PRELIMINARY STORMWATER CONTROL PLAN

FOR

HOME SUBDIVISION – PHASE B

Date: August 7, 2019

Project: Phase B – of the Home Subdivision at the end of Comfort way and Rolling Hills way south of Silberhorn Road, Sequim

Prepared by: Zenovic & Associates, Inc.
301 East 6th Street, #1
Port Angeles, WA 98362

INTRODUCTION

This Preliminary Stormwater Control Plan has been prepared as part of the City of Sequim's (City) stormwater requirements for application for Major Subdivision approval. The intent of this report is to describe the stormwater management system for Phase of the Home Subdivision and to demonstrate compliance with the *2012 Stormwater Management Manual for Western Washington (amended 2014)* as adopted by the City of Sequim (SMC 13.104.100). Phases B includes installing asphalt roadway, sidewalk, storm, water, sewer and power utilities for a total of 33 lots. This report will address each of the minimum requirements in the *Manual* and provide information on existing conditions of the site, proposed construction, method of stormwater runoff analysis, and stormwater detention and treatment design.

This report is primarily intended to address the stormwater from areas within the right-of-way. Runoff from residences will be controlled through the use of infiltration trenches installed on each lot during the construction of each residence.

The report will address all nine minimum requirements and will include the Preliminary Stormwater Site Plan in Appendix A.

EXISTING CONDITIONS

This project will be located on Parcel 03-30-30-59-0000 which encompass 9.14 acres. The majority of the site has been previously cleared and is unused. Access onto the site is from Rolling Hills Way or Comfort Way off of Silberhorn Road. The site slopes downhill from south to north at an average grade of 3.0 percent.

A steep slope is located on the adjacent property along the southeast property line. This slope varies in height from 30 to 50 feet in height and has an average grade of 50%. The slope appears to be stable and is further addressed in the geotechnical report prepared for this project. A stormwater catchment system consisting of catch basins and 24" diameter storm pipe was installed along the southeast border of the site. This system captures surficial runoff from offsite and conveys it to the northwest where it discharges to an open ditch located between Phase A of the Home Subdivision and the adjacent Heckman Subdivision to the east.

There were no defined drainage channels observed onsite.

Based on the NRCS soil survey, the site is located in an area with Sequim very gravelly sandy loam and a Sequim-Mckenna-Mukilteo complex soils.

A typical profile for Sequim very gravelly sandy loam consists of 0-10 inches of gravelly sandy loam, 10-23 inches of extremely cobbly loamy sand, and 23-60 inches of extremely cobbly sand. The soils are classified as a group A hydrologic soils (soils having a high infiltration rate (low runoff potential) when thoroughly wet. These soils consist mainly of deep, well drained to excessively drained sands or gravelly sands, and have a high rate of water transmission). Onsite test pits completed by this office confirmed the onsite soil types were consistent with the soils survey data with overlying depths of topsoil varying from 6 to 24 inches and no restrictive layer or water table found.

The Sequim-Mckenna-Mukilteo soils consist of a mixture of soil types. The Sequim soil portion is as described above. The Mckenna and Mukilteo portions are more poorly drained finer materials with limited depths to groundwater or restrictive layer.

Onsite investigations performed by this office consisted of excavating 10 test pits throughout the subject parcel. Samples were taken from various test pits for infiltration rate correlation through sieve analysis. Soils observed onsite were generally consistent with the soil types noted in the

NRCS Soils Report. The majority of the onsite soils were consistent with the Sequim very gravelly sandy loam with some finer materials (Mckenna & Mukilteo) observed at shallow depths in test pits excavated in the southwestern portion of the site. No restrictive layers or groundwater tables were observed in the excavated test pits.

MINIMUM REQUIREMENTS

The following section will describe how the project will conform to the nine minimum requirements of the Manual.

Minimum Requirement #1 - Preparation of Stormwater Site Plans

Preliminary Stormwater site plans have been prepared and submitted with the Application for Major Subdivision to the City of Sequim. Permanent Stormwater Site Plans will be submitted to the City of Sequim for approval during the Site Construction Permit application process.

Minimum Requirement #2 Construction Stormwater Pollution Prevention (SWPPP)

An erosion and sedimentation control plan and stormwater pollution prevention plan will be produced for each phase of the project and will be submitted to the City for approval during the Site Construction Permit process. These plans will include but are not limited to the following Best Management Practices:

1. Marking clearing limits to preserve the existing vegetation and limit land-disturbing activity.
2. Installation of stabilized construction entrances/exits to prevent sediment track-out.
3. Utilizing the temporary settling/infiltration ponds to control flow rates and prevent sediment from leaving the site.
4. Installation of silt fencing to protect adjacent properties from sediment.
5. Installation of inlet protection to protect new and existing drainage structures and systems from sediment.
6. Limitations on the time soils may remain exposed and unworked and requirements for soils stabilization.

As this project will disturb greater than one acre of land, this project is required to obtain coverage under the Construction Stormwater General Permit (CSGP) through the Department of Ecology which will require monthly reporting of discharge to the Department of Ecology and weekly inspections and oversight by a Certified Erosion and Sedimentation Control Lead. Changes will be made to the site and plan as needed to comply with the conditions of the CSGP. This permit will be obtained prior to land-disturbing activity.

Minimum Requirement #3 - Source Control of Pollution

All known, available and reasonable source control BMPs are required for this project. Specific source control BMPs to be employed on this project are:

- Landscaping and Lawn/Vegetation Management
- Maintenance and Repair of Vehicles and Equipment
- Maintenance of Stormwater Drainage and Treatment Systems
- Maintenance of Urban Streets

Minimum Requirement #4 - Preservation of Natural Drainage Systems and Outfalls

There are no clear drainage paths from the site. The intent of this project is to infiltrate all stormwater onsite through the use of large infiltration galleries to infiltrate runoff from the roadways and infiltration trenches/drywells located on each parcel to infiltrate roof and driveway runoff.

Minimum Requirement #5 – On-site Stormwater Management

Minimum requirement #5 is intended to promote the use of low impact development BMPs to infiltrate, disperse, and retain stormwater onsite. The applicant has the choice to either meet the LID Performance Standard and implement BMP T5.13 for onsite soil quality and depth or install LID BMPs per List #2 for all listed surfaces.

This project will be designed to achieve 100% infiltration of onsite stormwater through the use of infiltration ponds and trenches and thus meet the LID Performance Standard. Additionally onsite topsoil removed from roadway areas will be utilized in disturbed areas to meet the requirements of BMP T5.13.

Minimum Requirement #6 - Runoff Treatment

The primary method for runoff treatment will be through infiltration into native soils. Permanent inlet filters will be installed in all catch basins to provide pretreatment of stormwater and protect the infiltration trenches and ponds from sediment deposition. A 6" layer of sand will be installed at the base of infiltration trenches and a 6" layer of topsoil will be placed in the infiltration ponds to assist in treatment of stormwater.

Minimum Requirement #7 - Flow Control

The flow control performance standard per the 2012 Manual is to, "match developed discharge durations to pre-developed durations for the range of pre-developed discharge rates from 50% of the 2-year peak flow up to the full 50-year peak flow."

This project proposes to utilize infiltration trenches and infiltration ponds to infiltrate all runoff from the improvements within the right-of-way. Preliminary modeling of the stormwater facilities was completed using WWHM 2012 and facilities were able to achieve 100 percent infiltration with an assumed long-term infiltration rate of 5 in/hr.

This assumed infiltration rate was based on observation of the subsurface soils and correlation of infiltration rates from sieve analyses performed on samples throughout the site. This information is included in the geotechnical report prepared for the project.

Minimum Requirement #8 - Wetlands Protection

No known wetlands will be affected by this project.

