

POST-CONSTRUCTION STANDARDS PLAN

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INTRODUCTION AND REGULATORY REQUIREMENTS

1 Introduction and Regulatory Requirements

This Post-Construction Standards Plan was developed to provide guidance for various site design requirements of the Phase II Municipal Separate Storm Water Sewer System (MS4) Permit. The City of Redding (City) is considered a traditional, small Phase II municipality; therefore, is required to implement all provisions of the MS4 Permit.

1.1 Purpose of the Plan

According to the California State Water Resource Control Board (Water Board), urban storm water runoff is listed as the primary source of impairment for ten percent of all rivers, lakes and reservoirs, and seventeen percent of all estuaries in California.¹ While these numbers may not seem large, considering that urban areas cover six percent of California's² land mass, the impact of urban runoff is disproportionately large. Urbanization is the development of land through which buildings and hardscapes prevent water from infiltrating into the ground. The water that would have naturally infiltrated prior to development becomes run-off which usually flows away from the property into natural waterways or manmade storm drain facilities. Increasing the run-off leaving a site may cause erosive flows that carry pollutants (trash, dirt, chemicals, etc.) into local waterbodies and may change the shape of natural channels downstream. Poorly managed additional run-off from urbanization could cause flooding and deterioration



Figure 1: Channels, Streams, and drainage are impacted by increased upstream impervious surface

of waterways that, prior to upstream urbanization, were adequate to handle the pre-development runoff. Increased storm water run-off has a direct impact on municipalities. Municipalities perform more maintenance on existing systems and develop new drainage systems with higher capacities. Urbanization and the resulting runoff, impacts the State's ability to utilize all of the beneficial uses of its surface waters.

This document provides the local design and development community with information about how to meet the local Regional Water Board requirements for mitigating the negative impact of increased storm water runoff caused by new development and/or redevelopment

within the City of Redding. This document provides Low Impact Development resources and

¹ Fact Sheet of the Phase II MS4 Permit, Order No. 2013-0001-DWQ, p. 33 - 34

² U.S. Department of Agriculture, 2009

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hydromodification management techniques as defined by the Phase II MS4 Permit, Order No. 2013-0001-DWQ (Phase II MS4 Permit). Low Impact Development (LID) mitigates runoff from frequent small rain events by the use of evapo-transpiration, infiltration, capture / reuse, and biotreatment to reduce the

Low Impact Development – A sustainable practice that benefits water supply and contributes to water quality protection. Unlike traditional storm water management, which collects and conveys storm water runoff through storm drains, pipes, or other conveyances to a centralized storm water facility, Low Impact Development (LID) takes a different approach by using site design and storm water management to maintain the site's pre-development runoff rates and volumes. The goal of LID is to mimic a site's predevelopment hydrology by using design techniques that infiltrate, filter, store, evaporate, and detain runoff close to the source of rainfall. LID has been a proven approach in other parts of the country and is seen in California as an alternative to conventional storm water management.

Source: Phase II MS4 Permit Glossary

amount of runoff conveyed by City storm drains. Hydromodification management techniques are used to design development sites so that post-construction runoff flow rates do not exceed those of the pre-construction conditions.

This document provides guidance on how to develop the entitlement level and plan check level submittal packages to adequately demonstrate how the project will meet the LID and hydromodification requirements of the City of Redding's Phase II MS4 Permit.

1.2 Federal and State Regulatory Requirements

The Federal Clean Water Act is the impetus behind all regulations to manage storm water discharges from new development and redevelopment projects. The Clean Water Act distributes authority to the States to issue National Pollutant Discharge Elimination System (NPDES) permits. The permits are for discharges of storm water from construction, industrial, and municipal entities to

Waters of the United States. Large and medium size municipalities were issued individual municipal NPDES permits in the first phase (Phase I) of the process. Subsequently, small municipalities identified by the State of California were required to obtain permit coverage under the Phase II General NPDES Permit for Municipal Separate Storm Water Sewer Systems (MS4). These Phase II MS4s (municipalities) are required to implement various storm water management programs, one of which is to require certain new development and applicable redevelopment projects to incorporate post-construction storm water control measures into their design. Post-construction storm water control measures include LID and hydromodification techniques which are contained in Section E. 12 of the MS4 General Permit. (Refer to [Appendix 3](#) for copy of Section E.12 of the Phase II MS4 Permit.)

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1.3 Regional Approach and Municipal Collaboration

The post-construction requirements are not new with this version of the Phase II MS4 Permit. The previous version of the permit also contained LID and post-construction requirements. For many years now, Phase I MS4s have been requiring development and redevelopment projects to include post-construction design measures. Projects outside of any MS4 now are incorporating post-construction and LID measures into their designs as required by the State's Construction General Permit. However, as Low Impact Development strategies have grown to maturity, post-construction requirements and programs have changed significantly such that there can be dramatic differences between neighboring municipalities. With the roll out of the current Phase II MS4 Permit and the requirement for small municipalities to, for the most part, completely overhaul their post-construction requirements to meet the Section E.12 requirements, an opportunity arose for many Phase II MS4s to combine resources and develop a consistent Post-Construction Storm Water Standards Plan. Collaboration on this task not only shares the cost of development with other Phase II MS4s, but also provides a standardized plan that developers will encounter in 17 different Central Valley municipalities. Another benefit is that it allows for regional training of plan checkers on this common plan, saving more cost and time for each municipality.

1.4 Overview of the Post-Construction Requirements

The Phase II MS4 Permit requires the City of Redding to condition certain **small projects** with implementing one or more **Site Design Measures** that “treat” storm water runoff using methods to evapo-transpire, infiltrate, harvest and reuse, or biotreat. After proponents of small projects select the Site Design Measure(s), they are required to quantify the runoff reduction achieved through the implementation of those measures. This is done using the State Water Board's Post-Construction Calculator (which can be downloaded following the information provided in [Appendix 5](#)).

Proponents of **larger projects** are required to implement specific **Source Control Measures** to minimize the impact of pollutant-generating activities. For example, if the project includes a permanent trash enclosure in its design, it will be required to be designed following the California Storm Water Quality Association's (CASQA) design standard SD-32; meaning, that among other requirements, the trash enclosure will need to have a wall or screen around it and a rain proof covering or container lids.

This larger project will need to incorporate specific **Low Impact Development (LID) Standards** such as concentrating development

Hydromodification - Modification of hydrologic pathways (precipitation, surface runoff, infiltration, groundwater flow, return flow, surface-water storage, groundwater storage, evaporation and transpiration) that results in negative impacts to watershed health and functions.

Source Control - Land use or site planning practices, or structural or nonstructural measures, that aim to prevent runoff pollution by reducing the potential for contact with rainfall runoff at the source of pollution. Source control BMPs minimize the contact between pollutants and urban runoff.

Source: Phase II MS4 Permit Glossary

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on portions of the site with less permeable soils and preserving areas that can promote infiltration. As with the smaller project, the larger project will need to implement **Site Design Measures** to the extent technically feasible to “treat” storm water. Potential Site Design Measures include permeable pavement or a green roof. In the case of larger projects, the Site Design Measure(s) will be sized following specified hydraulic sizing criteria. In addition, the project is required to incorporate **Storm Water Treatment Measures (SWTM)**. SWTM can be used for treatment and infiltration of the 85th percentile 24 hour storm and hydromodification requirements in Section 5.5. The project proponent or subsequent property owner is required to maintain the effectiveness of all storm water control measures in perpetuity.

1.5 Role of the Municipal Plan Checker

The Phase II MS4 Permit states that the municipality “shall require these post-construction standards to be applied on applicable new and redevelopment regulated projects, both private development requiring municipal permits and public projects, to the extent allowable by applicable law.” Therefore, the role of the municipal plan checker is to verify that applicable projects have been properly conditioned with the post-construction standards. The plan checker is responsible for performing the following tasks:

- Providing conditions of approval that inform the developer their project must comply with the Phase II MS4 Permit hydromodification and Post Construction BMP implementation requirements.
- Communicate to the project proponent any required changes or modifications and request a re-submittal of information.
- Maintain records of all submitted post-construction design information and plans for a minimum of 5 years.
- Maintain records of Regulated and Small Projects that have post construction BMP’s. The City will leverage the information for annual verification that the storm water treatment measures and hydromodification measures are being maintained in an effective condition.
- Perform an entitlement level review of the submitted post-construction package including the completed Post-Construction Project Worksheet (included in [Appendix 7](#)).

1.6 Role of the Project Owner

The Phase II MS4 Permit and The City of Redding require the project owner incorporate, construct, and maintain post-construction measures. The project owner is responsible for performing the following tasks:

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- Selecting, sizing, and engineering site design measures, source control measures, storm water treatment measures, and hydromodification management techniques that are adequate in meeting the requirements of the MS4 Phase II Permit.
- Providing the City plan checker the required submittal package, supporting information, maps, drawings, and calculations; including those that have been stamped by a certified and / or licensed professional.
- Providing an Operation and Maintenance Plan for the on-going maintenance of the constructed post-construction design measures.
- Providing any additional requested information to the plan checker.
- Verifying that approved site design measures and source control measures are constructed as specified on the approved plans.

APPLICABILITY

2 Applicability

All projects fall into one of three possible categories: **small, regulated, or not applicable**. If a project does not qualify under either of the two following sections, the Post Construction Standards Plan does not apply to it.

2.1 Small Projects 2,500 to 5,000 ft²

Small Projects are defined by the MS4 Phase II Permit as those that create and/or replace between 2,500 ft² and 5,000 ft² of impervious surface. This includes projects that have no net increase in the impervious footprint. Single family homes that create and / or replace 2,500 ft² or more of impervious surface and are not part of a larger plan of development are considered to be applicable small projects. Small projects would include, but are not limited to, the following:

New construction that creates between 2,500 ft² and 5,000 ft² of impervious surface;

A demolition of a small project site and the redevelopment of that site if more than 2,500 ft² of impervious surface is replaced or created;

The replacement of 2,500 ft² or more of a parking lot;

The construction of a new parking lot that is less than 5,000 ft²; and

A roadway or sidewalk project that is creating or replacing between 2,500 ft² and 5,000 ft² of impervious surface.

Linear utility projects (LUPs) are not subject to the small project Site Design Measure requirements. If a small project see section 4: Requirements for Small Projects.

2.2 Regulated Projects >5,000 FT²

“Regulated Project” is defined by the MS4 Phase II Permit as one that will create and / or replace 5,000 ft² or more of impervious surface. Regulated Projects include new and redevelopment projects on public or private land that fall under the planning and permitting authority of the City. Redevelopment is defined as any land-



Figure 2 A single family home that creates and / or replaces 2,500 ft² or more is a small project.

Impervious Surface - A surface covering or pavement of a developed parcel of land that prevents the land's natural ability to absorb and infiltrate rainfall/storm water. Impervious surfaces include, but are not limited to; roof tops, walkways, patios, driveways, parking lots, storage areas, impervious concrete and asphalt, and any other continuous watertight pavement or covering. Landscaped soil and pervious pavement, including pavers with pervious openings and seams, underlain with pervious soil or pervious storage material, such as a gravel layer sufficient to hold the specified volume of rainfall runoff are not impervious surfaces.

Source: Phase II MS4 Permit Glossary

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disturbing activity that results in the creation, addition, or replacement of exterior impervious surface areas on a site on which some past development has occurred. Regulated Projects do not include the following:

Detached single family homes that are not a part of a larger plan of development (they are considered to be a “small project” even if they exceed 5,000 ft² of impervious surface);

Projects that are exclusively interior remodels;

Routine maintenance or repair such as exterior wall surface replacement, pavement grinding and resurfacing within the existing footprint, and roofing replacement or repair;

Projects consisting solely of sidewalks or bicycle lanes built as part of new streets or roads and built to direct storm water runoff to adjacent vegetated areas;

Projects consisting solely of impervious trails built to direct storm water to adjacent non-erodible permeable areas;

Projects consisting solely of sidewalks, bicycle lanes, or trails constructed with permeable surfaces;

Replacement of damaged pavement or the replacement of short, non-contiguous sections of roadways; and

Trenching, excavation, and resurfacing associated with Linear Utility Projects (LUPs) unless it has a discrete location that has 5,000 ft² or more of newly constructed contiguous impervious surface such as a pump station or maintenance facility. In such cases, only the discrete location is subject to this Post-Construction Standards Plan.

Please note that some of the above-listed projects may still be considered “small projects” even if they are exempted from being a Regulated Project.

2.3 The 50% Rule

If a redevelopment project results in an increase of more than 50 percent of the impervious surface of a previously existing development, runoff from the entire project, consisting of all existing, new, and/or replaced impervious surfaces, must be included in the selection and sizing of site design measures, LID design standards, and hydromodification management measures to the extent feasible. However, if the redevelopment project results in an increase of less than 50 percent of the impervious surface, only runoff from the new and/or replaced impervious surface must be included in the selection and sizing of site design measures, LID design standards, and hydromodification management measures. Note that an **increase** of more/less than 50% of impervious surface includes those redeveloped areas within the existing



Figure 3 - Capital improvement projects such as roadways must include post-construction design measures and be appropriately sized.

APPLICABILITY

development as well as those areas that are added to the site.

For street and road widening projects that include additional traffic lanes, where the addition of traffic lanes results in an alteration of more than 50 percent of the impervious surface, runoff from the entire project must be included in the selection and sizing of site design measures, LID design standards, and hydromodification management measures. However, if the addition of traffic lanes results in an alteration of less than 50 percent of the impervious surface, only the runoff from the new and / or replaced impervious surface is required to be included in the selection and sizing of site design measures, LID design standards, and hydromodification management measures.

2.3.1 Effective Date of Applicability

The City of Redding has been enforcing Post Construction BMP requirements associated with the current MS4 Phase II General Permit since June 19, 2015. Until that date, all projects must comply with the existing and previously-adopted post-construction requirements in Attachment 4 of the previous MS4 Phase II Permit (Order 2003-0005-DWQ). The City of Redding has released this Post-Construction Standards Plan to guide developers in the application of the Post Construction Standards associated with the new MS4 Phase II Permit. The requirements outlined in this manual are applicable to all public and private projects that meet the “Small” and “Regulated” project criteria. Any discretionary projects that have been deemed complete prior to June 19, 2015 and have unexpired vesting tentative maps will only need to comply with the City’s post-construction requirements that were in effect at the time of the map approval. Capital improvement projects or city-owned projects, for which their governing body or designee approved the initiation of the project design prior to June 19, 2015, will need only to comply with the post-construction requirements that were in place at that time.

THE SUBMITTAL AND REVIEW PROCESS

3 The Submittal and Review Process

Projects subject to this Post-Construction Standards Plan originate from different sources. Projects may be private non-discretionary or discretionary projects, or City-owned projects.

3.1 Ministerial (Non-Discretionary Building Permit) Projects

Ministerial or non-discretionary projects are not required to pass through the plan check process. Typically, these projects will either not be applicable to this Post-Construction Standards Plan or be considered “small” projects as defined in [Section 2.1](#). Specific submittal requirements for small projects are identified in [Section 4](#) of this plan. In general, proponents of non-discretionary small projects will need to submit, at the permit counter, information about the project, the selected design measures, and a printout copy of the State Water Board’s Post-Construction Calculator results.

If a ministerial project is found to be a “Regulated Project” as defined in [Section 2.2](#), the project shall include site design measures, source control measures, LID design standards, and hydromodification management. If a ministerial project becomes a “regulated project” then it goes through plan check. The project becomes a discretionary project as described in [Section 3.2](#)

3.2 Discretionary (Plan Check) Projects

Discretionary projects are those that go through plan check and are conditioned with specific requirements. Discretionary projects have the potential to be classified as “small”, “regulated”, or not applicable to this Post-Construction Standards Plan. Proponents of discretionary projects submit a post-construction submittal package. The post construction submittal package can be submitted separately or within the hydrology calculations. The minimum requirements are: site design plans and specifications, a completed Post-Construction Project Worksheet ([Appendix 7](#)), any calculations, and an O&M Plan ([Appendix 8](#)). The plan checker reviews the post-construction submittal package for completeness and will direct it to the appropriate engineering reviewers. Once comments are received from the engineering reviewers, the project proponent will be notified by the plan checker of any required modifications or of the approval of the proposed post-construction design measures. Regulated Projects are tracked by the City for annual verification that the Storm Water Treatment Measures and hydromodification measures are being maintained in an effective condition.

3.3 Capital Improvement / City-Owned Projects

Public projects, capital improvement projects (CIPs), or other City-Owned projects typically do not pass through the plan check process, but are reviewed for applicability of the post-construction requirements. The City of Redding conditions and reviews projects for compliance with the Phase II MS4 Permit.

THE SUBMITTAL AND REVIEW PROCESS

1. The sponsoring department reviews and evaluates the project's applicability for post-construction requirements and determines whether the proposed project is a "small" project as defined in [Section 2.1](#), a "regulated" project as defined in [Section 2.2](#), or exempt from the post-construction requirements.
2. The sponsoring department submits a completed Post-Construction Project Worksheet (included in [Appendix 7](#)) to Public Works Environmental Management. The Engineering Department, or the design consultant, will provide the sizing and design criteria for the selected site design measures, source control measures, LID design standards, and hydromodification management techniques.
3. The Engineering Department will develop an operation and maintenance plan for the post-construction treatment and hydromodification measures.
4. The Storm Water Management Program will maintain records of all project-related post-construction design information and plans for a minimum of 5 years.
5. Regulated Projects are tracked by the Storm Water Management Program for annual verification that the Storm Water Treatment Measures are being maintained in an effective condition.

REQUIREMENTS FOR SMALL PROJECTS (2,500 TO 5,000 FT²)

4 Requirements for Small Projects (2,500 to 5,000 ft²)

The following is a 3-step process required by the City of Redding for small projects as defined in [Section 2.1](#).

