Appendix F

Water Quality Report

Preliminary Stormwater Quality Compliance Form

(This form is to be used in conjunction with the City's Stormwater Quality Design Manual, and should be submitted with all new development and redevelopment applications.

1) Project Information

Project name: Iron Point Road Apartments Lot 1 Assessor Parcel Number(s): 072-3120-001

Site Address: South side of Iron Point Road and North of Highway 50.

Applicant Name: Cole Partners Development Company Phone Number: _____

Address: 2484 Natomas Park Drive, suite 101, Sacramento, CA 95833

Project Contact: Robert Cole Phone Number: 916-273-4020

Project Category (check all that apply): *Refer to Design Manual Table 3-2 for Project Categories*

- ☐ *Residential (Single Family)*
- ☐ *Residential (Multi-Family)*
- ☒ *Commercial Developments*
- ☐ *Automotive Repair Shops*
- ☐ *Retail Gasoline Outlets*
- ☐ *Restaurants*
- ☐ *Industrial Development*
- ☐ *Hillside Developments*
- ☐ *Parking Lot*

Project Gross Area : 6.85 (acres) Improvement Area : 5.74 (acres)

Existing Impervious Surface Area: 0 Proposed Total Impervious Surface Area: 4.31 (acres)

Watershed or receiving water: Upper American River

2) Source Controls (check applicable pollutant sources):

Refer to Design Manual Table 3-2 for Requirements

- ☒ *Storm Drain Message and Signage*
- ☐ *Fueling Areas*
- ☐ *Loading/Unloading Areas*
- ☐ *Outdoor Storage Areas*
- ☐ *Outdoor Work Areas*
- ☐ *Vehicle/Equipment Wash Areas*
- ☒ *Waste Management Areas*
- ☐ *Other Describe* _____

3) Runoff Reduction Measures:

Refer to Design Manual Table 3-2 for Requirements

Will runoff reduction measures be utilized for this project? ☐ Yes ☒ No

If yes, check selected runoff reduction measures to be used, and attach Runoff Reduction worksheets (Design Manual Appendix D).

- ☐ *Alternative Driveway Design*
- ☐ *Disconnected Roof Drains*
- ☐ *Divided Sidewalks*
- ☐ *Not Directly Connected Pavement*
- ☐ *Green Roof*
- ☐ *Interceptor Trees*
- ☐ *Porous Pavement*
- ☐ *Other Describe* _____

4) Treatment Requirements

Refer to Design Manual Table 3-2 for Requirements

Is treatment required? ☒ Yes ☐ No If no, form is complete with signature.

Otherwise, indicate number of sheds: 3 Complete following treatment sections of this form.

Early consideration of stormwater quality during site planning may reduce the overall cost of treatment controls. Runoff reduction methods and innovative design options can drastically reduce the size of treatment options. In addition, early consideration allows for non-proprietary treatment options that can significantly reduce construction and maintenance costs.

Preliminary Stormwater Quality Compliance Form

City Wide Job # _____

5) Attach Project Overview and Stormwater Quality Narrative

[X] Include Project description indicating nature of project (e.g. is it a newly developing site, replacement of previously developed site, is it an infill site). Describe activities planned for site that may impact water quality such as a retail gasoline outlet as part of a development. Describe selected treatment options. If proposing proprietary measure, state why other treatment options are not feasible. Project description should be no more than 1 page relating to stormwater quality.

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6) Attach Preliminary Site Plans and/or Drawings Showing:

[X] Existing and natural hydrologic features
[X] Existing and proposed drainage system
[X] Proposed grading plan
[X] Proposed sheds including
- Name
- Existing amount of pervious and impervious areas
- Proposed amount of pervious and impervious areas
- Proposed treatment control measure(s)

[X] Pollutant source areas including loading docks, food service areas, refuse areas, outdoor processes and storage, vehicle cleaning, repair or maintenance, fuel dispensing, equipment washing, etc.
[X] Proposed design features to minimize impervious areas, applicable runoff reduction techniques, innovative design, and all treatment options selected

*Note: Preliminary plans should identify all treatment options proposed. Sufficient engineering should be completed to properly size stormwater quality control measures. For information related to correct sizing and other requirements refer to *Stormwater Quality Design Manual for Sacramento and South Placer Regions.*

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7) List Sheds and Selected Stormwater Quality Treatment Controls

Shed Name	Total Shed Area		Flow (cfs) or Volume (ft^3)	Treatment Controls Selected
	Impervious Area	Pervious Area		
1	214,751 SF		5500 (ft^3)	Bioretention
	135,293 SF	79,548 SF		
2	17,860 SF		398 (ft^3)	Bioretention
	11,252 SF	6,608 SF		
3	17,535 SF		0.099 (cfs)	Stormfilter
	11,047 SF	6,488 SF		

Attach more sheets as necessary

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8) Signature

Print Name: James Vanderpost ___ Indicate Owner or Title Civil Engineer

Signature: _____ Date: 05/21/2021

Preliminary Water Quality Report

For:

Iron Point Road Apartments Lot 1

Folsom, CA

Project Address:
Iron Point Road
Folsom, CA

Prepared by:
RSC Engineering, Inc.
1420 Rocky Ridge Dr., Suite 150
Roseville CA, 95661

Date:
May 21, 2021

RSC Engineering, Inc.
Consulting Engineers

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info@rsc-engr.com

Table of Contents

Appendices:

Introduction:

The approximately 6.85-acre Iron Point Road Apartments site is located on the south side of Iron Point Road. The existing site is an undeveloped plot. The proposed project consists of 6 separate buildings totaling 153 of apartment units. Existing site will be graded, and asphalt parking lots and concrete walkways will be constructed to accommodate the new buildings. Stormwater planter facilities and a Contech stormwater unit will be implemented across the site to achieve the stormwater treatment as required by the Stormwater Quality Design Manual for the Sacramento Region (SQDM). See Appendix B for information on BMP locations.

Exhibit 1 - Vicinity Map:

Objective:

Develop sizing for stormwater planter facilities and a Contech Unit to satisfy the Stormwater quality and LID and hydromodification requirements of the SQDM.

Stormwater Treatment:

The proposed development at the project site consists of approximately 4.31 acres of new impervious cover. Where feasible, stormwater planter facilities will be placed to treat the runoff from each specific drainage shed. Where stormwater planters are not feasible due to space constraints topography, a Contech stormwater unit will be used to treat the runoff from that area.

The proposed stormwater planter facilities are sized with a 12” ponding depth, 18” of 0.3 porosity plant media, and 9” of 0.4 porosity gravel per the minimum requirements of the Stormwater Quality Design Manual. The stormwater planter facilities will have a ditch box inlet with a window elevation 12” above the finish grade for overflow and drainage control. These drain inlets will be piped to discharge into the existing storm drain system build by the adjacent project site. The sizing of the storm water planters is shown in a table on the stormwater quality exhibit (Appendix B).

The project proposes to use a Contech Stormfilter. The calculations are summarized in a table on the stormwater quality exhibit (Appendix B). Manufactures info sheet for the unit is included in Appendix E.

LID Calculations:

Completed LID Spreadsheets are included in Appendix A. A spreadsheet was completed for the project to show compliance with the required LID point system. Step 1 of the spreadsheet was completed to show the amount of LID points that the apartment complex earns by the amount of landscaping and pervious area within the project site. Once completed the project will be 63% impervious which provides 37 LID points, refer to the pervious cover exhibit in Appendix C for the pervious area calculation.

Section 3 of the LID spread sheet was provided to show the amount of LID points that the project will earn from constructing treatment control facilities. For this calculation, the total bioretention area, subdrain elevation and ponding depth is used, the location of the stormwater planter facilities can be found in exhibit in Appendix B. A total of 1.85 Acres of the impervious area will be managed through bioretention, per step 3 of the spread sheet this will provide 93.7 LID points.

By adding the results of the 2 sections of the spreadsheets as discussed above, it was calculated that the project will provide a total of 130.8 LID points, therefore complying with the requirements of the SQDM.

Hydromodification SAHM Simulation

A SAHM simulation compared pre-project and mitigated land use flow for 25% of a 2-year storm and a 10-year storm. The hydraulic soil rating was found to be class D using the USDA web soil survey website. Using Class D soil and an infiltration rate of 0.025 with a multiplier of 0.5 the simulation was conducted. The mitigated land use passed on all accounts. The full simulation report can be found in Appendix E.

Conclusions:

The Iron Point Road Apartments project will meet the water quality parameters and LID Points required by the Stormwater Quality Design Manual for the Sacramento Region by using stormwater planters, and a Contech Stormfilter unit in strategic locations across the site. Completed LID worksheet demonstrates the required LID stormwater treatment points are met.

Appendix A

Appendix D-2: Commercial Sites: Low Impact Development (LID) Credits and Treatment BMP Sizing Calculations

Name of Drainage Shed:
Location of project: Folsom

Fill in Blue Highlighted boxes

Step 1 - Open Space and Pervious Area Credits

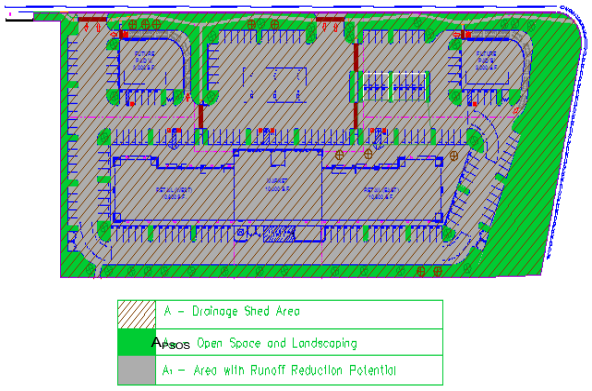
Is your project within the drainage area of a common drainage plan that includes open space? If not, skip to 1 b.

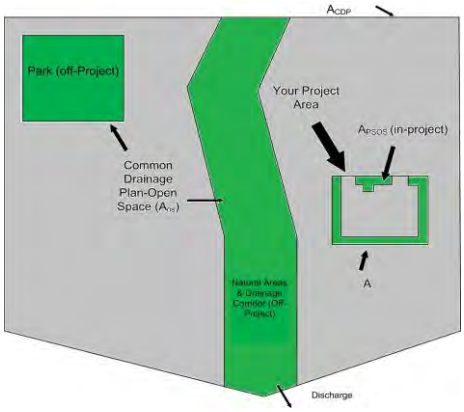
1 a. Common Drainage Plan Area	0	acres	A_{CDP}	
Common Drainage Plan Open Space (Off-project)	0	acres	A_{OS}	**see area example below**
a. Natural storage reservoirs and drainage corridors	0	acres		
b. Buffer zones for natural water bodies	0	acres		
c. Natural areas including existing trees, other vegetation, and soil	0	acres		
d. Common landscape area/park	0	acres		
e. Regional Flood Control/Drainage basins	0	acres		
1 b. Project Drainage Shed Area (Total)	6.85	acres	A	
Project-Specific Open Space (In-project, communal)**	2.54	acres	A_{PSOS}	
a. Natural storage reservoirs and drainage corridors	0.00	acres		
b. Buffer zones for natural water bodies	0.00	acres		**see area example below**
c. Natural areas including existing trees, other vegetation, and soil	0.00	acres		
d. Landscape area/park	2.54	acres		
e. Flood Control/Drainage basins	0.00	acres		

** Doesn't include impervious areas within individual lots and surrounding individual units. That is accounted for below using Form D-1a in Step 2.

Area with Runoff Reduction Potential	$A - A_{PSOS}$ =	4.31	acres	A_T
Assumed Initial Impervious Fraction	A_T / A =	0.63		I

Open Space & Pervious Area LID Credit (Step 1)
$(A_{OS}/A_{CDP}+A_{PSOS}/A)x100$ = 37 pts





Step 2 - Runoff Reduction Credits

Runoff Reduction Treatments	Impervious Area Managed			Efficiency Factor		Effective Area Managed (A_C)	
Porous Pavement:							
Option 1: Porous Pavement (see Fact Sheet, excludes porous pavement used in Option 2)	0	acres	x		=	0.000	acres
Option 2: Disconnected Pavement (see Fact Sheet, excludes porous pavement used in Option 1)	use Form D-2a for credits →					0.00	acres
Landscaping used to Disconnect Pavement (see Fact Sheet)	0.0000	acres			=	0.00	acres
Disconnected Roof Drains (see Fact Sheet and/or Table D-2b for summary of requirements)		acres			=	0.00	acres
Ecoroof (see Fact Sheet)	0	acres			=	0.00	acres
Interceptor Trees (see Fact Sheet)	use Form D-2b for credits →					0.00	acres
Total Effective Area Managed by Runoff Reduction Measures				A_C		0.00	acres
Runoff Reduction Credit (Step 2)				$(A_C / A_T)*100$ =		0	pts

Table D-2a

Porous Pavement Type	Efficiency Multiplier
Cobblestone Block Pavement	0.40
Pervious Concrete/Asphalt	0.60
Modular Block Pavement &	0.75
Reinforced Grass Pavement	1.00

Table D-2b

Maximum roof size	Minimum travel distance
≤ 3,500 sq ft	21 ft
≤ 5,000 sq ft	24 ft
≤ 7,500 sq ft	28 ft
≤ 10,000 sq ft	32 ft

Form D-2a: Disconnected Pavement Worksheet

See Fact Sheet for more information regarding Disconnected Pavement credit guidelines

Effective Area Managed (A_C)

Pavement Draining to Porous Pavement

2. Enter area draining onto Porous Pavement	0.00	acres	Box K1
3. Enter area of Receiving Porous Pavement (excludes area entered in Step 2 under Porous Pavement)	0.00	acres	Box K2
4. Ratio of Areas (Box K1 / Box K2)	0.00		Box K3

5. Select multiplier using ratio from Box K3 and enter into Box K4

Ratio (Box D)	Multiplier
Ratio is ≤ 0.5	1.00
Ratio is > 0.5 and < 1.0	0.83
Ratio is > 1.0 and < 1.5	0.71
Ratio is > 1.5 and < 2.0	0.55

	1		Box K4
6. Enter Efficiency of Porous Pavement (see table below)			Box K5

Porous Pavement Type	Efficiency Multiplier
Cobblestone Block Pavement	0.40
Pervious Concrete Asphalt Pavement	0.60
Modular Block Pavement Porous Gravel Pavement	0.75
Reinforced Grass Pavement	1.00

7. Multiply Box K2 by Box K5 and enter into Box K6	0.00	acres	Box K6
8. Multiply Boxes K1,K4, and K5 and enter the result in Box K7	0.00	acres	Box K7
9. Add Box K6 to Box K7 and multiply by 60%, and enter the Result in Box K8 This is the amount of area credit to enter into the "Disconnected Pavement" Box of Form D-2			0.00 acres

Form D-2b: Interceptor Tree Worksheet

See Fact Sheet for more information regarding Interceptor Tree credit guidelines

New Evergreen Trees

1. Enter number of new evergreen trees that qualify as Interceptor Trees in Box L1.		trees	Box L1
2. Multiply Box L1 by 200 and enter result in Box L2	0	sq. ft.	Box L2

New Deciduous Trees

3. Enter number of new deciduous trees that qualify as Interceptor Trees in Box L3.		trees	Box L3
4. Multiply Box L3 by 100 and enter result in Box L4	0	sq. ft.	Box L4

Existing Tree Canopy

5. Enter square footage of existing tree canopy that qualifies as Existing Tree canopy in Box L5.	0	sq. ft.	Box L5
6. Multiply Box L5 by 0.5 and enter the result in Box L6	0	sq. ft.	Box L6

Total Interceptor Tree EAM Credits

Add Boxes L2, L4, and L6 and enter it into Box L7	0	sq. ft.	Box L7
Divide Box L7 by 43,560 and multiply by 20% to get effective area managed and enter result in Box L8 This is the amount of area credit to enter into the "Interceptor Trees" Box of Form D-2	0.00	acres	Box L8

Step 3 - Runoff Management Credits

Capture and Use Credits

Impervious Area Managed by Rain barrels, Cisterns, and automatically-emptied systems

(see Fact Sheet) | - | enter gallons, for simple rain barrels | 0.00 | acres

Automated-Control Capture and Use System

(see Fact Sheet, then enter impervious area managed by the system) | 0.00 | acres

Bioretention/Infiltration Credits

Impervious Area Managed by Bioretention BMPs

(see Fact Sheet)

Bioretention Area	5,898	sq ft	
Subdrain Elevation	6	inches	
Ponding Depth, inches	12	inches	2.02 acres

Impervious Area Managed by Infiltration BMPs

(see Fact Sheet)

	Drawdown Time, hrs		drawdown_hrs_inf	
	Soil Infiltration Rate, in/hr		soil_inf_rate	
Sizing Option 1:	Capture Volume, acre-ft	0.00	capture_vol_inf	0.00 acres
Sizing Option 2:	Infiltration BMP surface area, sq ft	0	soil_surface_area	0.00 acres
	Basin or trench?		approximate BMP depth	0.00 ft

Impervious Area Managed by Amended Soil or Mulch Beds

(see Fact Sheet) | Mulched Infiltration Area, sq ft | | mulch_area | 0.00 acres

Total Effective Area Managed by Capture-and-Use/Bioretention/Infiltration BMPs | 2.02 | A_{LIDc}

Runoff Management Credit (Step 3) | A_{LIDC}/A_T*200 = | 93.7 | pts

Total LID Credits (Step 1+2+3) LID compliant, check for treatment sizing in Step 4 130.8

Does project require hydromodification management? If yes, proceed to using SacHM.

Adjusted Area for Flow-Based, Non-LID Treatment	$A_T - A_C - A_{LIDC}$ =	2.29	A_{AT}
Adjusted Impervious Fraction of A for Volume-Based, Non-LID Treatment	A_{AT} / A =	0.33	I_A

Further treatment is required, see choose flow-based or volume-based sizing in Step 4

Step 4a Treatment - Flow-Based (Rational Method)

Calculate treatment flow (cfs): Flow = Runoff Coefficient x Rainfall Intensity x Area

Look up value for i in Table D-2c (Rainfall Intensity)	0.20	i
Obtain A_{AT} from Step 3	2.29	A_{AT}
Use C = 0.95	0.95	C
Flow = 0.95 * i * A_{AT}	0.44	cfs

Table D-2c

Rainfall Intensity			
Roseville	i =	0.20	in/hr
Sacramento	i =	0.18	in/hr
Folsom	i =	0.20	in/hr

Step 4b Treatment - Volume-Based (ASCE-WEF)

Calculate water quality volume (Acre-Feet): WQV = Area x Maximized Detention Volume (P_0)

Obtain A from Step 1	6.85	A		hrs Specified Draw Down time
Obtain P_0: Maximized Detention Volume from figures E-1 to E-4 in Appendix E of this manual using I_A from Step 2.	0.26	P_0		
Calculate treatment volume (acre-ft): **Treatment volume = A x (P_0 / 12)**	0.15	Acre-Feet		

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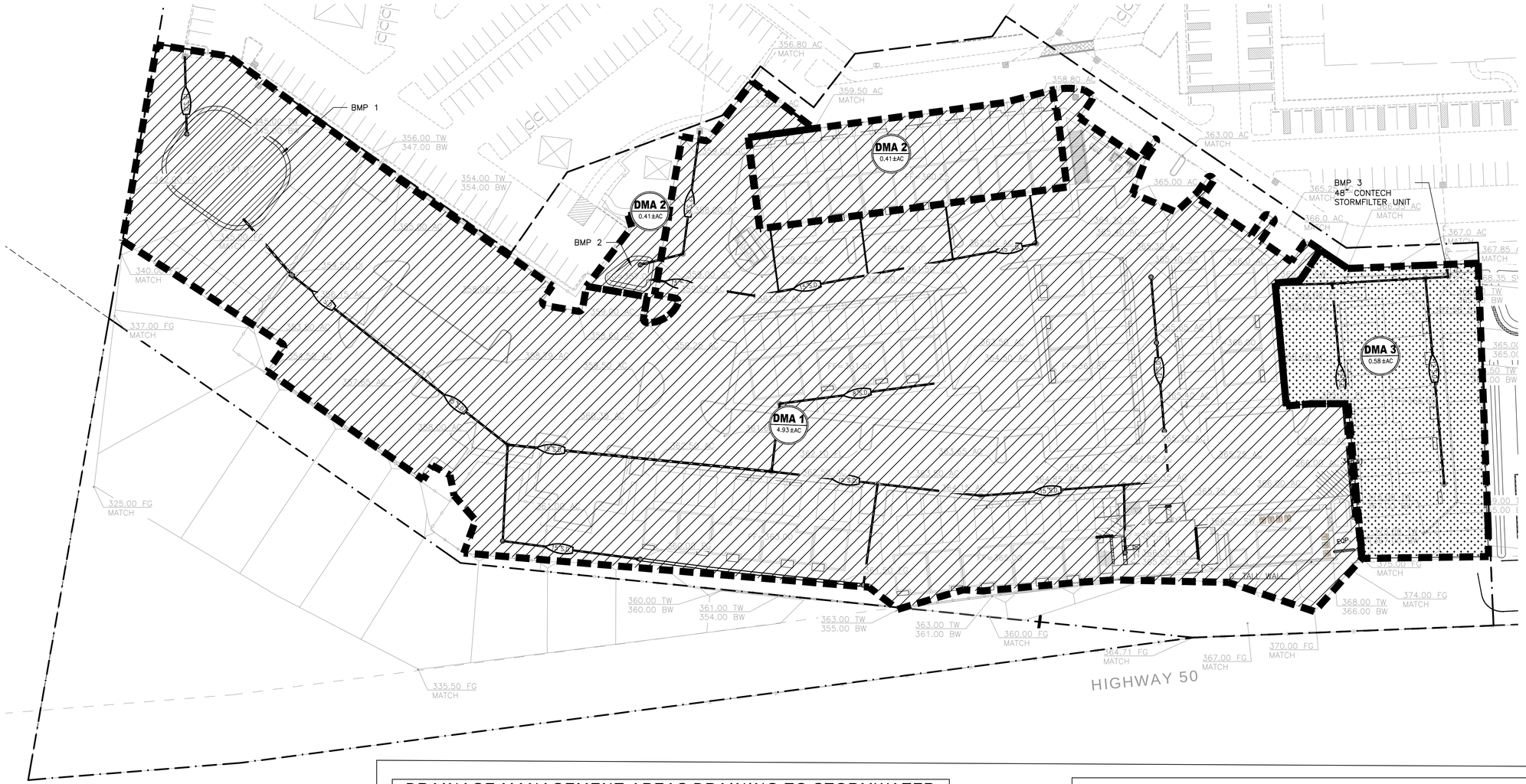
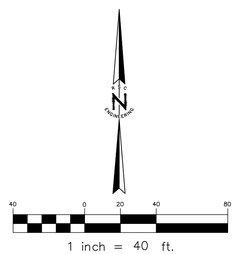


LEGEND

- STORMWATER PLANTER
- DRAINAGE MANAGEMENT AREAS TREATED BY STORMWATER PLANTER
- DRAINAGE MANAGEMENT AREAS TREATED BY CONTECH STORMFILTER UNIT



DRAINAGE MANAGEMENT AREAS DRAINING TO STORMWATER PLANTERS

DMA NUMBER	BMP NUMBER	TOTAL DMA AREA (SF)	STORMWATER PLANTER AREA (SF)	STORMWATER PLANTER DEPTH (INCHES)	SOIL MEDIA DEPTH (INCHES)	STORMWATER GRAVEL DEPTH (INCHES)	STORMWATER VOLUME PROVIDED (CF)	WATER QUALITY VOLUME REQUIRED (CF)	% COMPLIANT
1	1	214,751	5500	12	18	9	5500	5,369	102
2	2	17,860	398	12	18	9	398	381	104
	TOTAL	232,611	5,898						

THE STORMWATER PLANTERS ARE SIZED USING APPENDIX E OF THE STORMWATER QUALITY DESIGN MANUAL FOR THE SACRAMENTO REGION (SWQDM).