Minimum Requirement #9 - Operation and Maintenance

An Operation and Maintenance Manual will be produced for each phase of the project and will be submitted to the City for review during the Site Construction Permit application process.

APPENDIX A

STORMWATER SITE PLANS

CITY OF SEQUIM, MAJOR SUBDIVISION FOR:
HOME – PHASE B (PRE18-003)
IN SECTION 30, TOWNSHIP 30 NORTH,
RANGE 03 WEST, W.M.
CITY OF SEQUIM, CLALLAM COUNTY

PROJECT INFORMATION

APPLICANT/OWNER	GREEN CROW INVESTMENTS, LLC P.O. BOX 2439 PORT ANGELES, WA 98362
PROPOSED PROJECT	PHASE-2: A 38 LOT SUBDIVISION -OFF COMFRT WAY AND ROLLING HILLS WAY
ZONING	S. R4-8
UTILITIES	SANITARY SEWER, WATER - CITY OF SEQUIM POWER - CLALLAM COUNTY PUD #1 COMMUNICATIONS - CENTURY LINK, WAVE BROADBAND
PARCEL NO.	03-30-30-59-0000
DATE OF PREPARATION	JULY 2019

HORIZONTAL AND VERTICAL DATUM
TBD

MAP LEGEND

- SEISMIC SOIL AREA
- LANDSLIDE HAZARD AREA (NOT INCLUDED IN COUNTY CRITICAL AREAS MAPPING)
- 500' OFFSET FROM PROJECT BOUNDARIES
- STREAM/DITCH/IRRIGATION CHANNELS
- PROJECT PROPERTY BOUNDARIES
- PARCEL BOUNDARIES

MAPPING NOTES

PARCEL, STREAM AND SEISMIC SOIL MAPPING OBTAINED FROM CLALLAM COUNTY GIS MAPPING DATA.
WETLAND MAPPING OBTAINED FROM THE NATIONAL WETLAND INVENTORY COMPILED BY THE U.S. FISH AN D WILDLIFE SERVICE

THE CRITICAL AREAS SHOWN IN THIS PLAN ARE BASED ON GENERALIZED SOURCES ABOVE AND MAY NOT ACCURATELY REPRESENT THE ACTUAL TYPES AND EXTENTS OF THE CRITICAL AREAS IN THE SITE VICINITY. THIS MAP IS NOT INTENDED TO SUPERSEDE PRIOR OR SUBSEQUENT PROFESSIONAL STUDIES/SURVEYS OF THE ACTUAL CRITICAL AREAS LOCATED NEAR OR WITHIN THE PROJECT SITE

VICINITY NOTES

THE TOPOGRAPHY TO THE NORTH, AND WEST OF THE SITE SLOPE DOWN TO THE NORTH AT SIMILAR GRADES TO THOSE ONSITE. A STEEP SLOPE IS LOCATED ON THE ADJACENT PROPERTY TO THE SOUTHEAST AND PARALLELS THE SOUTHEAST PROPERTY LINE. THIS SLOPE VARIES IN HEIGHT FROM APPROXIMATELY 30 TO 50 FEET AND SLOPES AT APPROXIMATE GRADES OF 50%. THE AREA LOCATED ABOVE THE STEEP SLOPE IS PRIMARILY LEVEL WITH A SLIGHT SLOPE TO THE NORTH

THE ZONING OF THE ALL PARCELS WITHIN 500 RIET OF THE SUBJECT PARCEL ARE ZONED RESIDENTIAL (E ITHER R4-8 IN THE CITY OF SEQUIM AND S(R-I) (CLALLAM COUNTY)

SITE PLAN

Scale: 1" = 100'

0 100 200 300

ZENOVIC & ASSOCIATES
INCORPORATED
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EMAIL: ZENOVIC@ZENOVIC.NET

REVISIONS:

DATE	MARK	NOTE

TITLE: PHASE B - HOME SUBDIVISION AT COMFORT WAY AND ROLLING HILLS WAY SEQUIM, WA

VICINITY MAP

CLIENT: GREEN CROW INVESTMENTS CO. LLC
P.O. BOX 2439
PORT ANGELES, WA 98362

SCALE: 1" = 100'

FILE: 18252-VM

JOB NO: 18252

DATE: August 7, 2019

SET: PRE-PLAT

KEITH J. ROOMAY
STATE OF WASHINGTON
55777
REGISTERED
PROFESSIONAL ENGINEER
8/7/19

SHEET
C000



SITE PLAN
Scale: 1" = 40'

LOCATION MAP

LEGEND:

- ..... PROPERTY BOUNDARY
- ..... BUILDING SETBACK
- ..... EASEMENT BOUNDARY
- ..... R.O.W. CENTERLINE

SITE LAND USAGE DATA

OVERALL	NUMBER OF RESIDENTIAL LOTS	33 LOTS
	GROSS ACREAGE	9.14 AC±
	RESIDENTIAL LOT AREA	6.38 AC±
	COMMON OPEN SPACE AREA	0.52 AC±
	RIGHTS-OF-WAY AREA	2.24 AC±
	GROSS DENSITY	3.61 UNITS/AC
	NET DENSITY	5.17 UNITS/AC
PHASE B-1	NUMBER OF RESIDENTIAL LOTS	10 LOTS
	GROSS ACREAGE	2.42 AC±
	RESIDENTIAL LOT ACREAGE	1.80 AC±
	GROSS DENSITY	4.13 UNITS/ACRE
	NET RESIDENTIAL DENSITY	5.56 UNITS/ACRE
PHASE B-2	NUMBER OF RESIDENTIAL LOTS	11 LOTS
	GROSS ACREAGE	2.72 AC±
	RESIDENTIAL LOT ACREAGE	2.06 AC±
	GROSS DENSITY	4.04 UNITS/ACRE
	NET RESIDENTIAL DENSITY	5.34 UNITS/ACRE
PHASE B-3	NUMBER OF RESIDENTIAL LOTS	4 LOTS
	GROSS ACREAGE	1.68 AC±
	RESIDENTIAL LOT ACREAGE	0.75 AC±
	GROSS DENSITY	2.38 UNITS/ACRE
	NET RESIDENTIAL DENSITY	5.33 UNITS/ACRE
PHASE B-4	NUMBER OF RESIDENTIAL LOTS	8 LOTS
	GROSS ACREAGE	2.32 AC±
	RESIDENTIAL LOT ACREAGE	1.77 AC±
	GROSS DENSITY	3.44 UNITS/ACRE
	NET RESIDENTIAL DENSITY	4.52 UNITS/ACRE

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REVISIONS:

DATE	MARK	NOTE

TITLE: PHASE B - HOME SUBDIVISION AT COMFORT WAY AND ROLLING HILLS WAY SEQUIM, WA

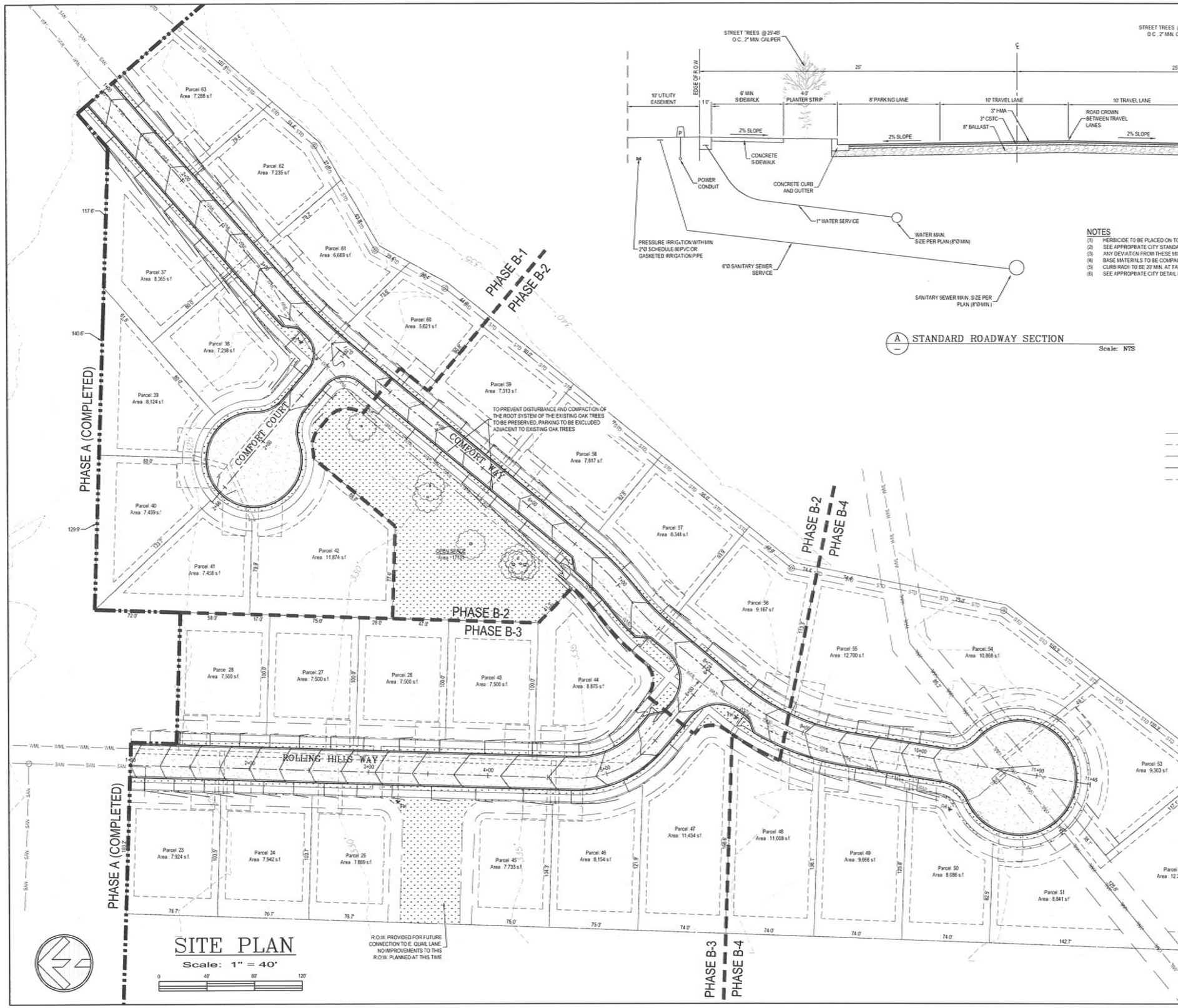
PRELIMINARY LOT LAYOUT

CLIENT: GREEN CROW INVESTMENTS CO. LLC
P.O. BOX 2439
PORT ANGELES, WA 98362

SCALE: 1" = 40'
FILE: 18252-P2
JOB NO: 18252
DATE: August 7, 2019
SET: PRE-PLAT

SETH J. ROOMA
STATE OF WASHINGTON
53777
REGISTERED
PROFESSIONAL ENGINEER
8/7/19

SHEET
C001



SITE PLAN

Scale: 1" = 40'

A STANDARD ROADWAY SECTION

Scale: NTS

NOTES
(1) HERBICIDE TO BE PLACED ON TOP COURSE PRIOR TO ASPHALT PAVING.
(2) SEE APPROPRIATE CITY STANDARD DETA.. FOR CULVERT PLACEMENT AND APPROACH CONSTRUCTION.
(3) ANY DEVIATION FROM THESE MINIMUM STANDARDS REQUIRES WRITTEN APPROVAL BY THE CITY ENGINEER PRIOR TO CONSTRUCTION.
(4) BASE MATERIALS TO BE COMPACTED TO 95% MAXIMUM DRY DENSITY AS DETERMINED BY THE MODIFIED PROCTOR.
(5) CURB RADII TO BE 20' MIN. AT FACE OF CURB UNLESS NOTED OTHERWISE.
(6) SEE APPROPRIATE CITY DETAIL FOR DRIVEWAY CONSTRUCTION.

LEGEND:

.... PROPERTY BOUNDARY
.... BUILDING SETBACK
.... EASEMENT BOUNDARY
.... TRAVELLED WAY CENTERLINE
.... EDGE OF DRIVEWAY
.... CONCRETE SIDEWALK
.... ASPHALT PAVING
.... OPEN SPACE/GREENBELT

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REVISIONS:

DATE	MARK	NOTE

TITLE: PHASE B - HOME SUBDIVISION AT COMFORT WAY AND ROLLING HILLS WAY SEQUIM, WA

PRELIMINARY CIRCULATION LAYOUT

CLIENT: GREEN CROW INVESTMENTS CO. LLC
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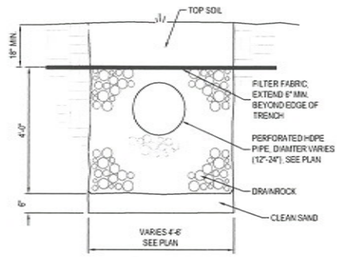
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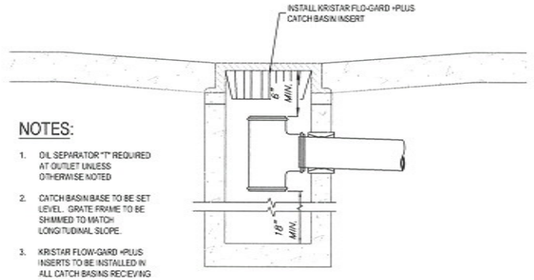
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LEGEND:

- .... PROPERTY BOUNDARY
- .... BUILDING SETBACK
- .... EASEMENT BOUNDARY
- .... PROPOSED STORM LINE
- .... PROPOSED WATER LINE
- .... PROPOSED SEWER LINE
- .... PROPOSED UTILITY/COMMUNICATION LINES
- .... PROPOSED IRRIGATION LINES
- .... PROPOSED SANITARY SEWER SERVICE
- .... PROPOSED SANITARY SEWER MANHOLE
- .... PROPOSED SANITARY SEWER CLEANOUT
- CB .... PROPOSED STORM DRAIN CATCH BASIN
- .... PROPOSED WATER SERVICE CONNECTION
- .... PROPOSED POWER/COMMUNICATION SERVICE
- FH .... PROPOSED FIRE HYDRANT
- .... PROPOSED PEDESTRIAN LUMINARIES (100' O.C. TYP.)



A C003 INFILTRATION TRENCH SECTION
Scale: NTS



NOTES:

1. OIL SEPARATOR "T" REQUIRED AT OUTLET UNLESS OTHERWISE NOTED
2. CATCH BASIN BASE TO BE SET LEVEL. GRATE FRAME TO BE SHIMMED TO MATCH LONGITUDINAL SLOPE.
3. KRISTAR FLOW-GARD +PLUS INSERTS TO BE INSTALLED IN ALL CATCH BASINS RECIEVING DIRECT SURFACE RUNOFF.

