

APPENDIX G-3

RUN-OFF CONTROL PLAN

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CONTINENTAL DEVELOPMENT CONSULTANTS

Civil Engineering • Land Planning & Zoning Entitlements • Building Design & Improvements • Construction Consulting

November 16th, 2024

Project: Brar Farms
Project Address: 3425 Marshall Road, West Sacramento, CA 95691
APN: 045-260-008, 009, 010, 045-270-001, & 002

Subject: Compliance with Low Impact Development (LID) requirements.

The proposed development meets Low Impact Development (LID) design requirements by incorporating a detention pond with a runoff capture capacity of 25.643 acre-feet, significantly exceeding the minimum required capacity of 2.106 acre-feet for flow treatment. Please refer to the attached Volumetric Post-Construction BMP Sizing Tool worksheet for detailed calculations.

Please contact for any further clarification.

Sincerely,

Harsev Singh

Project Engineer

(530)341-2558; singh.harsev@continentaldc.com

POST-CONSTRUCTION WORKSHEET FOR THE CITY OF WEST SACRAMENTO

PROJECT SUMMARY SHEET

Project Owner Information:

Project Owner Name:	RBS Holdings, LLC				
Name of Contact Person:	Ryan Hooper				
Mailing Street Address:	1730 I St, Suite 220				
City:	Sacramento	State:	CA	Zip:	95811
Telephone:	(916) 443-6956	Email:	info@thatchlaw.com		

Project Information:

Project Name:	Brar Farms				
Name of Contact Person:	Harsev Singh				
Project Address:	3425 Marshall Road				
City:	West Sacramento	State:	CA	Zip:	95691
Anticipated construction start date:	TBD	Ending date:	TBD		
Project size (ft ²):	2,613,164	Subject to the Construction General Permit? (Yes / No)	Yes		

Information of the Post-Construction Standards Plan Preparer:

Name of Organization:	Continental Development Consultants, Inc.				
Name of Contact Person:	Harsev Singh, MS, PE				
Mailing Street Address:	PO Box 1924				
City:	Woodland	State:	CA	Zip:	95776
Telephone:	(530) 341-2558	Email:	singh.harsev@continentaldc.com		

Project Applicability:

Type of Project: (Check one)	☐	Small Project (2,500 to 5,000 ft ² or detached single family home)	
	☒	Regulated Project (5,000 ft ²)	
	☐	Not applicable to the Post-Construction Standards Plan (provide reason in the space below)	
Is this a redevelopment project? (Yes / No)	No	Will the project result in an increase of more than 50% of the impervious surface? (Yes / No)	Yes
Has the project or the vesting map received approval from the municipality? (Yes, No, or N/A)	No	Date of project or vesting map approval:	
Describe the nature and scope of the construction project:	New Residential Subdivision		
Number of Drainage Management Areas (DMAs):	1		

POST-CONSTRUCTION WORKSHEET FOR THE CITY OF WEST SACRAMENTO

SMALL PROJECT SUBMITTAL SHEET

Project Information:

Project Name:	Brar Farms
Project Owner Name:	RBS Holdings, LLC
Project Address:	3425 Marshall Rd, West Sacramento, CA, 95691

Selection of Site Design Measures:

Select one or more of the following Site Design Measures (as identified in [Section 4.1](#) of the Post-Construction Standards Plan) which will be incorporated into the project's design.

Site Design Measures	Selected? (Yes / No)
Stream Setbacks and Buffers	
Soil Quality Improvement and Maintenance	
Tree Planting and Preservation	Yes
Rooftop and Impervious Area Disconnection	
Porous Pavement	
Green Roofs	
Vegetated Swales	
Rain Barrels and Cisterns	

Post-Construction Calculator Information:

Enter the following data from the State's Post-Construction Calculator:

Pre-project Runoff Volume (ft ³)	31,097
Post-project Runoff Volume (ft ³)	91,755
Net Credit of Volume Credits (ft ³)	60,658

Small Project Submittal Requirements:

The following must be submitted for Small Projects to the plan checker:

- Completed pages 1 and 2 of this Post-Construction Worksheet.
- Site plans showing the selected Site Design Measure(s) (identified in [Section 4.1](#)). The plans must be stamped by a California Civil Professional Engineer if any of the following Site Design Measures were selected: rooftop and impervious area disconnection, porous pavement, or rain cisterns. The plans must be stamped by a California Structural Professional Engineer if a green roof was selected or if there is a significant structural aspect to the rain cisterns and collection system. The plans must be stamped by a California Licensed Landscape Architect if any of the following Site Design Measures were selected: stream setbacks and buffers, soil quality improvement, or vegetated swales. The Site Design Measure(s) must be clearly called out on the submitted plans.
- A printout of the results page from the Water Board's SMARTS or Microsoft Excel™ Post-Construction Calculator.