1. STORM WATER VOLUME PROVIDED = (STORMWATER DEPTH + MEDIA DEPTHX0.3 + GRAVEL DEPTHX0.4) X STORMWATER PLANTER AREA
2. STORM WATER VOLUME REQUIRED = P_0XDMA AREA/12
   WHERE: P_0=MAXIMIZED DETENTION VOLUME FOR A 12 HOUR DRAW DOWN TIME (63% IMPERVIOUS) PER FIGURE E-1 IN THE SWQDM
3. % COMPLIANT=STORMWATER VOLUME PROVIDED/STORMWATER VOLUME REQUIRED

DRAINAGE MANAGEMENT AREAS DRAINING CONTECH STORMFILTER UNITS

DMA NUMBER	BMP NUMBER	TOTAL DMA AREA (SF)	WQF REQUIRED (CFS)	WQF PER CARTRIDGE (CFS) (18" CARTRIDGE)	NUMBER OF CARTRIDGES REQUIRED	NUMBER OF CARTRIDGES PROVIDED	WQF PROVIDED (C.F.)	% COMPLIANT
3	3	17,535	0.069	0.033	2.086	3	0.099	144
		17,535						

WQF=CiA, WHERE:
C=RUNNOF COEFFICIENT = .75
i=INTENSITY= .2 FOR SACRAMENTO COUNTY
A=AREA DMA (ACRES)

RSC ENGINEERING
1420 Rocky Ridge Drive, Suite 150
Roseville, CA 95661
Ph:916.788.2884 Fax:916.788.4408

APPENDIX B

STORMWATER QUALITY EXHIBIT | SWQ1

IRON POINT ROAD APARTMENTS - LOT 1

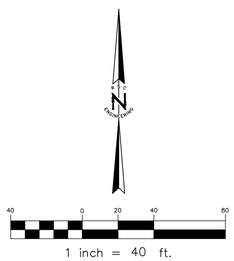
FOLSOM, CA.

MAY 19, 2021 | MR200320.00

GRUPE

COLE PARTNERS DEVELOPMENT COMPANY
REAL ESTATE INVESTMENT, DEVELOPMENT & MANAGEMENT

BSB DESIGN
BSBDESIGN.COM



LEGEND

NEW PERVIOUS AREA	
NEW IMPERVIOUS AREA	
SITE BOUNDARY	

TOTAL DISTURBED AREA	298,340 S.F.
NEW PERVIOUS AREA	110,506 S.F.
NEW IMPERVIOUS AREA	187,834 S.F.
PERCENT IMPERVIOUS	63 %

GRUPE

COLE PARTNERS DEVELOPMENT COMPANY
REAL ESTATE INVESTMENT, DEVELOPMENT & MANAGEMENT

APPENDIX C

IMPERVIOUS AREA EXHIBIT | SWQ2

IRON POINT ROAD APARTMENTS - LOT 1

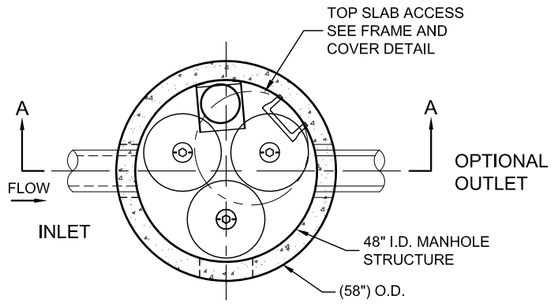
FOLSOM, CA.

MAY 19, 2021 | MR200320.00

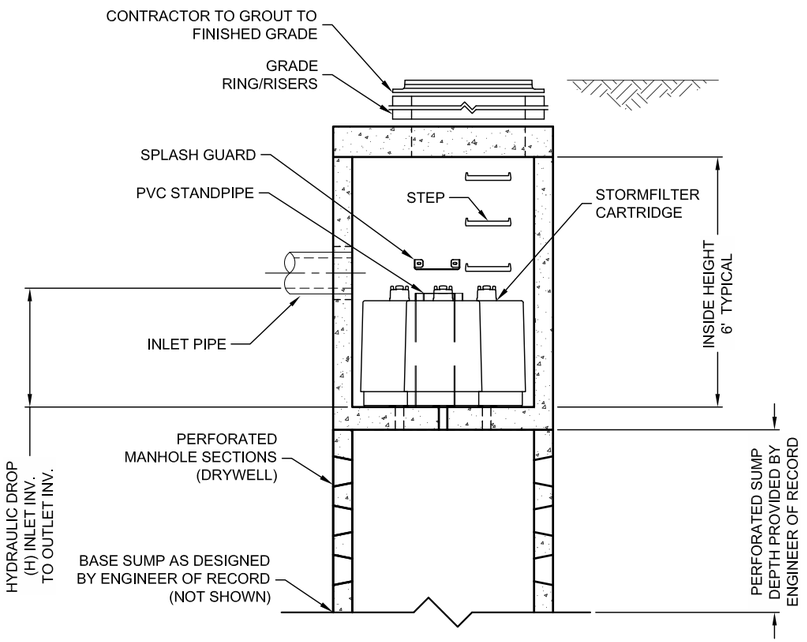
RSC ENGINEERING
1420 Rocky Ridge Drive, Suite 150
Roseville, CA 95661
Ph:916.788.2884 Fax:916.788.4408

BSB DESIGN
BSBDESIGN.COM

Appendix D



PLAN VIEW
TOP SLAB NOT SHOWN



SECTION A-A

The Stormwater Management StormFilter®
THIS PRODUCT MAY BE PROTECTED BY ONE OR MORE OF THE FOLLOWING U.S. PATENTS: 5,322,629; 5,504,379; 5,707,527; 5,985,157; 6,027,639; 6,649,048; RELATED FOREIGN PATENTS, OR OTHER PATENTS PENDING.

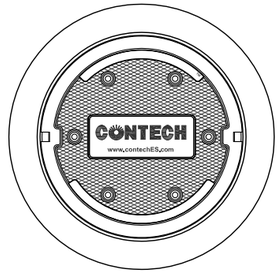
INFILTRATOR STORMFILTER DESIGN NOTES

INFILTRATOR STORMFILTER TREATMENT CAPACITY IS A FUNCTION OF THE CARTRIDGE SELECTION AND THE NUMBER OF CARTRIDGES. THE STANDARD MANHOLE STYLE IS SHOWN WITH THE MAXIMUM NUMBER OF CARTRIDGES (7).

Ø48" MANHOLE INFILTRATOR STORMFILTER PEAK HYDRAULIC CAPACITY IS 1.5 CFS. IF THE SITE CONDITIONS EXCEED 1.5 CFS AN UPSTREAM BYPASS STRUCTURE IS REQUIRED.

CARTRIDGE SELECTION

CARTRIDGE HEIGHT	27"		18"		LOW DROP	
RECOMMENDED HYDRAULIC DROP (H)	3.05'		2.3'		1.8'	
SPECIFIC FLOW RATE (gpm/sf)	2 gpm/ft²	1 gpm/ft²	2 gpm/ft²	1 gpm/ft²	2 gpm/ft²	1 gpm/ft²
CARTRIDGE FLOW RATE (gpm)	22.5	11.25	15	7.5	10	5



FRAME AND COVER
(DIAMETER VARIES)
N.T.S.

SITE SPECIFIC DATA REQUIREMENTS

STRUCTURE ID	*
WATER QUALITY FLOW RATE (cfs)	*
PEAK FLOW RATE (cfs)	*
RETURN PERIOD OF PEAK FLOW (yrs)	*
# OF CARTRIDGES REQUIRED	*
CARTRIDGE FLOW RATE	*
MEDIA TYPE (CSF, PERLITE, ZPG, GAC, PHS)	*

PIPE DATA:	I.E.	MATERIAL	DIAMETER
INLET PIPE #1	*	*	*
INLET PIPE #2	*	*	*
OUTLET PIPE	*	*	*

RIM ELEVATION	*

ANTI-FLOTATION BALLAST	WIDTH	HEIGHT
	*	*

NOTES/SPECIAL REQUIREMENTS:

* PER ENGINEER OF RECORD

GENERAL NOTES
1. CONTECH TO PROVIDE ALL MATERIALS UNLESS NOTED OTHERWISE.
2. DIMENSIONS MARKED WITH ( ) ARE REFERENCE DIMENSIONS. ACTUAL DIMENSIONS MAY VARY.
3. FOR SITE SPECIFIC DRAWINGS WITH DETAILED VAULT DIMENSIONS AND WEIGHTS, PLEASE CONTACT YOUR CONTECH ENGINEERED SOLUTIONS LLC REPRESENTATIVE. www.ContechES.com
4. INFILTRATOR STORMFILTER WATER QUALITY STRUCTURE SHALL BE IN ACCORDANCE WITH ALL DESIGN DATA AND INFORMATION CONTAINED IN THIS DRAWING.
5. STRUCTURE SHALL MEET AASHTO HS20 LOAD RATING, ASSUMING EARTH COVER OF 0' - 5' AND GROUNDWATER ELEVATION AT, OR BELOW, THE OUTLET PIPE INVERT ELEVATION. ENGINEER OF RECORD TO CONFIRM ACTUAL GROUNDWATER ELEVATION. CASTINGS SHALL MEET AASHTO M306 AND BE CAST WITH THE CONTECH LOGO.
6. FILTER CARTRIDGES SHALL BE MEDIA-FILLED, PASSIVE, SIPHON ACTUATED, RADIAL FLOW, AND SELF CLEANING. RADIAL MEDIA DEPTH SHALL BE 7-INCHES. FILTER MEDIA CONTACT TIME SHALL BE AT LEAST 39 SECONDS.
7. SPECIFIC FLOW RATE IS EQUAL TO THE FILTER TREATMENT CAPACITY (gpm) DIVIDED BY THE FILTER CONTACT SURFACE AREA (sq ft).

INSTALLATION NOTES
1. ANY SUB-BASE, BACKFILL DEPTH, AND/OR ANTI-FLOTATION PROVISIONS ARE SITE-SPECIFIC DESIGN CONSIDERATIONS AND SHALL BE SPECIFIED BY ENGINEER OF RECORD.
2. CONTRACTOR TO PROVIDE EQUIPMENT WITH SUFFICIENT LIFTING AND REACH CAPACITY TO LIFT AND SET THE STORMFILTER STRUCTURE (LIFTING CLUTCHES PROVIDED).
3. CONTRACTOR TO INSTALL JOINT SEALANT BETWEEN ALL STRUCTURE SECTIONS AND ASSEMBLE STRUCTURE.
4. CONTRACTOR TO PROVIDE, INSTALL, AND GROUT INLET PIPE(S).
5. CONTRACTOR TO TAKE APPROPRIATE MEASURES TO PROTECT CARTRIDGES FROM CONSTRUCTION-RELATED EROSION RUNOFF.

CONTECH® ENGINEERED SOLUTIONS LLC
www.ContechES.com
9025 Centre Pointe Dr., Suite 400, West Chester, OH 45069
800-338-1122 513-645-7000 513-645-7993 FAX

SFIN-MH48
INFILTRATOR STORMFILTER STANDARD DETAIL

Appendix E

SAHM

PROJECT REPORT

General Model Information

Project Name:	Lot 1 Hydromod
Site Name:	Folsom Iron Point Apt. Lot 1
Site Address:	
City:	Folsom
Report Date:	5/20/2021
Gage:	ORANGEVA
Data Start:	1964/10/01
Data End:	2004/09/30
Timestep:	Hourly
Precip Scale:	1.091
Version Date:	2021/05/20

POC Thresholds

Low Flow Threshold for POC1:	25 Percent of the 2 Year
High Flow Threshold for POC1:	10 Year

Landuse Basin Data

Pre-Project Land Use

Basin 1

Bypass:	No
GroundWater:	No
Pervious Land Use	acre
D,Grass,VSteep(>5%)	5.09
Pervious Total	5.09
Impervious Land Use	acre
Impervious Total	0
Basin Total	5.09

Element Flows To:

Surface	Interflow	Groundwater

Mitigated Land Use

Basin 1

Bypass:	No
GroundWater:	No

Pervious Land Use	acre
D,Grass,VSteep(>5%)	1.6
Pervious Total	1.6

Impervious Land Use	acre
Imperv,Mod (1-2%)	2.74
Impervious Total	2.74
Basin Total	4.34

Element Flows To:

Surface	Interflow	Groundwater
Surface retention 1	Surface retention 1	

Basin 2

Bypass:	No
GroundWater:	No

Pervious Land Use	acre
D,Grass,VSteep(>5%)	0.13
Pervious Total	0.13

Impervious Land Use	acre
Imperv,Mod (1-2%)	0.22
Impervious Total	0.22
Basin Total	0.35

Element Flows To:

Surface	Interflow	Groundwater
Surface retention 2	Surface retention 2	

Basin 3

Bypass:	Yes
GroundWater:	No

Pervious Land Use	acre
D,Grass,VSteep(>5%)	0.15
Pervious Total	0.15

Impervious Land Use	acre
Imperv,Mod (1-2%)	0.25
Impervious Total	0.25
Basin Total	0.4

Element Flows To:

Surface	Interflow	Groundwater

Routing Elements
Pre-Project Routing

Mitigated Routing

Bioretention 1

Bottom Length:	70.71 ft.
Bottom Width:	70.71 ft.
Material thickness of first layer:	0.5
Material type for first layer:	Sandy loam
Material thickness of second layer:	1.5
Material type for second layer:	Amended 5 in/hr
Material thickness of third layer:	0.75
Material type for third layer:	GRAVEL
Infiltration On	
Infiltration rate:	0
Infiltration safety factor:	1
Total Volume Infiltrated (ac-ft.):	0
Total Volume Through Riser (ac-ft.):	0
Total Volume Through Facility (ac-ft.):	237.496
Percent Infiltrated:	0
Total Precip Applied to Facility:	11.135
Total Evap From Facility:	9.669
Underdrain used	
Underdrain Diameter (feet):	0.34
Orifice Diameter (in.):	3
Offset (in.):	6
Flow Through Underdrain (ac-ft.):	214.747
Total Outflow (ac-ft.):	237.496
Percent Through Underdrain:	90.42
Discharge Structure	
Riser Height:	1 ft.
Riser Diameter:	24 in.
Element Flows To:	
Outlet 1	Outlet 2

Landscape Swale Hydraulic Table

Stage(feet)	Area(ac.)	Volume(ac-ft.)	Discharge(cfs)	Infilt(cfs)
0.0000	0.1746	0.0000	0.0000	0.0000
0.0577	0.1737	0.0027	0.0000	0.0000
0.1154	0.1723	0.0054	0.0000	0.0000
0.1731	0.1709	0.0081	0.0000	0.0000
0.2308	0.1696	0.0109	0.0000	0.0000
0.2885	0.1682	0.0136	0.0000	0.0000
0.3462	0.1668	0.0164	0.0000	0.0000
0.4038	0.1655	0.0193	0.0000	0.0000
0.4615	0.1641	0.0221	0.0000	0.0000
0.5192	0.1628	0.0252	0.0000	0.0000
0.5769	0.1615	0.0282	0.0000	0.0000
0.6346	0.1601	0.0313	0.0000	0.0000
0.6923	0.1588	0.0344	0.0000	0.0000
0.7500	0.1575	0.0375	0.0000	0.0000
0.8077	0.1562	0.0407	0.0000	0.0000
0.8654	0.1549	0.0439	0.0000	0.0000
0.9231	0.1536	0.0471	0.0000	0.0000
0.9808	0.1523	0.0503	0.0000	0.0000
1.0385	0.1510	0.0536	0.0000	0.0000
1.0962	0.1497	0.0569	0.0000	0.0000

1.1538	0.1484	0.0603	0.0000	0.0000
1.2115	0.1471	0.0636	0.0000	0.0000
1.2692	0.1459	0.0670	0.0000	0.0000
1.3269	0.1446	0.0705	0.0000	0.0000
1.3846	0.1433	0.0739	0.0000	0.0000
1.4423	0.1421	0.0774	0.0000	0.0000
1.5000	0.1408	0.0809	0.0000	0.0000
1.5577	0.1396	0.0845	0.0000	0.0000
1.6154	0.1384	0.0880	0.0000	0.0000
1.6731	0.1371	0.0917	0.0000	0.0000
1.7308	0.1359	0.0953	0.0000	0.0000
1.7885	0.1347	0.0990	0.0000	0.0000
1.8462	0.1335	0.1027	0.0000	0.0000
1.9038	0.1323	0.1064	0.0000	0.0000
1.9615	0.1311	0.1102	0.0000	0.0000
2.0192	0.1299	0.1139	0.0000	0.0000
2.0769	0.1287	0.1177	0.0000	0.0000
2.1346	0.1275	0.1215	0.0000	0.0000
2.1923	0.1263	0.1254	0.0000	0.0000
2.2500	0.1251	0.1293	0.0000	0.0000
2.3077	0.1239	0.1332	0.0000	0.0000
2.3654	0.1228	0.1371	0.0000	0.0000
2.4231	0.1216	0.1411	0.0000	0.0000
2.4808	0.1205	0.1451	0.0000	0.0000
2.5385	0.1193	0.1492	0.0111	0.0000
2.5962	0.1182	0.1532	0.0372	0.0000
2.6538	0.1170	0.1574	0.0620	0.0000
2.7115	0.1159	0.1615	0.0838	0.0000
2.7500	0.1148	0.1643	0.3649	0.0000

Landscape Swale Hydraulic Table

Stage(feet)	Area(ac.)	Volume(ac-ft.)	Discharge(cfs)	To Amended(cfs)	Infilt(cfs)
2.7500	0.1746	0.1643	0.0000	0.2725	0.0000
2.8077	0.1760	0.1744	0.0000	0.2725	0.0000
2.8654	0.1774	0.1846	0.0000	0.3354	0.0000
2.9231	0.1788	0.1949	0.0000	0.3668	0.0000
2.9808	0.1802	0.2052	0.0000	0.3983	0.0000
3.0385	0.1816	0.2156	0.0000	0.4297	0.0000
3.0962	0.1830	0.2262	0.0000	0.4611	0.0000
3.1538	0.1844	0.2368	0.0000	0.4926	0.0000
3.2115	0.1859	0.2474	0.0000	0.5240	0.0000
3.2692	0.1873	0.2582	0.0000	0.5555	0.0000
3.3269	0.1887	0.2691	0.0000	0.5869	0.0000
3.3846	0.1902	0.2800	0.0000	0.6183	0.0000
3.4423	0.1916	0.2910	0.0000	0.6498	0.0000
3.5000	0.1931	0.3021	0.0000	0.6812	0.0000
3.5577	0.1945	0.3133	0.0000	0.7127	0.0000
3.6154	0.1960	0.3245	0.0000	0.7441	0.0000
3.6731	0.1975	0.3359	0.0000	0.7755	0.0000
3.7308	0.1990	0.3473	0.0000	0.8070	0.0000
3.7885	0.2004	0.3589	0.1601	0.8384	0.0000
3.8462	0.2019	0.3705	0.6320	0.8699	0.0000
3.9038	0.2034	0.3822	1.2766	0.9013	0.0000
3.9615	0.2049	0.3939	2.0502	0.9327	0.0000
4.0192	0.2064	0.4058	2.9237	0.9642	0.0000
4.0769	0.2079	0.4177	3.8706	0.9956	0.0000
4.1346	0.2094	0.4298	4.8649	1.0271	0.0000
4.1923	0.2110	0.4419	5.8796	1.0585	0.0000

4.2500	0.2125	0.4541	6.8875	1.0899	0.0000
4.3077	0.2140	0.4664	7.8617	1.1214	0.0000
4.3654	0.2156	0.4788	8.7770	1.1528	0.0000
4.4231	0.2171	0.4913	9.6112	1.1843	0.0000
4.4808	0.2187	0.5039	10.347	1.2157	0.0000
4.5385	0.2202	0.5165	10.975	1.2472	0.0000
4.5962	0.2218	0.5293	11.494	1.2786	0.0000
4.6538	0.2233	0.5421	11.913	1.3100	0.0000
4.7115	0.2249	0.5551	12.257	1.3415	0.0000
4.7692	0.2265	0.5681	12.719	1.3729	0.0000
4.8269	0.2281	0.5812	13.074	1.4044	0.0000
4.8846	0.2296	0.5944	13.420	1.4358	0.0000
4.9423	0.2312	0.6077	13.757	1.4672	0.0000
5.0000	0.2328	0.6211	14.086	1.4987	0.0000
5.0577	0.2344	0.6346	14.407	1.5301	0.0000
5.1154	0.2361	0.6481	14.721	1.5616	0.0000
5.1731	0.2377	0.6618	15.029	1.5930	0.0000
5.2308	0.2393	0.6755	15.331	1.6244	0.0000
5.2500	0.2398	0.6802	15.627	1.6349	0.0000

Surface retention 1

Element Flows To:

Outlet 1	Outlet 2
	Bioretention 1

Bioretention 2

Bottom Length:	19.94 ft.
Bottom Width:	19.94 ft.
Material thickness of first layer:	0.5
Material type for first layer:	Sandy loam
Material thickness of second layer:	1.5
Material type for second layer:	Amended 5 in/hr
Material thickness of third layer:	0.75
Material type for third layer:	GRAVEL
Underdrain used	
Underdrain Diameter (feet):	0.34
Orifice Diameter (in.):	3
Offset (in.):	6
Flow Through Underdrain (ac-ft.):	19.479
Total Outflow (ac-ft.):	19.596
Percent Through Underdrain:	99.41
Discharge Structure	
Riser Height:	1 ft.
Riser Diameter:	24 in.
Element Flows To:	
Outlet 1	Outlet 2

Landscape Swale Hydraulic Table

Stage(feet)	Area(ac.)	Volume(ac-ft.)	Discharge(cfs)	Infilt(cfs)
0.0000	0.0305	0.0000	0.0000	0.0000
0.0577	0.0301	0.0002	0.0000	0.0000
0.1154	0.0295	0.0004	0.0000	0.0000
0.1731	0.0290	0.0007	0.0000	0.0000
0.2308	0.0284	0.0009	0.0000	0.0000
0.2885	0.0278	0.0012	0.0000	0.0000
0.3462	0.0273	0.0014	0.0000	0.0000
0.4038	0.0267	0.0017	0.0000	0.0000
0.4615	0.0262	0.0019	0.0000	0.0000
0.5192	0.0257	0.0022	0.0000	0.0000
0.5769	0.0251	0.0025	0.0000	0.0000
0.6346	0.0246	0.0028	0.0000	0.0000
0.6923	0.0241	0.0032	0.0000	0.0000
0.7500	0.0236	0.0035	0.0000	0.0000
0.8077	0.0231	0.0038	0.0000	0.0000
0.8654	0.0226	0.0042	0.0000	0.0000
0.9231	0.0221	0.0045	0.0000	0.0000
0.9808	0.0216	0.0049	0.0000	0.0000
1.0385	0.0211	0.0053	0.0000	0.0000
1.0962	0.0206	0.0057	0.0000	0.0000
1.1538	0.0202	0.0061	0.0000	0.0000
1.2115	0.0197	0.0065	0.0000	0.0000
1.2692	0.0192	0.0069	0.0000	0.0000
1.3269	0.0188	0.0073	0.0000	0.0000
1.3846	0.0183	0.0077	0.0000	0.0000
1.4423	0.0179	0.0082	0.0000	0.0000
1.5000	0.0174	0.0086	0.0000	0.0000
1.5577	0.0170	0.0091	0.0000	0.0000
1.6154	0.0166	0.0096	0.0000	0.0000
1.6731	0.0161	0.0101	0.0000	0.0000
1.7308	0.0157	0.0106	0.0000	0.0000