B C003 TYPE 1 CATCH BASIN
Scale: NTS

SITE PLAN
Scale: 1" = 40'

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REVISIONS:

DATE	MARK	NOTE

PRELIMINARY UTILITY PLAN

TITLE: PHASE B - HOME SUBDIVISION AT COMFORT WAY AND ROLLING HILLS WAY SEQUIM, WA

CLIENT: GREEN CROW INVESTMENTS CO. LLC
P.O. BOX 2439
PORT ANGELES, WA 98362

SCALE: 1" = 40'

FILE: 18252-P2

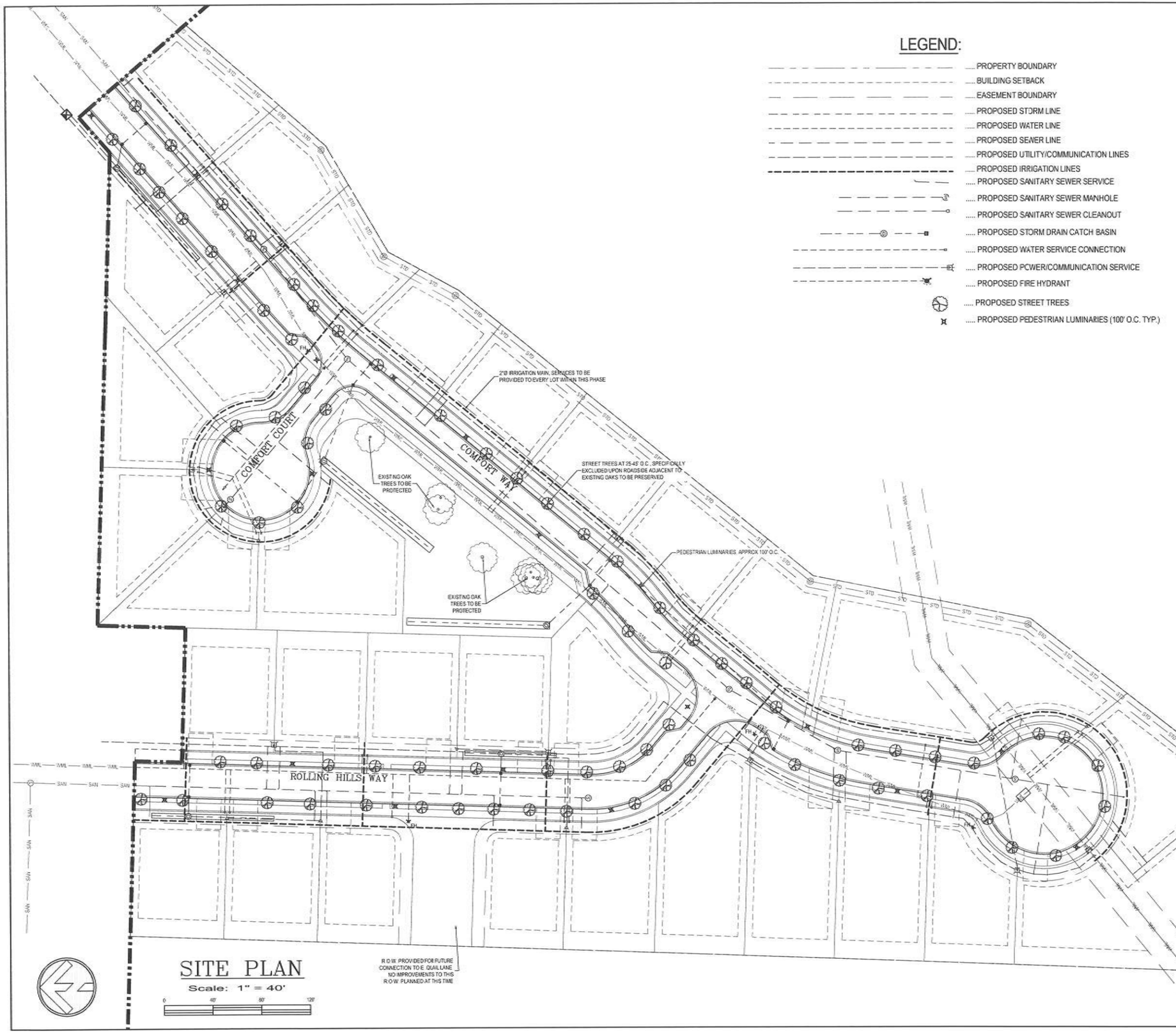
JOB NO: 18252

DATE: August 7, 2019

SET: PRE-PLAT

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SHEET
C003



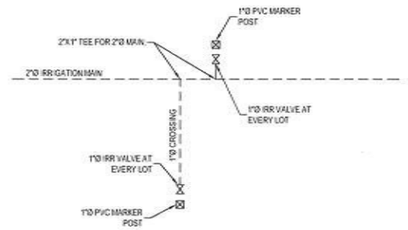
SITE PLAN

Scale: 1" = 40'

0 40' 80' 120'

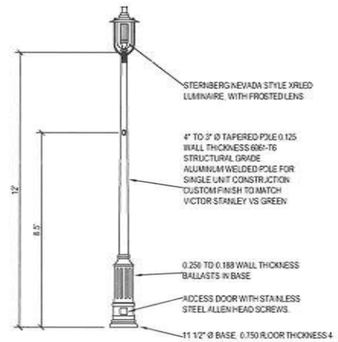
LEGEND:

- PROPERTY BOUNDARY
- BUILDING SETBACK
- EASEMENT BOUNDARY
- PROPOSED STORM LINE
- PROPOSED WATER LINE
- PROPOSED SEWER LINE
- PROPOSED UTILITY/COMMUNICATION LINES
- PROPOSED IRRIGATION LINES
- PROPOSED SANITARY SEWER SERVICE
- PROPOSED SANITARY SEWER MANHOLE
- PROPOSED SANITARY SEWER CLEANOUT
- PROPOSED STORM DRAIN CATCH BASIN
- PROPOSED WATER SERVICE CONNECTION
- PROPOSED PCWER/COMMUNICATION SERVICE
- PROPOSED FIRE HYDRANT
- PROPOSED STREET TREES
- PROPOSED PEDESTRIAN LUMINARIES (100' O.C. TYP.)



A C004 TYPICAL IRRIGATION CONNECTION

Scale: NTS



NOTES:

1. LIGHTS TO BE INSTALLED IN PLANTER STRIP 2' FROM BACK OF CURB AND AT LEAST 20' FROM STREET TREES.
2. CONTRACTOR TO COORDINATE WITH THECITY OF SEQUIM AND THE CALLAM COUNTY PUD #1 FOR PLACEMENT OF METERS AND CONDUIT RNUTING NECESSARY TO PROVIDE A FUNCTIONING LIGHTIN G SYSTEM.
3. LIGHT POLE BASE MINIMUM DIMENSIONS 18"Ø x 36" DEEP.
4. LIGHTS SHALL BE INSTALLED WITH A SINGLE PHOTOCELL CONTROLLING EACH LIGHTING CIRCUIT. PHOTOCELL TO BE ATTACHED TO THE LIGHTING BREAKER CABINET.

