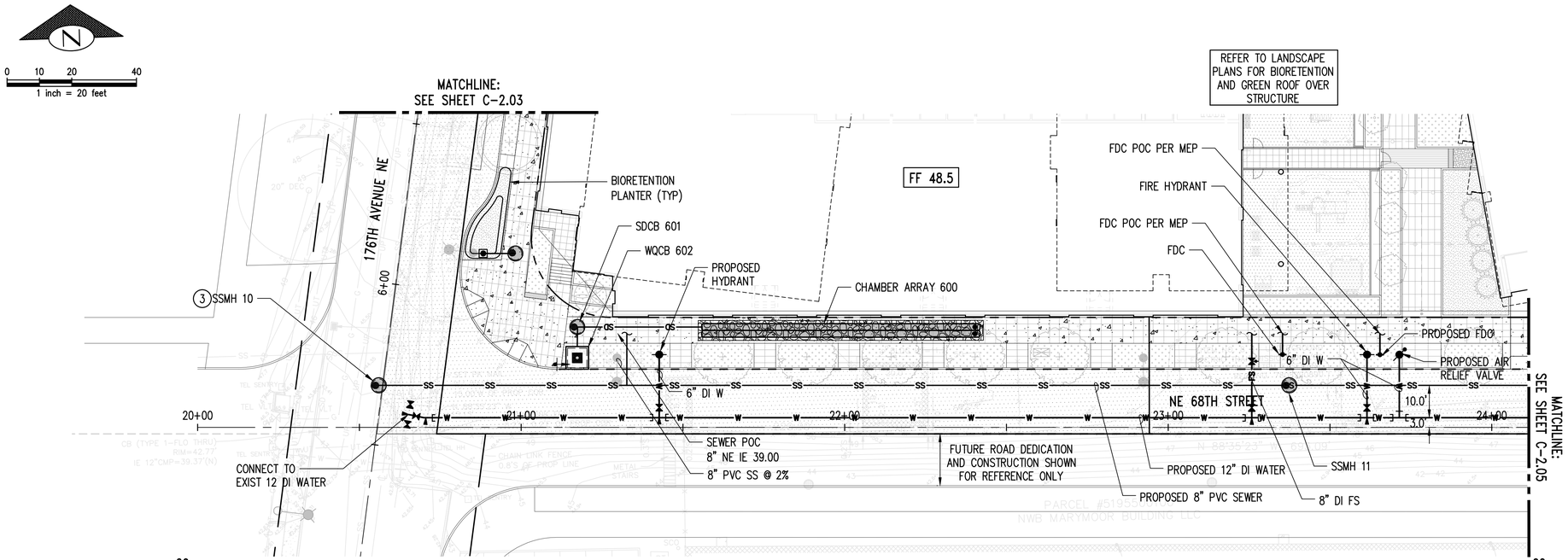
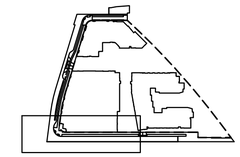
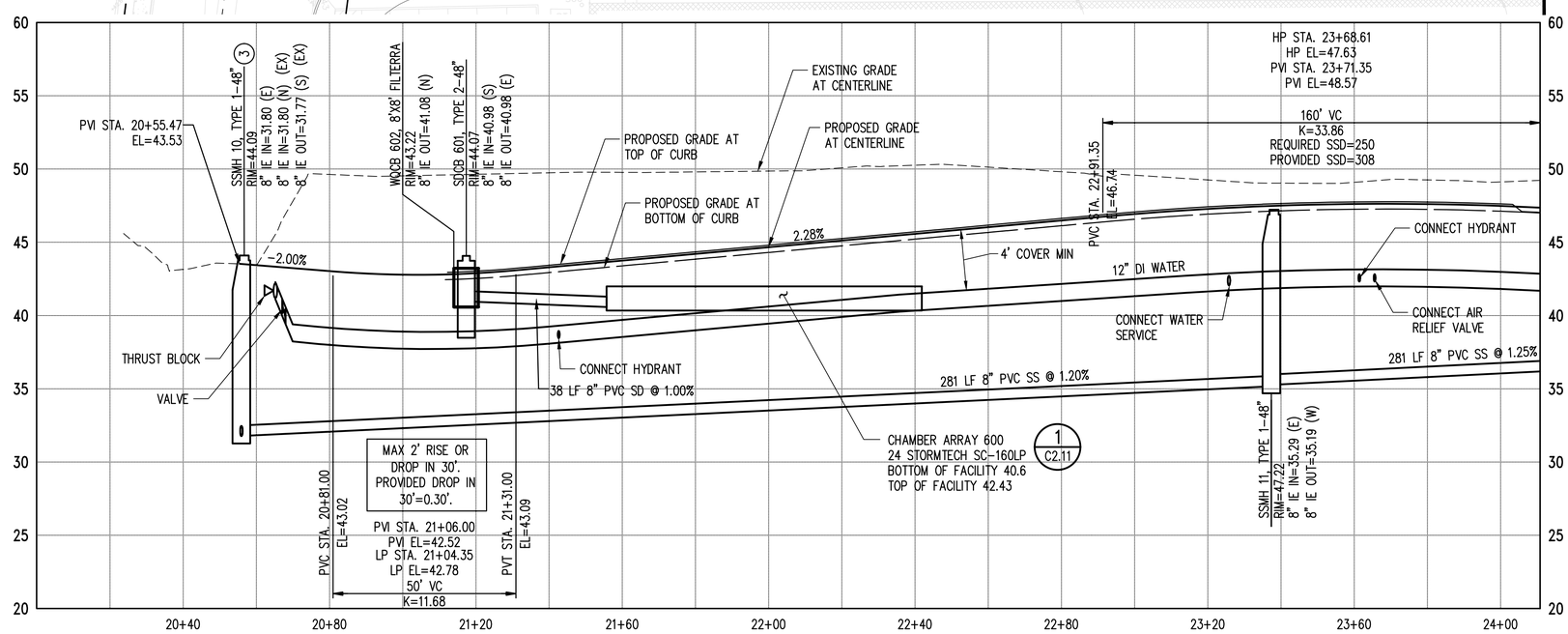




KEY MAP



NE 68TH STREET PROFILE

SCALE: H: 1" = 20' V: 1" = 5'

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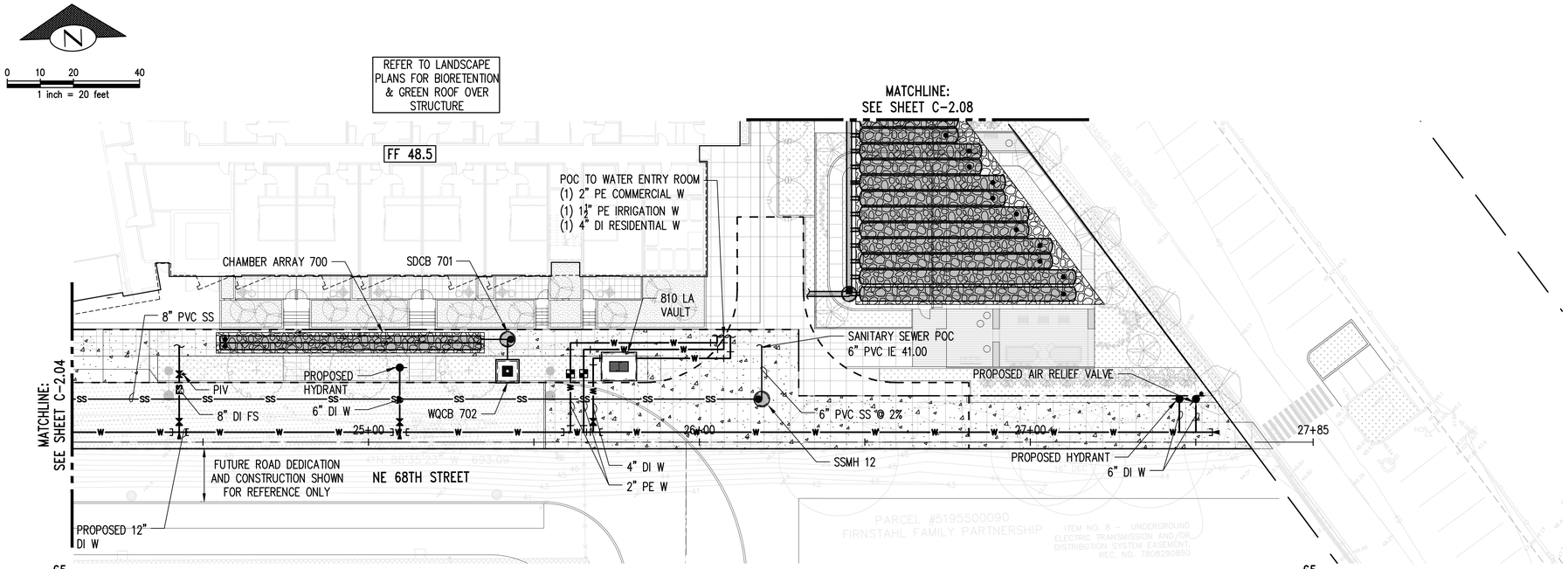
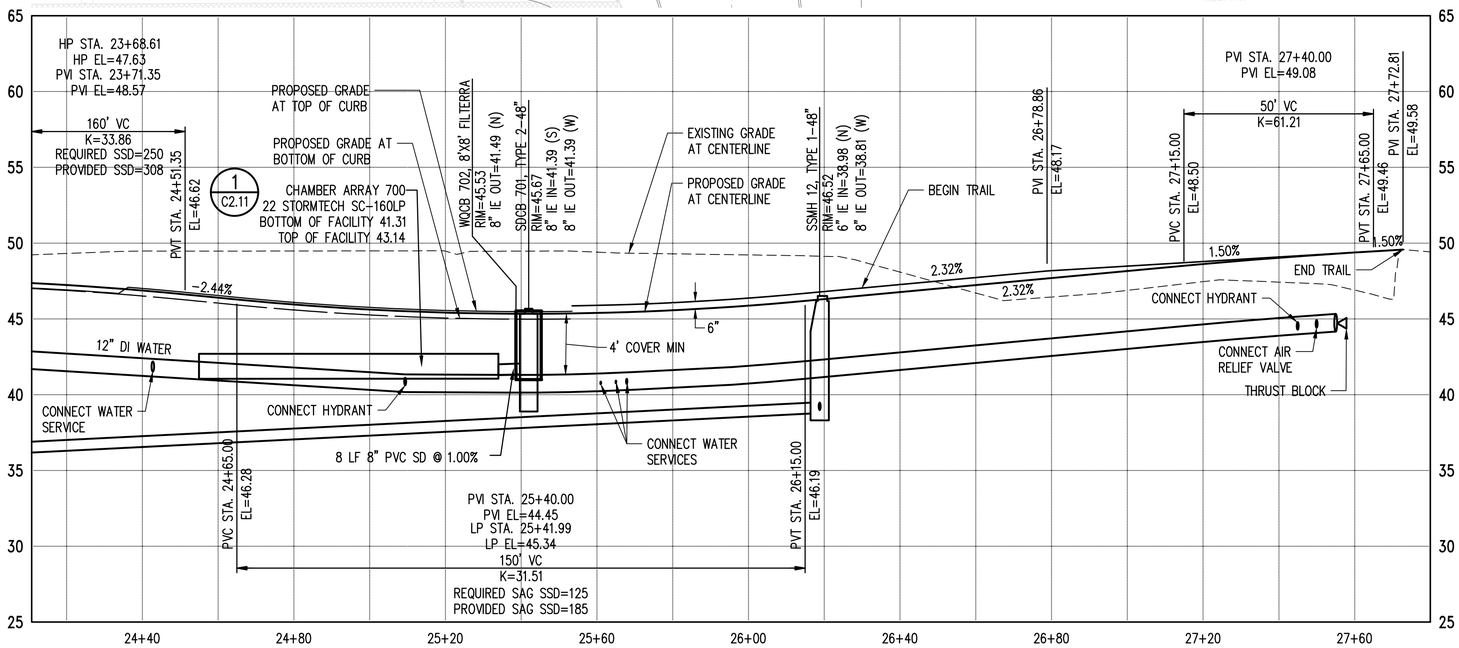
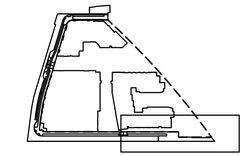




NE 68TH STREET PROFILE

SCALE: H: 1" = 20' V: 1" = 5'