4.1 Select Site Design Measures

- Step 1: The project proponent selects one or more of the following **Site Design Measures**:



Stream Setbacks and Buffers – are vegetated areas (including trees, shrubs, riparian habitat, or herbaceous vegetation) that exist or are established to protect a stream system, lake, reservoir, or estuary. These areas provide a buffer between the development and the water body to filter out pollutants carried by storm water, provide stabilization of erodible banks and opportunities to infiltrate water prior to discharging, and help slow peak flows. The *California Storm Water Quality Association's (CASQA) Best Management Handbook (BMP) for New Development and Redevelopment* has a specification sheet (TC-31) for Vegetated Buffer Strips that contains useful information applicable to stream setbacks and buffers. It can be downloaded at:

www.casqa.org/sites/default/files/BMPHandbooks/tc-31_from_newdevelopmentredevelopment_handbook.pdf

The City of Redding does have stream Setback and Buffer requirements in section 18.48 of the Municipal Code: A copy of the requirements are included in [Appendix 9](#).

www.acgov.org/pwa/documents/Contra%20Costa%20County%20HCP%20Table%206-4%20Setbacks.pdf



Soil Quality Improvement and Maintenance – is accomplished through the addition of soil amendments and the creation of a healthy microbial community. Higher organic content decreases erosion risk and provides nutrients needed to maintain healthy plants. Landscaping requires less fertilizer, irrigation, and pesticides. Engineered soils promote infiltration and moisture storage which provides LID and hydromodification benefits. The United States Department of Agriculture's Natural Resources Conservation Service (NRCS) has a publication called the *Urban Soil Primer* which is an excellent resource in

REQUIREMENTS FOR SMALL PROJECTS (2,500 TO 5,000 FT²)

helping developers understand how healthy soils improve water quality. This resource can be downloaded at:

www.nrcs.usda.gov/Internet/FSE_DOCUMENTS/nrcs142p2_052835.pdf



Tree Planting and Preservation – includes the preservation of existing, healthy, established trees of any type and the establishment of new ones. Both evergreens and deciduous trees can be planted. All trees are beneficial to water quality. Trees help soil stay in place, slow erosion from rain, and help slow water that may have started flowing. The planted trees or preserved tree canopy shall meet the following requirements:

1. Preserved tree credit requirements and credit for all land districts:
 - i. Tree canopy must cover the project property.
 - ii. Average trunk diameter. 4.5 ft above the ground (Diameter Breast Height or DBH) is 12 inches or greater.
 - iii. The area of tree canopy from qualifying trees is equivalent to the applicable credit (no limit).
 - iv. Summarized in Regional Water Quality Control Board's Small Project excel based calculator which is available online at:
http://www.waterboards.ca.gov/water_issues/programs/stormwater/phase_ii_municipal.shtml.
2. Planted tree credit requirements and credit for all land districts:
 - i. Planted tree minimum size is 15 gallon per Redding Municipal Code Section 18.45.120.
 - ii. Planted evergreen trees are given a credit of 110.00 ft² per tree planted (no limit).
 - iii. Planted deciduous trees are given a credit of 220.00 ft² per tree planted (no limit).
 - iv. Summarized in Regional Water Quality Control Board's Small Project excel based calculator which is available online at:
http://www.waterboards.ca.gov/water_issues/programs/stormwater/phase_ii_municipal.shtml.
3. Submit documentation in accordance with [Redding Municipal Code \(RMC\) Section 18.45](#) that shows the preserved or planted trees meet both City requirements and the State requirements in Items 1 and 2 above. An example of this document is included in [Appendix 10](#)-Preserved/Planted Tree Credit Submittal.
4. A contiguous area of preserved trees used to get a credit of .25 or more acres shall be maintained in an appropriate easement approved by the City Surveyor. In cases where trees are preserved within parking

REQUIREMENTS FOR SMALL PROJECTS (2,500 TO 5,000 FT²)

lot planters or along frontages then those trees will be counted towards tree credit but will not be maintained in an easement. All preserved trees shall be maintained in accordance with [Redding Municipal Code Section 18.45](#), and documented within the Statement of Responsibility for maintenance in perpetuity.

5. Trees receiving “Tree Credit” in Post-Construction calculations may only be removed per the following guidelines:
 - i. In accordance with RMC Section 18.45 and the City of Redding Comprehensive Tree Plan.
 - ii. If the planted/preserved tree(s) or portions of the canopy are mechanically removed by the City or ordered removed by the City for road, powerline, or other required clearance then the private or public property owner is not required to replace the removed canopy.
 - iii. If trees are removed as part of a private or public land development project, then equivalent treatment shall be assured prior to removal. The replacement BMP shall be sized for the most current design storm and shall be approved by the City Engineer.
6. In the case where qualifying trees are preserved in an effort to create a space with multiple beneficial uses to the surrounding community and one of those beneficial uses include improving water quality; the City will increase the state tree credit by a factor of two. Examples of multiple uses include but are not limited to:
 - i. Preservation of existing trees in areas that are used in trail corridors within any land use type.
 - ii. Preservation of existing trees in areas that are utilized for parks or recreational purposes within areas within any type of development.
 - iii. Preservation of trees that will become part of a buffer zone between different land use types.



Rooftop and Impervious Area Disconnection – is where roof drains and hardscapes do not discharge directly to a storm drain inlet but are directed to permeable areas or rain water collection and harvesting mechanisms. Water, in excess of the permeable area’s infiltration capacity or the capacity of the collection / harvesting system, can be directed to a drainage system. CASQA has a BMP specification sheet (SD-11) that provides information about designing roof runoff controls. It can be downloaded at:

REQUIREMENTS FOR SMALL PROJECTS (2,500 TO 5,000 FT²)

www.casqa.org/sites/default/files/BMPHandbooks/sd-11.pdf



Porous Pavement – is pavement that allows runoff to pass through it and infiltrate into the underlying soils. Porous pavement systems are typically designed with a subsurface drainage and storage system that consists of a bed of rock and piped collection system below the porous pavement. Where soils have high infiltration rates, water is allowed to dissipate directly into the soil. Where infiltration rates are less than desirable, a sub-grade gravity collection system conveys excess water to a storm water outfall or storm water sewer system. Porous pavement includes porous asphalt and concrete, porous pavers and bricks, cobbles, reinforced grass pavement, and gravel covered surfaces.



Green Roofs – is an engineered vegetative layer grown on a roof that allows a certain amount of runoff reduction by infiltration, storage, and evapo-transpiration. In 2010, the United States Environmental Protection Agency (USEPA) published a document titled: *Design Guidelines and Maintenance Manual for Green Roofs in the Semi-Arid and Arid West*. This guidance document can be downloaded at:

<http://www2.epa.gov/sites/production/files/documents/GreenRoofsSemiAridAridWest.pdf>



Vegetated Swales – are a vegetated, open-channel management practice designed specifically to treat and attenuate storm water runoff through infiltration, biotreatment, and evapo-transpiration. If they are designed with engineered soils, storage and greater infiltration can be achieved. CASQA has a BMP specification sheet (TC-30) that provides information about designing vegetated swales. It can be downloaded at:

www.casqa.org/sites/default/files/BMPHandbooks/TC-30.pdf



Rain Barrels and Cisterns – is a system that collects and stores storm water runoff from a roof or other impervious surfaces. Collected water is saved and reused for irrigation or other purposes. In 2008, the USEPA

REQUIREMENTS FOR SMALL PROJECTS (2,500 TO 5,000 FT²)

published a document titled: *Managing Wet Weather with Green Infrastructure Municipal Handbook: Rainwater Harvesting Policies*. This guidance document can be downloaded at:

http://water.epa.gov/infrastructure/greeninfrastructure/upload/gi_munichandbook_harvesting.pdf

The City of San Diego published a Rain Water Harvesting Guide, which can be downloaded at:

<http://www.sandiego.gov/water/pdf/conservation/rainwaterguide.pdf>

4.2 Quantify the Runoff Reduction

The second step for small projects is for the project proponent to quantify the runoff reduction resulting from the implementation of the selected Site Design Measure(s). The Phase II MS4 Permit does not set any goals or minimum amounts of runoff reduction. The project proponent is required to utilize the State Water Board's Post-Construction Calculator which is available on the Water Board's SMARTS website or can be accomplished through the State's Microsoft Excel™ version of the calculator. The online calculator or Excel™ version of the calculator will quantify the runoff reduction for the chosen site design measure(s) chosen. The Water Board has created an instructional video on how to populate and use the Post-Construction Calculator. Information about how to access the calculator is included in [Appendix 5](#) of this document.

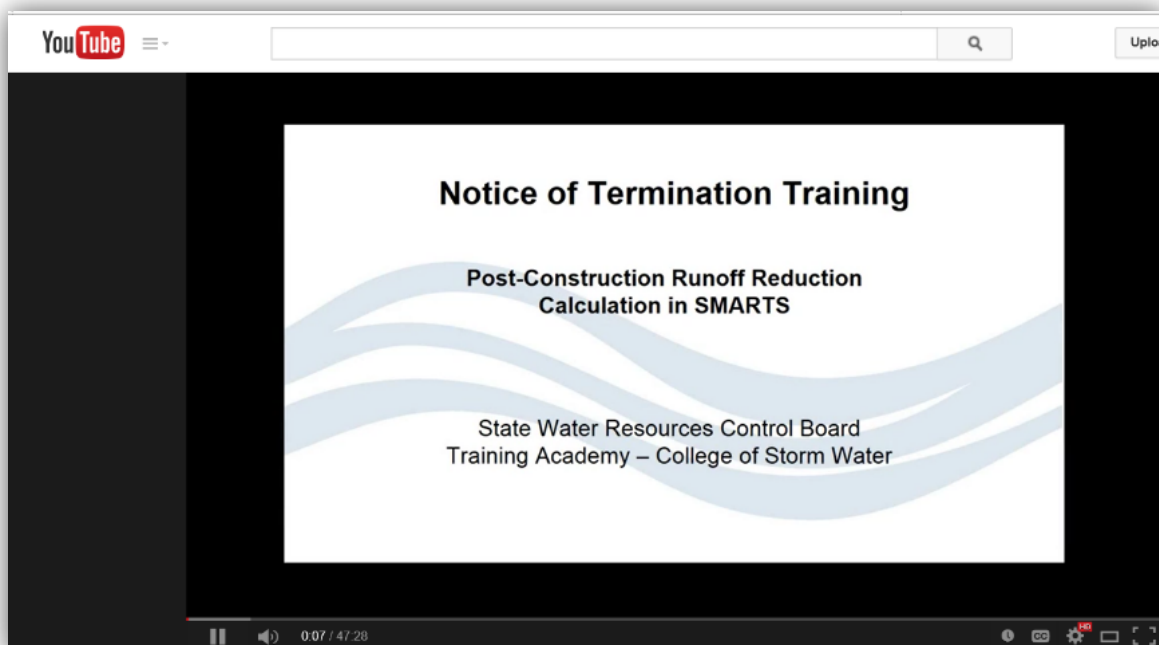


Figure 4 - The Water Board created this 47-minute video that describes how to use the Post-Construction Calculator on SMARTS. It will also help with the Excel version. Although the video was created for the Construction General Permit, it also applies to the Post-Construction Standards Plan. It can be accessed at:

<https://www.youtube.com/watch?v=W3nj4pj8WHY&feature=youtu.be>

REQUIREMENTS FOR SMALL PROJECTS (2,500 TO 5,000 FT²)

Post-Construction Calculator for Small Projects

The Water Board has created a Microsoft Excel version of the calculator that can now be downloaded from the State Water Board's website at the following link:
http://www.swrcb.ca.gov/water_issues/programs/stormwater/phase_ii_municipal.shtml

The screenshot shows the official website of the California State Water Resources Control Board. The header includes the CA.GOV logo and the agency name. A navigation bar at the top lists various sections like Home, About Us, Public Notices, Board Info, Board Decisions, Water Issues, Publications/Forms, and Press Room. Below this, a secondary navigation bar highlights 'Programs | Available Documents | Hot Topics |'. The main content area is titled 'Storm Water Program' and features a section for the 'PHASE II SMALL MUNICIPAL SEPARATE STORM SEWER SYSTEM (MS4) PROGRAM'. It includes a 'New!' announcement about the annual report being available in SMARTS and a list of steps to access the report. A sidebar on the left contains links to various resources, including 'STORM WATER' and 'STORM WATER Home'. A green arrow points to the 'NEW! Post-Construction Calculator for Small Projects' link in the bottom left of the sidebar.

REQUIREMENTS FOR SMALL PROJECTS (2,500 TO 5,000 FT²)

4.3 Prepare the Submittal

The third and final step for the “small” project proponent is to compile the information required for the entitlement level review and plan check:

4.3.1 The Entitlement Level Review Requirements:

- A completed Post-Construction Worksheets 1 and 2 (obtained from [Appendix 7](#)). 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 (rain barrels over 100 gallons). 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 Site Design Measure(s) must be clearly called out on the submitted plans.
- Rain Barrels purchased from landscaping supply stores need to be called out on the site drawings and can be easily installed using their manufacturer instructions.
- A printout of the results page from the Water Board’s SMARTS or Microsoft Excel™ Post-Construction Calculator as shown in Figure 5.

4.3.2 Plan Check Level Review Requirements:

- Final completed Post-Construction Worksheets 1 and 2 (obtained from [Appendix 7](#))
- Specific details that accompany Site Plans to show how specific Post Construction BMP(s) are made. For example, cross sectional details of bio retention swales, amended swales, etc.
- A printout of the results page from the Water Board’s SMARTS or Microsoft Excel™ Post-Construction Calculator as shown in Figure 5.

REQUIREMENTS FOR SMALL PROJECTS (2,500 TO 5,000 FT²)

INPUT FOR WATERSHED: Enter watershed details and click on the Compute & Save button.

I.a. Name:

I.b. County:

I.c. Closest Location:

I.d. Size(acres):

Pre-Construction INPUT

I.e. Dominant Soil Type:

I.f. Existing Dominant Non-built Land Use Type:

I.g. Existing rooftop impervious area(acres):

I.h. Existing non-rooftop impervious area(acres):

Post-Construction INPUT

I.i. Proposed Dominant Non-built Land Use Type:

I.j. Proposed rooftop impervious area(acres):

I.k. Proposed non-rooftop impervious area(acres):

OUTPUT:

O.a. Existing Runoff Curve Number:	89	O.d. Proposed Runoff Curve Number:	89.494
O.b. Design Storm(Inches):	0.49	O.e. Net Credit of Volume Credits:(Cubic feet)	3130.471
O.c. Pre-project Runoff Volume(Cubic Feet):	497.85	O.f. Post-project Runoff Volume(Cubic Feet):	569.14
O.g. Post-project Runoff Volume minus Volume Credits(Cubic Feet):	-2,561.34		

***Post-project Runoff Volume minus Volume Credits <= Pre-project Runoff Volume. No further calculation is necessary!

Volume Credit Calculator Worksheets:

Formula	Credit(Cubic Feet)
A. Porous Pavement	0
B. Tree Planting	223.772
C. Downspout Disconnection	
D. Impervious Area Disconnection	
E. Green Roof	
F. Stream Buffer	
G. Vegetative Swale	
H. Rain Barrels/Cisterns	
I. Soil Quality	2906.699

Select Site Design Measures here.

This is the runoff reduction quantity in ft³

Disregard this message

Figure 5 - The results summary from the Post-Construction Calculator is required to be provided with the submittal to the municipal plan checker. It is important to note that there is no requirement to meet any specific volume reduction, but only to quantify the reduction of the selected Site Design Measure(s). The calculator may state that the runoff volume credit has not been met; but, disregard any such message.

REQUIREMENTS FOR REGULATED PROJECTS

5 Requirements for Regulated Projects

The following is a 6-step process required by the City of Redding for Regulated Projects as defined in [Section 2.2](#).

5.1 Specify Drainage Management Areas

Regulated Projects are required to provide a map or diagram that divides the development into discrete Drainage Management Areas (DMAs). These are areas of the project where the nature of the development is distinct from the other portions of the development and, therefore, require a unique approach to mitigating storm water runoff. A separate DMA would also be necessary for portions of the project where post-construction design measures are dedicated to that portion and operate independently from the other DMAs. Some projects will have multiple DMAs while other projects may have only one single DMA.

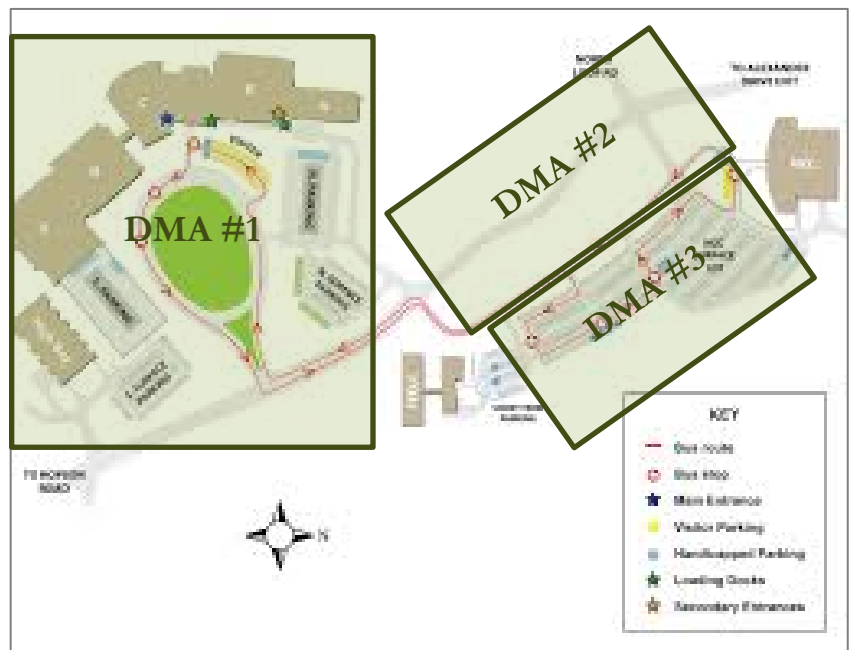


Figure 6 - Regulated Projects must submit a map with the boundaries of the various DMAs depicted.

5.2 Identify Applicable Source Controls

The project proponent is required to identify potential sources of pollutants and to include appropriate Best Management Practices / Source Controls. If a proposed Regulated Project has any of the potential pollutant-generating activities or sources identified in [Table 1](#), it must be designed and operated consistent with the recommendations provided in the CASQA Storm Water BMP Handbooks. A link is provided in [Table 1](#) to each BMP specification. The CASQA Handbooks can be accessed in their entirety at www.CASQA.org. There is an annual subscription to access the Commercial / Industrial Handbook and the Construction Handbook. At the date of this edition of the Post-Construction Standards Plan,

REQUIREMENTS FOR REGULATED PROJECTS

CASQA was still offering free access to their BMP Handbooks for Municipal Operations and New Development and Redevelopment.

TABLE 1 – LIST OF SOURCE CONTROLS

Activity / Pollutant Source	CASQA BMP Handbook Link	Activity or Design-based Control Measure
Accidental spills or leaks	<u>SC-11</u>	Activity
Interior floor drains	<u>SC-10</u>	Activity and Design (connection of interior floor drains to the storm drainage system is prohibited)
Parking / storage areas and maintenance	<u>SC-43</u>	Activity
Indoor and structural pest control	<u>SC-35</u>	Activity
Landscape / outdoor pesticide use	<u>SD-10</u> <u>BG-40</u>	Activity
Pools, spas, ponds, decorative fountains, and other water features	<u>BG-63</u> <u>SC-72</u>	Activity and Design
Restaurants, grocery stores, and other food service operations	<u>BG-30</u>	Activity
Refuse areas	<u>SC-34</u> <u>SD-32</u>	Activity and Design
Industrial processes	<u>SD-35</u> <u>SD-36</u>	Design
Outdoor storage of equipment or materials	<u>SC-32</u> <u>SD-34</u>	Activity and Design
Vehicle and equipment cleaning	<u>SC-21</u> <u>SD-33</u> <u>BG-65</u>	Activity and Design
Vehicle and equipment repair and maintenance	<u>SC-22</u> <u>BG-21</u>	Activity
Fuel dispensing areas	<u>SC-20</u> <u>SD-30</u> <u>BG-22</u>	Activity and Design
Loading docks	<u>SC-30</u> <u>SD-31</u>	Activity and Design
Fire sprinkler test water	<u>SC-41</u>	Activity

REQUIREMENTS FOR REGULATED PROJECTS

Activity / Pollutant Source	CASQA BMP Handbook Link	Activity or Design-based Control Measure
Drain or wash water from boiler drain lines, condensate drain lines, rooftop equipment, drainage sumps, and other sources	SC-10 SC-41	Activity
Unauthorized non-storm water discharges	SC-10	Activity
Building and grounds maintenance	SC-41	Activity

5.3 Incorporate Low Impact Development Design Standards

The project proponent must demonstrate how each DMA has been designed to accomplish the LID Standards listed in [Table 2](#).