B C004 LIGHT POLE DETAIL

Scale: NTS

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REVISIONS

DATE	MARK	NOTE

TITLE: PHASE B - HOME SUBDIVISION AT COMFORT WAY AND ROLLING HILLS WAY SEQUIM, WA

IRRIGATION AND LANDSCAPING PLAN

CLIENT: GREEN CROW INVESTMENTS CO. LLC
P.O. BOX 2439
PORT ANGELES, WA 98362

SCALE: 1" = 40'

FILE: 18252-P2

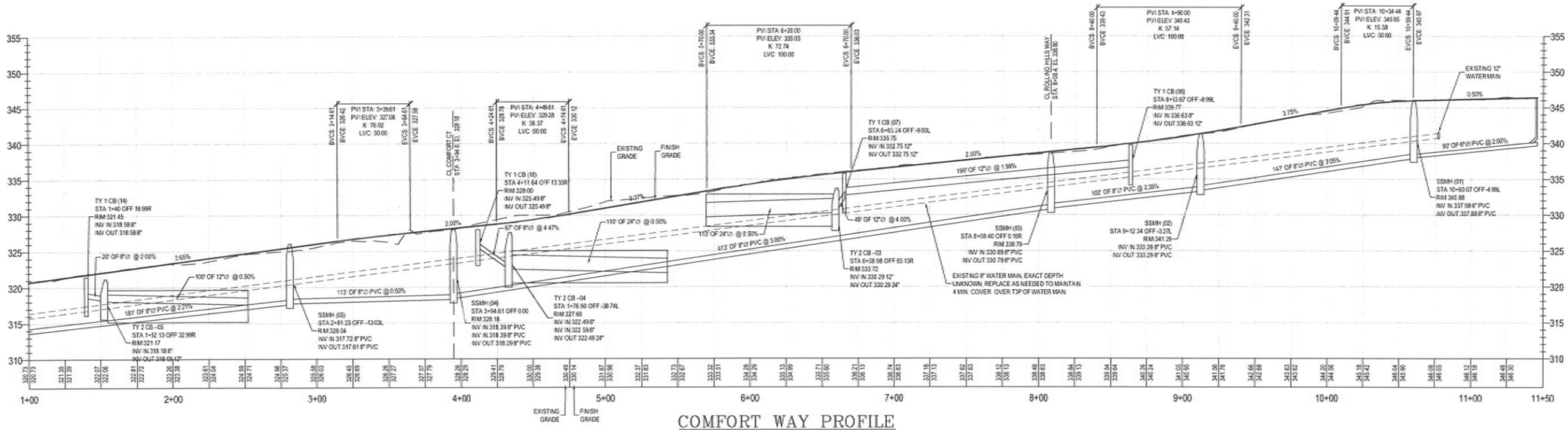
JOB NO: 18252

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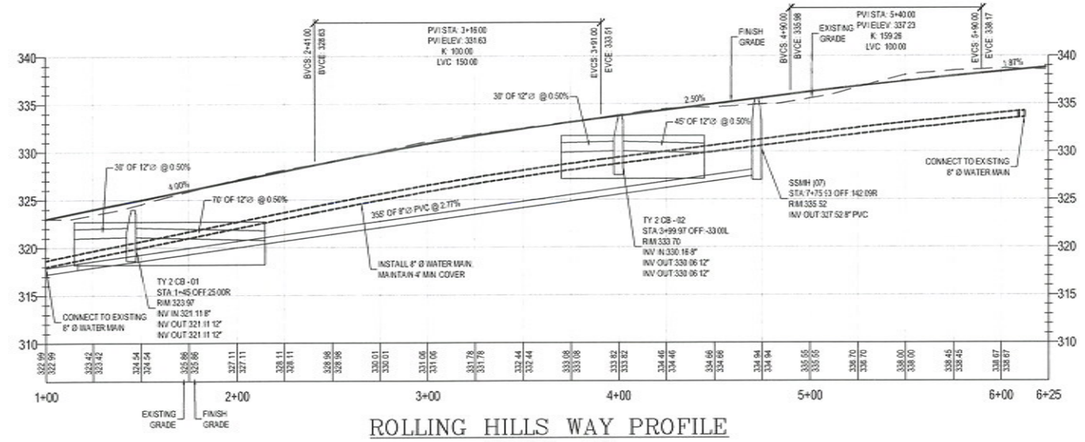
SET: PRE-PLAT

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8/7/19

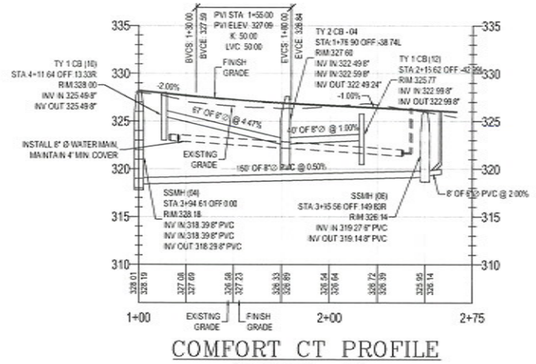
SHEET C004



COMFORT WAY PROFILE
SCALE: 40
VERT. EXAGERATION: 5.0



ROLLING HILLS WAY PROFILE
SCALE: 40
VERT. EXAGERATION: 5.0



COMFORT CT PROFILE
SCALE: 40
VERT. EXAGERATION: 5.0



SITE PLAN
Scale: 1" = 40'

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REVISIONS:

DATE	MARK	NOTE

TITLE: PHASE III - HOME SUBDIVISION AT COMFORT WAY AND ROLLING HILLS WAY SEQUIM, WA
ROADWAY PROFILES

CLIENT: GREEN CROW INVESTMENTS CO. LLC
P.O. BOX 2439
PORT ANGELES, WA 98362

SCALE: 1" = 40'
FILE: 18252-P2
JOB NO: 18252
DATE: August 7, 2019
SET: PRE-PLAT

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REGISTERED PROFESSIONAL ENGINEER
8/7/19

SHEET
C005

APPENDIX B

WWHM PROJECT REPORT

WWHM2012

PROJECT REPORT

General Model Information

Project Name:	18252 - PRELIM
Site Name:	Home - Phase B
Site Address:	Comfort Way
City:	Sequim
Report Date:	8/7/2019
Gage:	Port Angelis
Data Start:	1948/10/01
Data End:	2009/09/30
Timestep:	15 Minute
Precip Scale:	0.800
Version Date:	2018/10/10
Version:	4.2.16

POC Thresholds

Low Flow Threshold for POC1:	50 Percent of the 2 Year
High Flow Threshold for POC1:	50 Year

Landuse Basin Data

Predeveloped Land Use

Basin 1

Bypass:	No
GroundWater:	No
Pervious Land Use	acre
A B, Forest, Flat	1.1467
Pervious Total	1.1467
Impervious Land Use	acre
Impervious Total	0
Basin Total	1.1467

Element Flows To:

Surface	Interflow	Groundwater

Mitigated Land Use

Basin 1

Bypass:	No
GroundWater:	No

Pervious Land Use	acre
A B, Pasture, Flat	0.206
Pervious Total	0.206

Impervious Land Use	acre
ROADS FLAT	0.6657
SIDEWALKS FLAT	0.275
Impervious Total	0.9407
Basin Total	1.1467

Element Flows To:

Surface	Interflow	Groundwater
Gravel Trench Bed 1	Gravel Trench Bed 1	

Mitigated Routing

Gravel Trench Bed 1

Bottom Length:	330.00 ft.
Bottom Width:	4.00 ft.
Trench bottom slope 1:	0 To 1
Trench Left side slope 0:	0 To 1
Trench right side slope 2:	0 To 1
Material thickness of first layer:	4
Pour Space of material for first layer:	0.35
Material thickness of second layer:	0
Pour Space of material for second layer:	0
Material thickness of third layer:	0
Pour Space of material for third layer:	0
Infiltration On	
Infiltration rate:	5
Infiltration safety factor:	1
Wetted surface area On	
Total Volume Infiltrated (ac-ft.):	67.209
Total Volume Through Riser (ac-ft.):	0.003
Total Volume Through Facility (ac-ft.):	67.212
Percent Infiltrated:	100
Total Precip Applied to Facility:	0
Total Evap From Facility:	0
Discharge Structure	
Riser Height:	4 ft.
Riser Diameter:	8 in.
Element Flows To:	
Outlet 1	Outlet 2

