INITIAL STORM WATER LOW IMPACT DEVELOPMENT SUBMITTAL (ISWLID)

PLP20-0007

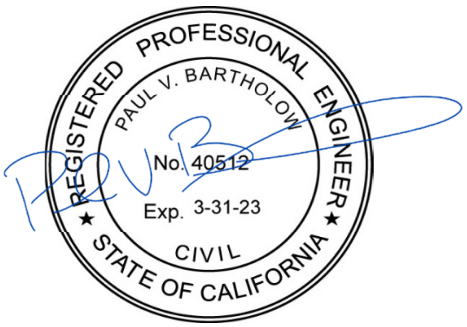
NUNES FARM & WINERY AT SARALEE'S VINEYARD

3400 SLUSSER ROAD
WINDSOR, CA 95492

APN'S: 057-070-047, 057-070-049, 057-070-050

JACKSON FAMILY INVESTMENTS III, LLC
425 AVIATION BLVD
SANTA ROSA, CA 95403
(707) 525-6529
B&R PROJECT #3719.10

DECEMBER 14, 2021
REV. APRIL 26, 2022



Prepared By:

Brelje & Race Consulting Engineers
475 Aviation Blvd. Suite 120, Santa Rosa, CA 95403
v. 707.576.1322 f. 707.576.0469
www.brce.com

Project Name: Nunes Farm & Winery at Saralee's Viney

Date: December 15, 2021

Storm Water Low Impact Development Submittal Coversheet

To be submitted with all SW LID submittals

1. **Submittal Information:**

Submittal Date: December 15, 2021

Initial SW LIDS ☑ **Final SW LIDS** ☐

Design Manual Used for design:

- ☐ 2005 Standard Urban Storm Water Mitigation Plan
- ☐ 2011 Storm Water Low Impact Development Technical Design Manual
- ☑ 2017 Storm Water Low Impact Development Technical Design Manual

2. **Applicant Information:**

Applicant Name (Owner or Developer): Jackson Family Investments III, LLC

Mailing Address: 425 Aviation Boulevard

City/State/Zip: Santa Rosa, CA 95403

Phone/Email/Fax: (707) 525-6529/korman@sonic.net

Project Name: Nunes Farm & Winery at Saral

Date: December 15, 2021

Storm Water Low Impact Development Submittal Coversheet

To be submitted with all SW LID submittals

3. Project Information:

Project Name: Nunes Farm & Winery at Saralee's Vineyard

Site Address: 4255 River Road

City/State/Zip: Santa Rosa, CA 95401

APN (s): 057-040-047, 057-040-049, 057-040-050

Permit # (s): TBD

Subdivision	☐	Grading Permit	☐	Building Permit	☐	Design Review	☐
Use Permit	☑	Hillside Development	☐	Encroachment	☐	Time Extension	☐

Other:

Project Name: Nunes Farm & Winery at Saralee

Date: December 15, 2021

City of Santa Rosa

Storm Water Low Impact Development Submittal Coversheet

To be submitted with all SW LID submittals

4. Design Information:

Narrative:

Project Description

- [x] Description of proposed project type, size, location, and any specific uses or features.
- [x] Description of any sensitive features (creeks, wetlands, trees, etc.) and whether they are going to be preserved, removed or altered.
- [x] Description of the existing site.
- [x] Description of how this project triggers these requirements (impervious area, CALGreen, 401 Permit, etc.).
- [ ] Describe any "on-site offset" used.

Pollution Prevention and Runoff Reduction Measures

- [x] Description of all proposed pollution prevention measures (street sweeping, covered trash enclosures, indoor uses, etc).
- [x] Description of all Runoff Reduction Measures (Interceptor Trees, Impervious Area Disconnection, and/or Alternative Driveway Design).

Type of BMPs Proposed

- [x] Description of the types of BMPs selected including priority group that each is in.
- [x] Description of level of treatment and volume capture achieved for each BMP.

Maintence

- [x] Description of maintenance for each type of BMP.
- [x] Description of funding mechanism.
- [x] Designation of Responsible Party.

Project Name: Nunes Farm & Winery at Sa

Date: December 15, 2021

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Exhibits:

Proposed SW LID Exhibit:

- [x] Exhibit should include: street names, property lines, storm drainage system, waterways, title block, scale and north arrow.
- [x] Tributary areas shown for all inlets (including off-site drainage areas).
- [x] C value for each tributary area.
- [x] Soil Type of existing site.
- [x] New or replaced impervious area shown.
- [x] All inlets and BMP, shown (including unique identifier).
- [ ] All interceptor trees shown.
- [x] All proposed BMPs shown including dimensions.

Existing Condition Exhibit

- [x] Exhibit should include: street names, property lines, proposed storm drainage system, waterways, title block, scale, and north arrow.
- [x] Soil Type of existing site.
- [x] Proposed tributary areas shown for all proposed inlets (including offsite drainage areas). Existing impervious areas.
- [x] Existing impervious area.

BMP Details:

- [x] Detail for each type of BMP selected- provide a preliminary 8.5”x11” detail for each BMP type or include on submitted drawings. These can be taken straight from the Fact Sheets if no significant changes are proposed.

On Plans:

- [x] Show all applicable elements of the selected BMPs on the appropriate plan sheets.

Calculations:

- [x] Calculations, for each inlet, and summary sheet using the Storm Water Calculator found at *www.srcity.org/stormwaterLID*
- [ ] Supplemental or supporting calculation if applicable.

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APPENDICES

ATTACHMENTS

1. PROJECT DESCRIPTION

The project site is located northwest of the intersection of River Road and Slusser Road. There are two current parcels comprising approximately 108.82 acres and 24.28 acres. The existing 108.82 acre parcel consists of vineyards, a large pond, vineyard office, and facilities from a former dairy and cattle breeding operation including barns, gravel and paved outdoor work areas, concrete manure and silage pits, driveways and walkways. The existing 24.28 acre parcel includes a duplex, a single family residence, barn with an enclosed shop, vineyards, driveways and walkways.

The proposed project includes a lot line adjustment which will change the two parcels to approximately 24.08 acres and 109.01 acres. This report describes preliminary stormwater design for the entire project including a winery, tasting rooms and related site improvements, in addition to existing vineyard management and cultivation uses. A Final SWLID report will be prepared that will apply to both of the two parcels underlying the project and will be applicable for post-construction use.

The existing and proposed developed portion of the site sits atop an existing knoll. The site therefore drains in all directions away from the knoll. Mark West Creek crosses the southeast corner of the east parcel. A portion of the site drains south towards the creek. The balance of the site drains north into cultivated fields, some of which is captured by existing ponds to the east and west of the knoll.

The Soil Map in Appendix C was generated using the USDA Natural Resources Conservation Service Web Soil Survey. The soil classification for the project area is primarily a mixture of Huichica loam (HtD), and Yolo sandy loam (YmB) except within the Mark West Creek riparian zone. Huichica loam is classified as hydrologic soil group C, and Yolo sandy loam is classified as hydrologic soil group B. Due to the level of accuracy of the soil mapping, the calculations have been performed by conservatively assuming that all project tributaries are within areas classified as hydrologic soil group C.

There are existing sensitive features present on this site, including the riparian corridor of Mark West Creek, native trees including Oak and Redwood (both individual trees and in groves), stock ponds and drainage ditches. A number of trees will be removed and mitigated on the site. However, the project does not propose work within any on-site or off-site areas that are environmentally sensitive.

It will be necessary to pave a lengthy stretch of existing gravel road leading from Slusser Road to the project intended to serve as the entry driveway for public access to the proposed tasting rooms. Providing this new impervious surface with LID BMP coverage is impractical as the road is immediately bordered by cultivated vineyards; we believe it likely that any formal BMP's installed to receive runoff from the driveway will not survive farming operations. Instead, runoff from a 1-inch event will be accounted for by oversizing the BMP's clustered around the buildings with an equivalent added volume capture capacity to offset the DMA 10 & 11 capture requirements.

The project will create or replace more than 10,000 sq. ft. of impervious surfaces, therefore it is subject to the requirements of the County of Sonoma's MS4 storm water permit.

2. POLLUTION PREVENTION AND RUNOFF REDUCTION MEASURES

The project design will incorporate pollution source controls intended to prevent pollutants from entering downstream drainage systems. Details for these source controls have not been developed at this use permit/preliminary design stage. At a minimum, the final design will include:

- Drainage inlets and structural BMP's will be fitted with gross pollutant (trash) racks and interceptor trays. Racks and trays will be regularly inspected and any captured debris removed and properly disposed of.
- The site landscape and hardscape will be professionally maintained, swept clean and with landscape leaves and debris removed on a regular schedule over the course of the year.
- Trash will be stored in covered exterior trash enclosures. Local drainage will be routed away from the trash enclosure location.

The final design may include runoff reduction measures such as interceptor trees, impervious area disconnection, or alternative pavement design. Because landscaping, paving and grading may change between preliminary design and final design, runoff reduction measures are not assumed to be applicable in the calculations for this preliminary submittal.

3. TYPES OF BMP'S PROPOSED

The hydromodification control requirement is to infiltrate and/or reuse 100% of the total calculated volume of storm water generated by the developed site for a 1.0-inch rain event in a 24-hour period (design storm). The LID strategies and BMPs proposed for use on this project include rainwater harvesting, and bioretention swales and planters. See text below for more details on proposed LID strategies and BMPs.

Rainwater Harvesting

As part of the sustainability goals of the project, rainwater will be harvested from the roofs of the proposed winery, tasting rooms, and joint utility building and used to supply a portion of the project potable water demand. These roof areas occur in DMA 5 of the West (Nunes) Parcel and DMA's 6, 7, 8 & 9 of the East (SLV) Parcel on the Proposed Condition Exhibits. Collected rainwater will be stored in above ground tanks with a 3-inch storm event minimum storage capacity allotted for combined harvested roof rainwater runoff from both parcels of approximately 14,700 cubic feet (110,000 gallons). The proposed minimum storage capacity is thus three times the amount needed to store and reuse runoff from a 1-inch storm event, which is the County mitigation standard event for LID. Harvested rainwater will be treated to potable water standards before entering the potable water distribution system.

Using harvested rainwater for indoor demands allows for year-round use of stored water, ensuring storage is available during the rainy season.

Bioretention Planters

The remainder of the site (DMA's 1-8) will achieve the hydromodification control requirement using bioretention planters. Portions of DMA's 6, 7 & 8 are roof areas and DMA 9 is a roof area in its entirety. These roof areas are designated as site area where rainwater will be harvested, diverted and stored for irrigation use in on-site storage tanks. Priority 1 Roadside Bioretention planters will consist of excavated areas backfilled with permeable granular material, sandy loam, and top soil, infiltrating naturally down into the soil. Planters will be landscaped with native vegetation that will maximize evapotranspiration. Those Bioretention BMP's located in depressions suitable for surface ponding will be constructed with drop inlet grates raised 6" above the surrounding planter surface. Bioretention areas are to be designed in general accordance with the City of Santa Rosa and County of Sonoma "Storm Water Low Impact Development Technical Design Manual" (LID Manual) and per the preliminary details provided in Appendix A.

4. LEVEL OF TREATMENT, DESIGN GOAL & CONCLUSIONS

The design goal of 100% infiltration and/or reuse for the overall site will be achieved by routing 100% of design storm runoff (or as near to 100% as possible) to either the rainwater harvesting system, or to bioretention planters. By meeting this hydromodification control requirement, both the 100% volume capture and treatment requirements are also satisfied. See the Storm Water Calculator Summary Sheet for detailed volume capacities for individual BMP's.

5. MAINTENANCE ACTIVITIES & FUNDING

BMPs shall be inspected and maintained in accordance with a maintenance plan which will be provided with the Final SWLID Submittals. The maintenance plans will include, at a minimum, the requirements listed on "Fact Sheet-Rainwater Harvesting" and "Fact-Sheet-Bioretention" as provided in Appendix E of the LID Manual.

All associated costs for inspection or maintenance of the BMPs shall be the responsibility of, budgeted for this purpose, and carried out by the property owner in perpetuity in accordance with the final SWLID maintenance agreement.

APPENDIX A

2017 STORM WATER LID DETERMINATION WORKSHEET

2017 Storm Water LID Determination Worksheet

PURPOSE AND APPLICABILITY: This determination worksheet is intended to satisfy the specific requirements of "ORDER NO. R1-2015-0030, NPDES NO. CA0025054 NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) PERMIT AND WASTE DISCHARGE REQUIREMENTS FOR DISCHARGES FROM THE MUNICIPAL SEPARATE STORM SEWER SYSTEMS." Additional design requirements imposed by Governing Agencies, such as local grading ordinances, CAL Green, CEQA, 401 permitting, and hydraulic design for flood control still apply as appropriate. Additionally, coverage under another regulation may trigger the requirement to design in accordance with the Storm Water LID Technical Design Manual.

Part 1: Project Information

Nunes Farm & Winery at Saralee's Vineyard Project Name	Jackson Family Investments III, LLC Applicant (owner or developer) Name
4255 River Road Project Site Address	425 Aviation Boulevard Applicant Mailing Address
Santa Rosa, CA 95401 Project City/State/Zip	Santa Rosa, CA 95403 Applicant City/State/Zip
TBD Permit Number(s) - (if applicable)	(707) 525-6529/korman@sonic.net Applicant Phone/Email/Fax
Brelje & Race Consulting Engineers Designer Name	475 Aviation Boulevard, Suite 120 Designer Mailing Address
Santa Rosa, CA 95403 Designer City/State/Zip	(707) 636-3748/stetina@brce.com Designer Phone/Email

Type of Application/Project:

☐ Subdivison ☐ Grading Permit ☐ Building Permit ☐ Hillside Development

☐ DesignReview ☑ Use Permit ☐ Encroachment ☐ Time Extensions ☐ Other :_____

PART 2: Project Exemptions

1. Is this a project that creates or replaces *less than* 10,000 square feet of impervious surface[1], including all project phases and off-site improvements?

   ☐ Yes ☑ No

1 Impervious surface replacement, such as the reconstruction of parking lots or excavation to roadway subgrades, is not a routine maintenance activity. Reconstruction is defined as work that replaces surfaces down to the subgrade. Overlays, resurfacing, trenching and patching are defined as maintenance activities per section VI.D.2.b.

2. Is this project a routine maintenance activity[2] that is being conducted to maintain original line and grade, hydraulic capacity, and original purpose of facility such as resurfacing existing roads and parking lots?

☐ Yes ☑ No

3. Is this project a stand alone pedestrian pathway, trail or off-street bike lane?

☐ Yes ☑ No

4. **Did you answer "YES" to any of the questions in Part 2?**

☐ **YES:** This project will *not* need to incorporate permanent Storm Water BMP's as required by the NPDES MS4 Permit. **Please complete the "Exemption Signature Section" on Page 4.**

☑ **NO:** Please complete the remainder of this worksheet.

