

REC Job Number 17067

July 25, 2014

Revised: June 2, 2016

July 8, 2016

August 1, 2016



RICK ENGINEERING COMPANY



rickengineering.com

Project Specific Water Quality Management Plan

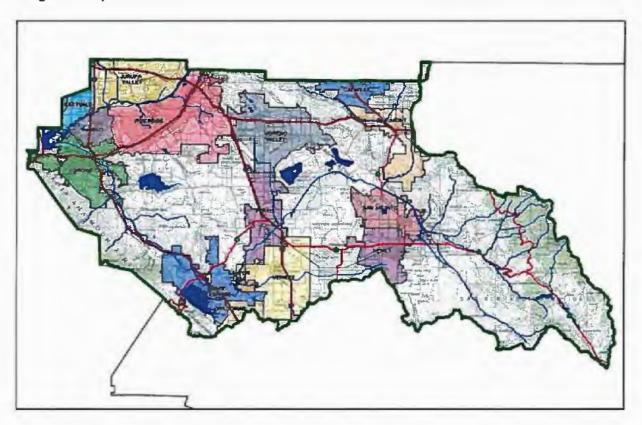
Project Title: Canyon Springs Healthcare Center

A PPROVED

Development No:

DEPT, OF PUBLIC WORKS

Design Review/Case No: P14-0294



□ Preliminary
 □ Final

Original Date Prepared: July 25, 2014

Revision Date(s): June 2, 2016

July 8, 2016; August 1, 2016

Prepared for Compliance with Regional Boord Order No. **R8-2010-0033**

Prepared for:

Canyon Springs Marketplace Corporation c/o TDA Investment Group 2025 Pioneer Court San Mateo, California 94403 Michael Morris

Prepared by:

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OWNER'S CERTIFICATION

This Project-Specific Water Quality Management Plan (WQMP) has been prepared for TDA Investment Group by Rick Engineering Company for the Canyon Springs Healthcare Center project.

This WQMP is intended to comply with the requirements for the City of Riverside for Design Review, Planning Case No. P14-0294 which includes the requirement for the preparation and implementation of a Project-Specific WQMP.

The undersigned, while owning the property/project described in the preceding paragraph, shall be responsible for the implementation and funding of this WQMP and will ensure that this WQMP is amended as appropriate to reflect up-to-date conditions on the site. In addition, the property owner accepts responsibility for interim operation and maintenance of Stormwater BMPs until such time as this responsibility is formally transferred to a subsequent owner. This WQMP will be reviewed with the facility operator, facility supervisors, employees, tenants, maintenance and service contractors, or any other party (or parties) having responsibility for implementing portions of this WQMP. At least one copy of this WQMP will be maintained at the project site or project office in perpetuity. The undersigned is authorized to certify and to approve implementation of this WQMP. The undersigned is aware that implementation of this WQMP is enforceable under City of Riverside Water Quality Ordinance 14.12.315.

"I, the undersigned, certify under penalty of law that the provisions of this WQMP have been reviewed and accepted and that the WQMP will be transferred to future successors in interest."

Owner's Signature

Paula Purcel

Owner's Printed Name

9110/16

Date

Owner's Title/Position

PREPARER'S CERTIFICATION

No. C 63285 Exp. 6/30/2018

"The selection, sizing and design of stormwater treatment and other stormwater quality and quantity control measures in this plan meet the requirements of Regional Water Quality Control Board Order No. R8-2010-0033 and any subsequent amendments thereto."

Preparer's Signature

Preparer's Printed Name

Preparer's Licensus

Date

Amaica

Preparer's Title/Position

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Section A: Project and Site Information

The project site is located on the existing vacant lot at the intersection of the 60 and 215 freeways. The site will be utilized as the new Canyon Springs Healthcare Center and will be a phased project broken up into 6 different parts.

In the pre-project condition, stormwater sheet flows in a southerly direction towards an existing onsite basin. This basin currently accounts for all HCOC volume generated by phases 2 and 6.

Area 1 will be a Senior Housing area, Area 2 will be assisted living, skilled nursing facility and independent living areas, Area 3 will be a hospital; Area 4 will be medical office buildings, and Area 6 will be the surgical center.

Each phase will be treated as one overall area, with all stormwater being detained onsite.

Area 1 will utilize bioretention areas in the landscaping surrounding the parking lot and senior housing areas, with additional bioretention areas proposed to store the HCOC volume. Stormwater from the building will be conveyed via roof drains and outlet to the parking lots where it will sheet flow into the bioretention areas. Runoff from the parking and drive aisles will sheet flow and enter into the bioretention areas via curb cuts.

Area 2 will utilize bioretention areas in the central landscaped area as well as the perimeter of the parking lot. Stormwater from the building will be conveyed via roof drains and outlet to the parking lots where it will sheet flow into the bioretention areas. Runoff from the parking and drive aisles will sheet flow and enter into the bioretention areas via curb cuts.

Area 3 will utilize bioretention areas in the landscaping surrounding the hospital, with additional bioretention areas proposed to store the HCOC volume. Stormwater from the building will be conveyed via roof drains and outlet to the parking lots where it will sheet flow into the bioretention areas. Runoff from the parking and drive aisles will sheet flow and enter into the bioretention areas via curb cuts.

Area 4 will utilize bioretention areas along the perimeter of the medical office buildings, with additional bioretention areas proposed to store the HCOC volume. Stormwater from the building will be conveyed via roof drains and outlet to the parking lots where it will sheet flow into the bioretention areas. Runoff from the parking and drive aisles will sheet flow and enter into the bioretention areas via curb cuts.

Area 5 will also utilize bioretention areas along the perimeter of the parking lot, with additional bioretention areas proposed to store the HCOC volume. Stormwater from the building will be conveyed via roof drains and outlet to the parking lots where it will sheet flow into the bioretention areas. Runoff from the parking and drive aisles will sheet flow and enter into the bioretention areas via curb cuts.

Area 6 will utilize 2 areas of permeable pavers in the parking lot where runoff will sheet flow and infiltrate. Any additional runoff will be stored in the proposed bioretention swale. All stormwater will sheet flow across the parking lot and into the proposed permeable pavers.

PROJECT INFORMATION			-
Type of Project:	Commercial		
Ward Area:	2		
Community Name:	Sycamore Canyon Business Park/Canyon Springs		
Development Name:	Canyon Springs Healthcare Center		
PROJECT LOCATION			
Latitude & Longitude (DMS):	Lat 33°56'04"N, Long 117°17'00"W		
Project Watershed and Sub-V	Natershed: Santa Ana River, Riverside Hydrologic Sub-area		
291-440-042, 291-440-043	-090-039, 291-090-040, 291-090-041, 291-440-018, 29 ⁻ 3, 291-440-044, 291-440-045, 291-440-047, 291-440-048 0-053, 291-450-054, 291-450-055, 291-450-056, 291-450-0	291-44	
Map Book and Page No.: PM	128/091-103		
PROJECT CHARACTERISTICS			
Proposed or Potential Land U	lse(s)	Comme	ercial/Parking Lot
Proposed or Potential SIC Cod	de(s)	8011, 8	051, 8059
Area of Impervious Project Fo	potprint (SF)	1,464,8	31
Total Area of <u>proposed</u> Imper	rvious Surfaces within the Project Limits (SF)/or Replacement	1,464,8	31
Does the project consist of of	ffsite road improvements?	Y	⊠N
Does the project propose to	construct unpaved roads?	Y	⊠N
Is the project part of a larger	common plan of development (phased project)?	⊠ Y	□ N
EXISTING SITE CHARACTERISTICS			
Total area of existing Impervi	ous Surfaces within the project limits (SF)	0	
Is the project located within a	any MSHCP Criteria Cell?	Y	⊠N
If so, identify the Cell number	r:	N/A	1.3
Are there any natural hydroic	ogic features on the project site?	□ Y	⊠ N
Is a Geotechnical Report atta	ched?		⊠N
If no Geotech. Report, list the	e NRCS soils type(s) present on the site (A, B, C and/or D)	N/A	
What is the Water Quality De	esign Storm Depth for the project?	0.63	

A.1 Maps and Site Plans

Appendix 1 includes a map of the local vicinity and existing site. In addition, WQMP Site Plan, located in Appendix 1, includes the following:

- Drainage Management Areas
- Proposed Structural BMPs
- Drainage Path
- Drainage Infrastructure, Inlets, Overflows
- Source Control BMPs
- Buildings, Roof Lines, Downspouts
- Impervious Surfaces
- Standard Labeling

Identify Receiving Waters

In order of upstream to downstream, the receiving waters that the project site is tributary to are as follows. A map of the receiving waters is included in Appendix 1.

Table A.1 Identification of Receiving Waters

Receiving Waters	EPA Approved 303(d) List Impairments	Designated Beneficial Uses	Proximity to RARE Beneficial Use
Santa Ana River Reach 3	Metals and Pathogens	AGR, GWR, MUN*, RARE, REC1, REC2, SPWN, WARM, WILD	Approximately 7 miles from site. A RARE water body.
Santa Ana River Reach 2	Pathogens	GWR, AGR, REC1, REC2, RARE, MUN*, WILD, WARM	Approximately 19 miles from site. A RARE water body.
Santa Ana River Reach 1	N/A	REC1, REC2, WILD, WARM, MUN	Approximately 36 miles from site. Approximately 9.3 miles from RARE
Tidal Prism-Santa Ana River	N/A	MUN*, REC1, REC2, COMM, WILD, RARE, MAR	Approximately 42 miles from site. A RARE water body.
Pacific Ocean	N/A	N/A	Approximately 44 miles from site.

A.2 Additional Permits/Approvals required for the Project:

Table A.2 Other Applicable Permits

Agency	Permit Re	quired
State Department of Fish and Game, 1602 Streambed Alteration Agreement	ΠА	⊠N
State Water Resources Control Board, Clean Water Act (CWA) Section 401 Water Quality Cert.	ΠА	⊠N
US Army Corps of Engineers, CWA Section 404 Permit	ΠΥ	⊠N
US Fish and Wildlife, Endangered Species Act Section 7 Biological Opinion	□ Y	⊠N
Statewide Construction General Permit Coverage	×	Пи
Statewide Industrial General Permit Coverage	□ Y	×Ν
Western Riverside MSHCP Consistency Approval (e.g., JPR, DBESP)	☐ Y	⊠N
Other (please list in the space below as required) City of Riverside Conditional Use Permit City of Riverside Design Review City of Riverside Building Permit City of Riverside Grading Permit City of Riverside Construction Permit	⊠Y ⊠Y ⊠Y ⊠Y	

if yes is answered to any of the questions above, the Co-Permittee may require proof of approval/coverage from those agencies as applicable including documentation of any associated requirements that may affect this Project-Specific WQMP.

Section B: Optimize Site Utilization (LID Principles)

Site Optimization

Did you identify and preserve existing drainage patterns? If so, how? If not, why?

Yes, all existing drainage patterns have been preserved to the greatest extent possible.

Did you identify and protect existing vegetation? If so, how? If not, why?

The site has already been mass graded therefore no vegetation is existing on site. The parkway surrounding the site is currently landscaped and will be protected in place.

Did you identify and preserve natural infiltration capacity? If so, how? If not, why?

No, geological studies have determined the existing infiltration rates to not be favorable for promoting infiltration.

Did you identify and minimize impervious area? If so, how? If not, why?

Yes, driveway and walkway widths have been designed at the minimum standard per the municipal ordinance.

Did you identify and disperse runoff to adjacent pervious areas? If so, how? If not, why?

Yes, runoff from this site will disperse to landscaping and bio-retention areas when possible. The project will canvey all overflow runoff to the existing detention basin far the Assisted Living Site and the Surgical Center.

Section C: Delineate Drainage Management Areas (DMAs)

Table C.1 DMA Classifications

DMA Name or ID	Surface Type(s)	Area (Sq. Ft.)	DMA Type
B1-1	Ornamental Landscape	4025	(B)
B1-2	Ornamental Landscape	15093	(B)
B1-3	Ornamental Landscape	10246	(B)
B1-4	Ornamental Landscape	17001	(B)
D1-1	Roof	20982	(D)
D1-2	Roof	49280	(D)
D1-3	Roof	4920	(D)
D1-4	Concrete/Asphalt	27030	(D)
D1-5	Roof	33289	(D)
D1-6	Ornamental Landscape	53188	(D)
D1-7	Concrete/Asphalt	14455	(D)
D1-8	Ornamental Landscape	11648	(D)
D1-9	Roof	2500	(D)
D1-10	Roof	13744	(D)
D1-11	Ornamental Landscape	77622	(D)
D1-12	Concrete/Asphalt	12935	(D)
D1-13	Ornamental Landscape	18056	(D)
D1-14	Concrete/Asphalt	14968	(D)
D1-15	Ornamental Landscape	24254	(D)

BRS1-1	Ornamental Landscape	4941	(D)
BR\$1-2	Ornamental Landscape	2088	(D)
BR\$1-3	Ornamental Landscape	1187	(D)
BRS1-4	Ornamental Landscape	480	(D)
BRS1-5	Ornamental Landscape	1290	(D)
BR\$1-6	Ornamental Landscape	974	(D)
BRS1-7	Ornamental Landscape	675	(D)
HYDRO:BRS1-1	Ornamental Landscape	6978	(D)
HYDRO:BRS1-2	Ornamental Landscape	11467	(D)

¹Reference Table 2-1 in the WQMP Guidance Document to populate this column

Area 2

DMA Name or ID	Surface Type(s)	Area (Sq. Ft.)	DMA Type
B2-1	Ornamental Landscape	14735	(B)
B2-2	Ornamental Landscape	116946	(B)
B2-3	Ornamental Landscape	2474	(B)
B2-4	Ornamental Landscape	10344	(B)
C2-1	Roof	3945	(C)
C2-2	Roof	37444	(C)
D2-1	Concrete/Asphalt	52295	(D)
D2-2	Ornamental Landscape	16132	(D)
D2-3	Roofs	29062	(D)
D2-4	Concrete/Asphalt	7715	(D)
D2-5	Concrete/Asphalt	14218	(D)
D2-6	Concrete/Asphalt	47218	(D)
D2-7	Ornamental Landscape	12828	(D)
D2-8	Ornamental Landscape	14043	(D)
D2-9	Roofs	39380	(D)
BRS2-1	Ornamental Landscape	3758	(D)
BRS2-2	Ornamental Landscape	1323	(D)
BRS2-3	Ornamental Landscape	1500	(D)
BRS2-4	Ornamental Landscape	1408	(D)

Reference Table 2-1 in the WQMP Guidance Document to populate this column

Area 3

DMA Name or ID	Surface Type(s)	Area (Sq. Ft.)	DMA Type
D3-1	Roofs	143612	(D)
D3-2	Concrete/Asphalt	37577	(D)
D3-3	Ornamental Landscape	39224	(D)
D3-4	Roofs	1925	(D)
D3-5	Roof	28275	(D)
D3-6	Roof	37500	(D)
D3-7	Concrete/Asphalt	40415	(D)
D3-8	Concrete/Asphalt	45827	(D)
D3-9	Concrete/Asphalt	16353	(D)
D3-10	Concrete/Asphalt	42080	(D)
D3-11	Concrete/Asphalt	37156	(D)
BRS3-1	Ornamental Landscape	5563	(D)
BRS3-2	Ornamental Landscape	1144	(D)
BRS3-3	Ornamental Landscape	2339	(D)
BRS3-4	Ornamental Landscape	1565	(D)
BRS3-5	Ornamental Landscape	4739	(D)
BRS3-6	Ornamental Landscape	7705	(D)
HYDRO: BRS3-1	Ornamental Landscape	6099	(D)

Reference Table 2-1 in the WQMP Guidance Document to populate this column

DMA Name or ID	Surface Type(s)	Area (Sq. Ft.)	DMA Type
B4-1	Ornamental Landscape	3,793	(B)
B4-2	Ornamental Landscape	5,650	(B)
B4-3	Ornamental Landscape	3,850	(B)
B4-4	Ornamental Landscape	3,850	(B)
B4-5	Ornamental Landscape	13,296	(B)
D4-1	Concrete/Asphalt	13,501	(D)
D4-2	Ornamental Landscape	8,945	(D)
D4-3	Concrete/Asphalt	24,764	(D)
D4-4	Concrete/Asphalt	24,764	(D)
D4-5	Concrete/Asphalt	24,382	(D)
D4-6	Ornamental Landscape	5,830	(D)
D4-7	Roof	22,700	(D)
D4-8	Roof	22,700	(D)
D4-9	Roof	65,043	(D)
D4-10	Concrete/Asphalt	16,396	(D)
D4-11	Concrete/Asphalt	10,328	(D)
D4-13	Concrete/Asphalt	6,697	(D)
D4-14	Concrete/Asphalt	11,453	(D)
D4-15	Concrete/Asphalt	9,657	(D)
D4-16	Concrete/Asphalt	8,155	(D)
D4-17	Concrete/Asphalt	6,383	(D)
D4-18	Concrete/Asphalt	6,827	(D)
D4-19	Ornamental Landscape	20,497	(D)
BRS4-1	Ornamental Landscape	3,174	(D)

BRS4-2	Ornamental Landscape	900	(D)
BRS4-3	Ornamental Landscape	900	(D)
BRS4-4	Ornamental Landscape	1,558	(D)
BRS4-5	Ornamental Landscape	6,642	(D)
BRS4-6	Ornamental Landscape	2,818	(D)
BRS4-7	Ornamental Landscape	540	(D)
BRS4-8	Ornamental Landscape	540	(D)
BRS4-9	Ornamental Landscape	412	(D)
BRS4-10	Ornamental Landscape	706	(D)
BRS4-11	Ornamental Landscape	3,954	(D)
BRS4-12	Ornamental Landscape	632	(D)

¹Reference Table 2-1 in the WQMP Guidance Document to populate this column

DMA Name or ID	Surface Type(s)	Area (Sq. Ft.)	DMA Type
D5-1	Concrete/Asphalt	19,843	(D)
D5-2	Concrete/Asphalt	51,185	(D)
D5-3	Concrete/Asphalt	21,605	(D)
D5-4	Roof	23,550	(D)
D5-5	Concrete/Asphalt	49,229	(D)
D5-6	Ornamental Landscape	5,878	(D)
BRS5-1	Ornamental Landscape	3,480	(D)
BRS5-2	Ornamental Landscape	1,533	(D)
BR\$5-3	Ornamental Landscape	1,400	(D)

¹Reference Table 2-1 in the WQMP Guidance Document to populate this calumn

Area 6

DMA Name or ID	Surface Type(s)	Area (Sq. Ft.)	DMA Type		
D6-1	Concrete/Asphalt	21,894	(D)		
D6-2	Roof	20,160	(D)		
D6-3	Ornamental Landscape	9,609	(D)		
D6-4	Ornamental Landscape	6,022	(D)		
D6-5	Roof	3,606	(D)		
D6-6	Ornamental Landscape	21,643	(D)		
D6-7	Concrete/Asphalt 11,645		(D)		
D6-8	Concrete/Asphalt	64,944	(D)		
D6-9	Ornamental Landscape	2,964	(D)		
D6-10	Ornamental Landscape	4,364	(D)		
D6-11	Ornamental Landscape	7,344	(D)		
BRS6-1	Ornamental Landscape	585	(D)		
PP6-1	Permeable Paving w/ Sand Filled Gap	5,313	(D)		
PP6-2	Permeable Paving w/ Sand Filled Gap	9,610	(D)		

¹Reference Table 2-1 in the WQMP Guidance Document to populate this column

Table C.2 Type 'B', Self-Retaining Areas

Self-Retai	ning Area			Type 'C' DMAs that are draining to the Self-Retaini Area							
	Post-project surface type	Area (square feet)	Storm Depth (inches)	DMA Name	[C] from C.4 =	D	equired epth (inches)	Retention			
B1-1	Ornamental Landscape	4025	0.62								
B1-2	Ornamental Landscape	12718	0.62								
B1-3	Ornamental Landscape	10246	0.62								

Self-Retai	ning Area			Type 'C' DMAs that are draining to the Self-Retaining Area							
DMA Name/ ID	Post-project surface type	Area (square feet) [A]	Storm Depth (inches)	DMA Name	(C) from Table C.4 = (C)	eRequired Retention Depth (inches)					
B2-1	Ornamental Landscape	14735	0.62	C2-1	3945	0.79					
B2-2	Ornamental Landscape	116946	0.62	C2-2	37444	0.82					
B2-3	Ornamental Landscape	2474	0.62			0.62					
B2-4	Ornamental Landscape	10344	0.62			0.62					

Area 4

Self-Retai	Self-Retaining Area				Type 'C' DMAs that are draining to the Self-Retainin Area						
DMA Name/ID	Post-project surface type	Area (square feet)	Storm Depth (inches)	DMA Name /			Required Depth (inches)	Retention			
					[C]		[D]				
B4-1	Ornamental Landscape	3,793	0.62								
B4-2	Ornamental Landscape	5,650	0.62								
B4-3	Ornamental Landscape	3,850	0.62								
B4-4	Ornamental Landscape	3,850	0.62								
B4-5	Ornamental Landscape	6,642	0.62								

$$[D] = [B] + \frac{\lfloor B \rfloor \cdot [C]}{[A]}$$

Table C.3 Type 'C', Areas that Drain to Self-Retaining Areas

DMA name /ID [D]		Receiving Self-F	DMA						
	feet) Ratio				st-project face type		AA Name/ ID		
C2-1 3945 Roof 1 3,945 B2-1 14735	/ID [D] [C]/[C	DMA name /ID	$[C] = [A] \times [B]$	(B)	Po.	[A]	Š		
	14735 3.73	B2-1	3,945	1	Roof	3945	C2-1		
C2-2 37444 Roof 1 37,444 B2-2 116946	116946 3.12	B2-2	37,444	1	Roof	37444	C2-2		

Table C.4 Type 'D', Areas Draining to BMPs

DMA Name or ID	BMP Name or ID
D1-1	BRS1-1
D1-2	BRS1-1
D1-3	BRS1-1
D1-4	BRS1-2
D1-5	BRS1-2
D1-5	BRS1-2
D1-7	BRS1-3
D1-8	BRS1-3
D1-9	BRS1-3
D1-10	BRS1-4
D1-11	BRS1-4
D1-12	BR\$1-5
D1-13	BRS1-6
D1-14	BRS1-7
D1-15	BRS1-5

DMA Name or ID	BMP Name or ID
D2-1	BRS2-1
D2-2	BRS2-1
D2-3	BRS2-2
D2-4	BRS2-3
D2-5	BRS2-2
D2-6	BRS2-4
D2-7	BRS2-4
D2-8	BRS2-3
D2-9	BRS2-3

DMA Name or ID	BMP Name or ID
D3-1	BRS3-1
D3-2	BRS3-1
D3-3	BR53-1
D3-4	BRS3-1
D3-5	BRS3-2
D3-6	BRS3-3
D3-7	BRS3-3
D3-8	BRS3-4
D3-9	BRS3-5
D3-10	BRS3-6
D3-11	BRS3-6

BMP Name or ID
BRS4-1
BRS4-1
BRS4-2
BRS4-3
BRS4-4
BRS4-4
BRS4-5
BRS4-11
BRS4-6
BRS4-6
BRS4-7
BRS4-9
BRS4-1
BRS4-10
BRS4-12
BRS4-8
BRS4-10
BRS4-5

DMA Name or ID	BMP Name or ID
D5-1	BRS5-1
D5-2	BRS5-1
D5-3	BRS5-3
D5-4	BRS5-3
D5-5	BRS5-2
D5-6	BRS5-2

DMA Name or ID	BMP Name or ID
D6-1	PP6-1
D6-2	PP6-1
D6-3	PP6-1
D6-4	PP6-1
D6-5	BRS6-1
D6-6	BRS6-1
D6-7	BRS6-1
D6-8	PP6-2
D6-9	PP6-2
D6-10	PP6-2
D6-11	PP6-2

Section D: Implement LID BMPs

D.1 Infiltration Applicability

Is there	an	approved	downstream	'Highest	and	Best	Use'	for	storm	water	runoff	(see	discussion	in
Chapter	2.4.	4 of the W	QMP Guidanc	e Docum	ent fo	or fur	ther d	letai	ls)?	Y	ΜM			

Geotechnical Report

A Geotechnical Report or Phase I Environmental Site Assessment may be required by the Copermittee to confirm present and past site characteristics that may affect the use of Infiltration BMPs. In addition, the Co-Permittee, at their discretion, may not require a geotechnical report for small projects as described in Chapter 2 of the WQMP Guidance Document. If a geotechnical report has been prepared, include it in Appendix 3. In addition, if a Phase I Environmental Site Assessment has been prepared, include it in Appendix 4.

Is this project classified as a small project consistent with the requirements of Chapter 2 of the WQMP Guidance Document?

Y

N

Infiltration Feasibility

Table D.1 Infiltration Feasibility

Does the project site	YES	NO
have any DMAs with a seasonal high groundwater mark shallower than 10 feet?		X
If Yes, list affected DMAs:		
have any DMAs located within 100 feet of a water supply well?	1	×
If Yes, list affected DMAs:		
have any areas identified by the geotechnical report as posing a public safety risk where infiltration of stormwater could have a negative impact?		×
If Yes, list affected DMAs:		
have measured in-situ infiltration rates of less than 1.6 inches / hour?	Ж	
If Yes, list affected DMAs: All DMAs affected		
have significant cut and/or fill conditions that would preclude in-situ testing of infiltration rates at the final infiltration surface?		*
If Yes, list affected DMAs:		
geotechnical report identify other site-specific factors that would preclude effective and safe infiltration?	13	
Describe here: Bedrock is extremely shallow; all BMPs will have subdrains to maintain a 48-hour drawdown		
tìme		

D.2 Harvest and Use Assessment

Please check what applies:

\square Reclaimed water will be used for the non-potable water demands for the project.
□ Downstream water rights may be impacted by Harvest and Use as approved by the Regional Board (verify with the Copermittee).
☐ The Design Capture Volume will be addressed using Infiltration Only BMPs. In such a case,
Harvest and Use 8MPs are still encouraged, but it would not be required if the Design Capture Volume will be infiltrated or evapotranspired.

D.3 Bioretention and Biotreatment Assessment

Other LID Bioretention and Biotreatment BMPs as described in Chapter 2.4.7 of the WQMP Guidance Document are feasible on nearly all development sites with sufficient advance planning.

Select one of the following:

☑ LID Bioretention/Biotreatment BMPs will be used for some or all DMAs of the project as noted below in Section D.4

 \square A site-specific analysis demonstrating the technical infeasibility of all LID BMPs has been performed and is included in Appendix 5.

☐ None of the above

D.4 Feasibility Assessment Summaries

Table D.2 LID Prioritization Summary Matrix

	LID BMP Hierarchy							
DMA Name/ID	1. Infiltration	2. Harvest and use	3. Bioretention	4. Biotreatment	(Alternative Compliance)			
D1-1								
D1-2								
D1-3			\boxtimes					
D1-4			X					
D1-5			X					
D1-6			X					
D1-7								
D1-8			\boxtimes					
D1-9								
D1-10								
D1-11								
D1-12								
D1-13								
D1-14								
D1-15								

	LID BMP Hierarchy						
DMA Name/ID	5. Infiltration	6. Harvest and use	7. Bioretention	8. Biotreatment	(Alternative Compliance)		
D2-1					- 1 -		
D2-2							
D2-3					T-I i		
D2-4							
D2-5				- H F - H			
D2-6			\boxtimes				
D2-7							
D2-8			\boxtimes				
D2-9			X				

	LID BMP Hierarchy						
DMA Name/ID	9. Infiltration	10. Harvest and use	11. Bioretention	12. Biotreatment	(Alternative Compliance)		
D3-1					9 9 7		
D3-2							
D3-3			X				
D3-4							
D3-5							
D3-6			X				
D3-7			X				
D3-8			\boxtimes				
D3-9	1 1						
D3-10			X				
D3-11							

Area 4

		LID BMP I	Hierarchy		No LID
DMA Name/ID	13. Infiltration	14. Harvest and use	15. Bioretention	16. Biotreatment	(Alternative Compliance)
D4-1					
D4-2					
D4-3					
D4-4			X		
D4-5					
D4-6					
D4-7					
D4-8					
D4-9					
D4-10					
D4-11			\boxtimes		
D4-13			\boxtimes		
D4-14			\boxtimes		
D4-15					
D4-16			\boxtimes		
D4-17			$\overline{\boxtimes}$		
D4-18			\boxtimes		
D4-19					

İ		No LID			
DMA Name/ID	17. Infiltration	18. Harvest and use	19. Bioretention	20. Biotreatment	(Alternative Compliance)
D5-1			\boxtimes		
D5-2			\boxtimes		
D5-3					
D5-4					
D5-5					
D5-6			\boxtimes		

Aicao					
		LID BMP I	Hlerarchy		No LID
DMA Name/ID	21. Infiltration	22. Harvest and use	23. Bioretention	24. Biotreatment	(Alternative Compliance)
D6-1					
D6-2					
D6-3					
D6-4					
D6-5			\boxtimes		
D6-6					
D6-7					
D6-8					
D6-9					
D6-10					
D6-11					

D.5 LID BMP Sizing

Table D.3 DCV Calculations for LID BMPs

DMA Type/ID	DMA Area (square feet)	Post-Project Surface Type	Effective Impervious Fraction, I _f	DMA Runoff Factor	DMA Areas x Runoff Factor [A] x [C]	BR	BRS1-1/Bioretention		
BR\$1-1	4941	Ornamental Landscaping	0.1	0.11	545.8		Design		
D1-1	20982	Roofs	1	0.89	18715.9	Design	Capture Volume,	Proposed Volume	
D1-2	49280	Roofs	1	0.89	43957.8	Storm Depth	V _{BMP} (cubic	on Plans (cubic	
D1-3	4920	Roofs	1	0.89	4388.6	(in)	feet)	feet)	
- ,	80123				67608.1	0.62	3493.1	4941	

DMA Type/ID	DMA Area (square feet)	Post-Project Surface Type	Effective Impervious Fraction, I _f	DMA Runoff Factor	DMA Areas x Runoff Factor [A] x [C]	BR:	S1-2/Biorete	ention
BR51-2	2088	Ornomental Landscaping	0.1	0.11	230.6			
D1-4	27030	Concrete or Asphalt	1	0.89	24110.8		Design Capture	Proposed
D1-5	33289	Roofs	1	0.89	29693.8	Design Storm	Volume,	Volume on Plans
D1-6	53188	Ornamental Landscaping	0.1	0.11	5875	Depth (in)	(cubic feet)	(cubic feet)
	115595		•		59910.2	0.62	3095.4	3236.4

DMA Type/ID	DMA Area (square feet)	Post-Project Surface Type	Effective Impervious Fraction, I _f	DMA Runoff Factor	DMA Areas x Runoff Factor	BR.	S1-3/Blorete	ention
	[A]		[D]	[C]	[A] X [C]			
BRS1-3	1187	Ornamental Landscaping	0.1	0.11	131.1			
D1-7	14455	Concrete or Asphalt	1	0.89	12893.9		Design Capture	Proposed
D1-8	11648	Ornamental Landscaping	0.1	0.11	1285.6	Design Starm Depth	Volume, V _{BMP} (cubic	Volume on Plans (cubic
D1-9	2500	Roofs	1	0.89	2230	(in)	feet)	feet)
	29790				16541.6	0.62	854.6	1839.85

DMA Type/ID	DMA Area (square feet)	Post-Project Surface Type	Effective Impervious Fraction, I _f	DMA Runoff Factor	DMA Areas x Runoff Factor [A] x [C]	BR.	BRS1-4/Bioretention		
BR\$1-4	480	Ornamental Landscaping	0.1	0.11	53		Design Capture	Proposed	
D1-10	13744	Raofs	1	0.89	12259.6	Design Storm	Valume,	Valume an Plans	
D1-11	7762	Ornamental Landscaping	0.1	0.11	857.4	Depth (in)	(cubic feet)	(cubic feet)	
	21986				13170	0.62	680.5	744	

DMA Type/ID	DMA Area (square feet)	Post-Project Surface Type	Effective Impervious Fraction, I _f	DMA Runoff Factor	DMA Areas x Runoff Factor	BRS	BRS1-5/Bioretention			
	[A]		[B]	[C]	[A] x [C]					
BRS1-5	1290	Ornamental Landscaping	0.1	0.11	142.5		Design			
D1-12	12935	Concrete or Asphalt	1	0.89	11538	Design Storm	Capture Volume, V _{BMP}	Proposed Volume on Plans		
D1-15	24254	Ornamental Landscaping	0.1	0.11	2679	Depth (in)	(cubic feet)	(cubic feet)		
	38479				14359.5	0.62	741.9	2000		

DMA Type/ID	DMA Area (square feet)	Post-Project Surface Type	Effective Impervious Fraction, I _f	DMA Runoff Factor	DMA Areas x Runoff Factor [A] x [C]	BR:	\$1-6/Biorete	ntion
BR\$1-6	974	Ornamental Landscaping	0.1	0.11	107.6	Design	Design Capture Volume,	Proposed Volume
D1-13	18056	Concrete or Aspholt	1	0.89	16106	Storm Depth (in)	V _{BMP} (cubic feet)	on Plans (cubic feet)
	19030				16213.6	0.62	837.7	1509

DMA Type/ID	DMA Area (square feet)	Post-Project Surface Type	Effective Impervious Fraction, I _f	DMA Runoff Factor	DMA Areas x Runoff Factor	BRS	51-7/Biorete	ntion
	[A]		[B]	[C]	[A] x [C]			
BRS1-7	675	Ornamental Landscaping	0.1	0.11	74.6	Design	Design Capture Volume,	Proposed Volume
D1-14	14968	Concrete or Asphalt	1	0.89	13351.5	Storm Depth (in)	V _{BMP} (cubic feet)	on Plans (cubic feet)
	15643				13426.1	0.62	693.7	1046

DMA Type/ID	DMA Area (square feet)	Post-Project Surface Type	Effective Impervious Fraction, I _f	DMA Runoff Factor	DMA Areas x Runoff Factor [A] x [C]	HYDRO	BR\$1-1/Blo	retention
HYDROBRS 1-1	6,978	Ornamental Landscaping	0.1	0.11	770.8	Design Storm Depth (in)	Design Capture Volume, V _{BMP} (cubic feet)	Proposed Volume on Plans (cubic feet)
	6978				770.8	0.62	39.8	12,560

DMA Type/ID	DMA Area (square feet)	Post-Project Surface Type	Effective Impervious Fraction, I _f	DMA Runoff Factor	DMA Areas x Runoff Factor [A] x [C]	HYDRO	DBRS1-2/Bio	retention
HYDROBRS 1-2	11,467	Ornamental Landscaping	0.1	0.11	1266.6	Design Storm Depth (in)	Storm V _{BMP} on Pla Depth (cubic (cubic	
.,, - •	11467				1266.6	0.62	65.4	20641

DMA Type/ID	DMA Area (square feet)	Post-Project Surface Type	Effective Impervious Fraction, I _f	DMA Runoff Factor	DMA Areas x Runoff Factor	BRS	BRS2-1/Bioretention		
	[A]		[B]	[C]	[A] x [C]				
BRS2-1	3758	Ornamental Landscaping	0.1	0.11	415.1		Design		
D2-1	52295	Concrete or Asphalt	1	0.89	46647.1	Design Storm	Volume,	Proposed Volume on Plans	
D2-2	16132	Ornamental Landscaping	0.1	0.11	1781.9	Depth (in)	(cubic feet)	(cubic feet)	
	72185				48844.1	0.62	2523.6	5825	

DMA Type/ID	DMA Area (square feet)	Post-Project Surface Type	Effective Impervious Fraction, I _f	DMA Runoff Factor	DMA Areas x Runoff Factor	BRS	52-2/Biorete	ntion
	[A]		[B]	[C]	[A] x [C]			
BRS2-2	1323	Ornamental Landscaping	0.1	0.11	146.1		Design Capture	Proposed
D2-5	14218	Cancrete or Asphalt	1	0.89	12682.5	Design Storm Depth	Valume, V _{BMP} (cubic	Volume on Plans (cubic
D2-3	29062	Roofs	1	0.89	25923.3	(in)	feet)	feet)
	44603	<u> </u>			38751.9	0.62	2002.2	2050

DMA Type/ID	DMA Area (square feet)	Post-Project Surface Type	Effective Impervious Fraction, I _f	DMA Runoff Factor	DMA Areas x Runoff Factor [A] x [C]		S2-3/Biorete	ention
BR\$2-3	1500	Ornamental Landscaping	0.1	0.11	165.7			
D2-4	7715	Concrete or Asphalt	1	0.89	6881.8		Design Capture	
D2-9	39380	Roof	1	0.89	35127	Design Storm	Volume,	Volume on Plans
D2-8	14043	Ornamental Landscaping	0.1	0.11	1551.2	Depth (in)	(cubic feet)	(cubic feet)
	62638				43725.7	0.62	2259.2	2325

DMA Type/ID	DMA Area (square feet)	Post-Project Surface Type	Effective Impervious Fraction, I;	DMA Runoff Factor	DMA Areas x Runoff Factor [A] x [C]		52-4/Biorete	ention
BR\$2-4	1408	Ornamental Landscaping	0.1	0.11	155.5		Design	
D2-6	47218	Concrete or Asphalt	1	0.89	42118.5	Design Storm	Capture Volume, V _{BMP}	Proposed Valume on Plans
D2-7	12828	Ornamental Landscaping	0.1	0.11	1417	Depth (in)	(cubic feet)	(cubic feet)
	61454		Anna Contact C		43691	0.62	2257.4	3172

DMA Type/ID	DMA Area (square feet)	Post-Project Surface Type	Effective Impervious Fraction, I _f	DMA Runoff Factor	DMA Areas x Runoff Factor	B R	:53-1/Bioreta	ention
BRS3-1	5563	Ornamental Landscaping	0.1	0.11	614.5			
D3-1	143612	Roofs	1	0.89	128101.9			
D3-2	37577	Cancrete or Asphalt	1	0.89	33518.7		Design Capture	Proposed
D3-3	39224	Ornamental Landscaping	0.1	0.11	4332.6	Design Storm Depth	Volume, V _{BMP} (cubic	Volume on Plans (cubic
D3-4	1925	Roofs	1	0.89	1717.1	(in)	feet)	feet)
	227901			<u> </u>	168284.8	0.62	8694.7	10458

DMA Type/ID	DMA Area (square feet)	Post-Project Surface Type	Effective Impervious Fraction, l _f	DMA Runoff Factor	DMA Areas x Runoff Factor	BRS	BR53-2/Bioretention			
	[A]		[B]	[C]	[A] x [C]					
BRS3-2	1144	Ornamental Landscaping	0.1	0.11	126.4	Design	Design Capture Volume,	Proposed Volume		
D3-5	28275	Roofs	1	0.89	25221.3	Storm Depth (in)	V _{BMP} (cubic feet)	on Plans (cubic feet)		
	29419				25347.7	0.62	1309.6	1773		

DMA Type/ID	DMA Area (square feet)	Post-Project Surface Type	Effective Impervious Fraction, I _f	DMA Runoff Factor	DMA Areas x Runoff Factor [A] x [C]	BRS3-3/Bioretention		
BR\$3-3	2339	Ornamental Landscaping	0.1	0.11	258.4		Design Capture	Praposed
D3-6	37500	Roofs	1	0.89	33450	Design Storm	Volume,	Volume on Plans
D3-7	40415	Concrete or Asphalt	1	0.89	36050.2	Depth (in)	(cubic feet)	(cubic feet)
	80254			<u> </u>	69758.6	0.62	3604.2	3625

DMA Type/ID	DMA Area (square feet)	Post-Project Surface Type	Effective Impervious Fraction, I _f	DMA Runoff Factor	DMA Areas x Runoff Factor [A] x [C]	BRS3-4/Bioretention		
BRS3-4	1565	Ornamental Landscaping	0.1	0.11	172.9	Design	Design Capture	Proposed Volume
D3-8	45827	Concrete or Asphalt	1	0.89	40877.7			on Plans (cubic
	47392				41050.6	0.62	2120.9	2425

DMA Type/ID	DMA Area (square feet)	Post-Project Surface Type	Effective Impervious Fraction, I _f	DMA Runoff Factor	DMA Areas x Runoff Factor [A] x [C]	BR.	BRS3-5/Bioretention		
BRS3-5	4739	Ornamental Landscaping	0.1	0.11	523.5	Design	Design Capture	Proposed Volume	
D3-9	16353	Concrete or Asphalt	1	0.89	14586.9	Storm V _{BMP} on Pi		on Plans (cubic	
	21092				15110.4	0.62	780.7	7345	

DMA Type/ID	DMA Area (square feet)	Post-Project Surface Type	Effective Impervious Fraction, I _f	DMA Runoff Factor	DMA Areas x Runoff Factor [A] x [C]	: BR.	BR53-6/Bioretention		
BRS3-6	7705	Ornamental Landscaping	0.1	0.11	851.1		Design		
D3-10	42080	Concrete or Asphalt	1	0.89	37535.4	Design Storm	Capture Volume, V _{BMP}	Praposed Volume on Plans	
D3-11	37156	Cancrete or Asphalt	1	0.89	33143.2	Depth (in)	(cubic feet)	(cubic feet)	
	86941			·	71529.7	0.62	3695.7	11943	

DMA Type/ID	DMA Area (square feet)	Post-Project Surface Type	Effective Impervious Fraction, I _f	DMA Runoff Factor	DMA Areas x Runoff Factor [A] x [C]	HYDROBRS3-1/Bioretention		
HYDROBRS 3-1	6099	Ornamental Landscaping	0.1	0.11	673.7	Design Volume, Vol Starm V _{BMP} on Depth (cubic (cubic		Praposed Volume on Plans (cubic feet)
	6099				673.7	0.62	34.8	9453.45

Area 4

DMA Type/ID	DMA Area (square feet)	Post-Project Surface Type	Effective Impervious Fraction, I _f	DMA Runoff Factor	DMA Areas x Runoff Factor [A] x [C]	BRS4-1/Bioretention		
BRS4-1	3,174	Ornamental Landscaping	0.1	0.11	350.6			
D4-1	13051	Concrete or Asphalt	1	0.89	11641.5		Design	
D4-2	8,945	Ornamental Landscaping	0.1	0.11	988	Design Storm	Capture Volume, V _{BMP}	Propased Volume on Plans
D4-14	11453	Concrete or Asphalt	1	0.89	10216.1	Depth (in)	(cubic feet)	(cubic feet)
	36623				23196.2	0.62	1198.5	4949.7

DMA Type/ID	DMA Area (square feet)	Post-Project Surface Type	Effective Impervious Fraction, I _f	DMA Runoff Factor	DMA Areas x Runoff Factor [A] x [C]	BRS4-2/Bioretention		
BRS4-2	900	Ornamental Landscaping	0.1	0.11	99.4	Design	Design Capture	Proposed Volume
D4-3	24764	Concrete or Asphalt	1	0.89	22089.5	Storm Depth (in)	Volume, V _{BMP} (cubic feet)	on Plans (cubic feet)
	25664	1		•••	22188.9	0.62	1146.4	1395

DMA Type/ID	DMA Area (square feet)	Post-Project Surface Type	Effective Impervious Fraction, I _f	DMA Runoff Factor	DMA Areas x Runoff Factor	BRS4-3/Bioretention		
BRS4-3	900	Ornamental Landscaping	0.1	0.11	99.4	Davige	Design Copture Volume,	Proposed Volume
D4-4	24764	Concrete or Asphalt	1	0.89	22089.5	Design Storm Depth (in)	Volume, V _{BMP} (cubic feet)	on Plons (cubic feet)
	25664				22188.9	0.62	1146.4	1395

DMA Type/ID	DMA Area (square feet)	Post-Project Surface Type	Effective Impervious Fraction, I _f	DMA Runoff Factor	DMA Areas x Runoff Factor	BRS4-4/Bioretentic		ntion
	[A]		[B]	[C]	[A] x [C]			
BRS4-4	1558	Ornamental Landscaping	0.1	0.11	172.1		Design	
D 4-5	24382	Concrete or Asphalt	1	0.89	21748.7	Design Storm	Capture Volume, V _{BMP}	Proposed Valume on Plans
D4-6	5830	Ornamental Landscaping	0.1	0.11	644	Depth (in)	(cubic feet)	(cubic feet)
····	31770			-	22564.8	0.62	1165.8	2415