POST-CONSTRUCTION WORKSHEET FOR THE CITY OF WEST SACRAMENTO

REGULATED PROJECT DMA SUBMITTAL SHEET

Drainage Management Area (DMA) & Project Information:

A separate Regulated Project DMA Submittal Sheet is required to be completed and submitted for each DMA. Refer to Section 5.1 of the Post-Construction Standards Plan for more information about DMAs.

Project Name:	Brar Farms
Project Owner Name:	RBS Holdings, LLC
Project Address:	3425 Marshall Rd, West Sacramento, CA, 95691
Name of the DMA:	DMA 1
DMA area (ft ²)	2,613,164

Selection of Applicable Source Controls:

Indicate which of the following activities or pollutant sources are included in this DMA of the new development or redevelopment. For more information about required Source Control refer to Section 5.2.

Site Design Measures	(Yes / No)
Accidental spills or leaks	
Interior floor drains	
Parking / storage areas and maintenance	
Indoor and structural pest control	
Landscape / outdoor pesticide use	Yes
Pools, spas, ponds, decorative fountains, and other water features	
Restaurants, grocery stores, and other food service operations	
Refuse areas	
Industrial processes	
Outdoor storage of equipment or materials	
Vehicle and equipment cleaning	
Vehicle and equipment repair and maintenance	
Fuel dispensing areas	
Loading docks	
Fire sprinkler test water	
Drain or wash water from boiler drain lines, condensate drain lines, rooftop equipment, drainage sumps, and other sources	
Unauthorized non-storm water discharges	
Building and grounds maintenance	

Hydrologic Soil Group and Soil Type Information:

Enter information concerning the soil types within this DMA. For more information, refer to Table 7 of the Post-Construction Standards Plan.

Soil Type Name	HSG Group (A, B, C, or D)
Willows silty clay loam, 0 percent slopes, MLRA 17	D
Willows clay, 0 percent slopes, MLRA 17	D

Low Impact Development (LID) Design Requirements:

Please describe how the project is meeting each of the following LID design requirements. Provide your response in the text box following each requirement or provide responses on a separate sheet.

1. Define the areas of the project that are to be left undisturbed or protected from soil disturbance. Identify sensitive environmental receptors such as water bodies, stream buffers, existing trees, riparian areas, and habitat areas.

The project will involve a complete redevelopment of the site, transforming the existing bare land by adding several landscaped areas.

2. How is the project concentrating development on portions of the site with less permeable soils and preserving areas that can promote infiltration?

The project proposes a pond in the central location of the development to promote infiltration

3. How is the project limiting the overall impervious coverage of the site consisting of paving and roofs?

The project is roughly 55% impervious and leave a significant portion containing enhanced landscaping

4. If applicable, how much setback is there of the development from creeks, wetlands, and riparian habitats?

Not applicable

5. List and describe the trees that will be preserved.

Not applicable

6. Describe how the new development or redevelopment site layout will conform along natural landforms.

Site is currently relatively flat and the proposed development maintains this.

7. Describe how the project is avoiding excessive grading and disturbance of vegetation and soils.

Grading is done to meet the engineering drainage is design standards and nothing further.

8. Describe how the new development or redevelopment is replicating the site's natural drainage patterns.

The development ensures that post-development runoff does not exceed pre-development levels by utilizing a detention pond, which regulates outflow to the public sewer system at rates lower than the pre-development flows.

9. Describe how the project will detain and retain runoff through the new development and redevelopment site.

The centrally located detention pond will store entire 100 year flows and releases it at rates lower than the pre-development flows.

Pre- and Post-Development Project Hydrology Information:

Provide the following hydrology information for this DMA.

Pre-development Conditions:

Percent Impervious	0
Average runoff coefficient for this DMA	0.2
Peak flow rate (ft ³ /sec) for this DMA using the 2-year 24-hour design value discussed in Section 5.5 .	2.10

Post-development Conditions:

Percent Impervious	55
Average runoff coefficient for this DMA	0.59
Peak flow rate (ft ³ /sec) for this DMA using the 2-year 24-hour design value discussed in Section 5.5 .	6.20

Selection of Site Design and Treatment Control Measures:

Indicate which Site Design and Treatment Control Measures will be used for this DMA. For more information, refer to [Table 3](#). Provide calculations and design drawings for the selected measures per the submittal requirements describe in [Section 5.6](#).