Part 3: Project Triggers

Projects that Trigger Requirements:
Please answer the following questions to determine whether this project requires permanent Storm Water BMP's and the submittal of a SW LIDs as required by the NPDES MS4 Permit order No. R1-2015-0030.

1. Does this project create or replace a combined total of 10,000 square feet or more of impervious surface[1] including all project phases and off-site improvements?

☑ Yes ☐ No

2. Does this project create or replace a combined total or 10,000 square feet or more of impervious streets, roads, highways, or freeway construction or reconstruction[3]? ☐ Yes ☑ No

3. Does this project create or replace a combined total of 1.0 acre or more of impervious surface[1] including all project phases and off-site improvements? ☑ Yes ☐ No

4. **Did you answer "YES" to any of the above questions in Part 3?**

☑ **YES:** This project will need to incorporate permanent Storm Water BMP's as required by the NPDES MS4 Permit. **Please complete remainder of worksheet and sign the "Acknowledgement Signature Section" on Page 4.**

☐ **NO:** This project will *not* need to incorporate permanent Storm Water BMP's as required by the NPDES MS4 permit. **Please complete the "Exemption Signature Section" on Page 4.**

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1 Imprevious surface replacement, such as the reconstruction of parking lots or excavation to roadway subgrades, is not a routine maintence activity. Reconstruction is defined as work that replaces surfaces down to the subgrade. Overlays, resurfacint, trenching and patching are defined as maintenance activities per section VI.D.2.b.

2 "Rountine Maintenance Activity" includes activities such as overlays and/or resurfacing of existing roads or parking lots as well as trenching and patching activities and reroofing activities per section VI.D.2.b.

3 "Reconstruction" is defined as work that extends into the subgrade of a pavement per section VI.D.2.b.

Part 4: Project Description

1. Total Project area: 14.7 ○ square feet ◉ acres

2. Existing land use(s): (check all that apply)

☐ Commercial ☐ Industrial ☑ Residential ☐ Public ☑ Other

Description of buildings, significant site features (creeks, wetlands, heritage trees), etc.:

Residences, Barns and Vineyard Cutivation and Management
Mark West Creek
Oak Trees and Redwood Groves

3. Existing impervious surface area: 3.25 ○ square feet ◉ acres

4. Proposed Land Use(s): (check all that apply)

☑ Commercial ☑ Industrial ☐ Residential ☐ Public ☑ Other

Description of buildings, significant site features (creeks, wetlands, heritage trees), etc.:

Winery
Tasting Rooms
Vineyard Cultivation and Management
Mark West Creek
Oak Trees and Redwood Groves

5. Proposed impervious surface area: 5.23 ○ square feet ◉ acres

Acknowledgment Signature Section:

As the property owner or developer, I understand that this project is required to implement permanent Storm Water Best Management Practices and provide a Storm Water Low Impact Development Submittal (SW LIDS) as required by the City's National Pollutant Discharge Elimination System (NPDES) Municipal Separate Storm Sewer Systems (MS4) Permit Order No. R1-2015-0030. *Any unknown responses must be resolved to determine if the project is subject to these requirements.

Applicant Signature

12-17-2021
Date

Exemption Signature Section:

As the property owner or developer, I understand that this project as currently designed does not require permanent Storm Water BMP's nor the submittal of a Storm Water Low Impact Development Submittal (SW LIDS) as required by the City's National Pollutant Discharge Elimination System (NPDES) Municipal Separate Storm Sewer Systems (MS4) Permit*. I understand that redesign may require submittal of a new Determination Worksheet and may require permanent Storm Water BMP's.

Applicant Signature

Date

*** This determination worksheet is intended to satisfy the specific requirements of "ORDER NO. R1-2015-0030, NPDES NO. CA0025054 NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) PERMIT AND WASTE DISCHARGE REQUIREMENTS FOR DISCHARGES FROM THE MUNICIPAL SEPARATE STORM SEWER SYSTEMS." Additional design requirements imposed by Governing Agencies, such as local grading ordinances, CAL Green, CEQA, 401 permitting, and hydraulic design for flood control still apply as appropriate. Additionally, coverage under another regulation may trigger the requirement to design in accordance with the Storm Water LID Technical Design Manual.**

Implementation Requirements: *All calculations shall be completed using the "Storm Water Calculator" available at: www.srcity.org/stormwaterLID*

Hydromodification Control/100% Volume Capture: Capture (infiltration and/or reuse) of 100% of the volume of runoff generated by a 1.0" 24-hour storm event, as calculated using the "Urban Hydrology for Small Watersheds" TR-55 Manual method. This is a retention requirement.

***Treatment Requirement*:** Treatment of 100% of the flow calculated using the modified Rational Method and a known intensity of 0.20 inches per hour.

Delta Volume Capture Requirement: Capture (infiltration and/or reuse) of the increase in volume of storm water due to development generated by a 1.0" 24-hour storm event, as calculated using the "Urban Hydrology for Small Watersheds" TR-55 Manual method. This is a retention requirement.

APPENDIX B

BMP SELECTION TABLES
COMPOSITE C FACTOR AND COMPOSITE CN CALCULATIONS
BMP SIZING CALCULATIONS
POST CONSTRUCTION BMP DETAILS

BMP Selection Table

	Best Management Practice (BMP)	Detail Sheet	Detail Title	Can be used with...	High Ground Water	Contamination	Slope Constraints	Achieves...	Treatment	Volume Capture	Pollution Prevention Credit	BMP in priority selected?	Yes	No	Explanation of selection	Other notes:
Universal LID Features- to be considered on all projects.	Living Roof	N/A	N/A		x	x	x		x	x						
	Rainwater Harvesting	N/A	N/A		x	x	x			x			X			
	Interceptor Trees	N/A	N/A		x	x	x				x			X		
	Vegetated Buffer Strip	UN-01	Vegetated Buffer Strip								x			X		
	Bovine Terrace	UN-02	Bovine Terrace		x						x			X		
	Impervious Area Disconnection	N/A	N/A		x	x	x				x			X		

BMP Selection Table

	Best Management Practice (BMP)	Detail Sheet	Detail Title	Can be used with...	High Ground Water	Contamination	Slope Constraints	Achieves...	Treatment	Volume Capture	Pollution Prevention Credit	BMP in this priority selected?	Yes	No	Explanation of selection	Other notes:
Priority 1 and 1A BMPs- to be installed with no underdrains or liners. Must drain all stading water within 72 hours.	Rain Garden	P1-01	Rain Garden						x	x				X		
	Roadside Bioretention	P1-02	Roadside Bioretention - no C & G						x	x			X			
	Vegetated Swale-with Bioretention	P1-06	Swale with Bioretention						x	x			X			
	Constructed Wetlands	N/A	N/A						x	x				X		
	Infiltration Trench	P1-07	Infiltration Trench						x	x				X		

BMP Selection Table

	Best Management Practice (BMP)	Detail Sheet	Detail Title	Can be used with...	High Ground Water	Contamination	Slope Constraints	Achieves...	Treatment	Volume Capture	Pollution Prevention Credit	BMP in this priority selected?	Yes	No	Explanation of selection	Other notes:
Priority 2 BMPs- with subsurface drains installed above the capture volume.	Rain Garden	P2-01	Rain Garden						x	x				X		
	Roadside Bioretention	P2-02	Roadside Bioretinton - Flush Design Roadside						x	x				X		
		P2-03	Roadside Bioretenion- Contiguous SW						x	x				X		
		P2-04	Roadside Bioretenion- Curb Opening						x	x				X		
		P2-05	Roadside Bioretenion- No C & G						x	x				X		
	Pervious Pavement	P2-06	Vegetated Buffer Strip						x	x				X		
	Constructed Wetlands	N/A	N/A						x	x				X		

BMP Selection Table

	Best Management Practice (BMP)	Detail Sheet	Detail Title	Can be used with...	High Ground Water	Contamination	Slope Constraints	Achieves...	Treatment	Volume Capture	Pollution Prevention Credit	BMP in this priority selected?	Yes	No	Explanation of selection	Other notes:
Priority 3 BMPs- installed with subdrains and/or impermeable liner. Does not achieve volume capture and must be used as part of a treatment train.	Rain Garden	P3-01	Rain Garden		x	x	x		x					X		
	Bioretention	P3-02	Roadside Bioretinton - Flush Design Roadside		x	x	x		x					X		
		P3-03	Roadside Bioretenion- Contiguous SW		x	x	x		x					X		
		P3-04	Roadside Bioretenion- Curb Opening		x	x	x		x					X		
		P3-05	Roadside Bioretenion- No C & G		x	x	x		x	x				X		
	Flow Through Planters													X		
	Pervious Pavement	P1-04	Vegetated Buffer Strip		x	x	x		x	x				X		
	Vegetated Swale	P3-07	Vegetated Swale		x	x	x		x	x				X		

BMP Selection Table

	Best Management Practice (BMP)	Can be used with...	High Ground Water	Contamination	Slope Constraints	Achieves...	Treatment	Volume Capture	Pollution Prevention Credit	BMP in this priority selected?	Yes	No	Explanation of selection	Other notes:
Priority 4 BMPs- does not achieve volume capture and must be used as part of a treatment train.	Tree Filter Unit		x	x	x		x					X		
	Modular Bioretention		x	x	x		x					X		
Priority 5 BMPs- does not achieve volume capture and must be used as part of a treatment train.	Chambered Separator Units		x	x	x		x					X		
	Centrifugal Separator Units		x	x	x		x					X		
	Trash Excluders		x	x	x		x					X		
	Filter Inserts		x	x	x		x					X		
Priority 6 BMPs-	Offset Program						N/A	N/A	N/A			X		
Other	Detention		x									X		

C & CN Factor Calculations

4/26/2022

Semi-Arid Range Lands; Cover Type - Herbacious; Condition - Good;
HSG - C Assumed for All DMA Landscape Areas: CN = 74)

DMA 1 1

Surface		C Value	Area	C*A		CN Value	Area	CN*A
Roof		0.90		0.00		98		0
Concrete		0.80		0.00		98		0
Asphalt		0.70	11709	8196.30		98	11709	1147482
Landscaping		0.10	1082	108.20		74	1082	80068
	Impervious Area		11709		Impervious Area		11709	
	Pervious Area		1082		Pervious Area		1082	
	Total Area		12791	8304.50	Total		12791	1227550
	Composite C			**0.65**	**Composite CN**			**96.0**

DMA 2 2

Surface		C Value	Area	C*A		CN Value	Area	CN*A
Roof		0.90	838	754.20		98	838	82124
Concrete		0.80	1287	1029.60		98	1287	126126
Asphalt		0.70	4087	2860.90		98	4087	400526
Landscaping		0.10	5592	559.20		74	5592	413808
	Impervious Area		6212		Impervious Area		6212	
	Pervious Area		5592		Pervious Area		CO	
	Total Area		11804	5203.90	Total		11804	1022584
	Composite C			**0.44**	**Composite CN**			**86.6**

DMA 3 3

Surface		C Value	Area	C*A		CN Value	Area	CN*A
Roof		0.90	5292	4762.80		98	5292	518616
Concrete		0.80		0.00		98		0
Asphalt		0.70	15367	10756.90		98	15367	1505966
Landscaping		0.10	35597	3559.70		74	35597	2634178
	Impervious Area		20659		Impervious Area		20659	
	Pervious Area		35597		Pervious Area		35597	
	Total Area		56256	19079.40	Total		56256	4658760
	Composite C			**0.34**	**Composite CN**			**82.8**

DMA 4 4

Surface		C Value	Area	C*A		CN Value	Area	CN*A
Roof		0.90		0.00		98		0
Concrete		0.80	5544	4435.20		98	5544	543312
Asphalt		0.70		0.00		98		0
Landscaping		0.10	6143	614.30		74	6143	454582
	Impervious Area		5544		Impervious Area		5544	
	Pervious Area		6143		Pervious Area		6143	
	Total Area		11687	5049.50	Total		11687	997894
	Composite C			**0.43**	**Composite CN**			**85.4**

DMA 5 5

Surface		C Value	Area	C*A		CN Value	Area	CN*A
Roof		0.90	0	0.00		98	0	0
Concrete		0.80	1536	1228.80		98	1536	150528
Asphalt		0.70	7708	5395.60		98	7708	755384
Landscaping		0.10	5234	523.40		74	5234	387316
	Impervious Area		9244		Impervious Area		9244	
	Pervious Area		5234		Pervious Area		5234	
	Total Area		14478	7147.80	Total		14478	1293228
	Composite C			**0.49**	**Composite CN**			**89.3**

DMA 6 6

Surface		C Value	Area	C*A		CN Value	Area	CN*A
Roof		0.90	0	0.00		98	0	0
Concrete		0.80	8585	6868.00		98	8585	841330
Asphalt		0.70	42112	29478.40		98	42112	4126976
Landscaping		0.10	43299	4329.90		74	43299	3204126
	Impervious Area		50697		Impervious Area		50697	
	Pervious Area		43299		Pervious Area		43299	
	Total Area		93996	40676.30	Total		93996	8172432
	Composite C			**0.43**	**Composite CN**			**86.9**

DMA 7 7

Surface		C Value	Area	C*A		CN Value	Area	CN*A
Roof		0.90	2191	1971.90		98	2191	214718
Concrete		0.80	6423	5138.40		98	6423	629454
Asphalt		0.70	20390	14273.00		98	20390	1998220
Landscaping		0.10	25513	2551.30		74	25513	1887962
	Impervious Area		29004		Impervious Area		29004	
	Pervious Area		25513		Pervious Area		25513	
	Total Area		54517	23934.60	Total		54517	4730354
	Composite C			**0.44**	**Composite CN**			**86.8**

DMA 8 8

Surface		C Value	Area	C*A		CN Value	Area	CN*A
Roof		0.90	0	0.00		98	0	0
Concrete		0.80	10190	8152.00		98	10190	998620
Asphalt		0.70	23915	16740.50		98	23915	2343670
Landscaping		0.10	32944	3294.40		74	32944	2437856
	Impervious Area		34105		Impervious Area		34105	
	Pervious Area		32944		Pervious Area		32944	
	Total Area		67049	28186.90	Total		67049	5780146
	Composite C			**0.42**	**Composite CN**			**86.2**

DMA 9 9

Surface		C Value	Area	C*A		CN Value	Area	CN*A
Roof		0.90	19998	17998.20		98	19998	1959804
Concrete		0.80		0.00		98		0
Asphalt		0.70		0.00		98		0
Landscaping		0.10		0.00		74		0
	Impervious Area		19998		Impervious Area		19998	
	Pervious Area		0		Pervious Area		0	
	Total Area		19998	17998.20	Total		19998	1959804
	Composite C			**0.90**	**Composite CN**			**98.0**