1.7885	0.0153	0.0111	0.0000	0.0000
1.8462	0.0149	0.0117	0.0000	0.0000
1.9038	0.0145	0.0122	0.0000	0.0000
1.9615	0.0141	0.0127	0.0000	0.0000
2.0192	0.0137	0.0133	0.0000	0.0000
2.0769	0.0133	0.0139	0.0000	0.0000
2.1346	0.0129	0.0145	0.0000	0.0000
2.1923	0.0126	0.0151	0.0000	0.0000
2.2500	0.0122	0.0157	0.0000	0.0000
2.3077	0.0118	0.0163	0.0000	0.0000
2.3654	0.0115	0.0169	0.0000	0.0000
2.4231	0.0111	0.0176	0.0000	0.0000
2.4808	0.0108	0.0182	0.0000	0.0000
2.5385	0.0104	0.0189	0.0111	0.0000
2.5962	0.0101	0.0196	0.0372	0.0000
2.6538	0.0098	0.0203	0.0650	0.0000
2.7115	0.0094	0.0210	0.0650	0.0000
2.7500	0.0091	0.0215	0.0650	0.0000

Landscape Swale Hydraulic Table

Stage(feet)	Area(ac.)	Volume(ac-ft.)	Discharge(cfs)	To Amended(cfs)	Infilt(cfs)
2.7500	0.0305	0.0215	0.0000	0.0217	0.0000
2.8077	0.0311	0.0233	0.0000	0.0217	0.0000
2.8654	0.0317	0.0251	0.0000	0.0267	0.0000
2.9231	0.0322	0.0269	0.0000	0.0292	0.0000
2.9808	0.0328	0.0288	0.0000	0.0317	0.0000
3.0385	0.0334	0.0307	0.0000	0.0342	0.0000
3.0962	0.0341	0.0326	0.0000	0.0367	0.0000
3.1538	0.0347	0.0346	0.0000	0.0392	0.0000
3.2115	0.0353	0.0366	0.0000	0.0417	0.0000
3.2692	0.0359	0.0387	0.0000	0.0442	0.0000
3.3269	0.0366	0.0408	0.0000	0.0467	0.0000
3.3846	0.0372	0.0429	0.0000	0.0492	0.0000
3.4423	0.0378	0.0451	0.0000	0.0517	0.0000
3.5000	0.0385	0.0473	0.0000	0.0542	0.0000
3.5577	0.0391	0.0495	0.0000	0.0567	0.0000
3.6154	0.0398	0.0518	0.0000	0.0592	0.0000
3.6731	0.0405	0.0541	0.0000	0.0617	0.0000
3.7308	0.0411	0.0565	0.0000	0.0642	0.0000
3.7885	0.0418	0.0589	0.1601	0.0667	0.0000
3.8462	0.0425	0.0613	0.6320	0.0692	0.0000
3.9038	0.0432	0.0638	1.2766	0.0717	0.0000
3.9615	0.0439	0.0663	2.0502	0.0742	0.0000
4.0192	0.0446	0.0688	2.9237	0.0767	0.0000
4.0769	0.0453	0.0714	3.8706	0.0792	0.0000
4.1346	0.0460	0.0740	4.8649	0.0817	0.0000
4.1923	0.0467	0.0767	5.8796	0.0842	0.0000
4.2500	0.0474	0.0794	6.8875	0.0867	0.0000
4.3077	0.0481	0.0822	7.8617	0.0892	0.0000
4.3654	0.0489	0.0850	8.7770	0.0917	0.0000
4.4231	0.0496	0.0878	9.6112	0.0942	0.0000
4.4808	0.0503	0.0907	10.347	0.0967	0.0000
4.5385	0.0511	0.0936	10.975	0.0992	0.0000
4.5962	0.0518	0.0966	11.494	0.1017	0.0000
4.6538	0.0526	0.0996	11.913	0.1042	0.0000
4.7115	0.0534	0.1027	12.257	0.1067	0.0000
4.7692	0.0541	0.1058	12.719	0.1092	0.0000
4.8269	0.0549	0.1089	13.074	0.1117	0.0000

4.8846	0.0557	0.1121	13.420	0.1142	0.0000
4.9423	0.0565	0.1153	13.757	0.1167	0.0000
5.0000	0.0573	0.1186	14.086	0.1192	0.0000
5.0577	0.0581	0.1219	14.407	0.1217	0.0000
5.1154	0.0589	0.1253	14.721	0.1242	0.0000
5.1731	0.0597	0.1287	15.029	0.1267	0.0000
5.2308	0.0605	0.1322	15.331	0.1292	0.0000
5.2500	0.0607	0.1334	15.627	0.1300	0.0000

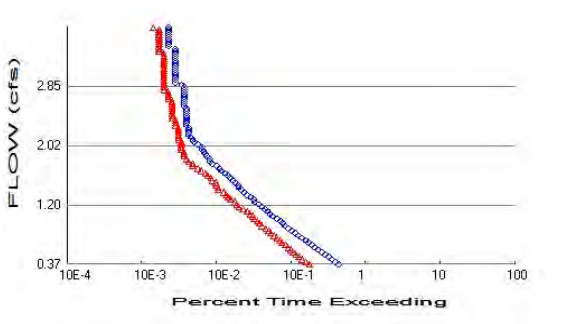
Surface retention 2

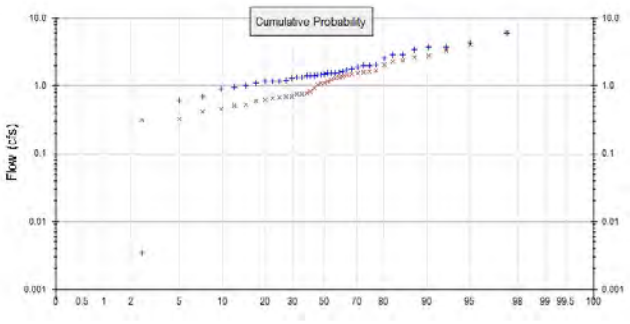
Element Flows To:

Outlet 1	Outlet 2
	Bioretention 2

Analysis Results

POC 1





\+ Pre-Project x Mitigated

Pre-Project Landuse Totals for POC #1
Total Pervious Area: 5.09
Total Impervious Area: 0

Mitigated Landuse Totals for POC #1
Total Pervious Area: 1.88
Total Impervious Area: 3.21

Flow Frequency Method: Log Pearson Type III 17B

Flow Frequency Return Periods for Pre-Project. POC #1

Return Period	Flow(cfs)
2 year	1.476649
5 year	2.43963
10 year	3.674646
25 year	4.667234

Flow Frequency Return Periods for Mitigated. POC #1

Return Period	Flow(cfs)
2 year	1.061884
5 year	1.999068
10 year	2.779299
25 year	4.530804

Annual Peaks

Annual Peaks for Pre-Project and Mitigated. POC #1

Year	Pre-Project	Mitigated
1965	1.520	1.297
1966	0.615	0.686
1967	1.548	1.590
1968	1.010	0.754
1969	1.475	1.026
1970	1.360	1.360
1971	1.530	1.099
1972	0.942	0.533
1973	2.878	1.660
1974	2.076	1.170
1975	1.589	0.705
1976	0.003	0.302
1977	0.002	0.314
1978	3.760	2.795

1979	1.161	0.514
1980	1.615	0.458
1981	1.479	0.779
1982	2.006	2.083
1983	2.902	2.280
1984	1.540	1.445
1985	1.414	0.702
1986	4.274	4.059
1987	1.182	0.834
1988	1.311	1.379
1989	1.867	0.422
1990	1.161	0.614
1991	1.348	1.247
1992	1.759	1.699
1993	1.434	0.934
1994	0.692	0.767
1995	6.065	6.208
1996	3.714	2.386
1997	3.388	3.322
1998	2.542	2.665
1999	0.899	0.324
2000	1.731	1.508
2001	1.156	0.620
2002	1.105	0.653
2003	1.426	1.105
2004	2.020	1.561

Ranked Annual Peaks

Ranked Annual Peaks for Pre-Project and Mitigated. POC #1

Rank	Pre-Project	Mitigated
1	6.0647	6.2080
2	4.2742	4.0591
3	3.7601	3.3217
4	3.7145	2.7952
5	3.3878	2.6645
6	2.9021	2.3858
7	2.8782	2.2797
8	2.5419	2.0834
9	2.0759	1.6993
10	2.0196	1.6605
11	2.0056	1.5901
12	1.8672	1.5612
13	1.7590	1.5085
14	1.7306	1.4453
15	1.6151	1.3792
16	1.5892	1.3599
17	1.5484	1.2967
18	1.5401	1.2471
19	1.5300	1.1697
20	1.5195	1.1052
21	1.4786	1.0991
22	1.4748	1.0264
23	1.4337	0.9344
24	1.4263	0.8344
25	1.4144	0.7788
26	1.3598	0.7673
27	1.3478	0.7543
28	1.3111	0.7046

29	1.1818	0.7019
30	1.1614	0.6858
31	1.1613	0.6527
32	1.1560	0.6201
33	1.1048	0.6143
34	1.0098	0.5328
35	0.9425	0.5144
36	0.8992	0.4576
37	0.6918	0.4223
38	0.6152	0.3235
39	0.0034	0.3135
40	0.0018	0.3017

Duration Flows

The Facility PASSED

Flow(cfs)	Predev	Mit	Percentage	Pass/Fail
0.3692	1534	624	40	Pass
0.4026	1390	555	39	Pass
0.4359	1251	493	39	Pass
0.4693	1132	447	39	Pass
0.5027	1024	411	40	Pass
0.5361	909	380	41	Pass
0.5695	813	352	43	Pass
0.6029	731	325	44	Pass
0.6363	666	297	44	Pass
0.6697	601	267	44	Pass
0.7030	554	247	44	Pass
0.7364	494	229	46	Pass
0.7698	449	209	46	Pass
0.8032	403	188	46	Pass
0.8366	364	178	48	Pass
0.8700	328	163	49	Pass
0.9034	295	145	49	Pass
0.9368	275	134	48	Pass
0.9702	254	125	49	Pass
1.0035	228	114	50	Pass
1.0369	202	108	53	Pass
1.0703	183	100	54	Pass
1.1037	171	91	53	Pass
1.1371	157	80	50	Pass
1.1705	145	71	48	Pass
1.2039	131	66	50	Pass
1.2373	116	62	53	Pass
1.2707	112	55	49	Pass
1.3040	102	51	50	Pass
1.3374	91	48	52	Pass
1.3708	83	44	53	Pass
1.4042	77	37	48	Pass
1.4376	70	37	52	Pass
1.4710	68	35	51	Pass
1.5044	63	35	55	Pass
1.5378	59	31	52	Pass
1.5712	54	30	55	Pass
1.6045	50	27	54	Pass
1.6379	46	25	54	Pass
1.6713	41	22	53	Pass
1.7047	39	20	51	Pass
1.7381	36	17	47	Pass
1.7715	31	17	54	Pass
1.8049	29	15	51	Pass
1.8383	29	14	48	Pass
1.8717	26	13	50	Pass
1.9050	25	13	52	Pass
1.9384	24	13	54	Pass
1.9718	23	12	52	Pass
2.0052	23	12	52	Pass
2.0386	20	12	60	Pass
2.0720	18	12	66	Pass
2.1054	17	11	64	Pass

2.1388	16	11	68	Pass
2.1722	15	11	73	Pass
2.2055	15	11	73	Pass
2.2389	15	11	73	Pass
2.2723	15	11	73	Pass
2.3057	14	10	71	Pass
2.3391	14	10	71	Pass
2.3725	14	10	71	Pass
2.4059	14	9	64	Pass
2.4393	14	9	64	Pass
2.4727	14	9	64	Pass
2.5060	14	9	64	Pass
2.5394	14	9	64	Pass
2.5728	13	9	69	Pass
2.6062	13	9	69	Pass
2.6396	13	9	69	Pass
2.6730	13	8	61	Pass
2.7064	13	8	61	Pass
2.7398	13	8	61	Pass
2.7732	13	8	61	Pass
2.8065	13	7	53	Pass
2.8399	13	7	53	Pass
2.8733	12	7	58	Pass
2.9067	10	7	70	Pass
2.9401	10	7	70	Pass
2.9735	10	7	70	Pass
3.0069	10	7	70	Pass
3.0403	10	7	70	Pass
3.0736	10	7	70	Pass
3.1070	10	7	70	Pass
3.1404	10	7	70	Pass
3.1738	10	7	70	Pass
3.2072	10	7	70	Pass
3.2406	10	7	70	Pass
3.2740	10	7	70	Pass
3.3074	10	7	70	Pass
3.3408	10	6	60	Pass
3.3741	10	6	60	Pass
3.4075	8	6	75	Pass
3.4409	8	6	75	Pass
3.4743	8	6	75	Pass
3.5077	8	6	75	Pass
3.5411	8	6	75	Pass
3.5745	8	6	75	Pass
3.6079	8	6	75	Pass
3.6413	8	6	75	Pass
3.6746	8	5	62	Pass

Water Quality

POC 2

POC #2 was not reported because POC must exist in both scenarios and both scenarios must have been run.

POC 3

POC #3 was not reported because POC must exist in both scenarios and both scenarios must have been run.

Model Default Modifications

Total of 0 changes have been made.

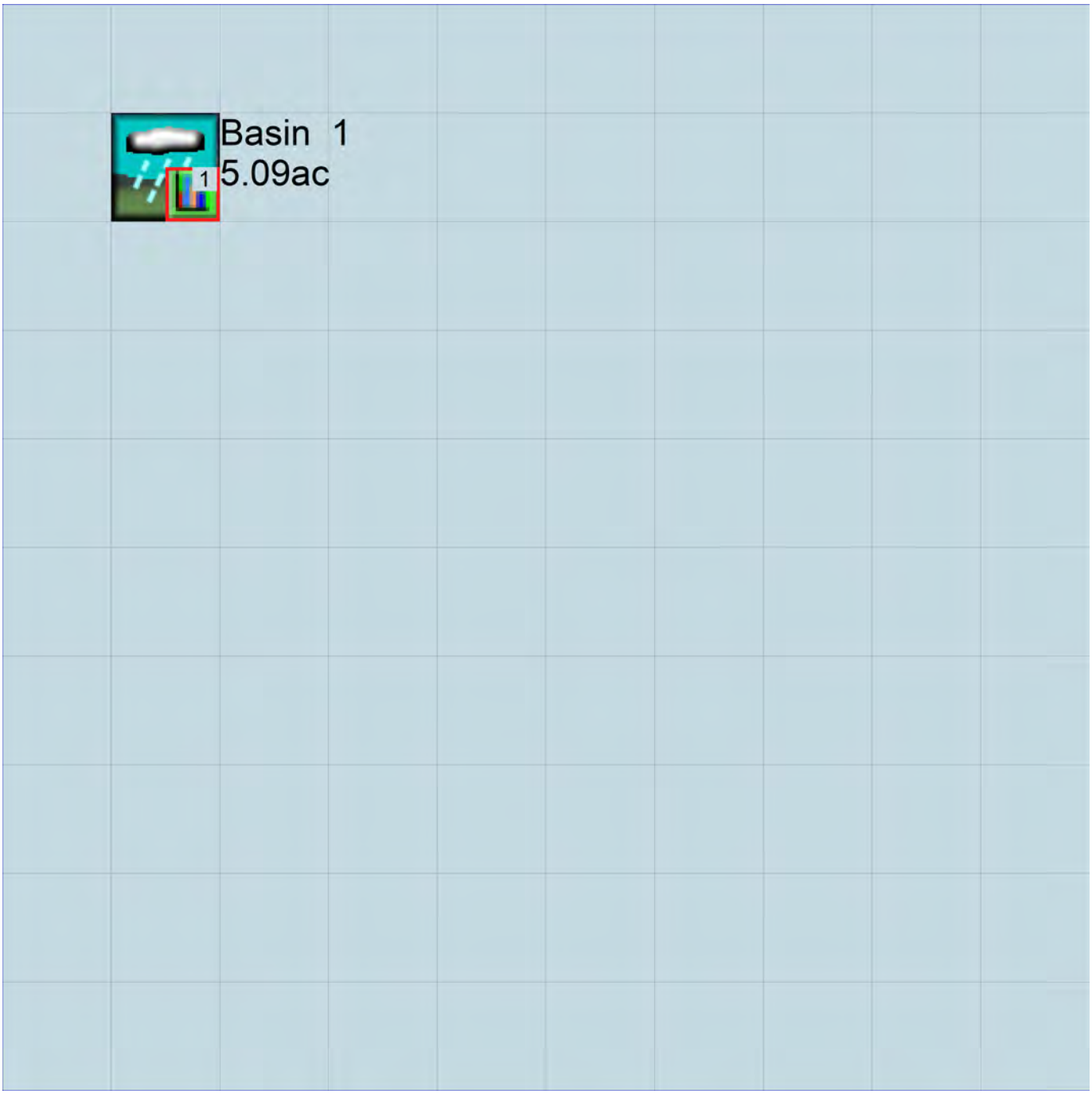
PERLND Changes

No PERLND changes have been made.

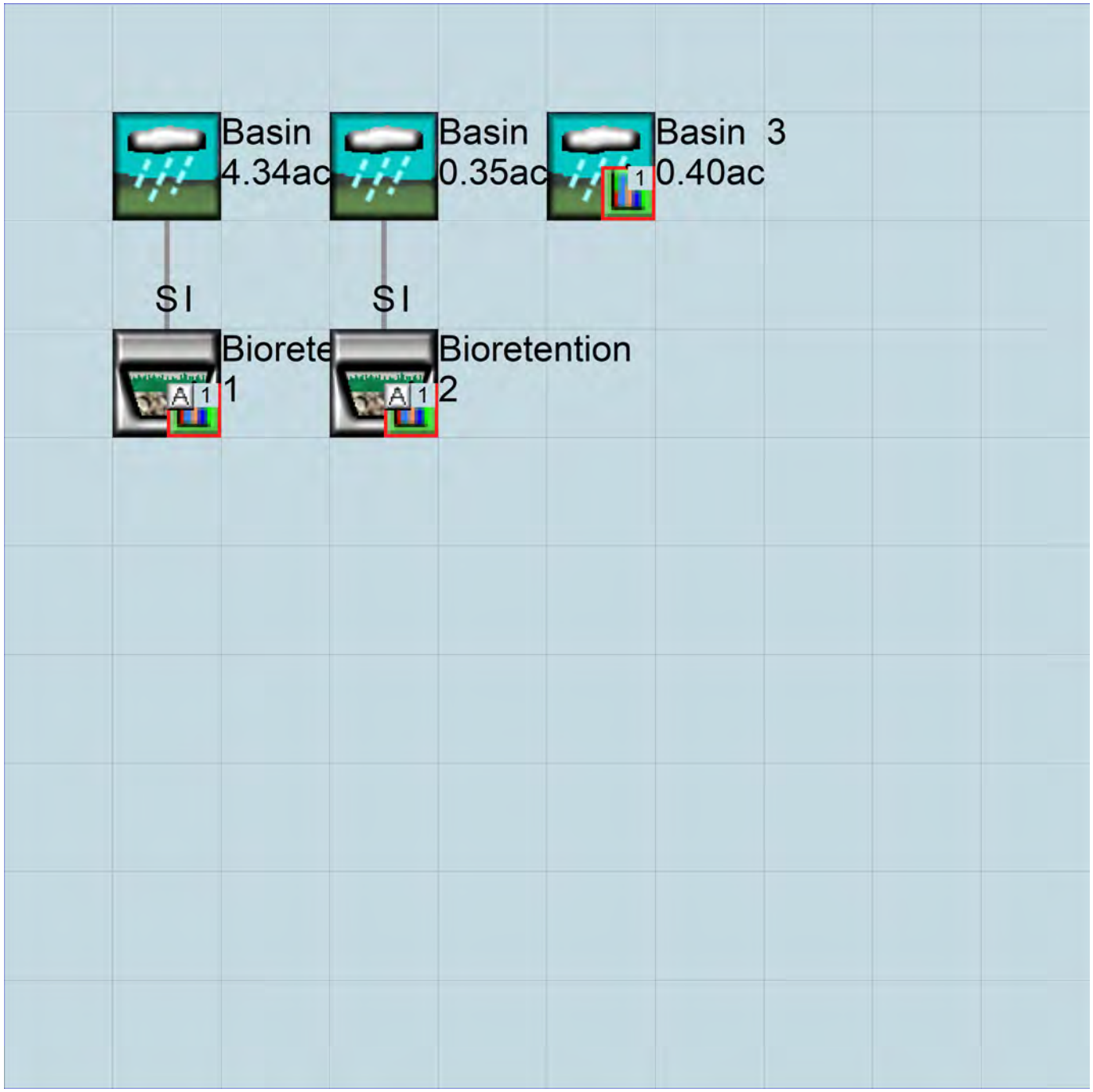
IMPLND Changes

No IMPLND changes have been made.

