ATTACHMENT D:

D2: SWCP TEMPLATE FOR REGULATED PROJECTS

Stormwater Control Plan for a Regulated Project

This template is to be used in conjunction with the instructions, criteria, and requirements in the *Santa Clara Valley Transportation Authority's (VTA's) Stormwater and Landscaping Design Criteria Manual.*

Name of Project:	
Project Number	
Date:	
Name of Owner:	
Owner's Representative and Contact Information:	
Preparer's Name:	
Prepared by:	
Preparer's Contact Information:	
Stamp of Licensed Professional Preparing the Plan:	

Table of Contents

Instructions

This Stormwater Control Plan template is to be used as a guide for compliance with Section F.5.g.2 of the Phase II Small MS4 General Permit. As a Permittee, VTA is required to implement measures for design, source control, runoff reduction, stormwater treatment and baseline hydromodification for all development and re-development projects that create and/or replace 5,000 square feet or more of impervious surface (Regulated Projects). A registered Professional Engineer (P.E.) must complete this Stormwater Control Plan. **Complete the template below to submit a SWCP that includes the following:**

Submittal Checklist:

- ❑ Project Data Form & Project Setting
- ❑ Design strategies to limit disturbance (if applicable)
- ❑ Completed Source Control Checklist
- ❑ Completed Site Design Runoff Reduction Checklists
- ❑ Explanation of Runoff Reduction Installation Infeasibility (if applicable)
- ❑ Completed Stormwater Treatment Measure Checklists
- ❑ Completed Stormwater Treatment Measure Calculation Worksheets
- ❑ Completed Stormwater Sizing Criteria Worksheets, if applicable (refer to SCVURPPP C.3 Handbook)
- ❑ SMARTS or OWP LID screenshots of completed Post-Construction Water Balance (or equivalent)
- ❑ Site Plan Drawings and supporting details and specifications
- ❑ O&M Plan for source controls, runoff reduction measures, and stormwater treatment measures
- ❑ Completed VTA Signoff for Stormwater and Landscaping Design

Project Data Form

Project Data Form	
Project Name/Number	
Application Submittal Date [to be verified by VTA staff]	
Date Design Initiated / Approval Date [to be verified by VTA staff]	
Construction Start Date	
Construction End Date	
Project Location [Street Address, intersection and/or lat & long]	
Project Phase No. [If project is being constructed in phases, indicate the phase number. If not, enter "NA"]	
Name of Owner or Developer	
Name of Project Manager	
Project Type and Description [Ex: "Parking Lot Addition," "Mixed use Transit Oriented Development"]	
Total Site Area of Disturbed Land (acres)	*Acres*
Total Pre-Project Impervious Surface Area (square feet)	*Square Feet*
Total New or Replaced Impervious Surface Area (square feet)	*Square Feet*
Total Post-Project Impervious Surface Area (square feet)	*Square Feet*

○ Setting

A. Project Location and Description

Include site location, division of parcels, planned land uses, zoning, setback and open space requirements, project phasing, number of residential units or square footage of office or retail, parking requirements, neighborhood character, project design objectives (for example LEED certification), other notable project characteristics. A vicinity map may also be useful.

B. Existing Site Features and Conditions

Include site size, shape, and topography. Hydrologic features, including any contiguous natural areas, wetlands, watercourses, seeps, or springs. Existing land uses. Soil types and hydrologic soil groups, vegetative cover, and impervious areas, if any. Existing drainage for site and nearby areas, including location of municipal storm drains.

C. Opportunities and Constraints for Stormwater Control

Examples of opportunities: Existing natural areas, low areas, oddly configured or otherwise unbuildable areas, easements and required landscape amenities including open space and buffers that might be used for bioretention facilities, and differences in elevation, which can provide needed hydraulic head.

Examples of constraints: impermeable soils, high groundwater, groundwater pollution or contaminated soils, steep slopes, geotechnical instability, density/high-intensity land use, heavy pedestrian or vehicular traffic, utility locations, safety concerns.

○ Low Impact Development Design Strategies

A. Limit Disturbance

If applicable, include documentation in your submittal demonstrating that the following design strategies have been incorporated into your project. **Check which strategies apply**:

- ❑ Limit disturbance of creeks and natural drainage features
- ❑ Minimize compaction of highly-permeable soils
- ❑ Limit clearing and grading of native vegetation at the site to the minimum area needed to build the project, allow access, and provide fire protection
- ❑ Minimize impervious surfaces by concentrating development on the least-sensitive portions of the site, while leaving the remaining land in a natural undisturbed state
- ❑ Not Applicable, if not applicable please explain why: Click or tap here to enter text.

B. Source Control BMPs

Source control Best Management Practices (BMPs) are required as a first step for Regulated Projects. Source controls are designed to reduce the level of contaminants and their concentrations in stormwater runoff at the source rather than treating stormwater pollution. For new projects, designers shall assess the pollutants generated during operation of the facility and include BMPs as needed, which may include enclosures or structures to prevent contact of stormwater with pollutants. Complete the Source Control Checklist (**Attachment 1** of this document) to determine the appropriate Source Control BMPs.

Describe the site activities and related potential sources of pollutants as well as the BMPs selected to prohibit the discharge of such pollutants. Include all selected Permanent Source Controls on your SWCP Drawings.

C. Site Design Runoff Reduction Measures

Site Design Runoff Reduction Measures must be incorporated into projects' design to reduce the amount of runoff to the extent technically feasible**. Select one or more Site Design Runoff Reduction Measure**:

☐ Option 1: Soil Quality Improvement & Maintenance

This is the simplest option. Amend project soils to increase permeability and promote creation of a microbial community.