Site Design or Treatment Control Measure	Sizing Criteria	Selected? (Yes / No)	Enter the Calculated Design Capture Volume or Flow Rate for the Selected Measure
Stream setbacks and vegetated buffers (Site Design Measure)	Flow		
Soil quality improvement (Site Design Measure)	Volume		
Tree planting and preservation (Site Design Measure)	SMARTS Calculator		
Porous pavement (Site Design Measure)	Volume		
Green roofs (Site Design Measure)	Volume		
Vegetated swales (Site Design Measure)	Flow		
Rain harvesting and reuse (Site Design Measure)	Volume		
Bioretention and rain gardens (Treatment Control Measure)	Volume		
Infiltration trench, Flow-through Planter, or Tree Wells (Treatment Control Measure)	Volume and Flow		
Retention and detention basins (Treatment Control Measure)	Volume	Yes	91,755 cu.ft.

Variations and Exceptions:

Identify any applicable variations or exceptions for this DMA.

Condition	Allowed Variation	Applicable to this DMA? If so, explain.
Facilities located within 10 feet of structures or other potential geotechnical hazards established by the geotechnical expert for the project	May incorporate an impervious cutoff wall between the bioretention / infiltration facility and the structure or other geotechnical hazard	
Facilities with documented high concentrations of pollutants in underlying soil or groundwater, facilities located where infiltration could contribute to a geotechnical hazard, and facilities located on elevated plazas or other structures	May incorporate an impervious liner and may locate the underdrain discharge at the bottom of the subsurface drainage/storage layer (this configuration is commonly known as a “flow-through planter”)	
Facilities located in areas of high groundwater, highly infiltrative soils or where connection of underdrain to a surface drain or to a subsurface storm drain are infeasible	May omit the underdrain	Groundwater level has historically been shallow and as such an underdrain in the pond area is excluded
Facilities serving high-risk areas such as fueling stations, truck stops, auto repairs, and heavy industrial sites	Are required to provide additional treatment to address pollutants of concern prior to the flow reaching the infiltration facility	

If infiltration is not feasible for this DMA, please provide an explanation of the infeasibility and a description of the alternate non-infiltrating treatment control measure(s) that will be used in accordance with the development requirements in Section 5.4.4.

Regulated Project Submittal Requirements:

The following must be submitted for Regulated Projects to the plan checker:

- The completed Post-Construction Worksheet including page 1 and, for each DMA, pages 3 – 10.
- A separate site plan for each DMA must be submitted. If there are multiple DMAs, a key map showing the location of the DMAs in relationship to one another and the entire site is required to be submitted. Each DMA site plan is required to show the following information:
 - ✓ DMA name and boundary;
 - ✓ The selected Site Design and Treatment Control Measures (identified in [Table 3](#));
 - ✓ The total drainage area in square feet of the DMA;
 - ✓ The pre-development peak flow rate at the point(s) of discharge;
 - ✓ The predicted post-development peak flow rate at the point(s) of discharge;
 - ✓ Areas of existing impervious surfaces (pre-development);
 - ✓ Proposed areas of impervious surfaces (post-development);
 - ✓ Setbacks from creeks, wetlands, and riparian habitats;
 - ✓ Existing topography and drainage patterns (pre-development);
 - ✓ Proposed topography and drainage patterns (post-development);
 - ✓ Soil types, soil type boundaries within the DMA, and their Hydrologic Soil Group Classification rating (A, B, C, or D); and
 - ✓ Trees, vegetation, and sensitive environmental areas to be protected and preserved.

Each plan must be stamped by a qualified licensed professional. The plans must be stamped by a California Civil Professional Engineer if any of the following control measures were selected: rooftop and impervious area disconnection, porous pavement, rain cisterns, bioretention or rain gardens, infiltration trench, or retention or detention basins. The plans must be stamped by a California Structural Professional Engineer if a green roof was selected or if there is a significant structural aspect to the rain cisterns and collection system. The plans must be stamped by a California licensed Landscape Architect if any of the following Site Design Measures were selected: stream setbacks and buffers, soil quality improvement, vegetated swales, bioretention and rain gardens. The selected Site Design and Treatment Control Measure(s) must be clearly called out on the submitted plans.