DMA 10 10

Surface		C Value	Area	C*A		CN Value	Area	CN*A
Roof		0.90		0.00		98		0
Concrete		0.80		0.00		98		0
Asphalt		0.70	6252	4376.40		98	6252	612696
Landscaping		0.10	2381	238.10		74	2381	176194
	Impervious Area		6252		Impervious Area		6252	
	Pervious Area		2381		Pervious Area		2381	
	Total Area		8633	4614.50	Total		8633	788890
	Composite C			**0.53**	**Composite CN**			**91.4**

DMA 11 11

Surface		C Value	Area	C*A		CN Value	Area	CN*A
Roof		0.90		0.00		98		0
Concrete		0.80		0.00		98		0
Asphalt		0.70	40110	28077.00		98	40110	3930780
Landscaping		0.10		0.00		74		0
	Impervious Area		40110		Impervious Area		40110	
	Pervious Area		0		Pervious Area		0	
	Total Area		40110	28077.00	Total		40110	3930780
	Composite C			**0.70**	**Composite CN**			**98.0**

DMA 12 11

Surface		C Value	Area	C*A		CN Value	Area	CN*A
Roof		0.90		0.00		98		0
Concrete		0.80	716	572.80		98	716	70168
Asphalt		0.70		0.00		98		0
Landscaping		0.10	5485	548.50		74	5485	405890
	Impervious Area		716		Impervious Area		716	
	Pervious Area		5485		Pervious Area		5485	
	Total Area		6201	1121.30	Total		6201	476058
	Composite C			**0.18**	**Composite CN**			**76.8**

DMA 13 11

Surface		C Value	Area	C*A		CN Value	Area	CN*A
Roof		0.90		0.00		98		0
Concrete		0.80		0.00		98		0
Asphalt		0.70	3720	2604.00		98	3720	364560
Landscaping		0.10	10870	1087.00		74	10870	804380
	Impervious Area		3720		Impervious Area		3720	
	Pervious Area		10870		Pervious Area		10870	
	Total Area		14590	3691.00	Total		14590	1168940
	Composite C			**0.25**	**Composite CN**			**80.1**

Saralee's Vineyard + Nunes Farm
Tabulation of BMP Volume Capture and On-site Offset Capacity
26-Apr-22

Total of BMP's 1-4, 6-9, 12-13 Req'd Volume Capture (Excluding Roof Runoff Harvesting)		8,518	CU FT
Total of BMP's 10 & 11 Required On-Site Offset Volume Capture	+	3,531	CU FT
Total Required Volume Capture		**12,048**	**CU FT**
Total of BMP's 1-4, 6-9, 12-13 Available Capacity		12,056	CU FT
Percent of Required Capacity Achieved by Project		**100.1%**	
Total of BMP's 5-9 Required Roof Runoff Harvesting Volume		4,484	CU FT
Total of BMP's 5-9 Assigned Storage Tank Capacity		13,470	CU FT
Percent of Required Capacity Achieved by Project		**300.4%**	

City of Santa Rosa WATER

STORM WATER CALCULATOR

LID BMP Summary Page & Site Global Values

Project Information:

Project Name:	Saralee's Vineyard + Nunes Farm
Address/Location:	3400 Slusser Road, Windsor, CA 95492
Designer:	Ralston
Date:	4/26/2022

Site Information:

Mean Seasonal Precipitation (MSP) of Project Site:	35.00	(inches)
K=MSP/3(K=	1.17	
Impervious area - pre development:	140,210.0	ft^2
Impervious area - post development:	301,164.0	ft^2

Based upon the pre and post development impervious area, the post construction BMP requirement is:

100% Capture & Treatment

Summary of Saved BMP Results:

		Tributary Area		Requirements		BMP Design Results						
							Hydromodification Control		Flow Base Treatment		Delta Volume Capture	
	BMP ID:	Tributary Area (ft^2.)	Runoff Reduction Measures (Y/N)	Type of Requirement Met	Type of BMP Design	Percent Achieved	Required $V_{Hydromod}$ (ft^3)	Achieved (ft^3)	Required Q Treatment (cfs)	Achieved (ft^3)	Required Vdelta (ft^3)	Achieved (ft^3)
1	1	12,791	No	Hydromod Volume Capture	Priority 1: P1-02 Roadside Bioretention - No Curb and Gutter	105.6	833.7174	880.0000				
2	2	11,804	No	Hydromod Volume Capture	Priority 1: P1-02 Roadside Bioretention - No Curb and Gutter	102.6	307.0220	315.0000				
3	3	56,256	No	Hydromod Volume Capture	Priority 1: P1-02 Roadside Bioretention - No Curb and Gutter	102.6	935.5373	960.0000				
4	4	11,687	No	Hydromod Volume Capture	Priority 1: P1-02 Roadside Bioretention - No Curb and Gutter	110.2	261.3213	288.0000				
5	5	14,478	No	Hydromod Volume Capture	Priority 1: P1-02 Roadside Bioretention - No Curb and Gutter	448.1	473.2858	2121.0000				
6	5 ROOF	5,056	No	Hydromod Volume Capture	Other: Detention	300.7	401.5981	1207.5822				
7	7	52,326	No	Hydromod Volume Capture	Priority 1: P1-02 Roadside Bioretention - No Curb and Gutter	100.4	1390.3019	1396.5000				
8	8	67,049	No	Hydromod Volume Capture	Priority 1: P1-02 Roadside Bioretention - No Curb and Gutter	163.9	1601.1301	2625.0000				
9	10	8,633	No	Hydromod Volume Capture	Priority 6: Offset Programs	100.0	344.8883	0.0000				
10	11	40,110	No	Hydromod Volume Capture	Priority 6: Offset Programs	100.0	3185.9373	0.0000				
11	12	6,201	No	Hydromod Volume Capture	Priority 1: P1-02 Roadside Bioretention - No Curb and Gutter	340.0	47.0656	160.0000				
12	6,7,8,9 ROOF	51,397	No	Hydromod Volume Capture	Other: Detention	300.4	4082.4636	12262.9124				
13	6	93,996	No	Hydromod Volume Capture	Priority 1: P1-02 Roadside Bioretention - No Curb and Gutter	109.5	2497.4736	2734.2000				
14	13	14,590	No	Hydromod Volume Capture	Priority 1: P1-02 Roadside Bioretention - No Curb and Gutter	337.4	170.7030	576.0000				
15												
16												
17												
18												
19												
20												
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30												

STORM WATER CALCULATOR

BMP Tributary Parameters

Project Name: **Saralee's Vineyard + Nunes Farm**

BMP ID:	1
BMP Design Criteria:	100% Capture & Treatment
Type of BMP Design:	Priority 1: P1-02 Roadside Bioretention - No Curb and Gutter
BMP's Physical Tributary Area:	12,791.0 ft^2
Description/Notes:	

Hydromodification Requirement: 100% Volume Capture; $V_{HYDROMOD}$

$V_{HYDROMOD}$ = 833.72 ft^3

Post development hydrologic soil type within tributary area:	C: 0.05 - 0.15 in/hr infiltration (transmission) rate
Post development ground cover description:	Farmsteads - buildings, lanes, driveways, surrounding lots
CN_{POST} :	
User Composite post development CN:	96.0

BMP Sizing Tool: Hydromodification Requirement

Percent of Goal Achieved = 105.55 %

	BMP Volume Below Ground		Ponded Water Above Ground	
Porosity:	0.40			
Depth below perforated pipe if present:	4.00	ft	Depth: 0.00	ft
Width:	0.00	ft	Width: 0.00	ft
Length:	0.00	ft	Length: 0.00	ft
Area:	550.00	ft^2	Area: 0.00	ft^2

STORM WATER CALCULATOR

BMP Tributary Parameters

Project Name: **Saralee's Vineyard + Nunes Farm**

BMP ID:	2
BMP Design Criteria:	100% Capture & Treatment
Type of BMP Design:	Priority 1: P1-02 Roadside Bioretention - No Curb and Gutter
BMP's Physical Tributary Area:	11,804.0 ft^2
Description/Notes:	

Hydromodification Requirement: 100% Volume Capture; $V_{HYDROMOD}$

$V_{HYDROMOD}$ = 307.02 ft^3

Post development hydrologic soil type within tributary area:	C: 0.05 - 0.15 in/hr infiltration (transmission) rate
Post development ground cover description:	Farmsteads - buildings, lanes, driveways, surrounding lots
CN_{POST} :	
User Composite post development CN:	87.0

BMP Sizing Tool: Hydromodification Requirement

Percent of Goal Achieved = 102.60 %

	BMP Volume Below Ground		Ponded Water Above Ground	
Porosity:	0.40			
Depth below perforated pipe if present:	4.00	ft	Depth: 0.50	ft
Width:	0.00	ft	Width: 0.00	ft
Length:	0.00	ft	Length: 0.00	ft
Area:	150.00	ft^2	Area: 150.00	ft^2

STORM WATER CALCULATOR

BMP Tributary Parameters

Project Name: **Saralee's Vineyard + Nunes Farm**

BMP ID:	3
BMP Design Criteria:	100% Capture & Treatment
Type of BMP Design:	Priority 1: P1-02 Roadside Bioretention - No Curb and Gutter
BMP's Physical Tributary Area:	56,256.0 ft^2
Description/Notes:	

Hydromodification Requirement: 100% Volume Capture; $V_{HYDROMOD}$

$V_{HYDROMOD}$ = 935.54 ft^3

Post development hydrologic soil type within tributary area:	C: 0.05 - 0.15 in/hr infiltration (transmission) rate
Post development ground cover description:	Farmsteads - buildings, lanes, driveways, surrounding lots
CN_{POST} :	
User Composite post development CN:	83.0

BMP Sizing Tool: Hydromodification Requirement

Percent of Goal Achieved = 102.61 %

	BMP Volume Below Ground		Ponded Water Above Ground	
Porosity:	0.40			
Depth below perforated pipe if present:	4.00	ft		
Depth:			0.00	ft
Width:	0.00	ft	0.00	ft
Length:	0.00	ft	0.00	ft
Area:	600.00	ft^2	0.00	ft^2

STORM WATER CALCULATOR

BMP Tributary Parameters

Project Name: **Saralee's Vineyard + Nunes Farm**

BMP ID:	4
BMP Design Criteria:	100% Capture & Treatment
Type of BMP Design:	Priority 1: P1-02 Roadside Bioretention - No Curb and Gutter
BMP's Physical Tributary Area:	11,687.0 ft^2
Description/Notes:	

Hydromodification Requirement: 100% Volume Capture; $V_{HYDROMOD}$

$V_{HYDROMOD}$ = 261.32 ft^3

Post development hydrologic soil type within tributary area:	C: 0.05 - 0.15 in/hr infiltration (transmission) rate
Post development ground cover description:	Farmsteads - buildings, lanes, driveways, surrounding lots
CN_{POST} :	
User Composite post development CN:	85.0

BMP Sizing Tool: Hydromodification Requirement

Percent of Goal Achieved = 110.21 %

	BMP Volume Below Ground		Ponded Water Above Ground	
Porosity:	0.40			
Depth below perforated pipe if present:	4.00	ft	Depth: 0.00	ft
Width:	0.00	ft	Width: 0.00	ft
Length:	0.00	ft	Length: 0.00	ft
Area:	180.00	ft^2	Area: 0.00	ft^2

STORM WATER CALCULATOR

BMP Tributary Parameters

Project Name: **Saralee's Vineyard + Nunes Farm**

BMP ID:	5
BMP Design Criteria:	100% Capture & Treatment
Type of BMP Design:	Priority 1: P1-02 Roadside Bioretention - No Curb and Gutter
BMP's Physical Tributary Area:	14,478.0 ft^2
Description/Notes:	

Hydromodification Requirement: 100% Volume Capture; $V_{HYDROMOD}$

$V_{HYDROMOD}$ = 473.29 ft^3

Post development hydrologic soil type within tributary area:	C: 0.05 - 0.15 in/hr infiltration (transmission) rate
Post development ground cover description:	Farmsteads - buildings, lanes, driveways, surrounding lots
CN_{POST} :	
User Composite post development CN:	89.0

BMP Sizing Tool: Hydromodification Requirement

Percent of Goal Achieved = 448.14 %

	BMP Volume Below Ground		Ponded Water Above Ground	
Porosity:	0.40			
Depth below perforated pipe if present:	4.00	ft	Depth: 0.50	ft
Width:	0.00	ft	Width: 0.00	ft
Length:	0.00	ft	Length: 0.00	ft
Area:	1,010.00	ft^2	Area: 1,010.00	ft^2

STORM WATER CALCULATOR

BMP Tributary Parameters

Project Name: **Saralee's Vineyard + Nunes Farm**

BMP ID:	5 ROOF
BMP Design Criteria:	100% Capture & Treatment
Type of BMP Design:	Other: Detention
BMP's Physical Tributary Area:	5,056.0 ft^2
Description/Notes:	

Hydromodification Requirement: 100% Volume Capture; $V_{HYDROMOD}$

$V_{HYDROMOD}$ = 401.60 ft^3

Post development hydrologic soil type within tributary area:	C: 0.05 - 0.15 in/hr infiltration (transmission) rate
Post development ground cover description:	Farmsteads - buildings, lanes, driveways, surrounding lots
CN_{POST} :	
User Composite post development CN:	98.0

BMP Sizing Tool: Hydromodification Requirement

Percent of Goal Achieved = 300.69 %

	BMP Volume Below Ground		Ponded Water Above Ground	
Porosity:	0.99			
Depth below perforated pipe if present:	0.71	ft	Depth: 0.00	ft
Width:	0.00	ft	Width: 0.00	ft
Length:	0.00	ft	Length: 0.00	ft
Area:	1,718.00	ft^2	Area: 0.00	ft^2

STORM WATER CALCULATOR

BMP Tributary Parameters

Project Name: **Saralee's Vineyard + Nunes Farm**

BMP ID:	6
BMP Design Criteria:	100% Capture & Treatment
Type of BMP Design:	Priority 1: P1-02 Roadside Bioretention - No Curb and Gutter
BMP's Physical Tributary Area:	93,996.0 ft^2
Description/Notes:	

Hydromodification Requirement: 100% Volume Capture; $V_{HYDROMOD}$

$V_{HYDROMOD}$ = 2,497.47 ft^3

Post development hydrologic soil type within tributary area:	C: 0.05 - 0.15 in/hr infiltration (transmission) rate
Post development ground cover description:	Farmsteads - buildings, lanes, driveways, surrounding lots
CN_{POST} :	
User Composite post development CN:	87.0

BMP Sizing Tool: Hydromodification Requirement

Percent of Goal Achieved = 109.48 %

	BMP Volume Below Ground		Ponded Water Above Ground	
Porosity:	0.40			
Depth below perforated pipe if present:	4.00	ft		
Depth:			0.50	ft
Width:	0.00	ft	0.00	ft
Length:	0.00	ft	0.00	ft
Area:	1,302.00	ft^2	1,302.00	ft^2