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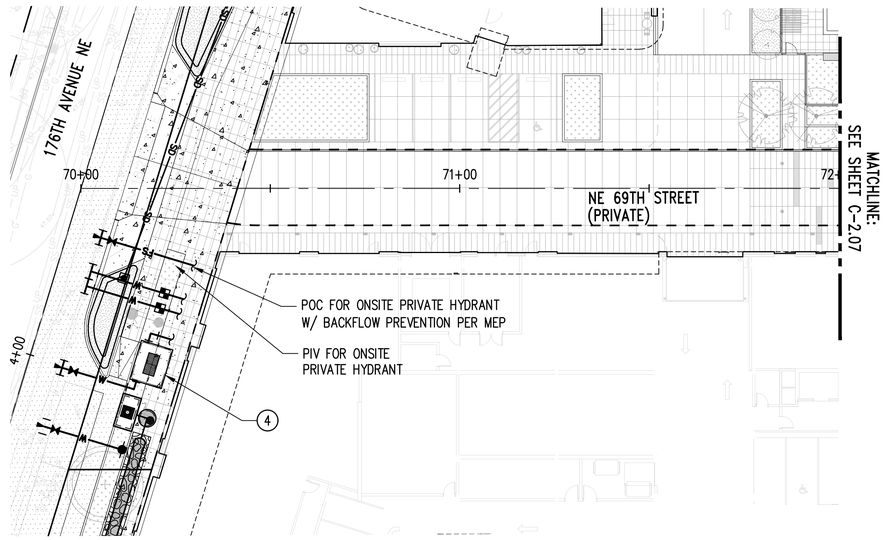
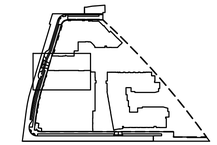
KyleA
Feb 27, 2019 - 2:22pm

N

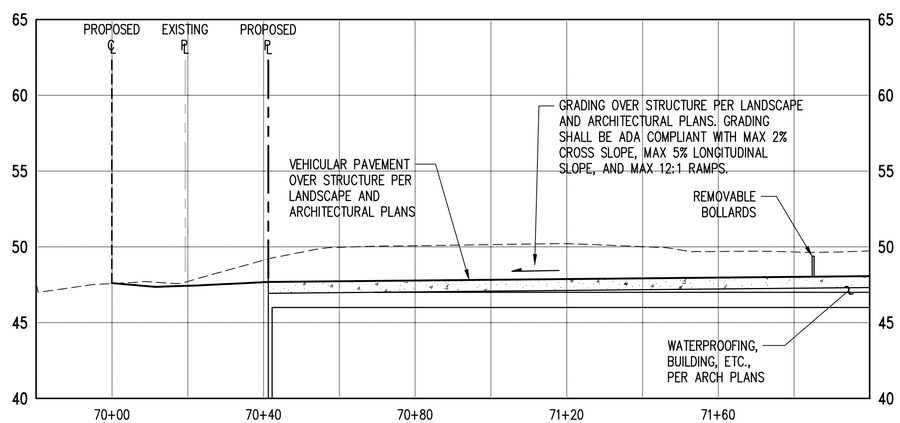
0 10 20 40

1 inch = 20 feet





KEY MAP



NE 69TH STREET PROFILE

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SHEET C-2.06

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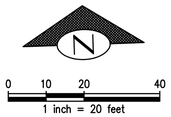

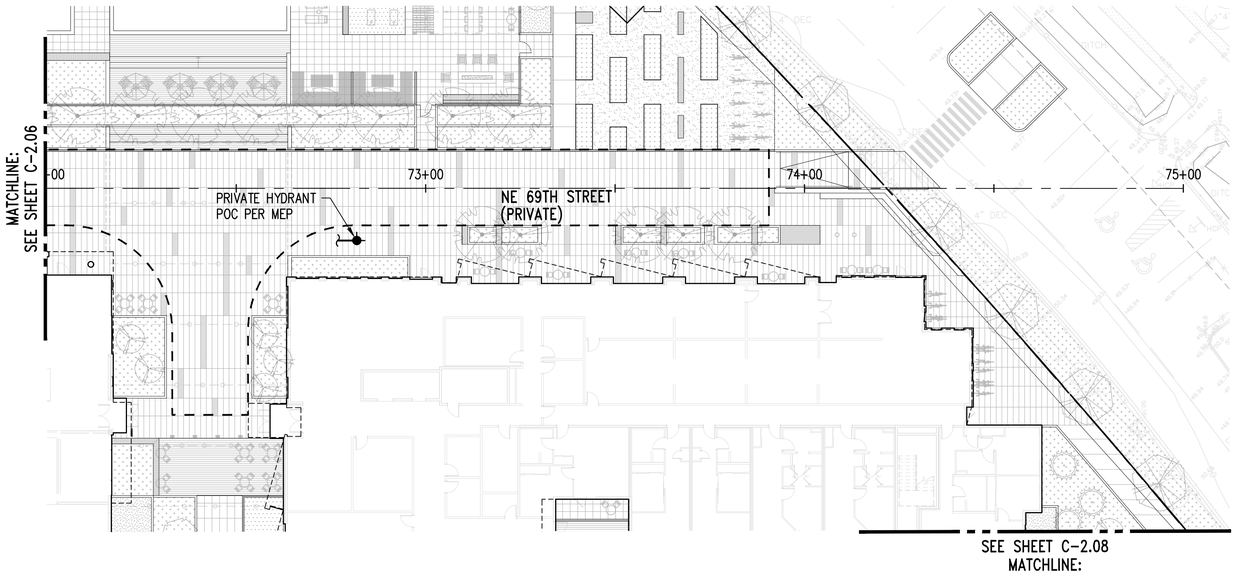

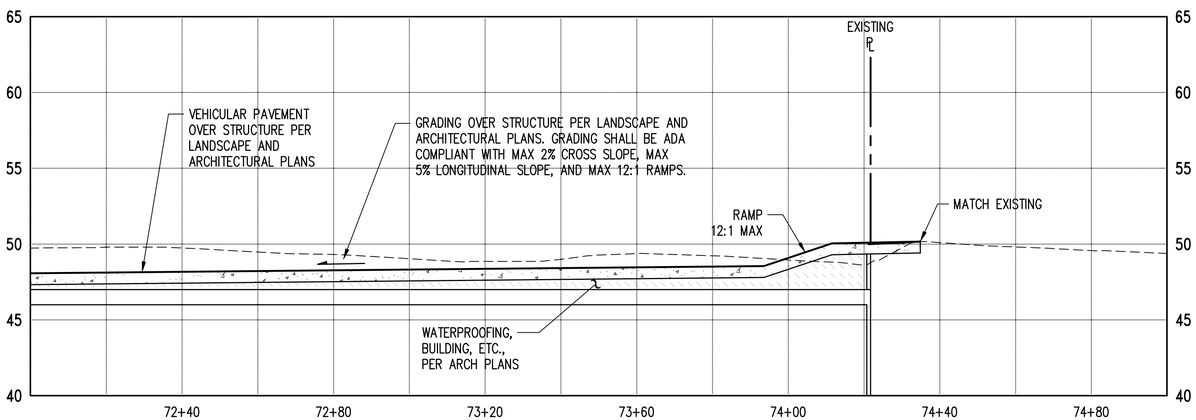

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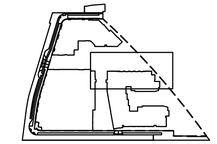

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3. SEWER MAIN IN 176TH AVENUE NE WILL BE UPSIZED TO 10" BY COR AS A PART OF REGIONAL PUMP STATION IMPROVEMENTS. NEW SEWER MAIN WILL EITHER MAINTAIN EXISTING IE'S OR DEEPEN THEM. PROJECT WILL COORDINATE WITH COR'S CONTRACTOR TO DETERMINE FINAL PIPE AND STRUCTURE INVERTS.
4. ROW UTILITIES IN HARDSCAPE SHALL HAVE NON-SKID LID.

NO.	DATE	BY	CHD.	APPR.	REVISION
1	8/13/18	KFR	JSF	JSF	PREP ROUND 1
2	10/18/18	KFR	JSF	JSF	PREP ROUND 2
3	12/21/18	KFR	JSF	JSF	PREP ROUND 3
4	01/14/19	KFR	JSF	JSF	DD PRICING SET
5	02/28/19	KFR	JSF	JSF	100% PREP SET

DRAWN BY JEP/RG | DESIGNED BY KFR
CHECKED BY JSF | APPROVED BY JSF
DATE 02/28/2019
J O B No. :1800077

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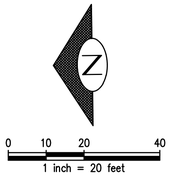
JEREMY S. FRIELLS STATE OF WASHINGTON 39847 REGISTERED PROFESSIONAL ENGINEER

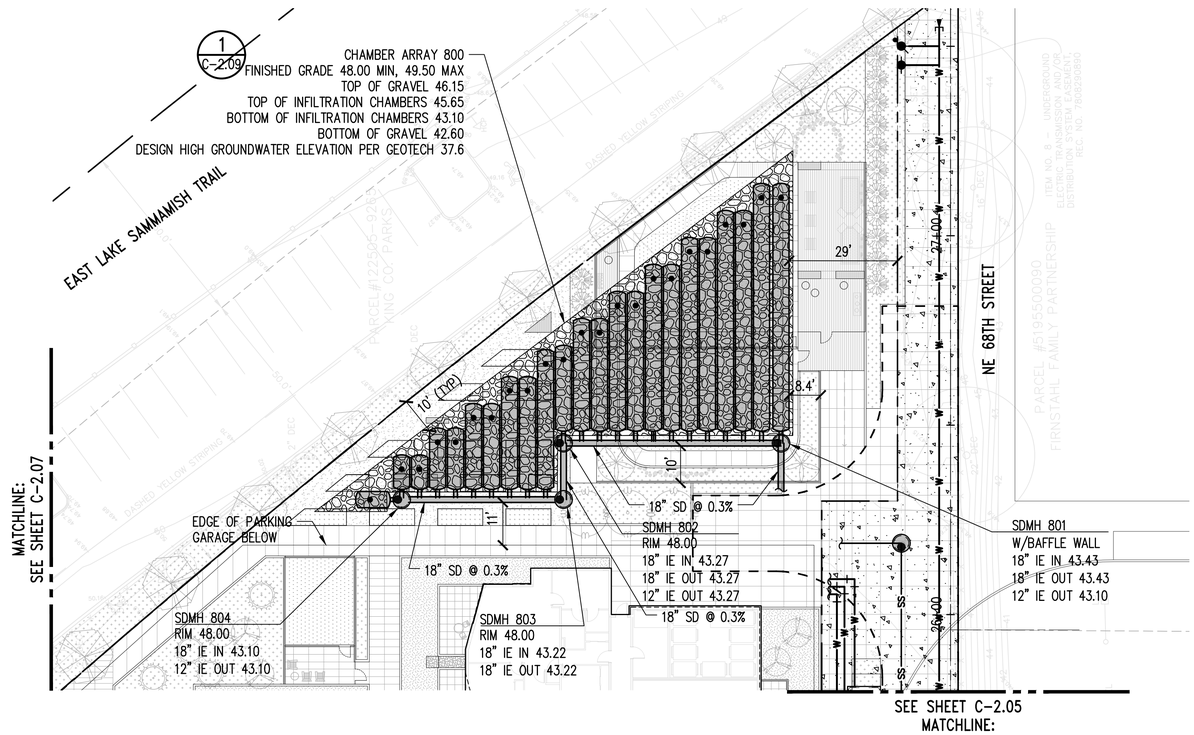
LMC MARYMOOR
REDMOND, WA

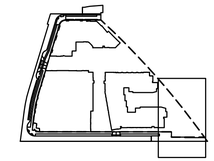
UTILITIES & DRAINAGE PLAN & PROFILE

SHEET C-2.07

\\kpff.com\Civil\1800001-1800999\1800077 Redmond Marymoor T03\CADD\Design\M100-CIVL-C2.1-UTIL.dwg KyleA Feb 27, 2019 - 2:22pm







KEY MAP

LEGEND:

- EXISTING PROPERTY LINE
- PROPOSED PROPERTY LINE
- CENTERLINE
- SD — STORM LINE
- SS — SEWER LINE
- W — WATER LINE
- FS — FIRE SERVICE LINE
- FILTERRA STRUCTURES
- AREA DRAIN
- CLEANOUT
- DRYWELL/SDMH
- SSMH
- HYDRANT
- FDC
- AIR RELIEF VALVE
- WATER FITTINGS
- POST INDICATOR VALVE
- WATER METER
- 810 LA VAULT

NOTES:

1. UTILITY LOCATES SHALL BE PERFORMED TO DETERMINE VERTICAL CLEARANCES BETWEEN EXISTING AND PROPOSED UTILITIES AND TO IDENTIFY POSSIBLE UTILITY CONFLICTS PRIOR TO CCR APPROVAL.
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ONSITE PROFILE

SCALE: H: 1" = 20' V: 1" = 5'

NO.	DATE	BY	CHD.	APPR.	REVISION
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LMC MARYMOOR
REDMOND, WA

UTILITIES & DRAINAGE PLAN & PROFILE

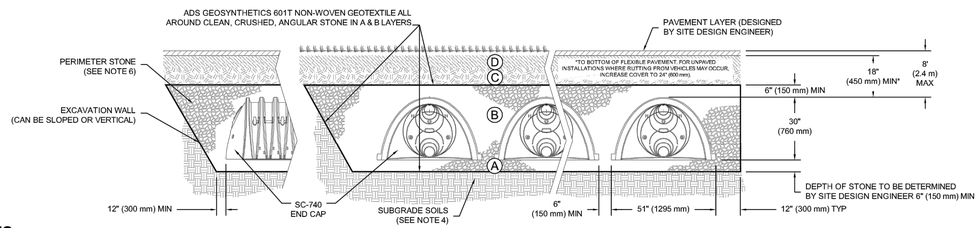
SHEET C-2.08

Feb 27, 2019 - 2:23pm KyleA \\kpff.com\Civil\1800001-1800999\1800077 Redmond Marymoor TOD\CADD\Design\M100-CIVIL-C2.1-UTIL.dwg