Confirm the following standard specifications are met:

- ❑ Soils for landscaping meet the following bulk identities:

- ❑ Sands, loamy sands: <1.6
- ❑ Sandy loams, loams: <1.4
- ❑ Sandy clay loams, loams, clay loams: <1.4
- ❑ Silts, silt loams: <1.3
- ❑ Silt loams, silty clay loams: <1.1
- ❑ Sandy clays, silty clays, some clay loams (35-45% clay): <1.1
- ❑ Clays (>45% clay): <1.1

☐ Option 2: Tree Planting & Preservation

Plant and or preserve healthy established tress that include both evergreens and deciduous, as applicable. Install Environmental Sensitive Area (ESA) fencing to protect trees.

On the site plan, show:

- ❑ Location of each preserved tree/ new planted tree
- ❑ Species of each preserved tree/ new planted tree
- ❑ Diameter of each preserved tree
- ❑ ESA fencing locations
- ❑ Irrigation if applicable

☐ Option 3: Porous/Permeable Pavement

Permeable pavements may include pervious concrete, pervious asphalt, porous pavers, crushed aggregate, open pavers with grass or plantings, open pavers with gravel, or solid pavers.
Permeable paving maybe substituted for conventional pavement on parking lots or other areas with light traffic.

Show on your site plan:

- ❑ Location, extent, and types of pervious pavements.

Confirm the following standard specifications are met:

- ❑ No erodible areas drain on to permeable pavement.
- ❑ Geotechnical investigation required to identify soil infiltration rate and to design the subgrade to support the anticipated traffic load. If known soil contamination is present, infiltration is not allowed.
- ❑ When infiltrating, 10 feet of separation between bottom of bed and seasonal high-water table.

❑ Subgrade compaction is minimal.

❑ Reservoir base course is of open-graded crushed stone. Base depth is adequate to retain rainfall (3 inches is adequate) and support design loads (more depth may be required).

❑ No subdrain is included or, if a subdrain is included, outlet elevation is a minimum of 3 inches above bottom of base course.

❑ Subgrade is uniform, and slopes are not so steep that subgrade is prone to erosion. Slopes of pervious pavement surface should not exceed 5% or up to 16% with underdrains. Slopes exceeding 3% typically require berms or check dams placed laterally over the soil subgrade to slow the flow of water and provide some infiltration.

❑ Rigid edge is provided to retain granular pavements and unit pavers.

❑ Solid unit pavers, if used, are set in sand or gravel with minimum 3/8-inch gaps between the pavers. Joints are filled with an open-graded aggregate free of fines.

❑ Permeable concrete or porous asphalt, if used, are installed by industry-certified professionals according to the vendor's recommendations.

❑ Selection and location of pavements incorporates *Americans with Disabilities Act* requirements (if applicable), site aesthetics, and uses.

☐ Option 4: Self-Retaining Area- Rooftop & Impervious Area Disconnection

Downspouts can be directed to vegetated areas adjacent to buildings or extended via pipes to reach vegetated areas further away. Paved areas can be designed with curb cuts, or without curbs, to direct flow into surrounding vegetation.

On the site plan, show:

❑ Each impervious area from which runoff will be directed, and its square footage.

❑ The vegetated areas that will receive runoff, and the approximate square footage of each.

❑ If necessary, explain in notes on the plan how runoff will be routed from impervious surfaces to vegetated areas.

Confirm the following standard specifications are met:

❑ Tributary impervious square footage in no instance exceeds twice the square footage of the receiving pervious area.

❑ Roof areas collect runoff and route it to the receiving pervious area via gutters and downspouts.

❑ Paved areas are sloped so drainage is routed to the receiving pervious area.

❑ Runoff is dispersed across the vegetated area and energy dissipator is installed at downspout to avoid erosion and promote infiltration.

❑ Vegetated area has amended soils, vegetation, and irrigation if needed to maintain soil stability and permeability.

❑ Any drain inlets within the vegetated area allow for a maximum of 3 inches of ponding.

❑ Area of rooftop connecting to each downspout is 600 SF or less.

❑ The maximum contributing impervious flow path is less than 75 ft *OR* if ≥ 75 ft, then storage device is implemented to achieve required disconnection length.

❑ The impervious area to any one discharge location is less than 5,000 SF.

❑ Complete and Attach to this SWCP:

❑ ***Self-Treating Area Calculations Worksheet*** – found at the end of this Attachment.

☐ Option 5: Self-Retaining Area- Vegetated Swales

This option includes vegetated shallow channels that collect and slowly convey runoff to down-stream discharge points.

Show on your site plan:

❑ Location and impervious area that will drain into swale.

Confirm the following standard specifications are met:

❑ Vegetated side slopes at 2H:1V max slope. Mowed turf swales at 3H:1V max.

❑ Grass height 4”-6”. Do not install trees if liner is present.

❑ Swale divider required for bottom widths > 10’. Min. required bottom width is 2’ excluding width of low flow channel. Max. bottom width with divider is 16’.

❑ Depth of flow for water quality treatment must not exceed 2/3 of the grass height and not greater than 3” (infrequently mowed) or 2” (frequently mowed).

❑ Perforation pipe should have perforations set at 120 degrees and perforation slots should be pointed down.

❑ If no underdrain, low flow drain shall extend entire length of swale and shall have a depth of 6” minimum and width no more than 5% swale bottom width. If used, anchored plate flow spreader shall have v-notches (maximum top width 5% of swale width) or holes to allow preferential exit of low flows.

❑ Install check dams or grade control structures for slopes >6% at 50” max spacing to achieve a max effective longitudinal slope of 6%. Flow spreaders must be provided at inlet and at base of each check dam.

❑ Install energy dissipator at the inlet.

❑ Swale length shall be 100’ or length required to provide 10 minutes residence time, whichever is greater.

❑ Tributary impervious square footage in no instance exceeds twice the square footage of the receiving pervious area.