Appendix
Pre-Project Schematic



Mitigated Schematic



Pre-Project UCI File

```
RUN

GLOBAL
  WWHM4 model simulation
  START       1964 10 01        END    2004 09 30
  RUN INTERP OUTPUT LEVEL    3    0
  RESUME     0 RUN     1                    UNIT SYSTEM     1
END GLOBAL

FILES
<File>  <Un#>   <-----------File Name------------------------------>***
<-ID->                                                              ***
WDM         26   Lot 1 Hydromod.wdm
MESSU       25   PreLot 1 Hydromod.MES
            27   PreLot 1 Hydromod.L61
            28   PreLot 1 Hydromod.L62
            30   POCLot 1 Hydromod1.dat
END FILES

OPN SEQUENCE
    INGRP               INDELT 00:60
      PERLND      52
      COPY       501
      DISPLY       1
    END INGRP
END OPN SEQUENCE
DISPLY
  DISPLY-INFO1
    # -  #<----------Title---------->***TRAN PIVL DIG1 FIL1  PYR DIG2 FIL2 YRND
    1        Basin  1                   MAX                    1    2   30    9
  END DISPLY-INFO1
END DISPLY
COPY
  TIMESERIES
    # -  #  NPT  NMN ***
    1         1    1
  501         1    1
  END TIMESERIES
END COPY
GENER
  OPCODE
    #    # OPCD ***
  END OPCODE
  PARM
    #    #         K ***
  END PARM
END GENER
PERLND
  GEN-INFO
    <PLS ><-------Name------->NBLKS   Unit-systems   Printer ***
    # -  #                         User  t-series Engl Metr ***
                                      in  out           ***
   52     D,Grass,VSteep(>5%)     1    1    1    1   27    0
  END GEN-INFO
  *** Section PWATER***

  ACTIVITY
    <PLS > ************ Active Sections ****************************
    # -  # ATMP SNOW PWAT  SED  PST  PWG PQAL MSTL PEST NITR PHOS TRAC ***
   52         0    0    1    0    0    0    0    0    0    0    0    0
  END ACTIVITY

  PRINT-INFO
    <PLS > ***************** Print-flags **************************** PIVL  PYR
    # -  # ATMP SNOW PWAT  SED  PST  PWG PQAL MSTL PEST NITR PHOS TRAC  *********
   52         0    0    4    0    0    0    0    0    0    0    0    0    1    9
  END PRINT-INFO
```

```
  PWAT-PARM1
    <PLS >  PWATER variable monthly parameter value flags  ***
    # -  # CSNO RTOP UZFG  VCS  VUZ  VNN VIFW VIRC  VLE INFC  HWT ***
   52         0    0    0    1    0    0    0    0    1    0    0
  END PWAT-PARM1

  PWAT-PARM2
    <PLS >      PWATER input info: Part 2         ***
    # -  # ***FOREST      LZSN    INFILT      LSUR     SLSUR     KVARY     AGWRC
   52             0       4.2      0.02       350       0.1         3      0.92
  END PWAT-PARM2

  PWAT-PARM3
    <PLS >      PWATER input info: Part 3         ***
    # -  # ***PETMAX    PETMIN    INFEXP    INFILD    DEEPFR    BASETP    AGWETP
   52            40        35         2         2         0         0      0.05
  END PWAT-PARM3
  PWAT-PARM4
    <PLS >     PWATER input info: Part 4                              ***
    # -  #     CEPSC      UZSN      NSUR     INTFW       IRC     LZETP ***
   52             0      0.25      0.25       0.5       0.4         0
  END PWAT-PARM4
  MON-LZETPARM
    <PLS >      PWATER input info: Part 3         ***
    # -  #  JAN  FEB  MAR  APR  MAY  JUN  JUL  AUG  SEP  OCT  NOV  DEC  ***
   52       0.4  0.4  0.4 0.45  0.5 0.55 0.55 0.55 0.55 0.55 0.45  0.4
  END MON-LZETPARM
  MON-INTERCEP
    <PLS >      PWATER input info: Part 3         ***
    # -  #  JAN  FEB  MAR  APR  MAY  JUN  JUL  AUG  SEP  OCT  NOV  DEC  ***
   52      0.12 0.12 0.12 0.11  0.1  0.1  0.1  0.1  0.1  0.1 0.11 0.12
  END MON-INTERCEP

  PWAT-STATE1
    <PLS > *** Initial conditions at start of simulation
               ran from 1990 to end of 1992 (pat 1-11-95) RUN 21 ***
    # -  # ***  CEPS      SURS       UZS       IFWS       LZS       AGWS      GWVS
   52             0         0      0.15          0         4      0.05         0
  END PWAT-STATE1

END PERLND

IMPLND
  GEN-INFO
    <PLS ><-------Name------->   Unit-systems   Printer ***
    # -  #                     User  t-series Engl Metr ***
                                     in  out           ***
  END GEN-INFO
  *** Section IWATER***

  ACTIVITY
    <PLS > ************ Active Sections ******************************
    # -  # ATMP SNOW IWAT  SLD  IWG IQAL   ***
  END ACTIVITY

  PRINT-INFO
    <ILS > ******** Print-flags ******** PIVL  PYR
    # -  # ATMP SNOW IWAT  SLD  IWG IQAL    *********
  END PRINT-INFO

  IWAT-PARM1
    <PLS >  IWATER variable monthly parameter value flags  ***
    # -  # CSNO RTOP  VRS  VNN RTLI     ***
  END IWAT-PARM1

  IWAT-PARM2
    <PLS >      IWATER input info: Part 2         ***
    # -  # ***  LSUR     SLSUR      NSUR     RETSC
  END IWAT-PARM2
```

```
  IWAT-PARM3
    <PLS >      IWATER input info: Part 3         ***
    # -  # ***PETMAX    PETMIN
  END IWAT-PARM3

  IWAT-STATE1
    <PLS > *** Initial conditions at start of simulation
    # -  # ***  RETS      SURS
  END IWAT-STATE1

END IMPLND

SCHEMATIC
<-Source->                  <--Area-->     <-Target->   MBLK   ***
<Name>   #                  <-factor->     <Name>   #   Tbl#   ***
Basin  1***
PERLND  52                        5.09     COPY   501     12
PERLND  52                        5.09     COPY   501     13

******Routing******
END SCHEMATIC

NETWORK
<-Volume-> <-Grp> <-Member-><--Mult-->Tran <-Target vols> <-Grp> <-Member->  ***
<Name>   #        <Name> # #<-factor->strg <Name>   #   #        <Name> # #  ***
COPY   501 OUTPUT MEAN   1 1   12.1        DISPLY   1     INPUT  TIMSER 1



<-Volume-> <-Grp> <-Member-><--Mult-->Tran <-Target vols> <-Grp> <-Member->  ***
<Name>   #        <Name> # #<-factor->strg <Name>   #   #        <Name> # #  ***
END NETWORK

RCHRES
  GEN-INFO
    RCHRES       Name        Nexits   Unit Systems   Printer                 ***
    # -  #<------------------><---> User T-series  Engl Metr LKFG            ***
                                           in  out                           ***
  END GEN-INFO
  *** Section RCHRES***

  ACTIVITY
    <PLS > ************* Active Sections *****************************
    # -  # HYFG ADFG CNFG HTFG SDFG GQFG OXFG NUFG PKFG PHFG ***
  END ACTIVITY

  PRINT-INFO
    <PLS > ***************** Print-flags ******************* PIVL  PYR
    # -  # HYDR ADCA CONS HEAT  SED  GQL OXRX NUTR PLNK PHCB PIVL  PYR  *********
  END PRINT-INFO

  HYDR-PARM1
    RCHRES  Flags for each HYDR Section                                      ***
    # -  #  VC A1 A2 A3  ODFVFG for each *** ODGTFG for each     FUNCT  for each
            FG FG FG FG  possible  exit  *** possible  exit      possible  exit
             *  *  *  *    *  *  *  *  *       *  *  *  *  *         ***
  END HYDR-PARM1

  HYDR-PARM2
    # -  #    FTABNO       LEN     DELTH     STCOR        KS      DB50       ***
  <------><--------><--------><--------><--------><--------><-------->       ***
  END HYDR-PARM2
  HYDR-INIT
    RCHRES  Initial conditions for each HYDR section                         ***
    # -  # ***   VOL     Initial  value  of COLIND     Initial  value  of OUTDGT
          *** ac-ft     for each possible exit        for each possible exit
  <------><-------->     <---><---><---><---><---> *** <---><---><---><---><--->
  END HYDR-INIT
END RCHRES
```

```
SPEC-ACTIONS
END SPEC-ACTIONS
FTABLES
END FTABLES

EXT SOURCES
<-Volume-> <Member> SsysSgap<--Mult-->Tran <-Target vols> <-Grp> <-Member->  ***
<Name>   # <Name> # tem strg<-factor->strg <Name>   #   #        <Name> # #  ***
WDM      2 PREC     ENGL    1.091          PERLND   1 999 EXTNL  PREC
WDM      2 PREC     ENGL    1.091          IMPLND   1 999 EXTNL  PREC
WDM      1 EVAP     ENGL    0.85           PERLND   1 999 EXTNL  PETINP
WDM      1 EVAP     ENGL    0.85           IMPLND   1 999 EXTNL  PETINP

END EXT SOURCES

EXT TARGETS
<-Volume-> <-Grp> <-Member-><--Mult-->Tran <-Volume-> <Member> Tsys Tgap Amd ***
<Name>   #        <Name> # #<-factor->strg <Name>   # <Name>    tem strg strg***
COPY   501 OUTPUT MEAN   1 1     12.1      WDM    501 FLOW     ENGL      REPL
END EXT TARGETS

MASS-LINK
<Volume>   <-Grp> <-Member-><--Mult-->     <Target>       <-Grp> <-Member->***
<Name>            <Name> # #<-factor->     <Name>                <Name> # #***
  MASS-LINK       12
PERLND     PWATER SURO       0.083333      COPY           INPUT  MEAN
  END MASS-LINK   12

  MASS-LINK       13
PERLND     PWATER IFWO       0.083333      COPY           INPUT  MEAN
  END MASS-LINK   13


END MASS-LINK

END RUN
```

Mitigated UCI File

```
RUN

GLOBAL
  WWHM4 model simulation
  START       1964 10 01        END    2004 09 30
  RUN INTERP OUTPUT LEVEL    3    0
  RESUME     0 RUN     1                    UNIT SYSTEM     1
END GLOBAL

FILES
<File>  <Un#>   <-----------File Name------------------------------>***
<-ID->                                                              ***
WDM         26   Lot 1 Hydromod.wdm
MESSU       25   MitLot 1 Hydromod.MES
            27   MitLot 1 Hydromod.L61
            28   MitLot 1 Hydromod.L62
            30   POCLot 1 Hydromod1.dat
END FILES

OPN SEQUENCE
    INGRP               INDELT 00:60
      PERLND      52
      IMPLND       2
      GENER        2
      RCHRES       1
      RCHRES       2
      GENER        4
      RCHRES       3
      RCHRES       4
      COPY         1
      COPY       501
      COPY       601
      DISPLY       1
    END INGRP
END OPN SEQUENCE
DISPLY
  DISPLY-INFO1
    # -  #<----------Title---------->***TRAN PIVL DIG1 FIL1  PYR DIG2 FIL2 YRND
    1        Surface retention  1        MAX                    1    2   30    9
  END DISPLY-INFO1
END DISPLY
COPY
  TIMESERIES
    # -  #  NPT  NMN ***
    1         1    1
  501         1    1
  601         1    1
  END TIMESERIES
END COPY
GENER
  OPCODE
    #    # OPCD ***
    2        24
    4        24
  END OPCODE
  PARM
    #    #         K ***
    2             0.
    4             0.
  END PARM
END GENER
PERLND
  GEN-INFO
    <PLS ><-------Name------->NBLKS   Unit-systems   Printer ***
    # -  #                          User  t-series Engl Metr ***
                                          in  out           ***
   52     D,Grass,VSteep(>5%)     1    1    1    1   27    0
  END GEN-INFO
```

```
  *** Section PWATER***

  ACTIVITY
    <PLS > ************ Active Sections ****************************
    # -  # ATMP SNOW PWAT  SED  PST  PWG PQAL MSTL PEST NITR PHOS TRAC ***
   52         0    0    1    0    0    0    0    0    0    0    0
  END ACTIVITY

  PRINT-INFO
    <PLS > ***************** Print-flags **************************** PIVL  PYR
    # -  # ATMP SNOW PWAT  SED  PST  PWG PQAL MSTL PEST NITR PHOS TRAC  *********
   52         0    0    4    0    0    0    0    0    0    0    0    0    1    9
  END PRINT-INFO

  PWAT-PARM1
    <PLS >  PWATER variable monthly parameter value flags  ***
    # -  # CSNO RTOP UZFG  VCS  VUZ  VNN VIFW VIRC  VLE INFC  HWT ***
   52         0    0    0    1    0    0    0    0    1    0    0
  END PWAT-PARM1

  PWAT-PARM2
    <PLS >      PWATER input info: Part 2          ***
    # -  # ***FOREST      LZSN    INFILT      LSUR     SLSUR     KVARY     AGWRC
   52              0       4.2      0.02       350       0.1         3      0.92
  END PWAT-PARM2

  PWAT-PARM3
    <PLS >      PWATER input info: Part 3          ***
    # -  # ***PETMAX    PETMIN    INFEXP    INFILD    DEEPFR    BASETP    AGWETP
   52             40        35         2         2         0         0      0.05
  END PWAT-PARM3
  PWAT-PARM4
    <PLS >     PWATER input info: Part 4                              ***
    # -  #     CEPSC      UZSN      NSUR     INTFW       IRC     LZETP ***
   52              0      0.25      0.25       0.5       0.4         0
  END PWAT-PARM4
  MON-LZETPARM
    <PLS >      PWATER input info: Part 3          ***
    # -  #  JAN  FEB  MAR  APR  MAY  JUN  JUL  AUG  SEP  OCT  NOV  DEC  ***
   52       0.4  0.4  0.4 0.45  0.5 0.55 0.55 0.55 0.55 0.55 0.45  0.4
  END MON-LZETPARM
  MON-INTERCEP
    <PLS >      PWATER input info: Part 3          ***
    # -  #  JAN  FEB  MAR  APR  MAY  JUN  JUL  AUG  SEP  OCT  NOV  DEC  ***
   52      0.12 0.12 0.12 0.11  0.1  0.1  0.1  0.1  0.1  0.1 0.11 0.12
  END MON-INTERCEP

  PWAT-STATE1
    <PLS > *** Initial conditions at start of simulation
               ran from 1990 to end of 1992 (pat 1-11-95) RUN 21 ***
    # -  # ***  CEPS      SURS       UZS      IFWS       LZS      AGWS      GWVS
   52              0         0      0.15         0         4      0.05         0
  END PWAT-STATE1

END PERLND

IMPLND
  GEN-INFO
    <PLS ><-------Name------->   Unit-systems   Printer ***
    # -  #                     User  t-series Engl Metr ***
                                  in  out           ***
    2     Imperv,Mod (1-2%)       1    1    1   27    0
  END GEN-INFO
  *** Section IWATER***

  ACTIVITY
    <PLS > ************ Active Sections ****************************
    # -  # ATMP SNOW IWAT  SLD  IWG IQAL   ***
    2         0    0    1    0    0    0
  END ACTIVITY
```

```
  PRINT-INFO
    <ILS > ******** Print-flags ******** PIVL  PYR
    # -  # ATMP SNOW IWAT  SLD  IWG IQAL    *********
    2         0    0    4    0    0    0    1    9
  END PRINT-INFO

  IWAT-PARM1
    <PLS >  IWATER variable monthly parameter value flags  ***
    # -  # CSNO RTOP  VRS  VNN RTLI     ***
    2         0    0    0    0    0
  END IWAT-PARM1

  IWAT-PARM2
    <PLS >      IWATER input info: Part 2         ***
    # -  # ***  LSUR     SLSUR      NSUR     RETSC
    2            100      0.02      0.05       0.1
  END IWAT-PARM2

  IWAT-PARM3
    <PLS >      IWATER input info: Part 3         ***
    # -  # ***PETMAX    PETMIN
    2              0         0
  END IWAT-PARM3

  IWAT-STATE1
    <PLS > *** Initial conditions at start of simulation
    # -  # ***  RETS      SURS
    2              0         0
  END IWAT-STATE1

END IMPLND

SCHEMATIC
<-Source->                <--Area-->     <-Target->   MBLK   ***
<Name>   #                <-factor->     <Name>   #   Tbl#   ***
Basin  1***
PERLND  52                       1.6     RCHRES   1      2
PERLND  52                       1.6     RCHRES   1      3
IMPLND   2                      2.74     RCHRES   1      5
Basin  2***
PERLND  52                      0.13     RCHRES   3      2
PERLND  52                      0.13     RCHRES   3      3
IMPLND   2                      0.22     RCHRES   3      5
Basin  3***
PERLND  52                      0.15     COPY   501     12
PERLND  52                      0.15     COPY   601     12
PERLND  52                      0.15     COPY   501     13
PERLND  52                      0.15     COPY   601     13
IMPLND   2                      0.25     COPY   501     15
IMPLND   2                      0.25     COPY   601     15

******Routing******
PERLND  52                       1.6     COPY     1     12
IMPLND   2                      2.74     COPY     1     15
PERLND  52                       1.6     COPY     1     13
PERLND  52                      0.13     COPY     1     12
IMPLND   2                      0.22     COPY     1     15
PERLND  52                      0.13     COPY     1     13
RCHRES   1                         1     RCHRES   2      8
RCHRES   3                         1     RCHRES   4      8
RCHRES   2                         1     COPY   501     16
RCHRES   1                         1     COPY   501     17
RCHRES   4                         1     COPY   501     16
RCHRES   3                         1     COPY   501     17
END SCHEMATIC

NETWORK
<-Volume-> <-Grp> <-Member-><--Mult-->Tran <-Target vols> <-Grp> <-Member->  ***
<Name>   #        <Name> # #<-factor->strg <Name>   #   #        <Name> # #  ***
```

```
COPY   501 OUTPUT MEAN   1 1   12.1        DISPLY   1     INPUT  TIMSER 1
GENER    2 OUTPUT TIMSER      .0002778     RCHRES   1     EXTNL  OUTDGT 1
GENER    4 OUTPUT TIMSER      .0002778     RCHRES   3     EXTNL  OUTDGT 1


<-Volume-> <-Grp> <-Member-><--Mult-->Tran <-Target vols> <-Grp> <-Member->  ***
<Name>   #        <Name> # #<-factor->strg <Name>   #   #        <Name> # #  ***
END NETWORK

RCHRES
  GEN-INFO
    RCHRES       Name        Nexits   Unit Systems   Printer                ***
    # -  #<-----------------><---> User T-series  Engl Metr LKFG             ***
                                        in  out                              ***
    1     Surface retentio-013    2    1    1    1   28    0    1
    2     Bioretention  1         1    1    1    1   28    0    1
    3     Surface retentio-017    2    1    1    1   28    0    1
    4     Bioretention  2         1    1    1    1   28    0    1
  END GEN-INFO
  *** Section RCHRES***

  ACTIVITY
    <PLS > ************ Active Sections ******************************
    # -  # HYFG ADFG CNFG HTFG SDFG GQFG OXFG NUFG PKFG PHFG ***
    1         1    0    0    0    0    0    0    0    0    0
    2         1    0    0    0    0    0    0    0    0    0
    3         1    0    0    0    0    0    0    0    0    0
    4         1    0    0    0    0    0    0    0    0    0
  END ACTIVITY

  PRINT-INFO
    <PLS > ***************** Print-flags ******************* PIVL  PYR
    # -  # HYDR ADCA CONS HEAT  SED  GQL OXRX NUTR PLNK PHCB PIVL  PYR  *********
    1         4    0    0    0    0    0    0    0    0    0    1    9
    2         4    0    0    0    0    0    0    0    0    0    1    9
    3         4    0    0    0    0    0    0    0    0    0    1    9
    4         4    0    0    0    0    0    0    0    0    0    1    9
  END PRINT-INFO

  HYDR-PARM1
    RCHRES  Flags for each HYDR Section                                  ***
    # -  #  VC A1 A2 A3  ODFVFG for each *** ODGTFG for each     FUNCT  for each
          FG FG FG FG  possible  exit  *** possible  exit      possible  exit
           *  *  *  *    *  *  *  *  *       *  *  *  *  *        ***
    1      0  1  0  0    4  5  0  0  0       0  1  0  0  0        2  1  2  2  2
    2      0  1  0  0    4  0  0  0  0       0  0  0  0  0        2  2  2  2  2
    3      0  1  0  0    4  5  0  0  0       0  1  0  0  0        2  1  2  2  2
    4      0  1  0  0    4  0  0  0  0       0  0  0  0  0        2  2  2  2  2
  END HYDR-PARM1

  HYDR-PARM2
    # -  #    FTABNO       LEN      DELTH     STCOR      KS       DB50       ***
  <------><--------><--------><--------><--------><--------><--------><------***
    1              1      0.01       0.0       0.0       0.0       0.0
    2              2      0.01       0.0       0.0       0.0       0.0
    3              3      0.01       0.0       0.0       0.0       0.0
    4              4      0.01       0.0       0.0       0.0       0.0
  END HYDR-PARM2
  HYDR-INIT
    RCHRES  Initial conditions for each HYDR section                     ***
    # -  # ***   VOL     Initial  value  of COLIND     Initial  value  of OUTDGT
         *** ac-ft     for each possible exit        for each possible exit
  <------><-------->     <---><---><---><---><---> *** <---><---><---><---><--->
    1           0         4.0  5.0  0.0  0.0  0.0       0.0  0.0  0.0  0.0  0.0
    2           0         4.0  0.0  0.0  0.0  0.0       0.0  0.0  0.0  0.0  0.0
    3           0         4.0  5.0  0.0  0.0  0.0       0.0  0.0  0.0  0.0  0.0
    4           0         4.0  0.0  0.0  0.0  0.0       0.0  0.0  0.0  0.0  0.0
  END HYDR-INIT
END RCHRES
```

```
SPEC-ACTIONS
*** User-Defined Variable Quantity Lines
***                          addr
***                         <------>
*** kwd  varnam optyp  opn  vari  s1 s2 s3 tp multiply  lc ls ac as agfn ***
  <****> <----> <----> <-> <----><-><-><-><-><--------> <><-> <><-> <--> ***
  UVQUAN vol2   RCHRES   2 VOL              4
  UVQUAN v2m2   GLOBAL     WORKSP  1        3
  UVQUAN vpo2   GLOBAL     WORKSP  2        3
  UVQUAN v2d2   GENER    2 K       1        3
*** User-Defined Variable Quantity Lines
***                          addr
***                         <------>
*** kwd  varnam optyp  opn  vari  s1 s2 s3 tp multiply  lc ls ac as agfn ***
  <****> <----> <----> <-> <----><-><-><-><-><--------> <><-> <><-> <--> ***
  UVQUAN vol4   RCHRES   4 VOL              4
  UVQUAN v2m4   GLOBAL     WORKSP  3        3
  UVQUAN vpo4   GLOBAL     WORKSP  4        3
  UVQUAN v2d4   GENER    4 K       1        3
*** User-Defined Target Variable Names
***                   addr or                        addr or
***                  <------>                       <------>
*** kwd   varnam ct  vari  s1 s2 s3  frac oper     vari  s1 s2 s3  frac oper
  <****>  <----><-> <----><-><-><-> <---> <-->    <----><-><-><-> <---> <-->
  UVNAME  v2m2    1 WORKSP  1          1.0 QUAN
  UVNAME  vpo2    1 WORKSP  2          1.0 QUAN
  UVNAME  v2d2    1 K       1          1.0 QUAN
*** User-Defined Target Variable Names
***                   addr or                        addr or
***                  <------>                       <------>
*** kwd   varnam ct  vari  s1 s2 s3  frac oper     vari  s1 s2 s3  frac oper
  <****>  <----><-> <----><-><-><-> <---> <-->    <----><-><-><-> <---> <-->
  UVNAME  v2m4    1 WORKSP  3          1.0 QUAN
  UVNAME  vpo4    1 WORKSP  4          1.0 QUAN
  UVNAME  v2d4    1 K       1          1.0 QUAN
*** opt foplop dcdts  yr mo dy hr mn d t   vnam  s1 s2 s3 ac quantity  tc  ts rp
  <****><-><--><><-><--> <> <> <> <><><>  <----><-><-><-><-><--------> <> <-><->
  GENER   2                               v2m2            =  8469.41
*** Compute remaining available pore space
  GENER   2                               vpo2            =  v2m2
  GENER   2                               vpo2           -=  vol2
*** Check to see if VPORA goes negative; if so set VPORA = 0.0
IF (vpo2 < 0.0) THEN
  GENER   2                               vpo2            =  0.0
END IF
*** Infiltration volume
  GENER   2                               v2d2            =  vpo2
*** opt foplop dcdts  yr mo dy hr mn d t   vnam  s1 s2 s3 ac quantity  tc  ts rp
  <****><-><--><><-><--> <> <> <> <><><>  <----><-><-><-><-><--------> <> <-><->
  GENER   4                               v2m4            =  1169.73
*** Compute remaining available pore space
  GENER   4                               vpo4            =  v2m4
  GENER   4                               vpo4           -=  vol4
*** Check to see if VPORA goes negative; if so set VPORA = 0.0
IF (vpo4 < 0.0) THEN
  GENER   4                               vpo4            =  0.0
END IF
*** Infiltration volume
  GENER   4                               v2d4            =  vpo4
END SPEC-ACTIONS
FTABLES
  FTABLE      2
   49    4
     Depth      Area    Volume  Outflow1 Velocity  Travel Time***
      (ft)   (acres) (acre-ft)   (cfs)   (ft/sec)    (Minutes)***
  0.000000  0.174600  0.000000  0.000000
  0.057692  0.173677  0.002675  0.000000
  0.115385  0.172298  0.005376  0.000000
  0.173077  0.170924  0.008104  0.000000
```

```
0.230769  0.169555  0.010858  0.000000
0.288462  0.168192  0.013639  0.000000
0.346154  0.166834  0.016446  0.000000
0.403846  0.165482  0.019280  0.000000
0.461538  0.164136  0.022141  0.000000
0.519231  0.162794  0.025159  0.000000
0.576923  0.161459  0.028205  0.000000
0.634615  0.160129  0.031280  0.000000
0.692308  0.158804  0.034383  0.000000
0.750000  0.157485  0.037515  0.000000
0.807692  0.156171  0.040676  0.000000
0.865385  0.154863  0.043866  0.000000
0.923077  0.153561  0.047085  0.000000
0.980769  0.152264  0.050334  0.000000
1.038462  0.150972  0.053612  0.000000
1.096154  0.149686  0.056920  0.000000
1.153846  0.148405  0.060258  0.000000
1.211538  0.147130  0.063625  0.000000
1.269231  0.145861  0.067023  0.000000
1.326923  0.144596  0.070451  0.000000
1.384615  0.143338  0.073909  0.000000
1.442308  0.142085  0.077397  0.000000
1.500000  0.140837  0.080916  0.000000
1.557692  0.139595  0.084466  0.000000
1.615385  0.138358  0.088046  0.000000
1.673077  0.137127  0.091658  0.000000
1.730769  0.135902  0.095300  0.000000
1.788462  0.134682  0.098974  0.000000
1.846154  0.133467  0.102679  0.000000
1.903846  0.132258  0.106416  0.000000
1.961538  0.131054  0.110184  0.000000
2.019231  0.129856  0.113939  0.000000
2.076923  0.128664  0.117725  0.000000
2.134615  0.127477  0.121543  0.000000
2.192308  0.126295  0.125393  0.000000
2.250000  0.125119  0.129275  0.000000
2.307692  0.123949  0.133189  0.000000
2.365385  0.122783  0.137135  0.000000
2.423077  0.121624  0.141113  0.000000
2.480769  0.120470  0.145123  0.000000
2.538462  0.119321  0.149167  0.011061
2.596154  0.118178  0.153243  0.037177
2.653846  0.117041  0.157351  0.062013
2.711538  0.115909  0.161493  0.083780
2.750000  0.114782  0.194431  0.364916
END FTABLE  2
FTABLE      1
 45    5
    Depth      Area    Volume  Outflow1  Outflow2  Velocity  Travel Time***
     (ft)   (acres) (acre-ft)   (cfs)     (cfs)   (ft/sec)    (Minutes)***
0.000000  0.114782  0.000000  0.000000  0.000000
0.057692  0.175989  0.010113  0.000000  0.272487
0.115385  0.177383  0.020307  0.000000  0.335369
0.173077  0.178783  0.030581  0.000000  0.366809
0.230769  0.180188  0.040936  0.000000  0.398250
0.288462  0.181599  0.051372  0.000000  0.429691
0.346154  0.183015  0.061889  0.000000  0.461132
0.403846  0.184437  0.072489  0.000000  0.492573
0.461538  0.185865  0.083171  0.000000  0.524013
0.519231  0.187297  0.093935  0.000000  0.555454
0.576923  0.188736  0.104782  0.000000  0.586895
0.634615  0.190180  0.115712  0.000000  0.618336
0.692308  0.191629  0.126726  0.000000  0.649777
0.750000  0.193084  0.137824  0.000000  0.681217
0.807692  0.194544  0.149005  0.000000  0.712658
0.865385  0.196010  0.160271  0.000000  0.744099
0.923077  0.197481  0.171622  0.000000  0.775540
0.980769  0.198958  0.183058  0.000000  0.806981
1.038462  0.200440  0.194579  0.160076  0.838421
1.096154  0.201928  0.206186  0.632006  0.869862
```

```
1.153846  0.203421  0.217878  1.276591  0.901303
1.211538  0.204920  0.229657  2.050250  0.932744
1.269231  0.206425  0.241523  2.923656  0.964185
1.326923  0.207934  0.253476  3.870589  0.995625
1.384615  0.209450  0.265516  4.864869  1.027066
1.442308  0.210971  0.277643  5.879618  1.058507
1.500000  0.212497  0.289859  6.887532  1.089948
1.557692  0.214029  0.302162  7.861727  1.121389
1.615385  0.215566  0.314554  8.776979  1.152829
1.673077  0.217109  0.327035  9.611245  1.184270
1.730769  0.218657  0.339606  10.34743  1.215711
1.788462  0.220211  0.352265  10.97533  1.247152
1.846154  0.221770  0.365015  11.49381  1.278593
1.903846  0.223335  0.377854  11.91307  1.310034
1.961538  0.224906  0.390784  12.25714  1.341474
2.019231  0.226481  0.403805  12.71908  1.372915
2.076923  0.228063  0.416917  13.07410  1.404356
2.134615  0.229650  0.430120  13.41973  1.435797
2.192308  0.231242  0.443415  13.75668  1.467238
2.250000  0.232840  0.456802  14.08557  1.498678
2.307692  0.234443  0.470281  14.40696  1.530119
2.365385  0.236052  0.483853  14.72133  1.561560
2.423077  0.237666  0.497518  15.02913  1.593001
2.480769  0.239286  0.511277  15.33074  1.624442
2.500000  0.239827  0.515883  15.62654  1.634922
END FTABLE  1
FTABLE      4
 49    4
   Depth      Area    Volume  Outflow1 Velocity  Travel Time***
    (ft)   (acres) (acre-ft)   (cfs)   (ft/sec)    (Minutes)***
0.000000  0.030484  0.000000  0.000000
0.057692  0.030099  0.000215  0.000000
0.115385  0.029526  0.000438  0.000000
0.173077  0.028959  0.000669  0.000000
0.230769  0.028397  0.000907  0.000000
0.288462  0.027841  0.001153  0.000000
0.346154  0.027290  0.001407  0.000000
0.403846  0.026745  0.001669  0.000000
0.461538  0.026205  0.001940  0.000000
0.519231  0.025671  0.002231  0.000000
0.576923  0.025142  0.002531  0.000000
0.634615  0.024619  0.002840  0.000000
0.692308  0.024101  0.003159  0.000000
0.750000  0.023589  0.003486  0.000000
0.807692  0.023083  0.003823  0.000000
0.865385  0.022581  0.004170  0.000000
0.923077  0.022086  0.004526  0.000000
0.980769  0.021595  0.004892  0.000000
1.038462  0.021111  0.005268  0.000000
1.096154  0.020632  0.005654  0.000000
1.153846  0.020158  0.006050  0.000000
1.211538  0.019690  0.006457  0.000000
1.269231  0.019227  0.006874  0.000000
1.326923  0.018770  0.007302  0.000000
1.384615  0.018318  0.007740  0.000000
1.442308  0.017872  0.008190  0.000000
1.500000  0.017431  0.008650  0.000000
1.557692  0.016996  0.009121  0.000000
1.615385  0.016566  0.009604  0.000000
1.673077  0.016142  0.010098  0.000000
1.730769  0.015723  0.010604  0.000000
1.788462  0.015310  0.011121  0.000000
1.846154  0.014902  0.011651  0.000000
1.903846  0.014500  0.012192  0.000000
1.961538  0.014104  0.012745  0.000000
2.019231  0.013712  0.013304  0.000000
2.076923  0.013327  0.013875  0.000000
2.134615  0.012947  0.014458  0.000000
2.192308  0.012572  0.015054  0.000000
2.250000  0.012203  0.015662  0.000000
```