ACCEPTABLE FILL MATERIALS: STORMTECH SC-740 CHAMBER SYSTEMS

MATERIAL LOCATION		DESCRIPTION	AASHTO MATERIAL CLASSIFICATIONS	COMPACTION / DENSITY REQUIREMENT
D	**FINAL FILL:** FILL MATERIAL FOR LAYER 'D' STARTS FROM THE TOP OF THE 'C' LAYER TO THE BOTTOM OF FLEXIBLE PAVEMENT OR UNPAVED FINISHED GRADE ABOVE. NOTE THAT PAVEMENT SUBBASE MAY BE PART OF THE 'D' LAYER	ANY SOIL/ROCK MATERIALS, NATIVE SOILS, OR PER ENGINEER'S PLANS. CHECK PLANS FOR PAVEMENT SUBGRADE REQUIREMENTS.	N/A	PREPARE PER SITE DESIGN ENGINEER'S PLANS. PAVED INSTALLATIONS MAY HAVE STRINGENT MATERIAL AND PREPARATION REQUIREMENTS.
C	**INITIAL FILL:** FILL MATERIAL FOR LAYER 'C' STARTS FROM THE TOP OF THE EMBEDMENT STONE ('B' LAYER) TO 18" (450 mm) ABOVE THE TOP OF THE CHAMBER. NOTE THAT PAVEMENT SUBBASE MAY BE A PART OF THE 'C' LAYER.	GRANULAR WELL-GRADED SOIL/AGGREGATE MIXTURES, <35% FINES OR PROCESSED AGGREGATE. MOST PAVEMENT SUBBASE MATERIALS CAN BE USED IN LIEU OF THIS LAYER.	AASHTO M145[1] A-1, A-2-4, A-3 OR AASHTO M43[1] 3, 357, 4, 467, 5, 56, 57, 6, 67, 68, 7, 78, 8, 89, 9, 10	BEGIN COMPACTIONS AFTER 12" (300 mm) OF MATERIAL OVER THE CHAMBERS IS REACHED. COMPACT ADDITIONAL LAYERS IN 6" (150 mm) MAX LIFTS TO A MIN. 95% PROCTOR DENSITY FOR WELL GRADED MATERIAL AND 95% RELATIVE DENSITY FOR PROCESSED AGGREGATE MATERIALS. ROLLER GROSS VEHICLE WEIGHT NOT TO EXCEED 12,000 lbs (53 kN). DYNAMIC FORCE NOT TO EXCEED 20,000 lbs (89 kN).
B	**EMBEDMENT STONE:** FILL SURROUNDING THE CHAMBERS FROM THE FOUNDATION STONE ('A' LAYER) TO THE 'C' LAYER ABOVE.	CLEAN, CRUSHED, ANGULAR STONE	AASHTO M43[1] 3, 357, 4, 467, 5, 56, 57	NO COMPACTION REQUIRED.
A	**FOUNDATION STONE:** FILL BELOW CHAMBERS FROM THE SUBGRADE UP TO THE FOOT (BOTTOM) OF THE CHAMBER.	CLEAN, CRUSHED, ANGULAR STONE	AASHTO M43[1] 3, 357, 4, 467, 5, 56, 57	PLATE COMPACT OR ROLL TO ACHIEVE A FLAT SURFACE. [2 3]

PLEASE NOTE:
1. THE LISTED AASHTO DESIGNATIONS ARE FOR GRADATIONS ONLY. THE STONE MUST ALSO BE CLEAN, CRUSHED, ANGULAR. FOR EXAMPLE, A SPECIFICATION FOR #4 STONE WOULD STATE: "CLEAN, CRUSHED, ANGULAR NO. 4 (AASHTO M43) STONE".
2. STORMTECH COMPACTION REQUIREMENTS ARE MET FOR 'A' LOCATION MATERIALS WHEN PLACED AND COMPACTED IN 6" (150 mm) (MAX) LIFTS USING TWO FULL COVERAGES WITH A VIBRATORY COMPACTOR.
3. WHERE INFILTRATION SURFACES MAY BE COMPROMISED BY COMPACTION, FOR STANDARD DESIGN LOAD CONDITIONS, A FLAT SURFACE MAY BE ACHIEVED BY RAKING OR DRAGGING WITHOUT COMPACTION EQUIPMENT. FOR SPECIAL LOAD DESIGNS, CONTACT STORMTECH FOR COMPACTION REQUIREMENTS.



NOTES:

1. SC-740 CHAMBERS SHALL CONFORM TO THE REQUIREMENTS OF ASTM F2418 "STANDARD SPECIFICATION FOR POLYPROPYLENE (PP) CORRUGATED WALL STORMWATER COLLECTION CHAMBERS", OR ASTM F2922 "STANDARD SPECIFICATION FOR POLYETHYLENE (PE) CORRUGATED WALL STORMWATER COLLECTION CHAMBERS".
2. SC-740 CHAMBERS SHALL BE DESIGNED IN ACCORDANCE WITH ASTM F2787 "STANDARD PRACTICE FOR STRUCTURAL DESIGN OF THERMOPLASTIC CORRUGATED WALL STORMWATER COLLECTION CHAMBERS".
3. "ACCEPTABLE FILL MATERIALS" TABLE ABOVE PROVIDES MATERIAL LOCATIONS, DESCRIPTIONS, GRADATIONS, AND COMPACTION REQUIREMENTS FOR FOUNDATION, EMBEDMENT, AND FILL MATERIALS.
4. THE SITE DESIGN ENGINEER IS RESPONSIBLE FOR ASSESSING THE BEARING RESISTANCE (ALLOWABLE BEARING CAPACITY) OF THE SUBGRADE SOILS AND THE DEPTH OF FOUNDATION STONE WITH CONSIDERATION FOR THE RANGE OF EXPECTED SOIL MOISTURE CONDITIONS.
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SC-740 STANDARD CROSS SECTION

REV	DRW	CHK	DESCRIPTION
01/18/16	JLM	JLM	UPDATE

DATE: 11/18/14 DRAWN: JLM
PROJECT #: CHECKED: JLM

StormTech® (Formerly Adscometics Water Quality)
70 INWOOD ROAD, SUITE 3 | ROCKY HILL, CT | 06067
(860) 929-7635 | FAX (860) 929-7636 | WWW.STORMTECH.COM

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4640 TRUEMAN BLVD
HILLIARD, OH 43026
1-800-733-7473

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SHEET 1 OF 1

SC-740 INFILTRATION CHAMBER
NTS
1
C-2.08

NO.	DATE	BY	CHD.	APPR.	REVISION
1	8/13/18	KFR	JSF	JSF	PREP ROUND 1
2	10/18/18	KFR	JSF	JSF	PREP ROUND 2
3	12/21/18	KFR	JSF	JSF	PREP ROUND 3
4	01/14/19	KFR	JSF	JSF	DD PRICING SET
5	02/28/19	KFR	JSF	JSF	100% PREP SET

DRAWN BY JEP/RG DESIGNED BY KFR
CHECKED BY JSF APPROVED BY JSF
DATE 02/28/2019
J O B No. :1800077

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REDMOND, WA

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SHEET C-2.09

Feb 27, 2019 - 2:23pm KyleA \\kpff.com\Civil\1800001-1800999\1800077 Redmond Marymoor TOD\CADD\Design\W100-CIVIL-C2.9-UTIL-D1.dwg

ACCEPTABLE FILL MATERIALS: STORMTECH SC-310 CHAMBER SYSTEMS

MATERIAL LOCATION		DESCRIPTION	AASHTO MATERIAL CLASSIFICATIONS	COMPACTION / DENSITY REQUIREMENT
D	**FINAL FILL:** FILL MATERIAL FOR LAYER 'D' STARTS FROM THE TOP OF THE 'C' LAYER TO THE BOTTOM OF FLEXIBLE PAVEMENT OR UNPAVED FINISHED GRADE ABOVE. NOTE THAT PAVEMENT SUBBASE MAY BE PART OF THE 'D' LAYER	ANY SOIL/ROCK MATERIALS, NATIVE SOILS, OR PER ENGINEER'S PLANS. CHECK PLANS FOR PAVEMENT SUBGRADE REQUIREMENTS.	N/A	PREPARE PER SITE DESIGN ENGINEER'S PLANS. PAVED INSTALLATIONS MAY HAVE STRINGENT MATERIAL AND PREPARATION REQUIREMENTS.
C	**INITIAL FILL:** FILL MATERIAL FOR LAYER 'C' STARTS FROM THE TOP OF THE EMBEDMENT STONE ("B" LAYER) TO 18" (450 mm) ABOVE THE TOP OF THE CHAMBER. NOTE THAT PAVEMENT SUBBASE MAY BE A PART OF THE 'C' LAYER.	GRANULAR WELL-GRADED SOIL/AGGREGATE MIXTURES, <35% FINES OR PROCESSED AGGREGATE. MOST PAVEMENT SUBBASE MATERIALS CAN BE USED IN LIEU OF THIS LAYER.	AASHTO M145[1] A-1, A-2-4, A-3 OR AASHTO M43[1] 3, 357, 4, 467, 5, 56, 57, 6, 67, 68, 7, 78, 8, 89, 9, 10	BEGIN COMPACTIONS AFTER 12" (300 mm) OF MATERIAL OVER THE CHAMBERS IS REACHED. COMPACT ADDITIONAL LAYERS IN 6" (150 mm) MAX LIFTS TO A MIN. 95% PROCTOR DENSITY FOR WELL GRADED MATERIAL AND 95% RELATIVE DENSITY FOR PROCESSED AGGREGATE MATERIALS. ROLLER GROSS VEHICLE WEIGHT NOT TO EXCEED 12,000 lbs (53 kN). DYNAMIC FORCE NOT TO EXCEED 20,000 lbs (89 kN).
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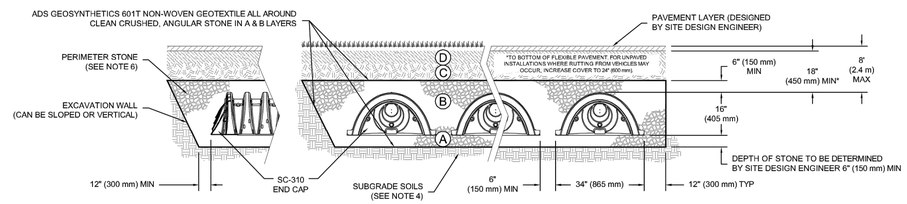

NOTES:

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SC-310 INFILTRATION CHAMBER (1)
NTS
C2.01,C2.02,C2.03

SC-310
STANDARD CROSS SECTION

REV	DRW	CHK	DESCRIPTION
07/18/16	JLM	JLM	UPDATE

DATE: 11/18/14 DRAWN: JLM
PROJECT #: CHECKED: JLM

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70 INVERNESS DRIVE SUITE B | ROCKY HILL, CT | 06067
TOLL FREE: 888-892-2694 | PHONE: 860-529-8188 | FAX: 860-529-8040 | WWW.STORMTECH.COM

ADS Advanced Drainage Systems, Inc.
4640 TRUEMAN BLVD
HILLIARD, OH 43026
1-800-733-7473

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SHEET
1 OF 1

NO.	DATE	BY	CHD.	APPR.	REVISION
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2	10/18/18	KFR	JSF	JSF	PREP ROUND 2
3	12/21/18	KFR	JSF	JSF	PREP ROUND 3
4	01/14/19	KFR	JSF	JSF	DD PRICING SET
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DRAWN BY JEP/RG | DESIGNED BY KFR
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DATE 02/28/2019
J O B No. :1800077

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UTILITIES & DRAINAGE DETAILS

SHEET C-2.10

Feb 27, 2019 - 2:23pm KYleA \\kpff.com\Civil\1800001-1800999\1800077 Redmond Marymoor TG01\CADD\Design\WT00-CIVL-C2.9-UTIL-DT.dwg