❑ Install appropriate outlet structure to accommodate low flow channel and/or underdrain, if present.

❑ Amend soils with 2" compost tilled into 6" of native soil unless native soil organic content is >10%.

❑ Maximum flow velocity for the runoff from the design storm event is less than or equal to 1.0 ft per second.

❑ 10-ft setback from foundations, 100-ft from septic fields and water supply wells, and 50-ft from steep slopes.

❑ BMP footprint is approximately 10-20% of the drainage area, drainage area less than 2 acres.

Complete and Attach to this SWCP:

❑ ***Self-Treating Area Calculations Worksheet*** – found at the end of this Attachment.

☐ Option 6: Green Roofs

Installing a vegetative layer on a roof can reduce the impervious coverage of the project.

Show on your site plan:

❑ Location and area of green roof that is impervious.

❑ Confirm the following standard specifications are met:

❑ Roof slope less than 15% OR has grid to hold the substrate in place until it forms a thick vegetation mat.

❑ PE has assessed the necessary load reserved and designed a roof structure to meet state and local needs.

❑ Include irrigation plan, if necessary, to sustain the green roof during extended dry periods.

❑ Incorporate watertight liner to prevent rainwater from intruding the underlying structure.

☐ Option 7: Rain Barrels & Cisterns

Use of cisterns or rain barrels to comply with this requirement is subject to municipality approval. Planning and Building Permits may be required from other agencies.

Show on your site plan:

❑ Impervious areas tributary to each cistern or rain barrel.

❑ Location of each cistern or rain barrel.

Confirm the following standard specifications are met:

- ❑ Rain barrels are sited at grade on a sound and level surface at or near gutter downspouts.
- ❑ Gutters tributary to rain barrels are screened with a leaf guard or maximum ½-inch to ¼-inch-minimum corrosion-resistant metallic hardware fabric.
- ❑ Water collected will be used for irrigation only.
- ❑ Openings are screened with a corrosion-resistant metallic fine mesh (1/16-inch or smaller) to prevent mosquito harborage.
- ❑ Large openings are secured to prevent entry by children.
- ❑ Rain barrels and gutters are to be cleaned annually.
- ❑ The local *mosquito and vector control* district is informed of the installation. The district will be provided additional information and/or rights of entry if they request.

☐ Option 8: Stream Setbacks & Buffers

A stream buffer is a vegetated area that exists or is established to protect a stream system, lake reservoir or coastal estuarine area.

Show on your site plan:

- ❑ Location of water body in proximity to project.
- ❑ Area of impervious area that will drain into a stream buffer.

Confirm the following standard specifications are met:

- ❑ Runoff from project enters flood prone width as sheet flow or within 500 ft of a stream channel as sheet flow (whichever is larger).
- ❑ Contributing overland slope is 5% or less *OR* if greater than 5% then a level spreader is used.
- ❑ The buffer area is protected from vehicle or other traffic barriers to reduce compaction.

Stream buffer will be maintained in an ungraded and uncompacted condition and vegetation will be maintained in a natural condition.

Complete the **Site Design Runoff Reduction Checklists** and related calculations (**Attachment E** of *VTA's Landscaping Design Criteria Manual*) for each Runoff Reduction Option selected.

- ❑ Attach only the completed checklists and calculations (if applicable) for the Options(s) selected to this SWCP.
- ❑ Attach related CAD files for all drainage drawings with this SWCP.

If runoff reduction measures are not implemented for the required amount of runoff reduction, explain why such measures were not technically feasible and why stormwater treatment measures must be used.

D. Stormwater Treatment Measures and Sizing Criteria

After incorporating Site Design Runoff Reduction Measures to the extent feasible, remaining runoff from impervious Drainage Management Areas (DMAs) must be directed to a bioretention facility, or equivalent. Bioretention facilities are designed to infiltrate, evapotranspire, and/or biotreat runoff based on the 85th percentile storm event.

Address each Drainage Management Area (DMA) requiring stormwater treatment and select a Stormwater Treatment Measure. A Bioretention Facility should be selected unless a permitted alternative design is met, special site conditions necessitate adjustments, or exceptions are needed due to infeasibility.

***Select one or more Stormwater Treatment Measures for the remaining runoff*:**

☐ Option 1: Bioretention Facility

Confirm the following standard specifications are met, if applicable, as required by the Phase II MS4 Permit, and include the relevant drawing details and specifications in your submittal:

Show on your site plan:

- ❑ Impervious areas tributary to the facility
- ❑ Location and footprint of the facility

Confirm the following standard specifications are met:

- ❑ Maximum surface loading rate of 5 inches per hour, based on the flow rates calculated. A sizing factor of 4% of tributary impervious area may be used.
- ❑ Minimum surface reservoir volume equal to surface area times a depth of 6 inches (6-inch ponding depth).
- ❑ Minimum planting medium depth of 18 inches. The planting medium must sustain a minimum infiltration rate of 5 inches per hour throughout the life of the project and must maximize runoff retention and pollutant removal.
- ❑ Subsurface drainage/storage (Class 2 gravel) layer with an area equal to the surface area and having a minimum depth of 12 inches.
- ❑ No compaction of soils beneath the facility or ripping/loosening of soils if compacted.
- ❑ No liners or other barriers interfering with infiltration (i.e. filter fabric). Design exceptions for impermeable liners are outlined in Option 2 below.

- ❑ Appropriate plant palette for the specified soil mix and maximum available water use. Refer to VTA's Sustainable Landscaping Policy.

- ❑ Overflow outlet connected to a downstream storm drain or approved discharge point. Overflow device has a 5mm perforated grate and allows for a min of 6" of ponding.

- ❑ Include irrigation system if needed. No overspray can enter the overflow. Consider use of a drip system.