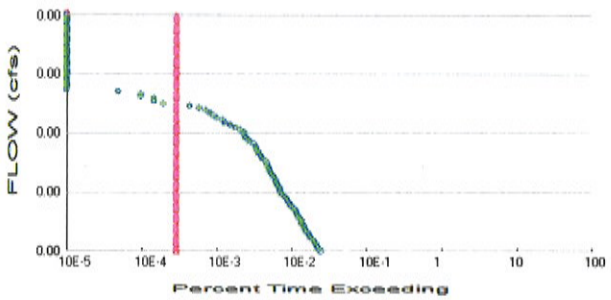
Gravel Trench Bed Hydraulic Table

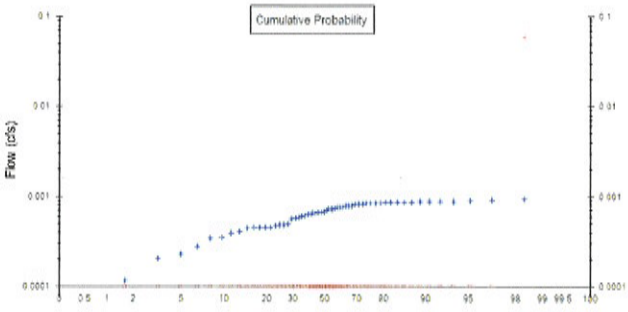
Stage(feet)	Area(ac.)	Volume(ac-ft.)	Discharge(cfs)	Infilt(cfs)
0.0000	0.030	0.000	0.000	0.000
0.0556	0.030	0.000	0.000	0.152
0.1111	0.030	0.001	0.000	0.152
0.1667	0.030	0.001	0.000	0.152
0.2222	0.030	0.002	0.000	0.152
0.2778	0.030	0.002	0.000	0.152
0.3333	0.030	0.003	0.000	0.152
0.3889	0.030	0.004	0.000	0.152
0.4444	0.030	0.004	0.000	0.152
0.5000	0.030	0.005	0.000	0.152
0.5556	0.030	0.005	0.000	0.152
0.6111	0.030	0.006	0.000	0.152
0.6667	0.030	0.007	0.000	0.152
0.7222	0.030	0.007	0.000	0.152
0.7778	0.030	0.008	0.000	0.152
0.8333	0.030	0.008	0.000	0.152
0.8889	0.030	0.009	0.000	0.152
0.9444	0.030	0.010	0.000	0.152
1.0000	0.030	0.010	0.000	0.152
1.0556	0.030	0.011	0.000	0.152
1.1111	0.030	0.011	0.000	0.152
1.1667	0.030	0.012	0.000	0.152
1.2222	0.030	0.013	0.000	0.152

1.2778	0.030	0.013	0.000	0.152
1.3333	0.030	0.014	0.000	0.152
1.3889	0.030	0.014	0.000	0.152
1.4444	0.030	0.015	0.000	0.152
1.5000	0.030	0.015	0.000	0.152
1.5556	0.030	0.016	0.000	0.152
1.6111	0.030	0.017	0.000	0.152
1.6667	0.030	0.017	0.000	0.152
1.7222	0.030	0.018	0.000	0.152
1.7778	0.030	0.018	0.000	0.152
1.8333	0.030	0.019	0.000	0.152
1.8889	0.030	0.020	0.000	0.152
1.9444	0.030	0.020	0.000	0.152
2.0000	0.030	0.021	0.000	0.152
2.0556	0.030	0.021	0.000	0.152
2.1111	0.030	0.022	0.000	0.152
2.1667	0.030	0.023	0.000	0.152
2.2222	0.030	0.023	0.000	0.152
2.2778	0.030	0.024	0.000	0.152
2.3333	0.030	0.024	0.000	0.152
2.3889	0.030	0.025	0.000	0.152
2.4444	0.030	0.025	0.000	0.152
2.5000	0.030	0.026	0.000	0.152
2.5556	0.030	0.027	0.000	0.152
2.6111	0.030	0.027	0.000	0.152
2.6667	0.030	0.028	0.000	0.152
2.7222	0.030	0.028	0.000	0.152
2.7778	0.030	0.029	0.000	0.152
2.8333	0.030	0.030	0.000	0.152
2.8889	0.030	0.030	0.000	0.152
2.9444	0.030	0.031	0.000	0.152
3.0000	0.030	0.031	0.000	0.152
3.0556	0.030	0.032	0.000	0.152
3.1111	0.030	0.033	0.000	0.152
3.1667	0.030	0.033	0.000	0.152
3.2222	0.030	0.034	0.000	0.152
3.2778	0.030	0.034	0.000	0.152
3.3333	0.030	0.035	0.000	0.152
3.3889	0.030	0.035	0.000	0.152
3.4444	0.030	0.036	0.000	0.152
3.5000	0.030	0.037	0.000	0.152
3.5556	0.030	0.037	0.000	0.152
3.6111	0.030	0.038	0.000	0.152
3.6667	0.030	0.038	0.000	0.152
3.7222	0.030	0.039	0.000	0.152
3.7778	0.030	0.040	0.000	0.152
3.8333	0.030	0.040	0.000	0.152
3.8889	0.030	0.041	0.000	0.152
3.9444	0.030	0.041	0.000	0.152
4.0000	0.030	0.042	0.000	0.152
4.0556	0.030	0.044	0.092	0.152
4.1111	0.030	0.045	0.255	0.152
4.1667	0.030	0.047	0.441	0.152
4.2222	0.030	0.049	0.610	0.152
4.2778	0.030	0.050	0.730	0.152
4.3333	0.030	0.052	0.799	0.152
4.3889	0.030	0.054	0.873	0.152
4.4444	0.030	0.055	0.933	0.152

4.5000	0.030	0.057	0.989	0.152
4.5556	0.030	0.059	1.043	0.152
4.6111	0.030	0.060	1.094	0.152
4.6667	0.030	0.062	1.143	0.152
4.7222	0.030	0.064	1.189	0.152
4.7778	0.030	0.066	1.234	0.152
4.8333	0.030	0.067	1.277	0.152
4.8889	0.030	0.069	1.319	0.152
4.9444	0.030	0.071	1.360	0.152
5.0000	0.030	0.072	1.399	0.152

Analysis Results
POC 1





+ Predeveloped x Mitigated

Predeveloped Landuse Totals for POC #1
Total Pervious Area: 1.1467
Total Impervious Area: 0

Mitigated Landuse Totals for POC #1
Total Pervious Area: 0.206
Total Impervious Area: 0.9407

Flow Frequency Method: Log Pearson Type III 17B

Flow Frequency Return Periods for Predeveloped. POC #1

Return Period	**Flow(cfs)**
2 year	0.00064
5 year	0.000889
10 year	0.001015
25 year	0.001138
50 year	0.001209
100 year	0.001266

Flow Frequency Return Periods for Mitigated. POC #1

Return Period	**Flow(cfs)**
2 year	0
5 year	0
10 year	0
25 year	0
50 year	0
100 year	0

Annual Peaks

Annual Peaks for Predeveloped and Mitigated. POC #1

Year	**Predeveloped**	**Mitigated**
1949	0.001	0.000
1950	0.001	0.000
1951	0.001	0.000
1952	0.001	0.000
1953	0.001	0.000
1954	0.001	0.000
1955	0.001	0.000
1956	0.000	0.000
1957	0.001	0.000
1958	0.000	0.000

1959	0.001	0.000
1960	0.001	0.000
1961	0.001	0.000
1962	0.000	0.000
1963	0.001	0.000
1964	0.001	0.000
1965	0.001	0.000
1966	0.000	0.000
1967	0.001	0.000
1968	0.001	0.000
1969	0.001	0.000
1970	0.001	0.000
1971	0.001	0.000
1972	0.001	0.000
1973	0.000	0.000
1974	0.000	0.000
1975	0.001	0.000
1976	0.001	0.000
1977	0.000	0.000
1978	0.000	0.000
1979	0.000	0.059
1980	0.001	0.000
1981	0.001	0.000
1982	0.001	0.000
1983	0.001	0.000
1984	0.000	0.000
1985	0.001	0.000
1986	0.001	0.000
1987	0.001	0.000
1988	0.001	0.000
1989	0.001	0.000
1990	0.000	0.000
1991	0.001	0.000
1992	0.001	0.000
1993	0.000	0.000
1994	0.000	0.000
1995	0.000	0.000
1996	0.001	0.000
1997	0.001	0.000
1998	0.000	0.000
1999	0.001	0.000
2000	0.001	0.000
2001	0.000	0.000
2002	0.001	0.000
2003	0.001	0.000
2004	0.001	0.000
2005	0.001	0.000
2006	0.001	0.000
2007	0.001	0.000
2008	0.000	0.000
2009	0.000	0.000