TABLE 2 – LID STANDARDS

1. Define the development envelope and protected areas, identifying areas that are most suitable for development and areas to be left undisturbed.
2. Concentrate development on portions of the site with less permeable soils and preserve areas that can promote infiltration.
3. Limit overall impervious coverage of the site with paving and roofs.
4. Set back development from creeks, wetlands, and riparian habitats.
5. Preserve significant trees.
6. Conform the site layout to natural landforms.
7. Avoid excessive grading and disturbance of vegetation and soils.
8. Replicate the site's natural drainage patterns.
9. Detain and retain runoff throughout the site.

In completing Post-Construction Project Worksheet (included in [Appendix 7](#)), the project proponent will demonstrate how each DMA is accomplishing the nine LID Standards defined in the MS4 Phase II permit which are listed in [Table 2](#). The demonstration can be done through narrative description, calculations, supporting information, and / or site plans and diagrams. The plan checker will review the project proponent's Post Construction BMP submittal and request any additional information to make sure the design reflects the nine LID standards listed [Table 2](#).

REQUIREMENTS FOR REGULATED PROJECTS

5.4 Select and Size Site Design and Treatment Control Measures

Regulated Projects select one or more Site Design Measures and/or SWTM(s) (also called “facilities” in the Phase II MS4 Permit) to treat and reduce storm water runoff. Regulated Projects often have greater volumes of stormwater and cannot solely rely on Site Design Measures (SDM’s) to mitigate the MS4 storm volume or flow requirements. Storm Water Treatment Measures (SWTM’s) are frequently combined with SDM’s to meet the MS4 design criteria. Both SDM’s and SWTM’s can be sized by volumetric or flow based approach that is detailed in the Phase II MS4 Permit.

5.4.1 List of Site Design Measures (SDMs), Storm Water Treatment Measures (SWTMs) and Associated Sizing Criteria

Many of the Site Design Measures are described in [Section 4.1](#) of this Post-Construction Standards Plan. [Table 3](#) lists these Site Design Measures along with other possible Treatment Control Measures that infiltrate, evapo-transpire, harvest and reuse, or biotreat storm water runoff. The project proponent will select one or more of these control measures for each DMA. For each measure listed in [Table 3](#), the appropriate hydraulic sizing criteria and CASQA specification is provided.

TABLE 3 – SITE DESIGN AND TREATMENT CONTROL MEASURES

Site Design or Treatment Control Measure	Description	CASQA Specification	Sizing Criteria
Stream setbacks and vegetated buffers <i>(Site Design Measure)</i>	<i>Preservation of a green strip or vegetated buffer between the development and the discharge point through which storm water runoff passes.</i>	<u>TC-10</u>	Flow
Soil quality improvement <i>(Site Design Measure)</i>	<i>Commonly used in conjunction with landscaping, bioretention, or storm water gardens. Also known as “engineered soils”, through which storm water can infiltrate. This provides additional on-site storage and reduces peak flow rates.</i>	<u>TC-40</u>	Volume
Tree planting and preservation <i>(Site Design Measure)</i>	<i>Incorporated into the site’s landscaping. Trees reduce the energy of falling rain and help to reduce peak flow rates.</i>	<u>SD-10</u>	SMARTS Calculator
Porous pavement <i>(Site Design Measure)</i>	<i>Porous asphalt, concrete, or pavers; cobbles or rock covered surfaces; typically with at least 18” of drainage rock below the porous surface covering to store and infiltrate storm water.</i>	<u>SD-20</u>	Volume
Green roofs <i>(Site Design Measure)</i>	<i>Plants and growing media permanently installed on a rooftop to allow a certain amount of storm water infiltration and storage.</i>	<u>TC-40</u>	Volume

REQUIREMENTS FOR REGULATED PROJECTS

Vegetated swales <i>(Site Design Measure)</i>	<i>Storm water conveyance swales that are vegetated to stabilize the swale and prevent erosion. Vegetated swales improve water quality by providing filtration and bio-uptake of pollutants and by promoting sedimentation of suspended particles. Often, vegetative swales are used in conjunction with “soil quality improvement” to provide greater infiltration and / or with retention or detention basins.</i>	<u>TC-30</u>	Flow
Rain harvesting and reuse <i>(Site Design Measure)</i>	<i>Large scale or small scale capture, collection and re-use of storm water runoff. Includes rain barrels used at downspouts and large cisterns and collection systems.</i>	<u>TC-12</u>	Volume
Bioretention and rain gardens <i>(Treatment Control Measure)</i>	<i>Depressed landscaped areas to which storm water runoff flows. These rain gardens are designed with engineered soils so that they facilitate infiltration and storage of storm water.</i>	<u>TC-32</u>	Volume
Infiltration trench, Flow-through Planter, or Tree Wells <i>(Treatment Control Measure)</i>	<i>Similar in concept to a French drain or a leach field, in which storm water runoff is able to drain to a trench or pit that has been filled with rock. It provides underground storage of the water until it can infiltrate into the soils.</i>	<u>TC-10</u>	Volume and Flow
Retention and detention basins <i>(Treatment Control Measure)</i>	<i>Aboveground storage of storm water runoff in a basin that allows it to infiltrate into soils and / or be stored and released at a slower flow rate. Impounded water must be infiltrated or discharged within 72 hours to avoid vector breeding problems.</i>	<u>TC-11</u> <u>TC-12</u> <u>TC-22</u> <u>TC-40</u>	Volume

Control measure(s) specified in [Table 3](#) can be used to meet the MS4 requirements stormwater runoff reduction and treatment for each DMA. For example, a site could use engineered soil within a vegetated swale and a rain harvesting / collection system for roof drains together to meet the MS4 requirements. Publicly available references for many of the Control Measure(s) in [Table 3](#) are provided in [Appendix 7](#). Deriving the volumetric or flow based design criteria for each DMA is discussed explicitly in the Phase II MS4 Permit. The volumetric and flow design requirements derivation for Post Construction BMP(s) is not within the scope of this document. The City of Redding uses the California Phase II LID Sizing Tool created by the Sacramento State Office of Water Programs for the design of Post Construction BMP(s) for Regulated Projects.

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5.4.2 California Phase II LID Sizing Tool

All Regulated Projects are to use [The California Phase II LID Sizing Tool](#) for the design of the Post Construction BMP(s) to comply with the MS4 Phase II Permit Treatment and Baseline hydromodification requirements. The California Phase II LID Sizing Tool was developed and is actively maintained by the Sacramento State Office of Water Programs.

California Phase II LID Sizing Tool

Welcome to the California Phase II Low Impact Development (LID) Sizing Tool. This is a web-based tool that assists stormwater practitioners in selecting and sizing LID Best Management Practices (BMPs) that meet the sizing requirements set forth in California's National Pollutant Discharge Elimination System (NPDES) [permit](#) for stormwater discharges from small municipal separate storm sewer systems (MS4s). The tool allows users to input their location, soil type, and impervious areas, and then queries a database containing pre-solved sizing factors and design curves for a variety of LID BMP types, performs permit-based sizing calculations, and tabulates allowable sizes for each LID BMP type. Sizing results are provided based on three different sizing methods allowed by the Phase II permit: a Design Storm Method, a Percent Capture Method, and a Baseline Bioretention or Equivalent Performance Method. Sizing results are also provided for the Central Coast RWQCB (Region 3) simple sizing method adopted via resolution [R3-2013-0032](#). Users are also provided references for considering LID BMP feasibility factors beyond sizing, such as site topography and geometry and LID BMP maintenance requirements and costs. The tool includes training [videos](#) to visually instruct users on various aspects of the tool's interface, input, and output. Further information about the tool and its development is provided in the [Documentation Manual](#).

Development of this tool was funded by the California State Water Resources Control Board's (SWRCB) Proposition 84 Stormwater Grant Program (SWGPs).

The tool consists of a website that is linked to a database through a server. The database stores precipitation and evaporation data for multiple geographic locations throughout California, pre-defined parameters for multiple LID BMP types and project soil types, and pre-solved design curves based on SWMM 5 modeling. Over 13,000 SWMM simulations were run to develop these curves. After the user enters project information into the tool's website, the server queries the database, performs calculations, and tabulates the areas required for various LID BMP types.

Use these Layers to help you find the inputs for steps 1 to 3 below the map

Step 1

☒ Climate Stations

Step 2

☐ Soil Types

Step 3

Find your impervious area

☐ Measure

Clear

Distance (feet): 0

Area (acres): 0

To ensure the most accurate values zoom in close to your site.

Other Layers

☐ Counties



Figure 7: California Phase II LID Sizing Tool Home Page

The LID online calculator, shown in Figure 7, has a built in GIS map to derive three input parameters: rain gauge, soil type, and impervious acreage needed to design Post Construction BMP's. The blue markers on the map interface in Figure 7 are different rain gauge locations (one can zoom in to find the exact gauge for the local Redding area). The rain gauge used for projects within the City of Redding is the **Redding Municipal Airport (Redding AP)**. The rain gauge defines the 85th percentile 24 hour storm, known as the Baseline MS4 Storm Event, as .91". The .91" is not a traditional design storm derived from intensity-duration (IDF) functions; rather, a description of the cumulative 24 hour precipitation data from the last 30 years. The 85th percentile storm defines that 85% of the time we receive less than or equal to .91" of rain within a 24 hour period. The design goal of Post Construction BMP's is to mitigate the

REQUIREMENTS FOR REGULATED PROJECTS

California Phase II LID Sizing Tool

Welcome to the California Phase II Low Impact Development (LID) Sizing Tool. This is a web-based tool that assists stormwater practitioners in selecting and sizing LID Best Discharge Elimination System (NPDES) [permit](#) for stormwater discharges from small municipal separate storm sewer systems (MS4s). The tool allows users to input their location for a variety of LID BMP types, performs permit-based sizing calculations, and tabulates allowable sizes for each LID BMP type. Sizing results are provided based on a Baseline Bioretention or Equivalent Performance Method. Sizing results are also provided for the Central Coast RWQCB (Region 3) simple sizing method adopted via a permit, such as site topography and geometry and LID BMP maintenance requirements and costs. The tool includes training [videos](#) to visually instruct users on various aspects of the tool. [Documentation Manual](#).

Development of this tool was funded by the California State Water Resources Control Board's (SWRCB) Proposition 84 Stormwater Grant Program (SWGPF).

The tool consists of a website that is linked to a database through a server. The database stores precipitation and evaporation data for multiple geographic locations throughout California based on SWMM 5 modeling. Over 13,000 SWMM simulations were run to develop these curves. After the user enters project information into the tool's website, the tool

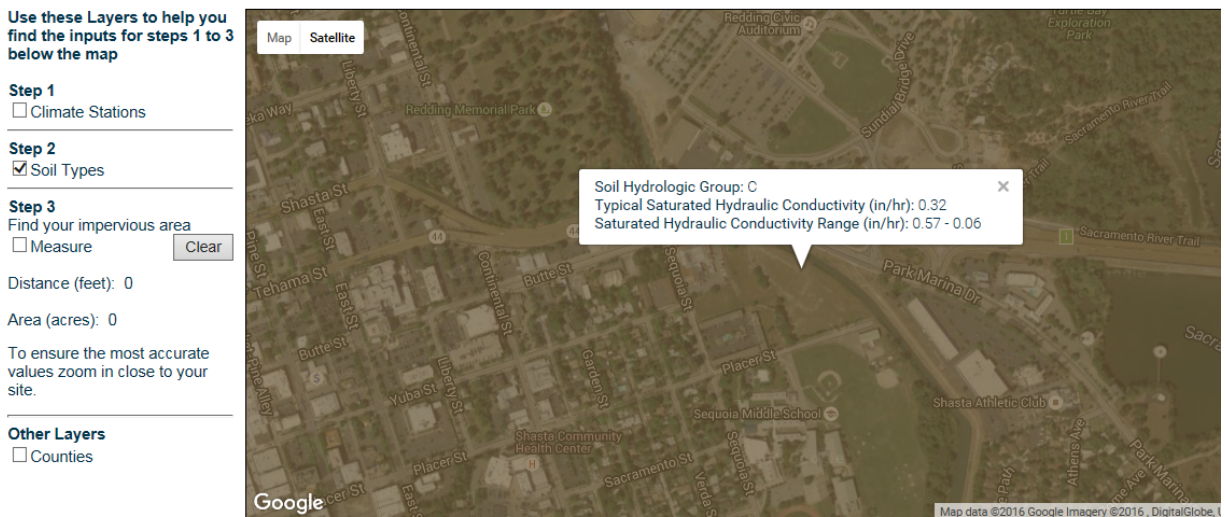


Figure 8: California Phase II LID Sizing Tool Soils Layer

run off from the high frequency low volume storm. The second input is the project Saturated Hydraulic Conductivity.

Saturated Hydraulic Conductivity is a soil property that can be derived from the soils map built into the Phase II LID Calculator shown in Figure 8. One could elect to conduct a site specific soil Hydraulic Conductivity Test. The value recommended by the Phase II LID Calculator shall be used for the analysis unless a different Saturated Hydraulic conductivity is found by soils testing. Within a DMA where the Post Construction BMP will span multiple soil types the soil with the lowest saturated hydraulic conductivity will govern the system. The City Engineer may require on site infiltration testing if deemed necessary for critical project Stormwater Treatment Control Measures that depend on infiltration. Examples of critical stormwater controls may be an infiltration trench that serves as detention and retention for the MS4 Baseline, 10 year, 25 year, and 100 year storm events. The last input value for the Phase II LID Sizing Tool is project impervious area (new or redeveloped).

The impervious area generating the runoff to be treated by specific Post Construction BMP's downstream is input into the impervious area field of the Online Calculator shown in Fig. 9. One can choose various

REQUIREMENTS FOR REGULATED PROJECTS

units from the drop down box to the right of the input field. The value is usually provided by the design drawings. The details of using the LID calculator are explained in its [manual](#) and within the result instructions. Submit a copy of the results for each DMA with the Post Construction BMP submittal package.

The tool consists of a website that is linked to a database through a server. The database stores precipitation and evaporation data for multiple geographic locations throughout California, pre-defined parameters for multiple LID BMP types and project soil types, and pre-solved design curves based on SWMM 5 modeling. Over 13,000 SWMM simulations were run to develop these curves. After the user enters project information into the tool's website, the server queries the database, performs calculations, and tabulates the areas required for various LID BMP types.

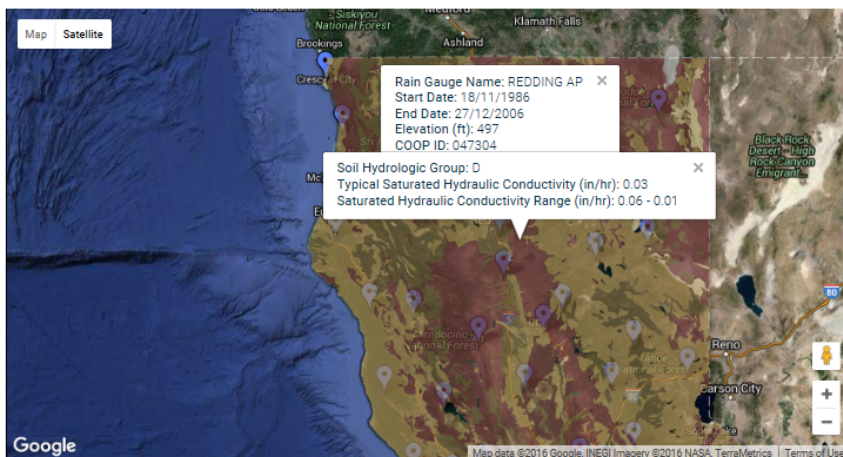
Use these Layers to help you find the inputs for steps 1 to 3 below the map

Step 1
☒ Climate Stations

Step 2
☒ Soil Types

Step 3
Find your impervious area
☐ Measure
Distance (feet): 0
Area (acres): 0
To ensure the most accurate values zoom in close to your site.

Other Layers
☐ Counties



Step 1 - Select a climate station

REDDING AP This tool provides results based on 91 climate stations throughout California. Use the drop down to choose the climate station that best represents your project site. You can view the stations on the map by checking the "Climate Stations" box under Step 1 of the Layers sidebar. Then click on any station on the map to learn its name, years on record, 85th percentile design storm, and other information. You will be able to override the design storm on the following page.

Step 2 - Input a saturated hydraulic conductivity

0.03 inches per hour Enter your project site's saturated hydraulic conductivity based on on-site field data.
If you don't know it, check with your local regulator to see if it is acceptable to use estimates from the USDA NRCS. If it is, you can view the USDA NRCS hydrologic soil group on the map above by checking the "Soil Types" box in Step 2 of the Layers sidebar and clicking on the color covering your project location.
To see tables of saturated hydraulic conductivities for soil groups and textures click here

Step 3 - Input the impervious area

10000 Square Feet The CA Phase II NPDES permit requires that the project site be divided into discrete Drainage Management Areas (DMAs). Runoff from each DMA must be managed using LID BMPs that meet specific sizing criteria specified in the permit. The tool uses a scenario where the DMA consists of a 100% impervious catchment draining to a LID BMP. Input the size of the impervious catchment of the DMA of interest for your project.
You can use your own measured area or calculate an area using the measure tool in Step 3 of the Layers sidebar.
After clicking submit you will be given a table of LID BMP sizes designed to treat the impervious area.

Figure 9: California Phase II LID Sizing Tool Input

For more information about the specific volumetric or flow refer to Section E.12.e of the Phase II MS4 Permit.

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5.4.3 Allowed Variations and Exceptions

Site Design and Treatment Control Measures that infiltrate or clean storm water can have an altered design if specific conditions exist. The conditions are listed in [Table 4](#) below.

TABLE 4 – ALLOWED DESIGN VARIATIONS

Condition	Allowed Variation
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
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

Other types of treatment measures can be used if the project proponent demonstrates that the use of treatment or infiltration control measures are not feasible at the site. Some treatment measures include but are not limited to tree-box biofilters, compost filters, or in-vault media filters for following types of projects:

- 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; and
- Historic sites, structures or landscapes that cannot alter their original configuration in order to maintain their historic integrity.

If any of these alternate non-infiltrating treatment control measures are utilized, they must meet the following performance criteria:

REQUIREMENTS FOR REGULATED PROJECTS

- Sized to treat the volumetric and flow criteria specified in Section E.12.e.ii.c of the Phase II MS4 Permit.
- Selected to effectively remove pollutants of concern associated with the new development.
- The project proponent is required to demonstrate that bioretention or infiltration control measures are not feasible at the project site. The selection of alternate non-infiltration treatment control measure(s) through the opinion of a qualified expert such as a California licensed Professional Civil Engineer, a California licensed Professional Geologist, a California licensed Geotechnical Engineer, and/or an EnviroCert International, Inc. Certified Professional in Storm Water Quality (CPSWQ). If an alternate non-infiltrating treatment control measure(s) is proposed by the project proponent, a technical report, stamped and signed by any of the above-referenced experts, demonstrating infeasibility of bioretention or infiltration and the selection and sizing of the alternate treatment control measure must be submitted with the Post-Construction Project Worksheet ([Appendix 7](#)).