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  2.307692  0.011839  0.016283  0.000000
  2.365385  0.011481  0.016917  0.000000
  2.423077  0.011128  0.017564  0.000000
  2.480769  0.010781  0.018224  0.000000
  2.538462  0.010439  0.018897  0.011061
  2.596154  0.010103  0.019584  0.037177
  2.653846  0.009773  0.020284  0.065006
  2.711538  0.009447  0.020997  0.065006
  2.750000  0.009128  0.026853  0.065006
  END FTABLE  4
  FTABLE      3
   45    5
     Depth      Area    Volume  Outflow1  Outflow2  Velocity  Travel Time***
      (ft)   (acres) (acre-ft)   (cfs)     (cfs)   (ft/sec)    (Minutes)***
  0.000000  0.009128  0.000000  0.000000  0.000000
  0.057692  0.031066  0.001775  0.000000  0.021669
  0.115385  0.031653  0.003585  0.000000  0.026669
  0.173077  0.032246  0.005428  0.000000  0.029170
  0.230769  0.032844  0.007306  0.000000  0.031670
  0.288462  0.033448  0.009218  0.000000  0.034170
  0.346154  0.034058  0.011165  0.000000  0.036670
  0.403846  0.034673  0.013148  0.000000  0.039170
  0.461538  0.035293  0.015166  0.000000  0.041671
  0.519231  0.035919  0.017220  0.000000  0.044171
  0.576923  0.036550  0.019311  0.000000  0.046671
  0.634615  0.037187  0.021438  0.000000  0.049171
  0.692308  0.037830  0.023602  0.000000  0.051672
  0.750000  0.038478  0.025803  0.000000  0.054172
  0.807692  0.039131  0.028041  0.000000  0.056672
  0.865385  0.039790  0.030318  0.000000  0.059172
  0.923077  0.040454  0.032633  0.000000  0.061673
  0.980769  0.041124  0.034986  0.000000  0.064173
  1.038462  0.041800  0.037378  0.160076  0.066673
  1.096154  0.042481  0.039809  0.632006  0.069173
  1.153846  0.043167  0.042280  1.276591  0.071674
  1.211538  0.043859  0.044790  2.050250  0.074174
  1.269231  0.044556  0.047341  2.923656  0.076674
  1.326923  0.045259  0.049931  3.870589  0.079174
  1.384615  0.045968  0.052563  4.864869  0.081675
  1.442308  0.046682  0.055236  5.879618  0.084175
  1.500000  0.047401  0.057950  6.887532  0.086675
  1.557692  0.048126  0.060705  7.861727  0.089175
  1.615385  0.048857  0.063503  8.776979  0.091676
  1.673077  0.049592  0.066343  9.611245  0.094176
  1.730769  0.050334  0.069225  10.34743  0.096676
  1.788462  0.051081  0.072150  10.97533  0.099176
  1.846154  0.051833  0.075119  11.49381  0.101677
  1.903846  0.052591  0.078131  11.91307  0.104177
  1.961538  0.053355  0.081188  12.25714  0.106677
  2.019231  0.054124  0.084288  12.71908  0.109177
  2.076923  0.054898  0.087433  13.07410  0.111678
  2.134615  0.055678  0.090622  13.41973  0.114178
  2.192308  0.056463  0.093857  13.75668  0.116678
  2.250000  0.057254  0.097138  14.08557  0.119178
  2.307692  0.058051  0.100464  14.40696  0.121679
  2.365385  0.058853  0.103836  14.72133  0.124179
  2.423077  0.059660  0.107255  15.02913  0.126679
  2.480769  0.060473  0.110720  15.33074  0.129179
  2.500000  0.060745  0.111886  15.62654  0.130013
  END FTABLE  3
END FTABLES

EXT SOURCES
<-Volume-> <Member> SsysSgap<--Mult-->Tran <-Target vols> <-Grp> <-Member->  ***
<Name>   # <Name> # tem strg<-factor->strg <Name>   #   #        <Name> # #  ***
WDM      2 PREC     ENGL    1.091          PERLND   1 999 EXTNL  PREC
WDM      2 PREC     ENGL    1.091          IMPLND   1 999 EXTNL  PREC
WDM      1 EVAP     ENGL    0.85           PERLND   1 999 EXTNL  PETINP
WDM      1 EVAP     ENGL    0.85           IMPLND   1 999 EXTNL  PETINP
WDM      2 PREC     ENGL    1.091          RCHRES   1     EXTNL  PREC
```

```
WDM      2 PREC     ENGL    1.091          RCHRES   3     EXTNL  PREC
WDM      1 EVAP     ENGL    0.5            RCHRES   1     EXTNL  POTEV
WDM      1 EVAP     ENGL    0.595          RCHRES   2     EXTNL  POTEV
WDM      1 EVAP     ENGL    0.5            RCHRES   3     EXTNL  POTEV
WDM      1 EVAP     ENGL    0.595          RCHRES   4     EXTNL  POTEV

END EXT SOURCES

EXT TARGETS
<-Volume-> <-Grp> <-Member-><--Mult-->Tran <-Volume-> <Member> Tsys Tgap Amd ***
<Name>   #        <Name> # #<-factor->strg <Name>   # <Name>    tem strg strg***
COPY     1 OUTPUT MEAN   1 1     12.1      WDM    701 FLOW     ENGL       REPL
COPY   501 OUTPUT MEAN   1 1     12.1      WDM    801 FLOW     ENGL       REPL
COPY   601 OUTPUT MEAN   1 1     12.1      WDM    901 FLOW     ENGL       REPL
RCHRES   2 HYDR   RO     1 1        1      WDM   1000 FLOW     ENGL       REPL
RCHRES   2 HYDR   STAGE  1 1        1      WDM   1001 STAG     ENGL       REPL
RCHRES   1 HYDR   STAGE  1 1        1      WDM   1002 STAG     ENGL       REPL
RCHRES   1 HYDR   O      1 1        1      WDM   1003 FLOW     ENGL       REPL
RCHRES   4 HYDR   RO     1 1        1      WDM   1004 FLOW     ENGL       REPL
RCHRES   4 HYDR   STAGE  1 1        1      WDM   1005 STAG     ENGL       REPL
RCHRES   3 HYDR   STAGE  1 1        1      WDM   1006 STAG     ENGL       REPL
RCHRES   3 HYDR   O      1 1        1      WDM   1007 FLOW     ENGL       REPL
END EXT TARGETS

MASS-LINK
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PERLND     PWATER SURO       0.083333      RCHRES         INFLOW IVOL
  END MASS-LINK     2

  MASS-LINK         3
PERLND     PWATER IFWO       0.083333      RCHRES         INFLOW IVOL
  END MASS-LINK     3

  MASS-LINK         5
IMPLND     IWATER SURO       0.083333      RCHRES         INFLOW IVOL
  END MASS-LINK     5

  MASS-LINK         8
RCHRES     OFLOW  OVOL   2                 RCHRES         INFLOW IVOL
  END MASS-LINK     8

  MASS-LINK        12
PERLND     PWATER SURO       0.083333      COPY           INPUT  MEAN
  END MASS-LINK    12

  MASS-LINK        13
PERLND     PWATER IFWO       0.083333      COPY           INPUT  MEAN
  END MASS-LINK    13

  MASS-LINK        15
IMPLND     IWATER SURO       0.083333      COPY           INPUT  MEAN
  END MASS-LINK    15

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RCHRES     ROFLOW                          COPY           INPUT  MEAN
  END MASS-LINK    16

  MASS-LINK        17
RCHRES     OFLOW  OVOL   1                 COPY           INPUT  MEAN
  END MASS-LINK    17


END MASS-LINK

END RUN
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Preliminary Stormwater Quality Compliance Form

(This form is to be used in conjunction with the City's Stormwater Quality Design Manual, and should be submitted with all new development and redevelopment applications.

1) Project Information

Project name: Iron Point Road Apartments Lot 6 Assessor Parcel Number(s): 072-3120-023

Site Address: South side of Iron Point Road and North of Highway 50.

Applicant Name: Cole Partners Development Company Phone Number: _____

Address: 2484 Natomas Park Drive, suite 101, Sacramento, CA 95833

Project Contact: Robert Cole Phone Number: 916-273-4020

Project Category (check all that apply): *Refer to Design Manual Table 3-2 for Project Categories*

- ☐ *Residential (Single Family)*
- ☐ *Residential (Multi-Family)*
- ☒ *Commercial Developments*
- ☐ *Automotive Repair Shops*
- ☐ *Retail Gasoline Outlets*
- ☐ *Restaurants*
- ☐ *Industrial Development*
- ☐ *Hillside Developments*
- ☐ *Parking Lot*

Project Gross Area : 4.68 (acres) Improvement Area : 4.58 (acres)

Existing Impervious Surface Area: 0 Proposed Total Impervious Surface Area: 2.99 (acres)

Watershed or receiving water: Upper American River

2) Source Controls (check applicable pollutant sources):

Refer to Design Manual Table 3-2 for Requirements

- ☒ *Storm Drain Message and Signage*
- ☐ *Fueling Areas*
- ☒ *Loading/Unloading Areas*
- ☒ *Outdoor Storage Areas*
- ☐ *Outdoor Work Areas*
- ☐ *Vehicle/Equipment Wash Areas*
- ☒ *Waste Management Areas*
- ☐ *Other Describe* _____

3) Runoff Reduction Measures:

Refer to Design Manual Table 3-2 for Requirements

Will runoff reduction measures be utilized for this project? ☒ Yes ☐ No

If yes, check selected runoff reduction measures to be used, and attach Runoff Reduction worksheets (Design Manual Appendix D).

- ☐ *Alternative Driveway Design*
- ☒ *Disconnected Roof Drains*
- ☐ *Divided Sidewalks*
- ☐ *Not Directly Connected Pavement*
- ☐ *Green Roof*
- ☐ *Interceptor Trees*
- ☐ *Porous Pavement*
- ☐ *Other Describe* _____

4) Treatment Requirements

Refer to Design Manual Table 3-2 for Requirements

Is treatment required? ☒ Yes ☐ No If no, form is complete with signature.

Otherwise, indicate number of sheds: 6 Complete following treatment sections of this form.

Early consideration of stormwater quality during site planning may reduce the overall cost of treatment controls. Runoff reduction methods and innovative design options can drastically reduce the size of treatment options. In addition, early consideration allows for non-proprietary treatment options that can significantly reduce construction and maintenance costs.

Preliminary Stormwater Quality Compliance Form

5) Attach Project Overview and Stormwater Quality Narrative

[X] Include Project description indicating nature of project (e.g. is it a newly developing site, replacement of previously developed site, is it an infill site). Describe activities planned for site that may impact water quality such as a retail gasoline outlet as part of a development. Describe selected treatment options. If proposing proprietary measure, state why other treatment options are not feasible. Project description should be no more than 1 page relating to stormwater quality.

---

6) Attach Preliminary Site Plans and/or Drawings Showing:

[X] Existing and natural hydrologic features
[X] Existing and proposed drainage system
[X] Proposed grading plan
[X] Proposed sheds including
- Name
- Existing amount of pervious and impervious areas
- Proposed amount of pervious and impervious areas
- Proposed treatment control measure(s)

[X] Pollutant source areas including loading docks, food service areas, refuse areas, outdoor processes and storage, vehicle cleaning, repair or maintenance, fuel dispensing, equipment washing, etc.
[X] Proposed design features to minimize impervious areas, applicable runoff reduction techniques, innovative design, and all treatment options selected

*Note: Preliminary plans should identify all treatment options proposed. Sufficient engineering should be completed to properly size stormwater quality control measures. For information related to correct sizing and other requirements refer to *Stormwater Quality Design Manual for Sacramento and South Placer Regions.*

---

7) List Sheds and Selected Stormwater Quality Treatment Controls

Shed Name	Total Shed Area		Flow (cfs) or Volume (ft^3)	Treatment Controls Selected
	Impervious Area	Pervious Area		
1	17,972 SF		550 (ft^3)	Bioretention
	13,120 SF	4,852 SF		
2	35,746 SF		1100 (ft^3)	Bioretention
	26,095 SF	9,651 SF		
3	87,771 SF		2800 (ft^3)	Bioretention
	64,073 SF	23,698 SF		
3	8,915 SF		256 (ft^3)	Disconnected Roof Drain
	6,508 SF	2,407 SF		
3	3,277 SF		168 (ft^3)	Disconnected Roof Drain
	2,392 SF	885 SF		
3	12,777 SF		0.066 (cfs)	Stormfilter
	9,327 SF	3,450 SF		

Attach more sheets as necessary

---

8) Signature

Print Name: James Vanderpost ___ Indicate Owner or Title Civil Engineer

Signature: _____ Date: 05/21/2021

Preliminary Water Quality Report

For:

Iron Point Road Apartments – Lot 6

Folsom, CA

Project Address:
Iron Point Road
Folsom, CA

Prepared by:
RSC Engineering, Inc.
1420 Rocky Ridge Dr., Suite 150
Roseville CA, 95661

Date:
May 21, 2021

RSC Engineering, Inc.
Consulting Engineers

1420 Rocky Ridge Dr.
Suite 150
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Fax 916.788.4408
info@rsc-engr.com

Table of Contents

Appendices:

Introduction:

The approximately 4.68-acre Iron Point Road Apartments Lot 6 site is located on the south side of Iron Point Road. The existing site is an undeveloped plot. The proposed project consists of 5 separate buildings totaling 100 of apartment units, a clubhouse and a pool. Existing site will be graded, and asphalt parking lots and concrete walkways will be constructed to accommodate the new buildings. Stormwater planter facilities, disconnected roof drains and a Contech stormwater unit will be implemented across the site to achieve the stormwater treatment required by the Stormwater Quality Design Manual for the Sacramento Region (SQDM). See Appendix B for information on BMP locations.

Exhibit 1 - Vicinity Map:

Objective:

Develop sizing for stormwater planter facilities, disconnected roof drains and a Contech Unit to satisfy the Stormwater quality and LID and hydromodification requirements of the SQDM.

Stormwater Treatment:

The proposed development at the project site consists of approximately 2.99 acres of new impervious cover. Where feasible, stormwater planter facilities will be placed to treat the runoff from each specific drainage shed. Where stormwater planters are not feasible due to space constraints and existing topography, a Contech stormwater unit or disconnected roof drains will be used to treat the runoff from that area.

The proposed stormwater planter facilities are sized with a 12” ponding depth, 18” of 0.3 porosity plant media, and 9” of 0.4 porosity gravel per the minimum requirements of the Stormwater Quality Design Manual. The stormwater planter facilities will have a ditch box inlet with a window elevation 12” above the finish grade for overflow and drainage control. These drain inlets will be piped to discharge into the existing storm drain system built by the adjacent project site. The sizing of the storm water planters is shown in a table on the stormwater quality exhibit (Appendix B).

Per the manual, a 21’ minimum travel distance across vegetation for a maximum roof size of 3,500 S.F. and a 32’ minimum travel distance across vegetation for a maximum roof size of 10,000 S.F. is required. The dispersal trenches will be manifolded every 8’. This will allow equal loading of the dispersal trenches to comply with this requirement. The sizing of the dispersal trenches is shown in a table on the stormwater quality exhibit.

The project proposes to use a Contech Stormfilter. The calculations are summarized in a table on the stormwater quality exhibit (Appendix B). Manufactures info sheet for the unit is included in Appendix E.

LID Calculations:

Completed LID Spreadsheets are included in Appendix A. A spreadsheet was completed for the project to show compliance with the required LID point system. Step 1 was completed to show the amount of LID points that the apartment complex earns by the amount of landscaping and pervious area within the project site. Once completed the project will be 73% impervious which provides 27 LID points, refer to the pervious cover exhibit in Appendix C for the pervious area calculation.

Sections 2 and 3 of the LID spread sheet was provided to show the amount of LID points that the project will earn from constructing treatment control facilities. For this calculation, the total bioretention area, subdrain elevation, ponding depth, length of trench, cross sections of trench, and total DMA area is used, the location of stormwater planter facilities can be found in exhibit in Appendix B. A total of 2.99 Acres of the impervious area will be managed through bioretention and disconnected roof drains, per step 2 and 3 of the spreadsheet this will provide 9 and 101.6 points respectively.