Ranked Annual Peaks

Ranked Annual Peaks for Predeveloped and Mitigated. POC #1

Rank	Predeveloped	Mitigated
1	0.0009	0.0589
2	0.0009	0.0000
3	0.0009	0.0000

4	0.0009	0.0000
5	0.0009	0.0000
6	0.0009	0.0000
7	0.0009	0.0000
8	0.0009	0.0000
9	0.0009	0.0000
10	0.0009	0.0000
11	0.0009	0.0000
12	0.0008	0.0000
13	0.0008	0.0000
14	0.0008	0.0000
15	0.0008	0.0000
16	0.0008	0.0000
17	0.0008	0.0000
18	0.0008	0.0000
19	0.0008	0.0000
20	0.0008	0.0000
21	0.0008	0.0000
22	0.0008	0.0000
23	0.0008	0.0000
24	0.0008	0.0000
25	0.0008	0.0000
26	0.0007	0.0000
27	0.0007	0.0000
28	0.0007	0.0000
29	0.0007	0.0000
30	0.0007	0.0000
31	0.0007	0.0000
32	0.0007	0.0000
33	0.0007	0.0000
34	0.0007	0.0000
35	0.0007	0.0000
36	0.0006	0.0000
37	0.0006	0.0000
38	0.0006	0.0000
39	0.0006	0.0000
40	0.0006	0.0000
41	0.0006	0.0000
42	0.0006	0.0000
43	0.0006	0.0000
44	0.0005	0.0000
45	0.0005	0.0000
46	0.0005	0.0000
47	0.0005	0.0000
48	0.0005	0.0000
49	0.0005	0.0000
50	0.0005	0.0000
51	0.0004	0.0000
52	0.0004	0.0000
53	0.0004	0.0000
54	0.0004	0.0000
55	0.0003	0.0000
56	0.0003	0.0000
57	0.0003	0.0000
58	0.0002	0.0000
59	0.0002	0.0000
60	0.0001	0.0000
61	0.0001	0.0000

Flow(cfs)	Predev	Mit	Percentage	Pass/Fail
0.0003	521	6	1	Pass
0.0003	501	6	1	Pass
0.0003	476	6	1	Pass
0.0003	454	6	1	Pass
0.0004	434	6	1	Pass
0.0004	408	6	1	Pass
0.0004	383	6	1	Pass
0.0004	368	6	1	Pass
0.0004	348	6	1	Pass
0.0004	327	6	1	Pass
0.0004	318	6	1	Pass
0.0004	309	6	1	Pass
0.0004	293	6	2	Pass
0.0004	287	6	2	Pass
0.0004	272	6	2	Pass
0.0005	259	6	2	Pass
0.0005	249	6	2	Pass
0.0005	239	6	2	Pass
0.0005	226	6	2	Pass
0.0005	212	6	2	Pass
0.0005	202	6	2	Pass
0.0005	191	6	3	Pass
0.0005	182	6	3	Pass
0.0005	169	6	3	Pass
0.0005	158	6	3	Pass
0.0005	152	6	3	Pass
0.0006	149	6	4	Pass
0.0006	144	6	4	Pass
0.0006	138	6	4	Pass
0.0006	134	6	4	Pass
0.0006	132	6	4	Pass
0.0006	124	6	4	Pass
0.0006	118	6	5	Pass
0.0006	112	6	5	Pass
0.0006	109	6	5	Pass
0.0006	105	6	5	Pass
0.0006	100	6	6	Pass
0.0007	99	6	6	Pass
0.0007	97	6	6	Pass
0.0007	87	6	6	Pass
0.0007	84	6	7	Pass
0.0007	77	6	7	Pass
0.0007	75	6	8	Pass
0.0007	72	6	8	Pass
0.0007	70	6	8	Pass
0.0007	66	6	9	Pass
0.0007	58	6	10	Pass
0.0007	55	6	10	Pass
0.0008	51	6	11	Pass
0.0008	49	6	12	Pass
0.0008	49	6	12	Pass
0.0008	43	6	13	Pass
0.0008	37	6	16	Pass
0.0008	32	6	18	Pass

0.0008	27	6	22	Pass
0.0008	25	6	24	Pass
0.0008	21	6	28	Pass
0.0008	19	6	31	Pass
0.0008	17	6	35	Pass
0.0008	15	6	40	Pass
0.0009	12	6	50	Pass
0.0009	9	6	66	Pass
0.0009	4	6	150	Fail
0.0009	3	6	200	Fail
0.0009	3	6	200	Fail
0.0009	2	6	300	Fail
0.0009	2	6	300	Fail
0.0009	1	6	600	Fail
0.0009	0	6	n/a	Fail
0.0009	0	6	n/a	Fail
0.0009	0	6	n/a	Fail
0.0010	0	6	n/a	Fail
0.0010	0	6	n/a	Fail
0.0010	0	6	n/a	Fail
0.0010	0	6	n/a	Fail
0.0010	0	6	n/a	Fail
0.0010	0	6	n/a	Fail
0.0010	0	6	n/a	Fail
0.0010	0	6	n/a	Fail
0.0010	0	6	n/a	Fail
0.0010	0	6	n/a	Fail
0.0010	0	6	n/a	Fail
0.0011	0	6	n/a	Fail
0.0011	0	6	n/a	Fail
0.0011	0	6	n/a	Fail
0.0011	0	6	n/a	Fail
0.0011	0	6	n/a	Fail
0.0011	0	6	n/a	Fail
0.0011	0	6	n/a	Fail
0.0011	0	6	n/a	Fail
0.0011	0	6	n/a	Fail
0.0011	0	6	n/a	Fail
0.0012	0	6	n/a	Fail
0.0012	0	6	n/a	Fail
0.0012	0	6	n/a	Fail
0.0012	0	6	n/a	Fail
0.0012	0	6	n/a	Fail
0.0012	0	6	n/a	Fail
0.0012	0	6	n/a	Fail

The development has an increase in flow durations from 1/2 Predeveloped 2 year flow to the 2 year flow or more than a 10% increase from the 2 year to the 50 year flow.

Water Quality

Water Quality BMP Flow and Volume for POC #1

On-line facility volume:	0 acre-feet
On-line facility target flow:	0 cfs.
Adjusted for 15 min:	0 cfs.
Off-line facility target flow:	0 cfs.
Adjusted for 15 min:	0 cfs.

LID Report

LID Technique	Used for Treatment ?	Total Volume Needs Treatment (ac-ft)	Volume Through Facility (ac-ft)	Infiltration Volume (ac-ft)	Cumulative Volume Infiltration Credit	Percent Volume Infiltrated	Water Quality	Percent Water Quality Treated	Comment
Total Volume Infiltrated		0.00	0.00	0.00		0.00	0.00	0%	No Treat. Credit
Compliance with LID Standard 8% of 2-yr to 50% of 2-yr									Duration Analysis Result = Passed

Model Default Modifications

Total of 0 changes have been made.