STORM WATER CALCULATOR

BMP Tributary Parameters

Project Name: **Saralee's Vineyard + Nunes Farm**

BMP ID:	6,7,8,9 ROOF
BMP Design Criteria:	100% Capture & Treatment
Type of BMP Design:	Other: Detention
BMP's Physical Tributary Area:	51,397.0 ft^2
Description/Notes:	

Hydromodification Requirement: 100% Volume Capture; $V_{HYDROMOD}$

$V_{HYDROMOD}$ = 4,082.46 ft^3

Post development hydrologic soil type within tributary area:	C: 0.05 - 0.15 in/hr infiltration (transmission) rate
Post development ground cover description:	Impervious - Paved Parking, Rooftop, Driveways
CN_{POST} :	98
User Composite post development CN:	0.0

BMP Sizing Tool: Hydromodification Requirement

Percent of Goal Achieved = 300.38 %

	BMP Volume Below Ground		Ponded Water Above Ground	
Porosity:	0.99			
Depth below perforated pipe if present:	7.21	ft	Depth: 0.00	ft
Width:	0.00	ft	Width: 0.00	ft
Length:	0.00	ft	Length: 0.00	ft
Area:	1,718.00	ft^2	Area: 0.00	ft^2

STORM WATER CALCULATOR

BMP Tributary Parameters

Project Name: **Saralee's Vineyard + Nunes Farm**

BMP ID:	7
BMP Design Criteria:	100% Capture & Treatment
Type of BMP Design:	Priority 1: P1-02 Roadside Bioretention - No Curb and Gutter
BMP's Physical Tributary Area:	52,326.0 ft^2
Description/Notes:	

Hydromodification Requirement: 100% Volume Capture; $V_{HYDROMOD}$

$V_{HYDROMOD}$ = 1,390.30 ft^3

Post development hydrologic soil type within tributary area:	C: 0.05 - 0.15 in/hr infiltration (transmission) rate
Post development ground cover description:	Farmsteads - buildings, lanes, driveways, surrounding lots
CN_{POST} :	
User Composite post development CN:	87.0

BMP Sizing Tool: Hydromodification Requirement

Percent of Goal Achieved = 100.45 %

	BMP Volume Below Ground		Ponded Water Above Ground	
Porosity:	0.40			
Depth below perforated pipe if present:	4.00	ft		
Depth:			0.50	ft
Width:	0.00	ft	0.00	ft
Length:	0.00	ft	0.00	ft
Area:	665.00	ft^2	665.00	ft^2

STORM WATER CALCULATOR

BMP Tributary Parameters

Project Name: **Saralee's Vineyard + Nunes Farm**

BMP ID:	8
BMP Design Criteria:	100% Capture & Treatment
Type of BMP Design:	Priority 1: P1-02 Roadside Bioretention - No Curb and Gutter
BMP's Physical Tributary Area:	67,049.0 ft^2
Description/Notes:	

Hydromodification Requirement: 100% Volume Capture; $V_{HYDROMOD}$

$V_{HYDROMOD}$ = 1,601.13 ft^3

Post development hydrologic soil type within tributary area:	C: 0.05 - 0.15 in/hr infiltration (transmission) rate
Post development ground cover description:	Farmsteads - buildings, lanes, driveways, surrounding lots
CN_{POST} :	
User Composite post development CN:	86.0

BMP Sizing Tool: Hydromodification Requirement

Percent of Goal Achieved = 163.95 %

	BMP Volume Below Ground		Ponded Water Above Ground	
Porosity:	0.40			
Depth below perforated pipe if present:	4.00	ft		
Depth:			0.50	ft
Width:	0.00	ft	0.00	ft
Length:	0.00	ft	0.00	ft
Area:	1,250.00	ft^2	1,250.00	ft^2

STORM WATER CALCULATOR

BMP Tributary Parameters

Project Name: **Saralee's Vineyard + Nunes Farm**

BMP ID:	10
BMP Design Criteria:	100% Capture & Treatment
Type of BMP Design:	Priority 6: Offset Programs
BMP's Physical Tributary Area:	8,633.0 ft^2
Description/Notes:	

Hydromodification Requirement: 100% Volume Capture; $V_{HYDROMOD}$

$V_{HYDROMOD}$ = 344.89 ft^3

Post development hydrologic soil type within tributary area:	C: 0.05 - 0.15 in/hr infiltration (transmission) rate
Post development ground cover description:	Farmsteads - buildings, lanes, driveways, surrounding lots
CN_{POST} :	
User Composite post development CN:	91.0

BMP Sizing Tool: Hydromodification Requirement

Percent of Goal Achieved = 100.03 %

	BMP Volume Below Ground		Ponded Water Above Ground	
Porosity:	0.10			
Depth below perforated pipe if present:	0.00	ft		
Depth:			0.50	ft
Width:	0.00	ft	0.00	ft
Length:	0.00	ft	0.00	ft
Area:	0.00	ft^2	690.00	ft^2

STORM WATER CALCULATOR

BMP Tributary Parameters

Project Name: **Saralee's Vineyard + Nunes Farm**

BMP ID:	11
BMP Design Criteria:	100% Capture & Treatment
Type of BMP Design:	Priority 6: Offset Programs
BMP's Physical Tributary Area:	40,110.0 ft^2
Description/Notes:	

Hydromodification Requirement: 100% Volume Capture; $V_{HYDROMOD}$

$V_{HYDROMOD}$ = 3,185.94 ft^3

Post development hydrologic soil type within tributary area:	C: 0.05 - 0.15 in/hr infiltration (transmission) rate
Post development ground cover description:	Farmsteads - buildings, lanes, driveways, surrounding lots
CN_{POST} :	
User Composite post development CN:	98.0

BMP Sizing Tool: Hydromodification Requirement

Percent of Goal Achieved = 100.00 %

	BMP Volume Below Ground		Ponded Water Above Ground	
Porosity:	0.10			
Depth below perforated pipe if present:	0.00	ft		
Depth:			0.50	ft
Width:	0.00	ft	0.00	ft
Length:	0.00	ft	0.00	ft
Area:	0.00	ft^2	6,372.00	ft^2

STORM WATER CALCULATOR

BMP Tributary Parameters

Project Name: **Saralee's Vineyard + Nunes Farm**

BMP ID:	12
BMP Design Criteria:	100% Capture & Treatment
Type of BMP Design:	Priority 1: P1-02 Roadside Bioretention - No Curb and Gutter
BMP's Physical Tributary Area:	6,201.0 ft^2
Description/Notes:	

Hydromodification Requirement: 100% Volume Capture; $V_{HYDROMOD}$

$V_{HYDROMOD}$ = 47.07 ft^3

Post development hydrologic soil type within tributary area:	C: 0.05 - 0.15 in/hr infiltration (transmission) rate
Post development ground cover description:	Farmsteads - buildings, lanes, driveways, surrounding lots
CN_{POST} :	
User Composite post development CN:	77.0

BMP Sizing Tool: Hydromodification Requirement

Percent of Goal Achieved = 339.95 %

	BMP Volume Below Ground		Ponded Water Above Ground	
Porosity:	0.40			
Depth below perforated pipe if present:	4.00	ft	Depth: 0.00	ft
Width:	0.00	ft	Width: 0.00	ft
Length:	0.00	ft	Length: 0.00	ft
Area:	100.00	ft^2	Area: 0.00	ft^2

STORM WATER CALCULATOR

BMP Tributary Parameters

Project Name: **Saralee's Vineyard + Nunes Farm**

BMP ID:	13
BMP Design Criteria:	100% Capture & Treatment
Type of BMP Design:	Priority 1: P1-02 Roadside Bioretention - No Curb and Gutter
BMP's Physical Tributary Area:	14,590.0 ft^2
Description/Notes:	

Hydromodification Requirement: 100% Volume Capture; $V_{HYDROMOD}$

$V_{HYDROMOD}$ = 170.70 ft^3

Post development hydrologic soil type within tributary area:	C: 0.05 - 0.15 in/hr infiltration (transmission) rate
Post development ground cover description:	Farmsteads - buildings, lanes, driveways, surrounding lots
CN_{POST} :	
User Composite post development CN:	80.0

BMP Sizing Tool: Hydromodification Requirement

Percent of Goal Achieved = 337.43 %

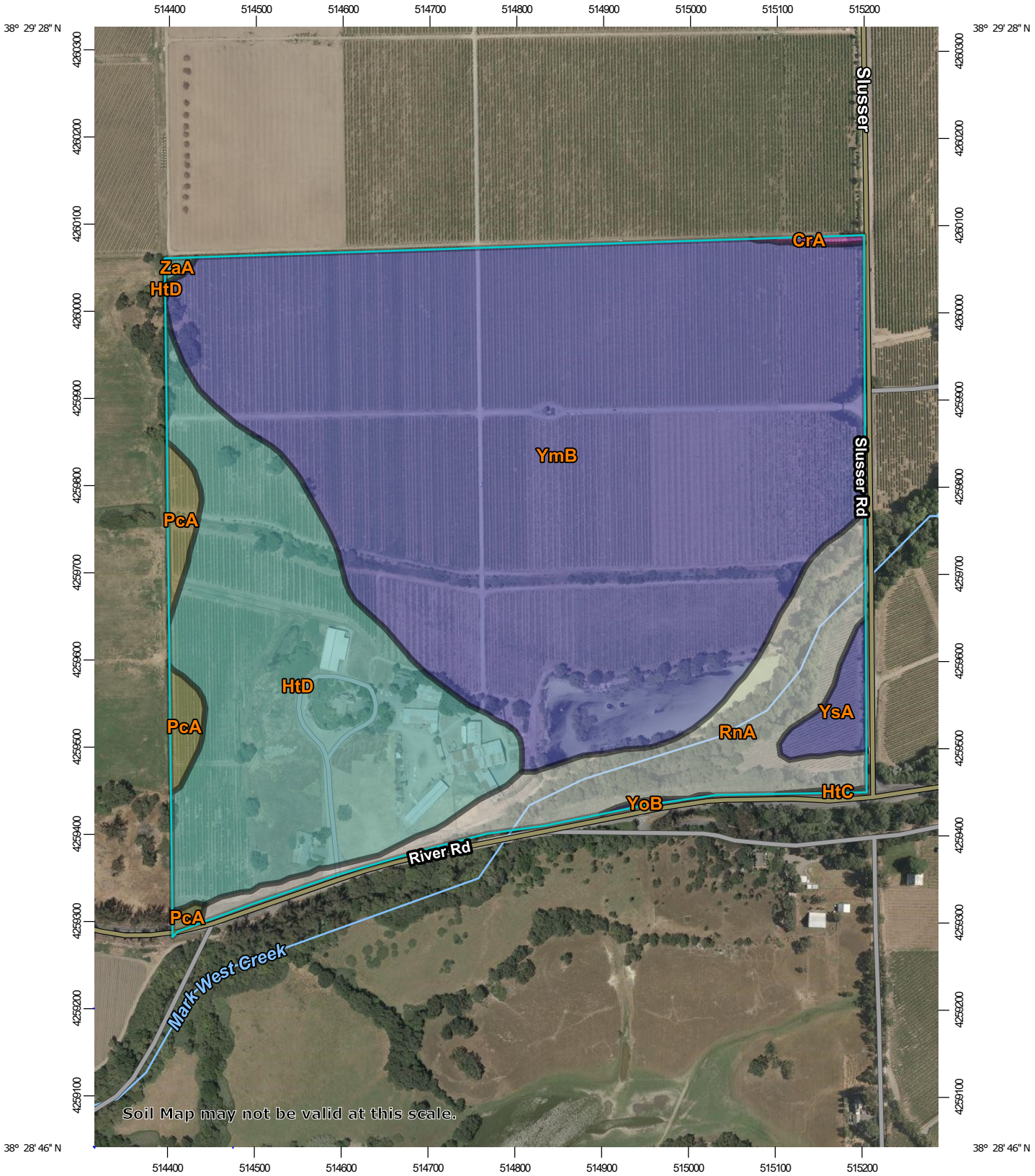
	BMP Volume Below Ground		Ponded Water Above Ground	
Porosity:	0.40			
Depth below perforated pipe if present:	4.00	ft	Depth: 0.00	ft
Width:	0.00	ft	Width: 0.00	ft
Length:	0.00	ft	Length: 0.00	ft
Area:	360.00	ft^2	Area: 0.00	ft^2

APPENDIX C

USDA HYDROLOGIC SOILS GROUP SITE MAP

TECH SHEET – POROSITY OF STRUCTURAL BACKFILL

Hydrologic Soil Group—Sonoma County, California
(Nunes Farm & Winery at Saralee's Vineyard)



Map Scale: 1:6,260 if printed on A portrait (8.5" x 11") sheet.

N

Meters
0 50 100 200 300

Feet
0 300 600 1200 1800

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 10N WGS84

MAP LEGEND

Area of Interest (AOI)
- Area of Interest (AOI)

Soils

Soil Rating Polygons
- A
- A/D
- B
- B/D
- C
- C/D
- D
- Not rated or not available

Soil Rating Lines
- A
- A/D
- B
- B/D
- C
- C/D
- D
- Not rated or not available

Soil Rating Points
- A
- A/D
- B
- B/D
- C
- C/D
- D
- Not rated or not available

Water Features
- Streams and Canals

Transportation
- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background
- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:20,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Sonoma County, California
Survey Area Data: Version 15, Sep 10, 2021

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Jun 1, 2020—Oct 30, 2020

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Hydrologic Soil Group

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
CrA	Cortina very gravelly sandy loam, 0 to 2 percent slopes	A	0.2	0.2%
HtC	Huichica loam, 2 to 9 percent slopes	C	0.1	0.1%
HtD	Huichica loam, 9 to 15 percent	C	32.4	23.9%
PcA	Pajaro clay loam, overwash, 0 to 2 percent slopes	C/D	2.4	1.8%
RnA	Riverwash		13.3	9.8%
YmB	Yolo sandy loam, overwash, 0 to 5 percent slopes	B	85.0	62.7%
YoB	Yolo loam, overwash, 0 to 5 percent slopes	B	0.1	0.1%
YsA	Yolo silt loam, 0 to 5 percent slopes, MLRA 14	B	1.9	1.4%
ZaA	Zamora silty clay loam, moist, 0 to 2 percent slopes, MLRA 14	C	0.2	0.1%
Totals for Area of Interest			**135.6**	**100.0%**

Description

Hydrologic soil groups are based on estimates of runoff potential. Soils are assigned to one of four groups according to the rate of water infiltration when the soils are not protected by vegetation, are thoroughly wet, and receive precipitation from long-duration storms.