DMA Type/ID	DMA Area (square feet)	Post-Project Surface Type	Effective Impervious Fraction, I _f	DMA Runoff Factor	DMA Areas x Runoff Factor	BRS4-5/Bioretention		
	[A]		[B]	[C]	[A] x [C]			
BR\$4-5	6642	Ornamental Landscaping	0.1	0.11	733.7		Design Capture	Proposed
D4-7	22700	Roofs	1	0.89	20248.4	Design Storm	Volume,	Valume on Plans
D4-19	20497	Ornomental Landscaping	0.1	0.11	2264.1	Depth (in)	(cubic feet)	(cubic feet)
	49839	/-y-missma	·		23246.2	0.62	1201.1	11955

DMA Type/ID	DMA Area (square feet)	Post-Project Surface Type	Effective Impervious Fraction, I _f	DMA Runoff Factor	DMA Areas x Runoff Factor	BRS4-6/Bioretention		
	[A]		[B]	[C]	[A] x [C]			
BR\$4-6	2818	Ornamental Landscaping	0.1	0.11	311.3		Design Copture	Proposed
D4-9	65043	Roofs	1	0.89	58018.4	Design Starm	Valume, V _{BMP}	Valume on Plans
D4-10	16396	Concrete or Asphalt	1	0.89	14625.2	Depth (in)	(cubic feet)	(cubic feet)
	84257				72954.9	0.62	3769.3	4368

DMA Type/ID	DMA Area (square feet)	Post-Project Surface Type	Effective Impervious Fraction, I ₄	DMA Runoff Factor	DMA Areas x Runoff Factor [A] x [C]	8RS4-7/Bioretention		
BRS4-7	540	Ornamental Landscaping	0.1	0.11	59.6	Dacian	Design Capture	Proposed
D4-11	10328	Concrete or Asphalt	1	0.89	9212.6	Design Volume, Volume Storm V _{BMP} on Plai Depth (cubic (cubic (in) feet) feet)		on Plans (cubic
	10868				9272.2	0.62	479.1	837

DMA Type/ID	DMA Area (square feet)	Post-Project Surface Type	Effective Impervious Fraction, I _f	DMA Runoff Factor	DMA Areas x Runoff Factor	BRS	54-8/Biorete	ention
	[A]		[B]	[C]	[A] x [C]			
BR54-8	540	Ornamental Landscaping	0.1	0.11	59.6	Design	Design Capture Volume,	Proposed Volume
D4-17	6383	Concrete or Asphalt	1	0.89	5693.6	Storm Depth (in)	V _{amp} (cubic feet)	on Plans (cubic feet)
	6923		, , , , , , , , , , , , , , , , , , ,		5753.2	0.62	297.2	837

DMA Type/ID	DMA Area (square feet)	Post-Project Surface Type	Effective Impervious Fraction, I _f	DMA Runoff Factor	DMA Areas x Runoff Factor	BRS	54-9/Biorete	ntion
	[A]		[8]	[C]	[A] x [C]			
BRS4-9	412	Ornamental Landscaping	0.1	0.11	45.5	Design	Design Capture Volume,	Proposed Volume
D4-13	6697	Concrete or Asphalt	1	0.89	5973.7	Storm Depth (in)	V _{BMP} (cubic feet)	an Plans (cubic feet)
	7109				6019.2	0.62	311	639

DMA Type/ID	DMA Area (square feet)	Post-Project Surface Type	Effective Impervious Fraction, I _f	DMA Runoff Factor	DMA Areas x Runoff Factor	BRS	4-10/Bioreto	ention
	[A]		[B]	[C]	[A] x [C]			
BRS4-10	706	Ornamental Landscaping	0.1	0.11	78		Design	
D4-18	6827	Concrete or Asphalt	1	0.89	6089.7	Design Storm	Volume,	Proposed Valume on Plons
D4-15	9657	Concrete or Asphalt	1	0.89	8614	Depth (in)	(cubic feet)	(cubic feet)
	17190				14781.7	0.62	763.7	1094

DMA Type/ID	DMA Area (square feet)	Post-Project Surface Type	Effective Impervious Fraction, I _f	DMA Runoff Factor	DMA Areas x Runoff Factor	BRS	4-11/Biorete	ention
	[A]		[B]	[C]	[A] x [C]			
BRS4-11	3954	Ornamental Londscaping	0.1	0.11	436.8	Design	Design Capture Volume,	Proposed Volume
D4-8	22700	Roofs	1	0.89	20248.4	Storm Depth (in)	V _{BMP} (cubic feet)	on Plans (cubic feet)
31 1 1	26654	·			20685.2	0.62	1068.7	7117.2

DMA Type/ID	DMA Area (square feet)	Post-Project Surface Type	Effective Impervious Fraction, I _f	DMA Runoff Factor	DMA Areas x Runoff Factor	BRS	4-12/Bioret	ention
	[A]		[B]	[C]	[A] x [C]			
BR\$4-12	632	Ornamental Landscaping	0.1	0.11	69.8	Design	Design Capture Valume,	Proposed Volume
D4-15	8155	Concrete ar Asphalt	1	0.89	7274.3	Storm Depth (in)	V _{BMP} (cubic feet)	on Plans (cubic feet)
	8787				7344.1	0.62	379.4	980

Area 5

DMA Type/ID	DMA Area (square feet)	Post-Project Surface Type	Effective Impervious Fraction, I ₁	DMA Runoff Factor	DMA Areas x Runoff Factor	BRS	55-1/Biorete	ntion
	[A]		[B]	[C]	[A] x [C]			
BRSS-1	3480	Ornamental Landscaping	0.1	0.11	384.4		Design	
D5-1	19843	Concrete or Asphalt	1	0.89	17700	Design Storm	Capture Volume, V _{BMP}	Proposed Volume on Plans
D5-2	51185	Concrete or Aspholt	1	0.89	45657	Depth (in)	(cubic feet)	(cubic feet)
	74508				63741.4	0.62	3293.3	5394

DMA Type/ID	DMA Area (square feet)	Post-Project Surface Type	Effective Impervious Fraction, I _f	DMA Runoff Factor	DMA Areas x Runoff Factor		S5-2/Biarete	ention
	[A]		[B]	[C]	[A] x [C]			
BR\$5-2	1533	Ornamental Landscaping	0.1	0.11	169.3		Design	
D5-5	49229	Concrete or Aspholt	1	0.89	43912.3	Design Storm	Volume,	Proposed Volume on Plans
D5-6	5878	Ornamental Landscaping	0.1	0.11	649.3	Depth (in)	(cubic feet)	(cubic feet)
	56640			•	44730.9	0.62	2311.1	2376

DMA Type/ID	DMA Area (square feet)	Post-Project Surface Type	Effective Impervious Fraction, I _f	DMA Runoff Factor	DMA Areas x Runoff Factor [A] x [C]	BRS	55-3/Biorete	ntion
BRS5-3	1400	Ornamental Landscaping	0.1	0.11	154.6		Design Capture	Proposed
D5-3	23550	Roofs	1	0.89	21006.6	Design Storm	Volume,	Volume on Plans
D5-4	21605	Concrete or Asphalt	1	0.89	19271.7	Depth (in)	(cubic feet)	(cubic feet)
					40432.9	0.62	2089	2170

Area 6

DMA Type/ID	DMA Area (square feet)	Post-Project Surface Type	Effective Impervious Fraction, I;	DMA Runoff Factor	DMA Areas x Runoff Factor [A] x [C]	PP6-1	I/Permeable	: Pavers
PP6-1	5313	Permeable Paving Blocks w/ Sand Filled Gap	0.25	0.20	1052.8			
D6-1	21894	Concrete or Asphalt	1	0.89	19529.4			
D6-2	20160	Roofs	1	0.89	17982.7	1	Design	
D6-3	9609	Ornamental Landscaping	0.1	0.11	1061.04	Design Storm	Capture Volume, V _{BMP}	Proposed Volume on Plans
D6-4	6022	Ornamental Landscaping	0.1	0.11	665.2	Depth (in)	(cubic feet)	(cubic feet)
	62998	.			40291.5	0.62	2081.7	2125.2

DMA Type/ID	DMA Area (square feet)	Post-Project Surface Type	Effective Impervious Fraction, I _f	DMA Runoff Factor	DMA Areas x Runoff Factor	PP6-2	l/Permeable	: Pavers
PP6-2	9610	Permeable Paving Blocks w/ Sand Filled Gap	0.25	0.20	1904.3			
D6-8	64944	Concrete or Asphalt	1	0.89	57930			
D6-9	2964	Ornamental Landscaping	0.1	0.11	327.4		Design	
D6-10	4364	Ornamental Landscaping	0.1	0.11	482	Design Storm	Capture Valume, V _{BMP}	Proposed Volume on Pions
D6-11	7344	Ornamental Landscaping	0.1	0.11	811.2	Depth (in)	(cubic feet)	(cubic feet)
	89226				61454.9	0.62	3175.2	3844

DMA Type/ID	DMA Area (square feet)	Post-Project Surface Type	Effective Impervious Fraction, I _f	DMA Runoff Factor	DMA Areas x Runoff Factor	BRS	66-1/Biorete	ntion
	[A]		[B]	[C]	[A] x [C]	!		
BRS-1	585	Ornamental Landscaping	0.1	0.11	54.6			
D6-5	3606	Roofs	1	0.89	3216.6		Design	
D6-6	21643	Ornamental Landscaping	0.1	0.11	2390.6	Design Starm	Capture Volume, V _{BMP}	Proposed Volume on Plans
D6-7	11645	Concrete or Asphalt	1	0.89	10387.3	Depth (in)	(cubic feet)	(cubic feet)
	37479				16059.1	0.62	829.7	906.75

[[]B], [C] is obtained as described in Section 2.3.1 of the WQMP Guidance Document

^[8] is obtained from Exhibit A in the WQMP Guidance Document

[[]G] Is obtained from a design procedure sheet, such as in LID BMP Design Handbook and placed in Appendix 6

Section E: Alternative Compliance (LID Waiver Program)

LID BMPs are expected to be feasible on virtually all projects. Where LID BMPs have been demonstrated to be infeasible as documented in Section D, other Treatment Control BMPs must be used (subject to LID waiver approval by the Copermittee). Check one of the following Boxes:

☑ LID Principles and LID BMPs have been incorporated into the site design to fully address all Drainage Management Areas. No alternative compliance measures are required for this project and thus this Section is not required to be completed.

- Or -

☐ The following Drainage Management Areas are unable to be addressed using LID BMPs. A site-specific analysis demonstrating technical infeasibility of LID BMPs has been approved by the Co-Permittee and included in Appendix 5. Additionally, no downstream regional and/or sub-regional LID BMPs exist or are available for use by the project. The following alternative compliance measures on the following pages are being implemented to ensure that any pollutant loads expected to be discharged by not incorporating LID BMPs, are fully mitigated.

Section F: Hydromodification

F.1 Hydrologic Conditions of Concern (HCOC) Analysis

The project does create a Hydrologic Condition of	Concern, not meeting the criteria for HCOC Exemption
as shown below:	

HCOC EXEMPTION 1: The Priority Development Project disturbs less than one acre. The Copermittee has the discretion to require a Project-Specific WQMP to address HCOCs on projects less than one acre on a case by case basis. The disturbed area calculation should include all disturbances associated with larger common plans of development.

Does the project qualify for this HCOC Exemption? Y N If Yes, HCOC criteria do not apply.

HCOC EXEMPTION 2: The volume and time of concentration¹ of storm water runoff for the post-development condition is not significantly different from the pre-development condition for a 2-year return frequency storm (a difference of 5% or less is considered insignificant) using one of the following methods to calculate:

- Riverside County Hydrology Manual
- Technical Release 55 (TR-55): Urban Hydrology for Small Watersheds (NRCS 1986), or derivatives thereof, such as the Santa Barbara Urban Hydrograph Method
- Other methods acceptable to the Co-Permittee
 Does the project qualify for this HCOC Exemption?
 Y
 N

Results included in Table F.1 below and hydrologic analysis in Appendix 7.

Table F.1 Hydrologic Conditions of Concern Summary Area A: (Mitigated by extra storage in Area 1)

	2 year - 24 hour		
	Pre-condition	Post-condition	% Difference
Time of Concentration	13.2 min	12.12 min	8.2%
Volume (Cubic Feet)	0.13 ac-ft	0.985 ac-ft	86.7%

Area B: (Mitigated by extra storage in Areas 3 and 4)

	2 year - 24 hour		
	Pre-condition	Post-condition	% Difference
Time of Concentration	17.64 min	13.2 min	25.2%
Volume (Cubic Feet)	0.19 ac-ft	1.37 ac-ft	86.1%

¹ Time of concentration is defined as the time after the beginning of the rainfall when all portions of the drainage basin are contributing to flow at the outlet.

HCOC EXEMPTION 3: All downstream conveyance channels to an adequate sump (for example, Prado Dam, Lake Elsinore, Canyon Lake, Santa Ana River, or other lake, reservoir or naturally erosion resistant feature) that will receive runoff from the project are engineered and regularly maintained to ensure design flow capacity; no sensitive stream habitat areas will be adversely affected; or are not identified on the Co-Permittees Hydromodification Sensitivity Maps.

Does the project qualify for this HCOC Exemption?	□ Y	\boxtimes N
=		V 3 -

F.2 HCOC Mitigation

As an alternative to the HCOC Exemption Criteria above, HCOC criteria is considered mitigated if the project meets one of the following conditions, as indicated:

- Additional LID BMPS are implemented onsite or offsite to mitigate potential erosion or habitat impacts as a result of HCOCs. This can be conducted by an evaluation of site-specific conditions utilizing accepted professional methodologies published by entities such as the California Stormwater Quality Association (CASQA), the Southern California Coastal Water Research Project (SCCRWP), or other Co-Permittee approved methodologies for site-specific HCOC analysis.
- b. The project is developed consistent with an approved Watershed Action Plan that addresses HCOC in Receiving Waters.
- C. Mimicking the pre-development hydrograph with the post-development hydrograph, for a 2-year return frequency storm. Generally, the hydrologic conditions of concern are not significant, if the post-development hydrograph is no more than 10% greater than pre-development hydrograph. In cases where excess volume cannot be infiltrated or captured and reused, discharge from the site must be limited to a flow rate no greater than 110% of the pre-development 2-year peak flow.
- d. None of the above.

AREA A: (EXTRA STORAGE IN DMA AREA 1)

Pre-Project HCOC	Past-Project HCOC	Total HCOC storage required	Total BMP Storage Proposed	BMP Storage Used by Vbmp	BMP Storage Remaining (to store HCOC)
5,662.8 ft ³	42,906.6 ft ³	37,243.8 ft ³	48,517.25 ft ³	10,502.1 ft ³	38,015.15 ft ³

AREA B: (EXTRA STORAGE IN DMA AREAS 3 AND 4)

DMA Area	Pre-Project HCOC	Post-Project HCOC	Total HCOC storage required	Total BMP Storage Proposed	BMP Storage Used by Vbmp	BMP Storage Remaining (to store HCOC)
3	***	***	gana	47,022.45 ft ³	20,219.8 ft ³	26,781.85 ft ³
4	-		***	37,981.9 ft ³	12,926.6 ft ³	25,055.3 ft ³
Total	8,276.4 ft ³	59,677.2 ft ³	51.400.8 ft ³	78,598.35 ft ³	33,146.4 ft ³	51,837.15 ft ³

Section G: Source Control BMPs

The following table identifies the potential sources of runoff pollutants for this project and specifies how they are addressed through permanent controls and operational BMPs:

Table G.1 Permanent and Operational Source Control Measures

Potential Sources of Runoff pollutants	Permanent Structural Source Control BMPs	Operational Source Control BMPs
On-Site Storm Drain Inlets	Mark all inlets with the words "Only Rain Down the Storm Drain" or similar. Catch Basin Markers may be available from the Riverside County Flood Control and Water Conservation District, call 951.995.1200 to verify.	Maintain and periodically repaint or replace inlet markings. Provide stormwater pollution prevention information to new site owners, leases, or operators. See applicable operational BMPs in Fact Sheet SC-44, "Drainage System Maintenance," in the CASQA Stormwater Quality Handbooks at www.cabmphandbooks.com
		Include the following in lease agreements: "Tenant shall not allow anyone to discharge anything to storm drains or to store or deposit materials so as to create a potential discharge to storm drains."
Interior floor drains and elevator shaft sump pumps	Interior floor drains and elevator shaft sump pumps will be plumbed to sanitary sewer.	Inspect and maintain drains to prevent blockages and overflow.
Landscape/Outdoor Pesticide Use	All final landscape plans will accomplish the following: Design landscaping to minimize irrigation and runoff, to promote surface infiltration where appropriate, and to minimize the use of fertilizers and pesticides that can contribute to stormwater pollution. Where landscaped areas are used to retain or detain stormwater, specify plants that are tolerant of saturated soil conditions. Consider using pest-resistant plants, especially adjacent to hardscape. To insure successful establishment, select plants appropriate to site soils, slopes, climate, sun, wind, rain, land use, air movement, ecological consistency, and plant interactions	Maintain landscaping using minimum or n pesticides. See applicable operational BMPs in "What you should know forLandscape and Gardening" at http://rcflood.org/stormwater/Downloads LandscapeGardenBrochure.pdf Provide IPM information to new owners, lessees and operators
Food Service	Describe the location and features of the designated cleaning area. Describe the items to be cleaned in this facility and how it has been sized to insure that the largest items can be accommodated.	See the brochure, "The Food Service Industry Best Management Practices for: Restaurants, Grocery Stores, Delicatessens and Bakeries" at http://rcflood.org/stormwater/ Provide this brochure to new site owners, lessees, and operators.

Refuse Areas	Describe how site refuse will be handled and provide supporting detail to what is shown on plans. Signs will be posted on or near dumpsters with the words "Do not dump hazardous materials here" or similar.	The following will be implemented: Provide adequate number of receptacles. Inspect receptacles regularly; repair or replace leaky receptacles. Keep receptacles covered. Prohibit/prevent dumping of liquid or hazardous wastes. Post "no hazardous materials" signs. Inspect and pick up litter daily and clean up spills immediately. Keep spill control materials available on-site. See Fact Sheet SC-34, "Waste Handling and Disposal" in the CASQA Stormwater Quality Handbooks at www.cabmphandbooks.com
Loading Docks		Move loaded and unloaded items indoors as soon as possible. See Fact Sheet SC-30, "Outdoor Loading and Unloading," in the CASQA Stormwater Quality Handbooks at www.cabmphandbooks.com
Plazas, sidewalks, and parking lots		Sweep plazas, sidewalks, and parking lots regularly to prevent accumulation of litter and debris. Collect debris from pressure washing to prevent entry into the storm drain system. Collect washwater containing any cleaning agent or degreaser and discharge to the sanitary sewer not to a storm drain.
Miscellaneous Drain or Wash Water or Other Sources	Boiler drain lines shall be directly or indirectly connected to the sanitary sewer system and may not discharge to the storm drain system. Condensate drain lines may discharge to landscaped areas if the flow is small enough that runoff will not occur. Condensate drain lines may not discharge to the storm drain system. Rooftop equipment with potential to produce pollutants shall be roofed and/or have secondary containment. Any drainage sumps on-site shall feature a sediment sump to reduce the quantity of sediment in pumped water.	

Section I: Operation, Maintenance and Funding

The Copermittee will periodically verify that Stormwater BMPs on your site are maintained and continue to operate as designed. To make this possible, your Copermittee will require that you include in Appendix 9 of this Project-Specific WQMP:

- 1. A means to finance and implement facility maintenance in perpetuity, including replacement cost.
- Acceptance of responsibility for maintenance from the time the BMPs are constructed until responsibility for operation and maintenance is legally transferred. A warranty covering a period following construction may also be required.
- 3. An outline of general maintenance requirements for the Stormwater BMPs you have selected.
- 4. Figures delineating and designating pervious and impervious areas, location, and type of Stormwater BMP, and tables of pervious and impervious areas served by each facility. Geolocating the BMPs using a coordinate system of latitude and longitude is recommended to help facilitate a future statewide database system.
- 5. A separate list and location of self-retaining areas or areas addressed by LID Principles that do not require specialized O&M or inspections but will require typical landscape maintenance as noted in Chapter 5, pages 85-86, in the WQMP Guidance. Include a brief description of typical landscape maintenance for these areas.

Your local Co-Permittee will also require that you prepare and submit a detailed Stormwater BMP Operation and Maintenance Plan that sets forth a maintenance schedule for each of the Stormwater BMPs built on your site. An agreement assigning responsibility for maintenance and providing for inspections and certification may also be required.

Maintenance Mechanism:	Property Owners Association	
Will the proposed BMPs be a Association (POA)?	maintained by a Home Owners' Association (HO	A) or Property Owners
⊠ Y □ N		

Include your Operation and Maintenance Plan and Maintenance Mechanism in Appendix 9. Additionally, include all pertinent forms of educational materials for those personnel that will be maintaining the proposed BMPs within this Project-Specific WQMP in Appendix 10.

Appendix 1: Maps and Site Plans

Locatian Map, WQMP Site Plan and Receiving Waters Map



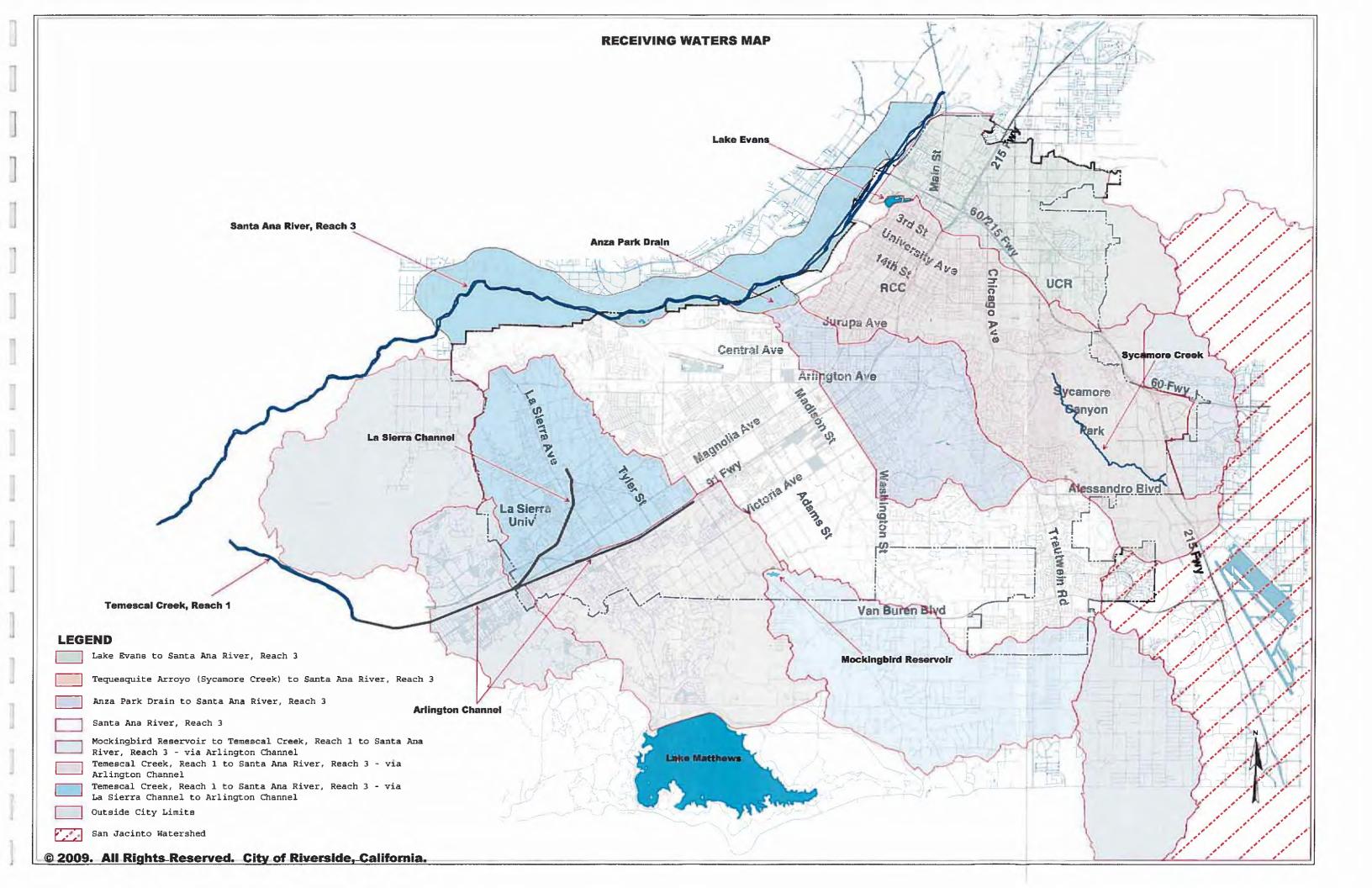
VICINITY MAP



1770 IOWA AVENUE - SUITE 100 RIVERSIDE, GA 92507 961.782.0707 (FAX)951.782.0723

rickengineering.com

San Diego - Orange - San Luis Obispo - Bakersfield - Sacramento - Phoenix - Tucson



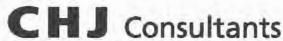
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Appendix 2: Construction Plans

Preliminary Grading Exhibit

Appendix 3: Soils Information

Geotechnical Study and Other Infiltration Testing Data



1355 E. Cooley Drive, Suite C, Colton, CA 92324 → Phone (909) 824-7311 → Fax (909) 503-1136 15345 Anacapa Road, Suite D, Victorville, CA 92392 → Phone (760) 243-0506 → Fax (760) 243-1225 77-564A Country Club Drive, Suite 122, Palm Desert, CA 92211 → Phone (760) 772-8234 → Fax (909) 503-1136

Job No. 14444-2

July 9, 2014

Canyon Springs Marketplace Corporation c/o TDA Investment Group 2025 Pioneer Court San Mateo, California 94403

Attention: Mr. Michael Morris

Subject:

Infiltration Investigation Canyon Springs Marketplace Riverside, California

Dear Mr. Morris:

As requested, infiltration testing was performed for storm water infiltration at the subject site. This report presents test data and summarizes the scope of testing. The site location and test locations are shown on Enclosure "A-1". The testing includes eight tests at approximately 5 feet below existing grade.

Test Procedure

Eight double-ring infiltrometer tests were performed to evaluate the infiltration potential of the site soils. Each test pit was excavated with a rubber-tire backhoe. The tests were performed in general conformance with ASTM D3385. During the test period, the water in the inner and annular rings was maintained at a constant level using a float valve and individual water source for each ring. The volume of water added to the inner and annular rings was measured using graduated cylinders and recorded at timed intervals. The graduated cylinder corresponding to the inner ring is readable to increments of 25 milliliters.



possible compaction related to site grading and potential silting of the percolating soils. A safety factor should be determined with consideration to other factors in the storm water retention system design, particularly storm water volume estimates, and the safety factors associated with those design components.

Limitations

CHJ Consultants has striven to perform our services within the limits prescribed by our client, and in a manner consistent with the usual thoroughness and competence of reputable geotechnical engineers and engineering geologists practicing under similar circumstances. No other representation, express or implied, and no warranty or guarantee is included or intended by virtue of the services performed or reports, opinion, documents, or otherwise supplied.

This report reflects the testing conducted on the site as the site existed during the investigation, which is the subject of this report. However, changes in the conditions of a property can occur with the passage of time, due to natural processes or the works of man on this or adjacent properties. Changes in applicable or appropriate standards may also occur whether as a result of legislation, application or the broadening of knowledge. Therefore, this report is indicative of only those conditions tested at the time of the subject investigation, and the findings of this report may be invalidated fully or partially by changes outside of the control of CHJ Consultants. This report is therefore subject to review and should not be relied upon after a period of one year.

The conclusions and recommendations in this report are based upon observations performed and data collected at separate locations, and interpolation between these locations, carried out for the project and the scope of services described. It is assumed and expected that the conditions between locations observed and/or sampled are similar to those encountered at the individual locations where observation and sampling was performed. However, conditions between these locations may vary significantly. Should conditions that appear different from those described herein be encountered in the field by the client or any firm performing services for the client or the client's assign, this firm should be contacted immediately in order that we might evaluate their effect.



Google earth

feet meters **2000 700**





Appendix 4: Historical Site Conditions

Phase I Environmental Site Assessment or Other Information on Post Site Use

(Not Applicable)

Appendix 6: BMP Design Details

BMP Sizing, Design Details and other Supporting Dacumentation

	Santa	Ana Wat	ershed - BMP	Design V	olume, V	ВМР	Legend		Required Ent
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	Type/ID	(square feet)	Туре	Fraction, I _f	Factor	Runoff Factor	Depth (in)	(cubic feet)	feet)
	BRS1-1	4941	Ornamental Landscaping	0.1	0.11	545.8			
	D1-1	20982	Roofs	1	0.89	18715.9	原。於美		
	D1-2	49280	Roofs	1	0.89	43957.8			
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d _I							ft
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Desc							
otes:	ribe Vegetati	on:					

	-	Mate this market	(Rev. 10-2011) neet shall only be used	in and made	a surel. DAID	designs from the	IID DMD	Design Handbox	Calculated
าลทบ	Name	REC	ieet snuit <u>onty</u> be used	ін сопуцисної	I WIIN DIVIE	uesigns from the	LID DMF		7/12/2016
med		EVB						Case No	
		Number/Nam	ie		Canyon S	prings Health	care Cente		
				BMP I	dentificati	on			
NA.	ME/ID	AREA 1: BI	ORETENTION: BI	RS1-2					
			Musi	match Nam	e/ID used	on BMP Design	Calculation	n Sheet	
				Design I	Rainfall D	epth			
erc	entile, 24	4-hour Rainfa	ll Depth,				D ₈₅ =	0.62	inches
he l	sohyetal	Map in Hand	lbook Appendix E						
			Drain	iage Manag	ement Are	a Tabulation			
		ins	ert additional rows i	f needed to d	ccommod	ate all DMAs di	aining to t	he BMP	
	DMA	DMA Area	Post-Project Surface	Effective Imperivous	DMA Runoff	DMA Areas x	Design Storm	Design Capture Volume, V _{BMP}	Proposed Volume on Plans (cubic
	Type/ID BRS1-2	(square feet)	Type Ornamental	Fraction, I _f	Factor 0.11	Runoff Factor 230.6	Depth (in)	(cubic feet)	feet)
-		10000	Landscaping						
-	D1-4 D1-5	27030 33289	Concrete or Asphalt Roofs	1	0.89	24110.8 29693.8			
-	D1-6	53188	Ornamental	0.1	0.11	5875			
-	D1-0	55166	Landscaping	0.1	0.11	30/3		1.50	
H									
L									
							1.00		
-									
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-							35.0		
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+		7							
1									STATE STATE
							A SE		
-									
		115595	7	otal	,	59910.2	0.62	3095.4	3236.4
		- Control of the							
:									
			storage available will			27.242.0	f	05	

Bioretention Essility	y - Design Procedure	BMP ID BRS1-2	Legend:	Required	Entries	
Diorection racinty			гледени.	Calculate	d Cells	
ompany Name:	REC			Date: 7	/12/2016	
esigned by:	EVB		County/City (Case No.:		
		Design Volume		_		
Enter the area tributary to this feature				$A_T = $	2.65	acres
Enter V _{BMP} determined from Section 2.1 of this Handbook				V _{BMP} =	3,095	ft³
	Type of B	ioretention Facility	Design			
	red (parallel to parking spaces quired (perpendicular to parkir	-				
	Bioreten	tion Facility Surface	Area			
Depth of Soil Filter Media Layer				$d_S =$	3.0	ft
Top Width of Bioretention Facility, excluding curb				$W_T = $	20.0	ft
Total Effective Depth, d_E $d_E = (0.3) \times d_S + (0.4) \times 1 - (0.7/w_T) + 0.5$				d _E =	1.77	ft
Minimum Surface Area, A_m $A_M (ft^2) = \frac{V_{BMP} (ft^3)}{d_F (ft)}$				A _M =	1,754	fit*
Proposed Surface Area				A=	2,088	ft²
	Biorete	ntion Facility Prope	rties			
Side Slopes in Bioretention Facility				z=	4	:1
Diameter of Underdrain					6	inche
Longitudinal Slope of Site (3% maximum)					0	%
6" Check Dam Sp					0	feet
Describe Vegetat	ion:					
otes:						

Required Entries Santa Ana Watershed - BMP Design Volume, V_{BMP} Legend: (Rev. 10-2011) Calculated Cells (Note this worksheet shall only be used in conjunction with BMP designs from the LID BMP Design Handbook) Company Name REC Date 7/12/2016 Designed by EVB Case No Canyon Springs Healthcare Center Company Project Number/Name BMP Identification BMP NAME / ID AREA 1: BIORETENTION: BRS1-3 Must match Name/ID used on BMP Design Calculation Sheet Design Rainfall Depth $D_{85} =$ 85th Percentile, 24-hour Rainfall Depth, 0.62 inches from the Isohyetal Map in Handbook Appendix E Drainage Management Area Tabulation

Insert additional rows if needed to accommodate all DMAs draining to the BMP Proposed Design Capture DMA Design Volume on Effective Volume, V_{BMP} DMA **DMA Area** Post-Project Surface Runoff DMA Areas x Storm Plans (cubic Imperivous Factor **Runoff Factor** Type/ID (square feet) Type Fraction, I Depth (in) (cubic feet) feet) Ornamental **BRS1-3** 0.1 1187 0.11 131.1 Landscaping 12893.9 D1-7 14455 Concrete or Asphalt 1 0.89 **Ornamental** D1-8 11648 0.1 0.11 1286.6 Landscaping D1-9 2500 1 0.89 2230 Roofs 16541.6 29790 0.62 854.6 1839.85

Notes:		
The remaining 985.25 cubic feet of	f storage available will go towards s	toring the 37.243.8 cubic feet of HCOC ve

ompany Na resigned by: Ente	r the area tribut	REC EVB ary to this feature	BRS1-3 Design Volume	Legend: County/City C	Date:	ted Cells 7/12/2016	
esigned by: Ente	er the area tribut	EVB	Design Volume	County/City (-	7/12/2016	
Ente Ente	er the area tribut	ary to this feature	Design Volume	County/City (Case No.:		
Ente			Design Volume				
Ente						-	
	er V _{BMP} determin	ed from Section 2			$A_T = $	0.684	acres
		ica moin occuon 2	.1 of this Handbook		V _{BMP} =	855	ft³
(a)		Type of E	Bioretention Facility	Design			
-	Side slopes required ()	parallel to parking spaces	or adjacent to walkways)				
0			ng space or Planter Boxes)				
			ntion Facility Surface	e Area			
Dep	th of Soil Filter	Media Layer			d _S =	3.0	ft
-	TILL CD!		1 1' 1			20.0	0
Top	Width of Blore	ention Facility, ex	cluding curb		$\mathbf{w}_{\mathrm{T}} = $	20.0	ft
Tota	al Effective Dept	h. dr					
	•	(0.4) x 1 - (0.7/w _T)) + 0.5		$d_E = 1$	1.77	Îft
Min	imum Surface A	rea, A _m					
A	$A_{\mathbf{M}}(\hat{\mathbf{n}}^2) =$	V_{BMP} (ft ³)	_		$A_{M} = $	485	_tt-
P	$\Lambda_{M}(\Pi) =$	d_{E} (ft)					2
Prop	osed Surface A	ea			A=_	1,187	_ft²
		D:					
			ention Facility Prope	arues		THE CONTRACTOR	
Side	Slopes in Biore	tention Facility			z =	4	:1
Dia	matar of I Indeed	roin				6	inche
Diai	neter of Underd	аш			-	U	Inche
Lon	gitudinal Slope	of Site (3% maxim	um)			0	_%
6" C	heck Dam Spac	ing			1	0	feet
Des	cribe Vegetation						
otes:		The second secon					

	Santa	Ana Wat	ershed - BMP (Rev. 10-2011)	Design Vo	olume, V	ВМР	Legend		Required Entr
		Note this worksh	neet shall <u>only</u> be used	in conjunction	n with BMP	designs from the	LID BMP		
	y Name	REC							7/12/2016
signe		EVB						Case No	
mpan	y Project	Number/Nam	le		Canyon S	prings Health	care Cente	Т	
				BMP I	dentificati	ion			
P NA	AME / ID	AREA 1: BI	ORETENTION: B						
			Musi	t match Nam	e/ID used	on BMP Design	Calculatia	n Sheet	
				Design I	Rainfall D	epth			
		4-hour Rainfa					$D_{85} =$	0.62	inches
n tne	Isonyetai	Map in Hand	lbook Appendix E						
			Drain	age Manage	ement Are	a Tabulation			
		ins	ert additional rows i	York of a Real			ainina to ti	he BMP	
ſ								Variable and	Proposed
- 1		No.		Effective	DMA		Design	Design Capture	Volume on
	DMA	DMA Area	Post-Project Surface	Imperivous	Runoff	DMA Areas x	5torm	Volume, V _{BMP}	Plans (cubic
L	Type/ID	(square feet)	Туре	Fraction, I _f	Factor	Runoff Factor	Depth (in)	(cubic feet)	feet)
	BRS1-4	480	Ornamental Landscaping	0.1	0.11	53			
	D1-10	13744	Roofs	1	0.89	12259.6	100		
	D1-11	7762	Ornamental Landscaping	0.1	0.11	857.4			
+									
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-									
-									
-	-								
-								是美国	
						145-150			- 3
					15,500				
-							THE REP		
-							10-27-20		

Votes	:
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The remaining 63.5 cubic feet of storage available will go towards storing the 37,243.8 cubic feet of HCOC volume.

Total

13170

0.62

680.5

Diametersian Profile	Design Duran dama	BMP ID	Tagand	Require	d Entries	
Bioretention Facility -	Design Procedure	BRS1-4	Legend:	Calcula	ted Cells	
ompany Name:	REC			-	7/12/2016	
esigned by:	EVB	D : 11 1	County/City C	Case No.:		
		Design Volume				
Enter the area trib	outary to this feature			$A_T =$	0.505	acres
Enter V _{BMP} determ	nined from Section 2.	.1 of this Handbook		V _{BMP} =	681	ft³
	Type of B	Bioretention Facility	Design			
(-	ed (parallel to parking spaces uired (perpendicular to parkln					
	Bioreten	tion Facility Surface	Агеа			
Depth of Soil Filt	er Media Layer			$d_S =$	3.0	ft
Top Width of Bio	oretention Facility, exc	cluding curb		$\mathbf{w}_{\mathrm{T}} =$	20.0	ft
Total Effective De $d_E = (0.3) \times d_S$	epth, d_E + (0.4) x 1 - (0.7/ w_T)	+ 0.5		$d_E =$	1.77	ft
Minimum Surface $A_{M} (ft^{2}) =$	e Area, A_m $V_{BMP} (ft^3)$ $d_F (ft)$	_		$A_{M} = $	386	_iit"
Proposed Surface				A=	480	ft²
	Biorete	ention Facility Prope	erties			
Side Slopes in Bio	oretention Facility			z =	4	:1
Diameter of Unde	rdrain			1	6	inche
Longitudinal Slop	oe of Site (3% maxim	um)		1	0	_%
6" Check Dam Sp	acing				0	feet
T) '1 T7 - / /'						
Describe Vegetati	on:					

		(Rev. 10-2011)			1			Calculated
any Name	Note this worksh	neet shall only be used	in conjunction	n with BMP	designs from the	LID BMP		7/12/2016
ned by	EVB							7/12/2010
	Number/Nam	ie		Canyon S	prings Health	care Cente		
			BMP I	dentificati	on			
NAME / ID	AREA 1: BI	ORETENTION: BI						
			PRO 2727 TO	e/ID used	on BMP Design	Calculation	n Sheet	
			Design l	Rainfall D	epth			
	4-hour Rainfa I Map in Hand	ull Depth, dbook Appendix E				D ₈₅ =	0.62	inches
		Drain	iage Manag	ement Are	a Tabulation			
	Ins	sert additional rows i			-	aining to t	he BMP	
DMA Type/ID	DMA Area (square feet)	Post-Project Surface Type	Effective Imperivous Fraction, I _f	DMA Runoff Factor	DMA Areas x Runoff Factor	Design Storm Depth (in)	Design Capture Volume, V _{BMP} (cubic feet)	Proposed Volume on Plans (cubic feet)
BRS1-5	1290	Ornamental Landscaping	0.1	0.11	142.5		10	
D1-12	12935	Concrete or Asphalt	1	0.89	11538			
D1-15	24254	Ornamental Landscaping	0.1	0.11	2679			
						l _e	Market State	
						新疆		
						Catheri		
					A CHARLES			
							and the second	
1								
	38479	7	otal		14359.5	0.62	741.9	2000

Diameteration	711:4.	Design Dresedore	BMP ID	T a grand.	Require	d Entries	
Biorelention	racinty	- Design Procedure	BRS1-5	Legend:	Calcula	ted Cells	
Company Name:		REC			-	7/12/2016	
Designed by:		EVB		County/City	Case No.:		
			Design Volume				
Enter the	e area tr	ibutary to this feature			$A_T =$	0.883	acres
Enter V _I	_{BMP} dete	rmined from Section 2.	1 of this Handbook		$V_{BMP} =$	742	ft³
		Type of B	ioretention Facility	Design			
Side s	opes requi	ired (parallel to parking spaces	or adjacent to walkways)				
O No sid	e slopes re	equired (perpendicular to parkin	g space or Planter Boxes)				
		Bioreten	tion Facility Surface	Area			
Depth of	Soil Fi	lter Media Layer			$d_S =$	3.0	ft
Top Wid	lth of B	ioretention Facility, exc	cluding curb		$W_T = $	20.0	ft
		Depth, d_E $d_S + (0.4) \times 1 - (0.7/w_T)$	+ 0.5		$d_E = $	1.77	ft
Minimu A _M (f		ce Area, A _m $V_{BMP}(\hat{\pi}^3)$	_		$A_{M} = $	421	jit"
Proposed		d _E (ft) ee Area			A=	1,290	_ft²
		Biorete	ntion Facility Proper	ties			
Side Slo	nes in B	Bioretention Facility	mon racinty 110po		z =	4	:1
Side Side	P05 III D	TOTOTOTICON I WORKEY					
Diamete	r of Uno	lerdrain			J	6	inches
Longitud	linal Slo	ope of Site (3% maxim	ım)		1	0	%
6" Check	Dam S	Spacing				0	feet
Describe	Vegeta	tion:					
Notes:							

npany Name	LAMES ALSO	ershed - BMP	Design Vo	olume, V	BMP	Legend		Required Entr
		(Rev. 10-2011)						Calculated Ce
ananu Name	Note this worksh	eet shall only be used	in conjunctio	n with BMP	designs from the	LID BMP		<u>k)</u> 7/12/2016
igned by	EVB						Case No	
npany Project	Number/Nam	ie		Canyon S	prings Health	care Cente	r	
			BMP I	dentificati	on			
P NAME / ID	AREA 1: BI	ORETENTION: BI						
		Must	t match Nam	ne/ID used	on BMP Design	Calculation	Sheet	
			Design l	Rainfall D	epth			_
n Percentile, 24 n the Isohyetal		ill Depth, Ibook Appendix E				D ₈₅ =	0.62	inches
		Drain	age Manag	ement Are	a Tabulation			
	ln.	sert additional rows i	f needed to	ccommod	ate all DMAs dr	aining to th	ne BMP	
DMA	DMA Area	Post-Project Surface	Effective Imperivous	DMA Runoff Factor	DMA Areas x Runoff Factor	Design Storm Depth (in)	Design Capture Volume, V _{BMP}	Proposed Volume on Plans (cubic
Type/ID BRS1-6	(square feet)	Type Ornamental	Fraction, I _f	0.11	107.6	Deput (in)	(cubic feet)	feet)
D1-13	18056	Landscaping Concrete or Asphalt	1	0.89	16106			
D1-13	18030	Concrete of Asphol	-	0.63	10100			
-	-							
								B 120
To all					150983			
						Turk.		
THE ST								
		1			The second second			the same of the sa

Diameteration	71114-v	Dasies Describes	BMP ID	T accord.	Required	Entries	
Bioretention	racinty	- Design Procedure	BRS1-6	Legend:	Calculate	d Cells	
Company Name:		REC				//12/2016	5
Designed by:		EVB	D	County/City (Case No.:		
			Design Volume			-	
Enter the	area tr	ibutary to this feature			$A_T = $	0.44	acres
Enter V _E	_{MP} dete	rmined from Section 2.	1 of this Handbook		V _{BMP} =	838	ft³
		Type of B	ioretention Facility	Design			
1,42	•	ired (parallel to parking spaces equired (perpendicular to parkin					
		Bioretent	tion Facility Surface	Агеа			
Depth of	Soil Fi	lter Media Layer			$d_S = $	3.0	fì
Top Wid	th of B	ioretention Facility, exc	luding curb		$\mathbf{w}_{\mathrm{T}} = \underline{}$	20.0	ft
		Depth, d _E d _S + (0.4) x 1 - (0.7/w _T)	+ 0.5		$d_E =$	1.77	ft
Minimur A _M (ft		ce Area, A_{m} $V_{BMP} (ft^{3})$ $d_{F} (ft)$	_		$A_{M} =$	475	<u>i</u> tt
Proposed	Surfac	2.,			A=	974	_ft²
		Biorete	ntion Facility Proper	rties			
Side Sloj	oes in B	Bioretention Facility			z =	4	:1
Diameter	of Uno	derdrain				6	inches
Longitud	inal Slo	ope of Site (3% maximu	ım)			0	%
6" Check	Dam S	Spacing				0	feet
Describe	Vegeta	tion:					
Notes:							
				-			

Santa	Ana Wat	ershed - BMP	Design Vo	olume, V	ВМР	Legend		Required Entr
		(Rev. 10-2011)		of pro	1	1 10 DIG	D. d. II. II.	Calculated Ce
npany Name	Note this workshing REC	eet shall <u>only</u> be used	in conjunctio	n with BMP	designs from the	E LID BMP		7/12/2016
igned by	EVB						Case No	
npany Project	Number/Nam	е		Canyon S	prings Health	care Cente	Т	
			D) (D)	1 465 4				
	DATE OF THE PERSON NAMED IN			dentificati	ion	-		
P NAME / ID	AREA 1: BI	ORETENTION: BI		from 1	2442.5	01.1.1.	01	
		Mus	t match Nan	ie/ID usea	on BMP Design	Calculation	1 Sheet	
			Design 1	Rainfall D	epth			
Percentile, 2	4-hour Rainfa	ll Depth,				D ₈₅	0.62	Inches
the Isohyeta	l Map in Hand	lbook Appendix E						
		Drain	age Manag	ement Are	a Tabulation			
	In.	sert additional rows (f needed to	accommod	ate all DMAs di	raining to th	ne BMP	
			Effective	DMA		Design	Design Capture	Proposed Volume on
DMA	DMA Area	Post-Project Surface	Imperivous	Runoff	DMA Areas x	Storm	Valume, V _{BMP}	Plans (cubic
Type/ID	(square feet)	Туре	Fraction, I	Factor	Runoff Factor	Depth (in)	(cubic feet)	feet)
BRS1-7	675	Ornamental Landscaping	0.1	0.11	74.6			
D1-14	14968	Concrete or Asphalt	1	0.89	13351.5	The contract		
						dan T		
				Appropriate to the				
						ar with		
	15643	1	otal		13426.1	0.62	693.7	1046
es:								
ne remaining 35	52.3 cubic feet	of storage available v	will go towar	ds storing t	the 37,243.8 cu	bic feet of	HCOC volume.	