By adding the results of the 3 sections of the spreadsheets as discussed above, it was calculated that the project will provide a total of 137.6 points, therefore complying with the requirements of the SQDM.

Hydromodification SAHM Simulation

A SAHM simulation compared pre-project and mitigated land use flow for 25% of a 2-year storm and a 10-year storm. The hydraulic soil rating was found to be class D using the USDA web soil survey website Using class D soil and an infiltration rate of 0.025 with a multiplier of 0.5 the simulation was conducted. The mitigated land use passed on all accounts. The full simulation report can be found in Appendix E.

Conclusions:

The Iron Point Road Apartments Lot 6 project will meet the water quality parameters and LID Points required by the Stormwater Quality Design Manual for the Sacramento Region by using stormwater planters, disconnected roof drains and a Contech Stormfilter unit in strategic locations across the site. Completed LID worksheet demonstrates the required LID stormwater treatment points are met.

Appendix A

Appendix D-2: Commercial Sites: Low Impact Development (LID) Credits and Treatment BMP Sizing Calculations

Name of Drainage Shed:
Location of project:

Fill in Blue Highlighted boxes

Step 1 - Open Space and Pervious Area Credits

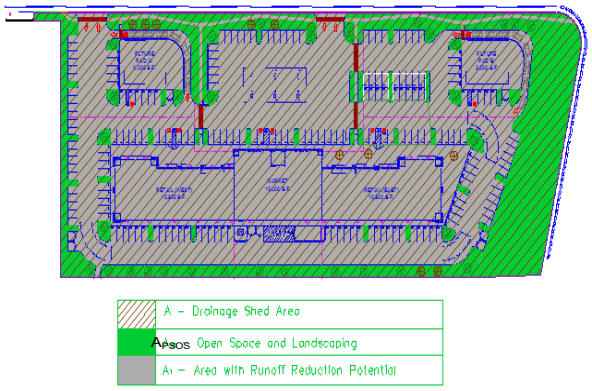
Is your project within the drainage area of a common drainage plan that includes open space? If not, skip to 1 b.

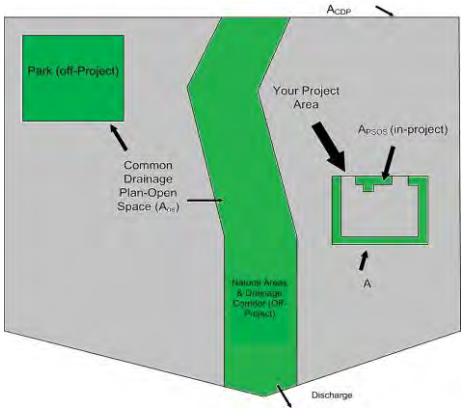
1 a. Common Drainage Plan Area	0	acres	A_{CDP}	
Common Drainage Plan Open Space (Off-project)	0	acres	A_{OS}	**see area example below**
a. Natural storage reservoirs and drainage corridors	0	acres		
b. Buffer zones for natural water bodies	0	acres		
c. Natural areas including existing trees, other vegetation, and soil	0	acres		
d. Common landscape area/park	0	acres		
e. Regional Flood Control/Drainage basins	0	acres		
1 b. Project Drainage Shed Area (Total)	4.11	acres	A	
Project-Specific Open Space (In-project, communal)**	1.11	acres	A_{PSOS}	
a. Natural storage reservoirs and drainage corridors	0.00	acres		
b. Buffer zones for natural water bodies	0.00	acres		**see area example below**
c. Natural areas including existing trees, other vegetation, and soil	0.00	acres		
d. Landscape area/park	1.11	acres		
e. Flood Control/Drainage basins	0.00	acres		

** Doesn't include impervious areas within individual lots and surrounding individual units. That is accounted for below using Form D-1a in Step 2.

Area with Runoff Reduction Potential	$A - A_{PSOS}$ =	3.00	acres	A_T
Assumed Initial Impervious Fraction	A_T / A =	0.73		I

Open Space & Pervious Area LID Credit (Step 1)
$(A_{OS}/A_{CDP}+A_{PSOS}/A)x100$ = 27 pts





Step 2 - Runoff Reduction Credits

Runoff Reduction Treatments	Impervious Area Managed			Efficiency Factor		Effective Area Managed (A_C)	
Porous Pavement:							
Option 1: Porous Pavement (see Fact Sheet, excludes porous pavement used in Option 2)	0	acres	x		=	0.000	acres
Option 2: Disconnected Pavement (see Fact Sheet, excludes porous pavement used in Option 1)	use Form D-2a for credits →					0.00	acres
Landscaping used to Disconnect Pavement (see Fact Sheet)	0.0000	acres			=	0.00	acres
Disconnected Roof Drains (see Fact Sheet and/or Table D-2b for summary of requirements)	0.27	acres			=	0.27	acres
Ecoroof (see Fact Sheet)	0	acres			=	0.00	acres
Interceptor Trees (see Fact Sheet)	use Form D-2b for credits →					0.00	acres
Total Effective Area Managed by Runoff Reduction Measures				A_C		0.27	acres
Runoff Reduction Credit (Step 2)				$(A_C / A_T)*100$ =		9	pts

Table D-2a

Porous Pavement Type	Efficiency Multiplier
Cobblestone Block Pavement	0.40
Pervious Concrete/Asphalt	0.60
Modular Block Pavement &	0.75
Reinforced Grass Pavement	1.00

Table D-2b

Maximum roof size	Minimum travel distance
≤ 3,500 sq ft	21 ft
≤ 5,000 sq ft	24 ft
≤ 7,500 sq ft	28 ft
≤ 10,000 sq ft	32 ft

Form D-2a: Disconnected Pavement Worksheet

See Fact Sheet for more information regarding Disconnected Pavement credit guidelines

Effective Area Managed (A_C)

Pavement Draining to Porous Pavement

2. Enter area draining onto Porous Pavement	0.00	acres	Box K1
3. Enter area of Receiving Porous Pavement (excludes area entered in Step 2 under Porous Pavement)	0.00	acres	Box K2
4. Ratio of Areas (Box K1 / Box K2)	0.00		Box K3

5. Select multiplier using ratio from Box K3 and enter into Box K4

Ratio (Box D)	Multiplier
Ratio is ≤ 0.5	1.00
Ratio is > 0.5 and < 1.0	0.83
Ratio is > 1.0 and < 1.5	0.71
Ratio is > 1.5 and < 2.0	0.55

	1		Box K4
6. Enter Efficiency of Porous Pavement (see table below)			Box K5

Porous Pavement Type	Efficiency Multiplier
Cobblestone Block Pavement	0.40
Pervious Concrete Asphalt Pavement	0.60
Modular Block Pavement Porous Gravel Pavement	0.75
Reinforced Grass Pavement	1.00

7. Multiply Box K2 by Box K5 and enter into Box K6	0.00	acres	Box K6
8. Multiply Boxes K1,K4, and K5 and enter the result in Box K7	0.00	acres	Box K7
9. Add Box K6 to Box K7 and multiply by 60%, and enter the Result in Box K8 This is the amount of area credit to enter into the "Disconnected Pavement" Box of Form D-2			0.00 acres

Form D-2b: Interceptor Tree Worksheet

See Fact Sheet for more information regarding Interceptor Tree credit guidelines

New Evergreen Trees

1. Enter number of new evergreen trees that qualify as Interceptor Trees in Box L1.		trees	Box L1
2. Multiply Box L1 by 200 and enter result in Box L2	0	sq. ft.	Box L2

New Deciduous Trees

3. Enter number of new deciduous trees that qualify as Interceptor Trees in Box L3.		trees	Box L3
4. Multiply Box L3 by 100 and enter result in Box L4	0	sq. ft.	Box L4

Existing Tree Canopy

5. Enter square footage of existing tree canopy that qualifies as Existing Tree canopy in Box L5.	0	sq. ft.	Box L5
6. Multiply Box L5 by 0.5 and enter the result in Box L6	0	sq. ft.	Box L6

Total Interceptor Tree EAM Credits

Add Boxes L2, L4, and L6 and enter it into Box L7	0	sq. ft.	Box L7
Divide Box L7 by 43,560 and multiply by 20% to get effective area managed and enter result in Box L8 This is the amount of area credit to enter into the "Interceptor Trees" Box of Form D-2	0.00	acres	Box L8

Step 3 - Runoff Management Credits

Capture and Use Credits

Impervious Area Managed by Rain barrels, Cisterns, and automatically-emptied systems

(see Fact Sheet) - enter gallons, for simple rain barrels | 0.00 acres

Automated-Control Capture and Use System

(see Fact Sheet, then enter impervious area managed by the system) | 0.00 acres

Bioretention/Infiltration Credits

Impervious Area Managed by Bioretention BMPs

(see Fact Sheet)

Bioretention Area 4,450 sq ft
Subdrain Elevation 6 inches
Ponding Depth, inches 12 inches | 1.52 acres

Impervious Area Managed by Infiltration BMPs

(see Fact Sheet)

Drawdown Time, hrs drawdown_hrs_inf
Soil Infiltration Rate, in/hr soil_inf_rate

Sizing Option 1: Capture Volume, acre-ft 0.00 capture_vol_inf | 0.00 acres

Sizing Option 2: Infiltration BMP surface area, sq ft 0 soil_surface_area | 0.00 acres

Basin or trench? approximate BMP depth 0.00 ft

Impervious Area Managed by Amended Soil or Mulch Beds

(see Fact Sheet) Mulched Infiltration Area, sq ft mulch_area | 0.00 acres

Total Effective Area Managed by Capture-and-Use/Bioretention/Infiltration BMPs | 1.52 A_{LIDc}

Runoff Management Credit (Step 3) A_{LIDC}/A_T*200 = 101.6 pts

Total LID Credits (Step 1+2+3) LID compliant, check for treatment sizing in Step 4 137.6

Does project require hydromodification management? If yes, proceed to using SacHM.

Adjusted Area for Flow-Based, Non-LID Treatment $A_T - A_C - A_{LIDC}$ = 1.21 A_{AT}

Adjusted Impervious Fraction of A for Volume-Based, Non-LID Treatment A_{AT} / A = 0.29 I_A

Further treatment is required, see choose flow-based or volume-based sizing in Step 4

Step 4a Treatment - Flow-Based (Rational Method)

Calculate treatment flow (cfs): Flow = Runoff Coefficient x Rainfall Intensity x Area

Look up value for i in Table D-2c (Rainfall Intensity): select a location o i

Obtain A_{AT} from Step 3: 1.21 A_{AT}

Use C = 0.95: 0.95 C

Flow = 0.95 * i * A_{AT}: #VALUE! cfs

Table D-2c

Rainfall Intensity			
Roseville	i =	0.20	in/hr
Sacramento	i =	0.18	in/hr
Folsom	i =	0.20	in/hr

Step 4b Treatment - Volume-Based (ASCE-WEF)

Calculate water quality volume (Acre-Feet): WQV = Area x Maximized Detention Volume (P_0)

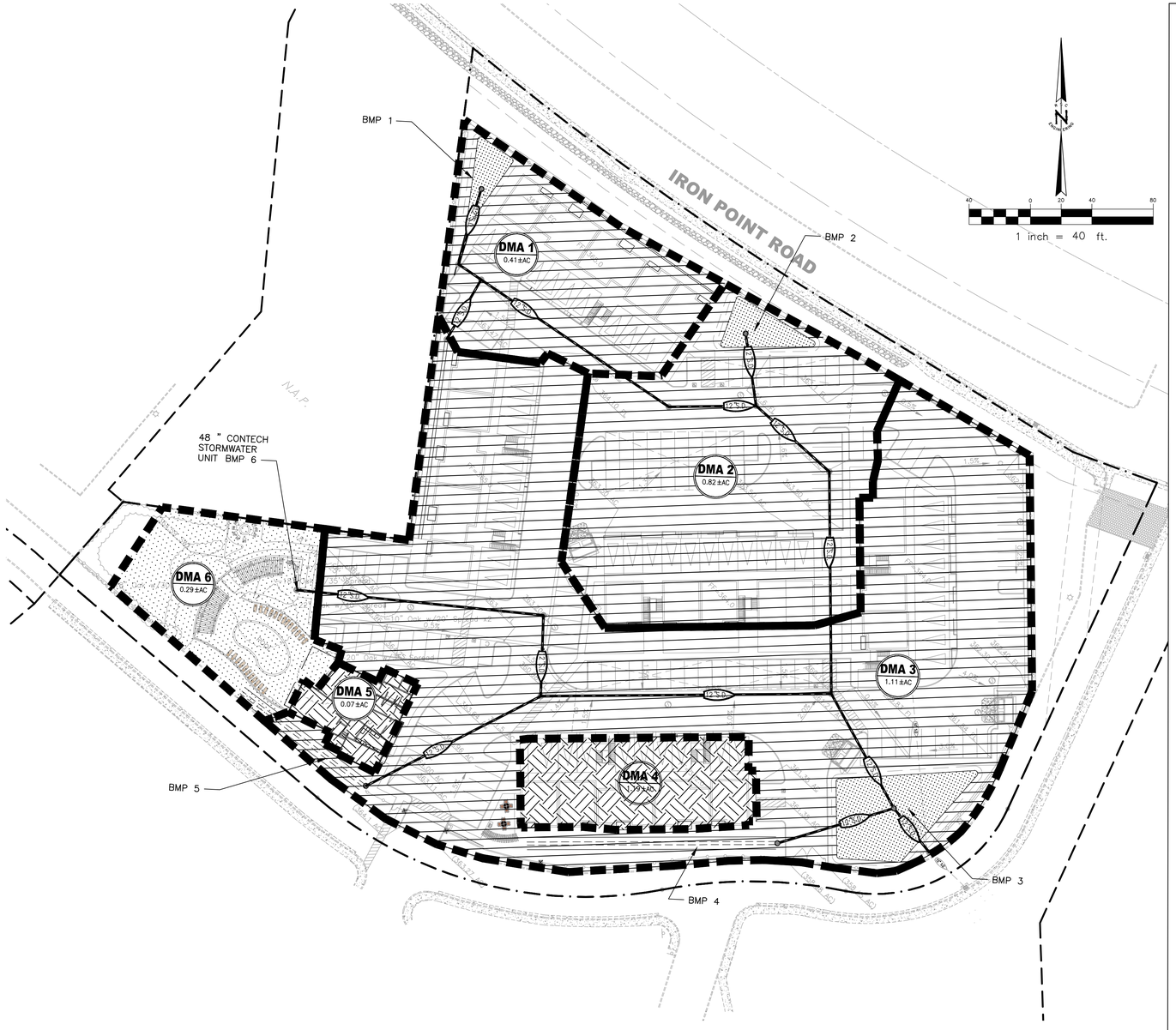
Obtain A from Step 1: 4.11 A | hrs Specified Draw Down time

Obtain P_0: Maximized Detention Volume from figures E-1 to E-4 in Appendix E of this manual using I_A from Step 2.: 0.24 P_0

Calculate treatment volume (acre-ft):

Treatment volume = A x (P_0 / 12): 0.08 Acre-Feet

v06232012



DRAINAGE MANAGEMENT AREAS DRAINING TO STORMWATER PLANTERS

DMA NUMBER	BMP NUMBER	TOTAL DMA AREA (SF)	STORMWATER PLANTER AREA (SF)	STORMWATER PLANTER DEPTH (INCHES)	SOIL MEDIA DEPTH (INCHES)	STORMWATER GRAVEL DEPTH (INCHES)	STORMWATER VOLUME PROVIDED (CF)	WATER QUALITY VOLUME REQUIRED (CF)	% COMPLIANT
1	1	17972	550	12	18	9	550	524	105
2	2	35746	1100	12	18	9	1100	1042.592	106
3	3	87771	2800	12	18	9	2800	2559.988	109
	TOTAL	141,489	4,450						

THE STORMWATER PLANTERS ARE SIZED USING APPENDIX E OF THE STORMWATER QUALITY DESIGN MANUAL FOR THE SACRAMENTO REGION (SWQDM).

1. STORM WATER VOLUME PROVIDED = (STORMWATER DEPTH + MEDIA DEPTHX0.3 + GRAVEL DEPTHX0.4) X STORMWATER PLANTER AREA
2. STORM WATER VOLUME REQUIRED = P_0XDMA AREA/12

WHERE: P_0=MAXIMIZED DETENTION VOLUME FOR A 12 HOUR DRAW DOWN TIME (73% IMPERVIOUS) PER FIGURE E-1 IN THE SWQDM

3. % COMPLIANT=STORMWATER VOLUME PROVIDED/STORMWATER VOLUME REQUIRED

DRAINAGE MANAGEMENT AREAS DRAINING TO DISCONNECTED ROOF DRAINS (DISPERSAL TRENCHES OR DRY WELLS)

DMA #	BMP NUMBER	BMP TYPE	TOTAL DMA AREA (SF)	VOLUME OF BMP NEEDED * (C.F.)	LENGTH OF BMP NEEDED * (L.F.)	CROSS SECTIONAL DIMENSIONS OF BMP	LENGTH OF BMP PROVIDED (FT)	VOLUME OF BMP PROVIDED (C.F.)	% COMPLIANT
4	4	DISPERSAL TRENCH	8915	N/A	32	4'X2'	32	256	100
5	5	DISPERSAL TRENCH	3277	N/A	21	4'X2'	21	168	100
			12,192						

TABLE DRD-1: FOR 3,500 SF MAX ROOF SIZE USE 21 FT MINIMUM TRAVEL DISTANCE.

TABLE DRD-1: FOR 10,000 SF MAX ROOF SIZE USE 32 FT MINIMUM TRAVEL DISTANCE.

% COMPLIANT= VOLUME OR LENGTH OF BMP PROVIDED/ VOLUME OR LENGTH OF BMP REQUIRED

DRAINAGE MANAGEMENT AREAS DRAINING CONTECH STORMFILTER UNITS

DMA NUMBER	BMP NUMBER	TOTAL DMA AREA (SF)	WQF REQUIRED (CFS)	WQF PER CARTRIDGE (CFS) (18" CARTRIDGE)	NUMBER OF CARTRIDGES REQUIRED	NUMBER OF CARTRIDGES PROVIDED	WQF PROVIDED (C.F.)	% COMPLIANT
6	6	12777	0.050	0.033	1.520	2	0.066	132
		12,777						

WQF=CiA, WHERE:
C=RUNNOF COEFFICIENT = .75
i=INTENSITY= .2 FOR SACRAMENTO COUNTY
A=AREA DMA (ACRES)

LEGEND

- STORMWATER PLANTER
- DRAINAGE MANAGEMENT AREAS TREATED BY STORMWATER PLANTER
- DRAINAGE MANAGEMENT AREAS TREATED BY CONTECH STORMFILTER UNIT
- DRAINAGE MANAGEMENT AREAS TREATED BY DISCONNECTED ROOF DRAINS

APPENDIX B

STORMWATER QUALITY EXHIBIT | SWQ1

IRON POINT ROAD APARTMENTS - LOT 6

FOLSOM, CA.

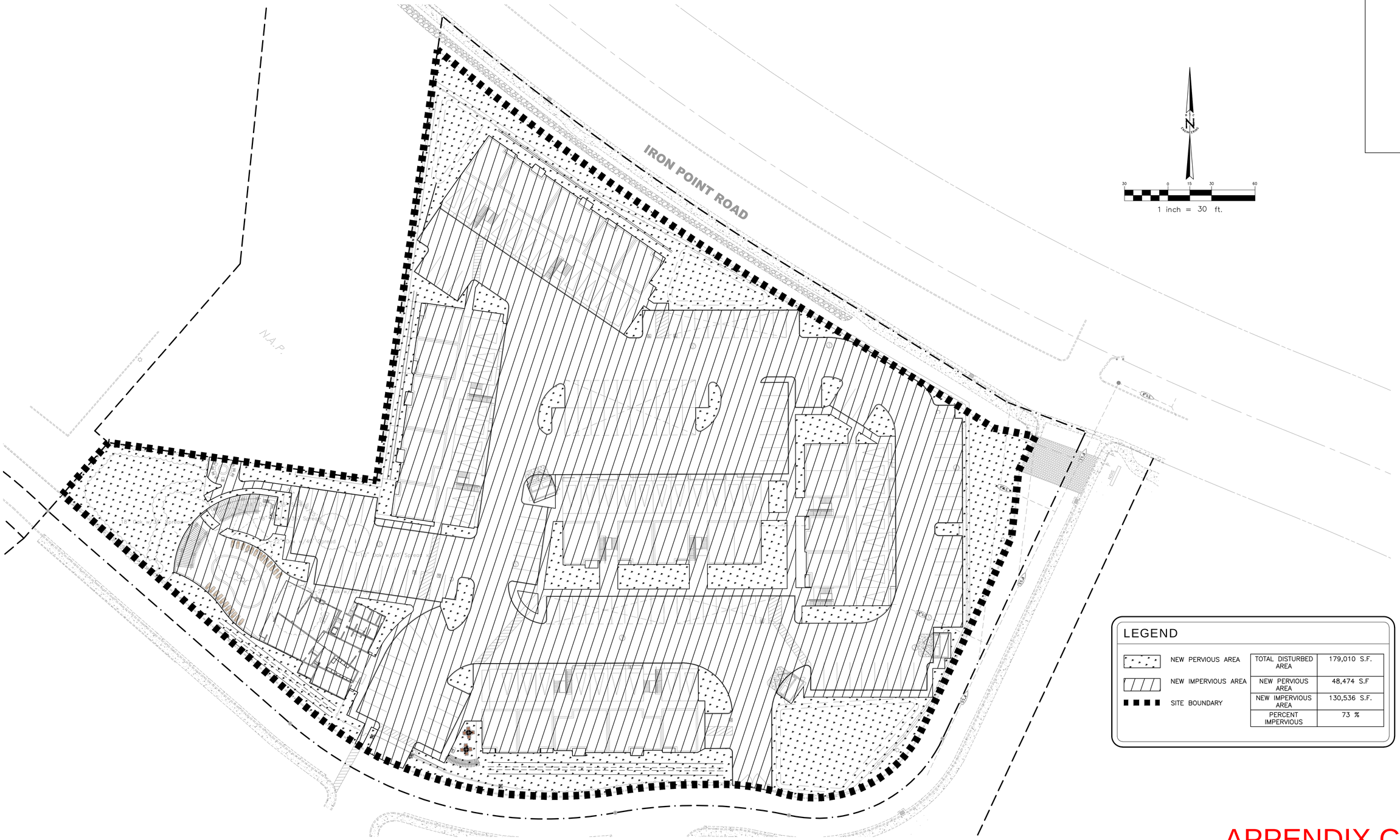
MAY 19, 2021 | MR200320.00

GRUPE

COLE PARTNERS DEVELOPMENT COMPANY
REAL ESTATE INVESTMENT, DEVELOPMENT & MANAGEMENT

RSC ENGINEERING
1420 Rocky Ridge Drive, Suite 150
Roseville, CA 95661
Ph:916.788.2884 Fax:916.788.4408

BSB DESIGN
BSBDESIGN.COM



LEGEND

- NEW PERVIOUS AREA
- NEW IMPERVIOUS AREA
- SITE BOUNDARY

TOTAL DISTURBED AREA	179,010 S.F.
NEW PERVIOUS AREA	48,474 S.F
NEW IMPERVIOUS AREA	130,536 S.F.
PERCENT IMPERVIOUS	73 %

RSC ENGINEERING
1420 Rocky Ridge Drive, Suite 150
Roseville, CA 95661
Ph:916.788.2884 Fax:916.788.4408

APPENDIX C

IMPERVIOUS AREA EXHIBIT | SWQ2

IRON POINT ROAD APARTMENTS - LOT 6

FOLSOM, CA.