- ❑ Perforation pipe should have perforations set at 120 degrees and perforation slot should be pointed down. At least 2" of drain rock should cover the underdrain. The underdrain should be placed at a minimum 0.5% slope to the storm drain or discharge point (unless a flatter slope is allowed based on site-specific conditions). It should be located with a discharge elevation at the top of gravel layer (typically) or at the bottom of the gravel layer (only if a design exception is needed for an impermeable liner).

- ❑ Energy dissipator: Install rock with filter fabric beneath it (or equivalent) at all openings to the basin. Rock should extend past opening.

- ❑ Slope must be no greater than 3:1.

- ❑ Indicate depth to groundwater.

- ❑ If basin has surrounding curb, the depth from the top of curve to the media should not exceed the height of the overflow by more than 2". If exceedance occurs consider safety measures, such as railing. Include curb cuts such that the flow of water is not impeded.

  NOTE: basins that do not pond and/or allow any short circuiting to the underdrain due to excessively long/thin dimensions are not acceptable designs. Basin dimensions must allow for intended ponding. Designers may be required to demonstrate that ponding will occur using flow modeling.

Special Site Conditions:

❑ Option 2: Flow-Through Planter

An above-ground planter box may be appropriate if the development site lacks level landscaped areas for dispersion and pervious pavements are not practical. Planter boxes can treat runoff from impervious surfaces and may adjust bioretention design parameters if certain special site conditions are met. Special site conditions and adjustments include:

- ❑ Facilities located within 10 feet of structures or other potential geotechnical hazards established by the geotechnical expert for the project:

Incorporate an impervious cutoff wall between the bioretention facility and the structure or other geotechnical hazard.

❑ Facilities in areas 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:

- Incorporate an impervious liner.
- Include details indicating how impermeability will be achieved.
- Locate the underdrain discharge at the bottom of the subsurface drainage/storage layer.

❑ Facilities located in areas of highly infiltrative soils or high groundwater, or where connection of underdrain to a surface drain or to a subsurface storm drain are infeasible:

- Omit the underdrain.

Show on your site plan:

❑ Impervious areas tributary to the planter box.

❑ Location and footprint of planter box.

Confirm the following standard specifications are met:

❑ Maximum surface loading rate of 5 inches per hour, based on the flow rates calculated. A sizing factor of 4% of tributary impervious area may be used.

❑ Minimum surface reservoir volume equal to surface area times a depth of 6 inches (6-inch ponding depth).

❑Minimum planting medium depth of 18 inches. The planting medium must sustain a minimum infiltration rate of 5 inches per hour throughout the life of the project and must maximize runoff retention and pollutant removal.

❑ Subsurface drainage/storage (Class 2 gravel) layer with an area equal to the surface area and having a minimum depth of 12 inches.

❑No compaction of soils beneath the facility or ripping/loosening of soils if compacted.

❑Appropriate plant palette for the specified soil mix and maximum available water use. Refer to VTA's Sustainable Landscaping Policy.

❑ Overflow outlet connected to a downstream storm drain or approved discharge point. Overflow device has a 5mm perforated grate and allows for a min of 6" of ponding.

❑ Planter is set level.

❑ Include irrigation system if needed. No overspray can enter the overflow. Consider use of a drip system.

❑ Perforation pipe should have perforations set at 120 degrees and perforation slot should be pointed down. At least 2" of drain rock should cover the underdrain. The underdrain should be placed at a minimum 0.5% slope to the storm drain or discharge point (unless a flatter slope is allowed based on site-specific conditions). It should be located with a discharge elevation at the top of gravel layer (typically) or at the bottom of the gravel layer (only if a design exception is needed for an impermeable liner).

❑ Energy dissipator: Install rock with filter fabric beneath it (or equivalent) at all openings to the planter. Rock should extend past opening.

❑ Slope must be no greater than 3:1.

❑ Indicate depth to groundwater.

❑ If planter has surrounding curb, the depth from the top of curve to the media should not exceed the height of the overflow by more than 2". If exceedance occurs consider safety measures, such as railing. Include curb cuts such that the flow of water is not impeded.

NOTE: Planters that do not pond and/or allow any short circuiting to the underdrain due to excessively long/thin dimensions are not acceptable designs. Basin dimensions must allow for intended ponding. Designers may be required to demonstrate that ponding will occur using flow modeling.

Other:

☐ Option 3: Alternative Design for Equivalent Bioretention Facility

This option may be permitted if the following measures demonstrate equivalent effectiveness to a Bioretention Facility.

Show on your site plan:

❑ Impervious areas tributary to the planter box

❑ Location and footprint of the Alternative Design Bioretention Facility

Confirm the following standard specifications are met:

❑ An equal or greater amount of runoff is infiltrated or evapotranspired

❑ An equal or lower pollutant concentration in runoff that is discharged after bioretention

❑ An equal or greater protection against shock loadings and spills

❑ An equal or greater accessibility and ease of inspection and maintenance

❑ Overflow fitted with 5 mm perforated grate

☐ Option 4: Tree-Box-Type Biofilter/ Tree-Well Filter

A Tree-Box-Type Biofilter or Tree-Well Filter may be used if it is demonstrated that the use of a bioretention facility (Option 1) or facility of equivalent effectiveness (Option 3) is infeasible. These may be used for the following:

❑ Projects creating or replacing an acre or less of impervious area, and located in a designated pedestrian-oriented commercial district (i.e., Smart Growth projects), and having at least 85% of the entire project site covered by permanent structures

❑ Facilities receiving runoff solely from existing (pre-project) impervious areas

❑ Historic sites, structures, or landscapes that cannot alter their original configuration to maintain their historic integrity

Show on your site plan:

❑ Impervious areas tributary to the tree filter

❑ Location and footprint of tree filter

Confirm the following standard specifications are met:

❑ Overflow fitted with 5 mm perforated grate.