5.5 Storm Water Treatment Control Measures

Remaining run-off from impervious areas within the DMA that is treated by Site Design Measures must be treated with Treatment Control Measures (both of which are identified in [Table 3](#)). In other words, if the DMA utilizes an amended strip, collection, and reuse system, **only the net runoff**, after factoring in the capacity of the amended strip and for the amount captured / recycled, is subject to being included in the treatment control requirements. Treatment “facilities” must comply with the following design parameters:

- The numeric sizing criteria specified in Section E.12.e(ii)(c) of the MS4 Phase II Permit.
- Maximum surface loading rate of the infiltration facility of 5 inches per hour, based on the runoff rates calculated for the DMA;
- Minimum surface reservoir volume equal to surface area of the infiltration facility times a depth of 6 inches;
- 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. A mixture of sand (60%-70%) meeting the specifications of American Society for Testing and Materials (ASTM) C33 and compost (30%-40%) may be used.
- Subsurface drainage/storage layer (typically gravel) with an area equal to the surface area and having a minimum depth of 12 inches;
- Underdrain with discharge elevation at top of the gravel layer;

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- No compaction of soils beneath the treatment control “facility”; or if the soils had previously been compacted, they must be ripped and loosened;
- No liners or other barriers interfering with infiltration; and
- Appropriate plant palette for the specified soil mix and maximum available water use.

Alternatives to the above-listed nine design parameters for treatment “facilities” is allowed if **all** of the following equivalent effectiveness features are demonstrated:

Equal or greater amount of runoff infiltrated or evapo-transpired;

Equal or lower pollutant concentrations in runoff that is discharged after biotreatment / infiltration;

Equal or greater protection against shock loadings and spills; and

Equal or greater accessibility and ease of inspection and maintenance.

5.6 Hydromodification Management Requirements

Effective June 30, 2016 regulated projects that create and / or replace one acre or more of impervious surface must incorporate SWTM(s) (from [Table 3](#)) that prevent the post-project runoff from exceeding the pre-project runoff for a 2-year, 24-hour storm event. Projects not increasing their impervious footprint are exempt from the hydromodification Management Requirements. The 2-year, 24-hour storm event can be found using the [NOAA Atlas 14 online tool](#). If hydromodification management requirements apply, submit analysis within the project Hydrology Report or a separate submittal that shows the runoff flow rate for the 2-year 24-hour storm will not increase above the pre-development conditions.

The following are just two examples of projects that would be included in the Hydromodification requirements:

- An individual owns a car lot on a 4 acre parcel. Two acres of the lot is impervious and the owner decides that more space is needed for offices on the site. The owner demolishes and repaves an existing two acre parking lot then adds another 3,000 square foot building on part of the undeveloped four acres. The entire project would be subject to the hydromodification requirement.
- A four acre parcel is being developed. The industrial business owner is adding a one acre warehouse, one acre of parking, and two acres of outside storage.

The following are just two examples of projects that would be excluded from the Hydromodification requirements:

- A 10,000 square foot building added to a vacant lot with 10,000 square feet of parking. The total impervious area is less than one acre.
- A two acre impervious site that is redeveloped and no new impervious surface is added to the existing lot.

REQUIREMENTS FOR REGULATED PROJECTS

5.7 Prepare the Submittal

There are two levels of Review for Regulated Projects: Entitlement and Plan Check. The entitlement level review looks for a reasonable conceptual layout of Post Construction BMP's and source control measures.

5.7.1 The Entitlement Level Review Requirements:

- A completed Post-Construction Worksheets 1, 3,4, and 5 (obtained from [Appendix 8](#)).
- Within the Hydrology Report or in a separate submittal include:
 - ✓ The LID calculator results and a small description of the Post Construction BMP's that were actually used to reach 100% compliance with the MS4 Phase II permit for each DMA.
 - ✓ **If the Hydromodification Management Requirements apply to the regulated project then include:**
 - Pre-development flow analysis for the 2-year, 24 hour storm event.
 - Post development flow analysis for the 2-year, 24 hour storm event showing that there is no increase in stormwater flow leaving the site.
- A site plan with DMA(s) shown needs the following information:
 - ✓ Impervious area
 - ✓ Label used to reference associated calculations
 - ✓ Drainage slope
 - ✓ Location and size of Post Construction BMP's intended to treat the run-off from the impervious area.
 - ✓ Specific Source Control Measures if applicable.
 - ✓ Area of existing impervious surface
 - ✓ Area of proposed impervious surface

5.7.2 Plan Check level review includes the following items:

- A final completed Post-Construction Worksheets 1,3,4, and 5 that reflects any changes made since the entitlement review (obtained from [Appendix 7](#)).
- Within the Hydrology Report or in a separate submittal include:
 - ✓ Final LID calculator results and a small description of the Post Construction BMP's that were actually used to reach 100% compliance with the MS4 Phase II permit for each DMA.
 - ✓ **If the Hydromodification requirements apply to the regulated project then include:**
 - Final pre-development flow analysis for the 2-year, 24 hour storm event.

REQUIREMENTS FOR REGULATED PROJECTS

- Final post development flow analysis for the 2-year, 24 hour storm event showing that there is no increase run off leaving the site.
- A final site plan with DMA(s) shown needs the following information:
 - ✓ Impervious Area
 - ✓ Label used to reference associated calculations
 - ✓ Drainage slope
 - ✓ Location and size of Post Construction BMP(s) intended to treat the run-off from the impervious area.
 - ✓ Specific source control measures if applicable
 - ✓ Underdrain invert elevations if applicable
 - ✓ Finish grade elevations
- Any cross sectional details for swales, bio-retention units, etc.
- Any manufacturer specification for proprietary Post Construction BMP(s) that may be used in place of the recommended BMP(s) or Site Design Measures (SDM) listed in the Sacramento State LID Calculator.
- Operation and Maintenance Plan for all Post Construction BMP(s) referenced in Section 6.
- Site Plans that incorporate Post Construction BMP's and all design calculations 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 selected Site Design and Treatment Control Measure(s) must be clearly called out on the submitted plans.

OPERATION AND MAINTENANCE OF POST-CONSTRUCTION MEASURES

6 Operation and Maintenance of Post-Construction Measures

6.1 Determining Applicable Projects

6.1.1 Projects Subject to a Recorded Statement of Responsibility and Operations & Maintenance Plan

Any “Regulated” Projects that use the following Storm Water Treatment Controls: Porous Pavement, have a group of contiguous preserved/planted trees .25 acres or more that are used for tree credit, Bioretention Units, Infiltration Galleries, Infiltration Trenches, Inlet Filters, Proprietary Treatment Measures, or Cisterns that require a building permit shall record a Statement of Responsibility and Operations & Maintenance Plan. A template of the document is available in [Appendix 8](#). These projects include but are not limited to the following:

A large Bioretention unit within a subdivision that will treat run-off from the newly developed streets, curbs, sidewalks, and 25% of the impervious area that will be developed on each lot and will be maintained by a Landscape Maintenance District.

Large manufacturing facility that uses infiltration galleries, bio-retention units, preserves .25 acres of trees as an employee lunchtime walking trail area, and installs water capture and reuse to provide necessary storm water retention and treatment.

Regulated redevelopment of a shopping center where bio-retention flow through planters and infiltration galleries are installed.

6.1.2 Projects Subject to a Recorded Water Quality Improvement Feature Document

In cases where the Post-Construction Storm Water Management Plan does not require each parcel within a larger subdivision to install SWTM(s) on each lot then no recorded documents are needed. The following discussion does not apply. However, each parcel within a larger “Regulated” Subdivision could have specific SWTM(s) prescribed on the subdivision map that must be installed to comply with State Post-Construction Storm Water Quality Standards. It is the responsibility of the owner/developer/builder to work with building to identify those requirements.

If parcels are required to install SWTM(s) then a Water Quality Improvement Feature (WQIF) document, available in [Appendix 11](#), shall be recorded prior to occupancy of the dwelling. The purpose of the WQIF document is to inform the owner(s) and future owner(s) about the location and basic maintenance requirements of the SWTM(s) installed on their parcel.

OPERATION AND MAINTENANCE OF POST-CONSTRUCTION MEASURES

6.1.3 Projects exempt from any type of recorded statement

Any “Small” Projects, “Regulated” projects not using any Post-Construction SWTM(s) that require recordation, or projects that installed Post-Construction Storm Water Treatment Measures prior to July 1, 2015 are not required to record any statements or notifications. These projects include, but are not limited to:

Construction of small office building and parking lot that adds 4,000 ft² of impervious area to a site and decides to plant new trees as part of their required frontage improvements and Small Project Post-Construction Storm Water Plan.

Redevelopment of 4,500 ft² of impervious area on an existing site which the owner plans to install some amended strips as part of their Small Project Post-Construction Storm Water Treatment plan

Regulated Project where owner decides to install a series of amended strips and vegetated swales to meet all Post-Construction storm water requirements.

6.1.4 Maintenance mechanisms

Any centralized SWTM or any feature used in storm water quality improvement that serves more than one parcel shall be maintained within a Landscape Maintenance District (LMD) or some equivalent mechanism.

6.2 Requirements for Recorded Statements

6.2.1 Projects Subject to a Recorded Statement of Responsibility

The owner of a project that qualifies for a Recorded Statement of Responsibility as defined in Section 6.1.1 is required to prepare a written plan for conducting regular inspections and maintenance of the installed treatment measure(s) located on site. The Recorded Statement of Responsibility contains three parts: Agreement, Site Map, and O&M plan. The Site Map shall identify the boundaries of the site and pertinent storm water controls. The proposed O&M activities should be similar to the maintenance measures identified in the CASQA BMP specifications or include a manufacturer’s recommendation. (Refer to the hyperlinked references in [Table 3](#).)

- The Site Map is required to have the following information:
 - ✓ Clearly labeled DMA(s)
 - ✓ Pertinent SWTM(s) and SDM(s) that are defined in Section 6.1.1

OPERATION AND MAINTENANCE OF POST-CONSTRUCTION MEASURES

- ✓ Appropriate easements containing preserved trees and planted trees used for impervious area credit of .25 Acres or more
- ✓ Section views if applicable for controls with treatment media and storage volumes
- The O&M Plan is required to identify the following information:
 - ✓ Property name and address;
 - ✓ Name of the DMA(s)
 - ✓ Property owner's contact information including name, mailing address, telephone number, and email address;
 - ✓ Contact information for any contracted or delegated inspectors and maintenance personnel;
 - ✓ Minimum inspection frequency by the property owner or their designee;
 - ✓ Conditions that require maintenance or repair of the Treatment Control Measure defined in Section 6.1.1; and
 - ✓ Preventative maintenance tasks, their frequency, and who will perform them.

The project proponent is required to use the form template provided in [Appendix 8](#) for the Recorded Statement of Responsibility submittal.

6.2.2 Projects Subject to a Water Quality Improvement Feature Document

The owner of the project that qualifies for a Water Quality Improvement Feature (WQIF) Document as defined in Section 6.1.2 is required to complete and record the WQIF document in [Appendix 11](#). Recordation of the WQIF document shall take place prior to occupancy. The WQIF Document shall contain two parts: The Agreement and Attachment A. The agreement has language that informs the current and next owner that they have SWTM(s) on their property, SWTM(s) are important to leave in place because they treat storm water, and the City expects the property owner will maintain them.

- Attachment A is required to have the following information:
 - ✓ Layout 1 shall contain a general sketch (does not need to be to scale) that defines the exterior walls of the dwelling and defines where the SWTM(s) are with respect to the exterior of the structure.
 - ✓ Table 1: Facilities List in Attachment A contains a list of the SWTM(s) installed at the site shown in Layout 1. Three frequently used SWTM(s) have been detailed and maintenance described that can be easily referenced by Table 1. Should the need arise for a SWTM(s) that is not included in the details provided then the owner is required to provide a cross-sectional detail and maintenance instructions on a separate sheet. If proprietary SWTM(s) are used then the project owner shall record maintenance information provided by the manufacturer.

OPERATION AND MAINTENANCE OF POST-CONSTRUCTION MEASURES

6.3 Review Processes

6.3.1 Recorded Statement of Responsibility Review

The completed Recorded Statement of Responsibility Form and all exhibits (included in [Appendix 8](#)) is a document package that must be accepted and signed by the property owner or the owner's duly authorized representative. The Recorded Statement of Responsibility contains a site map in Exhibit A and an O&M Plan in Exhibit B. Submission, City approval, and recordation of the complete Statement of Responsibility will be conditioned during entitlements. If the project qualifies as a Regulated Project and uses the SWTM(s) listed in 6.1.1 then The Building Department will look for proof of recordation prior to issuance of a final subdivision map or a certificate of occupancy.

6.3.1.1 During Entitlements:

Regulated Projects will be conditioned such that if the Treatment Controls listed in Section 6.1.1 of this plan are used then a Storm Water Management Program Post-Construction Statement of Responsibility (SOR) shall be approved by the City and recorded prior to the signing of the Final Subdivision Map or issuance of a Certificate of Occupancy. Review of Statement of Responsibility Submittal:

- ✓ Submit a completed Storm Water Management Program Post-Construction Statement of Responsibility (SOR).
- ✓ Include DMA(s), site details, and applicable SWTM(s) or SDM(s) in the drawing contained in Exhibit A of the SOR.
- ✓ If tree credit is used, clearly define Open Space Easements or planted trees on the map contained in Exhibit A of the SOR.
- ✓ Provide a detailed Operations and Maintenance (O&M) Plan in Exhibit B of the SOR that addresses the proposed maintenance plan for each Post-Construction SWTM(s) from Section 6.1.1

6.3.1.2 Prior to Final Subdivision Map or Certificate of Occupancy:

Provide documentation to the Storm Water Engineer that verifies that the proper documents have been successfully recorded.

6.3.2 Water Quality Improvement Feature Document Review

Parcels within subdivisions that condition each lot with mitigation for impervious area shall submit a WQIF Document for review at the time construction documents are submitted to the City. The WQIF submittal shall include the following:

- ✓ Completed Agreement

OPERATION AND MAINTENANCE OF POST-CONSTRUCTION MEASURES

- ✓ Completed Exhibit A
- ✓ Any additional information in the event that the details on Exhibit A are not sufficient.

The documents will be reviewed for completeness and returned to the owner when the building plan check is complete.

6.4 Recertification

6.4.1 Projects with Recorded Statements of Responsibility (SOR)

Nov. 1st of every year a notification will be sent to each owner of a project with a Recorded Statement of Responsibility. The owner will be instructed to complete the annual recertification document and remit back to the City by Jan. 31st of the following year. The recertification assures the City that the Post-Construction SWTM(s) are functioning as designed and are being maintained. The City will inspect the SWTM(s) that it deems necessary.

6.4.2 Projects with a Recorded Water Quality Improvement Feature (WQIF) Document

Every three years a notification will be sent to the owners with a WQIF document recorded. The document will inform the owner that the City expects they have been maintaining their SWTM(s) and that we expect that have not been removed.

CITY SPECIFIC INFORMATION

7 City Specific Information



7.1 Contact Information

The City of Redding is subject to the State Water Board's Phase II MS4 Permit. In response to the requirements of the permit, the City of Redding conditions applicable new development and redevelopment projects with requirements as discussed in this Plan.

For more information on the requirements of this plan or to obtain additional guidance on how to meet the conditions of this plan, please contact:

Mieke Sheffield
Storm Water Management Program Coordinator
City of Redding
777 Cypress Ave., Redding, CA 96001
530-225-4889
msheffield@cityofredding.org

Chris Sparber
Storm Water Management Program Engineer
City of Redding
777 Cypress Ave., Redding, CA 96001
530-225-4421
cjsparber@cityofredding.org

For more information about the City of Redding's storm water program or to download a copy of this Post-Construction Standards Plan or related-forms and tools, go to:

City of Redding Storm Water Website: <http://www.cityofredding.org/departments/public-works/environmental-management/storm-water-management>

7.2 Municipal Code, Standards, and Appeals

Municipal Code Chapter 14.19 ([Appendix 10](#))

Storm Water Discharges From Small Municipal Separate Storm Sewer Systems (MS4s) Order NO. 2013-0001-DWQ

Section 800 of the City of Redding Construction Standards

APPENDIX 1 - GLOSSARY

Glossary for the Post-Construction Standards Plan³

Capital Improvement Project (CIP) – A public project that is owned by the City. It is not subject to the plan check process but is subject to the Post-Construction Standards Plan and Section E.12 of the Phase II MS4 Permit. (Definition provided by the document publisher.)

Detached Single-family Home - The building of one single new house or the addition and/or replacement of impervious surface associated with one single existing house, which is not part of a larger plan of development.

Discretionary Project – A project that is subject to the City plan check process and discretionary review and conditioning.

Facility – For the purpose of this Post-Construction Development Standards Plan, facility refers to a Site Design Control or Treatment Control Measure and does not refer to a property, parcel, industrial plant, or place of business. (Definition provided by the document publisher.)

Hydromodification - Modification of hydrologic pathways (precipitation, surface runoff, infiltration, groundwater flow, return flow, surface-water storage, groundwater storage, evaporation and transpiration) that results in negative impacts to watershed health and functions.

Impervious Surface - A surface covering or pavement of a developed parcel of land that prevents the land's natural ability to absorb and infiltrate rainfall/storm water. Impervious surfaces include, but are not limited to; roof tops, walkways, patios, driveways, parking lots, storage areas, impervious concrete and asphalt, and any other continuous watertight pavement or covering. Landscaped soil and pervious pavement, including pavers with pervious openings and seams, underlain with pervious soil or pervious storage material, such as a gravel layer sufficient to hold the specified volume of rainfall runoff are not impervious surfaces.

Industrial Development - Development or redevelopment of property to be used for industrial purposes, such as factories, manufacturing buildings, and research and development parks.

Linear Underground/Overhead Projects (LUPs) - Include, but are not limited to, any conveyance, pipe, or pipeline for the transportation of any gaseous, liquid (including water and wastewater for domestic City services), liquescent, or slurry substance; any cable line or wire for the transmission of electrical energy; any cable line or wire for communications (e.g., telephone, telegraph, radio, or television messages); and associated ancillary facilities. Construction activities associated with LUPs include, but are not limited to, (a) those activities necessary for the installation of underground and overhead linear facilities (e.g., conduits, substructures, pipelines, towers, poles, cables, wires, connectors, switching, regulating and transforming equipment, and associated ancillary facilities); and include, but are not limited to, (b) underground utility mark-out, potholing, concrete and asphalt cutting and removal, trenching, excavation, boring and drilling, access road and pole/tower pad and cable/wire pull station, substation construction, substructure installation,

³ Definitions (unless otherwise specified) are from the Phase II MS4 NPDES General Permit, Order No. 2013-0001-DWQ, Attachment I; www.swrcb.ca.gov/water_issues/programs/stormwater/docs/phsii2012_5th/att_i_glossary_final.pdf

construction of tower footings and/or foundations, pole and tower installations, pipeline installations, welding, concrete and/ or pavement repair or replacement, and stockpile/borrow locations.

Low Impact Development – A sustainable practice that benefits water supply and contributes to water quality protection. Unlike traditional storm water management, which collects and conveys storm water runoff through storm drains, pipes, or other conveyances to a centralized storm water facility, Low Impact Development (LID) takes a different approach by using site design and storm water management to maintain the site's pre-development runoff rates and volumes. The goal of LID is to mimic a site's predevelopment hydrology by using design techniques that infiltrate, filter, store, evaporate, and detain runoff close to the source of rainfall. LID has been a proven approach in other parts of the country and is seen in California as an alternative to conventional storm water management.