J

Company Name: REC Designed by: BVB County/City Case No.: Designed by: Design Volume Enter the area tributary to this feature A _T = 0.36 acm Enter V _{BMP} determined from Section 2.1 of this Handbook V _{BMP} = 694 ft ³ Type of Bioretention Facility Design Side slopes required (perpendicular to parking spaces or adjacent to walkways) No side slopes required (perpendicular to parking space or Planter Boxes) Bioretention Facility Surface Area Depth of Soil Filter Media Layer $d_S = 3.0$ ft Top Width of Bioretention Facility, excluding curb $d_S = 3.0$ ft Total Effective Depth, $d_E d_E = (0.3) \times d_S + (0.4) \times 1 - (0.7/w_T) + 0.5$ $d_E = 1.77$ ft Minimum Surface Area, $d_T = d_T	Dia	metantian Essil	it. Design Duggedone	BMP ID	T accords	Required	l Entries	
Designed by: EVB County/City Case No.: Design Volume Enter the area tributary to this feature $A_T = 0.36$ acm Enter V_{BMP} determined from Section 2.1 of this Handbook $V_{BMF} = 694$ ft ³ Type of Bioretention Facility Design Side slopes required (perpendicular to parking spaces or adjacent to walkways) No side slopes required (perpendicular to parking space or Planter Boxes) Bioretention Facility Surface Area Depth of Soil Filter Media Layer $d_S = 3.0$ ft Top Width of Bioretention Facility, excluding curb $d_S = 3.0$ ft Total Effective Depth, $d_E d_E = (0.3) \times d_S + (0.4) \times 1 - (0.7/w_T) + 0.5$ $d_E = 1.77$ ft Minimum Surface Area, $d_E = 1.77$ ft Minimum Surface Area, $d_E = 1.77$ ft Minimum Surface Area $d_E = 1.77$ ft Bioretention Facility Properties Side Slopes in Bioretention Facility $d_E = 1.77$ ft Bioretention Facility Properties Side Slopes in Bioretention Facility $d_E = 1.77$ ft included the surface Area	B10	retention Facili	ny - Design Procedure	BRS1-7	Legend:	Calculat	ed Cells	
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$	_						7/12/2016	j i
Enter the area tributary to this feature Enter V_{BMP} determined from Section 2.1 of this Handbook $V_{BMP} = 694$ ft ³ Type of Bioretention Facility Design Side slopes required (parallel to parking spaces or adjacent to walkways) No side slopes required (perpendicular to parking space or Planter Boxes) Bioretention Facility Surface Area Depth of Soil Filter Media Layer $d_S = 3.0$ ft Top Width of Bioretention Facility, excluding curb $w_T = 20.0$ ft Total Effective Depth, d_E $d_E = (0.3) \times d_S + (0.4) \times 1 - (0.7/w_T) + 0.5$ Minimum Surface Area, A_m $A_M (ft^2) = \frac{V_{BMP}(ft^3)}{d_E(ft)}$ Proposed Surface Area Bioretention Facility Properties Side Slopes in Bioretention Facility $z = 4$:1 Diameter of Underdrain Longitudinal Slope of Site (3% maximum)	Design	ed by:	EVB		County/City (Case No.:		
Enter V_{BMP} determined from Section 2.1 of this Handbook $V_{BMP} = 694$ ft ³ Type of Bioretention Facility Design Side slopes required (parallel to parking spaces or adjacent to walkways) No side slopes required (perpendicular to parking space or Planter Boxes) Bioretention Facility Surface Area Depth of Soil Filter Media Layer $d_S = 3.0$ ft Top Width of Bioretention Facility, excluding curb $d_S = 3.0$ ft Total Effective Depth, d_E $d_E = (0.3) \times d_S + (0.4) \times 1 - (0.7/w_T) + 0.5$ $d_E = 1.77$ ft Minimum Surface Area, $d_S = 3.0$ ft Minimum Surface Area, $d_S = 3.0$ ft $d_S = 3.$	-			Design Volume				
Type of Bioretention Facility Design Side slopes required (parallel to parking spaces or adjacent to walkways) No side slopes required (perpendicular to parking space or Planter Boxes) Bioretention Facility Surface Area Depth of Soil Filter Media Layer $d_S = 3.0$ ft Top Width of Bioretention Facility, excluding curb $w_T = 20.0$ ft Total Effective Depth, d_E $d_E = (0.3) \times d_S + (0.4) \times 1 - (0.7/w_T) + 0.5$ Minimum Surface Area, A_m $A_M (ft^2) = \frac{V_{BMP} (ft^2)}{d_E (ft)}$ Proposed Surface Area Bioretention Facility Properties Side Slopes in Bioretention Facility $z = 4$:1 Diameter of Underdrain Longitudinal Slope of Site (3% maximum)		Enter the area	a tributary to this feature			$A_{T}=$	0.36	acres
Side slopes required (parallel to parking spaces or adjacent to walkways) O No side slopes required (perpendicular to parking space or Planter Boxes) Bioretention Facility Surface Area Depth of Soil Filter Media Layer $d_S = 3.0$ ft Top Width of Bioretention Facility, excluding curb $w_T = 20.0$ ft Total Effective Depth, d_E $d_E = (0.3) \times d_S + (0.4) \times 1 - (0.7/w_T) + 0.5$ $d_E = 1.77$ ft Minimum Surface Area, A_m $A_M = 394$ ft* May (ft³) $A_M = 394$ ft* Proposed Surface Area $A_E = 675$ ft² Bioretention Facility Properties Side Slopes in Bioretention Facility $z = 4$:1 Diameter of Underdrain 6 inch Longitudinal Slope of Site (3% maximum)		Enter V _{BMP} de	etermined from Section 2	. I of this Handbook	_	V _{BMP} =	694	ft³
			Type of H	Bioretention Facility	Design			
$\begin{array}{cccccccccccccccccccccccccccccccccccc$		Side slopes re	equired (parallel to parking spaces	or adjacent to walkways)				
Depth of Soil Filter Media Layer $d_S = 3.0 \text{ft}$ Top Width of Bioretention Facility, excluding curb $w_T = 20.0 \text{ft}$ Total Effective Depth, d_E $d_E = (0.3) \times d_S + (0.4) \times 1 - (0.7/w_T) + 0.5$ $d_E = 1.77 \text{ft}$ Minimum Surface Area, A_m $A_M (\text{ft}^2) = \frac{V_{BMP} (\text{ft}^2)}{d_E (\text{ft})}$ Proposed Surface Area $A = 675 \text{ft}^2$ Bioretention Facility Properties Side Slopes in Bioretention Facility $z = 4 :1$ Diameter of Underdrain 6inch Longitudinal Slope of Site (3% maximum) 0%		O No side slope	es required (perpendicular to parki	ng space or Planter Boxes)				
Top Width of Bioretention Facility, excluding curb $w_{T} = 20.0 \text{ft}$ Total Effective Depth, d_{E} $d_{E} = (0.3) \times d_{S} + (0.4) \times 1 - (0.7/w_{T}) + 0.5$ $d_{E} = 1.77 \text{ft}$ Minimum Surface Area, A_{m} $A_{M} (\text{ft}^{2}) = \frac{V_{BMP} (\text{ft}^{3})}{d_{E} (\text{ft})}$ Proposed Surface Area $A = 675 \text{ft}^{2}$ Bioretention Facility Properties Side Slopes in Bioretention Facility $z = 4 :1$ Diameter of Underdrain 6inch Longitudinal Slope of Site (3% maximum) 0%			Bioreter	ntion Facility Surface	Area			
Total Effective Depth, d_E $d_E = (0.3) \times d_S + (0.4) \times 1 - (0.7/w_T) + 0.5$ $d_E = 1.77 \text{ ft}$ Minimum Surface Area, A_m $A_M (ft^2) = \frac{V_{BMP} (ft^3)}{d_E (ft)}$ Proposed Surface Area $A = 675 \text{ ft}^2$ Bioretention Facility Properties Side Slopes in Bioretention Facility $z = 4 \text{ :1}$ Diameter of Underdrain 6 inch Longitudinal Slope of Site (3% maximum) 0 %		Depth of Soil	Filter Media Layer			$d_S = $	3.0	ft
$d_{E} = (0.3) \times d_{S} + (0.4) \times 1 - (0.7/w_{T}) + 0.5$ $d_{E} = 1.77 \text{ ft}$ Minimum Surface Area, A_{m} $A_{M} (ft^{2}) = \frac{V_{BMP} (ft^{3})}{d_{E} (ft)}$ Proposed Surface Area $A = 675 \text{ ft}^{2}$ Bioretention Facility Properties Side Slopes in Bioretention Facility $z = 4 \text{ :1}$ Diameter of Underdrain 6 inch Longitudinal Slope of Site (3% maximum) 0 %		Top Width of	Bioretention Facility, ex	cluding curb		$\mathbf{w}_{\mathrm{T}} = \mathbf{v}_{\mathrm{T}}$	20.0	ft
$A_{M} (\mathrm{ft}^{2}) = \frac{V_{BMP} (\mathrm{ft}^{3})}{d_{E} (\mathrm{ft})}$ Proposed Surface Area $A = 675 \mathrm{ft}^{2}$ Bioretention Facility Properties $z = 4 :1$ Diameter of Underdrain $b = 675 \mathrm{ft}^{2}$ Longitudinal Slope of Site (3% maximum)			1 . 2) + 0.5		$d_E = $	1.77	ft
Proposed Surface Area A= $\frac{675}{11}$ ft ² Bioretention Facility Properties Side Slopes in Bioretention Facility $z = \frac{4}{11}$ Diameter of Underdrain $\frac{6}{100}$ inch Longitudinal Slope of Site (3% maximum) $\frac{6}{100}$				_		$A_{M} = $	394	_it*
Side Slopes in Bioretention Facility $z = 4$:1 Diameter of Underdrain 6 inch Longitudinal Slope of Site (3% maximum) 0 %		Proposed Sur	= · ·			A=	675	ft²
Diameter of Underdrain 6 inch Longitudinal Slope of Site (3% maximum) 0 %		-	Biorete	ention Facility Proper	ties			
Longitudinal Slope of Site (3% maximum) 0 %		Side Slopes in	n Bioretention Facility			z =	4	_:1
		Diameter of U	Inderdrain				6	inches
6" Check Dam Spacing 0 feet		Longitudinal	Slope of Site (3% maxim	um)			0	%
		6" Check Dan	n Spacing				0	feet
Describe Vegetation:		Describe Veg	etation:					
Notes:	Notes:							

Santa	Ana Wat	ershed - BMP	Design Vo	olume, V	BMP	Legend		Required En
	\7_4-4\71_T	(Rev. 10-2011)				I I D DI C	D. J. W. H.	Calculated C
pany Name	REC	eet shall <u>only</u> be used	т сопуинсию	n אוואר מוואר מ	aesigns from th	e <u>Lid Bmp</u>		7/12/2016
gned by	EVB						Case No	
	Number/Nam	e		Canyon S	prings Health	care Cente		
	***			dentificat	on			
P NAME / ID	AREA 1: BI	ORETENTION: HO			on BMP Design	Calculation	Chaot	
		747431		Rainfall D		carcalatio.	, 5,1001	
Percentile, 2	4-hour Rainfa	ll Depth.	Design	idaman D	Срш	D ₈₅ =	0.62	inches
		lbook Appendix E				2-85	0.02	Inches
		Drain	age Manag	ement Are	a Tabulation			
	In.	sert additional rows i	f needed to	accommod	ote all DMAs di	aining to th	ie BMP	
DMA	DMA Area	Post-Project Surface	Effective Imperivous	DMA Runoff	DMA Areas x	Design Storm	Design Capture Volume, V _{BMP}	Proposed Volume on Plans (cubic
Type/ID HYDR:	(square feet)	Type Ornamental	Fraction, I _f	Factor	Runoff Factor	Depth (in)	(cubic feet)	feet)
BRS1-1	6978	Landscaping	0.1	0.11	770.8			
								No.
1								A DESTRU
				1-14-2-1-1-1-1		P. Shirt		
					760			
						744		
						No. 3		No. of the last of
						& M		
					And the second			
					hun-all			
	6978	70	otal		770.8	0.62	39.8	12560
5:								
remaining 12,	520.2 cubic fee	et of storage available	will go tow	ards storin	g the 37,243.8	cubic feet c	f HCOC volume.	

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lity Design Broadyns	BMP ID	Laconde	Require	d Entries	
my - Design Flocedure	HCOC:BRS1-1	Legend:	Calcula	ted Cells	
REC			·	7/12/2016	5
EVB	Davis Walana	County/City (Case No.:		
	Design volume		_		
a tributary to this feature			$A_T =$	0.16	acres
etermined from Section 2	.1 of this Handbook		$V_{BMP} =$	40	ft³
Type of B	Bioretention Facility	Design			
required (parallel to parking spaces	or adjacent to walkways)				
es required (perpendicular to parkir	ng space or Planter Boxes)				
Bioreten	tion Facility Surface	Area			
l Filter Media Layer			$d_S =$	3.0	ft
f Bioretention Facility, exc	cluding curb		$w_T =$	20.0	ft
we Depth, d_E x $d_S + (0.4) \times 1 - (0.7/w_T)$	+ 0.5		d _E ==	1.77	ft
rface Area, A _m $V_{BMP}(ft^3)$	_		$A_{M} = $	23	_tt~
face Area			A=_	6,978	_ft²
Biorete	ention Facility Proper	ties			
n Bioretention Facility			z =	4	:1
Jnderdrain			1	6	inches
Slope of Site (3% maxim	um)		1	0	%
n Spacing			Ī	0	feet
etation:					
	a tributary to this feature determined from Section 2 Type of E required (parallel to parking spaces required (perpendicular to parking Bioreten determined from Section 2 Type of E required (perpendicular to parking Bioreten determined from Section 2 Bioreten determined from Section 2 Type of E required (perpendicular to parking Bioreten determined from Section 2 Bioreten determined from Section 2 Type of E required (parallel to parking Bioreten determined from Section 2 Type of E required (parallel to parking spaces determined from Section 2 Bioreten determined from Section 2 Type of E required (parallel to parking spaces determined from Section 2 Bioreten determined from Section 2 Type of E required (parallel to parking spaces determined from Section 2 Bioreten determined from Section 2 Type of E required (parallel to parking spaces determined from Section 2 Bioreten determined from Section 2 Bioreten determined from Section 2 Type of E required (parallel to parking spaces determined from Section 2 Bioreten determined from Section 2 Biore	REC EVB Design Volume a tributary to this feature determined from Section 2.1 of this Handbook Type of Bioretention Facility required (parallel to parking spaces or adjacent to walkways) es required (perpendicular to parking space or Planter Boxes) Bioretention Facility Surface I Filter Media Layer If Bioretention Facility, excluding curb we Depth, d _E x d _S + (0.4) x 1 - (0.7/w _T) + 0.5 In Face Area, A _m V _{BMP} (ft ³) d _E (ft) face Area Bioretention Facility Proper In Bioretention Facility Underdrain Slope of Site (3% maximum) In Spacing	REC EVB Design Volume a tributary to this feature determined from Section 2.1 of this Handbook Type of Bioretention Facility Design required (parallel to parking spaces or adjacent to walkways) as required (perpendicular to parking space or Planter Boxes) Bioretention Facility Surface Area I Filter Media Layer If Bioretention Facility, excluding curb we Depth, d _E x d _S + (0.4) x 1 - (0.7/w _T) + 0.5 rface Area, A _m V _{BMP} (ft ³) d _E (ft) face Area Bioretention Facility Properties In Bioretention Facility Underdrain Slope of Site (3% maximum) In Spacing	Type of Bioretention Facility Surface Area Bioretention Facility, excluding curb The Depth, d_E $x d_S + (0.4) \times 1 - (0.7/w_T) + 0.5$ The Depth, d_E The Depth	Type of Bioretention Facility Surface Area Filter Media Layer Figure 1 Filter Media Layer Figure 2 Filter Media Layer A _B = 3.0 A _B = 3.0 A _B = 3.0 Filter Media Layer Filter Media Layer A _B = 3.0 Filtr Media Layer A _B = 3.0 Filtr Media Layer A _B = 3.0 Filt Media Layer A _B = 3.0 Filt Media Layer A _B = 3.0 Filt Media Layer A _B = 3.0 Filtr Media Layer A _B = 3.0 Filtr Media Layer A _B = 3.0 Filt Media Layer A _B = 3.0 Filt Medi

Santa	Ana Wat	ershed - BMP	Design Vo	olume, V	BMP	Legend		Required Entr
		(Rev. 10-2011)						Calculated Ce
	REC	eet shall <u>only</u> be used	in conjunctio	n with BMP	designs from the	LID BMP		7/12/2016
npany Name igned by	EVB	-					Case No	
pany Project	Control of the Control	e		Canyon S	prings Health	care Cente		
			22720					
	-		_	dentificati	on			
P NAME / ID	AREA 1: BI	ORETENTION: H					01	
		Mus	t match Nam	ie/ID used	on BMP Design	Colculation	n Sneet	
			Design l	Rainfall D	epth			
Percentile, 2		-				D ₈₅ =	0.62	inches
the Isohyetal	Map in Hand	lbook Appendix E						
		Drain	age Manag	ement Are	a Tabulation			
	Ins	sert additional rows i	f needed to	accommod	ate all DMAs dr	aining to th	те ВМР	
			Effective	DMA		Design	Design Capture	Proposed Volume on
DMA	DMA Area	Post-Project Surface	Imperivous	Runoff	DMA Areas x	Storm	Volume, V _{BMP}	Plans (cubic
Type/ID	(square feet)	Type	Fraction, I _f	Factor	Runoff Factor	Depth (in)	(cubic feet)	feet)
HYDRO: BRS1-2	11467	Ornamental Landscaping	0.1	0.11	1266.6		The little of th	
						1		
E								
								A Marin
						- table		
						1 0		
						3		
			_			1		
Tanal .								
				2-12				
		1						
	11467	T	otal		1266.6	0.62	65.4	20641
		•						
es:								
		et of storage available		1		1. 6 .	fucocuelum	

Diameter tire Facility	Davies Personalism	BMP ID	Lacando	Require	d Entries	
Bioretention Facility	- Design Procedure	HCOC:BRS1-2	Legend:	Calcula	ted Cells	
Company Name:	REC			-	7/12/2016	
Designed by:	EVB	Danian Walama	County/City (Case No.:		
	-	Design Volume				_
Enter the area trib	outary to this feature			$A_{T}^{=}$	0.26	acres
Enter V _{BMP} determ	mined from Section 2.	.1 of this Handbook		V _{BMP} =	65	ft³
	Type of B	Bioretention Facility	Design			
Side slopes require	ed (parallel to parking spaces	or adjacent to walkways)				
O No side slopes req	uired (perpendicular to parkir	ng space or Planter Boxes)				
	Bioreten	tion Facility Surface	Area			
Depth of Soil Filt	er Media Layer			$d_{S} =$	3.0	ft
Top Width of Bio	pretention Facility, exc	cluding curb		$\mathbf{w}_{\mathrm{T}} =$	20.0	ft
Total Effective D $d_E = (0.3) \times d_S$	epth, d_E + (0.4) x 1 - (0.7/w _T)) + 0.5		$d_E = $	1.77	ft
Minimum Surface $A_{M} (ft^{2}) =$	$V_{BMP}(\hat{\mathbf{ft}}^3)$	_		$A_{M} = [$	38	n*
Proposed Surface	d _E (ft) : Area			A=_	11,467	ft²
	Biorete	ention Facility Prope	rties			
Side Slopes in Bi	oretention Facility			z=	4	:1
Diameter of Unde	erdrain			1	6	inche
Longitudinal Slop	pe of Site (3% maxim	um)		1	0	%
6" Check Dam Sp	pacing			1	0	feet
Describe Vegetati	ion:					
Notes:						

	\	(Rev. 10-2011)						Calculated C
		heet shall <u>only</u> be used	in conjunction	a with BMP	designs from the	LID BMP		k) 7/12/2016
npany Nan igned by	EVB		-	-			Case No	
	ect Number/Nam	ne		Canyon S	prings Health	eare Cente		
			BMP I	dentificati	on			
P NAME /	ID AREA 2: BI	ORETENTION: BI						
		Must	match Nam	e/ID used	on BMP Design	Calculation	n Sheet	
			Design I	Rainfall D	epth			
n Percentile	, 24-hour Rainfa	III Depth,				D ₈₅ =	0.62	inches
n the Isohy	etal Map in Hand	dbook Appendix E						
		Drain	age Manage	ement Are	a Tabulation			
	Ins	sert additional rows i	f needed to a	ccommod	ate all DMAs dr	aining to t	he BMP	
V		-					Design Capture	Proposed
DMA	DMA Area	Post-Project Surface	Effective Imperivous	DMA Runoff	DMA Areas x	Design Storm	Volume, V _{BMP}	Volume on Plans (cubic
Type/	Cold In the Cold I	Type	Fraction, i	Factor	Runoff Factor	Depth (in)	(cubic feet)	feet)
BRS2-	1 3758	Ornomental Landscaping	0.1	0.11	415.1			
D2-1	52295	Concrete or Asphalt	1	0.89	46647.1	Val.		
D2-2	16132	Ornamental	0.1	0.11	1781.9			
		Landscaping						
1								
						17:30		
7								
		-						
								5 5 5 5
-							Service .	
	72185	7	otal		48844.1	0.62	2523.6	5825
		•						
tes:								

Rior	retention Facilit	y - Design Procedure	BMP ID	Legend:	Require	d Entries	
Dioi			BRS2-1	Legena.	Calcula	ted Cells	9
~	y Name:	REC			-	7/12/2016	
esigne	d by:	EVB		County/City (Case No.:		-
			Design Volume				
	Enter the area t	ributary to this feature			$A_T =$	1.66	acres
	Enter V _{BMP} det	ermined from Section 2	2.1 of this Handbook		$V_{BMP} =$	2,524	ft³
		Type of I	Bioretention Facility	Design			
	Side slopes req	uired (parallel to parking spaces	or adjacent to walkways)				
	O No side slopes	required (perpendicular to parki	ng space or Planter Boxes)				
		Bioreter	ntion Facility Surface	Area			
	Depth of Soil F	ilter Media Layer			d _S =	3.0	ft
	•	·			0 _		
	Top Width of I	Bioretention Facility, ex	cluding curb		$w_T =$	20.0	ft
	T-4-1 DEC	Dough d					
	Total Effective $d_{-} = (0.3) x$	d _s + $(0.4) \times 1 - (0.7/w_T)$) ± 0.5		d _E =	1.77	ft
	u _E (0.5) n	as (0.1) A 1 (0.11 M)	, - 0.5		GE	1.77	110
	Minimum Surf	oca Arao A					
		V_{BMP} (ft ³)			$A_{M} =$	1,430	ft
	$A_{M}(ft^{2}) = -$	d _E (ft)			141	1,150	_
	Proposed Surfa	ce Area			A=	3,758	ft^2
		Biorete	ention Facility Prope	rties			
	Side Slopes in 1	Bioretention Facility			z =	4	:1
	Diameter of Un	nderdrain			1	6	inche
	Longitudinal Sl	lope of Site (3% maxim	um)			0	%
	6" Check Dam	Spacing				0	feet
	Describe Veget	ation:					
otes:				and the same			

	Santa	Ana Wat	ershed - BMP (Rev. 10-2011)	Design Vo	lume, V	ВМР	Legend		Required Ent
36	(1)	lote this worksh	eet shall only be used	in conjunctio	n with BMP	designs from the	LID BMP	Design Handboo	
	-	REC							7/12/2016
igne		EVB						Case No	
npan	y Project	Number/Nam	e		Canyon S	prings Health	care Cente	T	
				BMP I	dentificat	ion			
P NA	AME/ID	AREA 2: BI	ORETENTION: B						
			Mus			on BMP Design	Calculation	5heet	
_				Design l	Rainfall D	epth	-		
	_	l-hour Rainfa Map in Hand	ll Depth, lbook Appendix E				D ₈₅ =	0.62	inches
						a Tabulation			·
		ln:	sert additional rows i	f needed to t	accommod	ate all DMAs di	aining to ti	ie BMP	
	DMA Type/ID	DMA Area (square feet)	Post-Project Surface Type	Effective Imperivous Fraction, I _r	DMA Runoff Factor	DMA Areas x Runoff Factor	Design Storm Depth (in)	Design Capture Volume, V _{BMP} (cubic feet)	Proposed Volume on Plans (cubic feet)
	BRS2-2	1323	Ornamental	0.1	0.11	146.1			
-	D2-5	14218	Landscaping Concrete or Asphalt	1	0.89	12682,5			
	D2-3	29062	Roofs	1	0.89	25923.3			
1	DZ-3	25002	Nocjs		0.05	23323.3			
1									
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		1							
		4-				The state of			
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ŀ						11.			A STATE OF
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						170			Carlo Page
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- 1									
I							S. ORG		A STATE OF THE STA
									W (100 2)
		44603	T	otal		38751.9	0.62	2002.2	2050
es:									40.4
-51									

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D	T *1*.	D ' D 1	BMP ID	Y 1	Require	ed Entries	
Bioretenti	on Facility	- Design Procedure	BRS2-2	Legend:	Calcula	ated Cells	
Company Nar	ne:	REC			Date:	7/12/2016	
esigned by:		EVE		County/City C	Case No.:		
			Design Volume				
Enter	the area tri	butary to this feature			$A_T =$	1.02	acres
Enter	V _{BMP} deter	mined from Section	2.1 of this Handbook		$V_{BMP} =$	2,002	ft³
		T yp e of	Bioretention Facility	Design			
Si	de slopes requir	red (parallel to parking space	es or adjacent to walkways)				
O N	o side siopes red	quired (perpendicular to park	king space or Planter Boxes)				
		Biorete	ention Facility Surface	Area			
Deptl	of Soil Fil	ter Media Layer			$d_S =$	3.0	ft
Top \	Width of Bi	oretention Facility, ex	xcluding curb		$\mathbf{w}_{T} =$	20.0	ft
	Effective Γ = (0.3) x d ₃	Depth, d _E _S + (0.4) x 1 - (0.7/w ₂	_r) + 0.5		$d_E =$	1.77	ft
	$ \text{num Surfac} \\ _{4} (ft^{2}) = $	v _{BMP} (ft ³)			A _M =	1,135	ľť"
Mark House	osed Surface	d _E (ft) e Area			A=	1,323	ft²
		Biore	tention Facility Prope	rties			
Side	Slopes in Bi	ioretention Facility			z =	4	:1
Diam	eter of Und	erdrain				6	inche
Long	itudinal Slo	pe of Site (3% maxim	num)			0	%
6" C l	eck Dam S	pacing				0	feet
	ribe Vegetat	tion:					
lotes:							

	Ana Wat	ershed - BMP (Rev. 10-2011)	Design Vo	olume, V	ВМР	Legend:		Required Ent Calculated C
		neet shall only be used	in conjunction	n with BMP	designs from the	LID BMP		
mpany Name	REC							7/12/2016
signed by mpany Project	EVB			Cenvon	prings Health	care Cente	Case No	
inpany Project	TAILLIDEL/TAIL	16		Caryon b	prings ricator	care cente	1	·
			BMP I	dentificati	ion			
IP NAME / ID	AREA 2: BI	ORETENTION: BI						
		Must			on BMP Design	Calculation	i Sheet	
	1.0		Design 1	Rainfall D	epth			
h Percentile, 2 m the Isohveta		ill Depth, ibook A pp endix E				D_{85} =	0.62	inches
in the isonycta	i wap in rian							
	-				a Tabulation			
	ins	sert additional rows i	needed to d	эссоттоа	ate all DIVIAS al	aining to ti	ne BIVIP	Proposed
			Effective	DMA		Design	Design Capture	Volume on
DMA	DMA Area	Post-Project Surface	Imperivous	Runoff	DMA Areas x	Storm	Volume, V _{BMP}	Plans (cubic
Type/ID	(square feet)	Туре	Fraction, I	Factor	Runoff Factor	Depth (in)	(cubic feet)	feet)
BRS2-3	1500	Ornamental Landscaping	0.1	0.11	165.7			
D2-4	7715	Concrete or Asphalt	1	0.89	6881.8	N. ELECTRICAL STREET, ST.	The last	
D2-9	39380	Roofs	1	0.89	35127			国主
D2-8	14043	Ornamental Landscaping	0.1	0.11	1551.2		公 市 医	
1								
1					HE ALBERTA			
			1					
							图 5 以 5 周	
						1	B B LEWIS	
						ALUE:	2259.2	

D1	D : D 1	BMP ID	т 1	Required	Entries	
Bioretention Facility	- Design Procedure	BRS2-3	Legend:	Calculate	ed Cells	
Company Name:	REC			-	7/12/2016	
Designed by:	EVB		County/City (Case No.:		
		Design Volume				
Enter the area trib	outary to this feature			$A_T =$	1.44	acres
Enter V _{BMP} deten	mined from Section 2.	.1 of this Handbook		V _{BMP} =	2,259	ft³
	Type of B	Bioretention Facility	Design			
Side slopes require	ed (parallel to parking spaces	or adjacent to walkways)				
O No side slopes req	juired (perpendicular to parkin	ng space or Planter Boxes)				
	Bioreten	tion Facility Surface	Area		-	
Depth of Soil Filt	ter Media Layer			$d_S = $	3.0	ft
Top Width of Bio	oretention Facility, exc	cluding curb		$W_T = $	20.0	ft
Total Effective D $d_E = (0.3) \times d_S$	epth, d _E (0.4) x 1 - (0.7/w _T)	+ 0.5		$d_E =$	1.77	ft
Minimum Surface				Δ ==	1 200	fit"
$A_{M}(ft^{2}) =$	V_{BMP} (ft ³) d_{E} (ft)			$A_{M} = $	1,280	
Proposed Surface	2 ()			A=	1,500	ft ²
	Biorete	ention Facility Prope	rties			
Side Slopes in Bi	oretention Facility			z =	4	:1
Diameter of Unde	erdrain				6	inche
Longitudinal Slop	pe of Site (3% maxim	um)			0	<u>%</u>
6" Check Dam Sp	pacing				0	feet
Describe Vegetat	ion:					
Notes:						

Sant	a Ana Wat	(Rev. 10-2011)	Design Vo	olume, V	ВМР	Legend		Required Entr Calculated Ce
		heet shall only be used	in conjunction	n with BMP	designs from the	LID BMP		
Company Name								7/12/2016
esigned by	EVB ct Number/Nan	00		Camion	prings Health	oore Conte	Case No	
ompany Froje	Ct Indilibei/Inali	ic		Canyon	himiga meatur	care Certic	il .	
			BMP I	dentificat	ion			
MP NAME /	D AREA 2: BI	ORETENTION: BI						
		Musi	t match Nam	ie/ID used	on BMP Design	Calculation	n Sheet	
			Design 1	Rainfall D	epth			
	, 24-hour Rainfa tal Map in Hand	all Depth, dbook Appendix E				D ₈₅ =	0.62	inches
		Drain	nage Manag	ement Are	a Tabulation			
	In	sert additional rows i	f needed to	accommod	ate all DMAs di	raining to t	he BMP	
DMA	and the second second	Post-Project Surface	Effective Imperivous	DMA Runoff	DMA Areas x	Design Storm	Design Capture Valume, V _{BMP}	Proposed Volume on Plans (cubic
Type/I	D (square feet)	Type Ornamental	Fraction, I	Factor	Runoff Factor	Depth (in)	(cubic feet)	feet)
BRS2-4	1408	Landsca ping	0.1	0.11	155.5			
D2-6	47218	Concrete or Asphalt	1	0.89	42118.5	1 4		
D2-7	12828	Ornamental Landscaping	0.1	0.11	1417			
		EMPROCESTATE						
							5 33	
								重制 3
						and the		型是数
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				-				
				- 12				
						400		
				-		W. Fall		1000
	-				AL THE REAL PROPERTY.			
							No.	
	61454	1	otal		43591	0.62	2257.4	3172
	-	•						
otes:	,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,				*			
otes.								

Disease Partition	Design Burnelius	BMP ID	Υ	Required	Entries	
Bioretention Facility -	Design Procedure	BRS2-4	Legend:	Calculate	ed Cells	
Company Name:	REC			_	7/12/2016	
Designed by:	EVB		County/City (Case No.:		
		Design Volume				
Enter the area trib	outary to this feature			$A_{T} = $	1.41	acres
Enter V _{BMP} determ	nined from Section 2	.1 of this Handbook		$V_{BMP} = $	2,257	ft³
	Type of I	Bioretention Facility	Design			
	ed (parallel to parking spaces uired (perpendicular to parki					
	Bioreten	tion Facility Surface	Area			
Depth of Soil Filt	er Media Layer			$d_S =$	3.0	ft
Top Width of Bio	retention Facility, ex	cluding curb		$\mathbf{w}_{\mathrm{T}} =$	20.0	ft
Total Effective Do $d_E = (0.3) \times d_S$	epth, d_E + (0.4) x 1 - (0.7/ w_T)) + 0.5		$d_E = $	1.77	ft
Minimum Surface $A_{M}(ft^{2}) =$	e Area, A_m $V_{BMP} (ft^3)$ $d_E (ft)$			A _M =	1,279	ľť
Proposed Surface	2 ()			A=	1,408	ft²
	Biorete	ention Facility Prope	rties			
Side Slopes in Bio	oretention Facility			z =	4	:1
Diameter of Unde	erdrain				6	inche
Longitudinal Slop	oe of Site (3% maxim	um)		1	0	1 %
6" Check Dam Sp	pacing			0	0	feet
Describe Vegetati	on:					
Notes:						

	Ana Wat	ershed - BMP (Rev. 10-2011)	Design Vo	olume, V	ВМР	Legend		Required Ent
	(Note this works)	heet shall only be used	in conjunctio	n with BMP	designs from the	LID BMP	Design Handboo	
npany Name	REC							7/12/2016
signed by	EVB					1	Case No	
mpany Project	Number/Nam	ne		Canyon S	prings Health	care Cente	r	
			BMP I	dentificati	on			
IP NAME / ID	AREA 3: BI	ORETENTION: BI	RS3-I					
				e/ID used	on BMP Design	Calculation	Sheet	
				Rainfall D				
h Percentile, 2	4-hour Rainfa	all Depth,				D ₈₅ =	0.62	inches
		dbook Appendix E				283	0.02	inches
•	•							
		Drain	age Manag	ement Are	a Tabulation			
	Ins	sert additional rows i	f needed to	accommod	ate all DMAs di	aining to ti	ne BMP	
				344			Davis Cantum	Proposed
			Effective	DMA		Design	Design Capture	Volume on
DMA Type/ID	DMA Area (square feet)	Post-Project Surface Type	Imperivous Fraction, i	Runoff Factor	DMA Areas x Runoff Factor	Storm Depth (in)	Volume, V _{BMP} (cubic feet)	Plans (cubic feet)
To the second	T	Ornamental				Beparing	(Lubic Jeet)	Evene vaniki
BRS3-1	5563	Landscaping	0.1	0.11	614.5			
D3-1	143612	Roofs	1	0.89	128101.9			
D3-2	37577	Concrete or Asphalt	1	0.89	33518.7			
D3-3	39224	Ornamental Landscaping	0.1	0.11	4332.6			
D3-4	1925	Roofs	1	0.89	1717.1		10000000000000000000000000000000000000	The state of the s
			-		}			
			7					
								TAVE V
-		-				6.2		
			-					
			1000					
					10-10-10-10-10-10-10-10-10-10-10-10-10-1			
				No.		美国		MEALINE
						夏 元 5		
					A 1 50 m	E 20		
						新新		The state of the s
				-				No. of Concession, Name of Street, or other Designation, Name of Street, Original Property and Name of Stree
	227901		otal		168284.8	0.62	8694.7	10458

Bioretention Facility -	Design Procedure	BMP ID	Legend:	Required Entries				
Bioretention Facility -	Design Flocedure	BRS3-1	Legena.	Calculate	ed Cells			
Company Name:	REC				/12/2016			
Designed by:	EVB	Daries Maluma	County/City (Case No.:		_		
-		Design Volume						
Enter the area trib	utary to this feature			$A_T = $	5.15	acres		
Enter V _{BMP} determ	nined from Section 2	.1 of this Handbook		$V_{BMP} = $	8,674	ft³		
	Type of B	Sioretention Facility	Design					
 Side slopes required 	f (parallel to parking spaces	or adjacent to walkways)						
	ired (perpendicular to parkir							
	Bioreten	tion Facility Surface	e Area					
Depth of Soil Filte	er Media Layer			$d_S =$	3.0	ft		
Top Width of Bio	Top Width of Bioretention Facility, excluding curb							
	Total Effective Depth, d_E $d_E = (0.3) \times d_S + (0.4) \times 1 - (0.7/w_T) + 0.5$							
Minimum Surface $A_{M}(ft^{2}) =$		A _M =	4,915	ft*				
Proposed Surface		A=	5,563	ft²				
	Biorete	ention Facility Prope	erties					
Side Slopes in Bio	retention Facility			z =	4	:1		
Diameter of Under	rdrain				6	inche		
Longitudinal Slop	Longitudinal Slope of Site (3% maximum)							
6" Check Dam Spa	acing				0	feet		

pany Name RE igned by EV pany Project Num P NAME / ID AR Percentile, 24-ho the Isohyetal Ma DMA Type/ID (sq BRS3-2	C /B nber/Name REA 3: BIG our Rainfal ap in Hand	ORETENTION: BI Muss Il Depth, book Appendix E	BMP I RS3-2 t match Nam Design I	Canyon S dentification e/ID used of Rainfall D ement Are	prings Health ion on BMP Design epth ea Tabulation ate all DMAs dr DMA Areas x Runoff Factor	Care Cente	Date Case No r	Proposed Volume on Plans (cubic
pany Name RE igned by EV pany Project Num P NAME / ID AR Percentile, 24-ho the Isohyetal Ma DMA Type/ID (sq BRS3-2	MA Area quare feet)	ORETENTION: BI Musi Il Depth, book Appendix E Drain Sert additional rows I Post-Project Surface Type Ornamental Landscaping	BMP 1 RS3-2 t match Nam Design 1 nage Manag f needed to a Effective Imperivous Fraction, I _t 0.1	Canyon S Identification Iden	prings Health ion on BMP Design epth ea Tabulation ate all DMAs dr DMA Areas x Runoff Factor	Calculation Das=	Date Case No r Sheet 0.62 Design Capture Volume, V _{BMP}	Proposed Volume on Plans (cubic
pany Project Num P NAME / ID AR Percentile, 24-ho the Isohyetal Ma DMA Type/ID (sq BRS3-2	REA 3: BIG Dur Rainfal ap in Hand Ins OMA Area quare feet)	ORETENTION: BI Musi II Depth, book Appendix E Drain sert additional rows I Post-Project Surface Type Ornamental Landscaping	Design I	Rainfall D ement Are accommode DMA Runoff Factor	epth Tabulation ate all DMAs dr DMA Areas x Runoff Factor	Calculation D ₈₅ =	Sheet 0.62 Design Capture Volume, V _{BMP}	Proposed Volume on Plans (cubic
P NAME / ID AR Percentile, 24-ho the Isohyetal Ma Type/ID (sq BRS3-2	OMA Area quare feet)	ORETENTION: BI Musi II Depth, book Appendix E Drain sert additional rows I Post-Project Surface Type Ornamental Landscaping	Design I	Rainfall D ement Are accommode DMA Runoff Factor	epth Tabulation ate all DMAs dr DMA Areas x Runoff Factor	Calculation D ₈₅ =	0.62 Design Copture Volume, VBMP	Proposed Volume on Plans (cubic
Percentile, 24-ho the Isohyetal Ma DMA Type/ID (sq BRS3-2	our Rainfal ap in Hand Ins OMA Area quare feet)	Musi Il Depth, book Appendix E Drain sert additional rows (Post-Project Surface Type Ornamental Landscaping	Design I	Rainfall D ement Are accommode DMA Runoff Factor 0.11	epth a Tabulation ate all DMAs dr DMA Areas x Runoff Factor	D ₈₅ =	0.62 Design Capture Volume, V _{BMP}	Proposed Volume on Plans (cubic
Percentile, 24-ho the Isohyetal Ma DMA Type/ID (sq BRS3-2	our Rainfal ap in Hand Ins OMA Area quare feet)	Musi Il Depth, book Appendix E Drain sert additional rows (Post-Project Surface Type Ornamental Landscaping	Design I	ement Are accommode DMA Runoff Factor	ea Tabulation ate all DMAs dr DMA Areas x Runoff Factor	D ₈₅ =	0.62 Design Capture Volume, V _{BMP}	Proposed Volume on Plans (cubic
DMA D Type/ID (sq	Ins MA Area quare feet)	II Depth, book Appendix E Drain sert additional rows I Post-Project Surface Type Ornamental Landscaping	Design I	ement Are accommode DMA Runoff Factor	ea Tabulation ate all DMAs dr DMA Areas x Runoff Factor	D ₈₅ =	0.62 Design Capture Volume, V _{BMP}	Proposed Volume on Plans (cubic
DMA D Type/ID (sq	Ins MA Area quare feet)	Drain Drain Drain Post-Project Surface Type Ornamental Landscaping	enage Manage fractive Imperivous Fraction, It	DMA Runoff Factor	DMA Areas x Runoff Factor	aining to the Design Storm	Design Copture	Proposed Volume on Plans (cubic
DMA D Type/ID (sq	Ins MA Area quare feet)	Drain Drain Drain Fost-Project Surface Type Ornamental Landscaping	Effective Imperivous Fraction, I _t	DMA Runoff Factor	DMA Areas x Runoff Factor	aining to the Design Storm	Design Copture	Proposed Volume on Plans (cubic
Type/ID (sq BRS3-2	IMA Area quare feet)	Post-Project Surface Type Ornamental Landscaping	Effective Imperivous Fraction, I _t	DMA Runoff Factor	DMA Areas x Runoff Factor	Design Storm	Design Capture Volume, V _{BMP}	Volume on Plans (cubic
Type/ID (sq BRS3-2	IMA Area quare feet)	Post-Project Surface Type Ornamental Landscaping	Effective Imperivous Fraction, I _f	DMA Runoff Factor	DMA Areas x Runoff Factor 126.4	Design Storm	Design Capture Volume, V _{BMP}	Volume on Plans (cubic
Type/ID (sq BRS3-2	quare feet)	Type Ornamental Landscaping	Imperivous Fraction, I _f	Runoff Factor	Runoff Factor 126.4	Storm	Volume, V _{BMP}	Volume on Plans (cubic
BRS3-2	1144	Ornamental Landscaping	0.1	0.11	126.4	Depth (in)	(cubic jeet)	
		The second secon					ale towns and	feet)
13-3	28275	ROOJS	1	0.89	20224.2	1		
	-				25221.3			
								是整造
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						(A 10)		
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				1				
				He E				
	-							Sept 20
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						Court S		
				<u> </u>				
						100		
						10.000	Missian Albandaria	0.00
-	29419	1	otai		25347.7	0.62	1309.6	1773
s:								
remaining 463.4 c	ubic feet o	f storage available w	rill go toward	s storing th	ne 51,400.8 cub	oic feet of H	COC volume.	