ACCEPTABLE FILL MATERIALS: STORMTECH SC-160LP CHAMBER SYSTEMS

MATERIAL LOCATION		DESCRIPTION	AASHTO MATERIAL CLASSIFICATIONS	COMPACTION / DENSITY REQUIREMENT
D	**FINAL FILL:** FILL MATERIAL FOR LAYER 'D' STARTS FROM THE TOP OF THE 'C' LAYER TO THE BOTTOM OF FLEXIBLE PAVEMENT OR UNPAVED FINISHED GRADE ABOVE. NOTE THAT PAVEMENT SUBBASE MAY BE PART OF THE 'D' LAYER	ANY SOIL/ROCK MATERIALS, NATIVE SOILS, OR PER ENGINEER'S PLANS. CHECK PLANS FOR PAVEMENT SUBGRADE REQUIREMENTS.	N/A	PREPARE PER SITE DESIGN ENGINEER'S PLANS. PAVED INSTALLATIONS MAY HAVE STRINGENT MATERIAL AND PREPARATION REQUIREMENTS.
C	**INITIAL FILL:** FILL MATERIAL FOR LAYER 'C' STARTS FROM THE TOP OF THE EMBEDMENT STONE ("B" LAYER) TO 14" (355 mm) ABOVE THE TOP OF THE CHAMBER. NOTE THAT PAVEMENT SUBBASE MAY BE A PART OF THE 'C' LAYER.	GRANULAR WELL-GRADED SOIL/AGGREGATE MIXTURES, <35% FINES OR PROCESSED AGGREGATE. MOST PAVEMENT SUBBASE MATERIALS CAN BE USED IN LIEU OF THIS LAYER.	AASHTO M145[1] A-1, A-2-4, A-3 OR AASHTO M43[1] 3, 357, 4, 467, 5, 56, 57, 6, 67, 68, 7, 78, 8, 89, 9, 10	BEGIN COMPACTIONS AFTER 12" (300 mm) OF MATERIAL OVER THE CHAMBERS IS REACHED. COMPACT ADDITIONAL LAYERS IN 6" (150 mm) MAX LIFTS TO A MIN. 95% PROCTOR DENSITY FOR WELL GRADED MATERIAL AND 95% RELATIVE DENSITY FOR PROCESSED AGGREGATE MATERIALS. ROLLER GROSS VEHICLE WEIGHT NOT TO EXCEED 12,000 lbs (53 kN). DYNAMIC FORCE NOT TO EXCEED 20,000 lbs (89 kN).
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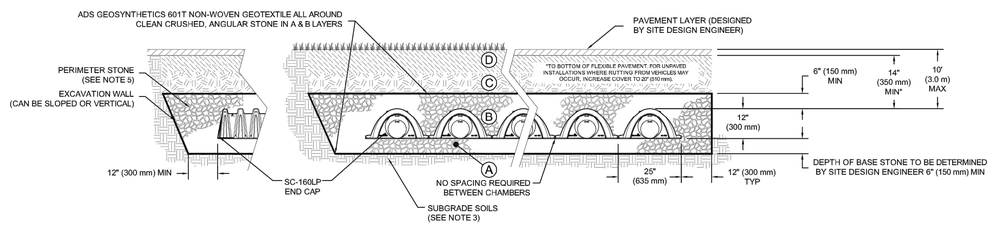

NOTES:

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SC-160LP STANDARD CROSS SECTION

REV	DRW	CHK	DESCRIPTION

DATE: 01/19/16 DRAWN: JLM
PROJECT #: CHECKED: JLM

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75 NAVOOS ROAD, SUITE 3 | ROCKY HILL, CT | 06067
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SHEET 1 OF 1

SC-160LP INFILTRATION CHAMBER (1 / C2.04,C2.05)
NTS

NO.	DATE	BY	CHD.	APPR.	REVISION
1	8/13/18	KFR	JSF	JSF	PREP ROUND 1
2	10/18/18	KFR	JSF	JSF	PREP ROUND 2
3	12/21/18	KFR	JSF	JSF	PREP ROUND 3
4	01/14/19	KFR	JSF	JSF	DD PRICING SET
5	02/28/19	KFR	JSF	JSF	100% PREP SET

DRAWN BY JEP/RG | DESIGNED BY KFR
CHECKED BY JSF | APPROVED BY JSF
DATE 02/28/2019
J O B No. :1800077

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LMC MARYMOOR
REDMOND, WA

UTILITIES & DRAINAGE DETAILS

SHEET C-2.11

Feb 27, 2019 – 2:23pm KyleA \\kpff.com\Civil\1800001-1800999\1800077 Redmond Marymoor T03\CADD\Design\MT0D-CIVL-C2.9-UTIL-DT.dwg

Appendix C

1. MGS Flood Reports

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MGS FLOOD
PROJECT REPORT

Program Version: MGSFlood 4.46
Program License Number: 200410007
Project Simulation Performed on: 12/17/2018 5:46 PM
Report Generation Date: 12/17/2018 5:46 PM

Input File Name: 2018-12-21 Onsite Infiltration- Contech.fld
Project Name: LMC Marymoor
Analysis Title: Onsite Infiltration
Comments:

PRECIPITATION INPUT

Computational Time Step (Minutes): 5

Extended Precipitation Time Series Selected
Climatic Region Number: 15

Full Period of Record Available used for Routing
Precipitation Station : 96004005 Puget East 40 in_5min 10/01/1939-10/01/2097
Evaporation Station : 961040 Puget East 40 in MAP
Evaporation Scale Factor : 0.750

HSPF Parameter Region Number: 1
HSPF Parameter Region Name : USGS Default

********** Default HSPF Parameters Used (Not Modified by User) **********

********** **WATERSHED DEFINITION** **********

Predevelopment/Post Development Tributary Area Summary

		Predeveloped	Post Developed
Total Subbasin Area (acres)	4.110	4.110	
Area of Links that Include Precip/Evap (acres)	0.000	0.000	
Total (acres)	4.110	4.110	

----------SCENARIO: PREDEVELOPED
Number of Subbasins: 1

---------- Subbasin : Subbasin 1 ----------

	-------Area (Acres) --------
Till Pasture	4.110
Subbasin Total	4.110

----------SCENARIO: POSTDEVELOPED
Number of Subbasins: 1

---------- Subbasin : Subbasin 1 ----------

	-------Area (Acres) --------
Till Grass	0.643
Impervious	3.467
Subbasin Total	4.110

********** **LINK DATA** **********

----------SCENARIO: PREDEVELOPED
Number of Links: 0

********** **LINK DATA** **********

----------SCENARIO: POSTDEVELOPED
Number of Links: 1

Link Name: Infiltration Chamber
Link Type: Structure
Downstream Link: None

User Specified Elevation Volume Table Used

Elevation (ft)	Pond Volume (cu-ft)
0.00	0.
42.68	113.
42.77	225.
42.85	338.
42.93	451.
43.02	563.
43.10	676.
43.18	789.
43.27	901.
43.35	1014.
43.43	1259.
43.52	1504.
43.60	1747.
43.68	1989.
43.77	2230.
43.85	2469.
43.93	2706.
44.02	2941.
44.10	3174.
44.18	3406.
44.27	3634.
44.35	3861.
44.43	4085.
44.52	4305.

44.60	4523.
44.68	4738.
44.77	4949.
44.85	5157.
44.93	5361.
45.02	5561.
45.10	5755.
45.18	5944.
45.27	6127.
45.35	6304.
45.43	6474.
45.52	6635.
45.60	6784.
45.68	6913.
45.77	7036.
45.85	7152.
45.93	7264.
46.02	7377.
46.10	7490.
46.18	7602.
46.27	7715.
46.35	7828.
46.43	7940.
46.52	8053.
46.60	8166.
46.68	8278.
46.77	8391.
46.85	8504.

Constant Infiltration Option Used
Infiltration Rate (in/hr): 20.00

Riser Geometry
Riser Structure Type : Circular
Riser Diameter (in) : 24.00
Common Length (ft) : 0.000
Riser Crest Elevation : 46.70 ft

Hydraulic Structure Geometry

Number of Devices: 0

**************************FLOOD FREQUENCY AND DURATION STATISTICS************************

----------SCENARIO: PREDEVELOPED
Number of Subbasins: 1
Number of Links: 0

----------SCENARIO: POSTDEVELOPED
Number of Subbasins: 1
Number of Links: 1

*************Groundwater Recharge Summary ***************

Recharge is computed as input to Perlnd Groundwater Plus Infiltration in Structures

Total Predeveloped Recharge During Simulation

Model Element	Recharge Amount (ac-ft)
Subbasin: Subbasin 1	722.348
Total:	722.348

Total Post Developed Recharge During Simulation

Model Element	Recharge Amount (ac-ft)
Subbasin: Subbasin 1	78.551
Link: Infiltration Chamber	1685.331
Total:	1763.882

Total Predevelopment Recharge is Less than Post Developed
Average Recharge Per Year, (Number of Years= 158)
Predeveloped: 4.572 ac-ft/year, Post Developed: 11.164 ac-ft/year

*************Water Quality Facility Data ***************

----------SCENARIO: PREDEVELOPED

Number of Links: 0

----------SCENARIO: POSTDEVELOPED

Number of Links: 1

********** Link: Infiltration Chamber **********

Basic Wet Pond Volume (91% Exceedance): 16001. cu-ft
Computed Large Wet Pond Volume, 1.5*Basic Volume: 24002. cu-ft

Time to Infiltrate 91% Treatment Volume, (Hours): 2.85

Infiltration/Filtration Statistics----------
Inflow Volume (ac-ft): 1685.33
Inflow Volume Including PPT-Evap (ac-ft): 1685.33
Total Runoff Infiltrated (ac-ft): 1685.33, 100.00%
Total Runoff Filtered (ac-ft): 0.00, 0.00%
Primary Outflow To Downstream System (ac-ft): 0.46
Secondary Outflow To Downstream System (ac-ft): 0.00
Percent Treated (Infiltrated+Filtered)/Total Volume: 100.00%

*************Compliance Point Results ***************

Scenario Predeveloped Compliance Subbasin: Subbasin 1

Scenario Postdeveloped Compliance Link: Infiltration Chamber

***** Point of Compliance Flow Frequency Data *****

Recurrence Interval Computed Using Gringorten Plotting Position

Predevelopment Runoff		Postdevelopment Runoff	
Tr (Years)	Discharge (cfs)	Tr (Years)	Discharge (cfs)
2-Year	0.173	2-Year	4.264E-04
5-Year	0.377	5-Year	4.301E-04
10-Year	0.549	10-Year	4.336E-04
25-Year	1.147	25-Year	4.377E-04
50-Year	1.403	50-Year	4.440E-04
100-Year	1.978	100-Year	4.529E-04
200-Year	2.042	200-Year	4.537E-04

** Record too Short to Compute Peak Discharge for These Recurrence Intervals

****** Flow Duration Performance ******

Excursion at Predeveloped 50%Q2 (Must be Less Than or Equal to 0%):	-100.0%	PASS
Maximum Excursion from 50%Q2 to Q2 (Must be Less Than or Equal to 0%):	-100.0%	PASS
Maximum Excursion from Q2 to Q50 (Must be less than 10%):	-79.8%	PASS
Percent Excursion from Q2 to Q50 (Must be less than 50%):	0.0%	PASS

MEETS ALL FLOW DURATION DESIGN CRITERIA: PASS

****** LID Duration Performance ******

Excursion at Predeveloped 8%Q2 (Must be Less Than 0%):	-100.0%	PASS
Maximum Excursion from 8%Q2 to 50%Q2 (Must be Less Than 0%):	-100.0%	PASS

MEETS ALL LID DURATION DESIGN CRITERIA: PASS

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MGS FLOOD
PROJECT REPORT

Program Version: MGSFlood 4.46
Program License Number: 200410007
Project Simulation Performed on: 02/26/2019 2:36 PM
Report Generation Date: 02/26/2019 2:36 PM

Input File Name: ROW Basin 100.fld
Project Name: LMC Marymoor - ROW Infiltration
Analysis Title: ROW Basin 100
Comments:

PRECIPITATION INPUT

Computational Time Step (Minutes): 5

Extended Precipitation Time Series Selected
Climatic Region Number: 15

Full Period of Record Available used for Routing
Precipitation Station : 96004005 Puget East 40 in_5min 10/01/1939-10/01/2097
Evaporation Station : 961040 Puget East 40 in MAP
Evaporation Scale Factor : 0.750

HSPF Parameter Region Number: 1
HSPF Parameter Region Name : USGS Default

********** Default HSPF Parameters Used (Not Modified by User) **********

********** **WATERSHED DEFINITION** **********

Predevelopment/Post Development Tributary Area Summary

	Predeveloped	Post
Developed		
Total Subbasin Area (acres)	0.327	0.327
Area of Links that Include Precip/Evap (acres)	0.000	0.000
Total (acres)	0.327	0.327

----------SCENARIO: PREDEVELOPED
Number of Subbasins: 1

---------- Subbasin : Subbasin 1 ----------

	-------Area (Acres) --------
Till Pasture	0.327
Subbasin Total	0.327

----------SCENARIO: POSTDEVELOPED
Number of Subbasins: 1

---------- Subbasin : ROW Basin 100 ----------

	-------Area (Acres) --------
Till Grass	0.013
Impervious	0.315
---	---
Subbasin Total	0.327

********** **LINK DATA** **********

----------SCENARIO: PREDEVELOPED
Number of Links: 0

********** **LINK DATA** **********

----------SCENARIO: POSTDEVELOPED
Number of Links: 1

Link Name: Infiltration Chamber 100
Link Type: Structure
Downstream Link: None

User Specified Elevation Volume Table Used

Elevation (ft)	Pond Volume (cu-ft)
42.60	0.
42.68	13.
42.77	27.
42.85	40.
42.93	54.
43.02	67.
43.10	81.
43.18	109.
43.27	137.
43.35	164.
43.43	191.
43.52	217.
43.60	243.
43.68	268.
43.77	293.
43.85	317.
43.93	340.
44.02	362.
44.10	382.
44.18	401.
44.27	417.
44.35	432.
44.43	446.