Ministerial Project – A project that is non-discretionary and consists of a grading or building permit that is pulled “over-the-counter” without a plan check review process. (Definition provided by the document publisher.)

Municipal Separate Storm Sewer System (MS4) - The regulatory definition of an MS4 (40 CFR 122.26(b)(8)) is "a conveyance or system of conveyances (including roads with drainage systems, City streets, catch basins, curbs, gutters, ditches, man-made channels, or storm drains): (i) Owned or operated by a state, city, town, borough, county, parish, district, association, or other public body (created to or pursuant to state law) including special districts under state law such as a sewer district, flood control district or drainage district, or similar entity, or an Indian tribe or an authorized Indian tribal organization, or a designated and approved management agency under section 208 of the Clean Water Act that discharges into waters of the United States. (ii) Designed or used for collecting or conveying storm water; (iii) Which is not a combined sewer; and (iv) Which is not part of a Publicly Owned Treatment Works (POTW) as defined at 40 CFR 122.2." In practical terms, operators of MS4s can include City's and local sewer districts, state and federal departments of transportation, public universities, public hospitals, military bases, and correctional facilities. The Storm water Phase II Rule added federal systems, such as military bases and correctional facilities by including them in the definition of small MS4s.

National Pollutant Discharge Elimination System (NPDES) - A national program for issuing, modifying, revoking and reissuing, terminating, monitoring and enforcing permits, and imposing and enforcing pretreatment requirements, under sections 307, 402, 318, and 405 of the CWA.

New Development - New Development means land disturbing activities; structural development, including construction or installation of a building or structure, creation of impervious surfaces; and land subdivision on an area that has not been previously developed.

Non-Discretionary Project – A project that is not subject to the city plan check process; also known as a ministerial project. (Definition provided by the document publisher.)

Pervious Pavement - Pavement that stores and infiltrates rainfall at a rate that exceeds conventional pavement.

Pollutants of Concern - Pollutants of concern found in urban runoff include sediments, non-sediment solids, nutrients, pathogens, oxygen-demanding substances, petroleum hydrocarbons, heavy metals, floatables, polycyclic aromatic hydrocarbons (PAHs), trash, and pesticides and herbicides.

Redevelopment - Land-disturbing activity that results in the creation, addition, or replacement of exterior impervious surface area on a site on which some past development has occurred. Redevelopment does not include trenching, excavation and resurfacing associated with LUPs; pavement grinding and resurfacing of existing roadways; construction of new sidewalks, pedestrian ramps, or bike lanes on existing roadways; or routine replacement of damaged pavement such as pothole repair or replacement of short, non-contiguous sections of roadway.

Regulated Project – Refers to projects subject to the new and redevelopment standards in Section E.12c. of the Phase II MS4 Permit and includes projects that create and / or replace 5,000 ft² or more of impervious surface.

Residential Housing Subdivision - Any property development of multiple single-family homes or of dwelling units intended for multiple families/households (e.g., apartments, condominiums, and town homes).

Riparian Areas – Plant communities contiguous to and affected by surface and subsurface hydrologic features of perennial or intermittent water bodies. Riparian areas have one or both of the following characteristics: 1) distinctively different vegetative species than adjacent areas, and 2) species similar to adjacent areas but exhibiting more vigorous or robust growth forms. Riparian areas are usually transitional between wetland and upland.

Small Project – Projects that create and / or replace between 2,500 and 5,000 ft² of impervious surface and detached single family home projects that create and / or replace more than 2,500 ft² and that are not part of a larger common plan. (Definition provided by the document publisher.)

Smart Growth Projects – Projects that produce multiple-benefits such as economic, social and environmental benefits. Smart growth projects commonly include high density development projects that result in a reduction of runoff volume per capita as a result of reduced impervious surface.

Source Control - Land use or site planning practices, or structural or nonstructural measures, that aim to prevent runoff pollution by reducing the potential for contact with rainfall runoff at the source of pollution. Source control BMPs minimize the contact between pollutants and urban runoff.

Surface Drainage - Any above-ground runoff (sheet, shallow concentrated, and open channel) that flows into the storm drain system.

Storm Drain System - The basic infrastructure in a municipal separate storm sewer system that collects and conveys storm water runoff to a treatment facility or receiving water body.

Storm Water – Storm water is generated when precipitation from rain and snowmelt events flows over land or impervious surfaces and does not percolate into the ground. As storm water flows over the land or impervious surfaces, it accumulates debris, chemicals, sediment or other pollutants that could adversely affect water quality if the storm water is discharged untreated.

Storm Water Treatment System - Any engineered system designed to remove pollutants from storm water runoff by settling, filtration, biological degradation, plant uptake, media absorption/adsorption or other physical, biological, or chemical process. This includes landscape-based systems such as grassy swales and bioretention units as well as proprietary systems.

Structural Controls - Any structural facility designed and constructed to mitigate the adverse impacts of storm water and urban runoff pollution.

Treatment - Any method, technique, or process designed to remove pollutants and/or solids from polluted storm water runoff, wastewater, or effluent.

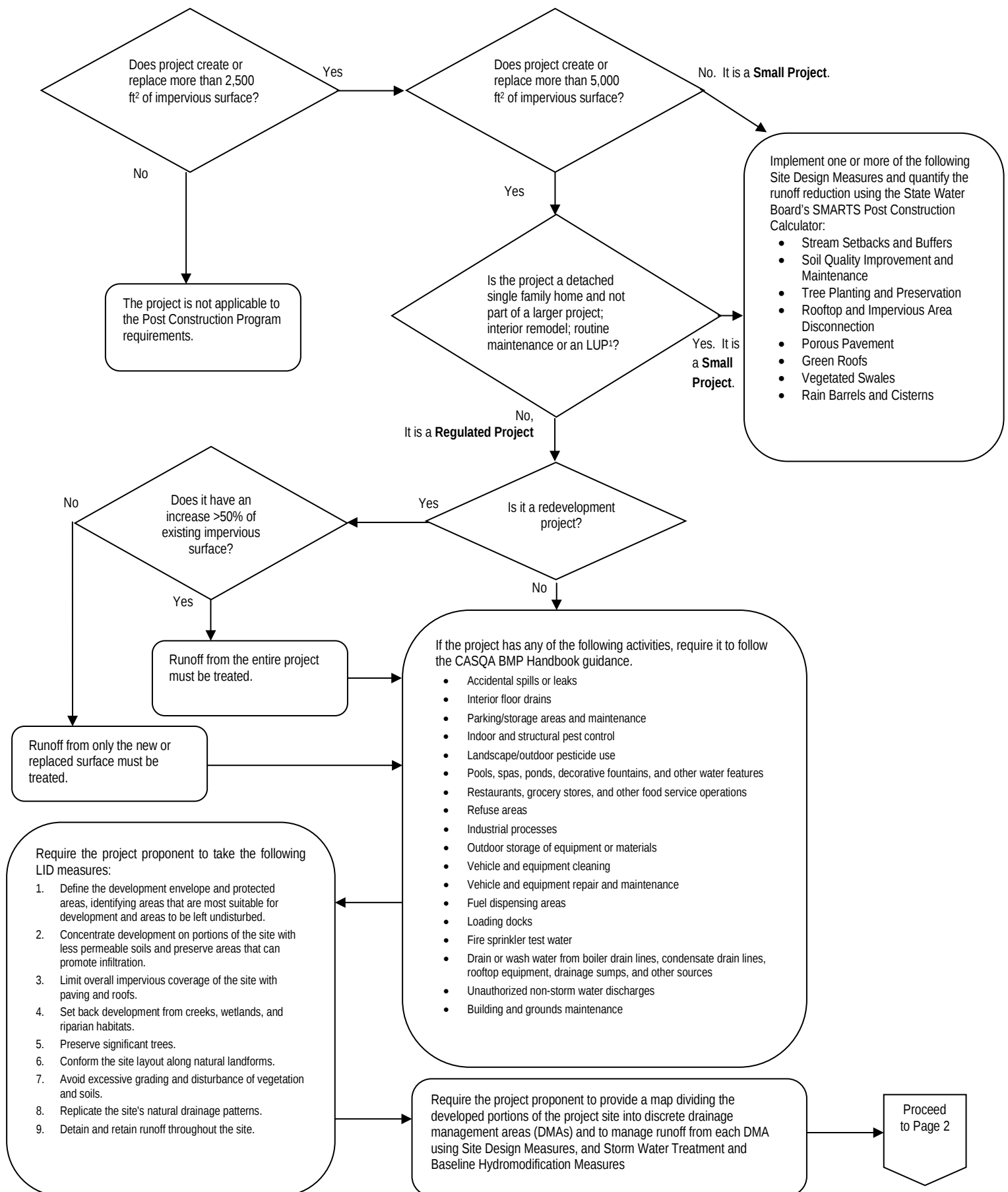
APPENDIX 2 - ACRONYMS

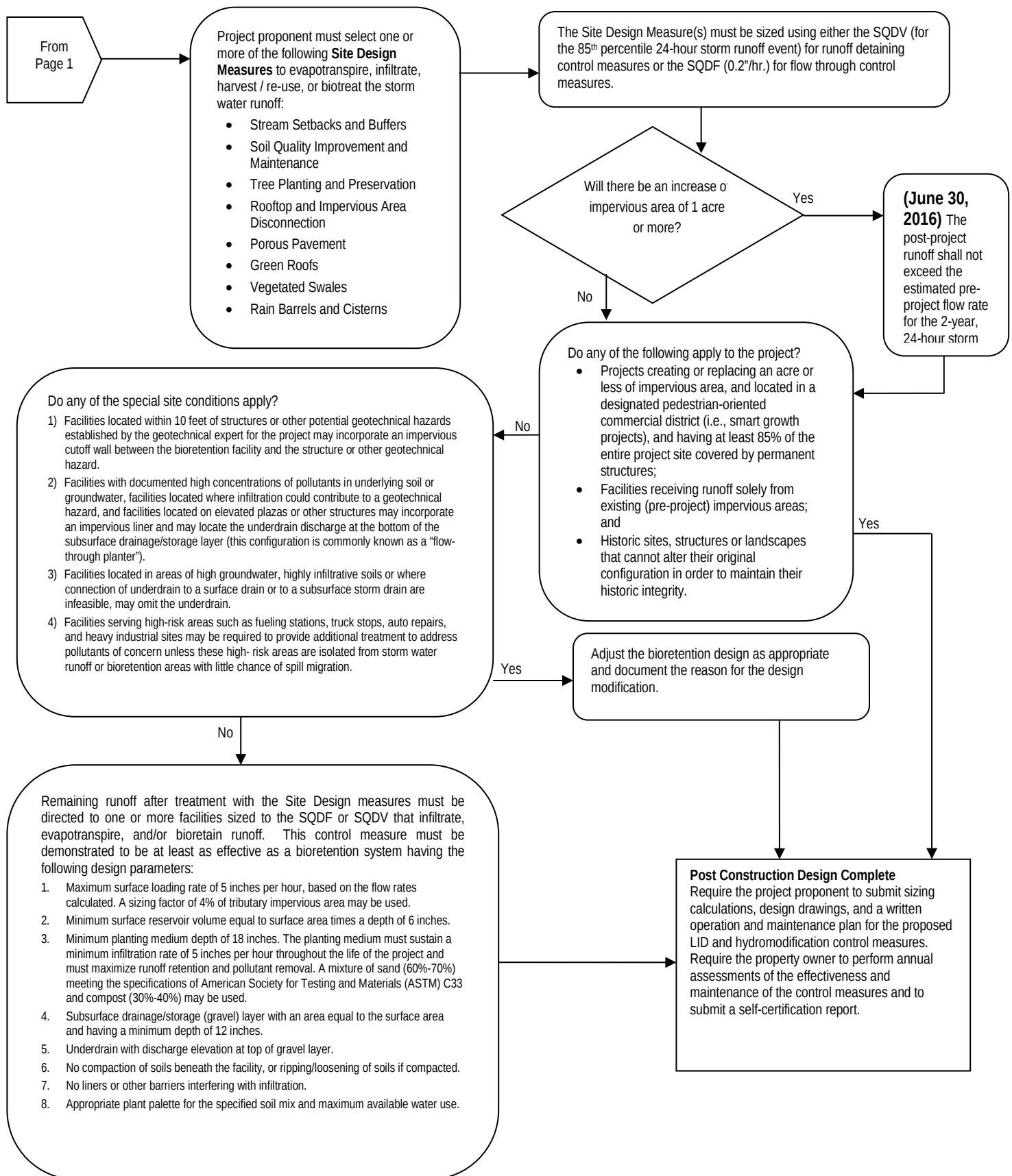
Acronyms of the Post-Construction Standards Plan

ASTM	American Society for Testing and Materials
BMP	Best Management Practice
CASQA	California Storm Water Quality Association (www.CASQA.org)
CPSWQ	Certified Professional in Storm Water Quality
CIP	Capital Improvement Project
CWA	Clean Water Act
DMA	Drainage Management Area
HSG	Hydrologic Soil Group
LID	Low Impact Development
LUPs	Linear Utility Projects
MS4	Municipal Separate Storm Sewer System
NOAA	National Oceanic and Atmospheric Administration
NPDES	National Pollutant Discharge Elimination System
NRCS	Natural Resources Conservation Service
O&M	Operation and Maintenance
PE	Professional Engineer
SDM	Site Design Measure
SMARTS	Storm Water Multi-Application, Reporting, and Tracking System (https://smarts.waterboards.ca.gov/smarts/faces/SwSmartsLogin.jsp)
SWTM	Storm Water Treatment Measure
USDA	United States Department of Agriculture
USEPA	United States Environmental Protection Agency

APPENDIX 3 – SECTION E.12 OF THE PHASE II MS4 PERMIT

APPENDIX 4 – POST-CONSTRUCTION MANAGEMENT FLOW CHART

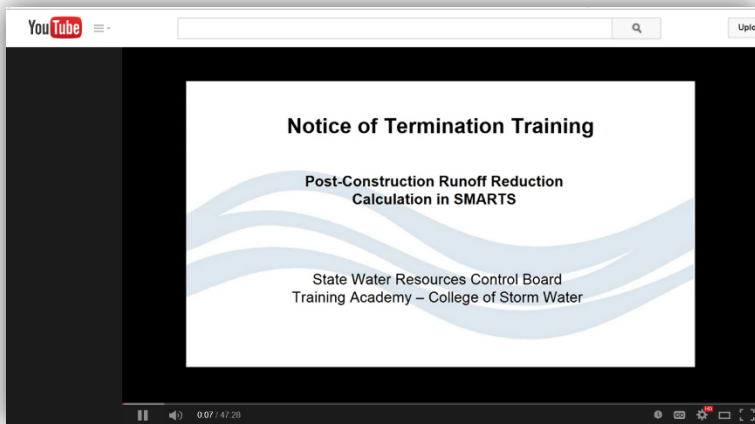




APPENDIX 5 – STATE OF CALIFORNIA POST-CONSTRUCTION CALCULATOR

Instructions on the Download and Use of the State of California's Post-Construction Calculator

Post-Construction Calculator which is available on the Water Board's SMARTS website or can be accomplished through the State's Microsoft Excel™ version of the calculator. The Water Board has created an instructional video on how to populate and use the Post-Construction Calculator.



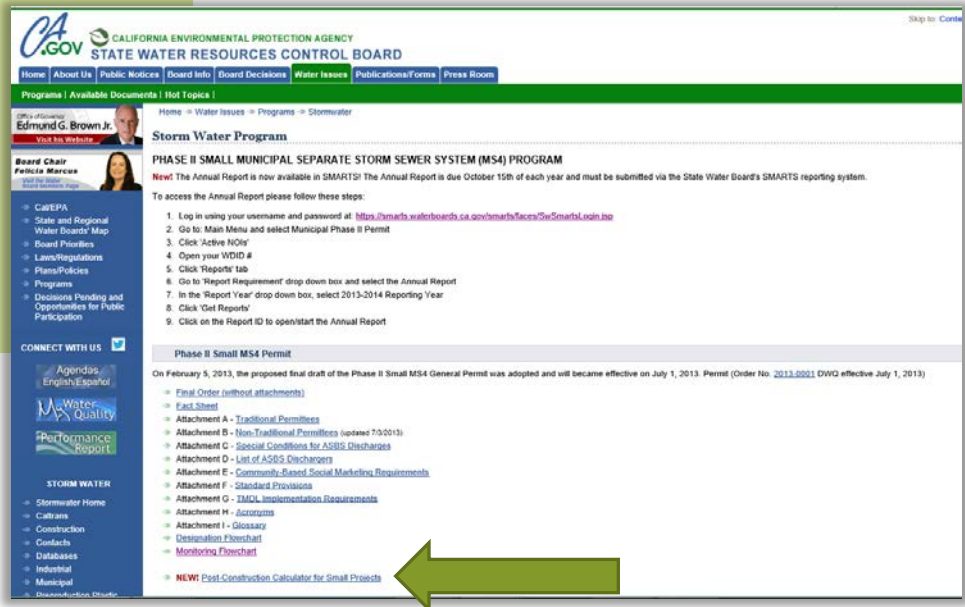
The Water Board created this 47-minute video that describes how to use the Post-Construction Calculator on SMARTS. It will also help with the Excel version. Although the video was created for the Construction General Permit, it also applies to the Post-Construction Standards Plan. It can be accessed at:

<https://www.youtube.com/watch?v=W3nj4pj8WHY&feature=youtu.be>

Post-Construction Calculator for Small Projects

The Water Board has created a Microsoft Excel version of the calculator that can now be downloaded from the State Water Board's website at the following link:

http://www.swrcb.ca.gov/water_issues/programs/stormwater/phase_ii_municipal.shtml



APPENDIX 6 – DESIGN STANDARD RESOURCES

The following are some online design references for Design Standards and Treatment Controls:

Porous Pavement:

- Caltrans Pervious Pavement Design Guidance, August 2014
www.dot.ca.gov/hq/oppd/stormwtr/bmp/DG-Pervious-Pvm_082114.pdf
- Caltrans Pervious Pavement Specifications and Design Tool:
www.dot.ca.gov/hq/oppd/stormwtr/pervious.htm
- USEPA Guidance Website on Porous Asphalt Pavement:
<http://water.epa.gov/polwaste/npdes/swbmp/Porous-Asphalt-Pavement.cfm>
- Pennsylvania Storm Water Best Management Practices Manual on Pervious Pavement:
www.stormwaterpa.org/assets/media/BMP_manual/chapter_6/Chapter_6-4-1.pdf
- University of New Hampshire Stormwater Center: Design Specifications for Porous Asphalt Pavement and Infiltration Beds:
www.unh.edu/unhsc/sites/unh.edu.unhsc/files/pubs_specs_info/unhsc_pa_spec_10_09.pdf
- National Asphalt Pavement Association's Porous Asphalt Pavements for Storm Water Management Guide Book (Downloadable – cost \$30)
<http://store.asphaltpavement.org/index.php?productID=759>
- Bay Area Stormwater Management Agencies Association and City of Berkeley: Pervious Pavement - Storm Water Control for Small Projects
www.ci.berkeley.ca.us/uploadedFiles/Online_Service_Center/Planning/Stormwater%20Fact%20Sheet_BASMAA_Pervious_Paving.pdf
- Santa Clara Valley Urban Runoff Pollution Prevention Program: Chapter 6 Technical Guidance for Stormwater Treatment and Site Design Measures
www.scvurppp-w2k.com/permit_c3_docs/c3_handbook_2012/Chapter_6-Tech_Guidance_Stormwater_Treatment_Site_Design_Measures_2012.pdf