❑ Impervious area slopes to top of tree filter.

❑ Vegetation is centered in treatment area.

❑ Perforation pipe should have perforations set at 120 degrees and perforation slots should be pointed down or installed per manufacturer's recommendation.

❑ Ensure that the drip line of trees does not impede pedestrians.

❑ Install mulch, per manufacturer's recommendation.

❑ Include irrigation system if needed. No overspray can enter the overflow. Consider use of a drip system.

❑ The top of the impervious surface to the top of the planting media layer should be a maximum depth of 1 foot or per the manufacturer's recommendation.

❑ Inflow rate is that generated by a continuous rainfall intensity of 0.2 inches/hour.

Maximum design surface loading rate of 50 inches per hour.

❑ Inlet design to capture flows at least up to the maximum design surface loading rate and to by-pass high flows.

❑ Minimum media depth of 3.5 feet (may be reduced, but maintaining the same media volume, if required because of inadequate head to discharge point).

☐ Option 5: In-Vault Media Filter

An In-Vault Media Filter may be used if it is demonstrated that the use of a bioretention facility (Option 1) or facility of equivalent effectiveness (Option 3) is infeasible. These may be used for the following:

❑ Projects creating or replacing an acre or less of impervious area, and located in a designated pedestrian-oriented commercial district (i.e., smart growth projects), and having at least 85% of the entire project site covered by permanent structures

❑ Facilities receiving runoff solely from existing (pre-project) impervious areas

❑ Historic sites, structures, or landscapes that cannot alter their original configuration to maintain their historic integrity.

Show on your site plan:

❑ Impervious areas tributary to the media filter

❑ Location and footprint of the media filter

Confirm the following standard specifications are met:

❑ Overflow fitted with 5 mm perforated grate

❑ Impervious area slopes to media filter

❑ Inflow rate is that generated by a continuous rainfall intensity of 0.2 inches per hour

❑ Replaceable cartridge filters

❑ Maximum design filter surface loading rate of 1 gpm/ft2

❑ Storage volume detains runoff and allows settling of coarse solids prior to filtration

❑ Flow through the cartridge filters is controlled by an orifice or other device so that the design surface loading rate is not exceeded

❑ **Other biotreatment or media filter**

❑ Other(description):

Describe the overall site comparison of pre-construction surfaces to post-construction surfaces. Describe each DMA and identify the Site Design Runoff Reduction Measures and Stormwater Treatment Measures installed to reduce/treat stormwater runoff.

Complete the **Stormwater Treatment Measure Calculation Worksheets** (**Attachment 2** of this document) for each Stormwater Treatment Measure selected above.

❑ Attach only the completed checklists and related calculations for the Options(s) selected to this SWCP.

❑ Attach related CAD files for all drainage drawings with this SWCP.

Alternatively, use of an "equivalent" method to quantify stormwater treatment is acceptable. Designers may also size the stormwater treatment measures using volumetric or flow-based hydraulic sizing criteria. If this method is used, refer to the **Santa Clara Valley Urban Runoff Pollution Prevention Program** (SCVURPPP) C.3 **Stormwater Handbook** and complete the Sizing Criteria Worksheets.

❑ Attach the completed worksheets to this SWCP. In addition, provide the *applicable* details for the calculations in the Volumetric & Flow-Based Criteria Table in **Attachment 2** of this document.

E. Post-Construction Water Balance

To determine the post-construction water balance for the project, use the State's Storm Water Multiple Application & Report Tracking System (SMARTS) system or use the Office of Water Programs (OWP) online California Phase II LID Sizing Tool- v1.1.

To use the SMARTS system, refer to **Attachment G** of the *VTA Stormwater and Landscaping Design Criteria Manual*. Take screenshots of the Water Balance and attach to this SWCP. To use the OWP Low Impact Development (LID) Sizing Tool refer to **Attachment H** of the *VTA Stormwater and Landscaping Design Criteria Manual*.

❑ Take screenshots of the Water Balance and attach to this SWCP.

○ Stormwater Control Plan Drawings Checklist

Verify incorporation of SWCP requirements in drawings/plan sheets:

Stormwater Control Plan Page #	Source Control or Treatment Control Measure	See Plan Sheet #s

○ Stormwater Operations and Maintenance Plan

Designers must specify how to operate and maintain the BMPs selected by developing an **Operation and Maintenance (O&M) Manual**. The O&M Plan should include the Source Controls, Runoff Reduction Measures, and Stormwater Treatment Measures selected in the SWCP. Refer to **Attachment L** of the *VTA Stormwater and Landscaping Design Criteria Manual* for a Template O&M Manual.

❑ Attach the completed O&M Manual to this SWCP.

○ Submittal and VTA Signoff

Complete the **VTA Signoff for Stormwater and Landscaping Design**, **Attachment F** of the *VTA Stormwater and Landscaping Design Criteria Manual* and submit with this SWCP. Submittal of the Draft(s) and Final Stormwater Control Plans (SWCPs) should be concurrent with every major design submittal (i.e., 35%, 65%, 95% and As-Built Record Documents after construction).

Attachment 1: Source Control Checklist

Instructions:

1. Review Column 1 and identify which of these potential sources of stormwater pollutants apply to your site. Check each box that applies.

2. Review Column 2 and incorporate all corresponding applicable Structural/Permanent Source Control BMPs in your Stormwater Control Plan drawings.

3. Review Columns 3 and 4 and incorporate all corresponding applicable Structural Source Control BMPs and Operational Source Control BMPs in a table in your Stormwater Control Plan. Describe your specific BMPs in your SWCP and explain any special conditions or situations that required omitting BMPs or substituting alternative BMPs.