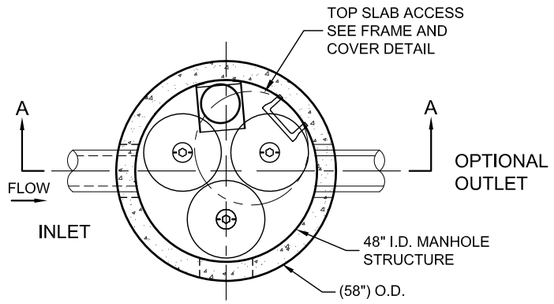
GRUPE

COLE PARTNERS DEVELOPMENT COMPANY
REAL ESTATE INVESTMENT, DEVELOPMENT & MANAGEMENT

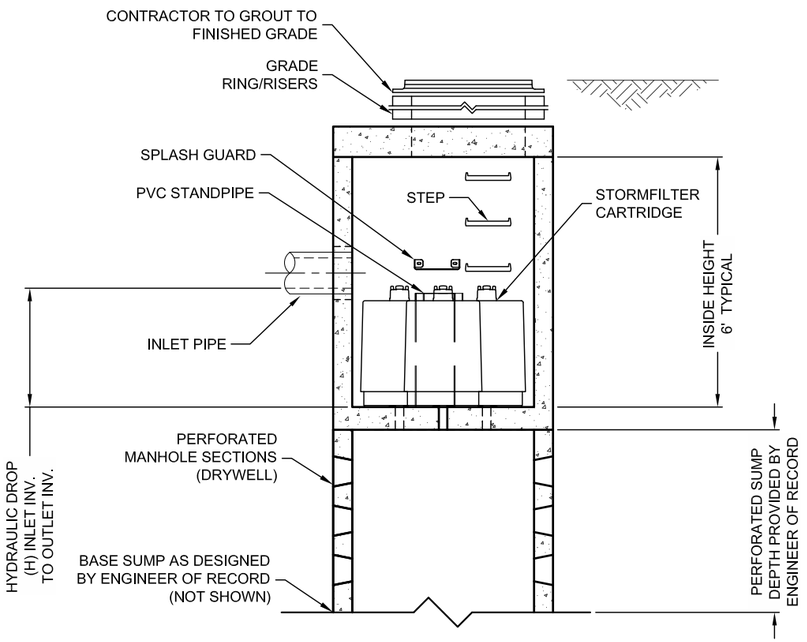
BSB DESIGN
BSBDESIGN.COM

MAY 19, 2021 | MR200320.00

Appendix D



PLAN VIEW
TOP SLAB NOT SHOWN



SECTION A-A

The Stormwater Management StormFilter®
THIS PRODUCT MAY BE PROTECTED BY ONE OR MORE OF THE FOLLOWING U.S. PATENTS: 5,322,629; 5,504,379; 5,707,527; 5,985,157; 6,027,639; 6,649,048; RELATED FOREIGN PATENTS, OR OTHER PATENTS PENDING.

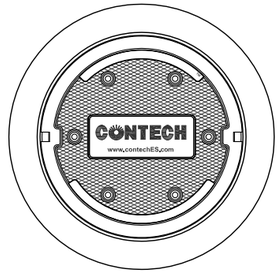
INFILTRATOR STORMFILTER DESIGN NOTES

INFILTRATOR STORMFILTER TREATMENT CAPACITY IS A FUNCTION OF THE CARTRIDGE SELECTION AND THE NUMBER OF CARTRIDGES. THE STANDARD MANHOLE STYLE IS SHOWN WITH THE MAXIMUM NUMBER OF CARTRIDGES (7).

Ø48" MANHOLE INFILTRATOR STORMFILTER PEAK HYDRAULIC CAPACITY IS 1.5 CFS. IF THE SITE CONDITIONS EXCEED 1.5 CFS AN UPSTREAM BYPASS STRUCTURE IS REQUIRED.

CARTRIDGE SELECTION

CARTRIDGE HEIGHT	27"		18"		LOW DROP	
RECOMMENDED HYDRAULIC DROP (H)	3.05'		2.3'		1.8'	
SPECIFIC FLOW RATE (gpm/sf)	2 gpm/ft²	1 gpm/ft²	2 gpm/ft²	1 gpm/ft²	2 gpm/ft²	1 gpm/ft²
CARTRIDGE FLOW RATE (gpm)	22.5	11.25	15	7.5	10	5



FRAME AND COVER
(DIAMETER VARIES)
N.T.S.

SITE SPECIFIC DATA REQUIREMENTS

STRUCTURE ID	*
WATER QUALITY FLOW RATE (cfs)	*
PEAK FLOW RATE (cfs)	*
RETURN PERIOD OF PEAK FLOW (yrs)	*
# OF CARTRIDGES REQUIRED	*
CARTRIDGE FLOW RATE	*
MEDIA TYPE (CSF, PERLITE, ZPG, GAC, PHS)	*

PIPE DATA:	I.E.	MATERIAL	DIAMETER
INLET PIPE #1	*	*	*
INLET PIPE #2	*	*	*
OUTLET PIPE	*	*	*

RIM ELEVATION	*

ANTI-FLOTATION BALLAST	WIDTH	HEIGHT
	*	*

NOTES/SPECIAL REQUIREMENTS:

* PER ENGINEER OF RECORD

GENERAL NOTES
1. CONTECH TO PROVIDE ALL MATERIALS UNLESS NOTED OTHERWISE.
2. DIMENSIONS MARKED WITH ( ) ARE REFERENCE DIMENSIONS. ACTUAL DIMENSIONS MAY VARY.
3. FOR SITE SPECIFIC DRAWINGS WITH DETAILED VAULT DIMENSIONS AND WEIGHTS, PLEASE CONTACT YOUR CONTECH ENGINEERED SOLUTIONS LLC REPRESENTATIVE. www.ContechES.com
4. INFILTRATOR STORMFILTER WATER QUALITY STRUCTURE SHALL BE IN ACCORDANCE WITH ALL DESIGN DATA AND INFORMATION CONTAINED IN THIS DRAWING.
5. STRUCTURE SHALL MEET AASHTO HS20 LOAD RATING, ASSUMING EARTH COVER OF 0' - 5' AND GROUNDWATER ELEVATION AT, OR BELOW, THE OUTLET PIPE INVERT ELEVATION. ENGINEER OF RECORD TO CONFIRM ACTUAL GROUNDWATER ELEVATION. CASTINGS SHALL MEET AASHTO M306 AND BE CAST WITH THE CONTECH LOGO.
6. FILTER CARTRIDGES SHALL BE MEDIA-FILLED, PASSIVE, SIPHON ACTUATED, RADIAL FLOW, AND SELF CLEANING. RADIAL MEDIA DEPTH SHALL BE 7-INCHES. FILTER MEDIA CONTACT TIME SHALL BE AT LEAST 39 SECONDS.
7. SPECIFIC FLOW RATE IS EQUAL TO THE FILTER TREATMENT CAPACITY (gpm) DIVIDED BY THE FILTER CONTACT SURFACE AREA (sq ft).

INSTALLATION NOTES
1. ANY SUB-BASE, BACKFILL DEPTH, AND/OR ANTI-FLOTATION PROVISIONS ARE SITE-SPECIFIC DESIGN CONSIDERATIONS AND SHALL BE SPECIFIED BY ENGINEER OF RECORD.
2. CONTRACTOR TO PROVIDE EQUIPMENT WITH SUFFICIENT LIFTING AND REACH CAPACITY TO LIFT AND SET THE STORMFILTER STRUCTURE (LIFTING CLUTCHES PROVIDED).
3. CONTRACTOR TO INSTALL JOINT SEALANT BETWEEN ALL STRUCTURE SECTIONS AND ASSEMBLE STRUCTURE.
4. CONTRACTOR TO PROVIDE, INSTALL, AND GROUT INLET PIPE(S).
5. CONTRACTOR TO TAKE APPROPRIATE MEASURES TO PROTECT CARTRIDGES FROM CONSTRUCTION-RELATED EROSION RUNOFF.

CONTECH® ENGINEERED SOLUTIONS LLC
www.ContechES.com
9025 Centre Pointe Dr., Suite 400, West Chester, OH 45069
800-338-1122 513-645-7000 513-645-7993 FAX

SFIN-MH48
INFILTRATOR STORMFILTER STANDARD DETAIL

Appendix E

SAHM

PROJECT REPORT

General Model Information

Project Name:	Lot 6
Site Name:	Folsom Iron Point Apt. Lot 1
Site Address:	
City:	Folsom
Report Date:	5/21/2021
Gage:	ORANGEVA
Data Start:	1964/10/01
Data End:	2004/09/30
Timestep:	Hourly
Precip Scale:	1.091
Version Date:	2021/05/20

POC Thresholds

Low Flow Threshold for POC1:	25 Percent of the 2 Year
High Flow Threshold for POC1:	10 Year

Landuse Basin Data

Pre-Project Land Use

Basin 1

Bypass:	No
GroundWater:	No
Pervious Land Use	acre
D,Grass,VSteep(>5%)	4.58
Pervious Total	4.58
Impervious Land Use	acre
Impervious Total	0
Basin Total	4.58

Element Flows To:

Surface	Interflow	Groundwater

Mitigated Land Use

Basin 1

Bypass:	No
GroundWater:	No
Pervious Land Use	acre
D,Grass,Mod (1-2%)	0.11
Pervious Total	0.11
Impervious Land Use	acre
Imperv,Mod (1-2%)	0.3
Impervious Total	0.3
Basin Total	0.41

Element Flows To:

Surface	Interflow	Groundwater
Surface retention 1	Surface retention 1	

Basin 2

Bypass:	No
GroundWater:	No

Pervious Land Use	acre
D,Grass,Mod (1-2%)	0.22
Pervious Total	0.22

Impervious Land Use	acre
Imperv,Mod (1-2%)	0.6
Impervious Total	0.6
Basin Total	0.82

Element Flows To:

Surface	Interflow	Groundwater
Surface retention 2	Surface retention 2	

Basin 3

Bypass:	Yes
GroundWater:	No

Pervious Land Use	acre
D,Grass,Mod (1-2%)	0.57
Pervious Total	0.57

Impervious Land Use	acre
Imperv,Mod (1-2%)	1.53
Impervious Total	1.53
Basin Total	2.1

Element Flows To:

Surface	Interflow	Groundwater
Surface retention 3	Surface retention 3	

Basin 4

Bypass:	No
GroundWater:	No

Pervious Land Use	acre
D,Grass,Mod (1-2%)	0.05
Pervious Total	0.05

Impervious Land Use	acre
Imperv,Mod (1-2%)	0.15
Impervious Total	0.15
Basin Total	0.2

Element Flows To:

Surface	Interflow	Groundwater

Basin 5

Bypass:	No
GroundWater:	No

Pervious Land Use	acre
D,Grass,Mod (1-2%)	0.02
Pervious Total	0.02

Impervious Land Use	acre
Imperv,Mod (1-2%)	0.05
Impervious Total	0.05
Basin Total	0.07

Element Flows To:

Surface	Interflow	Groundwater

Basin 6

Bypass:	No
GroundWater:	No

Pervious Land Use	acre
D,Grass,Mod (1-2%)	0.08
Pervious Total	0.08

Impervious Land Use	acre
Imperv,Mod (1-2%)	0.21
Impervious Total	0.21
Basin Total	0.29

Element Flows To:

Surface	Interflow	Groundwater

Routing Elements
Pre-Project Routing

Mitigated Routing

Bioretention 1

Bottom Length:	27.90 ft.
Bottom Width:	27.90 ft.
Material thickness of first layer:	0.5
Material type for first layer:	Sandy loam
Material thickness of second layer:	1
Material type for second layer:	Amended 5 in/hr
Material thickness of third layer:	0.75
Material type for third layer:	GRAVEL
Infiltration On	
Infiltration rate:	0.025
Infiltration safety factor:	0.5
Total Volume Infiltrated (ac-ft.):	0
Total Volume Through Riser (ac-ft.):	0
Total Volume Through Facility (ac-ft.):	237.496
Percent Infiltrated:	0
Total Precip Applied to Facility:	11.135
Total Evap From Facility:	9.669
Underdrain used	
Underdrain Diameter (feet):	0.34
Orifice Diameter (in.):	4
Offset (in.):	6
Flow Through Underdrain (ac-ft.):	214.747
Total Outflow (ac-ft.):	237.496
Percent Through Underdrain:	90.42
Discharge Structure	
Riser Height:	1 ft.
Riser Diameter:	24 in.
Element Flows To:	
Outlet 1	Outlet 2

Landscape Swale Hydraulic Table

Stage(feet)	Area(ac.)	Volume(ac-ft.)	Discharge(cfs)	Infilt(cfs)
0.0000	0.0393	0.0000	0.0000	0.0000
0.0467	0.0393	0.0003	0.0000	0.0000
0.0934	0.0387	0.0007	0.0000	0.0000
0.1401	0.0382	0.0010	0.0000	0.0000
0.1868	0.0377	0.0014	0.0000	0.0000
0.2335	0.0372	0.0018	0.0000	0.0000
0.2802	0.0366	0.0021	0.0000	0.0000
0.3269	0.0361	0.0025	0.0000	0.0000
0.3736	0.0356	0.0029	0.0000	0.0000
0.4203	0.0351	0.0033	0.0000	0.0000
0.4670	0.0346	0.0037	0.0000	0.0002
0.5137	0.0341	0.0041	0.0000	0.0002
0.5604	0.0336	0.0046	0.0000	0.0002
0.6071	0.0331	0.0050	0.0000	0.0002
0.6538	0.0326	0.0055	0.0000	0.0002
0.7005	0.0322	0.0059	0.0000	0.0002
0.7473	0.0317	0.0064	0.0000	0.0002
0.7940	0.0312	0.0069	0.0000	0.0002
0.8407	0.0307	0.0074	0.0000	0.0002
0.8874	0.0303	0.0078	0.0000	0.0002

0.9341	0.0298	0.0083	0.0000	0.0002
0.9808	0.0293	0.0089	0.0000	0.0002
1.0275	0.0289	0.0094	0.0000	0.0002
1.0742	0.0284	0.0099	0.0000	0.0002
1.1209	0.0280	0.0104	0.0000	0.0002
1.1676	0.0275	0.0110	0.0000	0.0002
1.2143	0.0271	0.0115	0.0000	0.0002
1.2610	0.0266	0.0121	0.0000	0.0002
1.3077	0.0262	0.0127	0.0000	0.0002
1.3544	0.0258	0.0132	0.0000	0.0002
1.4011	0.0253	0.0138	0.0000	0.0002
1.4478	0.0249	0.0144	0.0000	0.0002
1.4945	0.0245	0.0150	0.0000	0.0002
1.5412	0.0241	0.0157	0.0000	0.0002
1.5879	0.0237	0.0163	0.0000	0.0002
1.6346	0.0232	0.0169	0.0000	0.0002
1.6813	0.0228	0.0175	0.0000	0.0002
1.7280	0.0224	0.0182	0.0000	0.0002
1.7747	0.0220	0.0188	0.0000	0.0002
1.8214	0.0216	0.0195	0.0000	0.0002
1.8681	0.0212	0.0202	0.0000	0.0002
1.9148	0.0209	0.0209	0.0000	0.0002
1.9615	0.0205	0.0216	0.0000	0.0002
2.0082	0.0201	0.0223	0.0000	0.0002
2.0549	0.0197	0.0230	0.0343	0.0002
2.1016	0.0193	0.0237	0.0757	0.0002
2.1484	0.0190	0.0244	0.1270	0.0002
2.1951	0.0186	0.0252	0.1270	0.0002
2.2418	0.0182	0.0259	0.1270	0.0002
2.2500	0.0179	0.0261	0.5706	0.0002

Landscape Swale Hydraulic Table

Stage(feet)	Area(ac.)	Volume(ac-ft.)	Discharge(cfs)	To Amended(cfs)	Infilt(cfs)
2.2500	0.0393	0.0261	0.0000	0.0424	0.0000
2.2967	0.0399	0.0279	0.0000	0.0424	0.0000
2.3434	0.0404	0.0298	0.0000	0.0503	0.0000
2.3901	0.0410	0.0317	0.0000	0.0543	0.0000
2.4368	0.0415	0.0336	0.0000	0.0583	0.0000
2.4835	0.0421	0.0356	0.0000	0.0622	0.0000
2.5302	0.0426	0.0376	0.0000	0.0662	0.0000
2.5769	0.0432	0.0396	0.0000	0.0702	0.0000
2.6236	0.0437	0.0416	0.0000	0.0741	0.0000
2.6703	0.0443	0.0436	0.0000	0.0781	0.0000
2.7170	0.0449	0.0457	0.0000	0.0820	0.0000
2.7637	0.0454	0.0478	0.0000	0.0860	0.0000
2.8104	0.0460	0.0500	0.0000	0.0900	0.0000
2.8571	0.0466	0.0521	0.0000	0.0939	0.0000
2.9038	0.0472	0.0543	0.0000	0.0979	0.0000
2.9505	0.0477	0.0565	0.0000	0.1019	0.0000
2.9973	0.0483	0.0588	0.0000	0.1058	0.0000
3.0440	0.0489	0.0611	0.0000	0.1098	0.0000
3.0907	0.0495	0.0633	0.0000	0.1137	0.0000
3.1374	0.0501	0.0657	0.0000	0.1177	0.0000
3.1841	0.0507	0.0680	0.0000	0.1217	0.0000
3.2308	0.0513	0.0704	0.0000	0.1256	0.0000
3.2775	0.0519	0.0728	0.0967	0.1296	0.0000
3.3242	0.0526	0.0753	0.4284	0.1336	0.0000
3.3709	0.0532	0.0777	0.8902	0.1375	0.0000

3.4176	0.0538	0.0802	1.4503	0.1415	0.0000
3.4643	0.0544	0.0828	2.0898	0.1454	0.0000
3.5110	0.0550	0.0853	2.7938	0.1494	0.0000
3.5577	0.0557	0.0879	3.5484	0.1534	0.0000
3.6044	0.0563	0.0905	4.3398	0.1573	0.0000
3.6511	0.0569	0.0932	5.1539	0.1613	0.0000
3.6978	0.0576	0.0958	5.9763	0.1653	0.0000
3.7445	0.0582	0.0985	6.7926	0.1692	0.0000
3.7912	0.0589	0.1013	7.5883	0.1732	0.0000
3.8379	0.0595	0.1040	8.3500	0.1771	0.0000
3.8846	0.0602	0.1068	9.0650	0.1811	0.0000
3.9313	0.0609	0.1097	9.7227	0.1851	0.0000
3.9780	0.0615	0.1125	10.315	0.1890	0.0000
4.0247	0.0622	0.1154	10.836	0.1930	0.0000
4.0714	0.0629	0.1183	11.285	0.1970	0.0000
4.1181	0.0635	0.1213	11.664	0.2009	0.0000
4.1648	0.0642	0.1243	11.983	0.2049	0.0000
4.2115	0.0649	0.1273	12.257	0.2088	0.0000
4.2500	0.0655	0.1298	12.650	0.2121	0.0000

Surface retention 1

Element Flows To:

Outlet 1	Outlet 2
	Bioretention 1

Bioretention 2

Bottom Length:	33.87 ft.
Bottom Width:	33.87 ft.
Material thickness of first layer:	0.5
Material type for first layer:	Sandy loam
Material thickness of second layer:	1
Material type for second layer:	Amended 5 in/hr
Material thickness of third layer:	0.75
Material type for third layer:	GRAVEL
Infiltration On	
Infiltration rate:	0.025
Infiltration safety factor:	0.5
Total Volume Infiltrated (ac-ft.):	0
Total Volume Through Riser (ac-ft.):	0
Total Volume Through Facility (ac-ft.):	19.596
Percent Infiltrated:	0
Total Precip Applied to Facility:	1.696
Total Evap From Facility:	1.09
Underdrain used	
Underdrain Diameter (feet):	0.34
Orifice Diameter (in.):	4
Offset (in.):	6
Flow Through Underdrain (ac-ft.):	19.479
Total Outflow (ac-ft.):	19.596
Percent Through Underdrain:	99.41
Discharge Structure	
Riser Height:	1 ft.
Riser Diameter:	24 in.
Element Flows To:	
Outlet 1	Outlet 2

Landscape Swale Hydraulic Table

Stage(feet)	Area(ac.)	Volume(ac-ft.)	Discharge(cfs)	Infilt(cfs)
0.0000	0.0515	0.0000	0.0000	0.0000
0.0467	0.0514	0.0005	0.0000	0.0000
0.0934	0.0508	0.0010	0.0000	0.0000
0.1401	0.0502	0.0015	0.0000	0.0000
0.1868	0.0496	0.0020	0.0000	0.0000
0.2335	0.0490	0.0026	0.0000	0.0000
0.2802	0.0484	0.0031	0.0000	0.0000
0.3269	0.0478	0.0037	0.0000	0.0000
0.3736	0.0472	0.0042	0.0000	0.0000
0.4203	0.0467	0.0048	0.0000	0.0000
0.4670	0.0461	0.0054	0.0000	0.0003
0.5137	0.0455	0.0060	0.0000	0.0003
0.5604	0.0449	0.0066	0.0000	0.0003
0.6071	0.0444	0.0072	0.0000	0.0003
0.6538	0.0438	0.0079	0.0000	0.0003
0.7005	0.0432	0.0085	0.0000	0.0003
0.7473	0.0427	0.0092	0.0000	0.0003
0.7940	0.0421	0.0098	0.0000	0.0003
0.8407	0.0416	0.0105	0.0000	0.0003
0.8874	0.0410	0.0112	0.0000	0.0003
0.9341	0.0405	0.0119	0.0000	0.0003
0.9808	0.0400	0.0126	0.0000	0.0003

1.0275	0.0394	0.0133	0.0000	0.0003
1.0742	0.0389	0.0140	0.0000	0.0003
1.1209	0.0384	0.0148	0.0000	0.0003
1.1676	0.0378	0.0155	0.0000	0.0003
1.2143	0.0373	0.0163	0.0000	0.0003
1.2610	0.0368	0.0171	0.0000	0.0003
1.3077	0.0363	0.0178	0.0000	0.0003
1.3544	0.0358	0.0186	0.0000	0.0003
1.4011	0.0353	0.0194	0.0000	0.0003
1.4478	0.0348	0.0202	0.0000	0.0003
1.4945	0.0343	0.0211	0.0000	0.0003
1.5412	0.0338	0.0219	0.0000	0.0003
1.5879	0.0333	0.0227	0.0000	0.0003
1.6346	0.0328	0.0236	0.0000	0.0003
1.6813	0.0323	0.0244	0.0000	0.0003
1.7280	0.0318	0.0253	0.0000	0.0003
1.7747	0.0314	0.0262	0.0000	0.0003
1.8214	0.0309	0.0270	0.0000	0.0003
1.8681	0.0304	0.0279	0.0000	0.0003
1.9148	0.0299	0.0288	0.0000	0.0003
1.9615	0.0295	0.0298	0.0000	0.0003
2.0082	0.0290	0.0307	0.0000	0.0003
2.0549	0.0286	0.0316	0.0343	0.0003
2.1016	0.0281	0.0326	0.0757	0.0003
2.1484	0.0277	0.0336	0.1133	0.0003
2.1951	0.0272	0.0345	0.1460	0.0003
2.2418	0.0268	0.0355	0.1873	0.0003
2.2500	0.0263	0.0357	0.5706	0.0003