Diametentian E	ممثانية	Dogion Dropodyna	BMP ID	Lagand	Required	l Entries	
Dioretennon P	асшцу	- Design Procedure	BRS3-2	Legend:	Calculate	ed Cells	
Company Name:		REC			_	7/12/2016	
Designed by:		EVB		County/City (Case No.:		
			Design Volume				
Enter the	area tr	ibutary to this feature			$A_T = $	0.67	acres
Enter V _{Bl}	⁄₽ dete	rmined from Section 2	.1 of this Handbook		V _{BMP} =	1,310	ft³
		Type of B	Bioretention Facility	Design			
Side slo	pes requ	ired (parallel to parking spaces	or adjacent to walkways)				
O No side	slopes re	equired (perpendicular to parkir	ng space or Planter Boxes)				
		Bioreten	tion Facility Surface	Area			
Depth of	Soil Fi	lter Media Layer			$d_S = $	3.0	ft
Top Widt	h of B	ioretention Facility, exc		$\mathbf{w}_{\mathrm{T}} = \underline{}$	20.0	ft	
Total Effective $d_E = (0.001)^{-1}$		Depth, d_E $d_S + (0.4) \times 1 - (0.7/w_T)$		$d_E =$	1.77	ft	
Minimum	Surfa	ce Area, A _m			A -	7.10	fit*
A_{M} (ft ²)=	V_{BMP} (ft ³) d_{E} (ft)			$A_{M} = $	742	111
Proposed	Surfac	- : :			A=	1,144	ft ²
		Biorete	ention Facility Proper	ties			
Side Slop	es in B	ioretention Facility	,,,		z=	4	:1
Diameter	of Und	lerdrain				6	inches
Longitudi	Longitudinal Slope of Site (3% maximum)					0	<u></u> %
6" Check	Dam S	pacing				0	feet
Describe	Vegeta	tion:					
Notes:							

<u>Santa</u>	Ana Wat	ershed - BMP	Design V	olume, V	ВМР	Legend		Required Ent
		(Rev. 10-2011)				1 1D D1 0	P1 - 15 - 15 - 1	Calculated C
mpany Name	REC	eet shall <u>only</u> be used	in conjunctio	n איזיר BMP	designs from the	LID BME		7/12/2016
igned by	EVB						Case No	
npany Project	Number/Nam	е		Canyon S	prings Health	care Cente	7	
			BMP	ldentificati	on			
P NAME / [D	AREA 3: BI	ORETENTION: BI						
		Mus			on BMP Design	Calculation	Sheet	
Percentile, 2	4-hour Rainfa	ll Depth.	Design .	Rainfall D	epth	D ₈₅ =	0.62	inches
		ibook Appendix E				1283	0.02	inches
					a Tabulation		S south	
	In.	sert additional rows	f needed to	accommodi	rte all DMAs dr	aining to th	ne BMP	Proposed
DMA	DMA Area	Post-Project Surface	Effective Imperivous	DMA Runoff	DMA Areas x	Design Storm	Design Capture Volume, V _{IMP}	Volume on Plans (cubic
Type/ID	(square feet)	Type	Fraction, k	Factor	Runoff Factor	Depth (in)	(cubic feet)	feet)
BRS3-3	2339	Ornomental Landscaping	0.1	0.11	258.4			
D3-6	37500	Roofs	1	0.89	33450			
D3-7	40415	Concrete or Asphalt	1	0.89	36050.2			
			-					
				-		-35		
				E-25-102				
				12		7 360		
		-						
-								
-								
						100	2015	123
						1		1,00
						Towns.		
						15 - St.		
						N = Th		
	80254	T	otaí	AT-	69758.6	0.62	3604.2	3625
	GUZ34	,			03730.0	DIGE	JUPAL	JAKU
es:								
	8 cubic feat of	storage available wi	li go toward	s storing the	51.400 g aubi	r feet of Hr	OC volume	
E TELLIA THING ZU	TO LUMIT ICCL DI	arounder dyangoic Mi	Bo toward:	Sacoring (III	. 54,400.0001	e receornie	, oe volunie.	

D!+-	otantia - Essili	ity Dogios Preseduce	BMP ID	Lacand	Require	ed Entries	
DIOD	elegiton Pacili	ity - Design Procedure	BRS3-3	Legend:	Calcula	ted Cells	
_	y Name:	REC		0 . (0)	-	7/12/2016	
Designe	d by:	EVB	Design Volume	County/City (Case No.:		_
			Design volune				
	Enter the area	tributary to this feature			$A_T =$	1.84	acres
	Enter V _{BMP} de	etermined from Section 2	.1 of this Handbook		$V_{BMP} =$	3,604	ft³
		Type of B	ioretention Facility	Design			
		equired (parallel to parking spaces as required (perpendicular to parkin					
		Bioreten	tion Facility Surface	Area			
	Depth of Soil	Filter Media Layer		$d_S =$	3.0	ft	
	Top Width of	Bioretention Facility, exc		$\mathbf{w}_{T} =$	20.0	ft	
	Total Effective $d_E = (0.3)$	we Depth, d_E x $d_S + (0.4) \times 1 - (0.7/w_T)$		$d_E =$	1.77	ft	
	Minimum Su	rface Area, A _m			A =	0.040	itt*
	$A_{M}(\hat{\mathbf{r}}^{2}) = -$	$V_{BMP}(ft^3)$ $d_E(ft)$	_		$A_{\mathbf{M}} = $	2,043	
	Proposed Sur	2 , ,			A=	2,339	_ft²
_		Biorete	ntion Facility Prope	rties			
	Side Slopes in	n Bioretention Facility			z =	4	:1
	Diameter of U	Jnderdrain				6	inche
Longitudinal Slope of Site (3% maximum)						0	%
	6" Check Dan				I	0	feet
Votes:	Describe Veg	etation:					

Santa	Ana Watershed - BMF (Rev. 10-2011)	Legend;		Required Entrie			
(Note this worksheet shall only be use	d In conjunctio	n with BMP designs	from the LID BMP	Design Handboo	<u>k</u>)	
Company Name	REC				Date	7/12/2016	
Designed by	EVB				Case No		
Company Project	ct Number/Name Canyon Springs Healthcare Center						
			Rainfall Depth	Design Calculation			
85th Percentile, 2	4-hour Rainfall Depth,			D ₈₅ =	0.62	inches	
from the Isohyeta	l Map in Handbook Appendix E	i.					
	Dra	inage Manag	ement Area Tabu	lation	_		
	Insert additional rows	s if needed to	occommodate all D	MAs draining to th	ie BMP		
		Effective	DMA	Design	Design Capture	Proposed Valume on	

DMA Type/ID	OMA Area (square feet)	Post-Project Surface Type	Effective Imperivous Fraction, 4	DMA Runoff Factor	OMA Areas x Runoff Factor	Design Storm Depth (in)	Design Capture Valume, V _{BMP} (cubic feet)	Proposed Valume on Plans (cubic feet)
BRS3-4	1565	Ornamental Landscaping	0.1	0.11	172.9			
D3-8	45827	Concrete or Asphalt	1	0.89	40877.7			
					10.2			C. A.
							4	
						1		
* ***	47392	1	otal		41050.6	0.52	2120.9	2425

Ν	ot	Ĉ	S	

The remaining 304.1 cubic feet of storage available will go towards storing the 51,400.8 cubic feet of HCOC volume.

D' and at Date	Paris Danie	BMP ID	T	Require		
Bioretention Facil	lity - Design Procedure	BRS3-4	Legend:	Calcula	ted Cells	
Company Name:	REC			-	7/12/2016	
esigned by:	EVB		County/City C	Case No.:		
		Design Volume				
Enter the are	a tributary to this feature			A _T =	1.08	acres
Enter V _{BMP} d	letermined from Section 2.	.1 of this Handbook		V _{BMP} =	2,121	ft³
	Type of B	ioretention Facility	Design			
	required (parallel to parking spaces ses required (perpendicular to parkin					
	Bioreten	tion Facility Surface	Area			
Depth of Soi	l Filter Media Layer			$d_S =$	3.0	ft
Top Width o	f Bioretention Facility, exc		$\mathbf{w}_{\mathrm{T}} = \mathbf{v}_{\mathrm{T}}$	20.0	ft	
Total Effection $d_E = (0.3)$		$d_{E} = $	1.77	A		
Minimum Su $A_{M}(\hat{x}^{2}) =$		A _M =	1,202	Įtt"		
Proposed Su	d _E (ft) rface Area		A=	1,565	ft²	
	Biorete	ntion Facility Prope	rties			
Side Slopes i	in Bioretention Facility			z=	4	:1
Diameter of	Diameter of Underdrain					
Longitudinal			0	%		
6" Check Da	m Spacing				0	feet
Describe Ve	getation:					
lotes:						

Santa	Ana Wat	ershed - BMP (Rev. 10-2011)	Design Vo	olume, V	ВМР	Legend		Required Entrie Calculated Cell		
		eet shall <u>only</u> be used	In conjunctio	n with BMP	designs from the	LID BMP				
Company Name	REC							7/12/2016		
Designed by	EVB					Case No				
Company Project	ompany Project Number/Name Canyon Springs I						r			
BMP NAME / ID	AREA 3: BI	ORETENTION; BI	t match Nan	ne/ID used Rainfall D	on BMP Design	Calculation	Sheet			
			TrestEtt 1	каппап Б	ерш			_		
85th Percentile, 2 from the Isohyeta		Il Depth, Ibook Appendix E				D ₈₅ =	0.62	inches		
		Drain	age Manag	ement Are	a Tabulation					
	In.	sert additional rows i	f needed to a	accommod	ate all DMAs dr	aining to th	ie BMP			
DMA Type/ID	DMA Area (square feet)	Post-Project Surface Type	Effective Imperivous Fraction, k	DMA Runoff Factor	DMA Areas x Runoff Factor	Design Storm Depth (in)	Design Capture Volume, V _{MAP} (cubic feet)	Proposed Volume on Plans (cubic feet)		

DMA Type/ID	DMA Area (square feet)	Post-Project Surface Type	Effective Imperivous Fraction, I _f	DMA Runoff Factor	DMA Areas x Runoff Factor	Design Storm Depth (in)	Design Capture Volume, V _{BMP} (cubic feet)	Proposed Volume on Plans (cubic feet)
BR53-5	4739	Ornamental Landscaping	0.1	0.11	523.5			
D3-9	16353	Concrete or Asphalt	1	0.89	14586.9			
				= 1				
								15
					BURLE	To be a		
				22.53				
	2							
						192		
						1		
					RELIE	130-1-8		
	21092	To	otal		15110.4	0.62	780.7	7345

Notes:	
The remaining 6,546.3 cubic feet of storage available will go towards storing the 51,400.8 cubic feet of HCOC volume.	

Bioretention Facility -	Design Procedure	BMP ID	Legend:	Required		
Diorecention Facility	Design Freeduce	BRS3-5	Begend.	Calculate		
Company Name:	REC		a	_	7/12/2016	
Designed by:	EVB	Design Volume	County/City (Case No.:		
		Design volume				
Enter the area trib	utary to this feature			$A_T = $	0.48	acres
Enter V _{BMP} determ	nined from Section 2.	.1 of this Handbook		V _{BMP} =	781	ft³
	Type of B	ioretention Facility	Design			
 Side slopes require 	d (parallel to parking spaces	or adjacent to walkways)				
	aired (perpendicular to parkin					
	Bioreten	tion Facility Surface	e Area			
Depth of Soil Filte	er Media Layer			d _S =	3.0	ft
Top Width of Bio	Top Width of Bioretention Facility, excluding curb					
•				_		_
Total Effective De	epth, d _E					
$d_{\rm E} = (0.3) \times d_{\rm S}$	$+ (0.4) \times 1 - (0.7/w_T)$	+ 0.5		$d_E = $	1.77	ft
Minimum Surface	Area, Am					
$A_{M}(ft^{2}) =$	$V_{BMP}(ft^3)$	_		$A_{\mathbf{M}} = $	443	_ft ⁻
	d _E (ft)					. 7
Proposed Surface	Area			A=	4,739	_ft²
	D: .	B. 211. B.				
	Biorete	ention Facility Prope	nies	_		
Side Slopes in Bio	Side Slopes in Bioretention Facility					
Diameter of Unde	udua: u				6	inche
Dianjeter of Under	TOTALL			_	6	Inche
Longitudinal Slop	Longitudinal Slope of Site (3% maximum)					%
6" Check Dam Sp.	acing				0	feet
Describe Vegetation	· · ·					

Santa	Ana Wat	ershed - BMP	Design V	olume, V	ВМР	Legend		Required En
	Toda elita a alab	(Rev. 10-2011)		d D1/0	de la constant	I ID DIG	D 1 17 11	Calculated C
ipany Name	REC	eet shall <u>only</u> be used	іл сопріпсио	אוויו מוויו מ	aesigns from th	e <u>LID BMP</u>		7/12/2016
igned by	EVB						Case No	
	Number/Nam	ne		Canyon S	prings Health	care Cente	ar .	
			BMP	Identificati	ion			
P NAME / ID	AREA 3: BI	ORETENTION: BI						
		Mus	t match Nan	ne/ID used	on BMP Design	Calculation	5heet	
			Design l	Rainfall D	epth			
Percentile, 2	4-hour Rainfa	di Depth,				D ₈₅ =	0.62	inahaa
		lbook Appendix E				~85	0.02	inches
		Danie	ana Manaa		a Tabulation			
	i-	•				-7-1 4- 41	- 7140	
-	111.	sert additional rows i	needed to	accommod	ote un DiviAs at	aining to ti	ie Bivir	Proposed
100			Effective	DMA		Design	Design Capture	Volume on
DMA Tunn (ID	DMA Area	Post-Project Surface	Imperivous	Runoff	DMA Areas x	Storm	Volume, V _{BMP}	Plans (cubic
Type/ID	(square feet)	Type Ornamental	Fraction, 4		Runoff Factor	Depth (in)	(cubic feet)	feet)
BR53-6	7705	Landscaping	0.1	0.11	851.1			
D3-10	42080	Concrete or Asphalt	1	0.89	37535.4	100		
D3-11	37156	Concrete or Asphalt	1	0.89	33143.2			
		415 (1000)				10.00		
				a s Allahari				
						Notice and		A THE REAL PROPERTY.
						300		2100
								質に当
						516		
				1.00			- 15 To 15	
					TELES			
1								
	86941	7	otal		71529.7	0.62	3695.7	11943
	00374		AND THE RESERVE OF THE PERSON		1 80 8 3 1 1	U.U.L	3033.6	14579
25:	47.0			,		1		1
a remaining 8,2	47.3 cubic feet	of storage available	will go towa	rds storing	the 51,400.8 c	ubic feet of	HCOC volume.	

edure	BRS3-6	Legend:				
	DIED U		Calcula	ited Cells		
REC				7/12/2016		
EVB	Design Walters	County/City (Case No.:			
	Design volume					
Enter the area tributary to this feature						
ection 2.	1 of this Handbook		V _{BMP} =	3,696	ft³	
ype of B	ioretention Facility	Design				
	-					
Bioretent	tion Facility Surface	Атеа				
Depth of Soil Filter Media Layer						
Top Width of Bioretention Facility, excluding curb						
Total Effective Depth, d_E $d_E = (0.3) \times d_S + (0.4) \times 1 - (0.7/w_T) + 0.5$						
Minimum Surface Area, A_m $A_M (ft^2) = \frac{V_{BMP} (ft^3)}{d_E (ft)}$						
Proposed Surface Area					ft ²	
Rioreter	ntion Facility Prope	nlies				
	and racing riope				:1	
Side Slopes in Bioretention Facility						
Diameter of Underdrain					inche	
Longitudinal Slope of Site (3% maximum)					<u></u> %	
			1	0	feet	
		V-11				
	feature ection 2. ype of B ing spaces ar to parkin Bioreten er ility, exc (0.7/w _T) Biorete	Design Volume feature ection 2.1 of this Handbook ype of Bioretention Facility ing spaces or adjacent to walkways) ar to parking space or Planter Boxes) Bioretention Facility Surface er ility, excluding curb (0.7/w _T) + 0.5 Bioretention Facility Prope	Design Volume feature ection 2.1 of this Handbook ype of Bioretention Facility Design ing spaces or adjacent to walkways) ar to parking space or Planter Boxes) Bioretention Facility Surface Area er ility, excluding curb (0.7/w _T) + 0.5	Design Volume feature A_T = ection 2.1 of this Handbook V_{BMP} = sype of Bioretention Facility Design ing spaces or adjacent to walkways) ar to parking space or Planter Boxes) Bioretention Facility Surface Area er d_S = fility, excluding curb w_T = $(0.7/w_T) + 0.5$ d_E = Bioretention Facility Properties fility z =	Design Volume feature $A_T = 1.9$ ection 2.1 of this Handbook $V_{BMP} = 3,696$ type of Bioretention Facility Design fing spaces or adjacent to walkways) ar to parking space or Planter Boxes) Bioretention Facility Surface Area er $d_S = 3.0$ where $d_S = 3.0$ (0.7/which is the properties of the properties o	

Santa	Ana wat	ershed - BMP (Rev 10-2011)	Design Vo	olume, V	вмР	Legend		Required Ent Calculated C
0	Vote this worksh	eet shall only be used	in conunctio	nauth RMP	designs from the	IID RMP	Design Handbac	
pany Name	REC	cei santi emp be asea	in conjunction	1 11 11 11 20121	mesigna ji oni in	210 0/41		7/12/2016
gned by	EVB			Case No				
pany Project	Number/Nam	le		Canyon S	prings Health	care Cente	r	
			BMD I	dentificati	On			
NIANE / III	ADDA 2. DI	ORETENTION: H			OIL			
NAUME/ID	AREA 5. DI				on BMP Design	Calculation	Sheet	
			Design l	Rainfall D	epth			
	4-hour Rainfa I Map in Hand	ll Depth, Ibook Appendix E				D ₈₅ =	0.62	inches
		Drain	iage Manag	ement Are	a Tabulation			
	In	sert additional rows i	f needed to a	ccommod	ete all DMAs di	aining to th	е ВМР	
DMA	DMA Area	Post-Project Surface	Effective Imperivous	DMA Runoff	DMA Areas x	Design Storm	Design Capture Volume, V _{BMP}	Proposed Volume on Plans (cubic
Type/ID	(square feet)	Type	Fraction, 4	Factor	Runoff Factor	Depth (in)	(cubic feet)	feet)
HYDRO: BRS3-1	6099	Ornomental Landscaping	0.1	0.11	673.7			
						E S		
				· · · ·			A Section	
				200				1 1 1 1 1 1 1
								R STORY
					1000			200
							1 信量公司	
	1							
						15 T		5 5 5
								DOS T
The same				1 3 3 7	la l			
	5099	Ţ	otal		673.7	0.62	34.8	9453.45
s:								
	18 65 cubic 6s	et of storage available	e will on tow	ards storin	a the 51 400 9	cubic feet s	of HCOC volume	
	TOTAL CARICIE	er or septed a a usuali	S 41111 PO LOW	2,33,300111	D 1110 DZ, 100.0	Capic Icet (, rece volunte	

Diagramatica Engility	Decice Propodure	BMP ID	Legand	Required Entries			
Bioretention Facility	- Design Frocedure	HCOC: BRS3-1	Legend:	Calcula	ted Cells		
ompany Name:	REC				7/12/2016		
esigned by:	EVB	Daries Walana	County/City C	Case No.:			
		Design Volume				_	
Enter the area trib	outary to this feature			$A_T =$	0.22	acres	
Enter V _{BMP} determ	Enter V_{BMP} determined from Section 2.1 of this Handbook						
	Type of B	lioretention Facility	Design				
	ed (parailel to parking spaces ulred (perpendicular to parkin						
	Bioreten	tion Facility Surface	Area				
Depth of Soil Filt	Depth of Soil Filter Media Layer						
Top Width of Bio	Top Width of Bioretention Facility, excluding curb						
	Total Effective Depth, d_E $d_E = (0.3) \times d_S + (0.4) \times 1 - (0.7/w_T) + 0.5$						
Minimum Surface	e Area, A _m V _{BMP} (ft ³)			$A_{M} = $	20	ti*	
$A_{\rm M}$ (ft ²) =	d _E (ft)						
Proposed Surface	: Area			A=	6,099	ft²	
	Biorete	ention Facility Prope	rties				
Side Slopes in Bi	Side Slopes in Bioretention Facility						
Diameter of Unde	Diameter of Underdrain					inche	
	Longitudinal Slope of Site (3% maximum)					%	
6" Check Dam Sp	pacing				0	feet	
Describe Vegetat	ion:						
otes:	TOIL.						

Santa	Ana Watershed - BM		Legend:	Required Entries
	(Rev. 10-2011	1)		Calculated Cells
	(Note this worksheet shall puly be u	sed in conjunction with BMP designs from	n the LID BMP Design H	
Company Name	REC			Date 7/12/2016
Designed by	EVB		C	ase No
Company Project	Number/Name	Canyon Springs He	althcare Center	
BMP NAME / II	AREA 4: BIORETENTION:			
		BMP Identification		
	M	lust match Name/ID used on BMP De	sign Calculation Sheet	
		Design Rainfall Depth		
85th Percentile, 2	4-hour Rainfall Depth,		$D_{85} = 0.0$	52 inches
from the Isohyeta	il Map in Handbook Appendix	Е		III CONTROL
	Dı	rainage Management Area Tabulati	on	
	Insert additional roy	vs if needed to accommodate all DMA	as draining to the BMP	

DMA Type/ID	DMA Area (square feet)	Post-Project Surface Type	Effective Imperivous Fraction, I _f	DMA Runoff Factor	DMA Areas x Runoff Factor	Design Storm Depth (in)	Design Capture Volume, V _{BMP} (cubic feet)	Proposed Volume on Plans (cubic feet)
BR54-1	3174	Ornamental Landscaping	0.1	0.11	350.6			
D4-1	13051	Concrete or Asphalt	ī	0.89	11641.5		CONTRACTOR OF THE PARTY OF THE	
04-2	8945	Ornamental Landscaping	0.1	0.11	988			
D4-14	11453	Concrete or Asphalt	1	0.89	10216.1			
				7				
					- 7			
				DIAM'S S				
				991				
	36623	7	otal		23196.2	0.62	1198.5	4949.7

ľ	Notes:			
l	The remaining 3,751.2 cubic feet of storage avail	able will g	to towards storing the 51,400.8 cubic fe	eet of HCOC volume

Rigger	tention Easil	lity - Design Procedure	BMP ID	Legend:	Required	I Entries	
Diote	tention rach	nty - Design Flocedure	BRS4-1	Legend.	Calculat	ed Cells	
ompany		REC		G . (G): (_	7/12/2016	
esigned	by:	EVI	Design Volume	County/City (Case No.:		-
			Design volume				_
F	Enter the area	a tributary to this feature			$A_T =$	0.84	acres
F	Enter V _{BMP} d	etermined from Section	2.1 of this Handbook		V _{BMP} =	1,199	ft³
		Type of	Bioretention Facility	Design			
(required (parallel to parking space es required (perpendicular to parl					
		Biorete	ention Facility Surface	e Area			
Ι	Depth of Soil	I Filter Media Layer			$d_S =$	3.0	ft
Τ	Top Width of	f Bioretention Facility, e	xeluding curb		$\mathbf{w}_{\mathrm{T}} = \mathbf{v}_{\mathrm{T}}$	20.0	ft
Т	Total Effective $d_E = (0.3)$	ve Depth, d _E x d _S + (0.4) x 1 - (0.7/w-	r) + 0.5		$d_E = $	1.77	ft
λ	Minimum Su $A_{M}(\hat{\pi}^{2}) = -$	rface Area, A_m $V_{\text{BMP}}(ft^3)$ $d_F(ft)$			A _M =	680	ft-
P	Proposed Sur				A=_	3,174	ft²
_		Biore	tention Facility Prope	arties			
S	Side Slopes i	n Bioretention Facility			z=_	4	:1
Γ	Diameter of U	Underdrain			1	6	inche
L	ongitudinal	Slope of Site (3% maxin	num)		1	0	%
6	" Check Dar	m Spacing				0	feet
Γ	Describe Veg	etation:					
otes:							

Santa	Ana Watershed - BN (Rev. 10-201	1P Design Volume, V _{BMP}	Legend:	Required Entries Calculated Cells
(Note this worksheet shall only be t	used in conjunction with BMP designs from	m the LID BMP Design H	(andbook)
Company Name	REC			Date 7/12/2016
Designed by	EVB		C	ase No
Company Project	Number/Name	Canyon Springs Hea	althcare Center	
BMP NAME / II	AREA 4: BIORETENTION	: BRS4-2 Must match Name/ID used on BMP De	sion Calculation Shoot	
BMP NAME / II				
	,	wast match warneylo used on black bes	sign Colcolotion Sheet	
		Design Rainfall Depth		
85th Percentile, 2	4-hour Rainfall Depth,		D ₈₅ = 0.6	52 inches
from the Isohyeta	l Map in Handbook Appendix	E		and the same
	D	rainage Management Area Tabulati	ion	

Insert additional rows if needed to accommodate all DMAs draining to the BMP

DMA Type/ID	DMA Area (square feet)	Post-Project Surface Type	Effective Imperivous Fraction, I _f	DMA Runoff Factor	DMA Areas x Runoff Factor	Design Storm Depth (in)	Design Copture Volume, V _{BMP} (cubic feet)	Proposed Volume on Plans (cubic feet)
BR\$4-2	900	Ornamental Landscaping	0.1	0.11	99.4			
D4-3	24764	Concrete or Asphalt	1	0.89	22089.5			
		Celo y as						
						1		
	25664		otal		22188.9	0,62	1146.4	1395

N	otac	
44	otes	

The remaining 248.6 cubic feet of storage available will go towards storing the 51,400.8 cubic feet of HCOC volume.

BRS4-2 Design Volume	Legend:	Date:	ted Cells 7/12/2016	
Design Volume	County/City (-	7/12/2016	
Design Volume	County/City (age Ma •		
Design volume		Jase IVO		
	-			
		$A_T = $	0.589	acres
1 of this Handbook		V _{BMP} =	1,146	ft³
ioretention Facility	Design			
ion Facility Surface	Area			
		$d_S =$	3.0	ft
luding curb		$\mathbf{w}_{T} = \mathbf{v}_{T}$	20,0	ft
+ 0.5		$d_E =$	1.77	fi
		A -	650	lt*
-		A _M -	650	1.
		A=_	900	ft²
ntion Facility Prope	rties			
		z=	4	:1
		1	6	inche
m)			_0]%
			0	feet
	ioretention Facility I or adjacent to walkways) g space or Planter Boxes) tion Facility Surface cluding curb	ioretention Facility Design or adjacent to walkways) g space or Planter Boxes) tion Facility Surface Area cluding curb + 0.5	incretention Facility Design or adjacent to walkways) g space or Planter Boxes) tion Facility Surface Area $d_S = \begin{bmatrix} \\ \\ \\ \\ \end{bmatrix}$ cluding curb $w_T = \begin{bmatrix} \\ \\ \\ \\ \end{bmatrix}$ $+ 0.5$ $d_E = \begin{bmatrix} \\ \\ \\ \\ \end{bmatrix}$ and the facility Properties $z = \begin{bmatrix} \\ \\ \\ \\ \end{bmatrix}$	ioretention Facility Design or adjacent to walkways) g space or Planter Boxes) tion Facility Surface Area $d_S = 3.0$ Eluding curb $w_T = 20.0$ $d_E = 1.77$ $A_M = 650$ $A = 900$ Intion Facility Properties $z = 4$ 6 Intion Mark 1990

Santa	Ana Wat	rershed - BMP (Rev. 10-2011)	Design Vo	olume, V	ВМР	Legend		Required Entrie Calculated Cell
	Note this worksh	eet shall <u>only</u> be used	in conjunction	n with BMP	designs from the	LID BMP	Design Handbo	9 <u>k</u>)
Company Name	REC						Date	7/12/2016
Designed by	EVB						Case No	
Company Project	Number/Nam	ie		Canyon S	prings Health	care Cente	T	
BMP NAME / II	AREA 4: BI	ORETENTION: BI	t match Nam	e/ID used Rainfall D	on BMP Design	Calculation	1 Sheet	
05:1 D :: (1)	V	11.75	Dough		орш			
85th Percentile, 2 from the Isohyeta		ili Depth, Ibook Appendix E				D ₈₅ =	0.62	inches
		Drain	age Manage	ement Are	a Tabulation			
	In.	sert additional rows (f needed to d	ccommod	ate all DMAs di	aining to ti	he BMP	
DMA Type/ID	DMA Area (square feet)	Post-Project Surface	Effective Imperivous	DMA Runoff Factor	DMA Areas x	Design Storm	Design Capture Volume, V _{BMP}	Proposed Volume on Plans (cubic

DMA Type/ID	DMA Arga (square feet)	Post-Project Surface Type	Effective Imperivous Fraction, I ₁	DMA Runoff Factor	DMA Areas x Runoff Factor	Design Storm Depth (in)	Design Capture Volume, V _{BMP} (cubic feet)	Proposed Volume on Plans (cubic feet)
BR 54 -3	900	Ornamental Landscaping	0.1	0.11	99.4			
D4-4	24764	Concrete or Asphalt	1	0.89	22089,5			
						至雙		
						1		
				Admir v				
						A PART		
			-					
						A STATE		
						Seller		
						1		
	25664	T	otal		22188.9	0.62	1146.4	1395

Notes:	
The remaining 248.6 cubic feet of storage available will go to	wards storing the 51,400.8 cubic feet of HCOC volume.

Bioretention Facility	- Design Procedure	BMP ID	Legend:	Require		
		BRS4-3	Bogona.	Calculat		
ompany Name:	REC			_	7/12/2016	
esigned by:	EVB	Darian Valuma	County/City (Case No.:		
		Design Volume				
Enter the area trib	outury to this feature			$A_T = $	0.589	acres
Enter V _{BMP} deten	nined from Section 2.	I of this Handbook		V _{BMP} =	1,146	ft³
	Type of B	ioretention Facility	Design			
Side slopes require	ed (parallel to parking spaces	or adjacent to walkways)				
	uired (perpendicular to parkin					
	Bioreten	tion Facility Surface	Area			
Depth of Soil Filt	er Media Layer			$d_S =$	3.0	ft
Top Width of Bio	retention Facility, exc	eluding curb		$\mathbf{w}_{\mathrm{T}} = $	20.0	ft
Total Effective De $d_E = (0.3) \times d_S$	epth, d_E + (0.4) x 1 - (0.7/ w_T)	+ 0.5		$d_E =$	1.77	ft
Minimum Surface $A_{M} (ft^{2}) = \cdots$	e Area, A _m $V_{BMP}(ft^3)$ $d_E(ft)$			A _M =	650	Ħ*
Proposed Surface				A=	900	ft ²
	Biorete	ntion Facility Proper	ties			
Side Slopes in Bio	oretention Facility			z =	4	:1
Diameter of Unde	erdrain			1	6	inche
Longitudinal Slop	e of Site (3% maximu	ım)			0	%
6" Check Dam Sp	acing				0	feet
Describe Vegetati	on:					
otes:						

Santa	Ana Wat	ershed - BMP (Rev. 10-2011)	Design Vo	olume, V	ВМР	Legend		Required Entri Calculated Cel
npany Name igned by	REC EVB	seet shall <u>anh:</u> be used	in conjunction				Date Case No	7/12/2016
npany Projec	Number/Nam	le	BMP I	Canyon S	prings Health	care Cente	ar	
P NAME / II	AREA 4: BI	ORETENTION: BI	RS4-4					
		Musi	t match Nam	e/ID used	on BMP Design	Calculation	n Sheet	
			Design I	Rainfall D	epth			
	4-hour Rainfa Il Map in Hand	JI Depth, ibook Appendix E	Design I	Rainfall D	epth	D ₈₅ =	0.62	inches
	d Map in Hand	ibook Appendix E Drair	nage Manag	ement Are	a Tabulation			inches
	d Map in Hand	ibook Appendix E	nage Manag	ement Are	a Tabulation			
	d Map in Hand	ibook Appendix E Drair	nage Manag	ement Are	a Tabulation			Proposed Volume on Plans (cubic feet)
n the Isohyeta	l Map in Hand	ibook Appendix E Drain ert additional rows i Post-Project Surface	age Manage f needed to d Effective Imperivous	ement Are	ea Tabulation ate all DMAs de DMA Areas x	Design Storm	he BMP Design Capture Volume, V _{BMP}	Proposed Volume on Plans (cubic
DMA	l Map in Hand Ins DMA Area (square feet)	ibook Appendix E Drain ert additional rows i Post-Project Surface Type Ornamental	effective	ement Are occommod DMA Runoff Factor	ea Tabulation ote all DMAs di DMA Areas x Runoff Pactor	Design Storm	he BMP Design Capture Volume, V _{BMP}	Proposed Volume on Plans (cubic

191-20		1965	Traderon in			Berlin and Bridge and all	(00000)	
BR54-4	1558	Ornamental Landscaping	0.1	0.11	172,1			
D4-5	24382	Concrete or Asphalt	1	0.89	21748.7		*	3 1 3 3
D4-6	5830	Ornamental Landscaping	0.1	0.11	644			
	4							
						7 7		
				T.D.				1 10
	31770	7	otal		22564.8	0.62	1165.8	2415

LANGEON.	N	O	PPC	
	LA	v	w	

The remaining 1,249.2 cubic feet of storage available will go towards storing the 52,400.8 cubic feet of HCOC volume.

Bioretention Faci	lity - Design Procedure	BMP ID	Legend:	Required Entries	
Dioxetennon radi	inty - Design 1 roccdure	BRS4-4	Legend.	Calculated Cells	
ompany Name:	REC			Date: 7/12/2016	
Pesigned by:	EVB		County/City C	Case No.:	
	tion of the second	Design Volume			
Enter the are	a tributary to this feature			$A_{T} = 0.729$	acres
Enter V _{BMP} d	determined from Section 2	.1 of this Handbook		V _{BMP} = 1,166	ft³
	Type of B	Sioretention Facility	Design		
 Side slopes 	required (parallel to parking spaces	or adjacent to walkways)			
O No side slop	pes required (perpendicular to parkin	ng space or Planter Boxes)			
	Bioreten	tion Facility Surface	Area		
Depth of Soi	l Filter Media Layer			$d_{S} = 3.0$	ft
Top Width o	f Bioretention Facility, exc	cluding curb		$w_T = 20.0$	ft
Total Effective	ve Depth, d _E				
$d_E = (0.3)$	$x d_S + (0.4) x 1 - (0.7/w_T)$	+ 0.5		$d_{\rm E} = 1.77$	ft
Minimum Su	urface Area, Am				12-
$A_{M}(ft^{2}) = -$	V _{BMP} (ft ³)	-		$A_{\rm M} = 661$	Ħ*
Proposed Sur	α _E (1t)			A= 1,558	ft ²
	Biorete	ntion Facility Proper	ties		
Side Slopes i	n Bioretention Facility			z=4	:1
Diameter of U	Underdrain			6	inche
_	Slope of Site (3% maximu	m)		0	%
6" Check Dar	m Spacing			0	feet
Describe Veg	getation:				
otes:					

Required Entries Santa Ana Watershed - BMP Design Volume, VBMP Legend: (Rev. 10-2011) Calculated Cells (Note this worksheet shall ante be used in conjunction with BMP designs from the LID BMP Design Handbook) Date 7/12/2016 Company Name REC EVB Designed by Case No Company Project Number/Name Canyon Springs Healthcare Center BMP Identification BMP NAME / ID AREA 4: BIORETENTION: BRS4-6 Must match Name/ID used on BMP Design Calculation Sheet Design Rainfall Depth 85th Percentile, 24-hour Rainfall Depth, $D_{85} =$ 0.62 inches from the Isohyetal Map in Handbook Appendix E Drainage Management Area Tabulation

Insert additional rows if needed to accommodate all DMAs draining to the BMP

DMA Type/ID	DMA Area (square feet)	Post-Project Surface Type	Effective Imperivous Fraction, I _I	DMA Runoff Factor	DMA Areas x Runoff Factor	Design Storm Depth (in)	Design Capture Volume, V _{BAP} (cubic feet)	Proposed Valume on Plans (cubic feet)
BRS4-6	2818	Ornamental Landscaping	aı	0.11	311_3			
D4-9	65043	Roofs	1	0.89	58018.4			CENTRE.
D4-10	16396	Concrete or Asphalt	1	0.89	14625.2			
								Cutta 6
							V + + -7/1	
		2						
						Sep.		
				40				
	84257	7	otal		72954.9	0.62	3769.3	4368

Pe I	-	۰	-	~	۰
Ν	L.	L	⊏	S	

The remaining 598.7 cubic feet of storage available will go towards storing the 51,400.8 cubic feet of HCOC volume.

Santa	Ana Watershed - BM	Legend:	Required Entries Calculated Cells	
- (Note this worksheet shall only be u	sed in conjunction with BMP designs from	m the LID BMP Design Hou	ndbook)
Company Name	REC			Date 7/12/2016
Designed by	EVB		Case	No
Company Project	Number/Name	Canyon Springs He	althcare Center	
	N	fust match Nome/ID used on BMP De. Design Rainfall Depth	sign Calculation Sheet	
-	4-hour Rainfall Depth, 1 Map in Handbook Appendix		D ₈₅ = 0.62	Inches
	Dr	rainage Management Area Tabulati	ion	
	Insert additional rov	vs if needed to accommodate all DMA	As draining to the BMP	
				Proposed

I

DMA Type/ID	DMA Area (square feet)	Post-Project Surface Type	Effective Imperivous Fraction, k	DMA Runoff Factor	OMA Areas x Runoff Factor	Design Storm Depth (in)	Design Capture Valume, V _{BMP} (cubic feet)	Proposed Volume on Plans (cubic feet)
BRS4-7	540	Ornamental Landscaping	0.1	0.11	59.6			
D4-11	10328	Concrete or Asphalt	1	0.89	9212.6			
								1 1
								i
						7 19		
	10868	7	otal		9272.2	0.62	479.1	837

Notes:	
The remaining 357.9 cubic feet of storage available will go towards storing the 51,400.8 cubic feet of HCOC volume.	

Bioretention Facility - Design Procedure	BMP ID	Legend:	Require	d Entries	
BRS	4-7	Legenu.		ted Cells	
ompany Name: REC		Ct/C't C	_	7/12/2016	
esigned by: EVB	1 Volume	County/City C	ase No.:		
L/Coxgx	1 VOIUIIC	_			
Enter the area tributary to this feature			$A_{T} = $	0.249	acres
Enter V _{BMP} determined from Section 2.1 of this	is Handbook		V _{BMP} =	479	₩.
Type of Bioreten	tion Facility	Design			
Side slopes required (parallel to parking spaces or adjace)No side slopes required (perpendicular to parking space or					
Bioretention Fa	cility Surface	Area			
Depth of Soil Filter Media Layer			$d_S =$	3.0	ft
Top Width of Bioretention Facility, excluding	curb		$\mathbf{w}_{\mathrm{T}} = \mathbf{I}$	20.0	ft
Total Effective Depth, d_E $d_E = (0.3) \times d_S + (0.4) \times 1 - (0.7/w_T) + 0.5$			$d_E = [$	1.77	ft
Minimum Surface Area, A_m $A_M (ft^2) = \frac{V_{BMP} (ft^3)}{d_E (ft)}$			$A_{M} = $	272	Ħ"
Proposed Surface Area			A=_	540	ft²
Bioretention F	acility Proper	rties			
Side Slopes in Bioretention Facility	•		z =	4	:1
Diameter of Underdrain				6	inche
Longitudinal Slope of Site (3% maximum)			1	0	%
6" Check Dam Spacing			1	0	feet
Describe Vegetation:					
oles:					

Required Entries Santa Ana Watershed - BMP Design Volume, V_{BMP} Legend: (Rev. 10-2011) Calculated Cells (Note this worksheet shall only be used in conjunction with BMP designs from the LID BMP Design Handbook) Date 7/12/2016 Company Name REC EVB Designed by Case No Canyon Springs Healthcare Center Company Project Number/Name BMP Identification BMP NAME / ID AREA 4: BIORETENTION: BRS4-8 Must match Name/ID used on BMP Design Calculation Sheet Design Rainfall Depth 85th Percentile, 24-hour Rainfall Depth, D85= 0.62 inches from the Isohyetal Map in Handbook Appendix E Drainage Management Area Tabulation insert additional rows if needed to accommodate all DMAs draining to the BMP

DMA Type/ID	OMA Area (square feet)	Post-Project Surface Type	Effective Imperivous Fraction, 4	DMA Rugoff Factor	DMA Areas x Runoff Factor	Design Storm Depth (in)	Design Copture Volume, V _{BMP} (cubic feet)	Proposed Volume on Plans (cubic feet)
BRS4-8	540	Ornamental Landscaping	0.1	0.11	59.6			
D4-17	6383	Concrete or Asphalt	1	0.89	5693.6			
150								
						生態		
						3.0		
							u Pin	
							al this	
- 1	5923	7	otal		5753.2	0.62	297.2	837

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The remaining 539.8 cubic feet of storage available will go towards storing the 51,400.8 cubic feet of HCOC volume.