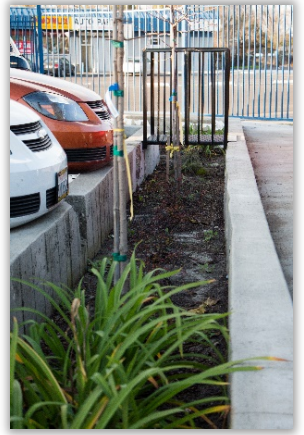
Rain Gardens:

- Bay Area Stormwater Management Agencies Association and Alameda County: Rain Gardens - Storm Water Control for Small Projects
http://alamedaca.gov/sites/default/files/departments-files/2013-04-29/11_-_rain_garden_fact_sheet.pdf
- Low Impact Development Center
(www.lowimpactdevelopment.org/)
Links for Guidance on the Design and Construction of a Rain Garden:
www.lowimpactdevelopment.org/raingarden_design/links.htm#top
Reference and Guidance Downloads:
www.lowimpactdevelopment.org/raingarden_design/download.htm



Flow-through Planters:

- San Mateo Countywide Water Pollution Prevention Program: C.3 Technical Guidance, 6.2 Flow-Through Planter
www.flowstobay.org/files/newdevelopment/C3techguide/12sec6.2Flowthru.pdf
 - Stormwater Planters (draft version), Derek C. Godwin, Marissa Sowles, and Desiree Tullos, Oregon Sea Grant Extension; Maria Cahill, Green Girl Land Development Solutions.
http://extension.oregonstate.edu/watershed/sites/default/files/stormwater_planters.pdf
- Santa Clara Valley Urban Runoff Pollution Prevention Program: Chapter 6 Technical Guidance for Stormwater Treatment and Site Design Measures
www.scvurppp-w2k.com/permit_c3_docs/c3_handbook_2012/Chapter_6-Tech_Guidance_Stormwater_Treatment_Site_Design_Measures_2012.pdf



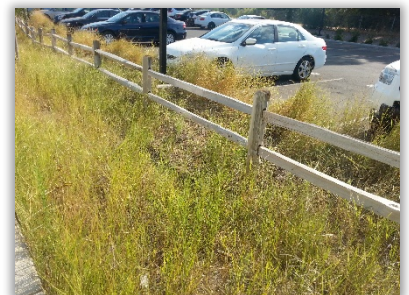
Infiltration Trenches and Tree Wells:

- USEPA Storm Water Technology Fact Sheet: Infiltration Trench (EPA 832-F-99-019, September 1999)
http://water.epa.gov/scitech/wastetech/upload/2002_06_28_mtb_infltrench.pdf
- Santa Clara Valley Urban Runoff Pollution Prevention Program: Chapter 6 Technical Guidance for Stormwater Treatment and Site Design Measures
www.scvurppp-w2k.com/permit_c3_docs/c3_handbook_2012/Chapter_6-Tech_Guidance_Stormwater_Treatment_Site_Design_Measures_2012.pdf
- Minnesota Urban Small Sites BMP Manual: Infiltration Trenches
<http://www.sccd.org/Infiltration%20Trenches.pdf>
- USEPA Stormwater to Street Trees: Engineering Urban Forests for Stormwater Management; (EPA 841-B-13-001, September 2013)
<http://water.epa.gov/polwaste/green/upload/stormwater2streettrees.pdf>



Bioswales, Vegetated Buffers & Swales:

- Caltrans Biofiltration Swale Design Guidance; California Department of Transportation; CTSW-TM-07-172-05, January 2009
www.dot.ca.gov/hq/LandArch/ec/stormwater/guidance/DG-BioSwale-Final02-011309.pdf &
www.dot.ca.gov/hq/LandArch/ec/stormwater/biofiltration_swales.htm
- Biofilters (Bioswales, Vegetative Buffers, & Constructed Wetlands) for Storm Water Discharge Pollution Removal; State of Oregon, Department of Environmental Quality, Dennis Jurries, PE; January 2003



www.deq.state.or.us/wq/stormwater/docs/nwr/biofilters.pdf

- Design Manual: Biological Filtration Canal (Bioswale); Dayna Yocum, Bren School of Environmental Science and Management, University of California, Santa Barbara
http://fiesta.bren.ucsb.edu/~chiapas2/Water%20Management_files/Bioswales-1.pdf
- Santa Clara Valley Urban Runoff Pollution Prevention Program: Chapter 6 Technical Guidance for Stormwater Treatment and Site Design Measures
www.scvurppp-w2k.com/permit_c3_docs/c3_handbook_2012/Chapter_6-Tech_Guidance_Stormwater_Treatment_Site_Design_Measures_2012.pdf
- USEPA Storm Water Technology Fact Sheet: Vegetated Swales (EPA 832-F-99-006, September 1999)
http://water.epa.gov/scitech/wastetech/upload/2002_06_28_mtb_vegswale.pdf

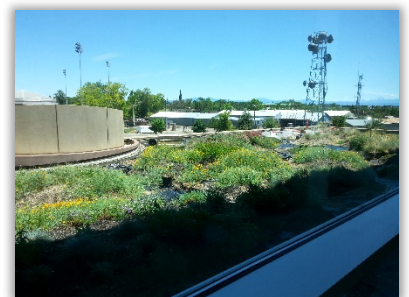
Rain Water Harvesting and Reuse:

- USEPA Managing Wet Weather with Green Infrastructure Municipal Handbook: Rainwater Harvesting Policies; Christopher Kloss, Low Impact Development Center, December 2008 (EPA-833-F-08-010)
http://water.epa.gov/infrastructure/greeninfrastructure/upload/gi_munichandbook_harvesting.pdf
- The City of San Diego Rain Water Harvesting Guide
www.sandiego.gov/water/pdf/conservation/rainwaterguide.pdf
- Santa Clara Valley Urban Runoff Pollution Prevention Program: Chapter 6 Technical Guidance for Stormwater Treatment and Site Design Measures
www.scvurppp-w2k.com/permit_c3_docs/c3_handbook_2012/Chapter_6-Tech_Guidance_Stormwater_Treatment_Site_Design_Measures_2012.pdf



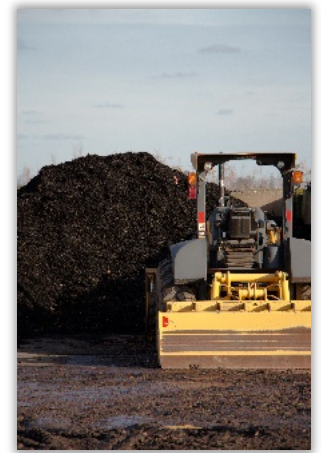
Green Roofs:

- USEPA Design Guidelines and Maintenance Manual for Green Roofs in the Semi-Arid and Arid West; Leila Tolderlund, University of Colorado Denver, November 2010
<http://www2.epa.gov/sites/production/files/documents/GreenRoofsSemiAridAridWest.pdf>
- City of Berkeley Office of Energy and Sustainable Development webpage: www.ci.berkeley.ca.us/greenroofs/
- City of Watsonville Green Roof Design Criteria webpage:
<http://cityofwatsonville.org/public-works-utilities/urban-greening-plan/green-roof-design> (contains a link to a downloadable 30-page Green Roof Design Criteria Plan published in March 2012)
- Green Roofs for Healthy Cities (private organization) webpage:
www.greenroofs.org/ Training, certifications, design manuals, and other resources available for designing green roofs.



Soil Quality Improvement and Compost:

- United States Department of Agriculture's Natural Resources Conservation Service (NRCS) Urban Soil Primer
www.nrcs.usda.gov/Internet/FSE_DOCUMENTS/nrcs142p2_052835.pdf
- US Composting Council Fact Sheets and Reports;
<http://compostingcouncil.org/factsheets-and-free-reports/>
- Department of Land, Air and Water Resources at UC Davis and the U.S. Forest Service's Center for Urban Forest Research Report on Engineered Soil, Trees and Stormwater Runoff: the UC Davis Parking Lot Project
www.fs.fed.us/psw/programs/uesd/uep/products/psw_cufr686_UCDParkingLot.pdf
- USEPA Stormwater to Street Trees: Engineering Urban Forests for Stormwater Management; (EPA 841-B-13-001, September 2013)
<http://water.epa.gov/polwaste/green/upload/stormwater2streettrees.pdf>



APPENDIX 7 – POST-CONSTRUCTION PROJECT WORKSHEET

POST-CONSTRUCTION WORKSHEET FOR THE CITY OF REDDING

PROJECT SUMMARY SHEET

Project Owner Information:

Project Owner Name:				
Name of Contact Person:				
Mailing Street Address:				
City:		State:		Zip:
Telephone:			Email:	

Project Information:

Project Name:				
Name of Contact Person:				
Project Address:				
City:		State:		Zip:
Anticipated construction start date:			Ending date:	
Project size (ft ²):			Subject to the Construction General Permit? (Yes / No)	

Information of the Post-Construction Standards Plan Preparer:

Name of Organization:				
Name of Contact Person:				
Mailing Street Address:				
City:		State:		Zip:
Telephone:			Email:	

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)		Will the project result in an increase of more than 50% of the impervious surface? (Yes / No)	
Has the project or the vesting map received approval from the City? (Yes, No, or N/A)		Date of project or vesting map approval:	
Describe the nature and scope of the construction project:			
Number of Drainage Management Areas (DMAs):			

POST-CONSTRUCTION WORKSHEET FOR THE CITY OF REDDING

SMALL PROJECT SUBMITTAL SHEET

Project Information:

Project Name:	
Project Owner Name:	
Project Address:	

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.

<i>Site Design Measures</i>	<i>Selected? (Yes / No)</i>
Stream Setbacks and Buffers	
Soil Quality Improvement and Maintenance	
Tree Planting and Preservation	
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 (ft³)	
Post-project Runoff Volume (ft³)	
Net Credit of Volume Credits (ft³)	

POST-CONSTRUCTION WORKSHEET FOR THE CITY OF REDDING

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:	
Project Owner Name:	
Project Address:	
Name of the DMA:	
DMA area (ft ²)	

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	
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	

Project Name:	
Project Owner Name:	
Project Address:	
Name of the DMA:	
DMA area (ft ²)	

Selection of Applicable Site Design and Storm Water Treatment Measures:

Indicate which of the Site Design or Storm Water Treatment Measures are used in this DMA of the new development or redevelopment. In Column 2 list the 100% compliance area for the chosen Post Construction BMP which is given in the online calculator results and then in column three list the area of the BMP that is actually used. Divide the actual area by the 100% compliance area to calculate the percent treated. The sum of all the rows in column four should be greater than 100%. For more information about required Source Control refer to Section 5.2.

Site Design Measure or Treatment Control Measure	Permit compliant LID BMP Areas (from Online Calc.)	Area used within project	Percent compliant
Total			>=100%

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	
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.

APPENDIX 8 – STATEMENT OF RESPONSIBILITY & O&M PLAN TEMPLATE

RECORDING REQUESTED BY:

City of Redding

WHEN RECORDED RETURN TO:

City Clerk
City of Redding
777 Cypress Avenue
Redding, CA 96001

APN. _____

THE AREA ABOVE IS RESERVED FOR RECORDER'S USE

STORM WATER MANAGEMENT PROGRAM POST- CONSTRUCTION STATEMENT OF RESPONSIBILITY

THE UNDERSIGNED DECLARE:

Documentary Transfer Tax - NONE
City of Redding EXEMPT - Rev. & Tax. C.A. ' 11922
NO FEE - CITY BUSINESS - Gov. Code ' 6103

THIS STORM WATER MANAGEMENT PROGRAM POST-CONSTRUCTION STATEMENT OF RESPONSIBILITY ("Agreement") is entered into this _____ day of _____, 20____, by and between the **CITY OF REDDING**, a Municipal Corporation ("AGENCY") and _____ ("OWNER").

A. **OWNERS**, are fee owners of record of that certain real property ("Property") described as _____, depicted on the map in Exhibit A attached hereto, located in the City of Redding, County of Shasta, State of California.

B. **WHEREAS**, at the time of initial approval of the development project known as _____, within the Property described herein, the AGENCY required the project to employ on-site control measures to minimize pollutants in urban runoff; and

WHEREAS, the OWNER has chosen to install the following treatment control measure(s):

hereinafter referred to as ("Facilities"), as the on-site control measures to minimize pollutants in urban runoff; and

WHEREAS, said Facilities have been installed in accordance with the requirements of the AGENCY's Post-Construction Standards Plan and the OWNER's plans and specifications accepted by the AGENCY; and

WHEREAS, said Facilities, with installation on private property and draining only private property, is a private facility with all operation, maintenance and replacement the sole responsibility of the OWNER in accordance with the terms of this Agreement; and

WHEREAS, the OWNER is aware that periodic and continuous maintenance (as described in the Operation & Maintenance or "O&M" Plan attached hereto in Exhibit B), including, but not limited to, filter material replacement and sediment removal, is required to assure peak performance of the Facilities and that, furthermore, such maintenance activity will require compliance with all Local, State, or Federal laws and regulations, including those pertaining to confined space and waste disposal methods, in effect at the time such maintenance occurs;

NOW THEREFORE, it is mutually stipulated and agreed as follows:

1. It is the intent of the parties hereto that burdens and benefits herein undertaken shall constitute covenants that run with said Property and constitute a lien there against.
2. The obligations herein undertaken shall be binding upon the heirs, successors, executors, administrators, trustees and assigns of the parties hereto. The term "OWNER" shall include not only the present OWNER, but also its heirs, successors, executors, administrators, trustees and assigns. OWNER shall notify any successor to title of all or part of the Property about the existence of this Agreement. OWNER shall provide such notice prior to such successor obtaining an interest in all or part of the Property. OWNER shall provide a copy of such notice to the AGENCY at the same time such notice is provided to the successor.
3. OWNER agrees to ensure that any written condition in the sales or lease agreements or deeds for the Property requires the buyer or lessee to assume responsibility for this Agreement and all attachments to this Agreement, until such responsibility is legally transferred to another entity.
4. OWNER hereby provides the AGENCY or AGENCY's designee complete access, of any duration, to the Facilities and its immediate vicinity at any time, upon reasonable notice, or in the event of emergency, as determined by the AGENCY with no advance notice, for the purpose of inspection, sampling, testing of the Facilities, and in case of emergency, to undertake all necessary repairs or other preventative measures at OWNER's expense as provided in paragraph seven (7) below.
5. OWNER shall use its best efforts, and follow industry standards, to diligently maintain the Facilities in a manner assuring effective performance at all times. All reasonable precautions shall be exercised by OWNER and OWNER's representative or contractor in the removal and extraction of material(s) from the Facilities and the ultimate disposal of the material(s) in a manner consistent with all relevant laws and regulations in effect at the time such action is taken.
6. The OWNER shall retain for a period of five (5) years all operation and maintenance records and

documentation identifying any material(s) removed (as well as quantity and the disposal destination of such materials) at the Facilities for AGENCY inspection. The AGENCY may at any time request copies of these documents and a copy shall be provided to the AGENCY within thirty (30) days of the request. The AGENCY shall make every effort at all times to minimize or avoid interference with OWNER's use of the Property.

7. In the event that OWNER, or its successors or assigns, fails to accomplish the necessary maintenance set forth in this Agreement within thirty (30) days of being given written notice by the AGENCY, the AGENCY is hereby authorized to cause any maintenance the AGENCY deems necessary to be done, and charge the entire cost and expense to the OWNER, notwithstanding paragraph 8 below, including administrative costs, attorney fees and interest thereon at the maximum rate authorized by State Law from the date of the notice of expense until paid in full. OWNER hereby agrees to pay such charge within thirty (30) days of receipt of AGENCY's written demand for payment.
 8. The AGENCY may require the owner to post security in form and for a time period satisfactory to the AGENCY to guarantee the performance of the obligations stated herein. Should the OWNER fail to perform the obligations under this Agreement, the AGENCY may, in the case of a cash bond, act for the OWNER using the proceeds from it, or in the case of a surety bond, require the sureties to perform the obligations of the Agreement.
 9. As an additional remedy, the AGENCY may withdraw any previous AGENCY approvals for improvements on the Property on which the Facilities have been installed until such time as AGENCY is reimbursed its reasonable costs incurred in accordance with paragraph seven (7) and/or eight (8) above.
 10. The OWNER will be sent an annual self-certification form each year by the AGENCY to certify that all inspections and maintenance have been performed pursuant to the O&M Plan, and that the Facilities are in effective working condition. The OWNER shall complete and return the annual self-certification form to the AGENCY within sixty (60) days of receipt. If the report is not received within the 60-day period, the AGENCY may perform the inspection and assessment and assess the OWNER for the cost of inspection including any administrative costs and interest thereon at the maximum rate authorized by the Municipal Code. OWNER hereby agrees to pay such charge within sixty (60) days of receipt of the AGENCY's written demand for payment.
 11. In event of legal action occasioned by any default or action of the OWNER, then the OWNER agrees to pay all costs incurred by the AGENCY in enforcing or defending the terms of this Agreement, including attorney fees and costs, other litigation fees and costs, as well and any other costs incurred as a result of legal action, regardless of who initiates the law suit, and that the same shall become a part of the lien against said Property.
 12. This Agreement, or any attachment to this Agreement, may be amended in writing by the parties hereto, or their respective successors and assigns.
 13. Any notice or demand for payment to a party required or called for in this Agreement shall be served in person, or by deposit in the U.S. Mail, first class postage prepaid, to addresses listed below on this Agreement either for the OWNER or the AGENCY. Notice(s) shall be deemed effective upon receipt, or seventy-two (72) hours after deposit in the U.S. Mail, whichever is earlier. A party may change a notice address only by providing written notice thereof to the other party.
- C. OWNER and AGENCY agree that this declaration is to run with land and will remain until an instrument is signed by both parties agreeing to change or revoke this declaration in whole or in part.

DATED: _____ day of _____, 20____

IF TO AGENCY:

Department of Public Works

Attn: Storm Water Management Program Coordinator

777 Cypress Ave.

Redding, CA 96001

IF TO OWNER:

EXHIBIT A

Property Map

EXHIBIT B

Operations and Maintenance Plan

OPERATION & MAINTENANCE (O&M) PLAN

Property Owner Information:

Property Owner Name:					
Name of Contact Person:					
Mailing Address:					
City:		State:		Zip:	
Telephone:			Email:		

Development Information:

Name of Development					
Development Address:					
City:		State:		Zip:	
Assessor Parcel No.:					
Name of Person or Organization Responsible for Performing Inspections and Maintenance of the Treatment Control Measures:					
Mailing Street Address:					
City:		State:		Zip:	
Telephone:			Email:		

Treatment Control Measures:

List the treatment control measures at the development and their inspection frequencies (minimum of once per year). For each treatment control measure, describe conditions that require maintenance or repair. Describe preventative maintenance needed to keep the treatment control measure effective.