The soils in the United States are assigned to four groups (A, B, C, and D) and three dual classes (A/D, B/D, and C/D). The groups are defined as follows:

Group A. Soils having a high infiltration rate (low runoff potential) when thoroughly wet. These consist mainly of deep, well drained to excessively drained sands or gravelly sands. These soils have a high rate of water transmission.

Group B. Soils having a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep or deep, moderately well drained or well drained soils that have moderately fine texture to moderately coarse texture. These soils have a moderate rate of water transmission.

Group C. Soils having a slow infiltration rate when thoroughly wet. These consist chiefly of soils having a layer that impedes the downward movement of water or soils of moderately fine texture or fine texture. These soils have a slow rate of water transmission.

Group D. Soils having a very slow infiltration rate (high runoff potential) when thoroughly wet. These consist chiefly of clays that have a high shrink-swell potential, soils that have a high water table, soils that have a claypan or clay layer at or near the surface, and soils that are shallow over nearly impervious material. These soils have a very slow rate of water transmission.

If a soil is assigned to a dual hydrologic group (A/D, B/D, or C/D), the first letter is for drained areas and the second is for undrained areas. Only the soils that in their natural condition are in group D are assigned to dual classes.

Rating Options

Aggregation Method: Dominant Condition

Component Percent Cutoff: None Specified

Tie-break Rule: Higher

Tech Sheet

StormTech®
Detention • Retention • Water Quality
A division of ADS

Porosity of Structural Backfill

Tech Sheet # 1
November 2012

General:
StormTech advises that a porosity of 40% is appropriate to use for the storage capacity of structural aggregate used in the bedding and embedment zones around StormTech chambers. This memo provides technical support for the use of a porosity of 40%. The major points of the memo are:

- 40% porosity is appropriate for the clean, open graded, angular aggregate material StormTech recommends for foundation and embedment.
- Most of the porosity data available is based on a compacted condition. StormTech requires compaction of the foundation (bedding) and allows dumped aggregate embedment around the chambers.
- Test data indicates that the average porosity of all gradations of the *compacted* foundation is approximately 40%. The porosity of the *dumped* backfill in the embedment zone is typically greater than 40% and the calculated weighted average porosity therefore exceeds 40% for typical StormTech systems.
- Porosity is protected from soils migration by a non-woven geotextile that surrounds the entire system. For some exfiltration systems, a drainage net is substituted for the geotextile on the bottom of the bed.

Terms:
Porosity (n) is defined as the volume voids over the total volume expressed as a percent: $n = (V_v / V_t) \times 100\%$. Other terms commonly used to describe porosity include; "voids" and "void space". A related term that should not be confused with porosity is *void ratio* (e) which is the volume of voids over the volume of solids expressed as a decimal: $e = V_v / V_s$.

Compilation of Known Test Data:

Sample	Data Source	Porosity	Bulk Density	Test / Description
AASHTO # 4	StormTech lab	39.9%	94.3 lbs/ft^3	dumped, corrected[1]
AASHTO # 57	StormTech lab	45.4%	87.2 lbs/ft^3	dumped, corrected[1]
AASHTO # 4	StormTech lab	37.4%	103.0 lbs/ft^3	jigged & tamped, corrected[1]
AASHTO # 57	StormTech lab	38.7%	97.7 lbs/ft^3	jigged & tamped, corrected[1]
AASHTO # 57	NTH lab	50 - 51%		tapped & agitated, dried[2]
AASHTO # 57	NTH lab	50 - 52 %		tapped & agitated, dried[2]
AASHTO # 3	NTH lab	53 - 54%		tapped & agitated, dried[2]
-1 ½"	Anderson Eng. Cons.	41.9%	96.8 lbs/ft^3	dry rodded, C29[3]
-1 ½"	Anderson Eng. Cons.	35.3%	101.7 lbs/ft^3	dry rodded, C29[3]
-1 ½"	Anderson Eng. Cons.	37.8%	98.6 lbs/ft^3	dry rodded, C29[3]
-1 ½"	Anderson Eng. Cons.	41.3%	93.6 lbs/ft^3	dry rodded, C29[3]
-1 ½"	Anderson Eng. Cons.	38.2%	98.7 lbs/ft^3	dry rodded, C29[3]
-3/4"	Anderson Eng. Cons.	38.5%	100.3 lbs/ft^3	dry rodded, C29[3]
-3/4"	Anderson Eng. Cons.	38.9%	97.9 bs/ft^3	dry rodded, C29[3]

Compilation of Known Test Data:

Sample	Data Source	Porosity	Bulk Density	Test / Description
AASHTO # 4	Universal Eng. Serv.	44.3%	78.6 lbs/ft^3	rodded C29[4]
AASHTO # 57	Universal Eng. Serv.	43.2%	79.8 lbs/ft^3	rodded C29[4]
AASHTO # 4	Universal Eng. Serv.	46.1%	70.8 lbs/ft^3	rodded C29[5]
AASHTO # 57	Universal Eng. Serv.	42.8%	74.8 lbs/ft^3	rodded C29[5]
-1 ½" Crushed Rock	CTL Thompson TX	46%	90.5 lbs/ft^3	rodded C29[6]
-1" Crushed Rock	CTL Thompson TX	45%	91.6 lbs/ft^3	rodded C29[6]
-1 ½" Crushed Conc	CTL Thompson TX	48%	77.1 lbs/ft^3	rodded C29[6]

[1]Testing was conducted by StormTech in October, 2003 using aggregate from Connecticut. Water was used to fill voids and a correction factor that reduced porosities by 3 to 16% was calculated and applied to correct for wall effects of the test container.

[2]Testing was conducted by NTH Consultants,Ltd. Exton, PA in December, 2002 for ADS. This was dry testing in accordance with the "Civil Engineering Reference Manual, Sixth Edition" by Michael R. Lindburg, PE.

[3]Testing was conducted by Anderson Engineering Consultants, Inc., Little Rock, AR in February, 2000 for 7 different aggregate samples from four suppliers in Arkansas.

[4]The material tested was lime rock from central Florida. Testing was conducted by Universal Engineering Sciences in Orlando, FL in November, 2005.

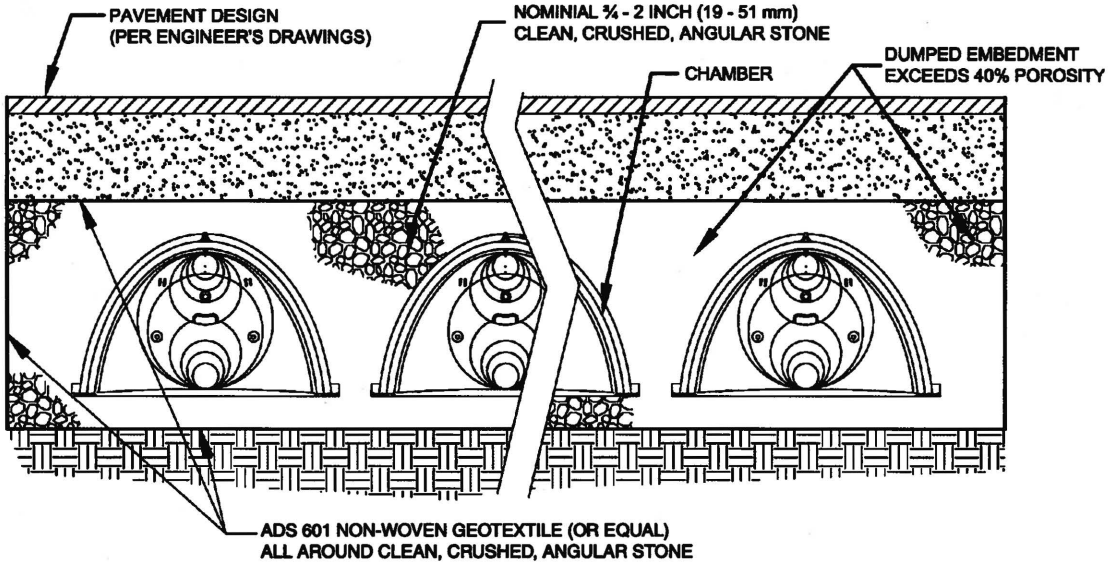
[5]The material tested was recycled, crushed concrete from central Florida. Testing was conducted by Universal Engineering Sciences in Orlando, FL in November, 2005.

[6]Testing was conducted by CTL | Thompson Texas, LLC in August, 2006.

ASTM C29 is the "Standard Test Method for Bulk Density (Unit Weight) and Voids in Aggregate".

Porosity References:

- "Urban Runoff Quality Management" WEF MOP 23 / ASCE MOP 87. Table 5.12 lists uniform sized gravel at 40%.
- "Controlling Urban Runoff:" by Thomas R. Schueler, July 1987 describes storage volume of the void space in the trench at 40% of the excavated trench volume.
- "On-site Stormwater Management: Applications for Landscape and Engineering" Second Edition by Bruce Ferguson and Thomas Debo states that open graded crushed stone has 40% void space.



ADS "Terms and Conditions of Sale" are available on the ADS website, www.ads-pipe.com
StormTech is a registered trademark of StormTech, Inc.
Universal Engineering Sciences is a registered trademark of Universal Engineering Sciences.

APPENDIX D

MAINTENANCE CHECKLIST

BMP FACT SHEETS

Form A
Storm Water Quality Feature Maintenance Check List
- Standard Conditions -

Date: _____ Inspector: _____

Start Time: _____ Project: _____

Stop Time: _____ Address: _____

Inspection Status Codes:
S = Satisfactory * = Refer to Form B (Specials) and/or Form C (Notes).
D = Deficient

Are there any special conditions and/or maintenance requirements noted for BMP(s)? Y N (circle one)
If Yes, attach Form B for Project.

	Drainage				Erosion						Vegetation				General			Special Features
	Drawdown - Drainage - Vector Risk - Pump Out-Blockage				Hydraulic Function - Failure - Sediment Clogging						Excessive Mowing - Herbicide Overuse - Health of Desired Vegetation -				Trash and Debris - Improper Modifications - Damage			
Reference code	D1	D2	D3	D4	E1	E2	E3	E4	E5	E6	V1	V2	V3	V4	G1	G2	G4	S
BMP ID:	Evidence of standing or ponding of water in the BMP area after 72 hours of dry weather?	Does the high flow bypass function as designed?	Is there sediment acumination in or around BMP?	Has water been observed flowing in the pervious concrete section during a low intensity storm?	Is there under cutting or washouts along the sidewalks and/or curbs abutting the planter area?	Is there channelization (gully) forming along the length of the planter area?	Is there accumulation of sediment (sand, dirt, mud) in the planter area ?	Observed or potential transport of mulch to drainage system?	Are there voids or holes present in the BMP?	Is there evidence of animal activity?	Is the vegetation clogging the inlet or flow path?	Evidence of Excessive Mowing and/or Herbicide Overuse?	Are there dead or dry plants or excessive weeds?	Is there an absence of correct vegetation?	Is there debris/trash accumulation in the BMP or high flow by pass?	Missing or damage structural features? (Grates, pipes, walls, curbs, etc.)	Evidence of improper modifications or removal of BMP?	**See Additional Special Conditions or Features Check List Requirement Form B**

Office Use:
Complete: _____ Issues Corrective Action: _____ Re-Inspection Required: _____

Storm Water Quality Special Feature Maintenence Check List

Date: _____

Start Time: _____

Stop Time: _____

Inspector: _____

Project: _____

Address: _____

Inspection Status Codes:

S = Satisfactory * - See Notes on Form C

D = Deficient

Special Feature or Conditions

Reference code	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11
Additional Special Maintenance Inspection Criterial	Add special inspection requirements in addition to Form A here.	Add special inspection requirements in addition to Form A here.	Add special inspection requirements in addition to Form A here.	Add special inspection requirements in addition to Form A here.	Add special inspection requirements in addition to Form A here.	Add special inspection requirements in addition to Form A here.	Add special inspection requirements in addition to Form A here.	Add special inspection requirements in addition to Form A here.	Add special inspection requirements in addition to Form A here.	Add special inspection requirements in addition to Form A here.	Add special inspection requirements in addition to Form A here.
BMP ID:											

Office Use:

Complete: _____ Issues Corrective Action: _____ Re-Inspection Required: _____

Form C
Storm Water Quality Feature Maintenence Check List
- Inspection Notes -

Date: _____

Inspector: _____

Project: _____

Address: _____

BMP ID:	Reference Code	**Notes**

FACT SHEET- BIORETENTION

BIORETENTION

Also know as: Street rain garden, roadside bioretention, and bioretention cell

DESCRIPTION

The bioretention area best management practice (BMP) functions as a soil and plant-based filtration and infiltration feature that removes pollutants through a variety of natural physical, biological, and chemical treatment processes.

ADVANTAGES

- Achieves both water quality and volume capture objectives.
- Bioretention areas provide storm water treatment that enhances the quality of downstream water bodies by using natural processes.
- The vegetation provides shade and wind breaks, absorbs noise, reduces heat island effects and improves an area's landscape.
- Bioretention provides habitat for birds and attracts other pollinators like butterflies and bees.
- Does not interrupt utility installation.
- Does not interfere with tree planting.

FACT SHEET- BIORETENTION

LIMITATIONS

- Bioretention is not recommended for areas where street slopes exceed 10%.
- Should not be used in areas of known contamination. If soil and/or groundwater contamination is present on the site or within a 100' radius of the proposed BMP location, the North Coast Regional Water Quality Control Board will need to be contacted and the site reviewed.
- Should not be used in areas of high groundwater. In general a minimum of 2' of clearance should be provided between the bottom of the bioretention cell and seasonal high groundwater.
- Should not be used in areas of slope instability where infiltrated storm water may cause failure. Slope stability should be determined by a licensed geotechnical engineer.
- Do not use in locations that can negatively impact building foundation or footings. Location shall be approved by a licensed Geotechnical Engineer.

KEY DESIGN FEATURES

ALL BIORETENTION

- Structural soil should be used within the bioretention area requiring load bearing capacity (adjacent to roadways and/or buildings.)
- Structural soil shall be installed as described in Reference Document E.
- Some BMPs may not require the use of structural soil and a more organic type planting soil and/or treatment media may be used in its place. It may be possible in some cases to use native soil or to amend the native soil so that it is suitable. Use of non-structural soil will depend on evaluation of the criteria in "Chapter 4-Site Assessment" as well as consideration of structural needs and may require evaluation by a licensed Geotechnical Engineer.
- Native soil should remain uncompacted to preserve infiltration capacity. Fence off the area during construction to protect it from compaction.
- Bottom of bioretention should be unlined to allow infiltration into native soil.
- Moisture barrier must be installed to protect road sub-base and any trenches adjacent to the bioretention area.
- If used, pervious concrete shall be designed and installed as described in Appendix G.
- If used, porous gutter must be protected during construction to prevent sediment loading.
- If the porous gutter design option is used additional trash and sediment capture BMPs may be required
- A curb opening type design may be used in place of a porous gutter if appropriate for the project.
- Bioretention areas shall be planted with plants from the approved plant and tree list included in Appendix F and shall be planted to achieve 51% cover.

