

City of Capitola

Stormwater Technical Guide for Tier 1 Projects

Guidance Document for Meeting Stormwater Post-
Construction Requirements for Tier 1 Projects

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SECTION 1

THE POST-CONSTRUCTION REQUIREMENTS

The General Phase II permit for discharges to small Municipal Separate Storm Sewer Systems (MS4s) was adopted by the State Water Resources Control Board in February 2013. The California Regional Water Quality Control Board for the Central Coast Region (Water Board) adopted the Post-Construction Requirements (PCRs) in July 2013. Permittees within the boundaries defined by the Water Board; including cities, certain institutions, and unincorporated urban areas; are subject to the PCRs.

This *Stormwater Technical Guide for Tier 1 Projects* (Tier 1 Guide) details requirements for Tier 1 projects within the City of Capitola. This Guide is designed as a tool to ensure compliance with the PCRs, facilitate review of applications, and promote integrated Low Impact Development (LID) design. This Guide interprets, clarifies, and adds to the PCR requirements. For Tier 2 and Tier 3 projects, refer to the *Stormwater Technical Guide for Tier 2 and Tier 3 Projects*.

What Projects Must Comply?

Development and redevelopment projects within the City are required to implement PCRs. The level and type of PCR implementation is determined by the scale of on-site development. Table 1 summarizes the criteria for determining the project type (i.e. applicable tier).

Table 1: Project Type

Tier	Detached Single Family Homes	All Others (Commercial, Industrial, Two-& Multi-Family Homes)
Exempt	New/Replaced impervious area < 2,500 sf	
Tier 1	New/Replaced impervious area ≥ 2,500 sf	New/Replaced impervious area ≥ 2,500 sf
Tier 2	N/A	Net impervious area ≥ 5,000 sf
Tier 3	Net impervious area ≥ 15,000 sf	New/Replaced impervious area ≥ 15,000 sf
Tier 4	New/Replaced impervious area ≥ 22,500 sf	

Notes:

Impervious area = includes structures, pavement, hardscaping – essentially any surface that will not allow water to infiltrate into the ground.

Net impervious area = the difference between post-project and pre-project impervious areas.

sf = square feet

This Guide addresses the requirements for Tier 1 projects. Note that development projects in Tier 2 must incorporate the requirements for Tiers 1 and 2; projects in Tier 3 must incorporate the requirements of Tiers 1, 2, and 3. The requirements for all tiers are summarized in Table 2.

All projects must also conserve natural areas, protect slopes and channels against erosion, and comply with local stream, riparian setbacks and tree-preservation policies as determined by the community development department.

Table 2: Tiered Implementation Requirements

Type of Project	Performance Requirements
Exempt from PCRs	Runoff Reduction <ul style="list-style-type: none"> Minimize runoff by redirecting downspouts to landscape Install a rain barrel
Tier 1 <ul style="list-style-type: none"> Projects, including single-family homes, that create or replace 2,500 sf or more of impervious area 	Site Design and Runoff Reduction <ul style="list-style-type: none"> Limit disturbance of natural drainage features. Limit clearing, grading, and soil compaction. Minimize impervious surfaces. Minimize runoff by dispersing runoff to landscape or using permeable pavements
Tier 2 <ul style="list-style-type: none"> Detached single-family homes that create or replace 15,000 sf or more of net impervious surface. All other projects that create or replace 5,000 sf or more of net impervious surface. 	Water Quality Treatment <ul style="list-style-type: none"> Meet all Tier 1 requirements Treat runoff with an approved and appropriately sized LID treatment system prior to discharge from the site.
Tier 3 <ul style="list-style-type: none"> Projects including single-family homes that create or replace 15,000 sf or more of impervious surface. 	Runoff Retention <ul style="list-style-type: none"> Meet all Tier 1 and Tier 2 requirements Prevent offsite discharge from events up to the 95th percentile rainfall event using Stormwater Control Measures.

The PCRs include a Tier 4 requirement: Projects that create or replace 22,500 square feet of impervious surface. For these larger projects, post-development peak flows discharged from the site must not exceed pre-project peak flows for the 2-year through 10-year storm events.

What is the purpose of Low Impact Development or “LID”?

LID design aims to mimic pre-development site hydrology as well as protect water quality by managing stormwater as close to its source as possible via infiltration into soils, evapotranspiration via plants, and/or harvesting for use. Runoff from roofs and paved areas is dispersed to landscaped areas or routed to LID facilities distributed throughout the site to minimize the impact of runoff from impervious areas (i.e. roofs, patios, pavement, etc.) to the storm drain, which ultimately flow to local streams, rivers, and the ocean.

For Tier 1 projects, the emphasis is to implement runoff reduction measures, which are the simplest methods for implementing LID into your design; while Tier 2 and Tier 3 projects will also implement LID treatment facilities (such as bioretention) to treat discharge from the site.

LID treatment facilities are discussed in further detail in the *Stormwater Technical Guide for Tier 2 and Tier 3 Projects*. Otherwise, included herein is sufficient information for ensuring your Tier 1 Project meets the PCRs requirements.

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SECTION 2

THE PATH TO STORMWATER COMPLIANCE

Runoff reduction features and facilities must be integrated into the planning, design, construction, operation, and maintenance of your project. Your runoff reduction measures should be an integral part of the earliest decisions about how the site will be developed to save unnecessary rework to comply with stormwater PCRs later in the process.

If you choose to implement a LID treatment facility, note that the PCRs require the City to maintain a database of LID treatment facilities and ensure the facilities are operating as designed. The site layout, drainage and LID facilities are all conditions of project approval; as such, they may not be removed or rendered ineffective without the City's approval.