If these sources will be used on the project site…	…Then your Stormwater Control Plan (SWCP) should include these Source Control BMP's		
1 Potential Sources of Runoff Pollutants	2 Permanent Source Controls—Show on SWCP Drawings	3 Permanent Source Controls—Include in this SWCP Table	4 Operational Source Control BMPs—Include in this SWCP Table
❑ A. On-site storm drain inlets (unauthorized non- stormwater discharges and accidental spills or leaks)	❑ Location of inlets.	❑ Mark all inlets with VTA's medallion stating "No Dumping. Flows to Bay" or similar.	❑ Maintain and periodically replace inlet medallions. ❑ Provide stormwater pollution prevention information and the "Stormwater Awareness for VTA Tenants" training tri-fold to new site owners, lessees, or operators. ❑ See applicable operational BMPs in Fact Sheet SC-44, "Drainage System Maintenance," in the CASQA Stormwater Quality Handbooks at www.casqa.org/resources/bmp-handbooks ❑ Include VTA's MS4 Lease Conditions in all lease agreements
❑ B. Escalators, elevators, and sump pumps	❑ Show drains and pump locations	❑ State that sump pumps will be plumbed to a sand oil interceptor or to sanitary sewer. ❑ Designer coordinated directly with Engineering and Program Delivery Department and Deputy Director of Rail and Facilities or their designee, and alternate design coupled with VTA O&M is equivalent to this BMP. Attach signoff for MS4 approval.	❑ Inspect and maintain drains to prevent blockages and overflow.

If these sources will be used on the project site…	…Then your Stormwater Control Plan (SWCP) should include these Source Control BMP's		
1 Potential Sources of Runoff Pollutants	2 Permanent Source Controls—Show on SWCP Drawings	3 Permanent Source Controls—Include in this SWCP Table	4 Operational Source Control BMPs—Include in this SWCP Table
❑ C. Interior parking garages	❑ Show drain locations	❑ State that parking garage floor drains will be plumbed to the sanitary sewer. This provides a means to drain fire sprinkler test water and other non-stormwater discharges to the sanitary sewer.	❑ Inspect and maintain drains to prevent blockages and overflow.
❑ D1. Need for future indoor, outdoor & structural pest control		❑ Note building design features that discourage entry of pests OR stormwater design features that may impede mosquito abatement (such as trash capture devices). ❑ Design landscaping to minimize the use of fertilizers and pesticides that can contribute to stormwater pollution. ❑ Consider using pest-resistant plants, especially adjacent to hardscape.	❑ Provide Integrated Pest Management (IPM) information to owners, lessees, and operators. ❑ Maintain landscaping using minimum or no pesticides. ❑ See applicable operational BMPs in Fact Sheet SC-41, "Building and Grounds Maintenance," in the CASQA Stormwater Quality Handbooks at www.casqa.org/resources/bmp-handbooks
❑ D2. Landscape and Grounds Maintenance/ Irrigation	❑ Show locations of native trees or areas of shrubs and ground cover to be undisturbed and retained. ❑ Show self-retaining landscape areas, if any. ❑ Show bioretention facilities.	❑ State that final landscape plans will accomplish all of the following. ❑ Preserve existing native trees, shrubs, and ground cover to the maximum extent possible. ❑ Where landscaped areas are used to retain or detain stormwater, specify plants that are tolerant of saturated soil conditions. ❑ Limit use of irrigation. If irrigation is used, limit run-off. ❑ To ensure successful establishment, select plants appropriate to site soils, slopes, climate, sun, wind, rain, land use, air movement, ecological consistency, and plant interactions. Refer to VTA's Landscaping Policy. ❑ Provide a means to drain fire department test water to landscaping where feasible.	❑ Provide Integrated Pest Management (IPM) information to owners, lessees, and operators. ❑ See applicable operational BMPs in Fact Sheet SC-41, "Building and Grounds Maintenance," in the CASQA Stormwater Quality Handbooks at www.casqa.org/resources/bmp-handbooks
❑ E. Ponds, decorative fountains, and other water features.	❑ Show location of water feature and a sanitary sewer cleanout in an accessible area within 10 feet.		❑ See applicable operational BMPs in Fact Sheet SC-72, "Fountain and Pool Maintenance," in the CASQA Stormwater Quality Handbooks at www.casqa.org/resources/bmp-handbooks

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❑ F. Food service	❑ For restaurants and other food service operations, show location (indoors or in a covered area outdoors) of a floor sink or other area for cleaning floor mats, containers, and equipment. ❑ On the drawing, show a note that this drain will be connected to a grease interceptor before discharging to the sanitary sewer.	❑ Describe the location and features of the designated cleaning area. ❑ Describe the items to be cleaned in this facility and how it has been sized to ensure that the largest items can be accommodated.	❑ State maintenance schedule for grease interceptor
❑ G. Refuse areas	❑ Show where site refuse and recycled materials will be handled and stored for pickup. See local municipal requirements for sizes and other details of refuse areas. ❑ Any drains from dumpsters, compactors, and tallow bin areas shall be connected to a grease removal device before discharge to sanitary sewer.	❑ State how site refuse will be handled and provide supporting detail to what is shown on plans.	❑ State how the following will be implemented: ❑ Provide adequate number of receptacles. Inspect receptacles regularly; repair or replace leaky receptacles. Ensure all receptacles have lids. Ensure O&M crew picks up litter as needed.
❑ H. Industrial processes.	❑ Show process area.	❑ If industrial processes are to be located on site, state: "All process activities to be performed indoors. No processes to drain to exterior or to storm drain system."	❑ Clean up spills immediately. Keep spill control materials available on-site. ❑ See Fact Sheet SC-34, "Waste Handling and Disposal" and Fact Sheet SC-10, "Non-Stormwater Discharges" in the CASQA Stormwater Quality Handbooks at www.casqa.org/resources/bmp-handbooks