- All bioretention areas shall be designed with a designated high flow bypass inlet for storms larger than the design storm.
- 6" perforated pipe to be installed at a depth of 6" below road structural section.
- Perforated pipe shall be installed in straight runs.
- The volume below the perforated pipe must be sufficient to hold and infiltrate the design volume.

SIZING DESIGN- GOAL AND REQUIREMENTS

- The **design goal** for all bioretention areas is to capture (infiltration and/or reuse) 100% of the volume of runoff generated by the 85th percentile 24 hour storm event. This is a retention requirement. If 100% volume capture is achieved than no additional treatment is required.
- If the design goal is not achievable, then the bioretention area *sizing requirement* is:
    - **Water Quality Treatment** of 100% of the flow generated by the 85th percentile 24 hour storm event, as calculated using the Rational Method and a known intensity of 0.20 inches per hour, **and**
    - **Volume Capture** (infiltration and/or reuse) of the increase in volume of storm water due to development generated by the 85th percentile 24 hour storm event. This is a retention requirement.
- All calculations shall be completed using the "Storm Water Calculator" available at www.srcity.org/stormwaterLID.

INSPECTION AND MAINTENANCE REQUIREMENTS

A maintenance plan shall be provided with the Final SUSMP. The maintenance plan shall include recommended maintenance practices, state the parties responsible for maintenance and upkeep, specify the funding source for ongoing maintenance with provisions for full replacement when necessary and provide site specific inspection checklist.

At a minimum maintenance shall include the following:

- Dry street sweeping upon completion of construction
- Dry street sweeping annually, and
    - When water is observed flowing in the gutter during a low intensity storm.
    - Algae is observed in the gutter.
    - Sediment/debris covers 1/3 of the gutter width or more.
- Inspect twice annually for sedimentation and trash accumulation in the gutter. Obstructions and trash shall be removed and properly disposed of.
- Inspect twice during the rainy season for ponded water.
- Pesticides and fertilizers shall not be used in the bioretention area.
- Plants should be pruned, weeds pulled and dead plants replaced as needed.

PLANTER STRIP BIORETENTION- CHECKLIST

Planter Strip Bioretention
Inspection and Maintenance Checklist
(aka: Street Rain Garden, Roadside Bioretention, Bioretention Cell)

Date of Inspection: _____
Inspector(s): _____
BMP ID #: _____
Property Owner: _____

Location Description: _____

Type of Inspection: ☐ Pre-rainy Season (PRS) ☐ Rainy Season (RS) ☐ After-rainy Season (ARS)

This Inspection and Maintenance Checklist is to be used in conjunction with its corresponding LID Factsheet and Maintenance Plan. Please review these documents before performing the field inspection.

Inspection Category	When to Inspect	Maintenance Issue	Is the Issue Present?	Require Maintenance	**Comments** (Describe maintenance completed and if needed maintenance was not conducted, note when it will be done)
Drainage	RS	Is there standing or pooling of water in the Bioretention area after 3 days of dry weather? Is water not draining into catch basin from the overflow pipe during a high intensity storm? *		• Check perforated pipe outlet for obstruction or damage. * • Flush perforated pipe to remove obstructions/sediment. * • Remove and replace the first few inches of topsoil. • Remove soil and inspect perforated pipe. Repair or replace perforated pipe, replace with new soil and regrade.	
	PRS RS ARS	Is there sediment visible in the gutter?		• In dry weather, use a mechanical sweeper or a Vactor truck to clean gutter pan.	
	RS	Is there water flowing in the pervious concrete gutter section during a low intensity storm? *		• In wet weather, use a Vactor truck to clean gutter pan.	

* If perforated pipe is present.

PLANTER STRIP BIORETENTION- CHECKLIST

Inspection Category	When to Inspect	Maintenance Issue	Is the Issue Present?	Require Maintenance	**Comments** (Describe maintenance completed and if needed maintenance was not conducted, note when it will be done)
Erosion	RS ARS	Is there under cutting or washouts along the sidewalks and/or curbs abutting the planter strip?		• Fill in eroded areas and regrade.	
	RS ARS	Is there channelization (gully) forming along the length of the planter area?		• Fill in eroded areas and regrade.	
	RS ARS	Is there accumulation of sediment (sand, dirt, mud) in the planter?		• Remove sediment and check the grading. Add replacement soil and/or mulch.	
	PRS RS ARS	Is the mulch unevenly distributed in the planter area?		• Redistribute and add additional mulch if needed. • Regrade planter area.	
	PRS RS ARS	Are there voids or deep holes present? Is there sediment present in the catch basin and in the overflow pipe?		• Check the perforated pipe for damage.*	
	PRS RS ARS	Is there evidence of animal activity such as holes or dirt mounds from digging or borrowing?		• Repair and fill in damage areas. • Rodent control activities must be in accordance with applicable laws and do not affect any protected species.	

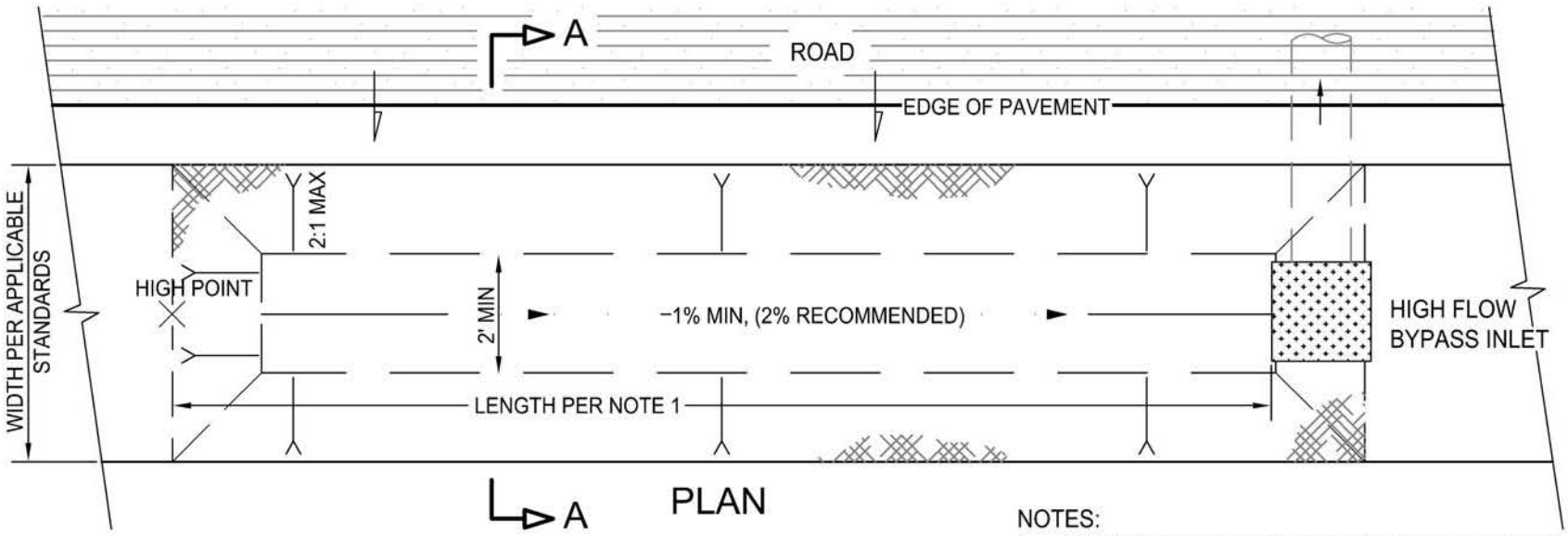
* If perforated pipe is present.

PLANTER STRIP BIORETENTION- CHECKLIST

Inspection Category	When to Inspect	Maintenance Issue	Is the Issue Present?	Require Maintenance	**Comments** (Describe maintenance completed and if needed maintenance was not conducted, note when it will be done)
Vegetation	PRS RS ARS	Is the vegetation clogging the inlet flow areas?		• Trim and/or remove the excess vegetation.	
	PRS RS ARS	Is the mulch distributed evenly throughout the planter area?		• Redistribute and add additional mulch if needed. • Regrade planter area.	
	PRS RS ARS	Are there dead or dry plants/weeds? Is the vegetation over grown?		• Remove dead and/or dry vegetation. Replace as needed. • Remove or trim any vegetation that is causing a visual barrier, trip, and or obstruction hazard.	

PLANTER STRIP BIORETENTION- CHECKLIST

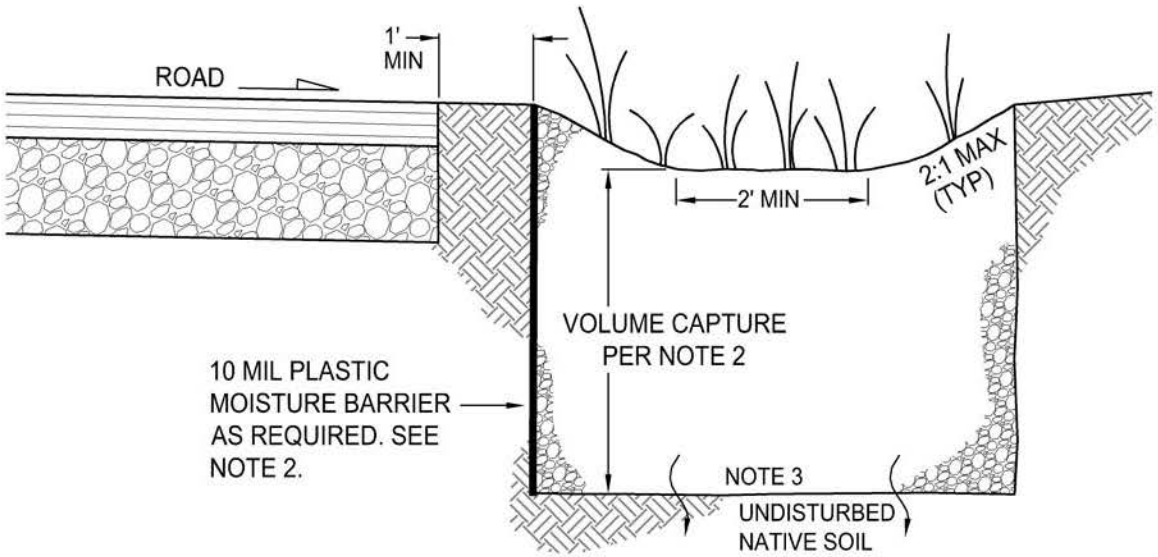
Inspection Category	When to Inspect	Maintenance Issue	Is the Issue Present?	Require Maintenance	**Comments** (Describe maintenance completed and if needed maintenance was not conducted, note when it will be done)
BMP General	PRS RS ARS	Is there debris/trash in the planter area?		• Remove all trash and debris.	
	PRS RS ARS	Is graffiti present?		• Remove all graffiti from the area.	
	PRS RS ARS	Are there missing or disturbed aesthetics features?		• Replace and/or reposition aesthetics features to original placement. • Placement should not disrupt flow characteristics/design.	
	PRS RS ARS	Is the vegetation irrigation functional?		• Repaired broken missing spray/drip emitters. • Reposition and/or adjust to eliminate over spray and/or over watering.	
	PRS RS ARS	Are the aesthetic features firmly secured in placed?		• Repair and/or replace loose or damage features.	
	PRS RS ARS	Check for damage sidewalk, curb, gutter, and catch basin including uplift and settling.		• Remove and replace damaged areas.	



PLAN

NOTES:

1. IF SWALE PROVIDES TREATMENT, LENGTH SHALL BE DESIGNED TO PROVIDE 12 MINUTES OF CONTACT TIME IF FLOW ENTERS UNIFORMLY ALONG LENGTH. LENGTH SHALL PROVIDE 5 MINUTES OF CONTACT TIME IF 90% OR MORE OF THE FLOW ENTERS AT THE UPSTREAM END.
2. SOIL TO BE SPECIFIED BY DESIGN ENGINEER TO MEET VOLUME CAPTURE AND GOVERNING AGENCY REQUIREMENTS. IF NON-STRUCTURAL SOIL IS SELECTED A CUTOFF WALL IS REQUIRED IN PLACE OF A MOISTURE BARRIER.
3. SWALE MUST CONVEY HIGH FLOWS PER GOVERNING AGENCY DESIGN STANDARDS.