Treatment Control Measure	Inspection Frequency	Describe Conditions that Require Maintenance / Repair and Describe Routine Preventative Maintenance

APPENDIX 9 – CITY OF REDDING MUNICIPAL CODE

CHAPTER 14.19 - STORMWATER QUALITY MANAGEMENT AND DISCHARGE CONTROL**Sections:****Division I - Title, Purpose and General Provisions****14.19.010 - Purpose and intent.**

The purpose and intent of this chapter is to protect and promote the health, safety and general welfare of the city's citizens by controlling non-stormwater discharges to the city's stormwater conveyance system and by reducing pollutants in stormwater discharges to the maximum extent practicable. This chapter is also intended to assist in the protection and enhancement of water quality of watercourses and water bodies in a manner pursuant to and consistent with the Federal Clean Water Act (33 U.S.C. §1251 et seq.) and Porter-Cologne Water Quality Control Act, and to provide the city with the legal authority to fully implement and enforce provisions set under the National Pollutant Discharge Elimination System General Permit No. CAS000004 for Stormwater Discharges from Small Municipal Storm Sewer Systems, Water Quality Order No. 2013-0001-DWQ.

(Ord. No. 2527, § I, 5-29-2015)

14.19.020 - Definitions.

Any term(s) defined in the Federal Clean Water Act, as amended, and/or defined in the regulations for the stormwater discharge permitting program issued by the United States Environmental Protection Agency, as amended, and which are not specifically defined in this chapter shall, when used in this chapter, have the same meaning as set forth in said Act or regulation. The terms used in this chapter shall have the following meanings:

"Best management practices" or "BMPs" means schedules of activities, prohibitions of practices, maintenance procedures, and other management practices to prevent or reduce to the maximum extent practicable the discharge of pollutants directly or indirectly to the city stormwater conveyance system or receiving waters. BMPs include but are not limited to treatment controls, structural controls, source controls, training requirements, facility management practices, and the prohibition of specific activities, practices, and procedures to control site runoff, spillage or leaks, sludge or waste disposal, or drainage from raw material storage that the city determines appropriate for the control of pollutants.

"City" means the City of Redding.

"City council" or "council" means the city council of the City of Redding.

"City Public Works Director or Public Works Director" means the person in a supervisory role of the divisions that comprise the public works department: Engineering division, streets division, traffic operations division, stormwater, storm drain utility, wastewater utility, water utility, and Redding Area Bus Authority.

"City stormwater conveyance system" means those public or natural facilities within the city which are owned, operated, maintained or controlled by the city by which stormwater may be conveyed to receiving waters, including, but not limited to, any city roads with drainage systems, municipal streets,

catch basins, water quality basins, detention basins, constructed wetlands, natural and artificial channels, aqueducts, canyons, stream beds, gullies, curbs, gutters, ditches, sumps, pumping stations, and storm drains.

"Clean Water Act" or "CWA" means the federal Water Pollution Control Act (33 U.S.C. §1251 et seq.) and any subsequent amendments thereto.

"Construction activity" means activities including, but not limited to, grading, digging, cutting, scraping, stockpiling or excavating of soil, placement of fill materials, paving, pavement removal, demolition, exterior construction, substantial removal of vegetation where soils are disturbed including but not limited to removal by clearing or grubbing, or any activity which bares soil or rock.

"Construction general permit" means the NPDES general permit for stormwater discharges associated with construction and land disturbance activities administered by the State of California in accordance with applicable provisions of the Federal Clean Water Act and the Porter-Cologne Water Quality Control Act.

"Development" means the construction, building or placement of any structure or portion thereof, or any activity such as excavation or grading to improve site conditions. Development does not include routine maintenance to maintain original line and grade, hydraulic capacity, or the original purpose of the facility, nor does it include emergency construction activities (i.e., land disturbances) required to protect public health and safety.

"Discharge" means the release, threatened release, or placement of any material into the city's stormwater conveyance system or receiving waters, including but not limited to stormwater, wastewater, solid materials, liquids, hazardous waste, raw materials, debris, litter, or any other substance.

"Enforcement agency" means the city is the primary enforcement agency for the purposes of this chapter. The enforcement agency shall coordinate program activities and authorize personnel to serve as enforcement officials to effectuate the purposes of this chapter.

"Enforcement official" means any agent of the city authorized by the enforcement agency to enforce compliance with this chapter. If the city council and the governing body of another public agency enter into an agreement authorizing that agency to administer and/or enforce some or all of the provisions of this chapter, "enforcement official" also shall mean the authorized official(s) of the agency designated in the agreement as the agency responsible for administering and enforcing the provisions of this chapter, as provided in the agreement.

"Hazardous material" means any material, including any substance, waste, or combination thereof, which because of its quantity, concentration, or physical, chemical, or infectious characteristics may cause, or significantly contribute to, a substantial present or potential hazard to human health, safety, property, or the environment when improperly treated, stored, transported, disposed of, or otherwise managed (California Health and Safety Code §25117).

"Illicit connection" means either of the following:

- 1.

Any drain or conveyance, whether on the surface or subsurface which allows an illicit discharge to enter the city's stormwater conveyance system including but not limited to any conveyances which allow any non-stormwater discharge including sewage, process wastewater, and wash water to enter the city's stormwater conveyance system and any collections to the city's stormwater conveyance system from indoor drains and sinks, regardless of whether said drain or connection had been previously allowed, permitted, or approved by a government agency; or

2. Any drain or conveyance connected from a commercial or industrial land use to the city's stormwater conveyance system which has not been documented in plans, maps, or equivalent records and approved by the city.

"Illicit discharge" means any direct or indirect non-stormwater discharge to the city's stormwater conveyance system or receiving waters, except as exempted in Division II, Section 14.19.100 of this chapter. The term illicit discharge does not include discharges that are regulated by a NPDES permit (other than the NPDES permit for discharges from the MS4).

"Industrial activity" means any activity subject to the NPDES industrial general permit as defined in 40 CFR, Section 122.26(b)(14).

"Industrial general permit" means the general permit for stormwater discharges associated with industrial activities, issued and administered by the State of California in accordance with applicable provisions of the Federal Clean Water Act and the Porter-Cologne Water Quality Control Act.

"Maximum extent practicable" or "MEP" means the technology-based standard established by Congress in Clean Water Act section 402(p)(3)(B)(iii) for small MS4 stormwater discharges. MEP emphasizes pollution prevention and source control BMPs primarily in combination with treatment methods. The MEP approach is an ever-evolving, flexible and advancing concept, which considers technical and economic feasibility. As knowledge about controlling urban runoff continues to evolve, so does what constitutes MEP.

"Municipal separate storm sewer system" or "MS4" means a conveyance or system of conveyances (including roads with drainage systems, municipal streets, catch basins, curbs, gutters, ditches, man-made channels, or storm drains) owned by a state, county, city, town, or other public body, that is designed or used for collecting or conveying stormwater, which is not a combined sewer, and which is not a part of a publicly owned treatment works.

"National Pollutant Discharge Elimination System" or "NPDES" means the primary permitting program under the Clean Water Act (33 U.S.C. Section 1251 et seq.) which regulates most discharges to receiving waters.

"National Pollution Discharge Elimination System permit" or "NPDES permit" means a permit issued by either the Regional Board or the State Water Resources Control Board pursuant to Chapter 5.5 (commencing with Section 13370) of Division 7 of the California Water Code to control discharges to waters of the United States.

"Phase II municipal general permit" means the general permit for stormwater discharges from small municipal separate storm sewer systems (MS4s), issued and administered by the State of California in accordance with applicable provisions of the Federal Clean Water Act and the Porter-Cologne Water Quality Control Act.

"Pollutant" means anything which causes or contributes to pollution. Pollutants may include, but are not limited to, paints, varnishes, and solvents; soil, sand, or sediment; oil and other automotive fluids; non-hazardous liquid, solid wastes and yard wastes; floatables; pesticides, herbicides, and fertilizers; hazardous substances and wastes; biological and fecal waste; dissolved and particulate metals; wastes and residues that result from constructing a building or structure (including but not limited to sediments, slurries, and concrete rinsates); and noxious or offensive matter of any kind.

"Pollution" means the human-made or human-induced alteration of the quality of waters which unreasonably affects, or has the potential to unreasonably affect, either the waters beneficial uses or the facilities which serve these beneficial uses (California Water Code §13050).

"Porter-Cologne Act" means the Porter-Cologne Water Quality Control Act and as amended (California Water Code §13000 et seq.). Under the Porter-Cologne Act, the State Water Resources Control Board has the ultimate authority over State water rights and water quality policy. Porter-Cologne also establishes nine Regional Water Quality Control Boards to oversee water quality on a day-to-day basis at the local/regional level.

"Premises" means any building, lot, parcel of land, or portion of land whether improved or unimproved including adjacent sidewalks and parking strips.

"Property owner" means any person, entity, company, and/or authorized representative having title to real property within the geographic area affected by this article.

"Receiving water limitations" means water quality standards contained in a Statewide Water Quality Control Plan, the California Toxics Rule, or in the applicable Regional Water Quality Control Board Basin Plan.

"Receiving waters" means natural surface bodies of water, as defined by the Phase II municipal general permit, including, but not limited to, creeks and rivers, which serve as discharge points for the city stormwater conveyance system.

"Regional Water Quality Control Board" or "Regional Board" means the Central Valley Regional Water Quality Control Board.

"Stormwater" means any surface flow, runoff, and drainage consisting entirely of water from storm events and/or snow melt.

"Stormwater pollution prevention plan" or "SWPPP" means a document that describes the BMPs to be implemented by the owner or operator to eliminate prohibited non-stormwater discharges and/or reduce to the MEP pollutant discharges to the city stormwater conveyance system as required by the construction general permit and industrial general permit.

"Waters of the United States" means surface watercourses and water bodies as defined in 40 CFR Section 122.2, including all natural waterways and definite channels and depressions in the earth that may carry water, even though such waterways may only carry water during rains and storms and may not carry stormwater at and during all times and seasons.

Any term(s) defined in the Federal Clean Water Act, as amended, and/or defined in the regulations for the stormwater discharge permitting program issued by the Environmental Protection Agency, as amended, and which are not specifically defined in this section, shall, when used in this article, have the same meaning as set forth in such Act or regulation.

(Ord. No. 2527, § I, 5-29-2015)

14.19.030 - Applicability.

The provisions of this chapter are applicable to all users and potential users located within the city and all users that discharge either directly or indirectly into the city stormwater conveyance system. Within the city this chapter shall also apply to stormwater and non-stormwater discharges made to receiving waters. This chapter does not apply to facilities operated by the State of California or by agencies of the federal government.

(Ord. No. 2527, § I, 5-29-2015)

14.19.040 - Responsibility for administration.

The city's public works director shall administer, implement, and enforce the provisions of this chapter. Any powers granted or duties imposed upon the public works director may be delegated by the public works director to persons or entities acting in the beneficial interest or in the employ of the city.

(Ord. No. 2527, § I, 5-29-2015)

14.19.050 - Severability.

The provisions of this chapter are hereby declared to be severable. If any section, subsection, subdivision, paragraph, sentence, clause or phrase of this chapter is for any reason held to be invalid or unconstitutional by a decision of any court of competent jurisdiction, such decision shall not affect the validity of the remaining sections, subsections, subdivisions, paragraphs, sentences, clauses or phrases of this chapter.

(Ord. No. 2527, § I, 5-29-2015)

14.19.060 - Regulatory consistency.

This chapter shall be construed to assure consistency with the requirements of the Clean Water Act and Porter-Cologne Water Quality Control Act, and acts amendatory thereof or supplementary thereto, or any applicable implementing regulations. In the event of any conflict between this chapter and any federal or state law or regulation, that requirement which establishes the higher standard for public health shall govern. To the extent permitted by law, nothing in this chapter shall preclude enforcement of any other applicable law, regulation, order, permit, or city ordinance.

(Ord. No. 2527, § I, 5-29-2015)

14.19.070 - Compliance disclaimer.

Compliance by any person with the provisions of this chapter shall not preclude the need to comply with other local, state or federal statutory or regulatory requirements relating to the control of pollutant discharges or protection of stormwater quality, or both.

(Ord. No. 2527, § I, 5-29-2015)

14.19.080 - Disclaimer of liability.

The degree of protection required by this chapter is considered reasonable for regulatory purposes and is based on scientific, engineering and other relevant technical considerations. The standards set forth herein are minimum standards and this chapter does not intend nor imply that compliance will ensure that there will be no unauthorized discharge of pollutants into receiving waters. This chapter shall not create liability on the part of the city, or any agent or employee thereof for any damages that result from reliance on this chapter or any administrative decision lawfully made thereunder.

(Ord. No. 2527, § I, 5-29-2015)

Division II. - Discharge Prohibitions

14.19.090 - General discharge prohibition.

It shall be unlawful for any person to discharge, or cause to be discharged, any non-stormwater, stormwater or pollutant to the city stormwater conveyance system or to receiving waters which results in, or contributes to a violation of a receiving water limitation or a violation of the municipal general permit.

(Ord. No. 2527, § I, 5-29-2015)

14.19.100 - Exceptions to discharge prohibitions.

The following discharges are exempt from the otherwise applicable non-stormwater discharge prohibition set forth in Section 14.19.090:

- (a) Any discharge regulated under a NPDES permit, waiver, or waste discharge order issued to the discharger, and administered by the state pursuant to Division 7 Chapter 5.5 of the California Water Code, provided that any such discharge is in compliance with all requirements of the NPDES permit, waiver, or order and all other applicable laws and regulations.
- (b) Any discharge from any of the following activities, provided that any such discharge does not cause or contribute to the violation of any receiving water limitation and appropriate control measures to minimize the impacts of such discharges are developed and implemented as determined by the public works director. This provision does not obviate the need to obtain any other appropriate permits for such discharges.
 - 1. Water line flushing.
 - 2. Individual residential car washing.
 - 3. Diverted stream flows.
 - 4. Rising groundwaters.
 - 5. Uncontaminated groundwater infiltration (as defined in 40 CFR §35.2005(20)) to separate storm sewers.

6. Uncontaminated pumped groundwater.
 7. Discharges from potable water sources.
 8. Foundation drains.
 9. Air conditioning condensation.
 10. Springs.
 11. Water from crawl space pumps.
 12. Footing drains.
 13. Flows from riparian habitats and wetlands.
 14. Dechlorinated and untreated swimming pool discharges.
 15. Incidental runoff from landscaped areas.
 16. Discharges or flows from fire-fighting activities.
- (c) Any discharges which the public works director, in concert with the regional board, determines in writing are necessary for the protection of public health or safety.
- (d) Additional categories of non-stormwater discharges which do not cause or contribute to the violation of any receiving water limitation may be excepted from the otherwise applicable prohibition by the public works director upon approval of the executive officer of the regional board, as provided in the municipal general permit, or any successor permits.

(Ord. No. 2527, § I, 5-29-2015)

14.19.110 - Exceptions to discharge prohibitions.

Notwithstanding the exemptions provided for in Section 14.19.100 above, if the regional board or the public works director determine that a discharge which is otherwise exempt from the prohibition on discharges causes or significantly contributes to the violation of any receiving water limitation or results in the conveyance of significant quantities of pollutants to receiving waters, or is otherwise a danger to public health or safety, the public works director may give written notice to the owner or operator of the facility that the discharge exception shall not apply to the discharge at issue following expiration of the thirty-day period commencing upon delivery of the notice. Upon expiration of such thirty-day period, any such discharge shall be unlawful. Upon finding that any continuance of the discharge poses a significant threat to the environment or to public health and safety, the public works director may waive the thirty-day waiting period and require immediate cessation of the discharge.

(Ord. No. 2527, § I, 5-29-2015)

14.19.120 - Threatened discharge prohibition.

It shall be unlawful for any person to maintain, or cause to be maintained, a threatened prohibited discharge after having received notice of the public works director's determination as to the existence of a threatened prohibited discharge.

(Ord. No. 2527, § I, 5-29-2015)

14.19.130 - Prohibition of illicit connections.

- (a) The construction, use or continued existence of illicit connections to the city stormwater conveyance system is prohibited.
- (b)

This prohibition expressly includes, without limitation, illicit connections made in the past, regardless of whether the connection was permissible under law or practices applicable or prevailing at the time of connection. Upon the effective date of the ordinance codified in this chapter, any person who maintains an illicit connection shall have thirty days or a time determined by the public works director from the effective date of the ordinance codified in this chapter to disconnect and discontinue use of such connection.

- (c) The public works director may require by written notice that a person responsible for an illicit connection to the stormwater conveyance system comply with the requirements of this chapter to eliminate or secure approval for the connection by a specified date, regardless of whether or not the connection or discharges to it had been established or approved prior to the effective date of this chapter.
- (d) If subsequent to eliminating a connection found to be in violation of this chapter the responsible person can demonstrate that an illicit discharge will no longer occur, said person may request city approval to reconnect to the city's stormwater conveyance system. The reconnection or reinstallation of the connection shall be at the responsible person's expense.
- (e) A violation of the provisions of this article shall occur irrespective of the negligence or intent of the violator to construct, maintain, operate or utilize an illicit connection or to cause, allow or facilitate any prohibited discharge.

(Ord. No. 2527, § I, 5-29-2015)

14.19.140 - Waste disposal prohibitions.

No person shall throw, deposit, leave, maintain, keep, or permit to be thrown, deposited, left, or maintained, in or upon any public or private property, driveway, parking area, street, alley, sidewalk, city stormwater conveyance system facility, or receiving waters, any refuse, rubbish, garbage, litter, cigarette butts, objects, construction materials, gravel, soil, and other accumulations, so that the same may cause or contribute to pollution in stormwater discharges. Wastes deposited in streets in proper waste receptacles for the purpose of collection are exempted from this prohibition.

(Ord. No. 2527, § I, 5-29-2015)

14.19.150 - Discharge in violation of industrial or construction general permits.

Any person subject to an industrial or construction general permit shall comply with all provisions of such permit. Proof of compliance with said permit may be required in a form acceptable to the public works director prior to or as a condition of a parcel map, tentative map, entitlement, building permit, grading permit, business license, or encroachment permit; upon inspection of the facility; during any enforcement proceeding or action; or for any other reasonable cause.

(Ord. No. 2527, § I, 5-29-2015)

Division III. - Prevention and Reduction of Pollutants in Stormwater

14.19.160 - General requirements.

- (a) The public works director and/or state or federal agencies may designate as subject activities any activities, including construction and industrial activities, considered potential sources of discharges of pollutants to the city stormwater conveyance system or receiving waters. The subject

activity may occur at stationary facilities or as a mobile activity that takes place at various job sites. State or federal agencies may require the city to enforce regulatory measures against the subject activity in question.

- (b) Industrial activities for which the municipal general permit specifies that the city shall routinely inspect, or which are listed in Municipal General Permit Section E.9. are hereby designated as subject activities.

(Ord. No. 2527, § I, 5-29-2015)

14.19.170 - Authorization to adopt and impose best management practices.