- Design drawings for the proposed Treatment Control Measures showing a plan view, elevation view, and subsurface cross-sections must be submitted. Sufficient detail and specifications should be included in these drawings to provide for adequate plan check review and for the construction of the treatment “facility”. Each design drawing must be stamped by a qualified licensed professional. The drawings must be stamped by a California Civil Professional Engineer if any of the following control measures were selected: rooftop and impervious area disconnection, porous pavement, rain cisterns, bioretention or rain gardens, infiltration trench, or retention or detention basins. The drawings must be stamped by a California Structural Professional Engineer if a green roof was selected or if there is a significant structural aspect to the rain cisterns and collection system. The drawings must be stamped by a California licensed Landscape Architect if any of the following Site Design Measures were selected: stream setbacks and buffers, soil quality improvement, vegetated swales, bioretention and rain gardens.

- A print out of the results page from the MS Excel™ Volumetric BMP Sizing Tool for each DMA and control measure that requires the volumetric sizing criteria is required to be submitted. (Refer to [Appendix 6](#) for information on how to download the tool.)
- Calculations stamped by the appropriate licensed individual (as described above) for each DMA and control measure that requires flow-based sizing criteria must be included with the submittal.
- An Operation and Maintenance Plan and signed Statement of Responsibility for the proposed treatment control measures must accompany the submittal (refer to [Section 6](#) and [Appendix 9](#)).



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

Water Features

 Streams and Canals

Transportation

 Rails

 Interstate Highways

 US Routes

 Major Roads

 Local Roads

Background

 Aerial Photography

C

 C

C/D

 C/D

D

 D

Not rated or not available

 Not rated or not available

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: Yolo County, California
Survey Area Data: Version 22, Aug 28, 2024

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

Date(s) aerial images were photographed: Apr 23, 2022—Apr 24, 2022

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
Wa	Willows silty clay loam, 0 percent slopes, MLRA 17	D	54.1	85.2%
Wb	Willows clay, 0 percent slopes, MLRA 17	D	9.4	14.8%
Totals for Area of Interest			63.5	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

Two Options for Calculating the Design Volume for the Volumetric BMPs

For projects in the Central Valley from Shasta County to Fresno County

Perform the following steps and enter the requested data. Print this page and include with the project's submittal.

Name of the DMA:

Step 1: Enter the size of the Drainage Management Area (DMA):

2,613,164 Square Feet

Step 2: Enter the total percentage of impervious area in the DMA:

55 % Impervious

$i =$

0.55 This is the impervious coefficient (i) used for the Urban Runoff Quality Management approach

Enter the number of existing or planned trees in the DMA:

Evergreen:

Deciduous:

Total Tree Credit:

0.0 ft³

Step 3: Specify the project location:

Mileage: Redding to Sacramento	150 miles
Sacramento to Fresno	160 miles
Is the project north or south of Sacramento?	South
What is the distance from Sacramento?	4
Percent of distance from Sacramento to Fresno	2.5%

Step 4: Specify the composite (average) runoff coefficient for the DMA:

Enter average runoff coefficient for the DMA:

0.59 Enter decimal coefficient (Refer to the coefficient tab)

C = 0.372 This is the average coefficient used for the Urban Runoff Management approach for impervious area.

This is your volumetric design value for the DMA based on the site location and average runoff coefficient.

DMA's Unit Basin Storage Volume (inches):

0.42

P6 = 0.55 inches

See the P6 Table tab

Basis for the Calculations (Refer to the attached CASQA Rain Graphs):

	Runoff Coefficients			Unit Basin Storage Volumes (inches) using 80% runoff capture with 48-hour draw down times
	0.25	0.50	0.75	
Weather Stations				
Redding	0.22	0.44	0.66	0.88
Sacramento	0.18	0.36	0.54	0.72
Fresno	0.12	0.24	0.37	0.49
Project Location	0.18	0.36	0.54	0.71

Regression constant for 48-hour draw down (a) =

1.963 Per the CASQA BMP for the Urban Runoff Management Approach

Step 5: Select one of the two optional calculations of the required BMP capture volume for the DMA:

Using the CASQA BMP Handbook Approach:

Required Capture Volume:

91,755 cubic feet

686,325 gallons

2,106 acre-feet

Use this one

Specify selection

Using the Urban Runoff Quality Management Approach:

Required Capture Volume:

87,578 cubic feet

655,082 gallons

2,011 acre-feet

Maximum Detention Volume (Po) =

0.402 inches

=(a)(P6)(C)