SECTION A-A

Not to Scale

PRIORITY 1 ROADSIDE BIORETENTION - NO CURB AND GUTTER		
SCALE: *NONE*	DATE: *03/29/17*	
DWN. *DIT* CHK. *HM*		P1–02

APPENDIX F

PLANT AND TREE LISTS

Botanical Name	Common Name	Low Zone	Mid Zone	High Zone	Vegetated Swales	Bioretention	Extended Detention Basin	Vegetated Buffer	Constructed Wetland	Tolerates Saturation	Drought Tolerant	WUCOLS	Likely WUCOLS if not rated	Other Notes
Grasses and Grass-like Plants														
Agrostis exarata	spike bentgrass		X	X	Yes		Yes	Yes				NR	M	
Alopecurus aequalis	short awn foxtail	X	X		Yes		Yes					NR	M	`
Alopecurus saccatus	Pacific foxtail	X	X		Yes		Yes					NR	M	
Bromus carinatus	California brome		X	X	Yes	Yes		Yes				NR	L	
Carex barbarae	Santa Barbara sedge	X	X		Yes	Yes	Yes	Yes	Yes	Yes	Yes	M		Not for full sun
Carex brevicaulis	short stem sedge		X	X	Yes	Yes	Yes	Yes			Yes	M		Short turf-like growth habit
Carex densa	dense sedge	X	X		Yes	Yes	Yes	Yes	Yes	Yes		M		
Carex deweyanna	Dewey sedge	X	X		Yes	Yes	Yes	Yes	Yes	Yes		M		
Carex divulsa	Berkeley sedge	X	X		Yes	Yes	Yes	Yes		Yes	Yes	M		Not a native. Mistakenly sold as the native C. tumulicola
Carex obnupta	slough sedge	X	X		Yes	Yes	Yes	Yes	Yes	Yes		M		
Carex pansa	California meadow sedge	X	X		Yes	Yes	Yes	Yes	Yes	Yes	Yes	M		
Carex rupestris	curly sedge	X	X		Yes	Yes	Yes	Yes	Yes	Yes		M		
Carex stipata	sawbeak sedge	X	X		Yes	Yes	Yes	Yes	Yes	Yes		M		
Carex subfusca	rusty sedge	X	X		Yes	Yes	Yes	Yes	Yes	Yes		M		
Carex testacea	New Zealand orange sedge	X	X		Yes	Yes	Yes	Yes	Yes	Yes		M		
Carex tumulicola	foothill sedge	X	X	X	Yes	Yes	Yes	Yes	Yes	Yes	Yes	M		
Carex vesicaria	inflated sedge	X	X		Yes	Yes	Yes	Yes	Yes	Yes		M		
Danthonia californica	California oatgrass		X	X	Yes		Yes		Yes			NR	L	
Deschampsia danthonoides	annual hairgrass		X	X	Yes	Yes	Yes	Yes	Yes	Yes		NR	L	Can tolerate saturation if top soil layer drains
Deschampsia cespitosa	tufted hairgrass		X	X	Yes	Yes	Yes	Yes		Yes		NR	L	Can tolerate saturation if top soil layer drains
Distichlis spicata	salt grass	X	X		Yes		Yes	Yes	Yes			NR	M	
Eleocharis acicularis	needle spike rush	X	X		Yes	Yes	Yes	Yes	Yes	Yes		NR	M	
Eleocharis macrostachya	creeping spike rush	X	X		Yes	Yes	Yes	Yes	Yes	Yes		NR	M	
Eleocharis ovata	ovate spike rush				Yes	Yes	Yes	Yes	Yes	Yes		NR	M	
Eleocharis palustris	creeping spike rush				Yes	Yes	Yes	Yes	Yes	Yes		NR	M	
Elymus glaucus	blue wild rye		X	X	Yes	Yes	Yes	Yes	Yes	Yes	Yes	L		
Festuca californica	California fescue			X	Yes	Yes	Yes	Yes			Yes	L		Can tolerate saturation if top soil layer drains
Festuca idahoensis	blue bunchgrass			X	Yes	Yes	Yes	Yes		Yes	Yes	VL		Can tolerate saturation if top soil layer drains
Festuca rubra	red fescue			X	Yes	Yes	Yes	Yes		Yes	Yes	L		Can be mowed as turf alternative. Can tolerate saturation if top soil layer drains
Glyceria occidentalis	western mannagrass	X	X		Yes	Yes	Yes	Yes	Yes	Yes	Yes	NR	H	
Hordeum brachyantherum	meadow barley		X	X	Yes	Yes	Yes	Yes	Yes			NR	M	Can tolerate saturation if top soil layer drains
Juncus balticus	Baltic rush	X	X		Yes	Yes	Yes	Yes	Yes			H		
Juncus bufonis	toad rush	X	X		Yes	Yes	Yes	Yes	Yes	Yes		H		
Juncus effusus	Pacific rush	X	X		Yes	Yes	Yes	Yes	Yes	Yes		H		
Juncus ensofolius	dagger leaf rush	X	X		Yes	Yes	Yes	Yes	Yes	Yes		H		
Juncus patens	blue rush	X	X	X	Yes	Yes	Yes	Yes	Yes	Yes	Yes	H	L	May not need summer irrigation after establishment
Juncus tenuis	slender rush	X	X		Yes	Yes	Yes	Yes	Yes	Yes	Yes	H		
Juncus xiphiodes	iris-leaved rush	X	X		Yes	Yes	Yes	Yes	Yes	Yes		H		
Leymus triticoides	creeping wild rye		X	X	Yes	Yes	Yes	Yes	Yes	Yes	Yes	VL		Can be mowed. Ideal plant for many uses.
Melica californica	California melic			X	Yes	Yes	Yes	Yes		Yes	Yes	NR	L	Can tolerate saturation if top soil layer drains
Melica imperfecta	small flowered melic			X	Yes	Yes	Yes	Yes		Yes	Yes	NR	L	Can tolerate saturation if top soil layer drains
Muhlenbergia rigens	deergrass			X	Yes	Yes	Yes	Yes			Yes	L		
Nassella lepida	foothill needlegrass			X	Yes		Yes	Yes			Yes	VL		
Nassella pulchra	purple needlegrass			X	Yes		Yes	Yes			Yes	VL		
Phalaris californica	California canary grass	X	X	X	Yes	Yes	Yes	Yes	Yes	Yes		M		
Pleuropogon californicus	semaphore grass				Yes				Yes			NR	H	
Scirpus americanus	three square	X					Yes		Yes	Yes		NR	H	
Scirpus californicus	California bulrush	X					Yes		Yes	Yes		NR	H	
Typha angustifolia	narrowleaf cattail	X					Yes		Yes	Yes		NR	H	
Typha latifolia	cattail	X					Yes		Yes	Yes		NR	H	

Botanical Name	Common Name	Low Zone	Mid Zone	High Zone	Vegetated Swales	Bioretention	Extended Detention Basin	Vegetated Buffer	Constructed Wetland	Tolerates Saturation	Drought Tolerant	WUCOLS	Likely Wucols	Other Notes
Herbaceous Plants														
Achilea millefolium	common yarrow			X	Yes	Yes					Yes	L		
Aster sp.	aster		X	X	Yes	Yes		Yes				M		
Athyrium filix-femina	lady fern		X	X	Yes	Yes		Yes				M		
Blechnum spicant	deer fern		X	X	Yes	Yes	Yes	Yes			Yes	L		
Camassia leichtilinii	camas lily	X	X		Yes	Yes	Yes					NR	H	
Camassia quamash	common camas	X	X		Yes	Yes	Yes					NR	H	
Epilobium canum	California fuschia			X	Yes	Yes		Yes*			Yes	L		
Eriogonum fasciculatum	flattop buckwheat			X	Yes	Yes					Yes	L		
Eschscholzia californica	California poppy			X	Yes	Yes					Yes	VL		
Fragaria chiloensis	beach strawberry			X	Yes	Yes		Yes		Yes	Yes	M	L	This species is adapted to low water conditions
Iris douglasiana	Douglas iris		X	X	Yes	Yes		Yes		Yes	Yes	L		
Lupinus bicolor	miniature lupine			X	Yes	Yes		Yes		Yes	Yes	NR	L	Tolerates saturation in winter only
Lupinus polyphyllus	large leaf lupine		X	X	Yes	Yes		Yes		Yes		NR	M	similar to Russell hybrids
Mimulus guttatus		X			Yes		Yes		Yes	Yes		H		
Polypodium californicum	California polypody		X	X	Yes	Yes		Yes			Yes	VL		
Polypodium glycrrhiza	licorice fern		X	X	Yes	Yes		Yes			Yes	VL		
Polystichum californicum	California sword fern	X	X	X	Yes	Yes	Yes	Yes	Yes	Yes	Yes	L		
Polystichum munitum	western sword fern	X	X	X	Yes	Yes	Yes	Yes	Yes	Yes		M		
Pteridiumn aquilinum	bracken fern		X	X	Yes	Yes	Yes	Yes				M		
Sisyrinchium bellum	blue-eyed grass			X	Yes	Yes		Yes		Yes	Yes	VL		
Sisyrinchium californicum	yellow-eyed grass		X	X	Yes	Yes		Yes		Yes		M		
Veronica liwanensis	speedwell			X	Yes	Yes		Yes				M		

FACT SHEET- RAINWATER HARVESTING

RAINWATER HARVESTING

Also know as: Rain Barrel, Cistern, and Rainwater Collection

DESCRIPTION

Rainwater harvesting is the practice of collecting and using rainwater from impervious surfaces such as roofs and patios. Rain barrels, or cisterns, are containers or tanks, designed to capture rainwater runoff from roofs later used for irrigation. Rain barrels are inexpensive, easy to install and maintain, and well suited for small-scale residential sites. Cisterns are larger than rain barrels and can be installed above or below ground depending upon design requirements and site conditions.

ADVANTAGES

- Can provide volume capture.
- Can be used as part of a treatment train with other BMPs.
- Low maintenance requirements (for above ground installations).
- Good for sites where infiltration is limited.
- Provides another source for irrigation water.
- Prioritized as a “Universal LID feature.”

LIMITATIONS

- Limited storage capacity.
- Does not provide water quality treatment.
- May require infrastructure (pumps or valves) to use stored water.
- Inadequate maintenance can result in mosquito breeding and/or algae production.
- May require building permits. Contact the governing agency for requirements.

FACT SHEET- RAINWATER HARVESTING

KEY DESIGN FEATURES

- Roof surfaces shall not include copper or materials treated with fungicides or herbicides.
- Gutters must be fully screened and installed at continuous grade.
- Storage containers, tank liners, and tank coatings must be listed as food grade, or be approved for potable water storage.
- Containers must be opaque, water tight, vented, completely covered and screened.
- Screen all openings.
- For above-ground systems, spigot and/or hose bib for drawing water must be at least 2 inches from the bottom and must be labeled “NONPOTABLE”.
- Overflow device must be equal in size to the total of all inlets and must lead to an approved discharge location with approved air gap.
- First flush diverter must be automatic self-draining with a clean out.
- Safety labels (non-potable, vector hazard, drowning hazard icons).
- Outdoor spigots must have an atmospheric vacuum breaker attached.

- Prior to installation, roofs must be cleaned, and downspouts disconnected from the storm drain system.
- All municipal water service lines to facilities with rainwater harvesting systems require the installation of an approved backflow prevention device. This condition may be met if the backflow prevention was installed as part of the fire sprinkler system.
- Not permitted within the front yard setback.
- Tanks up to 8 feet in height are permitted within the rear and side yard setbacks.
- Tanks in excess of 8 feet in height, shall be subject to the same setbacks as a detached residential accessory structure.
- Both rain barrels and above-ground cisterns must be sited in a stable, flat area. Rain barrels and cisterns may not block the path of travel for fire safety access.
- Overflow locations, which can include rain gardens, additional rain barrels or cisterns, or a discharge point to the storm drain system, must be designed to both direct outflow away from building foundations and prevent nuisance flows to adjacent properties.
- Overflow may not discharge water across a public right-of-way.
- Tanks should be placed in a cool or shaded area to avoid algal growth.
- Regular use of the water stored in systems between rain events is critical to ensure that storage is available for the next storm event.

FACT SHEET- RAINWATER HARVESTING

SIZING DESIGN GOALS AND REQUIREMENTS

- The **design goal** for rain water harvesting is to capture 100% of the runoff volume generated by the 85th percentile 24 hour storm event. 100% volume capture has been established as the ideal condition. If achieved, all requirements are satisfied and no additional treatment is required. This is a retention requirement.
- If the *design goal* is not achievable, then the rain water harvesting *sizing requirement* is:
- **Volume Capture** of the increase in volume of storm water due to development generated by the 85th percentile 24 hour storm event.
- All calculations shall be completed using the "Storm Water Calculator" available at www.srcity.org/stormwaterLID.

INSPECTION AND MAINTENANCE REQUIREMENTS

A maintenance plan shall be provided with the Final SUSMP. The maintenance plan shall include recommended maintenance practices, state the parties responsible for maintenance and upkeep, specify the funding source for ongoing maintenance with provisions for full replacement when necessary and provide site specific inspection checklist. At a minimum maintenance shall include the following:

- Inspect twice annually to confirm that all the parts are operable and not leaking.
- Debris and clear all screens to prevent mosquitoes and other vectors from breeding.
- Clean tanks annually with a non-toxic cleaner, such as vinegar and dispose of wash water in a sink, bathtub or sewer cleanout.
- Test all backflow prevention assemblies annually by the system owner using an approved certified tester.
- Regular use of the water stored in systems between rain events is critical to ensure that storage is available for the next storm event.
- Clear roof gutter screens.

RAINWATER HARVESTING- INSPECTION CHECKLIST

Rainwater Harvesting
Inspection and Maintenance Checklist
(aka: Rain Barrel, Cistern, Rainwater Collection)

Date of Inspection: _____
Inspector(s): _____
BMP ID #:_____
Property Owner: _____

Location Description: _____

Type of Inspection: ☐ Pre-rainy Season (PRS) ☐ Rainy Season (RS) ☐ After-rainy Season (ARS)

This Inspection and Maintenance Checklist is to be used in conjunction with its corresponding LID Factsheet and Maintenance Plan. Please review these documents before performing the field inspection

Inspection Category	When to Inspect	Maintenance Issue	Is the Issue Present?	Require Maintenance	**Comments** (Describe maintenance completed and if needed maintenance was not conducted, note when it will be done)
Drainage	RS	Is there standing or pooling of water after 3 days of dry weather around the storage tank(s) area?		• Regrade over flow drainage area. • Reposition splash block /dissipater. • Check for leaks from storage tank(s).	
	RS	Is there excessive splashing/spray from the overflow outlet?		• Reposition splash block or dissipater to reduce or eliminate splash/spray.	
	RS	Are the house/building gutters overflowing during a rain event?		• Check gutter down spout and gutter for obstructions. • Check storage tank(s) inlet screens for blockage. • Check storage tank(s) outlet(s) for blockage.	
	RS	Are the storage tank(s) over flowing?		• Check storage tank(s) outlet(s) for blockage.	

RAINWATER HARVESTING- INSPECTION CHECKLIST

Inspection Category	When to Inspect	Maintenance Issue	Is the Issue Present?	Require Maintenance	**Comments** (Describe maintenance completed and if needed maintenance was not conducted, note when it will be done)
Erosion	RS ARS	Is there evidence of under cutting or washouts around storage tank(s)?		• Reposition splash block(s) or dissipater(s). • Fill in eroded areas and regrade. • Repair any leaks or overflows from storage tank(s).	
	PRS RS ARS	Is there accumulation of sediment, debris in the storage tank(s)?		• Remove sediment and check inlet and gutter screens. • Verify that the lid of the storage tank is secure.	
	RS ARS	Is there under cutting or washouts around the outlet splash block(s)?		• Reposition splash block(s) or dissipater(s). • Fill in eroded areas and regrade.	

RAINWATER HARVESTING- INSPECTION CHECKLIST

Inspection Category	When to Inspect	Maintenance Issue	Is the Issue Present?	Require Maintenance	**Comments** (Describe maintenance completed and if needed maintenance was not conducted, note when it will be done)
Vegetation	PRS RS ARS	Is the vegetation clogging the outlet areas?		• Trim and/or remove the excess vegetation around the outlet flow areas.	
	PRS RS ARS	Is the mulch/gravel spread evenly throughout the storage tank(s) area?		• Redistribute and add additional mulch/gravel if needed. • Regrade storage area.	
	PRS RS ARS	Are there dead or dry plants/weeds?		• Remove dead and/or dry vegetation. Replace as needed. • Remove or trim any vegetation that is causing a trip or access hazard.	