Landscape Swale Hydraulic Table

Stage(feet)	Area(ac.)	Volume(ac-ft.)	Discharge(cfs)	To Amended(cfs)	Infilt(cfs)
2.2500	0.0515	0.0357	0.0000	0.0625	0.0000
2.2967	0.0521	0.0381	0.0000	0.0625	0.0000
2.3434	0.0527	0.0406	0.0000	0.0742	0.0000
2.3901	0.0534	0.0431	0.0000	0.0801	0.0000
2.4368	0.0540	0.0456	0.0000	0.0859	0.0000
2.4835	0.0546	0.0481	0.0000	0.0917	0.0000
2.5302	0.0552	0.0507	0.0000	0.0976	0.0000
2.5769	0.0559	0.0533	0.0000	0.1034	0.0000
2.6236	0.0565	0.0559	0.0000	0.1093	0.0000
2.6703	0.0572	0.0585	0.0000	0.1151	0.0000
2.7170	0.0578	0.0612	0.0000	0.1209	0.0000
2.7637	0.0584	0.0639	0.0000	0.1268	0.0000
2.8104	0.0591	0.0667	0.0000	0.1326	0.0000
2.8571	0.0598	0.0695	0.0000	0.1385	0.0000
2.9038	0.0604	0.0723	0.0000	0.1443	0.0000
2.9505	0.0611	0.0751	0.0000	0.1502	0.0000
2.9973	0.0617	0.0780	0.0000	0.1560	0.0000
3.0440	0.0624	0.0809	0.0000	0.1618	0.0000
3.0907	0.0631	0.0838	0.0000	0.1677	0.0000
3.1374	0.0638	0.0868	0.0000	0.1735	0.0000
3.1841	0.0644	0.0898	0.0000	0.1794	0.0000
3.2308	0.0651	0.0928	0.0000	0.1852	0.0000
3.2775	0.0658	0.0958	0.0967	0.1910	0.0000
3.3242	0.0665	0.0989	0.4284	0.1969	0.0000
3.3709	0.0672	0.1021	0.8902	0.2027	0.0000
3.4176	0.0679	0.1052	1.4503	0.2086	0.0000
3.4643	0.0686	0.1084	2.0898	0.2144	0.0000

3.5110	0.0693	0.1116	2.7938	0.2202	0.0000
3.5577	0.0700	0.1149	3.5484	0.2261	0.0000
3.6044	0.0707	0.1182	4.3398	0.2319	0.0000
3.6511	0.0714	0.1215	5.1539	0.2378	0.0000
3.6978	0.0721	0.1248	5.9763	0.2436	0.0000
3.7445	0.0729	0.1282	6.7926	0.2494	0.0000
3.7912	0.0736	0.1316	7.5883	0.2553	0.0000
3.8379	0.0743	0.1351	8.3500	0.2611	0.0000
3.8846	0.0751	0.1386	9.0650	0.2670	0.0000
3.9313	0.0758	0.1421	9.7227	0.2728	0.0000
3.9780	0.0765	0.1457	10.315	0.2787	0.0000
4.0247	0.0773	0.1492	10.836	0.2845	0.0000
4.0714	0.0780	0.1529	11.285	0.2903	0.0000
4.1181	0.0788	0.1565	11.664	0.2962	0.0000
4.1648	0.0795	0.1602	11.983	0.3020	0.0000
4.2115	0.0803	0.1640	12.257	0.3079	0.0000
4.2500	0.0809	0.1671	12.650	0.3127	0.0000

Surface retention 2

Element Flows To:

Outlet 1	Outlet 2
	Bioretention 2

Bioretention 3

Bottom Length:	61.38 ft.
Bottom Width:	61.38 ft.
Material thickness of first layer:	0.5
Material type for first layer:	Sandy loam
Material thickness of second layer:	1
Material type for second layer:	Amended 5 in/hr
Material thickness of third layer:	0.75
Material type for third layer:	GRAVEL
Infiltration On	
Infiltration rate:	0.025
Infiltration safety factor:	0.5
Total Volume Infiltrated (ac-ft.):	0
Total Volume Through Riser (ac-ft.):	0
Total Volume Through Facility (ac-ft.):	19.596
Percent Infiltrated:	0
Total Precip Applied to Facility:	0
Total Evap From Facility:	0
Underdrain used	
Underdrain Diameter (feet):	0.34
Orifice Diameter (in.):	4
Offset (in.):	6
Flow Through Underdrain (ac-ft.):	19.479
Total Outflow (ac-ft.):	19.596
Percent Through Underdrain:	99.41
Discharge Structure	
Riser Height:	1 ft.
Riser Diameter:	24 in.
Element Flows To:	
Outlet 1	Outlet 2

Landscape Swale Hydraulic Table

Stage(feet)	Area(ac.)	Volume(ac-ft.)	Discharge(cfs)	Infilt(cfs)
0.0000	0.1287	0.0000	0.0000	0.0000
0.0467	0.1286	0.0016	0.0000	0.0000
0.0934	0.1276	0.0033	0.0000	0.0000
0.1401	0.1266	0.0049	0.0000	0.0000
0.1868	0.1257	0.0066	0.0000	0.0000
0.2335	0.1247	0.0083	0.0000	0.0000
0.2802	0.1238	0.0100	0.0000	0.0000
0.3269	0.1229	0.0117	0.0000	0.0000
0.3736	0.1219	0.0135	0.0000	0.0000
0.4203	0.1210	0.0152	0.0000	0.0000
0.4670	0.1200	0.0170	0.0000	0.0011
0.5137	0.1191	0.0189	0.0000	0.0011
0.5604	0.1182	0.0207	0.0000	0.0011
0.6071	0.1173	0.0226	0.0000	0.0011
0.6538	0.1164	0.0245	0.0000	0.0011
0.7005	0.1154	0.0265	0.0000	0.0011
0.7473	0.1145	0.0284	0.0000	0.0011
0.7940	0.1136	0.0304	0.0000	0.0011
0.8407	0.1127	0.0324	0.0000	0.0011
0.8874	0.1118	0.0344	0.0000	0.0011
0.9341	0.1109	0.0364	0.0000	0.0011
0.9808	0.1100	0.0384	0.0000	0.0011

1.0275	0.1091	0.0404	0.0000	0.0011
1.0742	0.1083	0.0425	0.0000	0.0011
1.1209	0.1074	0.0446	0.0000	0.0011
1.1676	0.1065	0.0467	0.0000	0.0011
1.2143	0.1056	0.0488	0.0000	0.0011
1.2610	0.1047	0.0509	0.0000	0.0011
1.3077	0.1039	0.0531	0.0000	0.0011
1.3544	0.1030	0.0552	0.0000	0.0011
1.4011	0.1022	0.0574	0.0000	0.0011
1.4478	0.1013	0.0596	0.0000	0.0011
1.4945	0.1004	0.0619	0.0000	0.0011
1.5412	0.0996	0.0641	0.0000	0.0011
1.5879	0.0988	0.0663	0.0000	0.0011
1.6346	0.0979	0.0685	0.0000	0.0011
1.6813	0.0971	0.0708	0.0000	0.0011
1.7280	0.0962	0.0731	0.0000	0.0011
1.7747	0.0954	0.0754	0.0000	0.0011
1.8214	0.0946	0.0777	0.0000	0.0011
1.8681	0.0938	0.0800	0.0000	0.0011
1.9148	0.0929	0.0824	0.0000	0.0011
1.9615	0.0921	0.0848	0.0000	0.0011
2.0082	0.0913	0.0872	0.0000	0.0011
2.0549	0.0905	0.0896	0.0343	0.0011
2.1016	0.0897	0.0920	0.0757	0.0011
2.1484	0.0889	0.0944	0.1133	0.0011
2.1951	0.0881	0.0969	0.1460	0.0011
2.2418	0.0873	0.0994	0.1750	0.0011
2.2500	0.0865	0.0998	0.5706	0.0011

Landscape Swale Hydraulic Table

Stage(feet)	Area(ac.)	Volume(ac-ft.)	Discharge(cfs)	To Amended(cfs)	Infilt(cfs)
2.2500	0.1287	0.0998	0.0000	0.2053	0.0000
2.2967	0.1297	0.1059	0.0000	0.2053	0.0000
2.3434	0.1307	0.1119	0.0000	0.2437	0.0000
2.3901	0.1316	0.1181	0.0000	0.2629	0.0000
2.4368	0.1326	0.1242	0.0000	0.2821	0.0000
2.4835	0.1336	0.1304	0.0000	0.3013	0.0000
2.5302	0.1346	0.1367	0.0000	0.3204	0.0000
2.5769	0.1356	0.1430	0.0000	0.3396	0.0000
2.6236	0.1366	0.1494	0.0000	0.3588	0.0000
2.6703	0.1376	0.1558	0.0000	0.3780	0.0000
2.7170	0.1385	0.1622	0.0000	0.3972	0.0000
2.7637	0.1395	0.1687	0.0000	0.4163	0.0000
2.8104	0.1406	0.1753	0.0000	0.4355	0.0000
2.8571	0.1416	0.1818	0.0000	0.4547	0.0000
2.9038	0.1426	0.1885	0.0000	0.4739	0.0000
2.9505	0.1436	0.1952	0.0000	0.4931	0.0000
2.9973	0.1446	0.2019	0.0000	0.5122	0.0000
3.0440	0.1456	0.2087	0.0000	0.5314	0.0000
3.0907	0.1467	0.2155	0.0000	0.5506	0.0000
3.1374	0.1477	0.2224	0.0000	0.5698	0.0000
3.1841	0.1487	0.2293	0.0000	0.5890	0.0000
3.2308	0.1498	0.2363	0.0000	0.6082	0.0000
3.2775	0.1508	0.2433	0.0967	0.6273	0.0000
3.3242	0.1518	0.2503	0.4284	0.6465	0.0000
3.3709	0.1529	0.2575	0.8902	0.6657	0.0000
3.4176	0.1539	0.2646	1.4503	0.6849	0.0000
3.4643	0.1550	0.2718	2.0898	0.7041	0.0000

3.5110	0.1561	0.2791	2.7938	0.7232	0.0000
3.5577	0.1571	0.2864	3.5484	0.7424	0.0000
3.6044	0.1582	0.2938	4.3398	0.7616	0.0000
3.6511	0.1593	0.3012	5.1539	0.7808	0.0000
3.6978	0.1603	0.3087	5.9763	0.8000	0.0000
3.7445	0.1614	0.3162	6.7926	0.8191	0.0000
3.7912	0.1625	0.3237	7.5883	0.8383	0.0000
3.8379	0.1636	0.3313	8.3500	0.8575	0.0000
3.8846	0.1647	0.3390	9.0650	0.8767	0.0000
3.9313	0.1658	0.3467	9.7227	0.8959	0.0000
3.9780	0.1668	0.3545	10.315	0.9150	0.0000
4.0247	0.1679	0.3623	10.836	0.9342	0.0000
4.0714	0.1690	0.3702	11.285	0.9534	0.0000
4.1181	0.1702	0.3781	11.664	0.9726	0.0000
4.1648	0.1713	0.3861	11.983	0.9918	0.0000
4.2115	0.1724	0.3941	12.257	1.0110	0.0000
4.2500	0.1733	0.4008	12.650	1.0267	0.0000

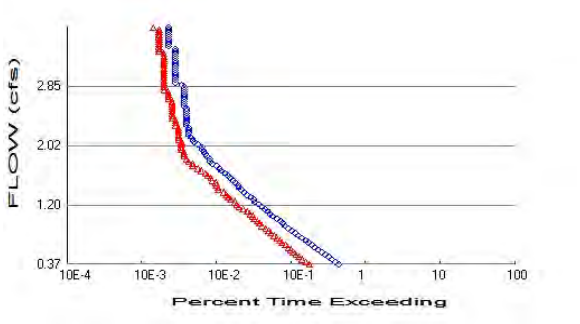
Surface retention 3

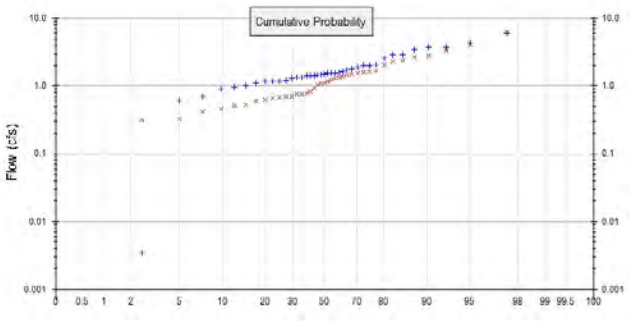
Element Flows To:

Outlet 1	Outlet 2
	Bioretention 3

Analysis Results

POC 1





\+ Pre-Project x Mitigated

Pre-Project Landuse Totals for POC #1
Total Pervious Area: 4.58
Total Impervious Area: 0

Mitigated Landuse Totals for POC #1
Total Pervious Area: 1.05
Total Impervious Area: 2.84

Flow Frequency Method: Log Pearson Type III 17B

Flow Frequency Return Periods for Pre-Project. POC #1

Return Period	Flow(cfs)
2 year	1.476649
5 year	2.43963
10 year	3.674646
25 year	4.667234

Flow Frequency Return Periods for Mitigated. POC #1

Return Period	Flow(cfs)
2 year	1.061884
5 year	1.999068
10 year	2.779299
25 year	4.530804

Annual Peaks

Annual Peaks for Pre-Project and Mitigated. POC #1

Year	Pre-Project	Mitigated
1965	1.520	1.297
1966	0.615	0.686
1967	1.548	1.590
1968	1.010	0.754
1969	1.475	1.026
1970	1.360	1.360
1971	1.530	1.099
1972	0.942	0.533
1973	2.878	1.660
1974	2.076	1.170
1975	1.589	0.705
1976	0.003	0.302
1977	0.002	0.314
1978	3.760	2.795

1979	1.161	0.514
1980	1.615	0.458
1981	1.479	0.779
1982	2.006	2.083
1983	2.902	2.280
1984	1.540	1.445
1985	1.414	0.702
1986	4.274	4.059
1987	1.182	0.834
1988	1.311	1.379
1989	1.867	0.422
1990	1.161	0.614
1991	1.348	1.247
1992	1.759	1.699
1993	1.434	0.934
1994	0.692	0.767
1995	6.065	6.208
1996	3.714	2.386
1997	3.388	3.322
1998	2.542	2.665
1999	0.899	0.324
2000	1.731	1.508
2001	1.156	0.620
2002	1.105	0.653
2003	1.426	1.105
2004	2.020	1.561

Ranked Annual Peaks

Ranked Annual Peaks for Pre-Project and Mitigated. POC #1

Rank	Pre-Project	Mitigated
1	6.0647	6.2080
2	4.2742	4.0591
3	3.7601	3.3217
4	3.7145	2.7952
5	3.3878	2.6645
6	2.9021	2.3858
7	2.8782	2.2797
8	2.5419	2.0834
9	2.0759	1.6993
10	2.0196	1.6605
11	2.0056	1.5901
12	1.8672	1.5612
13	1.7590	1.5085
14	1.7306	1.4453
15	1.6151	1.3792
16	1.5892	1.3599
17	1.5484	1.2967
18	1.5401	1.2471
19	1.5300	1.1697
20	1.5195	1.1052
21	1.4786	1.0991
22	1.4748	1.0264
23	1.4337	0.9344
24	1.4263	0.8344
25	1.4144	0.7788
26	1.3598	0.7673
27	1.3478	0.7543
28	1.3111	0.7046

29	1.1818	0.7019
30	1.1614	0.6858
31	1.1613	0.6527
32	1.1560	0.6201
33	1.1048	0.6143
34	1.0098	0.5328
35	0.9425	0.5144
36	0.8992	0.4576
37	0.6918	0.4223
38	0.6152	0.3235
39	0.0034	0.3135
40	0.0018	0.3017

Duration Flows

The Facility PASSED

Flow(cfs)	Predev	Mit	Percentage	Pass/Fail
0.3692	1534	624	40	Pass
0.4026	1390	555	39	Pass
0.4359	1251	493	39	Pass
0.4693	1132	447	39	Pass
0.5027	1024	411	40	Pass
0.5361	909	380	41	Pass
0.5695	813	352	43	Pass
0.6029	731	325	44	Pass
0.6363	666	297	44	Pass
0.6697	601	267	44	Pass
0.7030	554	247	44	Pass
0.7364	494	229	46	Pass
0.7698	449	209	46	Pass
0.8032	403	188	46	Pass
0.8366	364	178	48	Pass
0.8700	328	163	49	Pass
0.9034	295	145	49	Pass
0.9368	275	134	48	Pass
0.9702	254	125	49	Pass
1.0035	228	114	50	Pass
1.0369	202	108	53	Pass
1.0703	183	100	54	Pass
1.1037	171	91	53	Pass
1.1371	157	80	50	Pass
1.1705	145	71	48	Pass
1.2039	131	66	50	Pass
1.2373	116	62	53	Pass
1.2707	112	55	49	Pass
1.3040	102	51	50	Pass
1.3374	91	48	52	Pass
1.3708	83	44	53	Pass
1.4042	77	37	48	Pass
1.4376	70	37	52	Pass
1.4710	68	35	51	Pass
1.5044	63	35	55	Pass
1.5378	59	31	52	Pass
1.5712	54	30	55	Pass
1.6045	50	27	54	Pass
1.6379	46	25	54	Pass
1.6713	41	22	53	Pass
1.7047	39	20	51	Pass
1.7381	36	17	47	Pass
1.7715	31	17	54	Pass
1.8049	29	15	51	Pass
1.8383	29	14	48	Pass
1.8717	26	13	50	Pass
1.9050	25	13	52	Pass
1.9384	24	13	54	Pass
1.9718	23	12	52	Pass
2.0052	23	12	52	Pass
2.0386	20	12	60	Pass
2.0720	18	12	66	Pass
2.1054	17	11	64	Pass

2.1388	16	11	68	Pass
2.1722	15	11	73	Pass
2.2055	15	11	73	Pass
2.2389	15	11	73	Pass
2.2723	15	11	73	Pass
2.3057	14	10	71	Pass
2.3391	14	10	71	Pass
2.3725	14	10	71	Pass
2.4059	14	9	64	Pass
2.4393	14	9	64	Pass
2.4727	14	9	64	Pass
2.5060	14	9	64	Pass
2.5394	14	9	64	Pass
2.5728	13	9	69	Pass
2.6062	13	9	69	Pass
2.6396	13	9	69	Pass
2.6730	13	8	61	Pass
2.7064	13	8	61	Pass
2.7398	13	8	61	Pass
2.7732	13	8	61	Pass
2.8065	13	7	53	Pass
2.8399	13	7	53	Pass
2.8733	12	7	58	Pass
2.9067	10	7	70	Pass
2.9401	10	7	70	Pass
2.9735	10	7	70	Pass
3.0069	10	7	70	Pass
3.0403	10	7	70	Pass
3.0736	10	7	70	Pass
3.1070	10	7	70	Pass
3.1404	10	7	70	Pass
3.1738	10	7	70	Pass
3.2072	10	7	70	Pass
3.2406	10	7	70	Pass
3.2740	10	7	70	Pass
3.3074	10	7	70	Pass
3.3408	10	6	60	Pass
3.3741	10	6	60	Pass
3.4075	8	6	75	Pass
3.4409	8	6	75	Pass
3.4743	8	6	75	Pass
3.5077	8	6	75	Pass
3.5411	8	6	75	Pass
3.5745	8	6	75	Pass
3.6079	8	6	75	Pass
3.6413	8	6	75	Pass
3.6746	8	5	62	Pass

Water Quality

POC 2

POC #2 was not reported because POC must exist in both scenarios and both scenarios must have been run.

POC 3

POC #3 was not reported because POC must exist in both scenarios and both scenarios must have been run.

Model Default Modifications

Total of 0 changes have been made.

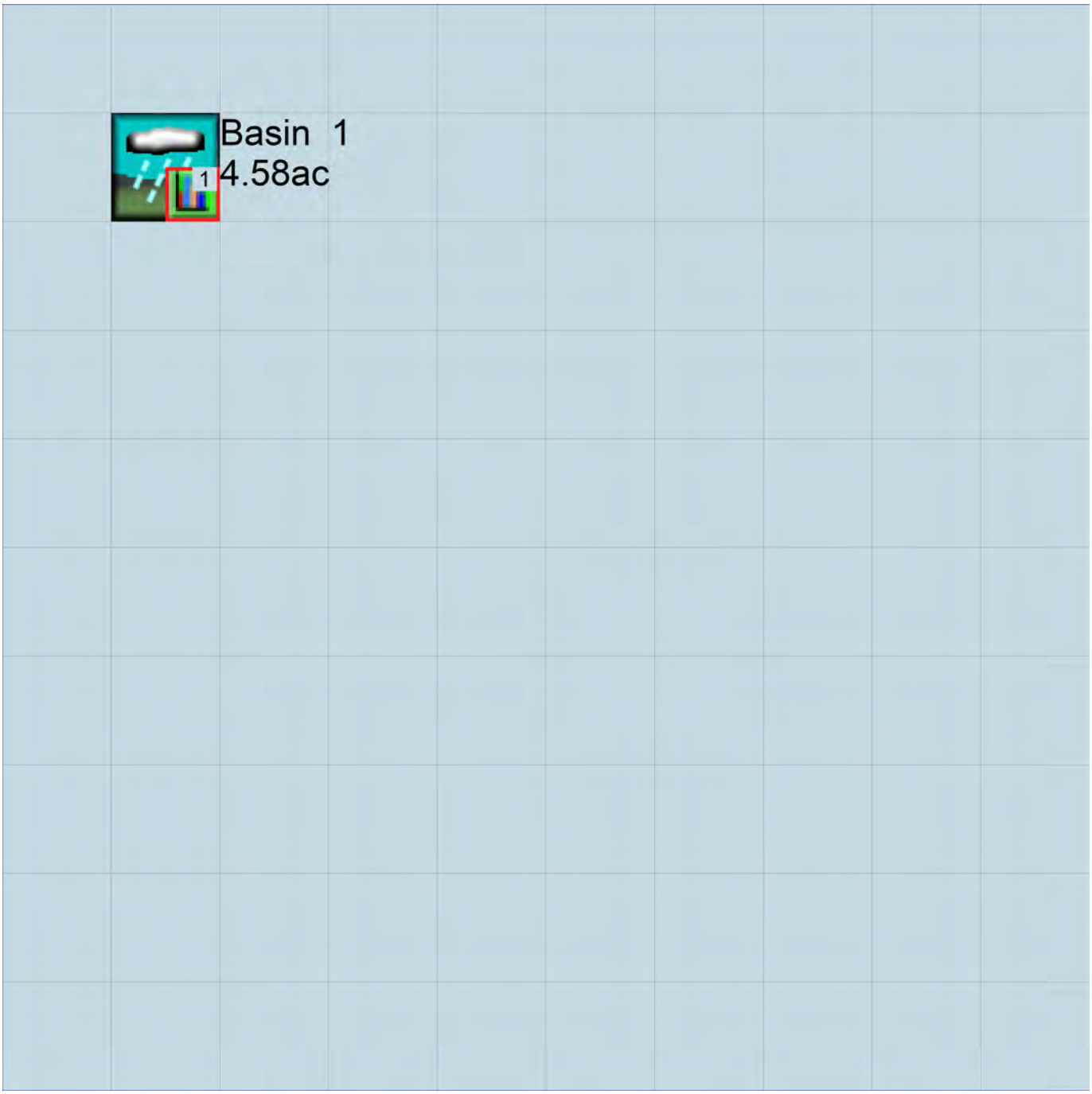
PERLND Changes

No PERLND changes have been made.

IMPLND Changes

No IMPLND changes have been made.

Appendix
Pre-Project Schematic



Mitigated Schematic

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