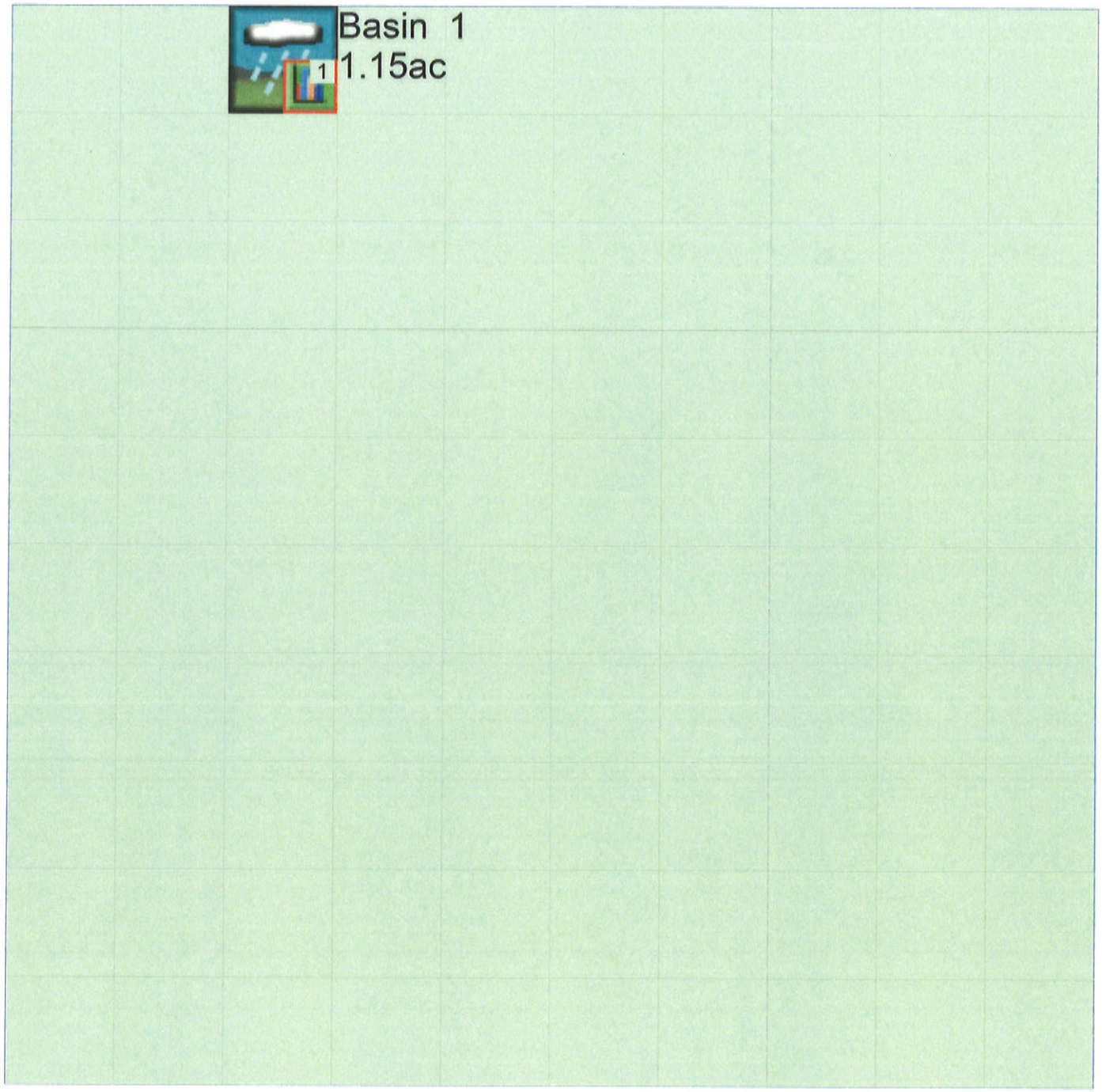
PERLND Changes

No PERLND changes have been made.

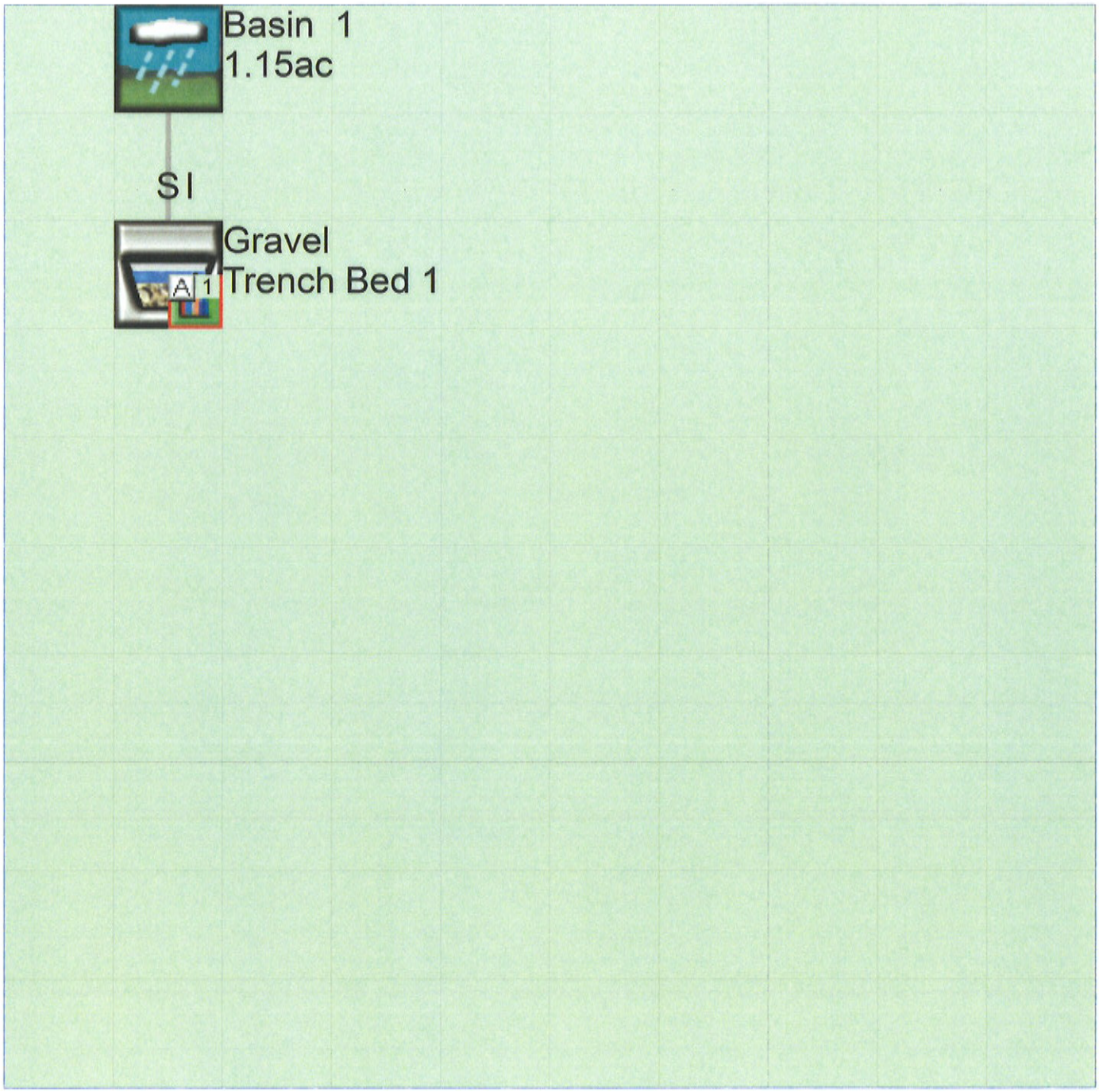
IMPLND Changes

No IMPLND changes have been made.

Appendix
Predeveloped Schematic



Mitigated Schematic



Disclaimer

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