44.52	460.
44.60	473.
44.68	487.
44.77	500.
44.85	514.
44.93	527.

Constant Infiltration Option Used
Infiltration Rate (in/hr): 20.00

Riser Geometry
Riser Structure Type : Circular
Riser Diameter (in) : 18.00
Common Length (ft) : 0.000
Riser Crest Elevation : 44.90 ft

Hydraulic Structure Geometry

Number of Devices: 0

**********FLOOD FREQUENCY AND DURATION STATISTICS**********

----------SCENARIO: PREDEVELOPED
Number of Subbasins: 1
Number of Links: 0

----------SCENARIO: POSTDEVELOPED
Number of Subbasins: 1
Number of Links: 1

********** **Subbasin: ROW Basin 100** **********

Flood Frequency Data(cfs)
(Recurrence Interval Computed Using Gringorten Plotting Position)

Tr (yrs)	Flood Peak (cfs)
2-Year	0.148
5-Year	0.194
10-Year	0.238
25-Year	0.307
50-Year	0.373
100-Year	0.466
200-Year	0.510

********** Link: Infiltration Chamber 100 ********** Link Inflow Frequency Stats
Flood Frequency Data(cfs)
(Recurrence Interval Computed Using Gringorten Plotting Position)

Tr (yrs)	Flood Peak (cfs)
2-Year	0.148
5-Year	0.194

10-Year	0.238
25-Year	0.307
50-Year	0.373
100-Year	0.466
200-Year	0.510

********** Link: Infiltration Chamber 100 ********** Link WSEL Stats

WSEL Frequency Data(ft)
(Recurrence Interval Computed Using Gringorten Plotting Position)

Tr (yrs)	WSEL Peak (ft)
1.05-Year	42.606
1.11-Year	42.607
1.25-Year	42.607
2.00-Year	42.610
3.33-Year	42.612
5-Year	42.614
10-Year	42.738
25-Year	43.104
50-Year	43.371
100-Year	43.591

*************Groundwater Recharge Summary ***************

Recharge is computed as input to Perlnd Groundwater Plus Infiltration in Structures

Total Predeveloped Recharge During Simulation

Model Element	Recharge Amount (ac-ft)
Subbasin: Subbasin 1	57.471
Total:	57.471

Total Post Developed Recharge During Simulation

Model Element	Recharge Amount (ac-ft)
Subbasin: ROW Basin 100	1.551
Link: Infiltration Chamber	143.810
Total:	145.361

Total Predevelopment Recharge is Less than Post Developed
Average Recharge Per Year, (Number of Years= 158)
Predeveloped: 0.364 ac-ft/year, Post Developed: 0.920 ac-ft/year

*************Water Quality Facility Data ***************

----------SCENARIO: PREDEVELOPED

Number of Links: 0

----------SCENARIO: POSTDEVELOPED

Number of Links: 1

********** Link: Infiltration Chamber 100 **********

Basic Wet Pond Volume (91% Exceedance): 1407. cu-ft
Computed Large Wet Pond Volume, 1.5*Basic Volume: 2110. cu-ft

Time to Infiltrate 91% Treatment Volume, (Hours): 2.07

Infiltration/Filtration Statistics----------
Inflow Volume (ac-ft): 143.81
Inflow Volume Including PPT-Evap (ac-ft): 143.81
Total Runoff Infiltrated (ac-ft): 143.81, 100.00%
Total Runoff Filtered (ac-ft): 0.00, 0.00%
Primary Outflow To Downstream System (ac-ft): 0.00
Secondary Outflow To Downstream System (ac-ft): 0.00
Percent Treated (Infiltrated+Filtered)/Total Volume: 100.00%

*************Compliance Point Results ***************

Scenario Predeveloped Compliance Subbasin: Subbasin 1

Scenario Postdeveloped Compliance Link: Infiltration Chamber 100

***** Point of Compliance Flow Frequency Data *****
Recurrence Interval Computed Using Gringorten Plotting Position

Predevelopment Runoff		Postdevelopment Runoff	
Tr (Years)	Discharge (cfs)	Tr (Years)	Discharge (cfs)
2-Year	1.374E-02	2-Year	0.000
5-Year	3.003E-02	5-Year	0.000
10-Year	4.369E-02	10-Year	0.000
25-Year	9.122E-02	25-Year	0.000
50-Year	0.112	50-Year	0.000
100-Year	0.157	100-Year	0.000
200-Year	0.162	200-Year	0.000

** Record too Short to Compute Peak Discharge for These Recurrence Intervals

****** Flow Duration Performance ******

Excursion at Predeveloped 50%Q2 (Must be Less Than or Equal to 0%):	0.0%	PASS
Maximum Excursion from 50%Q2 to Q2 (Must be Less Than or Equal to 0%):	0.0%	PASS
Maximum Excursion from Q2 to Q50 (Must be less than 10%):	0.0%	PASS
Percent Excursion from Q2 to Q50 (Must be less than 50%):	0.0%	PASS

MEETS ALL FLOW DURATION DESIGN CRITERIA: PASS

****** LID Duration Performance ******

Excursion at Predeveloped 8%Q2 (Must be Less Than 0%):	0.0%	PASS
Maximum Excursion from 8%Q2 to 50%Q2 (Must be Less Than 0%):	0.0%	PASS

MEETS ALL LID DURATION DESIGN CRITERIA: PASS

MGS FLOOD
PROJECT REPORT

Program Version: MGSFlood 4.46
Program License Number: 200410007
Project Simulation Performed on: 02/26/2019 2:43 PM
Report Generation Date: 02/26/2019 2:44 PM

Input File Name: ROW Basin 200.fld
Project Name: LMC Marymoor - ROW Infiltration
Analysis Title: ROW Basin 200
Comments:

PRECIPITATION INPUT

Computational Time Step (Minutes): 5

Extended Precipitation Time Series Selected
Climatic Region Number: 15

Full Period of Record Available used for Routing
Precipitation Station : 96004005 Puget East 40 in_5min 10/01/1939-10/01/2097
Evaporation Station : 961040 Puget East 40 in MAP
Evaporation Scale Factor : 0.750

HSPF Parameter Region Number: 1
HSPF Parameter Region Name : USGS Default

********** Default HSPF Parameters Used (Not Modified by User) **********

********** **WATERSHED DEFINITION** **********

Predevelopment/Post Development Tributary Area Summary

	Predeveloped	Post
Developed		
Total Subbasin Area (acres)	0.183	0.183
Area of Links that Include Precip/Evap (acres)	0.000	0.000
Total (acres)	0.183	0.183

----------SCENARIO: PREDEVELOPED
Number of Subbasins: 1

---------- Subbasin : Subbasin 1 ----------

	-------Area (Acres) --------
Till Pasture	0.183
Subbasin Total	0.183

----------SCENARIO: POSTDEVELOPED
Number of Subbasins: 1

---------- Subbasin : ROW Basin 200 ----------

	-------Area (Acres) --------
Till Grass	0.013
Impervious	0.171
---	---
Subbasin Total	0.183

********** **LINK DATA** **********

----------SCENARIO: PREDEVELOPED
Number of Links: 0

********** **LINK DATA** **********

----------SCENARIO: POSTDEVELOPED
Number of Links: 1

Link Name: Infiltration Chamber 200
Link Type: Structure
Downstream Link: None

User Specified Elevation Volume Table Used

Elevation (ft)	Pond Volume (cu-ft)
42.60	0.
42.68	8.
42.77	16.
42.85	24.
42.93	32.
43.02	40.
43.10	47.
43.18	64.
43.27	80.
43.35	96.
43.43	112.
43.52	128.
43.60	143.
43.68	158.
43.77	172.
43.85	186.
43.93	200.
44.02	213.
44.10	225.
44.18	236.
44.27	245.
44.35	254.
44.43	263.

44.52	270.
44.60	278.
44.68	286.
44.77	294.
44.85	302.
44.93	310.

Constant Infiltration Option Used
Infiltration Rate (in/hr): 20.00

Riser Geometry
Riser Structure Type : Circular
Riser Diameter (in) : 18.00
Common Length (ft) : 0.000
Riser Crest Elevation : 44.90 ft

Hydraulic Structure Geometry

Number of Devices: 0

**********FLOOD FREQUENCY AND DURATION STATISTICS**********

----------SCENARIO: PREDEVELOPED
Number of Subbasins: 1
Number of Links: 0

----------SCENARIO: POSTDEVELOPED
Number of Subbasins: 1
Number of Links: 1

********** **Subbasin: ROW Basin 200** **********

Flood Frequency Data(cfs)
(Recurrence Interval Computed Using Gringorten Plotting Position)

Tr (yrs)	Flood Peak (cfs)
2-Year	8.060E-02
5-Year	0.106
10-Year	0.129
25-Year	0.168
50-Year	0.206
100-Year	0.258
200-Year	0.281

********** Link: Infiltration Chamber 200 ********** Link Inflow Frequency Stats
Flood Frequency Data(cfs)
(Recurrence Interval Computed Using Gringorten Plotting Position)

Tr (yrs)	Flood Peak (cfs)
2-Year	8.060E-02
5-Year	0.106

10-Year	0.129
25-Year	0.168
50-Year	0.206
100-Year	0.258
200-Year	0.281

********** Link: Infiltration Chamber 200 ********** Link WSEL Stats

WSEL Frequency Data(ft)
(Recurrence Interval Computed Using Gringorten Plotting Position)

Tr (yrs)	WSEL Peak (ft)
1.05-Year	42.605
1.11-Year	42.606
1.25-Year	42.607
2.00-Year	42.609
3.33-Year	42.611
5-Year	42.612
10-Year	42.676
25-Year	42.988
50-Year	43.185
100-Year	43.473

*************Groundwater Recharge Summary ***************

Recharge is computed as input to Perlnd Groundwater Plus Infiltration in Structures

Total Predeveloped Recharge During Simulation

Model Element	Recharge Amount (ac-ft)
Subbasin: Subbasin 1	32.233
Total:	32.233

Total Post Developed Recharge During Simulation

Model Element	Recharge Amount (ac-ft)
Subbasin: ROW Basin 200	1.551
Link: Infiltration Chamber	79.174
Total:	80.725

Total Predevelopment Recharge is Less than Post Developed
Average Recharge Per Year, (Number of Years= 158)
Predeveloped: 0.204 ac-ft/year, Post Developed: 0.511 ac-ft/year

*************Water Quality Facility Data ***************

----------SCENARIO: PREDEVELOPED

Number of Links: 0

----------SCENARIO: POSTDEVELOPED

Number of Links: 1

********** Link: Infiltration Chamber 200 **********

Basic Wet Pond Volume (91% Exceedance): 767. cu-ft
Computed Large Wet Pond Volume, 1.5*Basic Volume: 1151. cu-ft

Time to Infiltrate 91% Treatment Volume, (Hours): 1.91

Infiltration/Filtration Statistics----------
Inflow Volume (ac-ft): 79.17
Inflow Volume Including PPT-Evap (ac-ft): 79.17
Total Runoff Infiltrated (ac-ft): 79.17, 100.00%
Total Runoff Filtered (ac-ft): 0.00, 0.00%
Primary Outflow To Downstream System (ac-ft): 0.00
Secondary Outflow To Downstream System (ac-ft): 0.00
Percent Treated (Infiltrated+Filtered)/Total Volume: 100.00%

*************Compliance Point Results ***************

Scenario Predeveloped Compliance Subbasin: Subbasin 1

Scenario Postdeveloped Compliance Link: Infiltration Chamber 200

***** Point of Compliance Flow Frequency Data *****
Recurrence Interval Computed Using Gringorten Plotting Position

Predevelopment Runoff		Postdevelopment Runoff	
Tr (Years)	Discharge (cfs)	Tr (Years)	Discharge (cfs)
2-Year	7.707E-03	2-Year	0.000
5-Year	1.684E-02	5-Year	0.000
10-Year	2.450E-02	10-Year	0.000
25-Year	5.116E-02	25-Year	0.000
50-Year	6.260E-02	50-Year	0.000
100-Year	8.828E-02	100-Year	0.000
200-Year	9.111E-02	200-Year	0.000

** Record too Short to Compute Peak Discharge for These Recurrence Intervals

****** Flow Duration Performance ******

Excursion at Predeveloped 50%Q2 (Must be Less Than or Equal to 0%):	0.0%	PASS
Maximum Excursion from 50%Q2 to Q2 (Must be Less Than or Equal to 0%):	0.0%	PASS
Maximum Excursion from Q2 to Q50 (Must be less than 10%):	0.0%	PASS
Percent Excursion from Q2 to Q50 (Must be less than 50%):	0.0%	PASS

MEETS ALL FLOW DURATION DESIGN CRITERIA: PASS

****** LID Duration Performance ******

Excursion at Predeveloped 8%Q2 (Must be Less Than 0%):	0.0%	PASS
Maximum Excursion from 8%Q2 to 50%Q2 (Must be Less Than 0%):	0.0%	PASS