Dioretantian Essilia	y - Design Procedure	BMP ID	Legend:	Required Entries	
Bioretention raciati	y - Design Procedure	BRS4-8	Legena;	Calculated Cells	
ompany Name:	REC			Date: 7/12/2016	
esigned by:	EVB	D ! III	County/City (Case No.:	
		Design Volume			
Enter the area	tributary to this feature			$A_{T} = 0.158$	acres
Enter V _{BMP} det	termined from Section 2	.1 of this Handbook		$V_{BMP} = 297$	ft³
	Type of B	ioretention Facility	Design		
_	quired (parallel to parking spaces required (perpendicular to parkin				
		tion Facility Surfac			
Depth of Soil I	Filter Media Layer		$d_{s} = 3.0$	ft	
Top Width of I	Bioretention Facility, exc		$w_T = 20.0$	ft	
Total Effective $d_E = (0.3) x$	Property, d_E $d_S + (0.4) \times 1 - (0.7/w_T)$		$d_{E} = 1.77$	ft	
Minimum Surf A _M (ft ²) =—	face Area, A_m $V_{BMP} (ft^3)$ $d_F (ft)$			$A_{M} = 169$	fit
Proposed Surfa	., . ,			A= 540	ft²
	Biorete	ntion Facility Prop	erties		
Side Slopes in	Bioretention Facility			z=4	:1
Diameter of Un	nderdrain			6	inche
Longitudinal S	lope of Site (3% maxim	um)		0	%
6" Check Dam				0	feet
Describe Vege	tation:				
otes:					

Santa	Ana Wat	<u>ershed</u> - BMP	Design Vo	olume, V	вмг	Legend		Required Entr
		(Rev. 10-2011)						Calculated Ce
mpany Name	Note this workshi REC	eet shall <u>only</u> be used	in conjunctio	n with BMP	designs from the	LID BME		7/12/2016
signed by	EVB			-			Case No	
	Number/Nam	P		Canwon 9	prings Health	care Cente		-
irbarry t toleor	. INCHIBET/INCH			Carlyon B	lymiks meaning	LAIG COLLE	_	
			BMP I	dentificati	on			
P NAME / J	AREA 4: BI	ORETENTION: BI						
		Mus	t match Nan	ne/ID used (on BMP Design	Calculation	Sheet	
			Design l	Rainfall D	epth			
	4-hour Rainfa I Map in Hand	ll Depth, lbook Appendix E				D ₈₅ =	0,62	inches
		Drair	age Manag	ement Are	a Tabulation			
	in.	sert additional rows i	f needed to	accommod	ate all DMAs dr	aining to th	е ВМР	
			1000	The same of			Dacina Conturn	Proposed
DMA	DMA Area	Post-Project Surface	Effective	DMA Runoff	DMA Areas x	Design	Design Capture Volume, V _{BMP}	Volume on Plans (cubic
Type/ID	(square feet)	Type	Imperivous Fraction, t _r	Factor	Runoff Factor	Storm Depth (in)	(cubic feet)	feet)
BRS4-9	412	Ornomental	0.1	0.14	45.5			Walk (in
D4-13	6697	Landscaping Concrete or Asphalt	1	0.89	5973.7			
0,10		Editor e ta or Papirone		0.00	3373.7			
						BELL		7 19 19
					(in the second	1		
Section 1								
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2000								
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N THE						No.		
						PAUL S		
						Be at 1		P) - C - C - C
	100							
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	7100		otal		COTO	0.00	70.5	670
	7109	,	ocur		6019.2	0.62	311	639
es:								
e remaining 32	8 cubic feet of	storage available will	go towards	storing the	51,400.8 cubic	feet of HC	OC volume.	

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Diameteration Facility	Design Design	BMP ID	Y accord.	Required	l Entries	
Bioretention Facility	- Design Procedure	BRS4-9	Legend:	Calculat	ed Cells	
Company Name:	REC			_	7/12/2016	
Designed by:	EVB	Davies V-l-	County/City	Case No.:		
		Design Volume		Les		
Enter the area tri	ibutary to this feature			$A_T =$	0.16	acres
Enter V _{BMP} deter	rmined from Section 2	.1 of this Handbook		V _{BMP} =	311	ft³
	Type of E	lioretention Facility	Design		-	
 Side slopes requi 	red (parallel to parking spaces	or adjacent to walkways)				
O No side slopes re	quired (perpendicular to parkir	ng space or Planter Boxes)				
	Bioreten	tion Facility Surface	Area			
Depth of Soil Fil	Iter Media Layer			$d_S = $	3.0	ft
Top Width of Bi	oretention Facility, ex	cluding curb		$\mathbf{w}_{\mathrm{T}} = $	20.0	ft
Total Effective I $d_{E} = (0.3) \times d$	Depth, d_E $d_S + (0.4) \times 1 - (0.7/w_T)$	+ 0.5		$d_E =$	1.77	ft
Minimum Surface $A_{M}(ft^{2}) =$	ce Area, A_m $V_{BMP} (ft^3)$ $d_E (ft)$			A _M =	177	ft"
Proposed Surfac	B			A=	412	ft²
	Biorete	ention Facility Prope	rties			
Side Slopes in B	ioretention Facility			z =	4	:1
Diameter of Und	lerdrain				6	inches
Longitudinal Slo	ppe of Site (3% maxim	um)		9	0	1 %
6" Check Dam S	pacing				0	feet
Describe Vegeta	tion:					
Notes:						
			-			

Required Entries Santa Ana Watershed - BMP Design Volume, V_{BMP} Legend; (Rev. 10-2011) Calculated Cells (Note this worksheet shall anly be used in conjunction with BMP designs from the LID BMP Design Handbook) REC Date 7/12/2016 Company Name Designed by EVB Case No Company Project Number/Name Canyon Springs Healthcare Center **BMP** Identification BMP NAME / ID AREA 4; BIORETENTION: BRS4-10 Must match Name/ID used on BMP Design Calculation Sheet Design Rainfall Depth 85th Percentile, 24-hour Rainfall Depth, D85= 0.62 inches from the Isohyetal Map in Handbook Appendix E

Drainage Management Area Tabulation

insert additional rows if needed to accommodate all DMAs draining to the BMP

DMA Type/ID	DMA Area (square feet)	Post-Project Surface Type	Effective Imperivous Fraction, I _f	DMA Runoff Factor	DMA Areas x Runoff Factor	Design Storm Depth (in)	Design Capture Volume, V _{BMP} (cubic feet)	Proposed Volume on Plans (cubic feet)
BR S4 -10	706	Ornamental Landscaping	0.1	0.11	78			
D4-18	6827	Concrete or Asphalt	1	0.89	6089.7		F-2	1 - 15
D4-15	9657	Concrete or Asphalt	1	0.89	8614		de la	
								1-1-
			-					
	17190	7	otal		14781.7	0.62	763.7	1094

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N	u	ι	G	3	i

The remaining 330.3 cubic feet of storage available will go towards storing the 51,400.8 cubic feet of HCOC volume.

Diameteration D-	oilite Donion Bosseless	BMP ID	Lagand	Require	ed Entries		
Dioretennon Fa	cility - Design Procedure	BRS4-10	Legend:	Calcula	ted Cells		
Company Name:	REC				7/12/2016		
Designed by:	EVB		County/City (Case No.:		_	
		Design Volume					
Enter the a	rea tributary to this feature			$A_T =$	0.326	acres	
Enter V_{BMI}	determined from Section 2	.1 of this Handbook		V _{BMP} =	764	ft³	
	Type of I	Bioretention Facility	Design				
Side slope	es required (parallel to parking spaces	or adjacent to walkways)					
O No side s	lopes required (perpendicular to parkl	ng space or Planter Boxes)					
	Bioreter	ition Facility Surface	Area				
Depth of S	oil Filter Media Layer			$d_S =$	3.0	ft	
Top Width	Top Width of Bioretention Facility, excluding curb						
	etive Depth, d_E 3) $\times d_S + (0.4) \times 1 - (0.7/w_T)$) + 0.5		d _E =	1.77	ft	
Minimum A_{M} ($\hat{\mathbf{m}}^{2}$)	Surface Area, A_m $= \frac{V_{BMP} (ft^3)}{d_F (ft)}$			$A_{M} = $	433	ft*	
Proposed S	Surface Area			A=	706	ft ²	
	Biorete	ention Facility Prope	rties				
Side Slope	Side Slopes in Bioretention Facility						
Diameter o	f Underdrain				6	inche	
Longitudin	al Slope of Site (3% maxim	um)			0	%	
6" Check I	Dam Spacing				0	feet	
Describe V	egetation:						
Votes:							

Required Entries Santa Ana Watershed - BMP Design Volume, VRMP Legend: (Rev. 10-2011) Calculated Cells (Note this worksheet shall only be used in conjunction with BMP designs from the LID BMP Design Handbook) Date 7/12/2016 Company Name REC Designed by EVB Case No Company Project Number/Name Canyon Springs Healthcare Center BMP Identification BMP NAME / ID AREA 4: BIORETENTION: BRS4-11 Must match Name/ID used on BMP Design Calculation Sheet Design Rainfall Depth 85th Percentile, 24-hour Rainfall Depth, D₈₅= 0.62 inches from the Isohyetal Map in Handbook Appendix E Drainage Management Area Tabulation

Insert additional rows if needed to accommodate all DMAs draining to the BMP Proposed Design Capture Effective DMA Design Valume on Volume, Vemp DMA DMA Area DMA Areas x Storm Plans (cubic Post-Project Surface Imperivous Runoff Factor Runoff Factor Depth (in) (cubic feet) Type/ID (square feet) Туре Fraction, I feet) Ornamental BRS4-11 0.1 0.11 486.B 3954 Landscaping D4 8 22700 20248.4 Roofs 1 0.89 26654 Total 20685.2 0.62 1068.7 7117.2

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The remaining 6,048.5 cubic feet of storage available will go towards storing the 51,400.8 cubic feet of HCOC volume.

Bioretention Facility - Design P.	Tocedure	BMP ID	Legend:	Require	d Entries		
		BRS4-11	Legend.		ted Cells		
Company Name:	REC		G	-	7/12/2016		
Designed by:	EVB	Design Volume	County/City	Case No.:			
		Design volume					
Enter the area tributary to the	us feature			$A_T =$	0.612	acres	
Enter V _{BMP} determined from	n Section 2	.1 of this Handbook		$V_{BMP}=$	1,069	£	
	Type of B	ioretention Facility	Design				
 Side slopes required (parallel to 	parking spaces	or adjacent to walkways)					
O No side slopes required (perpend	dicular to pa rk in	ng space or Planter Boxes)					
	Bioreten	tion Facility Surfac	e Area				
Depth of Soil Filter Media I	Depth of Soil Filter Media Layer						
Top Width of Bioretention	Top Width of Bioretention Facility, excluding curb						
Total Effective Depth, d _E						_	
$d_E = (0.3) \times d_S + (0.4) \times$	1 - (0.7/w _T)	+ 0.5		$\mathbf{d}_{\mathrm{E}} = $	1.77	ft	
Minimum Surface Area, A _u							
$A_{M}(ft^{2}) = \frac{V_{BMP}}{1 + r^{2}}$	(ft³)	_		$A_{M}=$	606	ft"	
$\mathbf{q}_{\mathbf{E}}$ (1	t)			A=	3,954	ft²	
Proposed Surface Area				A	3,734	-11	
	Biorete	ention Facility Prope	erties				
Side Slopes in Bioretention	Facility			z =	4	:1	
Diameter of Underdrain					6	inche	
Longitudinal Slope of Site (3% maxim	um)			0	%	
6" Check Dam Spacing				[0	feet	
Describe Vegetation:							
lotes:							

<u>Santa</u>	Ana Wat	(Rev. 10-2011)	Design V	olume, V	ВМР	Legend		Required En
/	Mata this months	neet shall only be used	da confirmation	m month DASD	danione from the	. I ID PMA	Design Handbas	
pany Name	REC	cer watt auch he usen	т сопушено	M INUV TOURT	aesiens from the	E LID DIME		7/12/2016
gned by	EVB						Case No	
	Number/Nam	ie		Canyon S	prings Health	care Cente		
			D1 (D)					
NAME / ID	ADEA 4. DI	ODEST-FISON D		Identificati	on			
NAME/ID	AREA 4: BI	ORETENTION: B) Mus		ne/ID used i	on BMP Design	Calculation	Sheet	
			Design 1	Rainfall D	epth			
Percentile, 2	4-hour Rainfa	ill De pth ,				D ₈₅ =	0.62	inches
the Isohyeta	l Map in Hand	dhook Appendix E						,,,,,,,
					a Tabulation			
	In	sert additional rows i	f needed to	accommode	ate all DMAs di	aining to th	ie BMP	
				5444		0	Design Capture	Proposed
DMA	DMA Area	Post-Project Surface	Effective Imperivous	DMA Runoff	DMA Areas x	Design Storm	Volume, V _{BMP}	Volume on Plans (cubic
Type/ID	(square feet)	Туре	Fraction, I	Factor	Runoff Factor	Depth (in)	(cubic feet)	feet)
BR\$4-12	632	Ornamental Landscaping	0.1	0.11	69.8			
D4-16	8155	Concrete or Asphalt	1	0.89	7274.3			
								A14 = 114
							E TO THE	
					a	AL DE		
								有限制
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					Marie Co.			
						The state of		
	8787	70	otal		7344.1	0.62	379.4	980
					7 760			
:								
remaining 60	0.6 cubic feet	of storage available v	/ill go towar	ds staring t	he 51,400.8 cu	bic feet of F	COC volume.	
			-		,			1

pio	retention Facil	lity - Design Procedure	BMP ID	Legend:	Required Entries	
BIUI	recinion Faci	nty - Design Procedure	BRS4-12	гевени.	Calculated Cells	
_	ıy Name:	REC			Date: 7/12/2016	
Designe	d by:	EVB	Design Volume	County/City (Case No.:	_
			Design volume			
	Enter the are	a tributary to this feature			$A_T = 0.2$	acres
	Enter V _{BMP}	letermined from Section 2	.1 of this Handbook		$V_{BMP} = 379$	ft³
		Type of E	ioretention Facility	Design		
	Side slopes i	required (parallel to parking spaces	or adjacent to walkways)			
	O No side slop	es required (perpendicular to parkîr	ng space or Planter Boxes)			
		Bioreten	tion Facility Surface	е Агеа		
	Depth of Soi	l Filter Media Layer		$d_S = 3.0$	ft	
	Top Width o	f Bioretention Facility, exc	cluding curb		$\mathbf{w}_{\mathrm{T}} = 20.0$	ft
	Total Effective $d_E = (0.3)$	ve Depth, d_E x $d_S + (0.4) \times 1 - (0.7/w_T)$	+ 0.5		$d_E = 1.77$	ft
	Minimum Su	rrface Area, Am				fi*
	$A_{M}(ft^{2}) = $	$V_{\text{BMP}}(\hat{\mathbf{n}}^3)$ $\mathbf{d}_{\mathbb{R}}(\hat{\mathbf{n}})$	-		$A_{M} = 215$	11
	Proposed Sur				A= 632	ft ²
		Diorete	mtian Englisty Brans	artion.		
		Biorete	ntion Facility Prope	nies		
	Side Slopes i	in Bioretention Facility			z = 4	_:1
	Diameter of		6	inches		
	Longitudinal	Slope of Site (3% maxim	um)		.0	%
	6" Check Dar	m Spacing			0	feet
	Describe Ve	getation:		100		
Votes:						

		(Rev. 10-2011)				Legend	-	Calculated C
(1	Note this worksh	eet shall only be used	in conjunctio	n with BMP	designs from the	LID BMP	Design Handboo	k)
pany Name	REC						Date	7/12/2016
gned by	EVB						Case No	
pany Project	Number/Nam	ie		Canyon S	prings Health	care Cente	Г	
			BMP I	dentificati	on		_	
NAME / ID	AREA 5: BI	ORETENTION: BI						
		Mus	t match Nan	ne/ID used	on BMP Design	Calculation	Sheet	
			Design 1	Rainfall D	epth			
_	4-hour Rainfa I Map in Hand	ll Depth, lbook Appendix E				$D_{85} =$	0.62	inches
		Drain	iage Manag	ement Are	a Tabulation			
	in.	sert additional rows i	f needed to	accommod	ate all DMAs di	aining to th	ie BMP	
DMA Type/ID	DMA Area (square feet)	Post-Project Surface Type	Effective Imperivous Fraction, Ir	DMA Runoff Factor	DIMA Areas x Runoff Factor	Design Storm Depth (in)	Design Capture Volume, V _{BMP} (cubic feet)	Proposed Volume on Plans (cubic feet)
BRSS-1	3480	Ornamental	0.1	0.11	384.4	DEPOPINI	(Eddre Jees)	Fig. 1
D5-1	19843	Landscaping Concrete or Asphalt	1	0.89	17700	1		Hart Torre
D5-2	51185	Concrete or Asphalt	2	0.89	45657		1 1 1 1 1 1 1	
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						V. Tella		
							医巨顶部门	
	74508	1	'otal		63741.4	0.62	3293.3	5394
S:								

Rio	retention Facility	- Design Procedure	BMP JD	Legend:	Require	d Entries	
Dioi	retembli Pacifity	- Design Flocedure	BRS5-1	Legend.		ted Cells	
_	ny Name:	REC			_	7/12/2016	
Designe	ed by:	EVB	Design Volume	County/City C	case No.:		
			Design volume				
	Enter the area tri	butary to this feature			$A_T = $	1.71	acres
	Enter V _{BMP} deter	mined from Section 2	.1 of this Handbook		V _{BMP} =	3,293	ft³
		Type of E	Bioretention Facility	Design			
	, ,	red (parallel to parking spaces quired (perpendicular to parkin					
		Bioreten	ntion Facility Surfac	e Area			
	Depth of Soil Fil	ter Media Layer			$d_S = $	3.0	ft
	Top Width of Bio	oretention Facility, ex	cluding curb		$W_T = $	20.0	ft
	Total Effective D $d_E = (0.3) \times d_S$	Depth, d _E _S + (0.4) x 1 - (0.7/w _T)) + 0.5		$d_{E} =$	1.77	ft
	Minimum Surface $A_M(\Re^2) =$	te Area, A_m $V_{BMP} (ft^3)$ $d_E (ft)$			A _M =	1,866	Ħ*
	Proposed Surface				A=	3,480	ft ²
		Biorete	ention Facility Prope	erties			
	Side Slopes in Bi	ioretention Facility			z =	4	:1
	Diameter of Und	erdrain				6	inche
	Longitudinal Slop	pe of Site (3% maxim	um)			0	%
	6" Check Dam S	pacing				0	feet
	Describe Vegetat	ion:					
Notes:							

			ershed - BMP 1 (Rev. 10-2011)	Ü	,	DIVER	Legend		Calculated C
	(1	Note this works	neet shall <u>only</u> be used	in conjunction	n with BMP	designs from the	LID BMP	Design Handboo	<u>k</u>)
		REC							7/12/2016
gned		EVB						Case No	
pany	Project i	Number/Nam	ie		Canyon S	prings Healtho	care Cente	<i>-</i>	
				BMP I	dentificati	on			
NA	ME/ID	AREA 5: BI	ORETENTION: BE						
			Must			on BMP Design	Calculation	n Sheet	
				Design I	Rainfall D	epth			
		l-hour Rainfa Map in Hand	ll Depth, Ibook Appendix E				D ₈₅ =	0.62	Inches
						a Tabulation			
-		Ins	ert additional rows i	f needed to d	ccommod	ate all DIMAs dr	aining to t	he BMP	
	DMA Type/ID	DMA Area (square feet)	Post-Project Surface Type	Effective Imperivous Fraction, I	DMA Runoff Factor	DMA Areas x Runoff Factor	Design Storm Depth (in)	Design Capture Volume, V	Volume on Plans (cubic feet)
-	BRSS-2	1533	Ornamental	Q.1	0.11	169.3			
	D5-S	49229	Landscaping Concrete or Asphalt	1	0.89	43912.3			
	D5-6	5878	Ornamental Landscaping	0.1	0.11	649.3			
						Diam'r.			
-									
1							The same	高温度 3	
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							11111		
				E-terrament -		N12			
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		56640	T	otal		44730.9	0.62	2311.1	2376
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Diameterties	Facility - Design Procedure	BMP ID	Legend:	Required Entries	
Bioretention		BRS5-2	Legenu.	Calculated Cells	
Company Name:	REC		G . (0): 6	Date: 7/12/201	16
Designed by:	EVB	Design Volume	County/City C	Case No.:	
11.80 11		Design volume			
Enter the	area tributary to this feature			$A_{T} = 1.3$	acres
Enter V _B	MP determined from Section 2	1 of this Handbook		$V_{BMP}=$ 2,311	ft³
	Type of I	Bioretention Facility	Design		
_	opes required (parallel to parking spaces e slopes required (perpendicular to parki				
	Bioreter	ition Facility Surface	Атеа		
Depth of	Soil Filter Media Layer			$d_{S} = 3.0$	ft
Top Wid	th of Bioretention Facility, ex	cluding curb		$W_{\rm T} = 20.0$	ft
	fective Depth, d_E (0.3) $\times d_S + (0.4) \times 1 - (0.7/w_E)$) + 0.5		$d_E = \boxed{1.77}$	ft
Minimur A _M (fi	m Surface Area, A_m $V_{BMF} (ft^3)$ $d_E (ft)$			$A_{M} = 1.310$	ft"
Proposed	i Surface Area			A= 1,533	ft ²
	Biorete	ention Facility Prope	rties		
Side Slop	pes in Bioretention Facility			z = 4	:1
Diameter	r of Underdrain			6	inches
Longitud	linal Slope of Site (3% maxim	um)		0	%
6" Check	Dam Spacing			0	feet
Describe	Vegetation:				
Votes:					

<u>Santa</u>	Ana Wat	ershed - BMP 1 (Rev. 10-2011)	Design V o	olume, V	BMP	Legend		Required Entrie Calculated Cells	
		eet shall <u>only</u> be used	in conjunction	n with BMP	designs from the	LID BMP			
Company Name	REC EVB			_			Case No	e 7/12/2016	
Designed by Company Project		е.	_	prings Health	eare Cente				
SMP NAME / II)	AREA 5: BI	ORETENTION: BI	t match Nam		 on BMP Design	Calculation) Sheet		
			Design 1	Rainfall D	epth				
5th Percentile, 24 rom the Isohyetal		li Depth, book Appendix E				D ₈₅ =	0.62	Inches	
		Drain	age Manag	ement Are	a Tabulation				
	Ins	sert additional rows i	f needed to d	occommod	ate all DMAs dr	aining to th	не ВМР		
DMA Type/ID	DMA Area (square feet)	Post-Project Surface Type	Effective Imperivous Fraction, k	DMA Runoff Factor	DMA Areas x Runoff Factor	Design Storm Depth (in)	Design Capture Valume, Vaup (cubic feet)	Proposed Volume on Plans (cubic feet)	
BRS5-3	1400	Ornamental Landscaping	0.1	0.11	154.6				
D5-3	23550	Roofs	1	0.89	21006.6		The same of	SECTION OF THE PERSON OF THE P	

DMA Type/ID	DMA Area (square feet)	Post-Project Surface Type	Effective Imperivous Fraction, I _f	DMA Runoff Factor	DMA Areas x Runoff Factor	Design Storm Depth (in)	Design Capture Valume, V _{MP} (cubic feet)	Proposed Volume on Plans (cubic feet)
BRS5-3	1400	Ornamental Landscaping	0.1	0.11	154.6			
D5-3	23550	Roofs	1	0.89	21006.6			
D5-4	21605	Concrete or Asphalt	1	0.89	19271.7			
			10.10					
		1						
					78 1012			11154
								THE REAL PROPERTY.
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				Tr Camerina				
								RES MARKE
						STATE OF THE STATE OF		
						195		1 St. 1
	46555	7	otal		40432.9	0.62	2089	2170

	-:	 	
Notes:			

Bioretention Facility - I	Decim Procedure	BMP ID	Legend:	Required E	ntries	
Dioretention Facinty -1		BRS5-3	Logona.	Calculated	_	
ompany Name:	REC		a tar	Date: 7/1	2/2016	
esigned by:	EVB		County/City (Case No.:		
		Design Volume				
Enter the area tribu	tary to this feature			$A_T = $	0.107 a	cres
Enter V _{BMP} determi	ned from Section 2	.1 of this Handbook		V _{BMP} =	2,089 f	ď
	Type of I	Bioretention Facility	Design			
		or adjacent to walkways) ng space or Planter Boxes)				
	Bioreter	ntion Facility Surface	Атеа			
Depth of Soil Filter	Media Layer			$d_S =$	3.0 f	ł
Top Width of Biore	etention Facility, ex	cluding curb		w _r =	20.0 f	t
Total Effective Dep $d_E = (0.3) \times d_S +$	oth, d _E (0.4) x 1 - (0.7/w _T)) + 0.5		$d_E =$	1.77 f	t
Minimum Surface $A_{\mathbf{M}}(\mathbf{ft}^2) =$	Area, A_m $V_{BMP} (ft^3)$ $d_E (ft)$			$A_{M} = $,184 f	t ⁻
Proposed Surface A				A=	,400 f	2
_	Biorete	ention Facility Prope	rties			
Side Slopes in Bior				z=	4	1
Diameter of Under	frain				6 in	nches
Longitudinal Slope	of Site (3% maxim	um)			0 %	6
6" Check Dam Space	cing			0.00	0 f	eet
Describe Vegetation	n:					
otes:		0-0-100				

	Of the state of the land of	(Rev. 10-2011) heet shall only be used	f		J d.	FFD DAGE	Design House to	Calculated Cells
any Name	REC	ieer snan one oe usea	ил сопушнено	н жий ролг	designs from the	LIDBME		7/12/2016
ned by	EVB						Case No	
	Number/Nam	ne		Canyon S	prings Health	care Cente		
, ,								
				dentificat	ion			
NAME / ID	AREA 6: PI	RMEABLE PAVE						
		Musi	t match Nom	ie/ID used	on BMP Design	Calculation	n Sheet	
			Design I	Rainfall D	epth			
Percentile 2	4-hour Rainfa	off Depth				D =	0.62	1.
		dbook Appendix E				D ₆₅ =	0.02	inches
,			age Manag	ement Are	ea Tabulation			
	in	sert additional rows i				raining to ti	не ВІИР	
				1			1	Proposed
Phat	D144.4	Sant Barbart States	Effective	DMA	Data turner	Design	Volume, V _{SMP}	Valume on Plans (cubic
Type/ID	(square feet)	Post-Project Surface Type	Imperivous Fraction, I	Runoff	DMA Areas x Runoff Factor	Storm Depth (in)	(cubic feet)	feet)
() payin	(odas - tare)	Permeable Poving	Traction, if		Turism rucio		· ·	July
PP6-1	5313	Blocks w/ Sand Filled	0.25	0.20	1052.8			
		Gap			40500.4			
D6-1	21894	Concrete or Asphalt	1	0.89	19529.4		30 30 30	
D6-2	20160	Roofs Ornamental		0.89	17982.7			
D6-3	9609	Landscaping	0.1	0.11	1061.4			12 11 19 15 2
06-4	6022	Ornamental	0.1	0.11	565.2			
		Landscaping						# H H
								4
							ELIT (Fig.	
						No.		SE SE
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				=1		2000		
						W 100		
						in ne		
		1-				100		K III
			-					Carlotte St.
					See Line			
						A CONTRACT		Section 1
	62998	T	a tol		40291.5	0.62	2081,7	2125.2

D- 11 D	D-!- D1.	BMP ID	I acond		Required Entries		
Permeable Pavement	- Design Procedure	PP6-1	Legend:	Calcul	ated Cells		
Company Name:	REC			Date:	4/28/2010		
esigned by:	EVB		County/City	Case No.:			
		Design Volume					
Enter the area tri	ibutary to this feature			A _T =	1.44 ac		
Enter V _{BMP} deter	rmines from Section 2	I of this Handbook		V _{BMP} =	2,082 ft ³		
	Реппеа	able Pavement Surface	Area				
Reservoir Layer	Depth, b _{TH}		b _{тн} =	12 i	nches		
Minimum Surfac	ce Area Required, As						
	$V_{\rm BMB}(ft^3)$		$A_{S}=$	5,204 f	t ²		
$A_{S(fi)} = \frac{1}{(0.1)^{n}}$	$\frac{V_{BMP}(ft^3)}{4 \times b_{TH}(in)) / 12(in/ft}$	Propo	sed Surface Area =		12		
			•				
	Permea	ble Pavement Cross S	ection				
		Per the	e Geotechnical	(A)	in		
		Engine		(B)	in		
A) PAVEMENTLAYER XXXX	energy properties			(C)	in		
(B) SAND LAYER	(B) SAND LAYER CO		oir Layer	(D)	12 in		
	OR 12" MAXIMUM THICKNESS SUBGRADE	Total I	Permeable Pavemeu	t Section	in		
	(EXISTING SOIL)	Slope	of Permeable Paven	nent	%		
Sediment Contro	ol Provided? (Use pull	ldown)					
Geotechnical rep	oort attached? (Use pu	illdown)					
escribe Surrounding V	ecetation:						
Cocrioe Darrounding v	ogotatian,			- T-0			

Santa		Design V	olume, V _{BMP}	Legend		Required Entries
						Calculated Cells
		d in conjunctio	n with BMP designs	from the LID BMP.		
Company Name						7/12/2016
Designed by	med by EVB pany Project Number/Name Canyon Springs He BMP Identification NAME / ID AREA 6: PERMEABLE PAVERS: PP6-2 Must match Name/ID used on BMP De. Design Rainfall Depth Percentile, 24-hour Rainfall Depth,				Case No	
Company Project	ned by EVB any Project Number/Name Canyon Spring BMP Identification NAME / ID AREA 6: PERMEABLE PAVERS: PP6-2				ď	
		BMP	Identification	<u> </u>		
BMP NAME / II	AREA 6: PERMEABLE PAVI	ERS: PP6-2				
	Mu	st match Nar	ne/ID used on BMP	Design Calculation	5heet	
		Design	Rainfall Depth			
85th Percentile, 2	4-hour Rainfall Depth.			D ₈₅ =	0.62	inches
	l Map in Handbook Appendix E			2-85	0.02	inches
	Drai	nage Manag	ement Area Tabu	lation		
	insert additional rows	If needed to	accommodate all D	MAs draining to th	e BMP	
						Proposed
		Effective	AMG	Design	Design Capture	Valume on

]

DMA Type/ID	DMA Area (square feet)	Post-Project Surface Type	Effective Imperivous Fraction, I _F	DMA Runoff Factor	DMA Areas x Runoff Factor	Design Storm Depth (in)	Design Capture Volume, V _{BMP} (cubic feet)	Proposed Valume on Plans (cubic feet)
PP6-2	9610	Permeable Paving Blocks w/ Sand Filled Gap	0.25	0.20	1904.3			
D6-8	64944	Concrete or Asphalt	1	0.89	57930			
D6-9	2964	Omamental Landscaping	0.1	0.11	327.4			
D6-10	4364	Ornomental Landscaping	0.1	0.11	482			
D6-11	7344	Ornamental Landscaping	0.1	0.11	811.2			
	89226	T	otal		61454.9	0.62	3175.2	3844

Notes:		

Darmachle Daves-o-4	Design Procedure	BMP ID	Lagand	Required Entries		
Permeable Pavement	- Design Procedure	PPC-3	Legend:	Calcu	lated Ce	lls
Company Name:	REC			Date:	7/12/2	2016
Designed by:	EVB		County/City	Case No.:	_	_
		Design Volume				
Enter the area tri	ibutary to this feature			A ₁ =	2.04	acre
Enter V _{BMP} deter	rmines from Section 2	.1 of this Handbook		V _{BMP} =	3,175	ft³
	Permea	ible Pavement Surfac	e Area			
Reservoir Layer	Depth, b _{TH}		b _™ =	12	inches	
Minimum Surfac	ce Area Required, As			-		
	$V_{BMP}(ft^3)$		A _S =	7,938	ft²	
$A_{S(R)} = {(0.}$	4 x b _{TH} (in)) / 12(in/ft	Prop	osed Surface Area =		ft²	
ζ		, 110pc	osed Surface Area	2,010	10	
	Da	ble Pavement Cross	7			
	remea	ole Pavement Cross	section			
				(A)		in
		Engin		(B)		m
A) PAVEMENTLAYER (B) SANDLAYER (C) BEDDING LAYER	AYEMENT LAYER (B) SANDLAYER GEOTECHNICAL ENGINEER RECOMMENDATIONS (D) RESERVOIR LAYER B _{TN} OR 12 ^M MAXIMUM THICKNESS	NCRETECURB Reser		(C) (D)	12	in
	OR 12" MAXIMUM THICKNESS		Permeable Pavemen	t Section [in
23	SUBGRADE (EXISTING SOIL)	Slope	of Permeable Paven	nent		9/0
Sediment Contro	ol Provided? (Use pull	down)				
Geotechnical rep	oort attached? (Use pu	lldown)				
Describe Surrounding V	egetation:					
reserve outrodicing *	egetation.					

DMA DMA Area Post-Project Surface Imperious Runoff DMA Areas x Storm Volume, V _{BMP} Plans	
esigned by EVB Case No company Project Number/Name Canyun Springs Healthcare Center BMP Identification MP NAME / ID AREA 6: BIORETENTION: BRS6-1 Must motch Name/ID used on BMP Design Calculation Sheet Design Rainfall Depth The percentile, 24-hour Rainfall Depth, and the Isohyetal Map in Handbook Appendix E Drainage Management Area Tabulation Insert additional rows if needed to accommodate all DMAs draining to the BMP DMA DMA DMA Area Post-Project Surface Imperious Fraction, Is Factor Runoff Factor Depth (in) (cubic feet) fig. BRS6-1 585 Ommental Landscoping 0.1 0.21 64.6 Design Capture Volume, Valum Plant Factor Depth (in) (cubic feet) fig. DG-5 3505 Roofs 1 0.89 3216.5 Design Capture Volume, Valum Plant Factor Depth (in) (cubic feet) fig. DG-6 21643 Ommental Landscoping 0.1 0.21 2390.6 Design Capture Volume, Valum Plant Factor Depth (in) (cubic feet) fig.	
BMP Identification MP NAME / ID AREA 6: BIORETENTION: BRS6-1 Must match Name/ID used on BMP Design Calculation Sheet Design Rainfall Depth th Percentile, 24-hour Rainfall Depth, om the Isohyetal Map in Handbook Appendix E Drainage Management Area Tabulation Insert additional rows if needed to accommodate all DMAs draining to the BMP DMA DMA Area Post-Project Surface Imperious Fraction, I, Factor Runoff Factor Depth (in) BRS6-1 585 Ommental Landscaping 0.2 0.11 64.6 D6-5 3606 Roofs 1 0.89 3216.6 D6-6 21643 Ommental Landscaping 0.1 0.11 2390.6	5
MP NAME / ID AREA 6: BIORETENTION: BRS6-1 Must match Name/ID used on BMP Design Calculation Sheet Design Rainfall Depth th Percentile, 24-hour Rainfall Depth, In the Isohyetal Map in Handbook Appendix E Drainage Management Area Tabulation Insert additional rows if needed to accommodate all DMAs draining to the BMP DMA DMA Area Post-Project Surface Imperious Runoff Factor Runoff Factor Depth (in) BRS6-1 585 Ornamental Landscaping 0.1 0.11 64.6 D6-5 3606 Roofs 1 0.89 3216.6 D6-6 21643 Ornamental Londscaping 0.1 0.21 2390.6	5
MP NAME / ID AREA 6: BIORETENTION: BRS6-1 Must motch Name/ID used on BMP Design Calculation Sheet Design Rainfall Depth th Percentile, 24-hour Rainfall Depth, m the Isohyetal Map in Handbook Appendix E Drainage Management Area Tabulation Insert additional rows if needed to accommodate all DMAs draining to the BMP DMA DMA DMA Area Post-Project Surface Imperious Fraction, II, Factor Runoff Factor Depth (in) BRS6-1 585 Omamental Landscaping 0.1 0.11 64.6 D6-5 3606 Roofs 1 0.89 3216.6 D6-6 21643 Ornamental Landscaping 0.1 0.11 2390.6	5
Design Rainfall Depth The Percentile, 24-hour Rainfall Depth, much Isohyetal Map in Handbook Appendix E Drainage Management Area Tabulation Insert additional rows if needed to accommodate all DMAs draining to the BMP DMA DMA Area Post-Project Surface Imperious Fraction, Italian Factor Runoff Factor Depth (in) (cubic feet) BRS6-1 585 Dmamental Landscaping 0.1 0.21 0.21 64.6 D6-6 21643 Omamental Landscaping 0.1 0.21 2390.6	5
Design Rainfall Depth The Percentile, 24-hour Rainfall Depth, In the Isohyetal Map in Handbook Appendix E Drainage Management Area Tabulation Insert additional rows if needed to accommodate all DMAs draining to the BMP DMA DMA DMA Area Type/ID (square feet) Type	5
The Percentile, 24-hour Rainfall Depth, muthe Isohyetal Map in Handbook Appendix E Drainage Management Area Tabulation Insert additional rows if needed to accommodate all DMAs draining to the BMP DMA DMA Area Post-Project Surface Imperious Fraction, It Factor Runoff Factor Depth (in) Coubic feet) BRS6-1 585 Ornamental Landscaping 0.1 0.11 64.6 D6-5 3606 Roofs 1 0.89 3216.6 D6-6 21643 Ornamental Landscaping 0.1 0.11 2390.6	5
Drainage Management Area Tabulation Insert additional rows if needed to accommodate all DMAs draining to the BMP DMA DMA Area Type/ID (square feet) Type BRS6-1 585 Omamental Landscaping 0.1 0.11 64.6 D6-5 3606 Roofs 1 0.89 3216.6 D6-6 21643 Omamental Landscaping 0.1 0.11 2390.6	S
Insert additional rows if needed to accommodate all DMAs draining to the BMP DMA	
Insert additional rows if needed to accommodate all DMAs draining to the BMP DMA	
DMA DMA Area Post-Project Surface Imperious Fraction, I, Factor Runoff Factor Depth (in) BRS6-1 585 Omamental Landscaping 0.1 0.11 64.6 D6-5 3606 Roofs 1 0.89 3216.6 D6-6 21643 Omamental Landscaping 0.1 0.11 2390.6	
DMA DMA Area Post-Project Surface Imperious Runoff DMA Areas x Storm Volume, V _{BMP} Plans Type/ID SRS6-1 S85 Ornamental Landscaping 0.1 0.11 64.6 D6-5 3606 Roofs 1 0.89 3216.6 D6-6 21643 Ornamental Landscaping 0.1 0.11 2390.6 D6-6 D	posed
Type/ID (square feet) Type Fraction, i, Factor Runoff Factor Depth (in) (cubic feet) fe BRS6-1 585 Omamental Landscaping 0.1 0.11 64.6 <td>me on</td>	me on
BR\$6-1 585 Ornamental tandscaping 0.1 0.11 64.6 D6-5 3606 Roofs 1 0.89 3216.6 D6-6 21643 Ornamental Landscaping 0.1 0.11 2390.6	eet)
D6-5 3506 Roofs 1 0.89 3216.5 D6-6 21643 Ornamental Landscaping 0.1 0.11 2390.6	
D6-6 21643 Landscaping 0.1 0.11 2390.6	
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N	otes:
E	Bioretention section: 0.25" ponding; 3' soil; 1' gravel

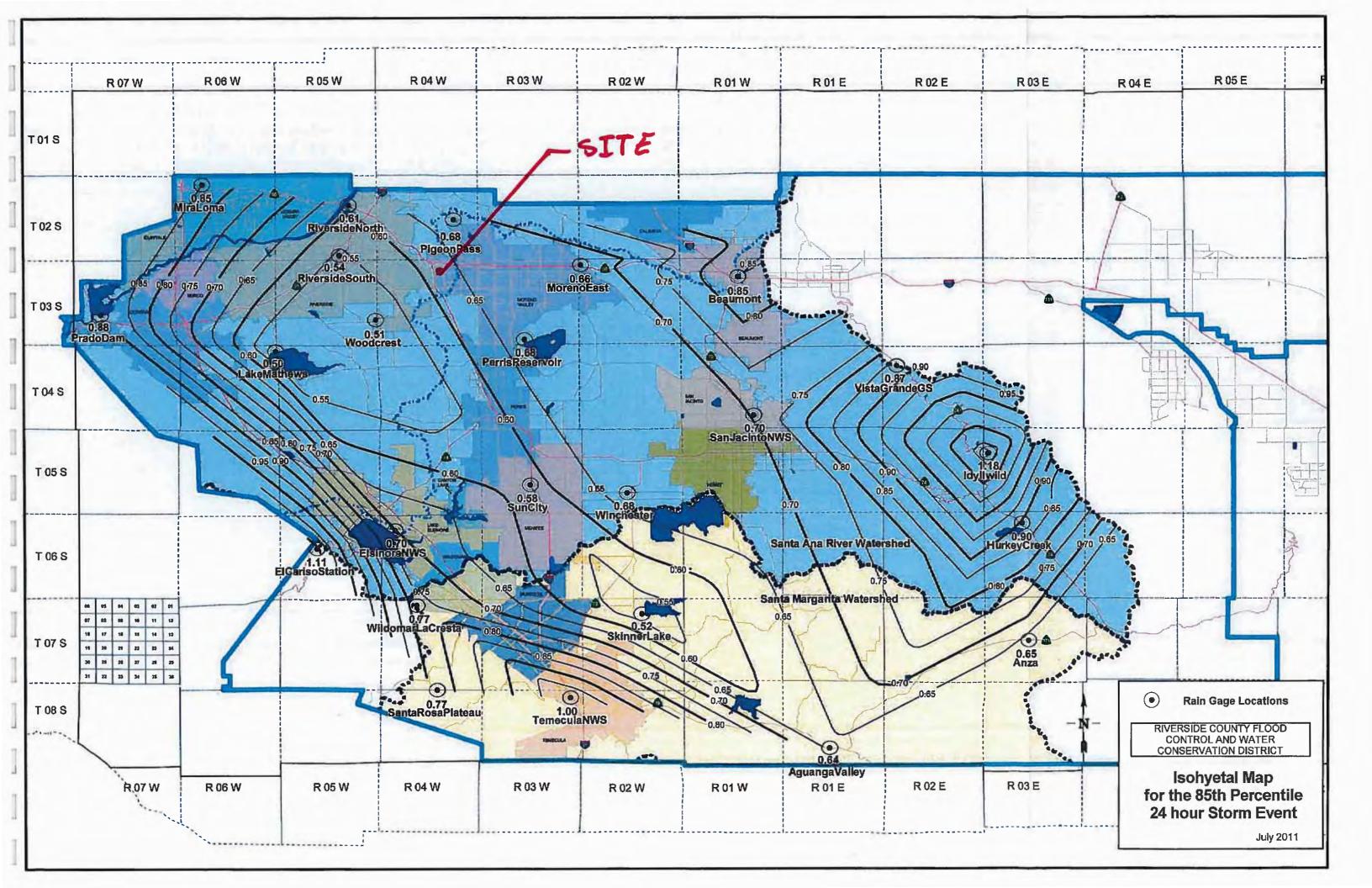
Total

16059.1

0.62

829.7

Company Name: Designed by: Enter the Enter V _B	REC EVB area tributary to this feature MP determined from Section 2 Type of E	Design Volume	Legend: County/City C	_	ed Cells 7/12/2016 0.86	
Enter the Enter V _B	area tributary to this feature MP determined from Section 2 Type of E	Design Volume		Case No.:		
Enter V _B	area tributary to this feature MP determined from Section 2 Type of F	Design Volume			0.86	Doma s
Enter V _B	MP determined from Section 2 Type of E	.1 of this Handbook	[A _T =	0.86	00000
Enter V _B	MP determined from Section 2 Type of E		τ	A _T =	0.86	0.0000
Side ske	Type of E		ξ			acres
_		1: E : 11:4		V _{BMP} =	830	ft³
_	ppes required (parallel to parking spaces	Bioretention Facility	Design			
_		or adjacent to walkways)				
	slopes required (perpendicular to parkir					
	Bioreten	ntion Facility Surfac	e Area			
Depth of	Soil Filter Media Layer			d _S =	3.0	fi
Top Wid		$\mathbf{w}_{\mathrm{T}} =$	20.0	ft		
Total Effective Depth, d_E $d_E = (0.3) \times d_S + (0.4) \times 1 - (0.7/w_T) + 0.5$				$d_E =$	1.77	ft
Minimun A _M (ft ⁱ	Surface Area, A_m $V_{BMP}(ft^3)$	_		A _M =	471	īt.
	d _E (ft) Surface Area			A=	585	ft²
-	Biorete	ention Facility Prope	erties			
Side Slop	es in Bioretention Facility			z =	4	:1
Diameter			6	inches		
Longitudinal Slope of Site (3% maximum)				1	0	%
6" Check	Dam Spacing				0	feet
Describe	Vegetation:					