RAINWATER HARVESTING- INSPECTION CHECKLIST

Inspection Category	When to Inspect	Maintenance Issue	Is the Issue Present?	Require Maintenance	**Comments** (Describe maintenance completed and if needed maintenance was not conducted, note when it will be done)
BMP General	PRS RS ARS	Is there debris/trash in the area?		• Remove all trash/debris.	
	PRS RS ARS	Is the surrounding area marked with Graffiti?		• Remove all graffiti from the area.	
	PRS RS ARS	Are there missing or disturbed aesthetics features?		• Replace and/or reposition aesthetics features to original placement. • Placement should not disrupt flow characteristics/design.	
	PRS RS ARS	Are the vector control/prevention devices in place and functional?		• Replace or repair all damage components. • Contact vector control if problem persist.	
	PRS RS ARS	Is the irrigation system functional?		• Repaired any broken components.	
	PRS RS ARS	Is the Backflow operation/maintenance log current? (if installed)		• Test all backflow prevention assemblies annually by the system owner using an approved certified tester.	
	PRS RS ARS	Is there algae or other growth in the storage containers?		• Clean tank(s) with non-toxic cleaner.	

LEGEND

- (1) (DMA) DRAINAGE MANAGEMENT AREA NUMBER
- TRIBUTARY AREA BOUNDARY
- EXISTING IMPERVIOUS AREA (64,245 SQ. FT.)
- C HYDROLOGIC SOIL GROUP CLASSIFICATION (ALL AREAS)
- PROPERTY LINE

MSP: 35 INCH/YEAR (K=1.17)

PRELIMINARY
FOR STUDY PURPOSES ONLY
DATE 04-26-22

SARALEE'S/NUNES

EXISTING CONDITIONS EXHIBIT - WEST PARCEL

APRIL 2022

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LEGEND

- (99) (DMA) DRAINAGE MANAGEMENT AREA NUMBER
- TRIBUTARY AREA BOUNDARY
- PRIORITY 1 ROADSIDE BIORETENTION – NO CURB AND GUTTER
- NEW OR REPLACED IMPERVIOUS AREA (52,109 SQ. FT.)
- ROOF AREAS SLATED FOR RAIN HARVESTING (5,056 SQ. FT. TOTAL)
- IMPERVIOUS AREA TO BE REMOVED (32,411 SQ. FT.)
- C HYDROLOGIC SOIL GROUP CLASSIFICATION (ALL AREAS)
- PROPERTY LINE

MSP: 35 INCH/YEAR (K=1.17)

DMA #	AREA (SF)	NET AREA* (SF)	CN POST*	C POST*	PROPOSED BMP SIZE
1	12,791	12,791	96.0	0.65	AREA = 550 SF (NO PONDING) DEPTH = 1.5 FT (TREATMENT) + 4.0 FT (CAPTURE) = 5.5 FT
2	11,804	11,804	86.6	0.44	AREA = 150 SF (0.5' PONDING) DEPTH = 1.5 FT (TREATMENT) + 4.0 FT (CAPTURE) = 5.5 FT
3	56,256	56,256	82.8	0.34	AREA = 600 SF (NO PONDING) DEPTH = 1.5 FT (TREATMENT) + 4.0 FT (CAPTURE) = 5.5 FT
4	11,687	11,687	85.4	0.43	AREA = 180 SF (NO PONDING) DEPTH = 1.5 FT (TREATMENT) + 4.0 FT (CAPTURE) = 5.5 FT
5	19,534	14,478	89.3	0.49	AREA = 1010 SF (0.5' PONDING) DEPTH = 1.5 FT (TREATMENT) + 4.0 FT (CAPTURE) = 5.5 FT
12	6,201	6,201	76.8	0.18	AREA = 100 SF (NO PONDING) DEPTH = 1.5 FT (TREATMENT) + 4.0 FT (CAPTURE) = 5.5 FT
5 ROOF	5,056	5,056	98.0	0.90	ROOF RAINWATER HARVESTING STORAGE VOLUME REQ'D: 402 CU. FT. (3,010 GAL)

* AFTER ROOF AREA SLATED FOR RAIN HARVESTING REMOVED, WHERE APPLICABLE (REDUCTION CREDITS FOR TREES, ETC. WILL BE APPLIED IN FINAL SWLID CALCULATIONS WHEN THE DETAILED LANDSCAPE PLANTING DESIGN IS AVAILABLE)

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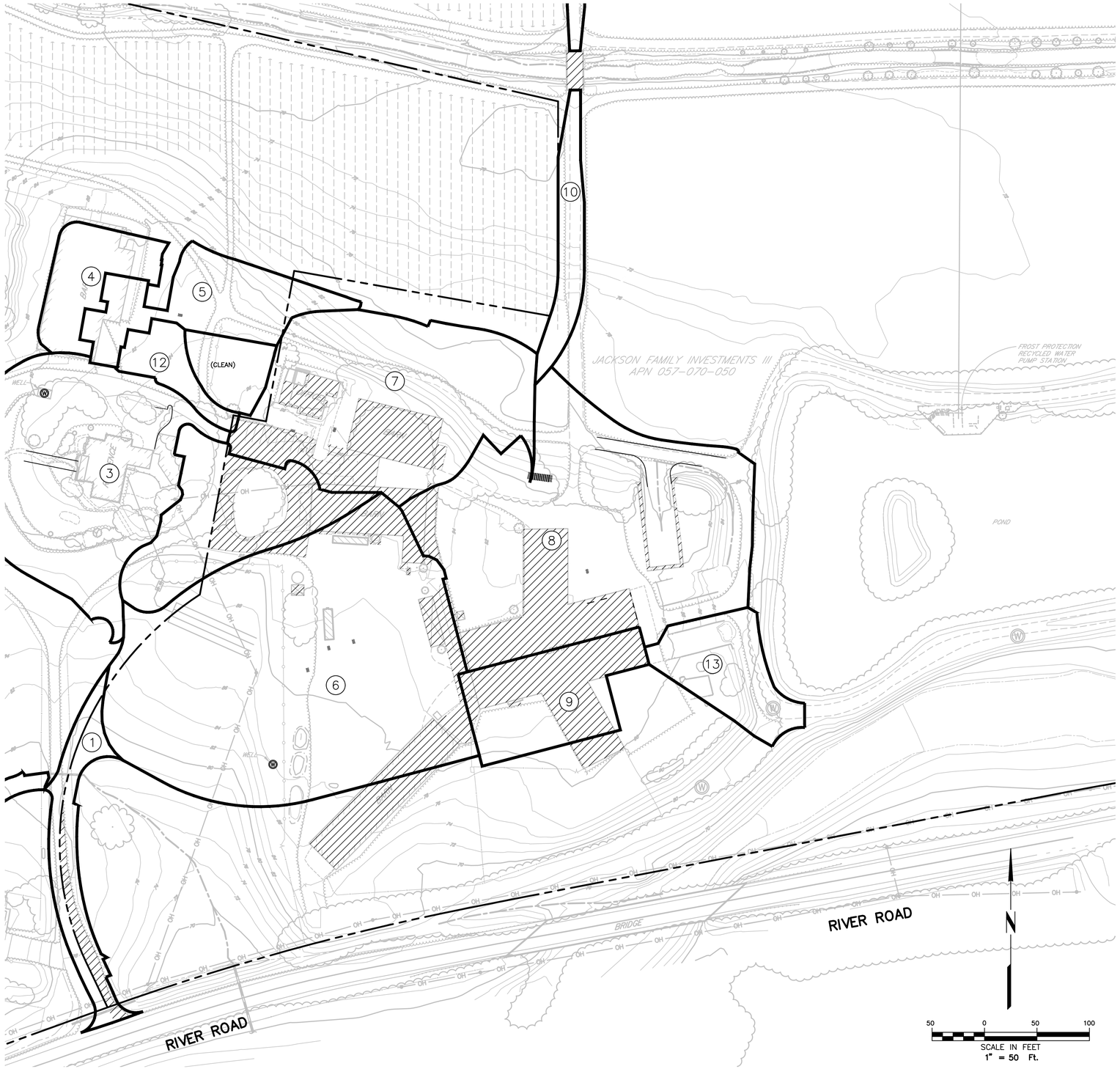

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EXISTING CONDITIONS EXHIBIT - EAST PARCEL

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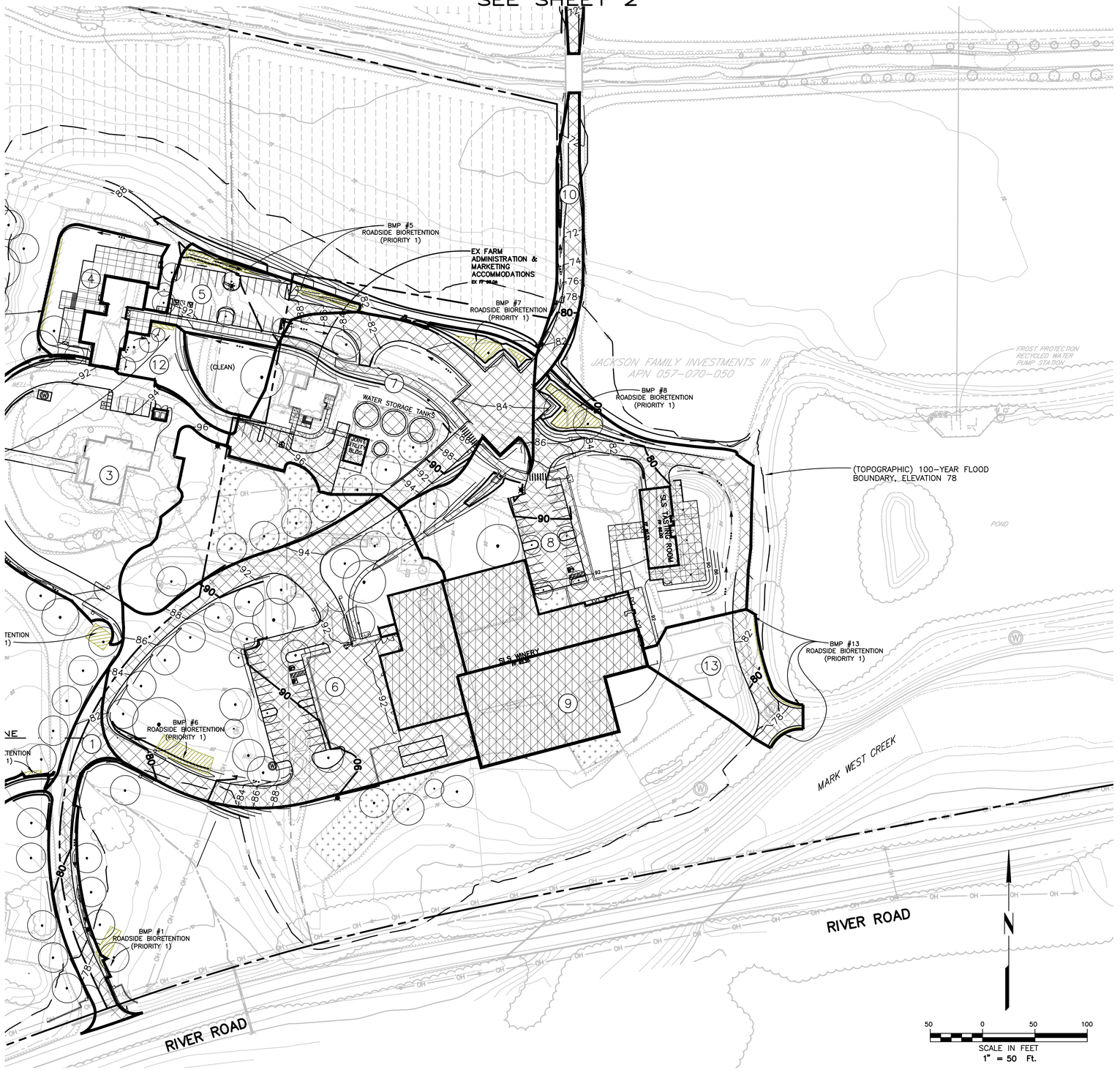

LEGEND

(99) (DMA) DRAINAGE MANAGEMENT AREA NUMBER

TRIBUTARY AREA BOUNDARY

PRIORITY 1 ROADSIDE BIORETENTION – NO CURB AND GUTTER

NEW OR REPLACED IMPERVIOUS AREA (246,247 SQ. FT. TOTAL INCL. ROOFS)

ROOF AREAS SLATED FOR RAIN HARVESTING (51,397 SQ. FT. TOTAL)

EXISTING IMPERVIOUS AREA TO BE REMOVED (25,071 SQ. FT.)

C HYDROLOGIC SOIL GROUP CLASSIFICATION (ALL AREAS)

K=1.17=35 INCH/YEAR

DMA #	AREA (SF)	NET AREA* (SF)	CN POST*	C POST*	PROPOSED BMP SIZE
6	105,934	93,996	86.9	0.43	AREA = 1,302 SF (0.5' PONDING) DEPTH = 1.5 FT (TREATMENT) + 4.0 FT (CAPTURE) = 5.5 FT
7	55,285	54,517	86.8	0.44	AREA = 665 SF (0.5' PONDING) DEPTH = 1.5 FT (TREATMENT) + 4.0 FT (CAPTURE) = 5.5 FT
8	85,757	67,049	86.2	0.40	AREA = 1250 SF (0.5' PONDING) DEPTH = 1.5 FT (TREATMENT) + 4.0 FT (CAPTURE) = 5.5 FT
10	8,633	8,633	91.4	0.53	ON-SITE OFFSET VOLUME = 345 CU. F.T. (AVAILABLE CAPACITY IN BMP'S 1-8)
13	14,590	14,590	80.1	0.25	AREA = 360 SF (NO PONDING) DEPTH = 1.5 FT (TREATMENT) + 4.0 FT (CAPTURE) = 5.5 FT
6, 7, 8, 9	51,397	51,397	98.0	0.90	ROOF RAINWATER HARVESTING MIN. STORAGE VOLUME REQD: 4,082 CU. FT. (30,600 GAL)

* AFTER ROOF AREA SLATED FOR RAIN HARVESTING REMOVED, WHERE APPLICABLE (REDUCTION CREDITS FOR TREES, ETC. WILL BE APPLIED IN FINAL SWLID CALCULATIONS WHEN THE DETAILED LANDSCAPE PLANTING DESIGN IS AVAILABLE)

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PROPOSED SWLID EXHIBIT - EAST PARCEL

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JACKSON FAMILY INVESTMENTS III
APN 057-070-047

IRRIGATION WELL

SLUSSER ROAD

PARK WEST CREEK

SEE SHEET 1

N

50 0 50 100

SCALE IN FEET
1" = 50 Ft.

LEGEND

(99) (DMA) DRAINAGE MANAGEMENT AREA NUMBER

TRIBUTARY AREA BOUNDARY

NEW OR REPLACED IMPERVIOUS AREA (227,746 SQ. FT. TOTAL)

C HYDROLOGIC SOIL GROUP CLASSIFICATION (ALL AREAS)

K=1.17=35 INCH/YEAR

DMA #	AREA (SF)	NET AREA (SF)	CN POST	C POST	PROPOSED BMP SIZE
11	40,110	40,110	98.0	0.70	ON-SITE OFFSET = 3,186 CU. FT. (AVAILABLE CAPACITY IN BMP'S 1-8)

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