MEETS ALL LID DURATION DESIGN CRITERIA: PASS

MGS FLOOD
PROJECT REPORT

Program Version: MGSFlood 4.46
Program License Number: 200410007
Project Simulation Performed on: 02/26/2019 2:59 PM
Report Generation Date: 02/26/2019 3:00 PM

Input File Name: ROW Basin 300.fld
Project Name: LMC Marymoor - ROW Infiltration
Analysis Title: ROW Basin 300
Comments:

PRECIPITATION INPUT

Computational Time Step (Minutes): 5

Extended Precipitation Time Series Selected
Climatic Region Number: 15

Full Period of Record Available used for Routing
Precipitation Station : 96004005 Puget East 40 in_5min 10/01/1939-10/01/2097
Evaporation Station : 961040 Puget East 40 in MAP
Evaporation Scale Factor : 0.750

HSPF Parameter Region Number: 1
HSPF Parameter Region Name : USGS Default

********** Default HSPF Parameters Used (Not Modified by User) **********

********** **WATERSHED DEFINITION** **********

Predevelopment/Post Development Tributary Area Summary

	Predeveloped	Post
Developed		
Total Subbasin Area (acres)	0.098	0.098
Area of Links that Include Precip/Evap (acres)	0.000	0.000
Total (acres)	0.098	0.098

----------SCENARIO: PREDEVELOPED
Number of Subbasins: 1

---------- Subbasin : Subbasin 1 ----------

	-------Area (Acres) --------
Till Pasture	0.098
Subbasin Total	0.098

----------SCENARIO: POSTDEVELOPED
Number of Subbasins: 1

---------- Subbasin : ROW Basin 300 ----------

	-------Area (Acres) --------
Till Grass	0.017
Impervious	0.081
Subbasin Total	0.098

********** **LINK DATA** **********

----------SCENARIO: PREDEVELOPED
Number of Links: 0

********** **LINK DATA** **********

----------SCENARIO: POSTDEVELOPED
Number of Links: 1

Link Name: Drywell 300
Link Type: Structure
Downstream Link: None

Prismatic Pond Option Used

Pond Floor Elevation (ft)	:	40.60
Riser Crest Elevation (ft)	:	46.50
Max Pond Elevation (ft)	:	47.00
Storage Depth (ft)	:	5.90
Pond Bottom Length (ft)	:	6.2
Pond Bottom Width (ft)	:	6.2
Pond Side Slopes (ft/ft)	:	L1= 0.00 L2= 0.00 W1= 0.00 W2= 0.00
Bottom Area (sq-ft)	:	38.
Area at Riser Crest El (sq-ft)	:	38.
(acres)	:	0.001
Volume at Riser Crest (cu-ft)	:	227.
(ac-ft)	:	0.005
Area at Max Elevation (sq-ft)	:	38.
(acres)	:	0.001
Vol at Max Elevation (cu-ft)	:	246.
(ac-ft)	:	0.006

Constant Infiltration Option Used
Infiltration Rate (in/hr): 20.00

Riser Geometry

Riser Structure Type	: Circular
Riser Diameter (in)	: 18.00
Common Length (ft)	: 0.000

Riser Crest Elevation : 46.50 ft

Hydraulic Structure Geometry

Number of Devices: 0

**********FLOOD FREQUENCY AND DURATION STATISTICS**********

----------SCENARIO: PREDEVELOPED
Number of Subbasins: 1
Number of Links: 0

----------SCENARIO: POSTDEVELOPED
Number of Subbasins: 1
Number of Links: 1

********** Subbasin: ROW Basin 300 **********

Flood Frequency Data(cfs)
(Recurrence Interval Computed Using Gringorten Plotting Position)

Tr (yrs)	Flood Peak (cfs)
2-Year	3.949E-02
5-Year	5.183E-02
10-Year	6.392E-02
25-Year	8.268E-02
50-Year	0.105
100-Year	0.131
200-Year	0.141

********** Link: Drywell 300 ********** Link
Inflow Frequency Stats
Flood Frequency Data(cfs)
(Recurrence Interval Computed Using Gringorten Plotting Position)

Tr (yrs)	Flood Peak (cfs)
2-Year	3.949E-02
5-Year	5.183E-02
10-Year	6.392E-02
25-Year	8.268E-02
50-Year	0.105
100-Year	0.131
200-Year	0.141

********** Link: Drywell 300 ********** Link
WSEL Stats
WSEL Frequency Data(ft)
(Recurrence Interval Computed Using Gringorten Plotting Position)

Tr (yrs)	WSEL Peak (ft)

1.05-Year	40.768
1.11-Year	40.819
1.25-Year	40.954
2.00-Year	41.549
3.33-Year	41.977
5-Year	42.451
10-Year	43.288
25-Year	45.144
50-Year	46.042
100-Year	46.497

*************Groundwater Recharge Summary ***************
Recharge is computed as input to Perlnd Groundwater Plus Infiltration in Structures

Total Predeveloped Recharge During Simulation

Model Element	Recharge Amount (ac-ft)
Subbasin: Subbasin 1	17.224
Total:	17.224

Total Post Developed Recharge During Simulation

Model Element	Recharge Amount (ac-ft)
Subbasin: ROW Basin 300	2.039
Link: Drywell 300	39.761
Total:	41.801

Total Predevelopment Recharge is Less than Post Developed
Average Recharge Per Year, (Number of Years= 158)
Predeveloped: 0.109 ac-ft/year, Post Developed: 0.265 ac-ft/year

*************Water Quality Facility Data ***************

----------SCENARIO: PREDEVELOPED

Number of Links: 0

----------SCENARIO: POSTDEVELOPED

Number of Links: 1

********** Link: Drywell 300 **********

Basic Wet Pond Volume (91% Exceedance): 376. cu-ft
Computed Large Wet Pond Volume, 1.5*Basic Volume: 564. cu-ft

Time to Infiltrate 91% Treatment Volume, (Hours): 5.87

Infiltration/Filtration Statistics----------

Inflow Volume (ac-ft): 39.76
Inflow Volume Including PPT-Evap (ac-ft): 39.76
Total Runoff Infiltrated (ac-ft): 39.76, 100.00%
Total Runoff Filtered (ac-ft): 0.00, 0.00%
Primary Outflow To Downstream System (ac-ft): 0.00
Secondary Outflow To Downstream System (ac-ft): 0.00
Percent Treated (Infiltrated+Filtered)/Total Volume: 100.00%

*************Compliance Point Results ***************

Scenario Predeveloped Compliance Subbasin: Subbasin 1

Scenario Postdeveloped Compliance Link: Drywell 300

***** Point of Compliance Flow Frequency Data *****
Recurrence Interval Computed Using Gringorten Plotting Position

Predevelopment Runoff		Postdevelopment Runoff	
Tr (Years)	Discharge (cfs)	Tr (Years)	Discharge (cfs)
2-Year	4.118E-03	2-Year	0.000
5-Year	9.000E-03	5-Year	0.000
10-Year	1.309E-02	10-Year	0.000
25-Year	2.734E-02	25-Year	0.000
50-Year	3.345E-02	50-Year	0.000
100-Year	4.717E-02	100-Year	1.197E-02
200-Year	4.869E-02	200-Year	3.162E-02

** Record too Short to Compute Peak Discharge for These Recurrence Intervals

****** Flow Duration Performance ******

Excursion at Predeveloped 50%Q2 (Must be Less Than or Equal to 0%):	-100.0%	PASS
Maximum Excursion from 50%Q2 to Q2 (Must be Less Than or Equal to 0%):	-99.6%	PASS
Maximum Excursion from Q2 to Q50 (Must be less than 10%):	-20.0%	PASS
Percent Excursion from Q2 to Q50 (Must be less than 50%):	0.0%	PASS

MEETS ALL FLOW DURATION DESIGN CRITERIA: PASS

****** LID Duration Performance ******

Excursion at Predeveloped 8%Q2 (Must be Less Than 0%):	-100.0%	PASS
Maximum Excursion from 8%Q2 to 50%Q2 (Must be Less Than 0%):	-100.0%	PASS

MEETS ALL LID DURATION DESIGN CRITERIA: PASS

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MGS FLOOD
PROJECT REPORT

Program Version: MGSFlood 4.46
Program License Number: 200410007
Project Simulation Performed on: 02/26/2019 3:09 PM
Report Generation Date: 02/26/2019 3:09 PM

Input File Name: ROW Basin 400.fld
Project Name: LMC Marymoor - ROW Infiltration
Analysis Title: ROW Basin 400
Comments:

PRECIPITATION INPUT

Computational Time Step (Minutes): 5

Extended Precipitation Time Series Selected
Climatic Region Number: 15

Full Period of Record Available used for Routing
Precipitation Station : 96004005 Puget East 40 in_5min 10/01/1939-10/01/2097
Evaporation Station : 961040 Puget East 40 in MAP
Evaporation Scale Factor : 0.750

HSPF Parameter Region Number: 1
HSPF Parameter Region Name : USGS Default

********** Default HSPF Parameters Used (Not Modified by User) **********

********** **WATERSHED DEFINITION** **********

Predevelopment/Post Development Tributary Area Summary

	Predeveloped	Post
Developed		
Total Subbasin Area (acres)	0.107	0.107
Area of Links that Include Precip/Evap (acres)	0.000	0.000
Total (acres)	0.107	0.107

----------SCENARIO: PREDEVELOPED
Number of Subbasins: 1

---------- Subbasin : Subbasin 1 ----------

	-------Area (Acres) --------
Till Pasture	0.107
Subbasin Total	0.107

----------SCENARIO: POSTDEVELOPED
Number of Subbasins: 1

---------- Subbasin : ROW Basin 400 ----------

	-------Area (Acres) --------
Till Grass	0.012
Impervious	0.095
---	---
Subbasin Total	0.107

********** **LINK DATA** **********

----------SCENARIO: PREDEVELOPED
Number of Links: 0

********** **LINK DATA** **********

----------SCENARIO: POSTDEVELOPED
Number of Links: 1

Link Name: Infiltration Chamber 400
Link Type: Structure
Downstream Link: None

User Specified Elevation Volume Table Used

Elevation (ft)	Pond Volume (cu-ft)
42.60	0.
42.68	6.
42.77	11.
42.85	17.
42.93	22.
43.02	28.
43.10	33.
43.18	45.
43.27	56.
43.35	68.
43.43	79.
43.52	90.
43.60	100.
43.68	111.
43.77	121.
43.85	130.
43.93	140.
44.02	149.
44.10	157.
44.18	165.
44.27	172.
44.35	178.
44.43	184.

44.52	189.
44.60	195.
44.68	200.
44.77	206.
44.85	211.
44.93	217.

Constant Infiltration Option Used
Infiltration Rate (in/hr): 20.00

Riser Geometry
Riser Structure Type : Circular
Riser Diameter (in) : 18.00
Common Length (ft) : 0.000
Riser Crest Elevation : 44.90 ft

Hydraulic Structure Geometry

Number of Devices: 0

**********FLOOD FREQUENCY AND DURATION STATISTICS**********

----------SCENARIO: PREDEVELOPED
Number of Subbasins: 1
Number of Links: 0

----------SCENARIO: POSTDEVELOPED
Number of Subbasins: 1
Number of Links: 1

********** **Subbasin: ROW Basin 400** **********

Flood Frequency Data(cfs)
(Recurrence Interval Computed Using Gringorten Plotting Position)

Tr (yrs)	Flood Peak (cfs)
2-Year	4.520E-02
5-Year	5.925E-02
10-Year	7.292E-02
25-Year	9.444E-02
50-Year	0.118
100-Year	0.147
200-Year	0.159

********** Link: Infiltration Chamber 400 ********** Link Inflow Frequency Stats
Flood Frequency Data(cfs)
(Recurrence Interval Computed Using Gringorten Plotting Position)

Tr (yrs)	Flood Peak (cfs)
2-Year	4.520E-02
5-Year	5.925E-02

10-Year	7.292E-02
25-Year	9.444E-02
50-Year	0.118
100-Year	0.147
200-Year	0.159

********** Link: Infiltration Chamber 400 ********** Link WSEL Stats

WSEL Frequency Data(ft)
(Recurrence Interval Computed Using Gringorten Plotting Position)

Tr (yrs)	WSEL Peak (ft)
1.05-Year	42.604
1.11-Year	42.605
1.25-Year	42.605
2.00-Year	42.607
3.33-Year	42.609
5-Year	42.610
10-Year	42.612
25-Year	42.682
50-Year	42.903
100-Year	43.182

*************Groundwater Recharge Summary ***************

Recharge is computed as input to Perlnd Groundwater Plus Infiltration in Structures

Total Predeveloped Recharge During Simulation

Model Element	Recharge Amount (ac-ft)
Subbasin: Subbasin 1	18.806
Total:	18.806

Total Post Developed Recharge During Simulation

Model Element	Recharge Amount (ac-ft)
Subbasin: ROW Basin 400	1.441
Link: Infiltration Chamber	44.880
Total:	46.321