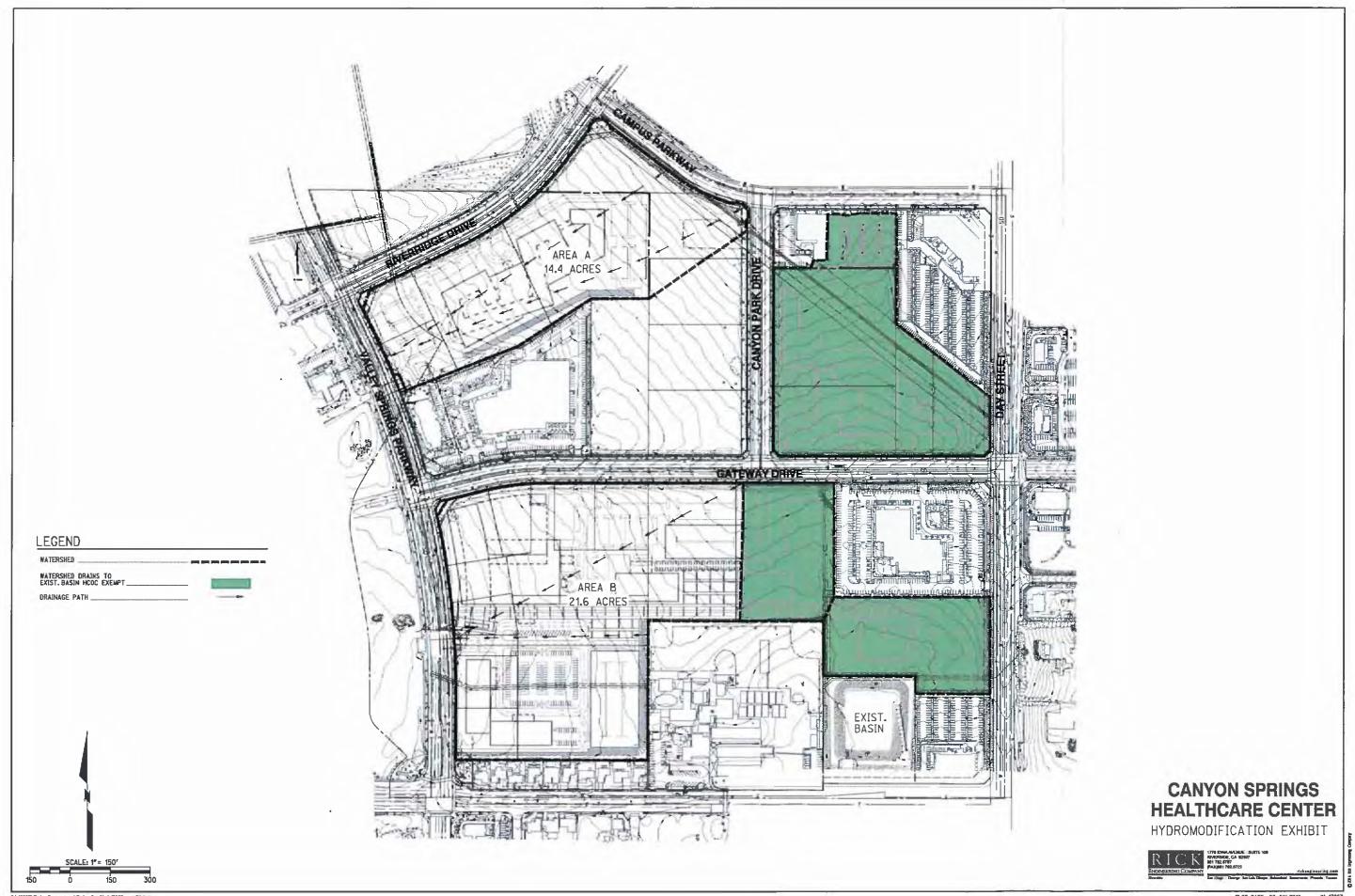


Appendix 7: Hydromodification

Supporting Detail Relating to Hydrologic Conditions of Concern

Appendix 7: Hydromodification

Supporting Detail Relating to Hydrologic Conditions of Concern



area A pre 2yr 24.txt WinTR-20 Printed Page File Beginning of Input Data List TR20.inp WinTR-20: Version 1.10 0 0 0.05 Canyon Springs HCC ARea A SUB-AREA: .0225 70. (22) Area A Outlet STREAM REACH: STORM ANALYSIS: 1.6 2-Yr Type II STRUCTURE RATING: GLOBAL OUTPUT: (0.109 (in)/12)x14.4(ac) 0.05 YYYYN YYYYNN 0.13 ac-ft WinTR-20 Printed Page File End of Input Data List Canyon Springs HCC ARea A Name of printed page file: TR20.out STORM 2-Yr

VI CT OI	Diamage	Kaili dage	Kullott		Lear			
Reach Identifier	Area (sq mi)	ID or Location	Amount (in)	Elevation (ft)	Time (hr)	Rate (cfs)	Rate (csm)	
Area A	0.023		0.109		12.11	0.75	33.49	
Line Start Time (hr)	(cfs)	Flow (cfs)	Values @ time (cfs)	e increment (cfs)	of 0.0 (cfs))14 hr (cfs)	(cfs)	
11.960 12.057 12.154 12.252 12.349 12.446 12.543 12.641 12.738 12.835 12.933 13.030 13.127 13.224	0.07 0.60 0.70 0.51 0.43 0.34 0.37 0.27 0.26 0.25 0.24 0.23	0.12 0.67 0.67 0.49 0.42 0.38 0.29 0.27 0.26 0.25 0.24 0.23 0.22	0.18 0.72 0.63 0.48 0.42 0.37 0.33 0.29 0.27 0.26 0.25 0.24 0.22	0.25 0.75 0.60 0.47 0.41 0.36 0.32 0.29 0.27 0.26 0.24 0.23 0.22 0.22	0.34 0.75 0.57 0.46 0.40 0.36 0.27 0.25 0.27 0.25 0.22 0.22	0.43 0.75 0.54 0.45 0.40 0.35 0.31 0.28 0.26 0.25 0.24 0.23 0.22	0.52 0.73 0.52 0.44 0.39 0.35 0.28 0.26 0.25 0.24 0.23 0.22	
13.419 13.516	0.21 0.20	0.20 0.20	0.20 0.20	0.20 0.20	0.20 0.19	0.20 0.19	0.20 0.19	

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Page 1

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0.18

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0.19

0.18

0.17

Runoff

----- Peak Flow -----

Area or

13.613

13.711

13.808

0.19

0.19

0.18

0.19

0.18

0.18

Drainage

Rain Gage

		а	irea A pre	Zyr 24.txt			
13.905	0.17	0.17	0.17	0.17	0.17	0.17	0.17
14.002	0.17	0.17	0.17	0.17	0.16	0.16	0.16
14.100	0.16	0.16	0.16	0.16	0.16	0.16	0.16
14.197	0.16	0.16	0.16	0.16	0.16	0.16	0.16
14.294	0.16	0.16	0.16	0.16	0.15	0.15	0.15
14.391	0.15	0.15	0.15	0.15	0.15	0.15	0.15
14.489	0.15	0.15	0.15	0.15	0.15	0.15	0.15
14.586	0.15	0.15	0.15	0.15	0.15	0.15	0.15
14.683	0.15	0.15	0.15	0.15	0.15	0.15	0.15
14.781	0.15	0.15	0.15	0.15	0.15	0.15	0.15
14.878	0.15	0.15	0.15	0.15	0.14	0.14	0.14
14.975	0.14	0.14	0.14	0.14	0.14	0.14	0.14
15.072	0.14	0.14	0.14	0.14	0.14	0.14	0.14
15.170	0.14	0.14	0.14	0.14	0.14	0.14	0.14
15.267	0.14	0.14	0.14	0.14	0.14	0.14	0.14
15.364	0.14	0.14	0.14	0.13	0.13	0.13	0.13
15.461	0.13	0.13	0.13	0.13	0.13	0.13	0.13
15.559	0.13	0.13	0.13	0.13	0.13	0.13	0.13
15.656	0.13	0.13	0.13	0.13	0.13	0.13	0.13
15.753	0.13	0.13	0.13	0.13	0.12	0.12	0.12
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Line Start Time (hr)	(cfs)	Flow (cfs)	values @ tir (cfs)	me increme (cfs)	nt of 0.0 (cfs)	14 hr (cfs)	(cfs)
	(cfs) 0.12 0.12 0.12 0.12 0.11 0.11 0.11 0.1						
18.477 18.574 18.671 18.768 18.866 18.963	0.10 0.09 0.09 0.09 0.09 0.09	0.10 0.09 0.09 0.09 0.09 0.09	0.10 0.09 0.09 0.09 0.09 0.09	0.10 0.09 0.09 0.09 0.09 0.09	0.09 0.09 0.09 0.09 0.09 0.09	0.09 0.09 0.09 0.09 0.09 0.09	0.09 0.09 0.09 0.09 0.09

			area A pre	2yr 24.txt			
19.060	0.09	0.09	0.09	0.09	0.09	0.09	0.09
19.157	0.09	0.09	0.09	0.09	0.09	0.09	0.09
19.255	0.09	0.09	0.09	0.09	0.09	0.09	0.09
19.352	0.09	0.09	0.09	0.09	0.09	0.08	0.08
19.449	0.08	0.08	0.08	0.08	0.08	0.08	0.08
19.546	0.08	0.08	0.08	0.08	0.08	0.08	0.08
19.644	0.08	0.08	0.08	0.08	0.08	0.08	0.08
19.741	0.08	0.08	0.08	0.08	0.08	0.08	0.08
19.838	0.08	0.08	0.08	0.08	0.08	0.08	0.08
19.935	0.08	0.08	0.08	0.08	0.08	0.08	0.08
20.033	0.08	0.08	0.08	0.08	0.08	0.08	0.08
20.033	0.08	0.08	0.08	0.08	0.08	0.08	0.08
20.130	0.08	0.08	0.08	0.08	0.08	0.08	0.08
20.325	0.08	0.08	0.08	0.08	0.08	0.08	0.08
20.323	0.08	0.08	0.08	0.08	0.08	0.08	0.08
			0.08	0.08	0.08	0.08	0.08
20.519	0.08	0.08	0.08	0.08	0.08	0.08	0.08
20.616	0.08	0.08				0.08	0.08
20.714	0.08	0.08	0.08	0.08	0.08	0.00	0.00
WinTR-20 Vers	ion 1.10		Page	2		07/31/2014	18:26

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Area or Reach Identifier	Drainage Area (sq mi)	Rain Gage ID or Location	area A pre Runoff Amount (in)	2yr 24.txt Elevation (ft)	Peak Time (hr)	Flow Rate (cfs)	Rate (csm)
OUTLET	0.023		0.109	` ,	12.11	0.75	33.49
Line Start Time (hr)	(cfs)			me increment (cfs)	of 0.0 (cfs)	14 hr (cfs)	(cfs)
11.960 12.057 12.154 12.252 12.349 12.446	0.60 0.70 0.51	0.67 0.67 0.49 0.42	0.18 0.72 0.63 0.48 0.42 0.37	0.25 0.75 0.60 0.47 0.41 0.36	0.34 0.75 0.57 0.46 0.40 0.36	0.43 0.75 0.54 0.45 0.40 0.35	0.52 0.73 0.52 0.44 0.39 0.35
WinTR-20 Vo	ersion 1.1	0	Page	3		07/31/2014	18:26
			Canyon Spri ARea				
WinTR-20 Vo	ersion 1.1	0	Canyon Spri	ngs HCC		07/31/2014	18:26

Line Start Time (hr)	(cfs)	Flow (cfs)	Values @ time (cfs)	increment (cfs)	of 0.014 (cfs)	hr (cfs)	(cfs)
12.543 12.641 12.738 12.835 12.835 13.030 13.127 13.224 13.322 13.419 13.516 13.613 13.711 13.808 13.905 14.000 14.197 14.499 14.586 14.683 14.781 14.878 14.975 15.072 15.170 15.267 15.364 15.461 15.559 15.656 15.753 15.850 15.948 16.045	0.34 0.30 0.27 0.26 0.25 0.24 0.23 0.22 0.21 0.20 0.19 0.17 0.16 0.16 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.14 0.14 0.14 0.14 0.14 0.14 0.13 0.13 0.13 0.13 0.13 0.12 0.12	0.33 0.29 0.27 0.26 0.25 0.24 0.23 0.20 0.19 0.16 0.15 0.15 0.15 0.15 0.15 0.14 0.14 0.14 0.14 0.14 0.13 0.13 0.12 0.12	0.33 0.29 0.27 0.26 0.25 0.24 0.22 0.22 0.20 0.19 0.18 0.17 0.16 0.16 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.14 0.14 0.14 0.14 0.14 0.14 0.13 0.13 0.13 0.13 0.13 0.12 0.12 0.12 0.12	0.32 0.29 0.27 0.26 0.24 0.23 0.22 0.22 0.20 0.19 0.18 0.17 0.16 0.16 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.14 0.14 0.14 0.14 0.14 0.14 0.14 0.13 0.13 0.13 0.13 0.12 0.12 0.12	0.31 0.28 0.27 0.22 0.22 0.22 0.22 0.22 0.19 0.18 0.16 0.15 0.15 0.15 0.14 0.14 0.14 0.14 0.14 0.13 0.12 0.12	0.31 0.28 0.26 0.25 0.22 0.21 0.22 0.21 0.19 0.18 0.16 0.15 0.15 0.15 0.14 0.14 0.14 0.14 0.14 0.14 0.14 0.12 0.12 0.12	0.30 0.28 0.26 0.27 0.22 0.21 0.20 0.19 0.16 0.16 0.15 0.15 0.15 0.15 0.14 0.14 0.14 0.14 0.14 0.13 0.13 0.12 0.12 0.12
			-				

		area A pre	2yr 24.txt			
16.142 0.12	0.12	0.12	0.12	0.12	0.12	0.11
16.239 0.11	0.11	0.11	0.11	0.11	0.11	0.11
16.337 0.11	0.11	0.11	0.11	0.11	0.11	0.11
16.434 0.11	0.11	0.11	0.11	0.11	0.11	0.11
16.531 0.11	0.11	0.11	0.11	0.11	0.11	0.11
16.629 0.11	0.11	0.11	0.11	0.11	0.11	0.11
16.726 0.11	0.11	0.11	0.11	0.11	0.11	0.11
16.823 0.11	0.11	0.11	0.11	0.11	0.11	0.11
16.920 0.11	0.11	0.11	0.11	0.11	0.11	0.11
17.018 0.11	0.11	0.11	0.11	0.11	0.11	0.11
17.115 0.11	0.11	0.11	0.11	0.11	0.11	0.11
17.212 0.11	0.11	0.11	0.11	0.11	0.11	0.11
17.309 0.11	0.11	0.11	0.11	0.11	0.11	0.11
17.407 0.11	0.11	0.11	0.11	0.11	0.11	0.10
WinTR-20 Version 1.10		Page	4		07/31/2014	18:26

Line Start Time (hr)	(cfs)	Flow (cfs)	Values @ time (cfs)	increment (cfs)	of 0.014 (cfs)	hr (cfs)	(cfs)
17.504 17.601 17.698 17.698 17.893 17.990 18.087 18.185 18.282 18.379 18.477 18.574 18.671 18.768 18.866 18.963 19.060 19.157 19.255 19.449 19.546 19.644 19.741 19.838 19.935 20.130 20.227 20.325 20.422 20.519 20.616 20.714 20.908	0.10 0.10 0.10 0.10 0.10 0.10 0.10 0.10 0.10 0.10 0.10 0.09 0.09 0.09 0.09 0.09 0.09 0.09 0.09 0.09 0.08	0.10 0.10 0.10 0.10 0.10 0.10 0.10 0.10 0.10 0.10 0.09 0.09 0.09 0.09 0.09 0.08	0.10 0.10 0.10 0.10 0.10 0.10 0.10 0.10	0.10 0.10 0.10 0.10 0.10 0.10 0.10 0.10 0.10 0.09 0.09 0.09 0.09 0.09 0.09 0.09 0.09 0.09 0.09 0.08	0.10 0.10 0.10 0.10 0.10 0.10 0.10 0.10 0.09 0.09 0.09 0.09 0.09 0.09 0.09 0.09 0.09 0.09 0.09 0.08	0.10 0.10 0.10 0.10 0.10 0.10 0.10 0.10 0.10 0.10 0.09 0.09 0.09 0.09 0.09 0.09 0.09 0.08	0.10 0.10 0.10 0.10 0.10 0.10 0.10 0.10 0.09 0.09 0.09 0.09 0.09 0.09 0.08 0.08 0.08 0.08 0.08 0.08 0.08 0.08 0.08 0.08 0.08 0.08 0.08 0.08 0.09
21.005 21.103 21.200	0.07 0.07 0.07	0.07 0.07 0.07	0.07 0.07 0.07	0.07 0.07 0.07	0.07 0.07 0.07	0.07 0.07 0.07	0.07 0.07 0.07

		a	irea A pre	2yr 24.txt			
21.297	0.07	0.07	0.07	0.07	0.07	0.07	0.07
21.394	0.07	0.07	0.07	0.07	0.07	0.07	0.07
21.492	0.07	0.07	0.07	0.07	0.07	0.07	0.07
21.589	0.07	0.07	0.07	0.07	0.07	0.07	0.07
21.686	0.07	0.07	0.07	0.07	0.07	0.07	0.07
21.783	0.07	0.07	0.07	0.07	0.07	0.07	0.07
21.881	0.07	0.07	0.07	0.07	0.07	0.07	0.07
21.978	0.07	0.07	0.07	0.07	0.07	0.07	0.07
22.075	0.07	0.07	0.07	0.07	0.07	0.07	0.07
22.173	0.07	0.07	0.07	0.07	0.07	0.07	0.07
22.270	0.07	0.07	0.07	0.07	0.07	0.07	0.07
22.367	0.07	0.07	0.07	0.07	0.07	0.07	0.07
WinTR-20 Versi	on 1.10		Page	5		07/31/2014	18:26

Line Start Time (hr)	(cfs)	Flow (cfs)	Values @ time (cfs)	increme (cfs)	nt of 0.01 (cfs)	4 hr (cfs)	(cfs)
22.464 22.562 22.659 22.756 22.853 22.951 23.048 23.145 23.242 23.340 23.437 23.534 23.631 23.729	0.07 0.07 0.07 0.07 0.07 0.07 0.07 0.07						
23.826 23.923 24.021	0.07 0.07 0.07	0.07 0.07 0.07	0.07 0.07 0.07	0.07 0.07 0.07	0.07 0.07 0.06	0.07 0.07 0.06	0.07 0.07 0.05

area A pre 2yr 24.txt

WinTR-20 Ve	rsion 1.10	Page	6		07/31/2014	18:26
		Canyon Spri ARea				
Area or Reach	Drainage Area Alternat			low by Stor		_
Identifier	(sq mi)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)
Area A OUTLET	0.023 0.023	0.75 0.75				

area A pre 2yr 24.txt

WinTR-20 Version 1.10

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WinTR-20 Printed Page File TR20.inp	area A post 2yr 24 Beginning of Inpu	4.txt ut Data List
WinTR-20: Version 1.10 Canyon Springs HCC ARea A post project	0	0 0.05
SUB-AREA: Area A Outlet	.0225	91. (202)
STREAM REACH:		
STORM ANALYSIS: 2-Yr	1.6	Type II 2
STRUCTURE RATING:		
GLOBAL OUTPUT: 2 0.05	YYYYN	YYYYNN (0.821 (in)/12)x14.4(ac)
WinTR-20 Printed Page File	End of Innut Data	0.985 ac-ft
willik 25 i i licea rage i i ie	Canyon Springs HCC	С
	ARea A post projec	
Nam	e of printed page fi TR20.out	ile:
	STORM	2-Yr
Area or Drainage Rain Gag Reach Area ID or Identifier (sq mi) Location	Amount Eleva	Peak Flow ation Time Rate Rate t) (hr) (cfs) (csm)
Area A 0.023	0.821	12.01 15.71 698.33
Line Start Time Flow (hr) (cfs) (cfs)		rement of 0.013 hrs) (cfs) (cfs)
9.128 0.05 0.06 9.217 0.06 0.06 9.307 0.06 0.06 9.396 0.07 0.0 9.485 0.08 0.06 9.575 0.08 0.06 9.664 0.09 0.06 9.753 0.10 0.10 9.843 0.11 0.1 9.932 0.12 0.13 10.021 0.13 0.1 10.11 0.14 0.1 10.200 0.16 0.16 10.378 0.20 0.20 10.468 0.22 0.22 10.557 0.24 0.24 10.646 0.26 0.25 10.736 0.29 0.36 10.825 0.32 0.33	5 0.06 0.0 6 0.06 0.0 7 0.07 0.0 8 0.08 0.0 9 0.09 0.0 1 0.10 0.1 1 0.11 0.1 2 0.12 0.1 3 0.14 0.1 5 0.15 0.1 6 0.16 0.1 8 0.18 0.1 0 0.20 0.2 0 0.24 0.2 0 0.27 0.2 0 0.30 0.3	06 0.06 0.06 0.06 07 0.07 0.07 0.07 07 0.07 0.07 0.07 08 0.08 0.08 0.08 08 0.09 0.09 0.09 09 0.09 0.10 0.11 11 0.11 0.12 0.12 12 0.13 0.13 0.13 14 0.14 0.14 0.14 15 0.15 0.16 0.16 17 0.17 0.17 0.17 18 0.19 0.19 0.19 20 0.21 0.21 0.21 22 0.23 0.23 0.23 25 0.25 0.25 0.26 27 0.28 0.28 0.29 31 0.31 0.32 0.32

		ar	ea A post	2yr 24.txt			
10.914	0.36	0.37	0.37	0.38	0.38	0.39	0.39
11.004	0.40	0.41	0.41	0.42	0.42	0.43	0.44
11.093	0.45	0.45	0.46	0.47	0.48	0.49	0.50
11. 1 82	0.50	0.52	0.53	0.54	0.55	0.56	0.57
11.271	0.58	0.59	0.61	0.62	0.63	0.64	0.66
11.361	0.67	0.68	0.70	0.71	0.73	0.74	0.75
11.450	0.77	0.78	0.80	0.81	0.83	0.85	0.87
11.539	0.90	0.94	0.99	1.06	1.14	1.23	1.33
11.629	1.45	1.59	1.74	1.92	2.12	2.35	2.60
11.718	2.86	3.14	3.44	3.77	4.13	4.52	4.94
11.607	5.38	5.86	6.38	6.95	7.61	8.35	9.20
11.897	10.11	11.05	11.97	12.86	13.66	14.35	14.91
11.986	15.32	15.58	15.71	15.70	15.55	15.25	14.80
12.075	14.16	13.37	12.49	11.56	10.62	9.69	8.81
12.16 5	7.98	7.23	6.56	6.00	5.53	5.13	4.78
12.254	4.48	4.22	3.98	3.78	3.59	3.43	3.29
12.343	3.16	3.04	2.94	2.84	2.75	2.66	2.58
12.432	2.51	2.44	2.37	2.30	2.24	2.18	2.12
12.522	2.06	2.01	1.96	1.91	1.87	1.82	1.78
12.61 1	1.74	1.70	1.67	1.64	1.61	1.58	1.56
inTR-20 Versi	on 1.10		Page	1		08/01/2014	8:51

Line Start Time (hr)	(cfs)	Flow (cfs)	Values @ time (cfs)	increment (cfs)	of 0.013 (cfs)	hr (cfs)	(cfs)
12.700 12.790 12.879 12.968 13.058 13.147 13.236 13.415 13.504 13.593 13.683 13.772 13.861 13.951 14.040 14.129 14.308 14.397 14.486 14.576 14.665 14.665 14.665 14.933 15.022 15.112 15.290 15.380 15.469 15.558	1.54 1.42 1.33 1.27 1.10 1.00 0.92 0.84 0.77 0.67 0.65 0.65 0.65 0.55 0.55 0.55 0.55 0.55	1.52 1.40 1.32 1.24 1.16 1.09 1.04 1.09 0.95 0.87 0.77 0.74 0.68 0.66 0.65 0.65 0.65 0.55 0.55 0.55 0.55	1.39 1.39 1.30 1.22 1.159 1.099 0.995 0.86 0.73 0.66 0.659 0.664 0.659 0.555 0.551 0.551	1.48 1.38 1.29 1.21 1.14 1.08 1.03 0.98 0.994 0.82 0.79 0.76 0.73 0.70 0.665 0.655 0.654 0.652 0.558 0.554 0.553 0.551 0.50	1.46 1.37 1.28 1.20 1.13 1.07 1.02 0.98 0.89 0.85 0.79 0.76 0.67 0.66 0.65 0.65 0.55 0.55 0.55 0.55 0.55	1.45 1.35 1.27 1.19 1.12 1.06 1.02 0.97 0.89 0.85 0.75 0.66 0.65 0.65 0.65 0.55 0.55 0.55 0.5	1.43 1.34 1.126 1.11 1.001 0.92 0.88 0.75 0.65 0.65 0.65 0.65 0.65 0.55 0.55 0.5
			Page	2			

			ar	ea A post	2yr 24.txt			
	15.647	0.49	0.49	0.49	0.49	0.48	0.48	0.48
	15.737	0.48	0.48	0.48	0.47	0.47	0.47	0.47
	15.826	0.47	0.47	0.46	0.46	0.46	0.46	0.46
	15.915	0.46	0.46	0.45	0.45	0.45	0.45	0.45
	16.005	0.45	0.44	0.44	0.44	0.44	0.44	0.44
	16.094	0.43	0.43	0.43	0.43	0.43	0.43	0.43
	16.183	0.43	0.43	0.43	0.42	0.42	0.42	0.42
	16.273	0.42	0.42	0.42	0.42	0.42	0.42	0.42
	16.362	0.42	0.42	0.42	0.42	0.42	0.41	0.41
	16.451	0.41	0.41	0.41	0.41	0.41	0.41	0.41
	16.541	0.41	0.41	0.41	0.41	0.41	0.41	0.41
	16.630	0.41	0.41	0.40	0.40	0.40	0.40	0.40
	16.719	0.40	0.40	0.40	0.40	0.40	0.40	0.40
	16.808	0.40	0.40	0.40	0.40	0.40	0.40	0.39
	16.898	0.39	0.39	0.39	0.39	0.39	0.39	0.39
	16.987	0.39	0.39	0.39	0.39	0.39	0.39	0.39
	17.076	0.39	0.39	0.39	0.38	0.38	0.38	0.38
	17.166	0.38	0.38	0.38	0.38	0.38	0.38	0.38
W	inTR-20 Vers	ion 1.10		Page	2		08/01/2014	8:51

Line Start Time (hr)	Flow (cfs) (cfs)	Values @ time (cfs)	increment (cfs)	of 0.013 (cfs)	hr (cfs)	(cfs)
17.255 17.344 17.434 17.523 17.612 17.701 17.791 17.880 17.969 18.059 18.148 18.237 18.327 18.416 18.505 18.505 18.505 18.684 18.773 18.862 19.041 19.130 19.220 19.309 19.398 19.488 19.577 19.666 19.755 19.845 19.934 20.113 20.202	0.38 0.37 0.37 0.37 0.37 0.38 0.38 0.37 0.37 0.37 0.36 0.36 0.36 0.35 0.35 0.35 0.35 0.35 0.35 0.35 0.35	0.38 0.37 0.37 0.36 0.35 0.35 0.35 0.33 0.33 0.33 0.33 0.33	0.38 0.37 0.37 0.36 0.35 0.35 0.35 0.35 0.35 0.35 0.31 0.30 0.30 0.29 0.28 0.28 0.28 0.28 0.25 0.25 0.25	0.38 0.37 0.36 0.36 0.35 0.35 0.35 0.34 0.34 0.33 0.32 0.32 0.33 0.30 0.30 0.29 0.28 0.28 0.28 0.25 0.25 0.25	0.38 0.37 0.36 0.37	0.38 0.37 0.36 0.36 0.35 0.33 0.33 0.33 0.33 0.33 0.33 0.33
20.291	0.25 0.25	0.25 Page	0.25 3	0.25		

				2yr 24.txt			
20.381 20.470	0.25 0.24	0.24 0.24	0.24 0.24	0.24 0.24	0.24 0.24	0.24 0.24	0.24 0.24
20.559 20.649	0.24 0.24	0.24 0.24	0.24 0.24	0.24 0.24	0.24 0.24	0.24 0.24	0.24 0.24
20.738	0.24	0.24	0.24	0.24	0.24	0.24	0.24
20.827 20.916	0.24 0.24	0.24 0.24	0.24 0.24	0.24 0.24	0.24 0.24	0.24 0.24	0.24 0.24
21.006	0.24	0.24	0.24	0.24	0.24	0.24	0.24
21.095 21.184	0.24 0.24	0.24 0.24	0.24 0.24	0.24 0.24	0.24 0.24	0.24 0.24	0.24 0.24
21.274	0.24	0.24	0.24	0.24	0.24	0.24	0.24
21.363 21.452	0.24 0.24	0.24 0.24	0.24 0.24	0.24 0.24	0.24 0.24	0.24 0.24	0.24 0.24
21.542	0.24	0.23	0.23	0.23	0.23	0.23	0.23
21.631 21.720	0.23 0.23	0.23 0.23	0.23 0.23	0.23 0.23	0.23 0.23	0.23 0.23	0.23 0.23
WinTR-20 Ver	sion 1. 10		Page	3		08/01/2014	8:51
			nyon Spri ea A post				
Line							
Start Time (hr)	(cfs)	Flow Va (cfs)	lues @ til (cfs)	me incremen (cfs)	t of 0.0 (cfs)	(cfs)	(cfs)
21.810	0.23	0.23	0.23	0.23	0.23	0.23	0.23

Start Time (hr)	(cfs)	Flow (cfs)	Values @ time (cfs)	increment (cfs)	of 0.013 (cfs)	hr (cfs)	(cfs)
21.810 21.899 21.988 22.077 22.167 22.256 22.345 22.435 22.703 22.792 22.881 22.970 23.149 23.238 23.328 23.417 23.506 23.596 23.685 23.774 23.864 23.953 24.042 24.131	0.23 0.23 0.23 0.23 0.23 0.23 0.23 0.22 0.22	0.23 0.23 0.23 0.23 0.23 0.23 0.23 0.22 0.22	0.23 0.23 0.23 0.23 0.23 0.23 0.23 0.22 0.22	0.23 0.23 0.23 0.23 0.23 0.23 0.23 0.23 0.22	0.23 0.23 0.23 0.23 0.23 0.23 0.23 0.22 0.22	0.23 0.23 0.23 0.23 0.23 0.23 0.23 0.22 0.22	0.23 0.23 0.23 0.23 0.23 0.23 0.22 0.22
Area or Reach Identifier	Drainage Area (sq mi)	Rain Gage ID or Location	Amount	Elevation (ft)	Peak Fl Time (hr)	ow Rate (cfs)	Rate (csm)
OUTLET	0.023		0.821		12.01	15.71	698.33
Line Start Time (hr)	(cfs)	Flow (cfs)	Values @ time (cfs) Page	(cfs)	of 0.013 (cfs)	hr (cfs)	(cfs)

	area A post	2yr 24.txt			
0.05 0.06 0.06 0.07 0.08 0.08 0.09 0.10	0.05 0.06 0.06 0.07 0.08 0.08 0.09 0.10	0.05 0.06 0.07 0.07 0.08 0.08 0.09 0.10	0.05 0.06 0.07 0.07 0.08 0.09 0.09 0.10 0.11	0.06 0.06 0.07 0.07 0.08 0.09 0.09 0.11 0.12	0.06 0.07 0.07 0.08 0.09 0.10 0.11
0.13	0.14	0.14	0.14	0.14	0.14
0.08	0.08	0.08	0.09	0.09	0.09
0.12 0.13 0.15 0.16	0.12 0.14 0.15 0.16	0.12 0.14 0.15 0.17	0.13 0.14 0.15 0.17	0.13 0.14 0.16 0.17	0.13 0.14 0.16 0.17

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Canyon Springs HCC

0.05 0.06 0.06 0.07 0.08 0.09 0.10 0.11 0.12 0.13 0.14 0.16

9.128 9.217 9.307 9.396 9.485 9.575 9.664 9.753 9.843 9.932

10.021 10.111 10.200

WinTR-20 Version 1.10

Canyon Springs HCC ARea A post project

Line Start Time (hr)	 (cfs)	Flow (cfs)	Values @ time (cfs)	increment (cfs)	of 0.013 (cfs)	hr (cfs)	(cfs)
10.289 10.378 10.468 10.557 10.646 10.825 10.914 11.004 11.093 11.182 11.271 11.361 11.450 11.539 11.629 11.718 11.807 11.986 12.075 12.165 12.254 12.343 12.432 12.522 12.611 12.700 12.879 12.968 13.058 13.147 13.236 13.147 13.593 13.683	0.18 0.20 0.224 0.224 0.224 0.336 0.450 0.558 0.677 0.945 10.131 14.198 10.131 11.105	0.18 0.20 0.22 0.24 0.33 0.337 0.45 0.59 0.68 0.94 11.05 12.04 11.70 1.32 1.40 1.70 1.32 1.40 1.00 0.95 0.83	0.18 0.20 0.22 0.24 0.37 0.33 0.46 0.53 0.61 0.61 0.99 1.74 6.38 11.71 12.49 6.56 3.94 11.30 1.30 1.30 1.30 1.30 0.99 1.74 6.38 11.39 1.30 1.30 0.99 1.74 6.38 11.39 1.30 1.30 0.99 1.74 6.38 11.39 1.30 1.30 1.30 1.30 1.30 1.30 1.30 1.30	0.18 0.20 0.22 0.225 0.334 0.388 0.477 0.542 0.621 1.927 1.927 1.927 1.927 1.927 1.927 1.927 1.927 1.927 1.938 1.948	0.19 0.21 0.22 0.235 0.340 0.38 0.42 0.48 0.553 0.73 0.83 1.14 2.123 1.666 1.37 1.20 1.137 1.20 1.137 1.20 1.137 1.20 1.137 1.20 0.85 0.85 0.85 0.85 0.85 0.85 0.85 0.8	913582593496445335255559336682855792662739951 113582582593496445335255559336682855792662739951	0.19 0.23 0.226 0.326 0.336 0.577 0.665 0.577 0.665 0.87 2.692 14.80 14.881 4.28 1.156 1.111 1.06 1.017 0.92 0.884 0.81
			Page	2			

			a	rea A post	: 2yr 24.txt			
	13.772	0.80	0.80	0.80	0.79	0.79	0.78	0.78
	13.861	0.77	0.77	0.76	0.76	0.76	0.75	0.75
	13.951	0.74	0.74	0.73	0.73	0.72	0.72	0.72
	14.040	0.71	0.71	0.70	0.70	0.70	0.69	0.69
	14.129	0.69	0.68	0.68	0.68	0.67	0.67	0.67
	14.219	0.67	0.66	0.66	0.66	0.66	0.66	0.65
	14.308	0.65	0.65	0.65	0.65	0.65	0.65	0.64
	14.397	0.64	0.64	0.64	0.64	0.64	0.63	0.63
	14.486	0.63	0.63	0.63	0.63	0.63	0.62	0.62
	14.576	0.62	0.62	0.62	0.62	0.61	0.61	0.61
	14.665	0.61	0.61	0.61	0.61	0.60	0.60	0.60
	14.754	0.60	0.60	0.60	0.59	0.59	0.59	0.59
Wi	nTR-20 Vers	ion 1.10		Page	5		08/01/2014	8:51

Line Start Time (hr)	(cfs)	Flow (cfs)	values @ time (cfs)	increment (cfs)	of 0.013 (cfs)	hr (cfs)	(cfs)
14.844 14.933 15.022 15.112 15.290 15.380 15.469 15.558 15.647 15.826 15.915 16.005 16.183 16.362 16.451 16.630 16.719 16.808 16.808 16.898 17.076 17.166 17.255 17.344 17.523 17.612 17.791 17.880 17.969 18.059 18.148 18.237 18.327 18.416	0.59 0.57 0.556 0.557 0.555 0.552 0.550 0.447 0.447 0.447 0.440 0.441 0.440 0.439 0.339 0.335 0.335 0.335 0.335 0.333 0.333	0.554 0.5554 0.5554 0.5554 0.5554 0.5554 0.5554 0.5554 0.6454 0.6554 0.6	0.59 0.57 0.56 0.55 0.55 0.55 0.55 0.49 0.49 0.49 0.44 0.44 0.42 0.41 0.40 0.39 0.38 0.37 0.36 0.35 0.35 0.35 0.35 0.35 0.35 0.35 0.35	0.58 0.57 0.55 0.55 0.55 0.55 0.55 0.55 0.49 0.49 0.49 0.44 0.42 0.41 0.40 0.39 0.38 0.38 0.37 0.36 0.35 0.33 0.33 0.33 0.33 0.33 0.33 0.33	0.58 0.57 0.55 0.55 0.55 0.55 0.55 0.48 0.44 0.44 0.44 0.44 0.44 0.42 0.42 0.43 0.33 0.33 0.33 0.33 0.33 0.33 0.33	0.58 0.57 0.55 0.55 0.55 0.55 0.48 0.44 0.44 0.44 0.44 0.44 0.44 0.43 0.33 0.3	0.58 0.56 0.55 0.55 0.55 0.55 0.55 0.55 0.55

		6	area A post	2yr 24.txt			
18,505	0.32	0.32	0.32	0.32	0.32	0.32	0.32
18.595	0.32	0.32	0.32	0.32	0.32	0.32	0.32
18.684	0.31	0.31	0.31	0.31	0.31	0.31	0.31
18.773	0.31	0.31	0.31	0.31	0.31	0.31	0.31
18.862	0.31	0.31	0.31	0.30	0.30	0.30	0.30
18.952	0.30	0.30	0.30	0.30	0.30	0.30	0.30
19.041	0.30	0.30	0.30	0.30	0.30	0.30	0.29
19.130	0.29	0.29	0.29	0.29	0.29	0.29	0.29
19.220	0.29	0.29	0.29	0.29	0.29	0.29	0.29
19.309	0.29	0.29	0.28	0.28	0.28	0.28	0.28
WinTR-20 V	ersion 1.10		Page	6		08/01/2014	8:51
			3-				

Line Start Time (hr)	(cfs)	Flow \ (cfs)	/alues @ time (cfs)	increment (cfs)	of 0.013 (cfs)	hr (cfs)	(cfs)
19.398 19.488 19.577 19.666 19.755 19.845 19.934 20.023 20.113 20.291 20.381 20.470 20.559 20.649 20.738 20.827 20.916 21.006 21.095 21.184 21.274 21.363 21.452 21.452 21.452 21.631 21.720 21.810 21.899 21.988 22.703 22.435 22.435 22.792 22.881 22.970 23.149	0.28 0.27 0.27 0.27 0.26 0.25 0.25 0.25 0.24 0.24 0.24 0.24 0.24 0.24 0.24 0.23 0.23 0.23 0.23 0.23 0.23 0.23 0.22 0.22	0.28 0.27 0.27 0.26 0.225 0.225 0.224 0.224 0.224 0.224 0.224 0.224 0.223 0.223 0.223 0.223 0.223 0.223 0.2222 0.222 0.000 0.002 0.002 0.002 0.002 0.002 0.002 0.002 0.002 0.002 0.002 0.0	0.28 0.28 0.27 0.26 0.26 0.25 0.25 0.25 0.24 0.24 0.24 0.24 0.24 0.24 0.24 0.24	0.28 0.27 0.27 0.26 0.27 0.26 0.25 0.25 0.25 0.25 0.24 0.24 0.24 0.24 0.24 0.24 0.24 0.24	0.28 0.28 0.27 0.27 0.26 0.25 0.25 0.25 0.25 0.24 0.24 0.24 0.24 0.24 0.24 0.24 0.23 0.23 0.23 0.23 0.23 0.23 0.22 0.22	0.28 0.28 0.27 0.26 0.25 0.25 0.25 0.224 0.24 0.24 0.24 0.24 0.24 0.224 0.23 0.23 0.23 0.23 0.222 0.222 0.222 0.222	0.28 0.27 0.27 0.26 0.25 0.25 0.25 0.24 0.24 0.24 0.24 0.24 0.24 0.24 0.23 0.23 0.23 0.23 0.23 0.22 0.22 0.22

		ar	ea A post	2yr 24.txt			
23.238	0.22	0.22	0.22	0.22	0.22	0.22	0.22
23.328	0.22	0.22	0.22	0.22	0.22	0.22	0.22
23.417	0.22	0.22	0.22	0.22	0.22	0.22	0.22
23.506	0.22	0.22	0.22	0.22	0.22	0.22	0.22
23.596	0.22	0.22	0.22	0.22	0.22	0.22	0.22
23.685	0.22	0.22	0.22	0.22	0.22	0.22	0.22
23.774	0.22	0.22	0.22	0.21	0,21	0.21	0.21
23.864	0.21	0.21	0.21	0.21	0.21	0.21	0.21
WinTR-20 Vers	ion 1.10		Page	7		08/01/2014	8:51
	0.21						C

Line Start Time (hr)	(cfs)	Flow (cfs)	Values @ time (cfs)	increment (cfs)		hr (cfs)	(cfs)
23.953 24.042 24.131	0.21 0.21 0.12	0.21 0.20 0.10	0.21 0.19 0.09	0.21 0.18 0.08	0.21 0.17 0.06	0.21 0.15 0.05	0.21 0.14

area A post 2yr 24.txt

WinTR-20 Version 1.10		Page	8		08/01/2014	8:51
		Canyon Spri ARea A post	ngs HCC project			
Area or Reach	Drainage Area Alternate	 2-Yr	Peak	Flow by Stor	m	
Identifier	(sq mi)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)
Area A OUTLET	0.023 0.023	15.71 15.71				

area A post 2yr 24.txt

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area B pre 2yr 24.txt Beginning of Input Data List WinTR-20 Printed Page File TR20.inp 0 0 0.05 WinTR-20: Version 1.10 Canyon Springs HCC ARea B Pre project 2 yr 24 hr tc (hr) SUB-AREA: .03375 Outlet 70. .294 Area A STREAM REACH: STORM ANALYSIS: 1.6 2-Yr Type II 2 STRUCTURE RATING: GLOBAL OUTPUT: 0.05 YYYYN **YYYYNN** WinTR-20 Printed Page File End of Input Data List 0.19 ac-ft

(0.109(in)/12)x21.6(ac)

Canyon Springs HCC ARea B Pre project 2 yr 24 hr

Name of printed page file: TR20.out

STORM 2-Yr

Area or Reach	Drainage Area	Rain Gage ID or	Runoff Amount	 Elevation	Peak Time		 Bata
Identifier		Location	(in)	(ft)	(hr)	Rate (cfs)	Rate (csm)
Area A	0.034		0.109		12.17	0.95	28.05
Line Start Time (hr)	(cfs)	Flow (cfs)	Values @ time (cfs)	e increment (cfs)	of 0.0 (cfs)	19 hr (cfs)	(cfs)
11.969 12.099 12.229 12.359 12.489 12.619 12.749 13.009 13.139 13.269 13.399 13.529 13.659 13.789 13.919 14.049 14.179 14.309 14.439	0.07 0.78 0.88 0.69 0.59 0.43 0.43 0.37 0.35 0.32 0.30 0.29 0.28 0.24 0.24	0.13 0.86 0.85 0.67 0.58 0.49 0.33 0.37 0.35 0.33 0.29 0.27 0.26 0.25 0.24 0.24	0.21 0.91 0.81 0.66 0.56 0.48 0.42 0.37 0.37 0.34 0.33 0.31 0.29 0.27 0.26 0.25 0.24	0.32 0.94 0.78 0.64 0.55 0.47 0.42 0.39 0.36 0.34 0.32 0.31 0.28 0.27 0.26 0.25 0.24 0.23	0.43 0.95 0.75 0.63 0.54 0.41 0.38 0.36 0.34 0.32 0.29 0.22 0.25 0.24 0.23 0.23	0.55 0.94 0.73 0.62 0.52 0.45 0.45 0.38 0.34 0.32 0.32 0.29 0.28 0.27 0.26 0.25 0.24 0.23	0.67 0.92 0.71 0.60 0.51 0.44 0.38 0.35 0.33 0.32 0.29 0.29 0.28 0.27 0.25 0.24 0.24
			Page	1			

			area B pro	e 2yr 24.tx	t		
14.569		0.23	0.23	0.23	0.23	0.23	0.23
14.699		0.22	0.22	0.22	0.22	0.22	0.22
14.829	0.22	0.22	0.22	0.22	0.22	0.22	0.22
14.959	0.22	0.22	0.22	0.22	0.22	0.22	0.21
15.089	0.21	0.21	0.21	0.21	0.21	0.21	0.21
15.219		0.21	0.21	0.21	0.21	0.21	0.21
15.349		0.21	0.20	0.20	0.20	0.20	0.20
15.479		0.20	0.20	0.20	0.20	0.20	0.20
15.609	0.20	0.20	0.20	0.19	0.19	0.19	0.19
15.739	0.19	0.19	0.19	0.19	0.19	0.19	0.19
15.869	0.19	0.19	0.19	0.18	0.18	0.18	0.18
15.999		0.18	0.18	0.18	0.18	0.18	0.18
16.129	0.18	0.18	0.18	0.17	0.17	0.17	0.17
16.259	0.17	0.17	0.17	0.17	0.17	0.17	0.17
16.389	0.17	0.17	0.17	0.17	0.17	0.17	0.17
16.5 1 9	0.17	0.17	0.17	0.17	0.17	0.17	0.17
16.649	0.17	0.17	0.17	0.17	0.17	0.17	0.17
16,779	0.17	0.17	0.17	0.17	0.17	0.17	0.17
16.909	0.17	0.16	0.16	0.16	0.16	0.16	0.16
17.039	0.16	0.16	0.16	0.16	0.16	0.16	0.16
wintr-20 v	ersion 1.10		Page	1		07/31/2014	18:19