- (a) Any person whom the public works director determines is conducting any subject activity shall prevent or reduce the discharge of pollutants from those activities, to the MEP, through the implementation of BMPs.
- (b) The public works director may adopt standards or requirements and describe BMPs for specified subject activities. Where BMP requirements are promulgated by the city or any federal, state, or regional agency for any activity, operation, or facility which would otherwise cause the discharge of pollutants to the city stormwater conveyance system or receiving waters, every person undertaking such activity or operation, or owning or operating such facility shall comply with such requirements.
- (c) Any alternative BMP implemented pursuant to subsection (b) of this section shall be subject to review and approval by the public works director. If a person conducting subject activities implements alternative BMPs without the prior written approval of the public works director and subsequently receives written notice from the public works director that the alternative BMPs do not provide the required equivalent level of protection from pollutant-laden storm or non-stormwater discharges, the continued implementation of such alternative BMPs shall be deemed to be a violation of requirements of this chapter as of the date of delivery of such notice.
- (d) Notwithstanding the presence or absence of requirements promulgated pursuant to subsections (a) and (b), any person engaged in activities or operations, or owning facilities or property which will or may result in pollutants entering the city stormwater conveyance system or receiving waters shall implement BMPs to the MEP.
- (e) Persons implementing BMPs will be required to establish, document, and conduct a maintenance program, subject to approval by the public works director, for any BMP. This requirement applies to BMPs required by the city and BMPs that were voluntarily installed. Maintenance requirements established pursuant to this section must be appropriate for site conditions, design of the BMPs, and must protect public safety, health, infrastructure, the environment and meet the purposes of this chapter.

(Ord. No. 2527, § I, 5-29-2015)

14.19.180 - Spill prevention and response.

- (a) The owner or operator of a commercial or industrial establishment shall provide reasonable protection from accidental discharge of pollutants into the city stormwater conveyance system or receiving waters. Facilities to prevent accidental discharge of pollutants shall be provided and maintained at the owner or operator's expense.
- (b) The public works director may designate types of industries where the owner or operator of the industry shall be required to notify the public works director within twenty-four hours of the discovery of an actual discharge into the city stormwater conveyance system. For any discharge

subject to the reporting requirements of the State of California Water Code Sections 13271 and 13272, notification in compliance therewith shall constitute sufficient notification for the purposes of this section.

- (c) Any person owning or occupying premises or conducting any activity that has knowledge of any non-stormwater discharge or threatened prohibited discharge, from the premises or activity to the city stormwater conveyance system or receiving waters shall immediately take all reasonable action to contain and otherwise minimize any such discharge.
- (d) Notwithstanding other requirements of law, as soon as any person responsible for a facility or operation, or responsible for emergency response for a facility or operation, has information of any known or suspected release of pollutants from said facility or operation which are resulting or may result in illicit discharges or pollutants discharging into the city stormwater conveyance system or receiving waters, said person shall take all necessary steps to ensure the discovery, containment, and cleanup of such release. In the event of such a release of a hazardous material, said person shall immediately notify emergency response officials of the occurrence via emergency dispatch services (911). In the event of such a release is of non-hazardous materials and not an emergency, said person shall notify the city's public works department in person or by phone no later than 3:00 p.m. of the next business day. If the discharge of pollutants emanates from a commercial or industrial establishment, the owner or operator of such establishment shall also retain an on-site written record of the discharge and the actions taken to prevent its recurrence. Such records shall be retained for at least three years.

(Ord. No. 2527, § I, 5-29-2015)

14.19.190 - Requirement to eliminate prohibited discharges.

Notwithstanding the requirements of Division III herein, the public works director may require by written notice that a person responsible for a prohibited discharge immediately, or by a specified date, discontinue the discharge and, if necessary, take measures at the cost of the discharger to eliminate the source of the discharge to prevent the occurrence of future illicit discharges.

(Ord. No. 2527, § I, 5-29-2015)

14.19.200 - Construction sites.

Any person owning or operating a construction site shall implement BMPs to control the discharge of pollutants to the city stormwater conveyance system or receiving waters to the MEP, in compliance with the municipal general permit, CGP and city construction standards.

(Ord. No. 2527, § I, 5-29-2015)

14.19.210 - Industrial sites.

Any person owning or operating an industrial site shall implement BMPs to control the discharge of pollutants to the city stormwater conveyance system or receiving waters to the MEP, in compliance with the municipal general permit, IGP and city construction standards.

(Ord. No. 2527, § I, 5-29-2015)

14.19.220 - New development and redevelopment.

(a)

The public works director shall ensure that development complies with measures and BMP performance standards, including but not limited to, those outlined in Section E.12. of the municipal general permit. The requirements for new development or redevelopment may include but are not limited to performance standards, operational BMPs site design measures, low impact development design standards, and hydromodification measures. The requirements may include associated maintenance programs and city access agreements.

- (b) Requirements established pursuant to subsection (a) may be included in city construction standards, written policies in the Redding Municipal Code, conditions of development, conditions of approval or any other appropriate instrument administered by the city. The owner and developer shall comply with the terms, provisions, and conditions as required in this chapter and the city Storm Drain Utility Ordinance, Chapter 14.18.

(Ord. No. 2527, § I, 5-29-2015)

14.19.230 - Watercourse protection.

- (a) Every person owning property through which a watercourse passes, or such person's lessee, shall keep and maintain that part of the watercourse within the property free of trash, debris, construction materials, and other obstacles that would pollute or contaminate the watercourse.
- (b) In addition, the owner or lessee shall maintain existing privately owned structures within or adjacent to a watercourse, so that such structures will not become a hazard to the use, function, or physical integrity of the watercourse.
- (c) The owner or lessee shall not remove healthy bank vegetation beyond routine maintenance, nor remove said vegetation in such a manner as to increase the vulnerability of the watercourse to erosion. The property owner shall be responsible for maintaining and stabilizing that portion of the watercourse that is within their property lines in order to protect it against erosion and degradation originating or contributed from their property.
- (d) Pertinent regulatory agencies' permits shall be obtained as required prior to work within those areas under the jurisdiction of those agencies.

(Ord. No. 2527, § I, 5-29-2015)

14.19.240 - Administrative rules and regulations.

- (a) The public works director shall have the authority to promulgate regulations, policies, and standards for the implementation of this chapter.
- (b) All regulations, policies, and standards promulgated by the public works director shall be consistent with the provisions of this chapter and the MS4 general permit.

(Ord. No. 2527, § I, 5-29-2015)

Division IV. - Inspection and Monitoring

14.19.250 - Authority to inspect.

- (a) Whenever necessary to make an inspection to enforce any provision of this chapter, or whenever the public works director has cause to believe that there exists, or potentially exists, in or upon any premises any condition which constitutes a violation of this chapter, the public works director may enter such premises at all reasonable times to inspect the same and to inspect records related to stormwater management compliance. In the event the owner or occupant refuses entry after a request to enter and inspect has been made, the city is hereby empowered to seek assistance from any court of competent jurisdiction in obtaining such entry.

- (b) Routine or area inspections shall be based upon such reasonable selection processes as may be deemed necessary to carry out the objectives of this chapter including, but not limited to, compliance with requirements of the municipal general permit, visual evidence, complaints received, knowledge or physical evidence of industrial activities or other pollutant sources, random sampling, sampling in areas with evidence of stormwater contamination, illicit connections, and discharge of non-stormwater to the city stormwater conveyance system or similar factors.
- (c) The public works director may conduct inspections pursuant to this chapter on private or public property. The public works director may enter upon private property to investigate the source of any discharge to any public street, inlet, gutter, the city stormwater conveyance system, or receiving waters.
- (d) For purposes of verifying compliance with the provisions of this chapter, the public works director may inspect any vehicle, truck, trailer, tank truck or other mobile equipment, or any stationary equipment, which may reasonably be believed to be sources of pollutants or non-stormwater discharges.

(Ord. No. 2527, § I, 5-29-2015)

14.19.260 - Authority to sample, establish sampling devices, and test.

- (a) During any inspection as provided herein, the public works director may take any samples and perform any testing deemed necessary to aid in the pursuit of the inquiry or to record site activities.
- (b) The public works director may erect and maintain monitoring and sampling devices for the purpose of measuring any discharge or potential source of discharge to the city stormwater conveyance system or receiving waters.
- (c) The public works director may investigate the integrity and layout of all storm drain and sanitary sewer system or other pipelines on the premises using appropriate tests, including, but not limited to, smoke or dye tests or video surveys.
- (d) The public works director may conduct any necessary surveys, take photographs or video tape, make measurements or drawings, and create any other record reasonably necessary to document conditions on the premises.

(Ord. No. 2527, § I, 5-29-2015)

14.19.270 - Requirement to monitor and analyze.

The public works director may require by written notice that any person engaged in any activity and/or owning or operating any facility which may cause or contribute to stormwater pollution, illicit discharges, and/or non-stormwater discharges to the city stormwater conveyance system or receiving waters, to undertake at said person's expense such monitoring and analyses and furnish such reports to the city as deemed necessary to determine compliance with this chapter.

(Ord. No. 2527, § I, 5-29-2015)

14.19.280 - Confidentiality of information.

- (a) Information and data on a discharger or potential discharger obtained from inspections reports, questionnaires, applications, permits, monitoring programs, records, or any other form of submittal to the city shall be available to the public or other governmental agency without notification unless the discharger or potential discharger specifically requests confidentiality as to

any portion thereof and is able to demonstrate to the satisfaction of the public works director that the release of such information would divulge information, processes or methods of production entitled to protection as trade secrets of the discharger or potential discharger.

- (b) Stormwater and non-stormwater constituents and characteristics will not be recognized as confidential information, and effluent data shall be available to the public without restriction.

(Ord. No. 2527, § I, 5-29-2015)

14.19.290 - Fees.

The public works director shall collect such fees as may be established by the city council to provide for the recovery of costs associated with implementing this chapter. Any such fees shall be established by resolution of the city council. Failure to pay required fees within the time period set in policy established by the public works director shall be a violation of this chapter.

(Ord. No. 2527, § I, 5-29-2015)

Division V. - Enforcement

14.19.300 - Notice of non-compliance.

All provisions of Chapter 14.19 shall be enforced pursuant to Chapter 1.13 and Chapter 1.14.

(Ord. No. 2527, § I, 5-29-2015)

14.19.310 - Cease and desist orders.

- (a) Any violation of this chapter in which the public works director determines that the violation constitutes an immediate threat to public health or safety, including by way of illustration and not limitation, significant harm to human or aquatic life or to the city stormwater conveyance system or receiving waters, may result in an order to immediately cease and desist all activities causing such immediate threat. A cease and desist order may direct the owner or occupant of any premises, or any other person responsible for any violation of this chapter, to take any of the following actions:
 - 1. Immediately discontinue any prohibited discharge.
 - 2. Immediately discontinue any other violation of this chapter.
 - 3. Clean up the area affected by the violation.
- (b) If the discharger fails to comply with a cease and desist order within the time specified in the order, the public works director may conduct abatement of the violation and the expense thereof shall be charged to the violator.
- (c) In the event a condition in violation of the provisions of this chapter constitutes an imminent danger to public safety or the environment, the public works director may enter the premises from which the violation emanates, abate the violation and restore any property affected by the violation, at the expense of the violator, without prior notice to or consent from the owner or occupant thereof and without judicial warrant.

(Ord. No. 2527, § I, 5-29-2015)

14.19.320 - Reimbursement of fines.

In addition to any other remedies provided by this chapter or any other law, the public works director may also seek and recover reimbursement from any person whose conduct or activity results in any fine, penalty or other charges being imposed upon the city by any authorized federal, state, or

local government agency, including, but not limited to, the Central Valley Regional Water Quality Control Board, for violations of the terms of the city's municipal general permit or otherwise, up to the actual amount of the fine, penalty, or charge imposed upon the city.

(Ord. No. 2527, § I, 5-29-2015)

APPENDIX 10 – PRESERVED/PLANTED TREE CREDIT SUBMITTAL

Tree Summary Example

Planted Trees			
Planted Tree Name (D)-Deciduous (E)-Evergreen	Impervious Area Credit (ft ²)	Number of Trees	Ext. Area (ft ²)
American Persimmon (D)	110	2	220
Juniper "Skyrocket" (E)	220	3	660
Tot. Credit			880

Preserved Trees				
Type	Quantity	Trunk Diameter (in)	Canopy Area (ft ²)	Ext. Area (ft ²)
Oak	5	14	500	2500
Oak	3	12	200	600
Tot. Credit				3100

Total Applicable Credit:	3980 ft ²
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Tree Summary

Planted Trees			
Planted Tree Name (D)-Deciduous (E)-Evergreen	Impervious Area Credit (ft ²)	Number of Trees	Ext. Area (ft ²)
		(A) Tot. Credit	

Preserved Trees				
Type	Quantity	Trunk Diameter (in)	Canopy Area (ft ²)	Ext. Area (ft ²)
			(B) Tot. Credit	

Total Applicable Credit (A+B) :	ft ²
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APPENDIX 11 – ON-SITE WATER QUALITY IMPROVEMENT DEVICE LOCATIONS AND MAINTENANCE

RECORDING REQUESTED BY:
City of Redding

WHEN RECORDED RETURN TO:
City Clerk
City of Redding
777 Cypress Avenue
Redding, CA 96001

APN. _____

THE AREA ABOVE IS RESERVED FOR RECORDER'S USE

ON-SITE WATER QUALITY IMPROVEMENT DEVICE LOCATIONS AND MAINTENANCE

THE UNDERSIGNED DECLARE:

Documentary Transfer Tax - NONE
City of Redding EXEMPT - Rev. & Tax. C.A. ' 11922
NO FEE - CITY BUSINESS - Gov. Code ' 6103

THE RESIDENTIAL WATER QUALITY IMPROVEMENT DEVICE LOCATIONS AND MAINTENANCE ("AGREEMENT") IS ENTERED INTO THIS ____ DAY OF ____, 20____, BY AND BETWEEN THE **CITY OF REDDING**, A MUNICIPAL CORPORATION ("AGENCY") AND _____ ("OWNER(S)").

A. **OWNERS**, are fee owner(s) of record of that certain real property ("Property") described as _____, depicted on the map in Exhibit A attached hereto, located in the City of Redding, County of Shasta, State of California.

B. **WHEREAS**, at the time of initial approval of the development project known as _____, within the Property described herein, the AGENCY required the project to employ on-site control measures to minimize pollutants in urban runoff; and

WHEREAS, said Facilities, Identified in Table 1 in Exhibit A, have been installed in accordance with the requirements of the AGENCY's Post-Construction Standards Plan and the OWNER's plans and specifications accepted by the AGENCY; and

NOW THEREFORE, it is mutually stipulated and agreed as follows:

1. The term "OWNER" shall include not only the present OWNER, but also its heirs, successors, executors, administrators, trustees and assigns. OWNER shall notify any successor to title of all or part of the Property about the existence of this Agreement. OWNER shall provide such notice prior to such successor obtaining an interest in all or part of the Property. OWNER shall provide a copy of such notice to the AGENCY at the same time such notice is provided to the successor.
2. OWNER shall complete or ensure the recommended maintenance is completed in accordance with the recommendations in Exhibit A.

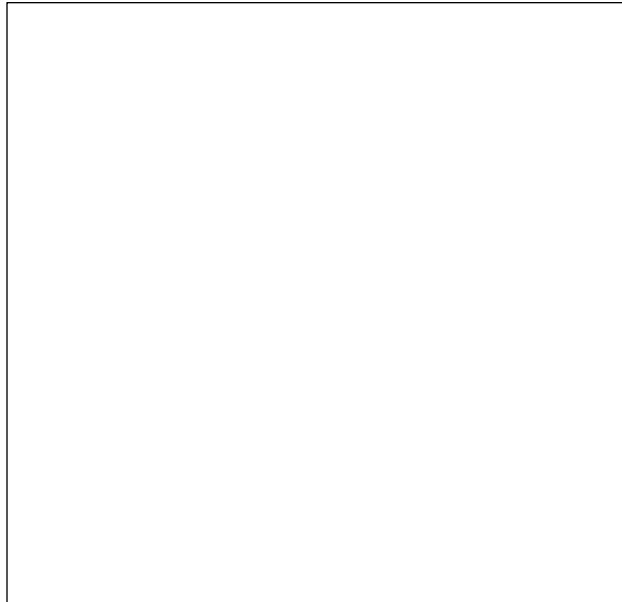
DATED: _____ day of _____, 20____

IF TO AGENCY:

Department of Public Works
Attn: Storm Water Management Program Coordinator
777 Cypress Ave.
Redding, CA 96001

IF TO OWNER:

EXHIBIT A



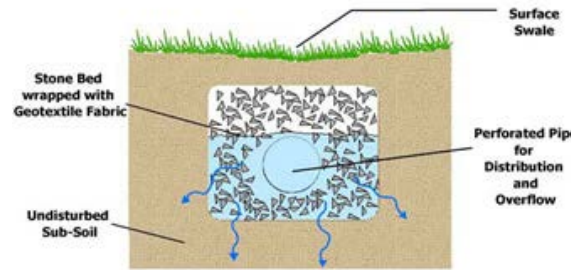
Layout 1: Storm Water Facility Locations (Not to Scale)

Location	Description (Include Area or Length)

Table 1: Facilities List

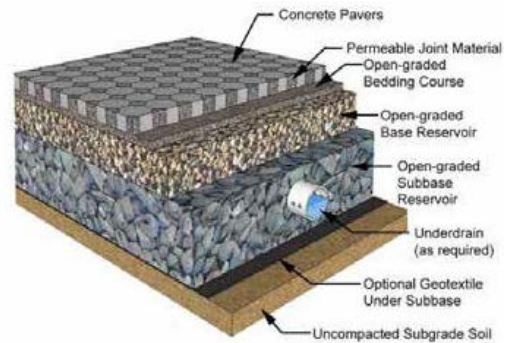
Infiltration

Trenches



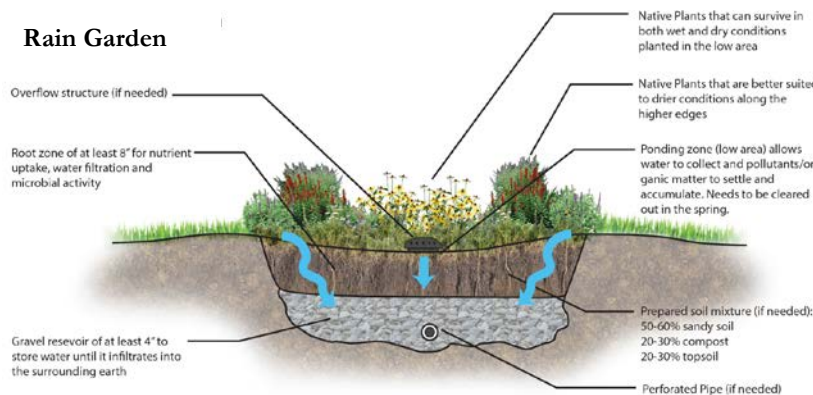
- If water ponds for more than two days, check perforated pipe underdrain for blockage or stone bed for dirt clogging annually.
- Replace clogged components immediately.

Porous Paver or Concrete



- If water ponds for more than two days, check perforated pipe underdrain for blockage or stone bed for dirt clogging annually.
- Replace open graded sub-base rock storage when fills with dirt
- Vacuum sweep or power wash dirt/trash collected on top of pavement as needed.

Rain Garden



- Remove trash as needed.
- If water ponds for more than two days, check perforated pipe underdrain for blockage or stone bed for dirt clogging annually
- Replace gravel rock storage when fills with dirt.
- Annually add more compost sand topsoil mixture to maintain 12"-18" of