Total Predevelopment Recharge is Less than Post Developed
Average Recharge Per Year, (Number of Years= 158)
Predeveloped: 0.119 ac-ft/year, Post Developed: 0.293 ac-ft/year

*************Water Quality Facility Data ***************

----------SCENARIO: PREDEVELOPED

Number of Links: 0

----------SCENARIO: POSTDEVELOPED

Number of Links: 1

********** Link: Infiltration Chamber 400 **********

Basic Wet Pond Volume (91% Exceedance): 431. cu-ft
Computed Large Wet Pond Volume, 1.5*Basic Volume: 646. cu-ft

Time to Infiltrate 91% Treatment Volume, (Hours): 1.53

Infiltration/Filtration Statistics----------
Inflow Volume (ac-ft): 44.88
Inflow Volume Including PPT-Evap (ac-ft): 44.88
Total Runoff Infiltrated (ac-ft): 44.88, 100.00%
Total Runoff Filtered (ac-ft): 0.00, 0.00%
Primary Outflow To Downstream System (ac-ft): 0.00
Secondary Outflow To Downstream System (ac-ft): 0.00
Percent Treated (Infiltrated+Filtered)/Total Volume: 100.00%

*************Compliance Point Results ***************

Scenario Predeveloped Compliance Subbasin: Subbasin 1

Scenario Postdeveloped Compliance Link: Infiltration Chamber 400

***** Point of Compliance Flow Frequency Data *****
Recurrence Interval Computed Using Gringorten Plotting Position

Predevelopment Runoff		Postdevelopment Runoff	
Tr (Years)	Discharge (cfs)	Tr (Years)	Discharge (cfs)
2-Year	4.496E-03	2-Year	0.000
5-Year	9.827E-03	5-Year	0.000
10-Year	1.430E-02	10-Year	0.000
25-Year	2.985E-02	25-Year	0.000
50-Year	3.653E-02	50-Year	0.000
100-Year	5.150E-02	100-Year	0.000
200-Year	5.316E-02	200-Year	0.000

** Record too Short to Compute Peak Discharge for These Recurrence Intervals

****** Flow Duration Performance ******

Excursion at Predeveloped 50%Q2 (Must be Less Than or Equal to 0%):	0.0%	PASS
Maximum Excursion from 50%Q2 to Q2 (Must be Less Than or Equal to 0%):	0.0%	PASS
Maximum Excursion from Q2 to Q50 (Must be less than 10%):	0.0%	PASS
Percent Excursion from Q2 to Q50 (Must be less than 50%):	0.0%	PASS

MEETS ALL FLOW DURATION DESIGN CRITERIA: PASS

****** LID Duration Performance ******

Excursion at Predeveloped 8%Q2 (Must be Less Than 0%):	0.0%	PASS
Maximum Excursion from 8%Q2 to 50%Q2 (Must be Less Than 0%):	0.0%	PASS

MEETS ALL LID DURATION DESIGN CRITERIA: PASS

MGS FLOOD
PROJECT REPORT

Program Version: MGSFlood 4.46
Program License Number: 200410007
Project Simulation Performed on: 02/26/2019 3:17 PM
Report Generation Date: 02/26/2019 3:17 PM

Input File Name: ROW Basin 500.fld
Project Name: LMC Marymoor - ROW Infiltration
Analysis Title: ROW Basin 500
Comments:

PRECIPITATION INPUT

Computational Time Step (Minutes): 5

Extended Precipitation Time Series Selected
Climatic Region Number: 15

Full Period of Record Available used for Routing
Precipitation Station : 96004005 Puget East 40 in_5min 10/01/1939-10/01/2097
Evaporation Station : 961040 Puget East 40 in MAP
Evaporation Scale Factor : 0.750

HSPF Parameter Region Number: 1
HSPF Parameter Region Name : USGS Default

********** Default HSPF Parameters Used (Not Modified by User) **********

********** **WATERSHED DEFINITION** **********

Predevelopment/Post Development Tributary Area Summary

	Predeveloped	Post
Developed		
Total Subbasin Area (acres)	0.038	0.038
Area of Links that Include Precip/Evap (acres)	0.000	0.000
Total (acres)	0.038	0.038

----------SCENARIO: PREDEVELOPED
Number of Subbasins: 1

---------- Subbasin : Subbasin 1 ----------

	-------Area (Acres) --------
Till Pasture	0.038
Subbasin Total	0.038

----------SCENARIO: POSTDEVELOPED
Number of Subbasins: 1

---------- Subbasin : ROW Basin 500 ----------

	-------Area (Acres) --------
Till Grass	0.010
Impervious	0.028
Subbasin Total	0.038

********** **LINK DATA** **********

----------SCENARIO: PREDEVELOPED
Number of Links: 0

********** **LINK DATA** **********

----------SCENARIO: POSTDEVELOPED
Number of Links: 1

Link Name: Drywell 500
Link Type: Structure
Downstream Link: None

Prismatic Pond Option Used

Pond Floor Elevation (ft)	:	40.60
Riser Crest Elevation (ft)	:	46.70
Max Pond Elevation (ft)	:	47.20
Storage Depth (ft)	:	6.10
Pond Bottom Length (ft)	:	10.0
Pond Bottom Width (ft)	:	2.0
Pond Side Slopes (ft/ft)	:	L1= 0.00 L2= 0.00 W1= 0.00 W2= 0.00
Bottom Area (sq-ft)	:	20.
Area at Riser Crest El (sq-ft)	:	20.
(acres)	:	0.000
Volume at Riser Crest (cu-ft)	:	122.
(ac-ft)	:	0.003
Area at Max Elevation (sq-ft)	:	20.
(acres)	:	0.000
Vol at Max Elevation (cu-ft)	:	132.
(ac-ft)	:	0.003

Constant Infiltration Option Used
Infiltration Rate (in/hr): 20.00

Riser Geometry

Riser Structure Type	: Circular
Riser Diameter (in)	: 18.00
Common Length (ft)	: 0.000

Riser Crest Elevation : 46.70 ft

Hydraulic Structure Geometry

Number of Devices: 0

**********FLOOD FREQUENCY AND DURATION STATISTICS**********

----------SCENARIO: PREDEVELOPED
Number of Subbasins: 1
Number of Links: 0

----------SCENARIO: POSTDEVELOPED
Number of Subbasins: 1
Number of Links: 1

********** Subbasin: ROW Basin 500 **********

Flood Frequency Data(cfs)
(Recurrence Interval Computed Using Gringorten Plotting Position)

Tr (yrs)	Flood Peak (cfs)
2-Year	1.430E-02
5-Year	1.889E-02
10-Year	2.282E-02
25-Year	2.996E-02
50-Year	3.969E-02
100-Year	4.877E-02
200-Year	5.217E-02

********** Link: Drywell 500 ********** Link
Inflow Frequency Stats
Flood Frequency Data(cfs)
(Recurrence Interval Computed Using Gringorten Plotting Position)

Tr (yrs)	Flood Peak (cfs)
2-Year	1.430E-02
5-Year	1.889E-02
10-Year	2.282E-02
25-Year	2.996E-02
50-Year	3.969E-02
100-Year	4.877E-02
200-Year	5.217E-02

********** Link: Drywell 500 ********** Link
WSEL Stats
WSEL Frequency Data(ft)
(Recurrence Interval Computed Using Gringorten Plotting Position)

Tr (yrs)	WSEL Peak (ft)

1.05-Year	40.619
1.11-Year	40.622
1.25-Year	40.635
2.00-Year	40.827
3.33-Year	41.033
5-Year	41.180
10-Year	41.723
25-Year	42.517
50-Year	43.127
100-Year	44.003

*************Groundwater Recharge Summary ***************
Recharge is computed as input to Perlnd Groundwater Plus Infiltration in Structures

Total Predeveloped Recharge During Simulation

Model Element	Recharge Amount (ac-ft)
Subbasin: Subbasin 1	6.679
Total:	6.679

Total Post Developed Recharge During Simulation

Model Element	Recharge Amount (ac-ft)
Subbasin: ROW Basin 500	1.209
Link: Drywell 500	14.694
Total:	15.903

Total Predevelopment Recharge is Less than Post Developed
Average Recharge Per Year, (Number of Years= 158)
Predeveloped: 0.042 ac-ft/year, Post Developed: 0.101 ac-ft/year

*************Water Quality Facility Data ***************

----------SCENARIO: PREDEVELOPED

Number of Links: 0

----------SCENARIO: POSTDEVELOPED

Number of Links: 1

********** Link: Drywell 500 **********

Basic Wet Pond Volume (91% Exceedance): 135. cu-ft
Computed Large Wet Pond Volume, 1.5*Basic Volume: 203. cu-ft

Time to Infiltrate 91% Treatment Volume, (Hours): 4.05

Infiltration/Filtration Statistics----------

Inflow Volume (ac-ft): 14.69
Inflow Volume Including PPT-Evap (ac-ft): 14.69
Total Runoff Infiltrated (ac-ft): 14.69, 100.00%
Total Runoff Filtered (ac-ft): 0.00, 0.00%
Primary Outflow To Downstream System (ac-ft): 0.00
Secondary Outflow To Downstream System (ac-ft): 0.00
Percent Treated (Infiltrated+Filtered)/Total Volume: 100.00%

**********Compliance Point Results **********

Scenario Predeveloped Compliance Subbasin: Subbasin 1

Scenario Postdeveloped Compliance Link: Drywell 500

*** Point of Compliance Flow Frequency Data ***
Recurrence Interval Computed Using Gringorten Plotting Position

Predevelopment Runoff		Postdevelopment Runoff	
Tr (Years)	Discharge (cfs)	Tr (Years)	Discharge (cfs)
2-Year	1.597E-03	2-Year	0.000
5-Year	3.490E-03	5-Year	0.000
10-Year	5.077E-03	10-Year	0.000
25-Year	1.060E-02	25-Year	0.000
50-Year	1.297E-02	50-Year	0.000
100-Year	1.829E-02	100-Year	0.000
200-Year	1.888E-02	200-Year	0.000

** Record too Short to Compute Peak Discharge for These Recurrence Intervals

**** Flow Duration Performance ****

Excursion at Predeveloped 50%Q2 (Must be Less Than or Equal to 0%):	0.0%	PASS
Maximum Excursion from 50%Q2 to Q2 (Must be Less Than or Equal to 0%):	0.0%	PASS
Maximum Excursion from Q2 to Q50 (Must be less than 10%):	0.0%	PASS
Percent Excursion from Q2 to Q50 (Must be less than 50%):	0.0%	PASS

MEETS ALL FLOW DURATION DESIGN CRITERIA: PASS

**** LID Duration Performance ****

Excursion at Predeveloped 8%Q2 (Must be Less Than 0%):	0.0%	PASS
Maximum Excursion from 8%Q2 to 50%Q2 (Must be Less Than 0%):	0.0%	PASS

MEETS ALL LID DURATION DESIGN CRITERIA: PASS

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MGS FLOOD
PROJECT REPORT

Program Version: MGSFlood 4.46
Program License Number: 200410007
Project Simulation Performed on: 02/26/2019 3:19 PM
Report Generation Date: 02/26/2019 3:19 PM

Input File Name: ROW Basin 600.fld
Project Name: LMC Marymoor - ROW Infiltration
Analysis Title: ROW Basin 600
Comments:

PRECIPITATION INPUT

Computational Time Step (Minutes): 5

Extended Precipitation Time Series Selected
Climatic Region Number: 15

Full Period of Record Available used for Routing
Precipitation Station : 96004005 Puget East 40 in_5min 10/01/1939-10/01/2097
Evaporation Station : 961040 Puget East 40 in MAP
Evaporation Scale Factor : 0.750

HSPF Parameter Region Number: 1
HSPF Parameter Region Name : USGS Default

********** Default HSPF Parameters Used (Not Modified by User) **********

********** **WATERSHED DEFINITION** **********

Predevelopment/Post Development Tributary Area Summary

	Predeveloped	Post
Developed		
Total Subbasin Area (acres)	0.303	0.303
Area of Links that Include Precip/Evap (acres)	0.000	0.000
Total (acres)	0.303	0.303

----------SCENARIO: PREDEVELOPED
Number of Subbasins: 1

---------- Subbasin : Subbasin 1 ----------

	-------Area (Acres) --------
Till Pasture	0.303
Subbasin Total	0.303

----------SCENARIO: POSTDEVELOPED
Number of Subbasins: 1

---------- Subbasin : ROW Basin 600 ----------

	-------Area (Acres) --------
Till Grass	0.046
Impervious	0.258
---	---
Subbasin Total	0.303

********** **LINK DATA** **********

----------SCENARIO: PREDEVELOPED
Number of Links: 0

********** **LINK DATA** **********

----------SCENARIO: POSTDEVELOPED
Number of Links: 1

Link Name: Infiltration Chamber 600
Link Type: Structure
Downstream Link: None

User Specified Elevation Volume Table Used

Elevation (ft)	Pond Volume (cu-ft)
40.60	0.
40.68	12.
40.77	24.
40.85	36.
40.93	47.
41.02	72.
41.10	96.
41.18	120.
41.27	143.
41.35	166.
41.43	187.
41.52	208.
41.60	228.
41.68	246.
41.77	262.
41.85	276.
41.93	289.
42.02	300.
42.10	312.
42.18	324.
42.27	336.
42.35	348.
42.43	360.