Canyon Springs HCC ARea B Pre project 2 yr 24 hr

Line Start Time (hr)	(cfs)	Flow (cfs)	values @ time (cfs)	increment (cfs)	of 0.019 (cfs)	hr (cfs)	(cfs)
17.169 17.299 17.429 17.558 17.688 17.818 17.948 18.078 18.208 18.338 18.598 18.728 18.858 18.728 19.378 19.118 19.248 19.378 19.508 19.638 19.638 19.768 19.898 20.028 20.158 20.288 20.418 20.548 20.678 20.938 21.068 21.198	0.16 0.16 0.16 0.16 0.15 0.15 0.15 0.15 0.14 0.14 0.14 0.14 0.13 0.13 0.13 0.13 0.12 0.12 0.12 0.12 0.11 0.11 0.11 0.11	0.16 0.16 0.16 0.16 0.15 0.15 0.15 0.15 0.14 0.14 0.14 0.13 0.13 0.13 0.12 0.12 0.11 0.11 0.11	0.16 0.16 0.16 0.16 0.15 0.15 0.15 0.15 0.15 0.14 0.14 0.14 0.14 0.13 0.13 0.13 0.13 0.12 0.12 0.12 0.12 0.11 0.11 0.11 0.11	0.16 0.16 0.16 0.16 0.15 0.15 0.15 0.15 0.15 0.14 0.14 0.14 0.13 0.13 0.13 0.13 0.13 0.12 0.12 0.12 0.12 0.11 0.11	0.16 0.16 0.16 0.16 0.15 0.15 0.15 0.15 0.15 0.14 0.14 0.14 0.14 0.13 0.13 0.13 0.13 0.13 0.12 0.12 0.12 0.11 0.11 0.11	0.16 0.16 0.16 0.15 0.15 0.15 0.15 0.15 0.14 0.14 0.14 0.14 0.13 0.13 0.13 0.12 0.12 0.12 0.11 0.11 0.11 0.11 0.11	0.16 0.16 0.16 0.15 0.15 0.15 0.15 0.14 0.14 0.14 0.14 0.13 0.13 0.13 0.12 0.12 0.12 0.11 0.11 0.11 0.11 0.11 0.11
21.328	0.11	0.11	0.11 Page	0,11 2	0,11	0.11	0.11

21.458 21.588 21.718 21.848 21.978 22.108 22.368 22.498 22.628 22.758 22.888 23.018 23.148 23.278 23.408 23.538 23.667	0.11 0.11 0.11 0.11 0.11 0.11 0.11 0.11	0.11 0.11 0.11 0.11 0.11 0.11 0.11 0.11	0.11 0.11 0.11 0.11 0.11 0.11 0.11 0.11 0.11 0.11 0.11 0.11 0.11 0.11	0.11 0.11 0.11 0.11 0.11 0.11	0.11 0.11 0.11 0.11 0.11 0.11 0.11 0.11	0.11 0.11 0.11 0.11 0.11 0.11	0.11 0.11 0.11 0.11 0.11 0.11 0.11 0.11
WinTR-20 V	ersion 1.10)	Page	2		07/31/201	4 18:19
		ARea	Canyon Spri B Pre proje	ngs HCC ct 2 yr 24 h	ır		
Line Start Time (hr)	(cfs)	Flow (cfs)	Values @ ti (cfs)	me increment (cfs)	of 0.0 (cfs)	019 hr (cfs)	(cfs)
23.797 23.927 24.057 24.187	0.11	0.11 0.11 0.10 0.05	0.11	0.11 0.11 0.09	0.11 0.11 0.08	0.11 0.11 0.08	0.10
Area or Reach Identifier	Drainage Area (sq mi)	Rain Gage ID or Location	Runoff Amount (in)	Elevation (ft)	Time	Flow Rate (cfs)	Rate
OUTLET	0.034		0.109		12.17	0.95	28.05
Line Start Time (hr)	(cfs)	Flow (cfs)	Values @ ti (cfs)	me increment (cfs)	of 0.0 (cfs)	019 hr (cfs)	(cfs)
11.969 12.099 12.229 12.359 12.489 12.619 12.749 13.009 13.139 13.269 13.399 13.529 13.659 13.789 13.919 14.049 14.179 14.309 14.309	0.07 0.78 0.88 0.69 0.59 0.40 0.37 0.35 0.33 0.32 0.29 0.28 0.26 0.25 0.24	0.13 0.86 0.85 0.67 0.58 0.49 0.37 0.35 0.33 0.31 0.29 0.27 0.26 0.25 0.24	0.91 0.81 0.66 0.48 0.42 0.39 0.37 0.34 0.33 0.29 0.27 0.26 0.25 0.24 0.23	0.32 0.94 0.78 0.64 0.55 0.47 0.42 0.39 0.36 0.34 0.32 0.31 0.28 0.27 0.26 0.25 0.24 0.23 0.23	0.43 0.95 0.75 0.63 0.54 0.46 0.38 0.36 0.32 0.29 0.29 0.27 0.26 0.23 0.23	0.55 0.94 0.73 0.62 0.52 0.45 0.38 0.36 0.32 0.31 0.29 0.28 0.27 0.26 0.25 0.23	0.67 0.92 0.71 0.60 0.51 0.44 0.40 0.38 0.35 0.33 0.29 0.29 0.28 0.27 0.25 0.24

			area B pre	2yr 24.txt			
14.569	0.23	0.23	0.23	0.23	0.23	0.23	0.23
14.699	0.23	0.22	0.22	0.22	0.22	0.22	0.22
14.829	0.22	0.22	0.22	0.22	0.22	0.22	0.22
14.95 9	0.22	0.22	0.22	0.22	0.22	0.22	0.21
15.089	0.21	0.21	0.21	0.21	0.21	0.21	0.21
15.219	0.21	0.21	0.21	0.21	0.21	0.21	0.21
15.349	0.21	0.21	0.20	0.20	0.20	0.20	0.20
15.479	0.20	0.20	0.20	0.20	0.20	0.20	0.20
15.609	0.20	0.20	0.20	0.19	0.19	0.19	0.19
15.739	0.19	0.19	0.19	0.19	0.19	0.19	0.19
15.869	0.19	0.19	0.19	0.18	0.18	0.18	0.18
15.9 9 9	0.18	0.18	0.18	0.18	0.18	0.18	0.18
16.129	0.18	0.18	0.18	0.17	0.17	0.17	0.17
16.259	0.17	0.17	0.17	0.17	0.17	0.17	0.17
16.389	0.17	0.17	0.17	0.17	0.17	0.17	0.17
16.519	0.17	0.17	0.17	0.17	0.17	0.17	0.17
WinTR-20 Vers	ion 1.10		Page	3		07/31/2014	18:19

Canyon Springs HCC ARea B Pre project 2 yr 24 hr

Line Start Time (hr)	(cfs)	Flow (cfs)	Values @ time (cfs)	increment (cfs)	of 0.019 (cfs)	hr (cfs)	 (cfs)
16.649 16.779 16.909 17.039 17.169 17.299 17.429 17.558 17.688 17.818 17.948 18.078 18.208 18.338 18.468 18.728 18.858 18.728 18.858 18.728 18.858 19.118 19.378 19.508 19.378 19.508 19.378 19.508 19.378 19.508 19.378 19.508 19.638 19.768 19.768 19.638 19.768 19.638 19.768 19.638 19.768 19.768 19.898 20.028 20.158 20.678 20.808 20.938 20.938 21.068	0.17 0.17 0.16 0.16 0.16 0.16 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.12 0.14 0.14 0.14 0.14 0.14 0.14 0.11 0.11	0.17 0.16 0.16 0.16 0.16 0.15 0.15 0.15 0.15 0.15 0.15 0.12 0.14 0.14 0.14 0.14 0.13 0.13 0.13 0.12 0.12 0.12 0.12 0.11 0.11 0.11	0.17 0.16 0.16 0.16 0.16 0.16 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.12 0.14 0.14 0.14 0.14 0.14 0.14 0.11 0.13 0.13 0.13 0.12 0.12 0.12 0.12 0.11 0.11 0.11	0.17 0.16 0.16 0.16 0.16 0.16 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.14 0.14 0.14 0.14 0.13 0.13 0.13 0.13 0.13 0.12 0.12 0.12 0.12 0.11 0.11	0.17 0.16 0.16 0.16 0.16 0.15 0.15 0.15 0.15 0.15 0.15 0.15 0.15	0.17 0.16 0.16 0.16 0.16 0.15 0.15 0.15 0.15 0.14 0.14 0.14 0.14 0.13 0.13 0.13 0.12 0.12 0.12 0.11 0.11 0.11	0.17 0.16 0.16 0.16 0.16 0.15 0.15 0.15 0.14 0.14 0.14 0.14 0.13 0.12 0.12 0.12 0.11 0.11 0.11 0.11
21.198 21.328	$0.11 \\ 0.11$	$0.11 \\ 0.11$	$\substack{0.11\\0.11}$	0.11 0.11	$0.11 \\ 0.11$	0.11 0.11	0.11 0.11

21.458 0.11				area	ı B pre 2yr	24.txt			
21.718 0.11	21	1.458	0.11			0.11	0.11	0.11	0.11
21.848 0.11	21	1.588	0.11	0.11	0.11	0.11	0.11	0.11	0.11
$\begin{array}{cccccccccccccccccccccccccccccccccccc$	21	1.718	0.11	0.11		0.11	0.11	0.11	0.11
$\begin{array}{cccccccccccccccccccccccccccccccccccc$									0.11
$\begin{array}{cccccccccccccccccccccccccccccccccccc$			- -						0.11
22.368 0.11									0.11
22.498 0.11									0.11
22.628 0.11								•	0.11
22.758 0.11 0.11 0.11 0.11 0.11 0.11 0.11 22.888 0.11 0.11 0.11 0.11 0.11 0.11 0.11 0.11 23.018 0.11 0.11 0.11 0.11 0.11 0.11 0.11 0.11 23.148 0.11 0.11 0.11 0.11 0.11 0.11 0.11 0.11									0.11
22.888 0.11 0.11 0.11 0.11 0.11 0.11 0.11 23.018 0.11 0.11 0.11 0.11 0.11 0.11 0.11 0.11 23.148 0.11 0.11 0.11 0.11 0.11 0.11 0.11 0.11									0.11
23.018									0.11
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$									0.11
									0.11
WinTR-20 Version 1 10 Page 4 07/31/2014 18:1	25	3.148	0.11	0.11	0.11	0.11	0.11	0.11	0.11
NININ EO 101210N 2120 1000 1	WinTR-	-20 Versio	n 1.10		Page 4		0	7/31/2014 1	8:19

Canyon Springs HCC ARea B Pre project 2 yr 24 hr

Line Start Time (hr)	(cfs)	Flow (cfs)	Values @ time (cfs)	increment (cfs)	of 0.019 (cfs)	hr (cfs)	(cfs)
23.278 23.408 23.538 23.667 23.797 23.927 24.057 24.187	0.11 0.11 0.11 0.11 0.11 0.11 0.10 0.06	0.11 0.11 0.11 0.11 0.11 0.11 0.10	0.11 0.11 0.11 0.11 0.11 0.11 0.10	0.11 0.11 0.11 0.11 0.11 0.11 0.09	0.11 0.11 0.11 0.11 0.11 0.11 0.08	0.11 0.11 0.11 0.11 0.11 0.11 0.08	0.11 0.11 0.11 0.11 0.11 0.10 0.07

area B pre 2yr 24.txt

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Canyon Springs HCC ARea B Pre project 2 yr 24 hr

Area or	Drainage		- Peak F	low by Storr	n	
Reach Identifier	Area Alternate (sq mi)	2-Yr (cfs)	(cfs)	(cfs)	(cfs)	(cfs)
Area A OUTLET	0.034 0.034	0.95 0.95				

area B pre 2yr 24.txt

WinTR-20 Version 1.10

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area B post 2yr 24.txt Beginning of Input Data List WinTR-20 Printed Page File TR20.inp WinTR-20: Version 1.10 Canyon Springs HCC ARea B post 2yr 24Hr 0 0 0.05 tc (hr) SUB-AREA: . 22 Outlet .03375 90. Area A STREAM REACH: STORM ANALYSIS: 2-Yr 1.6 Type II 2 STRUCTURE RATING: GLOBAL OUTPUT: 0.05 YYYYN YYYYNN (0.762(in)/12)x21.6= 1.37 ac-ft WinTR-20 Printed Page File End of Input Data List Canyon Springs HCC ARea B post 2yr 24Hr Name of printed page file:

STORM 2-Yr

Area or	Drainage	Rain Gage	Runoff		Peak Fl	OW	
Reach	Area	ID OF	Amount	Elevation	Time	Rate	Rate
Identifier	(sq mi)	Location	(in)	(ft)	(hr)	(cfs)	(csm)
Area A	0.034		0.762		12.03	21.35	632.58
Line Start Time		Flow	Values @ time	a increment	of 0.014	hr	
(hr)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)
9.430	0.05		0.05	0.05	0.06	0.06	0.06
9.527	0.06		0.06	0.06	0.07	0.07	0.07
9.624 9.722	0.07 0.08		0.07 0.08	0.07 0.09	0.08 0.09	0.08 0.09	0.08 0.09
9.819	0.09		0.10	0.10	0.10	0.11	0.11
9.916	0.11	0.11	0.11	0.12	0.12	0.12	0.12
10.014	0.13	0.13	0.13	0.13	0.14	0.14	0.14
10.111	0.14		0.15	0.15	0.16	0.16	0.16
10.208	0.16		0.17	0.17	0.18	0.18	0.18
10.305	0.19		0.20	0.20	0.20	0.21	0.21
10.403 10.500	0.2 1 0.24		0.22 0.25	0.23 0.26	0.23 0.26	0.23 0.26	0.24 0.27
10.597	0.27		0.28	0.29	0.29	0.30	0.31
10.694	0.31		0.32	0.33	0.34	0.34	0.35
10,792	0.36		0.37	0.38	0.38	0.39	0.40
10.889	0.40		0.42	0.43	0.43	0.44	0.45
10.986	0.46		0.48	0.48	0.49	0.50	0.51
11.083	0.52		0.54	0.55	0.56	0.58	0.59
11.181 11.278	0.60		0.63	0.65	0.66	0.68	0.69
11.2/6	0.71	0.73	0.74 Page	0.76	0.78	0.80	0.82

TR20.out

11.375	0.84	0.86	area B post 0.88	2yr 24.txt 0.90	0.92	0.94	0.96
11.472	0.98	1.00	1.02	1.05	1.08	1.12	1.17
11.570	1.24	1.33	1.44 2.87	1.56 3.20	1.71 3.56	1.88 3.96	2.07 4.39
11.667 11.764	2.30 4.86	2.57 5.38	2.07 5.95	6.57	7.24	7.98	8.80
11.862	9.73	10.80	12.00	13.32	14.68	16.01	17.28
11.959	18.43	19.42	20.21	20.82	21.21	21.35	21.26 14.62
12.056 12.153	20.94 13.34	20.36 12.13	19.50 11.00	18.42 9.96	17.20 9.05	15.92 8.29	7.65
12.251	7.10	6.63	6.21	5.84	5.52	5.23	4.98
12.348	4.75	4.55	4.37	4.20	4.04	3.90	3.77
12.445 12.542	3.65 2.94	3.54 2.85	3.43 2.77	3.32 2.70	3.21 2.63	3.11 2.56	3.02 2.49
12.640	2.44	2.38	2.34	2.29	2.25	2.22	2.18
12.737	2.15	2.13	2.10	2.07	2.05	2.03	2.00
12.834 12.931	1.98 1.85	$\frac{1.96}{1.83}$	1.94 1.81	1.92 1.80	1.91 1.78	1.89 1.76	1.87 1.74
13.029	1.72	1.71	1.69	1.68	1.66	1.64	1.63
13.126	1.61	1.60	1.58	1.57	1.56	1.55	1.53
13.223	1.52	1.51	1.50	1.49	1.48	1.47	1.46
WinTR-20 Vers	ion 1.10		Page	1		07/31/2014	18:24

Line		_			5 0 014		
Start Time (hr)	(cfs)	Flow (cfs)	Values @ time (cfs)	(cfs)	of 0.014 (cfs)	hr (cfs)	(cfs)
(111)	(613)	(013)	(613)	(013)	(0.0)		
13.320	1.45	1.44	1.43	1.42	1.41 1.34	1.40 1.33	1.39 1.32
13.418 13.515	1.38 1.31	1.37 1.31	1.36 1.30	1.35 1.29	1.28	1.27	1.26
13.612	1.25	1.24	1.23	1.23	1.22	1.21	1.20
13.710	$1.19 \\ 1.14$	$\frac{1.19}{1.14}$	1.18 1.13	1.17 1.12	$1.16 \\ 1.12$	$1.16 \\ 1.11$	$1.15 \\ 1.10$
13.807 13.904	1.09	1.09	1.08	1.07	1.07	1.06	1.05
14.001	1.05	1.04	1.03	1.03	1.02	1.01	1.01
14.099 14.196	1.00 0.97	1.00 0.96	0.99 0.96	0.99 0.96	0.98 0.95	0.98 0.95	0.97 0.95
14.293	0.94	0.94	0.94	0.94	0.93	0.93	0.93
14.390	0.93	0.92 0.91	0.92 0.90	0.92 0.90	0.92 0.90	$0.91 \\ 0.90$	0.91
14.488 14.585	0.91 0.89	0.89	0.89	0.89	0.88	0.88	0.88
14.682	0.88	0.87	0.87	0.87	0.87	0.86	0.86
14.779 14.877	0.86 0.84	0.86	0.85 0.84	0.85 0.84	0.85 0.83	0.85 0.83	0.84 0.83
14.974	0.83	0.82	0.82	0.82	0.82	0.81	0.81
15.071 15.168	0.81 0.79	0.81 0.79	0.80 0.79	0.80 0.78	0.80 0.78	0.80 0.78	0.79 0.78
15.266	0.78	0.77	0.77	0.77	0.77	0.76	0.76
15.363	0.76	0.76	0.75	0.75	0.75	0.75	0.74
15.460 15.558	0.74 0.72	0.74 0.72	0.74 0.72	0.73 0.72	0.73 0.71	0.73 0.71	0.73 0.71
15.655	0.71	0.70	0.70	0.70	0.70	0.69	0.69
15.752 15.849	0.69 0.67	0.69 0.67	0.68 0.67	0.68 0.66	0.68 0.66	0.68 0.66	0.67 0.66
15.947	0.65	0.65	0.65	0.65	0.64	0.64	0.64
16.044	0.64	0.63	0.63	0.63 0.62	0.63 0.62	0.63 0.61	0.62 0.61
16.141 16.238	0.62 0.61	0.62 0.61	0.62 0.61	0.62	0.61	0.61	0.61
16.336	0.60	0.60	0.60	0.60	0.60	0.60	0.60
16.433	0.60	0.60	0.60 Page :	0.60	0.59	0.59	0.59
			rage	_			

		ar	ea B post	2yr 24.txt			
16.530	0.59	0.59	0.59	0.59	0.59	0.59	0.59
16.627	0.59	0.59	0.58	0.58	0.58	0.58	0.58
16.725	0.58	0.58	0.58	0.58	0.58	0.58	0.57
16.822	0.57	0.57	0.57	0.57	0.57	0.57	0.57
16.919	0.57	0.57	0.57	0.57	0.56	0.56	0.56
17.016	0.56	0.56	0.56	0.56	0.56	0.56	0.56
17.114	0.56	0.55	0.55	0.55	0.55	0.55	0.55
17.211	0.55	0.55	0.55	0.55	0.55	0.55	0.54
17.308	0.54	0.54	0.54	0.54	0.54	0.54	0.54
17.406	0.54	0.54	0.54	0.53	0.53	0.53	0.53
17.503	0.53	0.53	0.53	0.53	0.53	0.53	0.53
17.600	0.53	0.52	0.52	0.52	0.52	0.52	0.52
17.697	0.52	0.52	0.52	0.52	0.52	0.51	0.51
17.795	0.51	0.51	0.51	0.51	0.51	0.51	0.51
17.892	0.51	0.51	0.50	0.50	0.50	0.50	0.50
17.989	0.50	0.50	0.50	0.50	0.50	0.50	0.49
18.086	0.49	0.49	0.49	0.49	0.49	0.49	0.49
18.184	0.49	0.49	0.49	0.49	0.48	0.48	0.48
WinTR-20 Vers	ion 1.10		Page	2		07/31/2014	18:24

Line Start Time (hr)	(cfs)	Flow (cfs)	Values @ time (cfs)	increment (cfs)	of 0.014 (cfs)	hr (cfs)	(cfs)
18.281 18.378 18.475 18.573 18.670 18.767 18.864 18.962 19.059 19.156 19.254 19.351 19.448 19.545 19.643 19.740 19.837 19.934 20.032 20.129 20.226 20.323 20.421 20.518 20.615 20.712 20.810 20.907 21.004 21.102 21.199 21.296 21.393	0.48 0.47 0.46 0.47 0.444 0.442 0.441 0.442 0.441 0.442 0.441 0.339 0.336 0.3355 0.3355 0.3355 0.3355 0.3353 0.335	0.48 0.47 0.46 0.446 0.446 0.447 0.447 0.440 0.440 0.438 0.336 0.335 0.335 0.335 0.335 0.335 0.335 0.335 0.335 0.335 0.335	0.48 0.47 0.46 0.45 0.45 0.444 0.43 0.42 0.40 0.39 0.38 0.36 0.35 0.35 0.35 0.35 0.35 0.35	0.48 0.47 0.47 0.46 0.445 0.443 0.442 0.440 0.42 0.440 0.388 0.335 0.335 0.335 0.335 0.335 0.335 0.335 0.335	0.48 0.47 0.47 0.46 0.45 0.443 0.41 0.40 0.439 0.336 0.35 0.35 0.35 0.35 0.35 0.35 0.35 0.35	0.446 0.446 0.446 0.445 0.446	0.48 0.46 0.46 0.46 0.444 0.444 0.441 0.441 0.441 0.441 0.33 0.33 0.33 0.33 0.33 0.33 0.33 0.3
21,491 21,588	0.34 0.34	0.34 0.34	0.34 0.34	0.34 0.34	0.34 0.34	0.34 0.34	0.34 0.34

21.685 21.782 21.880 21.977 22.074 22.171 22.366 22.463 22.560 22.658 22.755 22.852 22.950 23.047 23.144	0.34 0.34 0.33 0.33 0.33 0.33 0.33 0.33	0.34 0.33 0.33 0.33 0.33 0.33 0.33 0.32 0.32	0.34 0.33 0.33 0.33 0.33 0.33 0.33 0.33	0.34 0.34 0.33 0.33 0.33 0.33 0.33 0.33	0.32	0.33 0.33 0.33 0.32 0.32 0.32 0.32 0.32	0.33 0.33 0.33 0.32 0.32 0.32 0.32 0.32
WinTR-20 Ve	ersion I.I		Page :			07/31/2014	10:24
			Canyon Sprin ARea B post 2				
Line Start Time (hr)	(cfs)	Flow (cfs)	Values @ time (cfs)	e increment (cfs)	of 0.	014 hr (cfs)	(cfs)
23.241 23.339 23.436 23.533 23.630 23.728 23.825 23.922 24.019 24.117 24.214	0.32 0.32 0.32 0.31 0.31 0.31 0.31 0.22 0.08	0.32 0.32 0.32 0.31 0.31 0.31 0.30 0.19	0.32 0.31 0.31 0.31 0.31 0.31	0.32 0.32 0.31 0.31 0.31 0.31 0.31 0.29 0.15	0.32 0.32 0.31 0.31 0.31 0.31 0.31 0.28 0.13	0.31	$0.31 \\ 0.31$
Area or Reach Identifier	Area	ID or	Runoff Amount (in)	Elevation	Time	Flow Rate (cfs)	Rate
OUTLET	0.034		0.762		12.03	21.35	632.58
Line Start Time (hr)	(cfs)		values @ tim (cfs)	e increment (cfs)	of 0. (cfs)	014 hr (cfs)	
9.430 9.527 9.624 9.722 9.819 9.916 10.014 10.111 10.208 10.305 10.403 10.500 10.597 10.694 10.792	0.05 0.06 0.07 0.08 0.09 0.11 0.13 0.14 0.16 0.19 0.21 0.24 0.27	0.05 0.06 0.07 0.08 0.10 0.11 0.13 0.15 0.17 0.19 0.22 0.25 0.36	0.05 0.06 0.07 0.08 0.10 0.11 0.13 0.15 0.17 0.20 0.22 0.25 0.28 0.32 0.37 Page	0.05 0.06 0.07 0.09 0.10 0.12 0.13 0.15 0.17 0.20 0.23 0.26 0.29 0.33 0.38	0.06 0.07 0.08 0.09 0.10 0.12 0.14 0.16 0.20 0.23 0.26 0.29 0.34 0.38	0.06 0.07 0.08 0.09 0.11 0.12 0.14 0.16 0.18 0.21 0.23 0.26 0.30 0.34	0.06 0.07 0.08 0.11 0.12 0.14 0.16 0.21 0.24 0.27 0.31 0.35

			area B post	2yr 24.txt	:		
10.889	0.40	0.41	0.42	0.43	0.43	0.44	0.45
10.986	0.46	0.47	0.48	0.48	0.49	0.50	0.51
11.083	0.52	0.53	0.54	0.55	0.56	0.58	0.59
11.181	0.60	0.62	0.63	0.65	0.66	0.68	0.69
11.278	0.71	0.73	0.74	0.76	0.78	0.80	0.82
11.375	0.84	0.86	0.88	0.90	0.92	0.94	0.96
11.472	0.98	1.00	1.02	1.05	1.08	1.12	1.17
11.570	1.24	1.33	1.44	1.56	1.71	1.88	2.07
11.667	2.30	2.57	2.87	3.20	3.56	3,96	4.39
11.764	4.86	5.38	5.95	6.57	7.24	7.98	8.80
11.862	9.73	10.80	12.00	13.32	14.68	16.01	17.28
11.959	18.43	19.42	20.21	20.82	21.21	21.35	21.26
12.056	20.94	20.36	19.50	18.42	17.20	15.92	14.62
12.153	13.34	12.13	11.00	9.96	9.05	8.29	7.65
vinTR-20 versi	ion 1.10		Page	4		07/31/2014	18:24

(cfs)	Flow (cfs)	Values @ time (cfs)	increment (cfs)	of 0.014 (cfs)	hr (cfs)	(cfs)
7.10 4.75 3.65 2.94 2.15 1.98 1.72 1.61 1.52 1.45 1.38 1.31 1.05 1.00 0.97 0.94 0.93 0.88 0.88 0.88 0.88 0.78 0.74 0.72	6.63 4.55 3.85 2.38 2.13 1.96 1.83 1.71 1.60 1.54 1.37 1.37 1.37 1.14 1.09 1.04 0.96 0.92 0.87 0.88 0.87 0.77 0.76 0.74 0.72	6.21 4.37 3.43 2.77 2.34 2.10 1.94 1.69 1.58 1.50 1.43 1.36 1.30 1.23 1.18 1.08 1.03 0.99 0.96 0.94 0.92 0.87 0.87 0.85 0.87 0.85 0.87 0.77 0.75 0.74	5.84 4.20 3.32 2.70 2.29 2.07 1.92 1.80 1.68 1.57 1.42 1.35 1.23 1.17 1.12 1.07 1.03 0.99 0.96 0.94 0.92 0.89 0.87 0.85 0.85 0.87 0.75 0.75 0.75	5.52 4.04 3.21 2.63 2.25 2.05 1.78 1.76 1.48 1.28 1.12 1.07 1.09 1.07 1.09 1.07 1.09 1.07 1.09 1.07 1.09 1.07 1.09 1.07 1.09 1.07 1.09 1.07 1.07 1.07 1.07 1.07 1.07 1.07 1.07	5.23 3.901 2.562 2.039 1.764 1.327 1.1061 1.018	4.98 3.77 3.049 2.18 2.00 1.87 1.63 1.39 1.32 1.105 1.05 1.097 0.989 0.88 0.881 0.79 0.74 0.77 0.71 0.69
0.69 0.67 0.65	0.69 0.67 0.65	0.68 0.67 0.65	0.68 0.66 0.65	0.68 0.66 0.64	0.68 0.66 0.64	0.67 0.66 0.64
	7.10 4.75 3.65 2.94 2.44 2.15 1.98 1.85 1.61 1.52 1.45 1.38 1.31 1.09 1.09 0.94 0.97 0.94 0.88 0.86 0.88 0.89 0.79 0.74 0.72 0.74 0.72 0.74 0.72 0.69	(cfs) (cfs) 7.10 6.63 4.75 4.55 3.65 3.54 2.94 2.85 2.44 2.38 2.15 2.13 1.98 1.96 1.85 1.83 1.72 1.71 1.61 1.60 1.52 1.51 1.45 1.44 1.38 1.37 1.31 1.31 1.25 1.24 1.19 1.19 1.14 1.14 1.09 1.09 1.05 1.04 1.00 0.97 0.96 0.94 0.94 0.93 0.92 0.91 0.91 0.89 0.89 0.88 0.87 0.86 0.86 0.84 0.84 0.83 0.82 0.81 0.81 0.79 0.79 0.78 0.77 0.76 0.76 0.74 0.74 0.72 0.72 0.70 0.69 0.69 0.67	(cfs) (cfs) (cfs) 7.10 6.63 6.21 4.75 4.55 4.37 3.65 3.54 3.43 2.94 2.85 2.77 2.44 2.38 2.34 2.15 2.13 2.10 1.98 1.96 1.94 1.85 1.83 1.81 1.72 1.71 1.69 1.61 1.60 1.58 1.52 1.51 1.50 1.45 1.44 1.43 1.38 1.37 1.36 1.31 1.31 1.30 1.25 1.24 1.23 1.19 1.18 1.14 1.14 1.14 1.13 1.09 1.08 1.03 1.00 1.00 0.99 0.97 0.96 0.96 0.94 0.94 0.94 0.93 0.92 0.92 0.91 0.90 0.89	(cfs) (cfs) (cfs) 7.10 6.63 6.21 5.84 4.75 4.55 4.37 4.20 3.65 3.54 3.43 3.32 2.94 2.85 2.77 2.70 2.44 2.38 2.34 2.29 2.15 2.13 2.10 2.07 1.98 1.96 1.94 1.92 1.85 1.83 1.81 1.80 1.72 1.71 1.69 1.68 1.61 1.60 1.58 1.57 1.52 1.51 1.50 1.49 1.45 1.44 1.43 1.42 1.38 1.37 1.36 1.35 1.31 1.30 1.29 1.25 1.24 1.23 1.23 1.19 1.18 1.17 1.14 1.14 1.13 1.12 1.09 1.08 1.07 1.05 1.04 1.03 1.03	(cfs) (cfs) (cfs) (cfs) 7.10 6.63 6.21 5.84 5.52 4.75 4.55 4.37 4.20 4.04 3.65 3.54 3.43 3.32 3.21 2.94 2.85 2.77 2.70 2.63 2.44 2.38 2.34 2.29 2.25 2.15 2.13 2.10 2.07 2.05 1.98 1.96 1.94 1.92 1.91 1.85 1.83 1.81 1.80 1.78 1.72 1.71 1.69 1.68 1.66 1.61 1.60 1.58 1.57 1.56 1.52 1.51 1.50 1.49 1.48 1.45 1.44 1.43 1.42 1.41 1.38 1.37 1.36 1.35 1.34 1.31 1.31 1.30 1.29 1.28 1.25 1.24 1.23 1.23 1.22 <td>(cfs) (cfs) (cfs) (cfs) (cfs) 7.10 6.63 6.21 5.84 5.52 5.23 4.75 4.55 4.37 4.20 4.04 3.90 3.65 3.54 3.43 3.32 3.21 3.11 2.94 2.85 2.77 2.70 2.63 2.56 2.44 2.38 2.34 2.29 2.25 2.22 2.15 2.13 2.10 2.07 2.05 2.03 1.98 1.96 1.94 1.92 1.91 1.89 1.85 1.83 1.81 1.80 1.78 1.76 1.72 1.71 1.69 1.68 1.66 1.64 1.61 1.60 1.58 1.57 1.56 1.55 1.52 1.51 1.50 1.49 1.48 1.47 1.45 1.44 1.43 1.42 1.41 1.40 1.38 1.37 1.36 1.35</td>	(cfs) (cfs) (cfs) (cfs) (cfs) 7.10 6.63 6.21 5.84 5.52 5.23 4.75 4.55 4.37 4.20 4.04 3.90 3.65 3.54 3.43 3.32 3.21 3.11 2.94 2.85 2.77 2.70 2.63 2.56 2.44 2.38 2.34 2.29 2.25 2.22 2.15 2.13 2.10 2.07 2.05 2.03 1.98 1.96 1.94 1.92 1.91 1.89 1.85 1.83 1.81 1.80 1.78 1.76 1.72 1.71 1.69 1.68 1.66 1.64 1.61 1.60 1.58 1.57 1.56 1.55 1.52 1.51 1.50 1.49 1.48 1.47 1.45 1.44 1.43 1.42 1.41 1.40 1.38 1.37 1.36 1.35

		ar	ea B post	2yr 24.txt			
16.044	0.64	0.63	0.63	0.63	0.63	0.63	0.62
16.141	0.62	0.62	0.62	0.62	0.62	0.61	0.61
16.238	0.61	0.61	0.61	0.61	0.61	0.61	0.61
16.336	0.60	0.60	0.60	0.60	0.60	0.60	0.60
16.433	0.60	0.60	0.60	0.60	0.59	0.59	0.59
16.530	0.59	0.59	0.59	0.59	0.59	0.59	0.59
16.627	0.59	0.59	0.58	0.58	0.58	0.58	0.58
16.725	0.58	0.58	0.58	0.58	0.58	0.58	0.57
16.822	0.57	0.57	0.57	0.57	0.57	0.57	0.57
16.919	0.57	0.57	0.57	0.57	0.56	0.56	0.56
17.016	0.56	0.56	0.56	0.56	0.56	0.56	0.56
17.114	0.56	0.55	0.55	0.55	0.55	0.55	0.55
WinTR-20 Vers	ion 1.10		Page	5		07/31/2014	18:24

17.308 0.54 0.54 0.54 0.54 0.54 0.54 0.54 0.53 0.52 0.52 0.52 0.52 0.52 0.52 0.52 0.52 0.52 0.52 0.51 0.50 0.50 0.50 0.50 0.50 0.50 0.50 0.50 0.50 <	Line Start Time (hr)	tart Time	(cfs)	Flow (cfs)	Values @ time (cfs)	increment (cfs)	of 0.014 (cfs)	hr (cfs)	(cfs)
19.351 0.41 0.35	17.308 17.406 17.503 17.600 17.697 17.795 17.892 17.989 18.086 18.184 18.378 18.475 18.573 18.670 18.767 18.864 18.962 19.059 19.156 19.254 19.351 19.448 19.545 19.740 19.837 19.837 19.934 20.032 20.129 20.226 20.323 20.421 20.518 20.907 21.004	17.308 17.406 17.503 17.600 17.697 17.795 17.892 17.989 18.086 18.184 18.281 18.378 18.670 18.767 18.864 18.962 19.059 19.156 19.254 19.351 19.351 19.354 20.323 20.421 20.518 20.615 20.907 21.004	0.554 0.555 0.555 0.555 0.555 0.555 0.655	0.54 0.55 0.55 0.55 0.55 0.55 0.49 0.44 0.44 0.44 0.44 0.44 0.44 0.38 0.33 0.33 0.33 0.33 0.33 0.33 0.33	0.54 0.53 0.52 0.552 0.550 0.49 0.47 0.44 0.44 0.44 0.44 0.42 0.42 0.44 0.38 0.36 0.36 0.35 0.35 0.35 0.35 0.35 0.35	0.54 0.53 0.53 0.552 0.552 0.550 0.448 0.445 0.445 0.445 0.445 0.446 0.338 0.335 0.335 0.335 0.335 0.335 0.335 0.335 0.335 0.335	0.54 0.53 0.53 0.552 0.550 0.448 0.445 0.445 0.445 0.445 0.445 0.445 0.446 0.388 0.335 0.335 0.335 0.335 0.335 0.335	0.5532110009888766655555555555555555555555555555555	0.54 0.53 0.53 0.553 0.551 0.49 0.49 0.448 0.445 0.445 0.441 0.441 0.439 0.335 0.335 0.335 0.335 0.335 0.335 0.335

		аг	ea B post	2yr 24.txt			
21.199	0.34	0.34	0.34	0.34	0.34	0.34	0.34
21,296	0.34	0.34	0.34	0.34	0.34	0.34	0.34
21.393	0.34	0.34	0.34	0.34	0.34	0.34	0.34
21,491	0.34	0.34	0.34	0.34	0.34	0.34	0.34
21.588	0.34	0.34	0.34	0.34	0.34	0.34	0.34
21.685	0.34	0.34	0.34	0.34	0.34	0.34	0.34
21.782	0.34	0.34	0.34	0.34	0.34	0.34	0.34
21.880	0.34	0.34	0.34	0.34	0.34	0.34	0.34
21.977	0.33	0.33	0.33	0.33	0.33	0.33	0.33
22.074	0.33	0.33	0.33	0.33	0.33	0.33	0.33
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Line.		_7			5 0 014		
Start Time	(-F-)		Values @ time				(_E_)
(hr)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)
22.171 22.269	0.33 0.33	0.33	0.33 0.33	0.33 0.33	0.33 0.33	0.33	0.33 0.33
22.366	0.33	0.33		0.33	0.33	0.33	0.33
22.463	0.33	0.33		0.33	0.33	0.33	0.33
22.560	0.33	0.33		0.33	0.33	0.33	0.33
22.658	0.33	0.33		0.33	0.33	0.33	0.33
22.755	0.33	0.32		0.32	0.32	0.32	0.32
22.852	0.32	0.32		0.32	0.32	0.32	0.32
22.950	0.32	0.32		0.32	0.32	0.32	0.32
23.047	0.32	0.32		0.32	0.32	0.32	0.32
23.144	0.32	0.32		0.32	0.32	0.32	0.32
23.241	0.32	0.32		0.32	0.32	0.32	0.32
23.339	0.32	0.32		0.32	0.32	0.32	0.32
23.436 23.533	0.32 0.32	0.32		0.32	0.32	0.32	0.32
23.630	0.31	0.31	0.31	0.31 0.31	0.31 0.31	$0.31 \\ 0.31$	$0.31 \\ 0.31$
23.728	0.31	0.31		0.31	0.31	0.31	0.31
23.825	0.31	0.31		0.31	0.31	0.31	0.31
23.922	0.31	0.31	_	0.31	0.31	0.31	0.31
24.019	0.31	0.30		0.29	0.28	0.26	0.24
24.117	0.22	0,19		0.15	0.13	0.11	0.09
24.214	0.08	0.07	0.06				

area B post 2yr 24.txt

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Area or Reach	Drainage Area Alternate (sq mi)	Peak Flow by Storm 2-Yr						
		(cfs)	(cfs)	(cfs)	(cfs)	(cfs)		
Area A OUTLET	0.034 0.034	21.35 21.35						

area B post 2yr 24.txt

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Appendix 8: Source Control

Pollutant Sources/Source Control Checklist

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1 Potential Sources of Runoff Pollutants	2 Permanent Controls—Shown on WQMP Drawings	3 Permanent Controls—Listed in WQMP Table and Narrative	4 Operational BMPs—Included in WQMP Table and Narrative
A. On-site storm drain inlets	Locations of inlets.	Mark all inlets with the words "Only Rain Down the Storm Drain" or similar. Catch Basin Markers may be available from the Riverside County Flood Control and Water Conservation District, call 951.955.1200 to verify.	Maintain and periodically repaint or replace inlet markings. Provide stormwater pollution prevention information to new site owners, lessees, or operators. See applicable operational BMPs in Fact Sheet SC-44, "Drainage System Maintenance," in the CASQA Stormwater Quality Handbooks at www.cabmphandbooks.com Include the following in lease agreements: "Tenant shall not allow anyone to discharge anything to storm drains or to store or deposit materials so as to create a potential discharge to storm drains."
B. Interior floor drains and elevator shaft sump pumps		State that interior floor drains and elevator shaft sump pumps will be plumhed to sanitary sewer.	☐ Inspect and maintain drains to prevent hlockages and overflow.
C. Interior parking garages		State that parking garage floor drains will be plumbed to the sanitary sewer.	Inspect and maintain drains to prevent blockages and overflow.

1 Potential Sources of Runoff Pollutante	2 Permanent Controls—Shown on WQMP Drawings	3 Permanent Controls—Listed in WQMP Table and Narrative	4 Operational BMPs—Included in WQMP Table and Narrative
D1. Need for future indoor & structural pest control		☐ Note building design features that discourage entry of pests.	Provide Integrated Pest Management information to owners, lessees, and operators.
D2. Landscape/ Outdoor Pesticide Use	Show locations of native trees or areas of shrubs and ground cover to be undisturbed and retained. Show self-retaining landscape areas, if any. Show stormwater treatment and hydrograph modification management BMPs. (See instructions in Chapter 3, Step 5 and guidance in Chapter 5.)	State that final landscape plans will accomplish all of the following. Preserve existing native trees, shrubs, and ground cover to the maximum extent possible. Design landscaping to minimize irrigation and runoff, to promote surface infiltration where appropriate, and to minimize the use of fertilizers and pesticides that can contribute to stormwater pollution. Where landscaped areas are used to retain or detain stormwater, specify plants that are tolerant of saturated soil conditions. Consider using pest-resistant plants, especially adjacent to hardscape. To insure successful establishment, select plants appropriate to site soils, slopes, climate, sun, wind, rain, land use, air movement, ecological consistency, and plant interactions.	Maintain landscaping using minimum or no pesticides. See applicable operational BMPs in "What you should know forLandscape and Gardening" at http://rcflood.org/stormwater/Downloads/LandscapeGardenBrochure.pdf Provide IPM information to new owners, lessees and operators.