If these sources will be used on the project site…	…Then your Stormwater Control Plan (SWCP) should include these Source Control BMP's		
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❑ I. Outdoor storage of equipment or materials. (See rows J and K for source control measures for vehicle cleaning, repair, and maintenance.)	❑ Show any outdoor storage areas, including how materials will be covered. Show how areas will be graded and bermed to prevent run-on or run-off from area. ❑ Storage of non-hazardous liquids shall be covered and in secondary containment and/or drain to the sanitary sewer system, and be contained by berms, dikes, liners, or vaults. ❑ Storage of hazardous materials and wastes must be in compliance with the local hazardous materials ordinance and a Hazardous Materials Management Plan for the site.	❑ Include a detailed description of materials to be stored, storage areas, and structural features to prevent pollutants from entering storm drains. ❑ Where appropriate, reference documentation of compliance with the requirements of programs for: Hazardous Waste Generation, Hazardous Materials Release Response and Inventory, California Accidental Release (CalARP), Aboveground Storage Tank, Uniform Fire Code Article 80 Section 103(b) & (c) 1991, and Underground Storage Tank	❑ See the Fact Sheets SC-31, "Outdoor Liquid Container Storage" and SC-33, "Outdoor Storage of Raw Materials" in the CASQA Stormwater Quality Handbooks at www.casqa.org/resources/bmp-handbooks
❑ J. Vehicle and Equipment Cleaning	❑ Show on drawings as appropriate: ❑ (1) Commercial/industrial facilities having vehicle/equipment cleaning needs shall either provide a covered, bermed area for washing activities or discourage vehicle/equipment washing by removing hose bibs and installing signs prohibiting such uses. ❑ (2) Washing areas for cars, vehicles, and equipment shall be paved, designed to prevent run-on to or runoff from the area, and plumbed to drain to the sanitary sewer. ❑ (3) Industrial car wash facilities shall be designed such that no runoff from the facility is discharged to the storm drain system. Wastewater from the facility shall discharge to the sanitary sewer, or a wastewater reclamation system shall be installed.	❑ If a car wash area is not provided, describe measures taken to discourage on-site car washing and explain how these will be enforced.	❑ Describe operational measures to implement the following (if applicable): ❑ Wash water from vehicle and equipment washing operations shall not be discharged to the storm drain system. ❑ See Fact Sheet SC-21, "Vehicle and Equipment Cleaning," in the CASQA Stormwater Quality Handbooks at www.casqa.org/resources/bmp-handbooks

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❑ K. Vehicle/Equipment Repair and Maintenance	❑ Accommodate all vehicle equipment repair and maintenance indoors. Or designate an outdoor work area and design the area to prevent run-on and runoff of stormwater. ❑ Show secondary containment for exterior work areas where motor oil, brake fluid, gasoline, diesel fuel, radiator fluid, acid-containing batteries or other hazardous materials or hazardous wastes are used or stored. Drains shall not be installed within the secondary containment areas. ❑ Add a note on the plans that states either (1) there are no floor drains, or (2) floor drains are connected to wastewater pretreatment systems prior to discharge to the sanitary sewer and an industrial waste discharge permit will be obtained, if needed.	❑ State that no vehicle repair or maintenance will be done outdoors, or else describe the required features of the outdoor work area. ❑ State that there are no floor drains or if there are floor drains, note the agency from which an industrial waste discharge permit will be obtained and that the design meets that agency's requirements. ❑ State that there are no tanks, containers or sinks to be used for parts cleaning or rinsing or, if there are, note the agency from which an industrial waste discharge permit will be obtained and that the design meets that agency's requirements.	❑ In the Stormwater Control Plan, note that all the following restrictions apply to use the site: ❑ No person shall dispose of, nor permit the disposal, directly or indirectly of vehicle fluids, hazardous materials, or rinse water from parts cleaning into storm drains. ❑ No vehicle fluid removal shall be performed outside a building, nor on asphalt or ground surfaces, whether inside or outside a building, except in such a manner as to ensure that any spilled fluid will be in an area of secondary containment. Leaking vehicle fluids shall be contained or drained from the vehicle immediately. ❑ No person shall leave unattended parts or other open containers containing vehicle fluid, unless such containers are in use or in an area of secondary containment.
❑ L. Fuel Dispensing Areas	❑ Fueling areas shall have impermeable floors (i.e., portland cement concrete or equivalent smooth impervious surface) that are: a) graded at the minimum slope necessary to prevent ponding; and b) separated from the rest of the site by a grade break that prevents run-on of stormwater to the maximum extent practicable. ❑ Fueling areas shall be covered by a canopy that extends a minimum of ten feet in each direction from each pump. [Alternative: The fueling area must be covered and the cover's minimum dimensions must be equal to or greater than the area within the grade break or fuel dispensing area1.] The canopy [or cover] shall not drain onto the fueling area.		❑ The property owner shall dry sweep the fueling area routinely. ❑ See the Business Guide Sheet, "Automotive Service—Service Stations" in the CASQA Stormwater Quality Handbooks at www.casqa.org/resources/bmp-handbooks