Constant Infiltration Option Used
Infiltration Rate (in/hr): 20.00

Riser Geometry
Riser Structure Type : Circular
Riser Diameter (in) : 18.00
Common Length (ft) : 0.000
Riser Crest Elevation : 42.40 ft

Hydraulic Structure Geometry

Number of Devices: 0

**********FLOOD FREQUENCY AND DURATION STATISTICS**********

----------SCENARIO: PREDEVELOPED
Number of Subbasins: 1
Number of Links: 0

----------SCENARIO: POSTDEVELOPED
Number of Subbasins: 1
Number of Links: 1

********** **Subbasin: ROW Basin 600** **********

Flood Frequency Data(cfs)
(Recurrence Interval Computed Using Gringorten Plotting Position)

Tr (yrs)	Flood Peak (cfs)
2-Year	0.125
5-Year	0.162
10-Year	0.203
25-Year	0.261
50-Year	0.330
100-Year	0.409
200-Year	0.443

********** Link: Infiltration Chamber 600 ********** Link Inflow Frequency Stats
Flood Frequency Data(cfs)
(Recurrence Interval Computed Using Gringorten Plotting Position)

Tr (yrs)	Flood Peak (cfs)
2-Year	0.125
5-Year	0.162
10-Year	0.203
25-Year	0.261
50-Year	0.330
100-Year	0.409
200-Year	0.443

********** Link: Infiltration Chamber 600 ********** Link WSEL Stats

WSEL Frequency Data(ft)
(Recurrence Interval Computed Using Gringorten Plotting Position)

Tr (yrs)	WSEL Peak (ft)
1.05-Year	40.604
1.11-Year	40.605
1.25-Year	40.605
2.00-Year	40.608
3.33-Year	40.609
5-Year	40.610
10-Year	40.695
25-Year	40.989
50-Year	41.269
100-Year	41.503

**********Groundwater Recharge Summary **********

Recharge is computed as input to Perlnd Groundwater Plus Infiltration in Structures

Total Predeveloped Recharge During Simulation

Model Element	Recharge Amount (ac-ft)
Subbasin: Subbasin 1	53.253
Total:	53.253

Total Post Developed Recharge During Simulation

Model Element	Recharge Amount (ac-ft)
Subbasin: ROW Basin 600	5.606
Link: Infiltration Chamber	124.813
Total:	130.418

Total Predevelopment Recharge is Less than Post Developed
Average Recharge Per Year, (Number of Years= 158)
Predeveloped: 0.337 ac-ft/year, Post Developed: 0.825 ac-ft/year

**********Water Quality Facility Data **********

----------SCENARIO: PREDEVELOPED

Number of Links: 0

----------SCENARIO: POSTDEVELOPED

Number of Links: 1

********** Link: Infiltration Chamber 600 **********

Basic Wet Pond Volume (91% Exceedance): 1186. cu-ft
Computed Large Wet Pond Volume, 1.5*Basic Volume: 1780. cu-ft

Time to Infiltrate 91% Treatment Volume, (Hours): 1.98

Infiltration/Filtration Statistics----------
Inflow Volume (ac-ft): 124.81
Inflow Volume Including PPT-Evap (ac-ft): 124.81
Total Runoff Infiltrated (ac-ft): 124.81, 100.00%
Total Runoff Filtered (ac-ft): 0.00, 0.00%
Primary Outflow To Downstream System (ac-ft): 0.00
Secondary Outflow To Downstream System (ac-ft): 0.00
Percent Treated (Infiltrated+Filtered)/Total Volume: 100.00%

**********Compliance Point Results **********

Scenario Predeveloped Compliance Subbasin: Subbasin 1

Scenario Postdeveloped Compliance Link: Infiltration Chamber 600

***** Point of Compliance Flow Frequency Data *****
Recurrence Interval Computed Using Gringorten Plotting Position

Predevelopment Runoff		Postdevelopment Runoff	
Tr (Years)	Discharge (cfs)	Tr (Years)	Discharge (cfs)
2-Year	1.273E-02	2-Year	0.000
5-Year	2.783E-02	5-Year	0.000
10-Year	4.048E-02	10-Year	0.000
25-Year	8.453E-02	25-Year	0.000
50-Year	0.103	50-Year	0.000
100-Year	0.146	100-Year	0.000
200-Year	0.151	200-Year	0.000

** Record too Short to Compute Peak Discharge for These Recurrence Intervals

****** Flow Duration Performance ******

Excursion at Predeveloped 50%Q2 (Must be Less Than or Equal to 0%):	0.0%	PASS
Maximum Excursion from 50%Q2 to Q2 (Must be Less Than or Equal to 0%):	0.0%	PASS
Maximum Excursion from Q2 to Q50 (Must be less than 10%):	0.0%	PASS
Percent Excursion from Q2 to Q50 (Must be less than 50%):	0.0%	PASS

MEETS ALL FLOW DURATION DESIGN CRITERIA: PASS

****** LID Duration Performance ******

Excursion at Predeveloped 8%Q2 (Must be Less Than 0%):	0.0%	PASS
Maximum Excursion from 8%Q2 to 50%Q2 (Must be Less Than 0%):	0.0%	PASS

MEETS ALL LID DURATION DESIGN CRITERIA: PASS

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MGS FLOOD
PROJECT REPORT

Program Version: MGSFlood 4.46
Program License Number: 200410007
Project Simulation Performed on: 02/26/2019 3:21 PM
Report Generation Date: 02/26/2019 3:22 PM

Input File Name: ROW Basin 700.fld
Project Name: LMC Marymoor - ROW Infiltration
Analysis Title: ROW Basin 700
Comments:

PRECIPITATION INPUT

Computational Time Step (Minutes): 5

Extended Precipitation Time Series Selected
Climatic Region Number: 15

Full Period of Record Available used for Routing
Precipitation Station : 96004005 Puget East 40 in_5min 10/01/1939-10/01/2097
Evaporation Station : 961040 Puget East 40 in MAP
Evaporation Scale Factor : 0.750

HSPF Parameter Region Number: 1
HSPF Parameter Region Name : USGS Default

********** Default HSPF Parameters Used (Not Modified by User) **********

********** **WATERSHED DEFINITION** **********

Predevelopment/Post Development Tributary Area Summary

	Predeveloped	Post
Developed		
Total Subbasin Area (acres)	0.264	0.264
Area of Links that Include Precip/Evap (acres)	0.000	0.000
Total (acres)	0.264	0.264

----------SCENARIO: PREDEVELOPED
Number of Subbasins: 1

---------- Subbasin : Subbasin 1 ----------

	-------Area (Acres) --------
Till Pasture	0.264
Subbasin Total	0.264

----------SCENARIO: POSTDEVELOPED
Number of Subbasins: 1

---------- Subbasin : ROW Basin 700 ----------

	-------Area (Acres) --------
Till Grass	0.035
Impervious	0.229
---	---
Subbasin Total	0.264

********** **LINK DATA** **********

----------SCENARIO: PREDEVELOPED
Number of Links: 0

********** **LINK DATA** **********

----------SCENARIO: POSTDEVELOPED
Number of Links: 1

Link Name: Infiltration Chamber 700
Link Type: Structure
Downstream Link: None

User Specified Elevation Volume Table Used

Elevation (ft)	Pond Volume (cu-ft)
42.60	0.
42.68	11.
42.77	22.
42.85	33.
42.93	44.
43.02	66.
43.10	88.
43.18	110.
43.27	131.
43.35	152.
43.43	172.
43.52	191.
43.60	209.
43.68	226.
43.77	240.
43.85	253.
43.93	264.
44.02	275.
44.10	286.
44.18	297.
44.27	308.
44.35	319.
44.43	330.

Constant Infiltration Option Used
Infiltration Rate (in/hr): 20.00

Riser Geometry
Riser Structure Type : Circular
Riser Diameter (in) : 12.00
Common Length (ft) : 0.000
Riser Crest Elevation : 44.45 ft

Hydraulic Structure Geometry

Number of Devices: 0

**********FLOOD FREQUENCY AND DURATION STATISTICS**********

----------SCENARIO: PREDEVELOPED
Number of Subbasins: 1
Number of Links: 0

----------SCENARIO: POSTDEVELOPED
Number of Subbasins: 1
Number of Links: 1

********** **Subbasin: ROW Basin 700** **********

Flood Frequency Data(cfs)
(Recurrence Interval Computed Using Gringorten Plotting Position)

Tr (yrs)	Flood Peak (cfs)
2-Year	0.110
5-Year	0.144
10-Year	0.179
25-Year	0.230
50-Year	0.290
100-Year	0.360
200-Year	0.390

********** Link: Infiltration Chamber 700 ********** Link Inflow Frequency Stats
Flood Frequency Data(cfs)
(Recurrence Interval Computed Using Gringorten Plotting Position)

Tr (yrs)	Flood Peak (cfs)
2-Year	0.110
5-Year	0.144
10-Year	0.179
25-Year	0.230
50-Year	0.290
100-Year	0.360
200-Year	0.390

********** Link: Infiltration Chamber 700 ********** Link WSEL Stats

WSEL Frequency Data(ft)
(Recurrence Interval Computed Using Gringorten Plotting Position)

Tr (yrs)	WSEL Peak (ft)
1.05-Year	42.604
1.11-Year	42.605
1.25-Year	42.605
2.00-Year	42.607
3.33-Year	42.609
5-Year	42.609
10-Year	42.669
25-Year	42.949
50-Year	43.143
100-Year	43.420

**********Groundwater Recharge Summary **********

Recharge is computed as input to Perlnd Groundwater Plus Infiltration in Structures

Total Predeveloped Recharge During Simulation

Model Element	Recharge Amount (ac-ft)
Subbasin: Subbasin 1	46.399
Total:	46.399

Total Post Developed Recharge During Simulation

Model Element	Recharge Amount (ac-ft)
Subbasin: ROW Basin 700	4.262
Link: Infiltration Chamber	109.942
Total:	114.205

Total Predevelopment Recharge is Less than Post Developed
Average Recharge Per Year, (Number of Years= 158)
Predeveloped: 0.294 ac-ft/year, Post Developed: 0.723 ac-ft/year

**********Water Quality Facility Data **********

----------SCENARIO: PREDEVELOPED

Number of Links: 0

----------SCENARIO: POSTDEVELOPED

Number of Links: 1

********** Link: Infiltration Chamber 700 **********

Basic Wet Pond Volume (91% Exceedance): 1050. cu-ft
Computed Large Wet Pond Volume, 1.5*Basic Volume: 1575. cu-ft

Time to Infiltrate 91% Treatment Volume, (Hours): 1.92

Infiltration/Filtration Statistics----------
Inflow Volume (ac-ft): 109.94
Inflow Volume Including PPT-Evap (ac-ft): 109.94
Total Runoff Infiltrated (ac-ft): 109.94, 100.00%
Total Runoff Filtered (ac-ft): 0.00, 0.00%
Primary Outflow To Downstream System (ac-ft): 0.00
Secondary Outflow To Downstream System (ac-ft): 0.00
Percent Treated (Infiltrated+Filtered)/Total Volume: 100.00%

*************Compliance Point Results ***************

Scenario Predeveloped Compliance Subbasin: Subbasin 1

Scenario Postdeveloped Compliance Link: Infiltration Chamber 700

***** Point of Compliance Flow Frequency Data *****
Recurrence Interval Computed Using Gringorten Plotting Position

Predevelopment Runoff		Postdevelopment Runoff	
Tr (Years)	Discharge (cfs)	Tr (Years)	Discharge (cfs)
2-Year	1.109E-02	2-Year	0.000
5-Year	2.425E-02	5-Year	0.000
10-Year	3.527E-02	10-Year	0.000
25-Year	7.365E-02	25-Year	0.000
50-Year	9.012E-02	50-Year	0.000
100-Year	0.127	100-Year	0.000
200-Year	0.131	200-Year	0.000

** Record too Short to Compute Peak Discharge for These Recurrence Intervals

****** Flow Duration Performance ******

Excursion at Predeveloped 50%Q2 (Must be Less Than or Equal to 0%):	0.0%	PASS
Maximum Excursion from 50%Q2 to Q2 (Must be Less Than or Equal to 0%):	0.0%	PASS
Maximum Excursion from Q2 to Q50 (Must be less than 10%):	0.0%	PASS
Percent Excursion from Q2 to Q50 (Must be less than 50%):	0.0%	PASS

MEETS ALL FLOW DURATION DESIGN CRITERIA: PASS

****** LID Duration Performance ******

Excursion at Predeveloped 8%Q2 (Must be Less Than 0%):	0.0%	PASS
Maximum Excursion from 8%Q2 to 50%Q2 (Must be Less Than 0%):	0.0%	PASS

MEETS ALL LID DURATION DESIGN CRITERIA: PASS

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Appendix D

1. Geotechnical Report

Geotechnical report as prepared by PanGeo is included with this submittal under a separate cover.

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