1 Potential Sources of Runoff Pollutants	2 Permanent Controls—Shown on WQMP Drawings	3 Permanent Controls—Listed in WQMP Table and Narrative	4 Operational BMPs—Included in WQMP Table and Narrative
E. Pools, spas, ponds, decorative fountains, and other water features.	Show location of water feature and a sanitary sewer cleanout in an accessible area within 10 feet. (Exception: Public pools must be plumbed according to County Department of Environmental Health Guidelines.)	If the Co-Permittee requires pools to be plumbed to the sanitary sewer, place a note on the plans and state in the narrative that this connection will be made according to local requirements.	See applicable operational BMPs in "Guidelines for Maintaining Your Swimming Pool, Jacuzzi and Garden Fountain" at http://rcflood.org/stormwater/
F. Food service	For restaurants, grocery stores, and other food service operations, show location (indoors or in a covered area outdoors) of a floor sink or other area for cleaning floor mats, containers, and equipment. On the drawing, show a note that this drain will be connected to a grease interceptor before discharging to the sanitary sewer.	Describe the location and features of the designated cleaning area. Describe the items to be cleaned in this facility and how it has been sized to insure that the largest items can be accommodated.	See the brochure, "The Food Service Industry Best Management Practices for: Restaurants, Grocery Stores, Delicatessens and Bakeries" at http://rcflood.org/stormwater/ Provide this brochure to new site owners, lessees, and operators.
G. Refuse areas	Show where site refuse and recycled materials will be handled and stored for pickup. See local municipal requirements for sizes and other details of refuse areas. If dumpsters or other receptacles are outdoors, show how the designated area will be covered, graded, and paved to prevent run-on and show locations of berms to prevent runoff from the area. Any drains from dumpsters, compactors, and tallow bin areas shall be connected to a grease removal device before discharge to sanitary sewer.	State how site refuse will be handled and provide supporting detail to what is shown on plans. State that signs will be posted on or near dumpsters with the words "Do not dump hazardous materials here" or similar.	State how the following will be implemented: Provide adequate number of receptacles. Inspect receptacles regularly; repair or replace leaky receptacles. Keep receptacles covered. Prohibit/prevent dumping of liquid or hazardous wastes. Post "no hazardous materials" signs. Inspect and pick up litter daily and clean up spills immediately. Keep spill control materials available on-site. See Fact Sheet SC-34, "Waste Handling and Disposal" in the CASQA Stormwater Quality Handbooks at www.cabmphandbooks.com

1	2	3 Permanent Controls—Listed in WQMP Table and Narrative	4
Potential Sources of Runoff	Permanent Controls—Shown on WQMP		Operational BMPs—Included in WQMP
Pollutants	Drawings		Table and Narrative
H. Industrial processes.	Show process area.	If industrial processes are to be located on site, state: "All process activities to be performed indoors. No processes to drain to exterior or to storm drain system."	See Fact Sheet SC-10, "Non-Stormwater Discharges" in the CASQA Stormwater Quality Handbooks at www.cabmphandbooks.com See the brochure "Industrial & Commercial Facilities Best Management Practices for: Industrial, Commercial Facilities" at http://rcflood.org/stormwater/
1	2	3	4 Operational BMPs—Included in WQMP Table and Narrative
Potential Sources of Runoff	Permanent Controls—Shown on WQMP	Permanent Controls—Listed in WQMP	
Pollutants	Drawings	Table and Narrative	
. Outdoor storage of equipment or materials. (See rows J and K for source control measures for vehicle cleaning, repair, and maintenance,)	Show any outdoor storage areas, including how materials will be covered. Show how areas will be graded and bermed to prevent run-on or run-off from area. Storage of non-hazardous liquids shall be covered by a roof and/or drain to the sanitary sewer system, and be contained by berms, dikes, liners, or vaults. Storage of hazardous materials and wastes must be in compliance with the local hazardous materials ordinance and a Hazardous Materials Management Plan for the site.	Include a detailed description of materials to be stored, storage areas, and structural features to prevent pollutants from entering storm drains. Where appropriate, reference documentation of compliance with therequirements of Hazardous Materials Programs for: • Hazardous Waste Generation • Hazardous Materials Release Response and Inventory • California Accidental Release (CalARP) • Aboveground Storage Tank • Uniform Fire Code Article 80 Section 103(b) & (c) 1991 • Underground Storage Tank www.cchealth.org/groups/hazmat/	See the Fact Sheets SC-31, "Outdoor Liquid Container Storage" and SC-33, "Outdoor Storage of Raw Materials " in the CASQA Stormwater Quality Handbooks at www.cabmphandbooks.com

Potential Sources of Runoff Pollutants	Permanent Controls—Shown on WQMP Drawings	Permanent Controls—Listed in WQMP Table and Narrative	Operational BMPs—Included in WQMP Table and Narrative
□ J. Vehicle and Equipment Cleaning	(1) Commercial/industrial facilities having vehicle/equipment cleaning needs shall either provide a covered, bermed area for washing activities or discourage vehicle/equipment washing by removing hose bibs and installing signs prohibiting such uses. (2) Multi-dwelling complexes shall have a paved, bermed, and covered car wash area (unless car washing is prohibited on-site and boses are provided with an automatic shutoff to discourage such use). (3) Washing areas for cars, vehicles, and equipment shall be paved, designed to prevent run-on to or runoff from the area, and plumbed to drain to the sanitary sewer. (4) Commercial car wash facilities shall be designed such that no runoff from the facility is discharged to the storm drain system. Wastewater from the facility shall discharge to the sanitary sewer, or a wastewater reclamation system shall be installed.	If a car wash area is not provided, describe any measures taken to discourage on-site car washing and explain how these will be enforced.	Describe operational measures to implement the following (if applicable): Washwater from vehicle and equipment washing operations shall not be discharged to the storm drain system. Refer to "Outdoor Cleaning Activities and Professional Mobile Service Providers" for many of the Potential Sources of Runoff Pollutants categories below. Brochure can be found at http://rcflood.org/stormwater. Car dealerships and similar may rinse cars with water only.

1	2 Permanent Controls—Shown on WQMP Drawings	3	4
Potential Sources of Runoff		Permanent Controls—Listed in WQMP	Operational BMPs—Included in WQMP
Pollutants		Table and Narrative	Table and Narrative
K. Vehicle/Equipment Repair and Maintenance	Accommodate all vehicle equipment repair and maintenance indoors. Or designate an outdoor work area and design the area to prevent run-on and runoff of stormwater. Show secondary containment for exterior work areas where motor oil, brake fluid, gasoline, diesel fuel, radiator fluid, acid-containing batteries or other hazardous materials or hazardous wastes are used or stored. Drains shall not be installed within the secondary containment areas. Add a note on the plans that states either (1) there are no floor drains, or (2) floor drains are connected to wastewater pretreatment systems prior to discharge to the sanitary sewer and an industrial waste discharge permit will be obtained.	State that no vehicle repair or maintenance will be done outdoors, or else describe die required features of the outdoor work area. State that there are no floor drains or if there are floor drains, note the agency from which an industrial waste discharge permit will he obtained and that the design meets that agency's requirements. State that there are no tanks, containers or sinks to be used for parts cleaning or rinsing or, if there are, note the agency from which an industrial waste discharge permit will be obtained and that the design meets that agency's requirements.	In the Stormwater Control Plan, note that all of the following restrictions apply to use the site: No person shall dispose of, nor permit the disposal, directly or indirectly of vehicle fluids, hazardous materials, or rinsewater from parts cleaning into sturm drains. No vehicle fluid removal shall be performed outside a building, nor oo asphalt or gruund surfaces, whether inside or outside a building, except in such a manner as to ensure that any spilled lluid will be in an area of secondary cootanment. Leaking vehicle fluids shall be contained or drained from the vehicle immediately. No person shall leave unattended drip parts or other open containers containing vehicle fluid, unless such containers are in use or in an area of secondary containment. Refer to "Automotive Maintenance & Car Care Best Management Practices for Auto Body Shops, Auto Repair Shops, Car Dealerships, Gas Stations and Fleet Service Operations". Brochure can be found at http://rcflood.org/stormwater/ Refer to Outdoor Cleaning Activities and Professional Mobile Service Providers for many of the Potential Sources of Runoff Pollutants categories below, Brochure can be found at http://rcflood.org/stormwater/

Potential Sources of Runoff Pollutants	Permanent Controls—Shown on WQMP Drawings	3 Permanent Controls—Listed in WQMP Table and Narrative	Operational BMPs—Included in WQMP Table and Narrative
L. Fuel Dispensing Areas	Fueling areass shall have impermeable floors (i.e., portland cement concrete or equivalent smooth impervious surface) that are: a) graded at the minimum slope necessary to prevent ponding; and b) separated from the rest of the site by a grade break that prevents run-on of stormwater to the maximum extent practicable. Fueling areas shall be covered by a canopy that extends a minimum of ten feet in each direction from each pump. [Alternative: The fueling area must be covered and the cover's minimum dimensions must be equal to or greater than the area within the grade break or fuel dispensing area1.] The canopy [or cover] shall not drain onto the fueling area.		☐ The property owner shall dry sweep the fueling area routinely. ☐ See the Fact Sheet SD-30, "Fueling Areas" in the CASQA Stormwater Quality Handbooks at www.cabmphandbooks.com

[&]quot;The fueling area shall be defined as the area extending a minimum of 6.5 feet from the corner of each fuel dispenser or the length at which the hose and nozzle assembly may be operated plus a minimum of one foot, whichever is greater.

1	2	3	4 Operational BMPs—Included in WQMP Table and Narrative
Potential Sources of Runoff	Permanent Controls—Shown on WQMP	Permanent Controls—Listed in WQMP	
Pollutants	Drawings	Table and Narrative	
M. Loading Docks	Show a preliminary design for the loading dock area, including roofing and drainage. Loading docks shall be covered and/or graded to minimize run-on to and runoff from the loading area. Roof downspouts shall be positioned to direct stormwater away from the loading area. Water from loading dock areas shall be drained to the sanitary sewer, or diverted and collected for ultimate discharge to the sanitary sewer. Loading dock areas draining directly to the sanitary sewer shall be equipped with a spill control valve or equivalent device, which shall be kept closed during periods of operation. Provide a roof overhang over the loading area or install door skirts (cowling) at each bay that enclose the end of the trailer.		☐ Move loaded and unloaded items indoors as soon as possible. ☐ See Fact Sheet SC-30, "Outdoor Loading and Unloading," in the CASQA Stormwater Quality Handbooks at www.cabmphandbooks.com

1 Potential Sources of Runoff Pollutants	otential Sources of Runoff Permanent Controls—Shown on WQMP Permanent Controls—Listed in WQMP		al Sources of Runoff Permanent Controls—Shown on WQMP Permanent C		4 Operational BMPs—Included in WQMP Table and Narrative
N. Fire Sprinkler Test Water		Provide a means to drain fire sprinkler test water to the sanitary sewer.	See the note in Fact Sheet SC-41, "Building and Grounds Maintenance," in the CASQA Stormwater Quality Handbooks at www.cabmphandbooks.com		
O. Miscellaneous Drain or Wash Water or Other Sources Boiler drain lines Condensate drain lines Rooftop equipment Drainage sumps Roofing, gutters, and trim. Other sources		Boiler drain lines shall be directly or indirectly connected to the sanitary sewer system and may not discharge to the storm drain system. Condensate drain lines may discharge to landscaped areas if the flow is small enough that runoff will not occur. Condensate drain lines may not discharge to the storm drain system. Rooftop equipment with potential to produce pollutants shall be roofed and/or have secondary containment. Any drainage sumps on-site shall feature a sediment sump to reduce the quantity of sediment in pumped water. Avoid roofing, gutters, and trim made of copper or other unprotected metals that may leach into runoff. Include controls for other sources as specified by local reviewer.			

1	2	3	4 Operational BMPs—Included in WQMP Table and Narrative
Potential Sources of Runoff	Permanent Controls—Shown on WQMP	Permanent Controls—Listed in WQMP	
Pollutants	Drawings	Table and Narrative	
P. Plazas, sidewalks, and parking lots.			Sweep plazas, sidewalks, and parking lots regularly to prevent accumulation of litter and debris. Collect debris from pressure washing to prevent entry into the storm drain system. Collect washwater containing any cleaning agent or degreaser and discharge to the sanitary sewer not to a storm drain.

Appendix 9: O&M

Operation and Maintenance Plan and Documentation of Finance, Mointenance ond Recording Mechanisms

Operation and Maintenance Responsibility for Treatment Control BMPs

ВМР	Operation and Maintenance Activities	BMP Start Date	Frequency	Parties Responsible For Maintenance and Funding
On-site Storm Drain	Inspect storm drain and curb outlet systems and repair/replace if needed.	At the completion of project	The systems shall be monitored yearly and cleaned not later than October 15 each year.	
Landscaping and Irrigation	Inspect landscaping and irrigation systems and repair/replace if needed.	At the completion of project	The landscaping and irrigation systems shall be monitored monthly.	
Trash Receptacles	Inspect refuse areas and repair/replace if needed.	At the completion of project	The refuse areas shall be monitored daily.	
Education of Property Owners	Educational materials are included in this WQMP Attachment D. The owner shall distribute additional copies of handouts.	At the move in of the tenants	The educational material provided should be reviewed yearly as well as when there is a change in ownership.	PROPERTY OWNERS
Activity Restrictions	Any activity that may affect surrounding areas or the downstream receiving waters (such as car washes or leaving trash bin lids open) is strictly prohibited.	At the completion of project	Trash areas shall be checked before and after a major storm event. As well as on a monthly basis to reduce debris.	ASSOCIATION (POA)
Employee Training/ Education Program	Educational materials are included in this WQMP Attachment D. The owner shall distribute additional copies of handouts.	When employees are hired	The educational material provided shall be included in an employees training and reviewed quarterly.	
Street Sweeping	A street sweeper shall clean the privately maintained streets and parking areas to reduce debris.	At the completion of project	A street sweeper shall clean the privately maintained streets and parking areas monthly and before any known storm event.	

Appendix 10: Educational Materials

BMP Fact Sheets, Maintenance Guidelines and Other End-User BMP Information

3.5 Bioretention Facility

LID - Bioretention
Infiltration, Evapotranspiration, Evaporation, Biofiltration
This BMP is intended to be integrated into a project's landscaped area i
distributed manner. Typically, contributing drainage areas to Bioretention
Facilities range from less than 1 acre to a maximum of around 10 acres.
Rain Garden, Bioretention Cell, Bioretention Basin, Biofiltration Basin,
Landscaped Filter Basin, Porous Landscape Detention

Description

Bioretention Facilities are shallow, vegetated basins underlain by an engineered soil media. Healthy plant and biological activity in the root zone maintain and renew the macro-pore space in the soil and maximize plant uptake of pollutants and runoff. This keeps the Best Management Practice (BMP) from becoming clogged and allows more of the soil column to function as both a sponge (retaining water) and a highly effective and self-maintaining biofilter. In most cases, the bottom of a Bioretention Facility is unlined, which also provides an opportunity for infiltration to the extent the underlying onsite soil can accommodate. When the infiltration rate of the underlying soil is exceeded, fully biotreated flows are discharged via underdrains. Bioretention Facilities therefore will inherently achieve the maximum feasible level of infiltration and evapotranspiration and achieve the minimum feasible (but highly biotreated) discharge to the storm drain system.

Siting Considerations

These facilities work best when they are designed in a relatively level area. Unlike other BMPs, Bioretention Facilities can be used in smaller landscaped spaces on the site, such as:

- ✓ Parking islands
- ✓ Medians
- ✓ Site entrances

Landscaped areas on the site (such as may otherwise be required through minimum landscaping ordinances), can often be designed as Bioretention Facilities. This can be accomplished by:

- Depressing landscaped areas below adjacent impervious surfaces, rather than elevating those areas
- Grading the site to direct runoff from those impervious surfaces *into* the Bioretention Facility, rather than away from the landscaping
- Sizing and designing the depressed landscaped area as a Bioretention Facility as described in this Fact Sheet

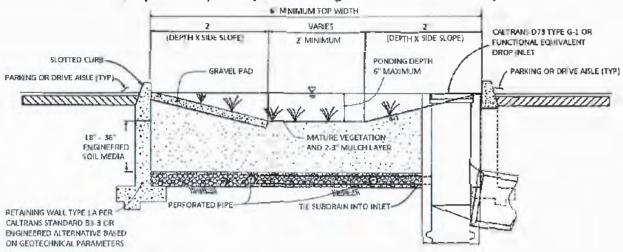
Riverside County - Low Impact Development BMP Design Handbook

Bioretention Facilities should however not be used downstream of areas where large amounts of sediment can clog the system. Placing a Bioretention Facility at the toe of a steep slope should also be avoided due to the potential for clogging the engineered soil media with erosion from the slope, as well as the potential for damaging the vegetation.

Design and Sizing Criteria

The recommended cross section necessary for a Bioretention Facility includes:

- Vegetated area
- 18' minimum depth of engineered soil media
- 12' minimum gravel layer depth with 6' perforated pipes (added flow control features such as orifice plates may be required to mitigate for HCOC conditions)



While the 18-inch minimum engineered soil media depth can be used in some cases, it is recommended to use 24 inches or a preferred 36 inches to provide an adequate root zone for the chosen plant palate. Such a design also provides for improved removal effectiveness for nutrients. The recommended ponding depth inside of a Bioretention Facility is 6 inches; measured from the flat bottom surface to the top of the water surface as shown in Figure 1.

Because this BMP is filled with an engineered soil media, pore space in the soil and gravel layer is assumed to provide storage volume. However, several considerations must be noted:

- Surcharge storage above the soil surface (6 inches) is important to assure that design flows do not bypass the BMP when runoff exceeds the soil's absorption rate.
- In cases where the Bioretention Facility contains engineered soil media deeper than 36 inches, the pore space within the engineered soil media can only be counted to the 36-inch depth.
- A maximum of 30 percent pore space can be used for the soil media whereas a maximum of 40 percent pore space can be use for the gravel layer.

Engineered Soil Media Requirements

The engineered soil media shall be comprised of 85 percent mineral component and 15 percent organic component, by volume, drum mixed prior to placement. The mineral component shall be a Class A sandy loam topsoil that meets the range specified in Table 1 below. The organic component shall be nitrogen stabilized compost¹, such that nitrogen does not leach from the media.

Table 1: Mineral Component Range Requirements

omponent
Sand
Silt
Clay

The trip ticket, or certificate of compliance, shall be made available to the inspector to prove the engineered mix meets this specification.

Vegetation Requirements

Vegetative cover is important to minimize erosion and ensure that treatment occurs in the Bioretention Facility. The area should be designed for at least 70 percent mature coverage throughout the Bioretention Facility. To prevent the BMP from being used as walkways, Bioretention Facilities shall be planted with a combination of small trees, densely planted shrubs, and natural grasses. Grasses shall be native or ornamental; preferably ones that do not need to be mowed. The application of fertilizers and pesticides should be minimal. To maintain oxygen levels for the vegetation and promote biodegradation, it is important that vegetation not be completely submerged for any extended period of time. Therefore, a maximum of 6 inches of ponded water shall be used in the design to ensure that plants within the Bioretention Facility remain healthy.

A 2 to 3-inch layer of standard shredded aged hardwood mulch shall be placed as the top layer inside the Bioretention Facility. The 6-inch ponding depth shown in Figure 1 above shall be measured from the top surface of the 2 to 3-inch mulch layer.

Curb Cuts

To allow water to flow into the Bioretention Facility, 1-foot-wide (minimum) curb cuts should be placed approximately every 10 feet around the perimeter of the Bioretention Facility. Figure 2 shows a curb cut in a Bioretention Facility. Curb cut flow lines must be at or above the V_{BMP} water surface level.

rev. 2/2012

¹ For more information on compost, visit the US Composting Council website at: http://compostingcouncil.org/



Figure 2: Curb Cut located in a Bioretention Facility

To reduce erosion, a gravel pad shall be placed at each inlet point to the Bioretention Facility. The gravel should be 1- to 1.5-inch diameter in size. The gravel should overlap the curb cut opening a minimum of 6 inches. The gravel pad inside the Bioretention Facility should be flush with the finished surface at the curb cut and extend to the bottom of the slope.

In addition, place an apron of stone or concrete, a foot square or larger, inside each inlet to prevent vegetation from growing up and blocking the inlet. See Figure 3

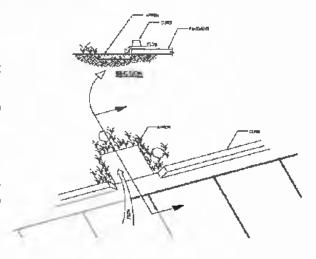


Figure 3: Apron located in a Bioretention Facility

Terracing the Landscaped Filter Basin

It is recommended that Bioretention Facilities be level. In the event the facility site slopes and lacks proper design, water would fill the lowest point of the BMP and then discharge from the basin without being treated. To ensure that the water will be held within the Bioretention Facility on sloped sites, the BMP must be terraced with nonporous check dams to provide the required storage and treatment capacity.

The terraced version of this BMP shall be used on non-flat sites with no more than a 3 percent slope. The surcharge depth cannot exceed 0.5 feet, and side slopes shall not exceed 4:1. Table 2 below shows the spacing of the check dams, and slopes shall be rounded up (i.e., 2.5 percent slope shall use 10' spacing for check dams).

Table 2: Check Dam Spacing

6" Check Dam Spacing	
Slope	Spacing
1%	25'
2%	15'
3%	10'

Roof Runoff

Roof downspouts may be directed towards Bioretention Facilities. However, the downspouts must discharge onto a concrete splash block to protect the Bioretention Facility from erosion.

Retaining Walls

It is recommended that Retaining Wall Type 1A, per Caltrans Standard B3-3 or equivalent, be constructed around the entire perimeter of the Bioretention Facility. This practice will protect the sides of the Bioretention Facility from collapsing during construction and maintenance or from high service loads adjacent to the BMP. Where such service loads would not exist adjacent to the BMP, an engineered alternative may be used if signed by a licensed civil engineer.

Side Slope Requirements

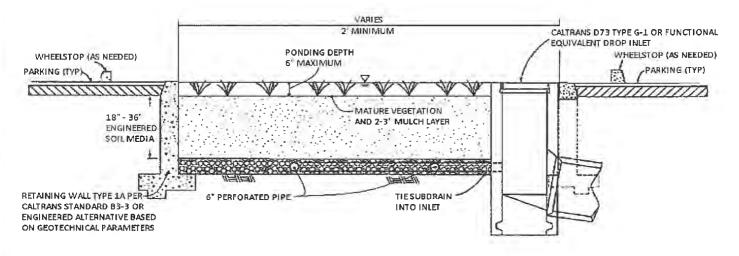
Bioretention Facilities Requiring Side Slopes

The design should assure that the Bioretention Facility does not present a tripping hazard. Bioretention Facilities proposed near pedestrian areas, such as areas parallel to parking spaces or along a walkway, must have a gentle slope to the bottom of the facility. Side slopes inside of a Bioretention Facility shall be 4:1. A typical cross section for the Bioretention Facility is shown in Figure 1.

Bioretention Facilities Not Requiring Side Slopes

Where cars park perpendicular to the Bioretention Facility, side slopes are not required. A 6-inch maximum drop may be used, and the Bioretention Facility must be planted with trees and shrubs to prevent pedestrian access. In this case, a curb is not placed around the Bioretention Facility,

but wheel stops shall be used to prevent vehicles from entering the Bioretention Facility, as shown in Figure 4.



Planter Boxes

Bioretention Facilities can also be placed above ground as planter boxes. Planter boxes must have a minimum width of 2 feet, a maximum surcharge depth of 6 inches, and no side slopes are necessary. Planter boxes must be constructed so as to ensure that the top surface of the engineered soil media will remain level. This option may be constructed of concrete, brick, stone or other stable materials that will not warp or bend. Chemically treated wood or galvanized steel, which has the ability to contaminate stormwater, should not be used. Planter boxes must be lined with an impermeable liner on all sides, including the bottom. Due to the impermeable liner, the inside bottom of the planter box shall be designed and constructed with a cross fall, directing treated flows within the subdrain layer toward the point where subdrain exits the planter box, and subdrains shall be oriented with drain holes oriented down. These provisions will help avoid excessive stagnant water within the gravel underdrain layer. Similar to the in-ground Bioretention Facility versions, this BMP benefits from healthy plants and biological activity in the root zone. Planter boxes should be planted with appropriately selected vegetation.

Figure 5: Planter Box

Figure 5: Planter Box Source: LA Team Effort

Overflow

An overflow route is needed in the Bioretention Facility design to bypass stored runoff from storm events larger than V_{BMP} or in the event of facility or subdrain clogging. Overflow systems must connect to an acceptable discharge point, such as a downstream conveyance system as shown in Figure 1 and Figure 4. The inlet to the overflow structure shall be elevated inside the Bioretention Facility to be flush with the ponding surface for the design capture volume $\{V_{BMP}\}$ as shown in Figure 4. This will allow the design capture volume to be fully treated by the Bioretention Facility, and for larger events to safely be conveyed to downstream systems. The overflow inlet shall <u>not</u> be located in the entrance of a Bioretention Facility, as shown in Figure 6.

Underdrain Gravel and Pipes

An underdrain gravel layer and pipes shall be provided in accordance with Appendix B – Underdrains.



Figure 6: Incorrect Placement of an Overflow Inlet.

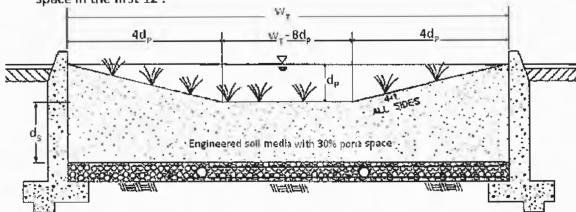
Inspection and Maintenance Schedule

The Bioretention Facility area shall be inspected for erosion, dead vegetation, soggy soils, or standing water. The use of fertilizers and pesticides on the plants inside the Bioretention Facility should be minimized.

Schedule	Activity
Ongoing	 Keep adjacent landscape areas maintained. Remove clippings from landscape maintenance activities. Remove trash and debris Replace damaged grass and/or plants Replace surface mulch layer as needed to maintain a 2-3 inch soil cover.
After storm events	Inspect areas for ponding
Annually	Inspect/clean inlets and outlets

Bioretention Facility Design Procedure

- 1) Enter the area tributary, A_T, to the Bioretention Facility.
- 2) Enter the Design Volume, V_{BMP}, determined from Section 2.1 of this Handbook
- 3) Select the type of design used. There are two types of Bioretention Facility designs: the standard design used for most project sites that include side slopes, and the modified design used when the BMP is located perpendicular to the parking spaces or with planter boxes that do not use side slopes.
- 4) Enter the depth of the engineered soil media, d_s. The minimum depth for the engineered soil media can be 18' in limited cases, but it is recommended to use 24' or a preferred 36' to provide an adequate root zone for the chosen plant paiette. Engineered soil media deeper than 36' will only get credit for the pore space in the first 36'.
- 5) Enter the top width of the Bioretention Facility.
- 6) Calculate the total effective depth, d_E, within the Bioretention Facility. The maximum allowable pore space of the soil media is 30% while the maximum allowable pore space for the gravel layer is 40%. Gravel layer deeper than 12' will only get credit for the pore space in the first 12'.



a. For the design with side slopes the following equation shall be used to determine the total effective depth. Where, d_P is the depth of ponding within the basin.

$$d_{E}(ft) = \frac{0.3 \times \left[\left(w_{T}(ft) \times d_{S}(ft) \right) + 4 \left(d_{P}(ft) \right)^{2} \right] + 0.4 \times 1(ft) + d_{P}(ft) \left[4 d_{P}(ft) + \left(w_{T}(ft) - 8 d_{P}(ft) \right) \right]}{w_{T}(ft)}$$

This above equation can be simplified if the maximum ponding depth of 0.5' is used. The equation below is used on the worksheet to find the minimum area required for the Bioretention Facility:

$$d_{\rm E}({\rm ft}) = (0.3 \times d_{\rm S}({\rm ft}) + 0.4 \times 1({\rm ft})) - \left(\frac{0.7 \, ({\rm ft}^2)}{w_{\rm T}({\rm ft})}\right) + 0.5({\rm ft})$$

b. For the design without side slopes the following equation shall be used to determine the total effective depth:

$$d_E(ft) = d_P(ft) + [(0.3) \times d_S(ft) + (0.4) \times 1(ft)]$$

The equation below, using the maximum ponding depth of 0.5', is used on the worksheet to find the minimum area required for the Bioretention Facility:

$$d_E(ft) = 0.5 (ft) + [(0.3) \times d_S(ft) + (0.4) \times 1(ft)]$$

7) Calculate the minimum surface area, A_M, required for the Bioretention Facility. This does not include the curb surrounding the Bioretention Facility or side slopes.

$$A_{M}(ft^{2}) = \frac{V_{BMP}(ft^{3})}{d_{E}(ft)}$$

- 8) Enter the proposed surface area. This area shall not be less than the minimum required surface area.
- 9) Verify that side slopes are no steeper than 4:1 in the standard design, and are not required in the modified design.
- 10) Provide the diameter, minimum 6 inches, of the perforated underdrain used in the Bioretention Facility. See Appendix B for specific information regarding perforated pipes.
- 11) Provide the slope of the site around the Bioretention Facility, if used. The maximum slope is 3 percent for a standard design.
- 12) Provide the check dam spacing, if the site around the Bioretention Facility is sloped.
- 13) Describe the vegetation used within the Bioretention Facility.

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Urbonas, Ben R. <u>Stormwater Sand Filter Sizing and Design: A Unit Operations Approach.</u> Denver: Urban Drainage and Flood Control District, 2002.

3.3 Permeable Pavement

Type of BMP	LID - Infiltration
Treatment Mechanisms	Infiltration, Evaporation
Maximum Drainage Area	10 acres
Other Names	porous pavement, pervious concrete, pervious asphalt, pervious gravel pavement, cobblestone block, modular block, modular pavement

Description

Permeable pavements can be either pervious asphalt and concrete surfaces, or permeable modular block. Unlike traditional pavements that are impermeable, permeable pavements reduce the volume and peak of stormwater runoff as well as mitigate pollutants from stormwater runoff, provided that the underlying soils can accept infiltration. Permeable pavement surfaces work best when they are designed to be flat or with gentle slopes. This factsheet discusses criteria that apply to infiltration designs.

The permeable surface is placed on top of a reservoir layer that holds the water quality stormwater volume, V_{BMP} . The water infiltrates from the reservoir layer into the native subsoil. Tests must be performed according to the Infiltration Testing Section in Appendix A to be able to use this design procedure.

In some circumstances, permeable pavement may be implemented on a project as a source control feature. Where implemented as a source control feature (sometimes referred to as a 'self-retaining' area), the pavement is not considered a 'BMP' that would be required to be designed and sized per this manual. Where permeable pavement receives runoff from adjacent tributary areas, the permeable pavement *may* be considered a BMP that must be sized according to this manual. Consult the Engineering Authority and the WQMP for any applicable requirements for designing and sizing permeable pavement installations.

Siting Considerations

The WQMP applicable to the project location should be consulted, as it may include criteria for determining the applicability of this and other Infiltration-based BMPs to the project.

Permeable pavements can be used in the same manner as concrete or asphalt in low traffic parking lots, playgrounds, walkways, bike trails, and sports courts. Most types of permeable pavement can be designed to meet Americans with Disabilities Act (ADA) requirements. Permeable pavements should not be used in the following conditions:

- O Downstream of erodible areas
- O Downstream of areas with a high likelihood of pollutant spills
- Industrial or high vehicular traffic areas (25,000 or greater average daily traffic)
- Areas where geotechnical concerns, such as soils with low infiltration rates, would preclude the use of this BMP.

Sites with Impermeable Fire Lanes

Oftentimes, Fire Departments do not allow alternative pavement types including permeable pavement. They require traditional impermeable surfaces for fire lanes. In this situation, it is acceptable to use an impermeable surface for the fire lane drive aisles and permeable pavement for the remainder of the parking lot.

Where impermeable fire lanes are used in the design, the impermeable surface must slope towards the permeable pavement, and the base layers shall remain continuous underneath the two pavement types, as shown in Figure 1. This continuous reservoir layer helps to maintain infiltration throughout the pervious pavement site, and can still be considered as part of the total required storage area.

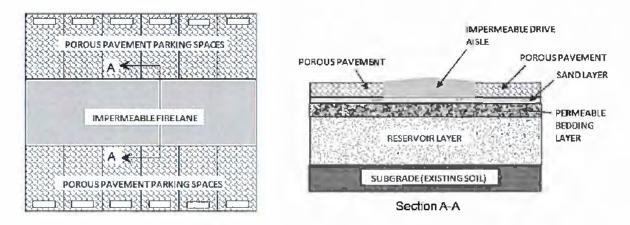


Figure 1: Impermeable Fire Lanes

Also, while a seal coat treatment may be used on the impermeable fire land, traditional seal coat treatments shall not be used on permeable pavement.

Setbacks

Always consult your geotechnical engineer for site specific recommendations regarding setbacks for permeable pavement. Recommended setbacks are needed to protect buildings, walls, onsite wells, streams and tanks.

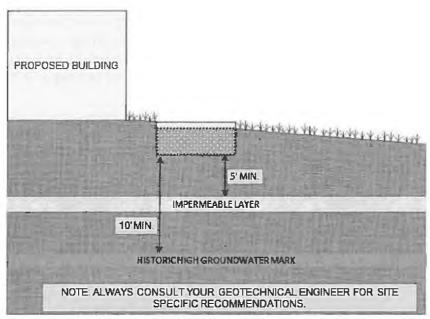


Figure 2: Permeable Pavement Setback Requirements

A minimum vertical separation of 10 feet is required from the bottom of the reservoir layer to the historic high groundwater mark, see Figure 2. A minimum vertical separation of 5 feet is required from the bottom of the reservoir layer to any impermeable layer in the soil. If the historic high groundwater mark is less than 10 feet below the reservoir layer section, or less than 5 feet from an impermeable layer, the infiltration design is not feasible.

Design and Sizing Criteria

To ensure that the pavement structural section is not compromised, a 24-hour drawdown time is utilized for this BMP instead of the longer drawdown time used for most volume based BMPs.

Reservoir Layer Considerations

Even with proper maintenance, sediment will begin to clog the soil below the permeable pavement. Since the soil cannot be scarified or replaced, this will result in slower infiltration rates over the life of the permeable pavement. Therefore, the reservoir layer is limited to a maximum of 12 inches in depth to ensure that over the life of the BMP, the reservoir layer will drain in an adequate time.

Note: All permeable pavement BMP installations (not including Permeable Pavement as a source control BMP i.e. a self-retaining area) must be tested by the geotechnical engineer to ensure that the sails drain at a minimum allowable rate to ensure drainage.. See the Infiltration Testing Section of this manual for specific details for the required testing and applied factors of safety.

Sloping Permeable Pavement

Ideally permeable pavement would be level, however most sites will have a mild slope. If the tributary drainage area is too steep, the water may be flowing too fast when it approaches the permeable pavement, which may cause water to pass over the pavement instead of percolating and entering the reservoir layer. If the maximum slopes shown in Table 1 are complied with, it should address these concerns.

Table 1: Design Parameters for Permeable Pavement

Design Parameter	Permeable Pavement
Maximum slope of permeable pavement	3%
Maximum contributing area slope	5%

Regardless of the slope of the pavement surface design, the bottom of the reservoir layers shall be flat and level as shown in Figure 3. The design shown ensures that the water quality volume will be contained in the reservoir layer. A terraced design utilizing non-permeable check dams may be a useful option when the depth of gravel becomes too great as shown in Figure 3.

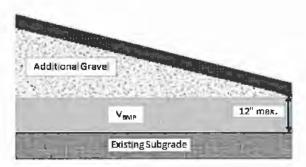


Figure 3: Sloped Cross Sections for Permeable Pavement

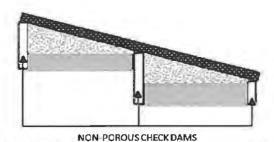


Figure 4: Permeable Pavement with Non-permeable Check Dams

In Figure 4, the bottom of the gravel reservoir layer is incorrectly sloped parallel to the pavement surface. Water would only be allowed to pond up to the lowest point of the BMP. Additional flows would simply discharge from the pavement. Since only a portion of the gravel layer can store water, this design would result in insufficient capacity. This is not acceptable.

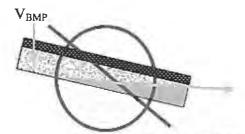


Figure 5: Incorrect Sloping of Permeable Pavement

To assure that the subgrade will empty within the 24 hour drawdown time, it is important that the maximum depth of 12 inches for the reservoir layer discussed in the design procedure is not exceeded. The value should be measured from the lowest elevation of the slope (Figure 4).

Minimum Surface Area

The minimum surface area required, A_s , is calculated by dividing the water quality volume, V_{BMP} , by the depth of water stored in the reservoir layer. The depth of water is found by multiplying the void ratio of the reservoir aggregate by the depth of the layer, b_{TH} . The void ratio of the reservoir aggregate is typically 40%; the maximum reservoir layer depth is 12".

Sediment Control

A pretreatment BMP should be used for sediment control. This pretreatment BMP will reduce the amount of sediment that enters the system and reduce clogging. The pretreatment BMP will also help to spread runoff flows, which allows the system to infiltrate more evenly. The pretreatment BMP must discharge to the surface of the pavement and not the subgrade. Grass swales may also be used as part of a treatment train with permeable pavements.

Liners and Filter Fabric

Always consult your geotechnical engineer for site specific recommendations regarding liners and filter fabrics. Filter fabric may be used around the edges of the permeable pavement; this will help keep fine sediments from entering the system. Unless recommended for the site, impermeable liners are not to be used below the subdrain gravel layer.

Overflow

An overflow route is needed in the permeable pavement design to bypass storm flows larger than the V_{BMP} or in the event of clogging. Overflow systems must connect to an acceptable discharge point such as a downstream conveyance system.

Roof Runoff

Permeable pavement can be used to treat roof runoff. However, the runoff cannot be discharged beneath the surface of the pavement directly into the subgrade, as shown in Figure 6. Instead the pipe should empty on the surface of the permeable pavement as shown in Figure 7. A filter on the drainpipe should be used to help reduce the amount of sediment that enters the permeable pavement.

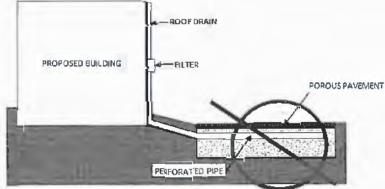


Figure 6: Incorrect Roof Drainage

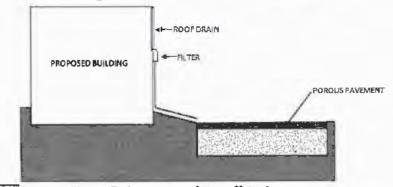


Figure 7: Correct Roof Runoff Drainage

Infiltration

Refer to the Infiltration Testing Section (Appendix A) in this manual for recommendations on testing for this BMP.

Pavement Section

The cross section necessary infiltration design of permeable pavement includes:

The thickness of the layers of permeable pavement, sand and bedding layers depends on whether it is permeable modular block or pervious pavement. A licensed geotechnical or civil engineer is required to determine the thickness of these upper layers appropriate for the pavement type and expected traffic loads.

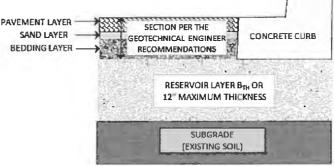


Figure 8: Infiltration Cross Section

 A 12" maximum reservoir layer consisting of AASHTO #57 gravel vibrated in place or equivalent with a minimum of 40% void ratio.

Inspection and Maintenance Schedule - Modular Block

Schedule	Activity
Ongoing	 Keep adjacent landscape areas maintained. Remove clippings from landscape maintenance activities. Remove trash and debris
Utility Trenching and other pavement repairs	 Remove and reset modular blocks, structural section and reservoir layer as needed. Replace damaged blocks in-kind. Do not pave repaired areas with impermeable surfaces.
After storm events	 Inspect areas for ponding
2-3 times per year	Sweep to reduce the chance of clogging
As needed	 Sand between pavers may need to be replaced if infiltration capacity is lost

Inspection and Maintenance Schedule -Pervious Concrete/Asphalt

Schedule	Activity
Ongoing	 Keep adjacent landscape areas maintained. Remove clippings from landscape maintenance activities. Remove trash and debris
Utility Trenching other pavement repairs	 Replace structural section and reservoir layer in kind. Re-pave using pervious concrete/asphalt. Do not pave repaired areas with impermeable surfaces.
After storm events	Inspect areas for ponding
2-3 times per year	 Vacuum the permeable pavement to reduce the chance of clogging
As needed	 Remove and replace damaged or destroyed permeable pavement

Design Procedure Permeable Pavement

- 1. Enter the Tributary Area, AT.
- 2. Enter the Design Volume, V_{BMP}, determined from Section 2.1 of this Handbook.
- Enter the reservoir layer depth, b_{TH} for the proposed permeable pavement. The reservoir layer maximum depth is 12 inches.
- 4. Calculate the Minimum Surface Area, A₅, required.

$$A_{S}(ft) = \frac{V_{BMP} (ft^{3})}{(0.4 \times b_{TH} (in))/12(in/ft)}$$

Where, the porosity of the gravel in the reservoir layer is assumed to be 40%.

- Enter the proposed surface area and ensure that this is equal to or greater than the minimum surface area required.
- 6. Enter the dimensions, per the geotechnical engineer's recommendations, for the pavement cross section. The cross section includes a pavement layer, usually a sand layer and a permeable bedding layer. Then add this to the maximum thickness of the reservoir layer to find the total thickness of the BMP.
- 7. Enter the slope of the top of the permeable pavement. The maximum slope is 3%.
- 8. Enter whether sediment control was provided.
- 9. Enter whether the geotechnical approach is attached.

- 10. Describe the surfaces surrounding the permeable pavement. It is preferred that a vegetation buffer is used around the permeable pavement.
- 11. Check to ensure that vertical setbacks are met. There should be a minimum of 10 feet between the bottom of the BMP and the top of the high groundwater table, and a minimum of 5 feet between the reservoir layer the top of the impermeable layer.

Reference Materials Used to Develop this Fact Sheet:

Adams, Michelle C. "Porous Asphalt Pavement with Recharge Beds: 20 Years and Still Working." <u>Stormwater Magazine</u> May-June 2003.

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California Department of Transportation. <u>CalTrans Standard Plans</u>. 15 September 2005. May 2010 http://www.dot.ca.gov/hq/esc/oe/project_plans/HTM/stdplns metnew99.htm,

Camp Dresser and McKee Inc.; Larry Walker Associates. <u>California Stormwater Best</u> <u>Management Practice Handbook for New Development and Redevelopment.</u> California Stormwater Quality Association (CASQA), 2004.

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Tennis, Paul D., Michael L. Leming and David J. Akers. <u>Pervious Concrete Pavements.</u> Silver Spring: Portland Cement Association and National Ready Mixed Concrete Association, 2004.

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Urbonas, Ben R. <u>Stormwater Sand Filter Sizing and Design: A Unit Operations Approach.</u>
Denver: Urban Drainage and Flood Control District, 2002.

Infiltration

Refer to the Infiltration Testing Section (Appendix A) in this manual for recommendations on testing for this BMP.

Pavement Section

The cross section necessary for infiltration design of permeable pavement includes:

 The thickness of the layers of permeable pavement, sand and bedding layers depends on whether it is permeable modular block or pervious pavement. A licensed geotechnical or civil engineer is required to determine the thickness of these

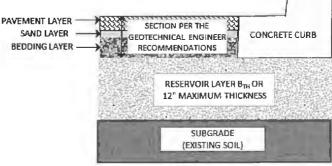


Figure 8: Infiltration Cross Section

upper layers appropriate for the pavement type and expected traffic loads.

 A 12" maximum reservoir layer consisting of AASHTO #57 gravel vibrated in place or equivalent with a minimum of 40% void ratio.

Inspection and Maintenance Schedule - Modular Block

Schedule	Activity
Ongoing	 Keep adjacent landscape areas maintained. Remove clippings from landscape maintenance activities. Remove trash and debris
Utility Trenching and other pavement repairs	 Remove and reset modular blocks, structural section and reservoir layer as needed. Replace damaged blocks in-kind. Do not pave repaired areas with impermeable surfaces.
After storm events	Inspect areas for ponding
2-3 times per year	Sweep to reduce the chance of clogging
As needed	 Sand between pavers may need to be replaced if infiltration capacity is lost

Inspection and Maintenance Schedule -Pervious Concrete/Asphalt

Schedule	Activity
Ongoing	 Keep adjacent landscape areas maintained. Remove clippings from landscape maintenance activities. Remove trash and debris
Utility Trenching other pavement repairs	 Replace structural section and reservoir layer in kind. Re-pave using pervious concrete/asphalt. Do not pave repaired areas with impermeable surfaces.
After storm events	Inspect areas for ponding
2-3 times per year	 Vacuum the permeable pavement to reduce the chance of clogging
As needed	 Remove and replace damaged or destroyed permeable pavement

Design Procedure Permeable Pavement

- 1. Enter the Tributary Area, A_T.
- 2. Enter the Design Volume, V_{BMP}, determined from Section 2.1 of this Handbook.
- 3. Enter the reservoir layer depth, b_{TH} for the proposed permeable pavement. The reservoir layer maximum depth is 12 inches.
- 4. Calculate the Minimum Surface Area, As, required.

$$A_{S}(ft) = \frac{V_{BMP} (ft^{3})}{(0.4 \times b_{TH} (in))/12 (in/ft)}$$

Where, the porosity of the gravel in the reservoir layer is assumed to be 40%.

- Enter the proposed surface area and ensure that this is equal to or greater than the minimum surface area required.
- 6. Enter the dimensions, per the geotechnical engineer's recommendations, for the pavement cross section. The cross section includes a pavement layer, usually a sand layer and a permeable bedding layer. Then add this to the maximum thickness of the reservoir layer to find the total thickness of the BMP
- 7. Enter the slope of the top of the permeable pavement. The maximum slope is 3%.
- 8. Enter whether sediment control was provided.
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- 11. Check to ensure that vertical setbacks are met. There should be a minimum of 10 feet between the bottom of the BMP and the top of the high groundwater table, and a minimum of 5 feet between the reservoir layer the top of the impermeable layer.

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