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❑ M. Loading Docks	❑ Show the loading dock area, including roofing and drainage. Loading docks shall be covered and/or graded to minimize run-on to and runoff from the loading area. Roof downspouts shall be positioned to direct stormwater away from the loading area. Water from loading dock areas shall be drained to the sanitary sewer or diverted into treatment. ❑ Loading dock areas draining directly to the sanitary sewer shall be equipped with a spill control valve or equivalent device, which shall be kept closed during periods of operation. ❑ Provide a roof overhang over the loading area		❑ Move loaded and unloaded items indoors as soon as possible. ❑ See Fact Sheet SC-30, "Outdoor Loading and Unloading," in the CASQA Stormwater Quality Handbooks at www.casqa.org/resources/bmp-handbooks
❑ N. Miscellaneous Drain or Wash Water or Other Sources ❑ Boiler drain lines ❑ Condensate drain lines ❑ Rooftop equipment ❑ Drainage sumps ❑ Roofing, gutters, and trim. ❑ Other sources	❑ Show drain lines and drainage sumps	❑ Boiler drain lines shall be directly or indirectly connected to the sanitary sewer system and may not discharge to the storm drain system. ❑ Condensate drain lines may discharge to landscaped areas if the flow is small enough that runoff will not occur. Condensate drain lines may not discharge to the storm drain system. ❑ Rooftop equipment with potential to produce pollutants shall be roofed and/or have secondary containment. ❑ Include controls for other sources as specified by local reviewer.	❑ If architectural copper is used, implement the following BMPs for management of rinse water during installation: ❑ If possible, purchase copper materials that have been pre-patinated at the factory. ❑ If patination is done on-site, prevent rinse water from entering storm drains by discharging to landscaping or by collecting in a tank and hauling off-site. ❑ Consider coating the copper materials with an impervious coating that prevents further corrosion and runoff. ❑ Implement the following BMPs during routine maintenance: ❑ Prevent rinse water from entering storm drains by discharging to landscaping or by collecting in a tank and hauling off-site.

If these sources will be used on the project site…	…Then your Stormwater Control Plan (SWCP) should include these Source Control BMP's		
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❑ O. Plazas, sidewalks, and parking lots.	❑ Show extent of permeable paving materials		❑ Sweep plazas, sidewalks, and parking lots regularly to prevent accumulation of litter and debris. Collect debris from pressure washing to prevent entry into the storm drain system. Collect wash water containing any cleaning agent or degreaser and discharge to the sanitary sewer not to a storm drain.

Attachment 2: Stormwater Treatment Measure Calculation Worksheets

Site design will be dependent on the area of the proposed post-construction impervious surfaces in comparison to the pre-construction impervious surfaces. Fill out the tables below to guide your treatment measure sizing requirements.

Total Pervious and Impervious Surfaces Comparison

Project Title	Total Area (SF)	Pre-Construction		Post-Construction		Pre-Con to Post-Con		
		Impervious Area (SF) [A]	Pervious Area (SF)	Impervious Area (SF) [B]	Pervious Area (SF)	Impervious Area		
						SF: [B] - [A] = [C]	% increase or decrease: [C/A] x100	% Increase
								❑ >50% ❑ <50%

Total Pervious and Impervious Surfaces Comparison- Roadway Projects

Fill out the table below for public road projects and/or any projects that are under the building and planning authority of a Permittee.

Project Title	Total Area (SF)	Pre-Construction		Post-Construction		Pre-Con to Post-Con	
		Impervious Area (SF) [A]	Pervious Area (SF)	Impervious Area (SF) [B]	Pervious Area (SF)	Impervious Area	
						SF: [B-A] = [C]	Is [C] greater than or equal to 5,000 SF?
							❑ Yes ❑ No

Drainage Management Areas with Stormwater Treatment Measures

Bioretention facilities are designed to infiltrate, evapotranspire, and/or biotreat runoff based on the 85th percentile 24-hour storm event. Fill out the tables below for each Drainage Management Area (DMA) requiring stormwater treatment.

A sizing factor of a minimum of 4% of the tributary impervious area may be used. If this method is used, complete the sizing calculations for the 4% method below.

Designers may also size the bioretention basin using volumetric or flow-based hydraulic sizing criteria. If this method is used, refer to the Santa Clara Valley Urban Runoff Pollution Prevention Program (SCVURPPP) C.3 Stormwater Handbook and complete the Sizing Criteria Worksheets. Attach the completed worksheets to this SWCP. In addition, provide the *applicable* details for the calculations in the Volumetric & Flow-Based Criteria Table below.

Sizing calculations for bioretention facilities use a runoff coefficient to determine the amount of contributing runoff from different surfaces. Use the Table below to determine the runoff coefficient for the impervious area contributing runoff to the facility. Then Complete the calculations table below to determine the sizing criteria for each drainage management area using bioretention facilities to treat stormwater.

Estimated Runoff Coefficient for Surfaces During Small Storms	
Type of Surface Contributing Run-Off	Runoff Coefficient [A]
Roofs	.90
Concrete or Asphalt	
Stone, brick, or concrete pavers with mortared or sand joints and bedding	
Grass	.10
Permeable Pavement	
Crushed aggregate	

Bioretention Facility Sizing Calculations – 4% Method

DMA ID (as referred to on drawings)	Total Drainage Management Area (SF)	Post Project Impervious Surface Type	Runoff Coefficient [A]	Impervious Surface Area (SF) [B]	Contributing Runoff (SF) [C] = [A] x [B]	Receiving Pervious Bioretention Area (SF) [D]	Impervious Ratio [E]= [D]/ [C]	Meets **minimum sizing factor of 4%?** ([E] ≥ 0.04)
								❑ Yes ❑ No
								❑ Yes ❑ No

Bioretention Facility Sizing Calculations – Volumetric & Flow-Based Criteria

DMA ID	Soil Type	Receiving Pervious Area (SF)	Impervious Surface Area (SF)	Post Project Impervious Surface Type	Runoff Coeff.	Depth to Groundwater (ft., in.)	Design Treatment Intensity (i=x in/hr)	Design Rainfall Intensity (I=x in/hr)	Treatment Flow Rate (CFS)	Unit Basin Storage (in.)	Basin Design Volume (CF)	Duration of Design Storm (hr.)