At this earliest stage, the City will require the property owner, by agreement, to maintain LID treatment facilities in perpetuity. The property owner will regularly inspect the facilities and annually report to the City the date and type of service performed to maintain the facility. Here are some of the key stormwater compliance milestones as you manage your project:

Pre-Application Meeting

Discuss stormwater requirements for your project at a pre-application meeting with planning and public works staff. Their experience with similar projects and with local procedures, requirements, and community plans can provide invaluable insights. Current contacts are listed at the City's website.

You should also discuss with staff the right timing for completing your Stormwater Control Plan. Often, site designs take a few iterative reviews by staff before a satisfactory site layout is achieved. It is important to consider site drainage and runoff reduction measures throughout this iterative process. However, it may make sense to delay compilation and formal submittal of your Stormwater Control Plan until the site layout is fairly well set.

Follow the Guide

Read this Guide all the way through and understand the principles and design procedures before beginning to design your project. Then, follow the steps in Section 3 to prepare the Stormwater Control Plan.

Stormwater Control Plan

Projects in Tier 1 may use the simple, Tier 1 Stormwater Control Plan (Appendix A) and instructions provided, as Appendix A, and available on the City's website. Section 3 describes what must be included in the Stormwater Control Plan.

If your project receives planning discretionary approval, a Condition of Approval will specify the project be constructed consistent with the Stormwater Control Plan.

Maintenance Responsibility

Following construction—or perhaps following a maintenance and warranty period—continued maintenance of runoff reduction measures is the responsibility of the property owner, who shall maintain the facilities in perpetuity.

SECTION 3

PREPARING A TIER 1 STORMWATER CONTROL PLAN

Objectives

Tier 1 projects are required to incorporate specific design measures to manage stormwater runoff from impervious surfaces (i.e. rooftops, pavement, etc.). It is relatively easy to achieve compliance with stormwater requirements for small Tier 1 land development projects; however, compliance for each project must be carefully documented. The applicant may use the simplified Tier 1 Stormwater Control Plan format to assure the appropriate information/documentation is provided to the City to obtain Project approval.

Staff will review your Tier 1 Stormwater Control Plan to confirm that the following design strategies have been incorporated into your project:

- Limit disturbance of creeks and natural drainage features
- Minimize compaction of highly permeable soils
- Limit clearing and grading of native vegetation at the site to the minimum area needed to build the project, allow access, and provide fire protection
- Minimize impervious surfaces by concentrating improvements on the least-sensitive portions of the site, while leaving the remaining land in a natural undisturbed state

You will need to show all runoff from impervious areas is dispersed to pervious areas. In the event that there are particular site constraints (limited footprint, rock features, steep grade, etc.) that limit your ability to incorporate the recommended runoff reduction measures described herein, with City approval, you may implement a properly designed LID treatment facility to treat site runoff. Detailed information as well as requirements for LID treatment facility design can be found in the *Stormwater Technical Guide for Tier 2 and Tier 3 Projects*.

Elements of the Tier 1 Stormwater Control Plan

There are three elements required to be included in the Tier 1 Stormwater Control Plan, which are:

- Completed project data form
- Site plan or sketch
- Completed checklist and information for the selected Runoff Reduction Measure(s).

City staff will use the Runoff Reduction Measure checklists, which are included in the Tier 1 Stormwater Control Plan, to evaluate the completeness of your Plan. The checklists mirror the requirements, which are detailed in the following section.

Runoff Reduction Measures

There are three types of runoff reduction measures available for consideration by the applicant. The three types are presented in order of preference and ease of long-term operation and maintenance:

- Measure 1: Disperse runoff from roofs or pavement to vegetated areas
- Measure 2: Permeable Pavement
- Measure 3: Cisterns or Rain Barrels

Each Runoff Reduction Measure is discussed in further detail below.

Runoff Reduction Measure 1: Disperse runoff from roofs or pavement to vegetated areas

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

On the site plan, show:

- Each impervious area from which runoff will be directed, and its square footage.
- The vegetated areas that will receive runoff, and the approximate square footage of each.
- If necessary, explain in notes on the plan how runoff will be routed from impervious surfaces to vegetated areas.

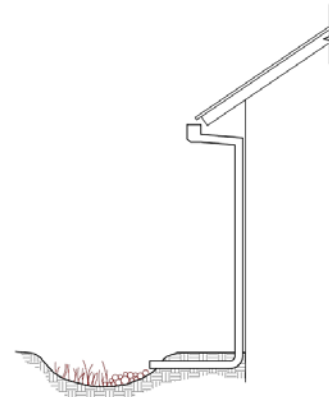


Figure 1: Example Roof Drainage to Vegetated Area

Connecting a roof leader to a vegetated area. The head from the eave height makes it possible to route roof drainage some distance away from the building.

Confirm the following standards are met:

- Tributary impervious square footage in no instance exceeds twice the square footage of the receiving pervious area (2:1 ratio of impervious area to pervious area). On your sketch, show rough dimensions that will confirm this criterion is met.
- Roof areas collect runoff and route it to the receiving pervious area via gutters and downspouts.

- Paved areas are sloped so drainage is routed to the receiving pervious area.
- Runoff is dispersed across the vegetated area (for example, with a splash block) to avoid erosion and promote infiltration.
- Vegetated area has amended soils, vegetation, and irrigation as required to maintain soil stability and permeability.
- Any area drains within the vegetated area have inlets at least 3 inches above surrounding grade (to prevent stormwater in vegetated areas from flowing directly into the drain inlet under normal operating conditions).

Runoff Reduction Measure 2: Permeable Pavement

Permeable pavements may include pervious concrete, pervious asphalt, porous pavers, crushed aggregate, open pavers with grass or plantings (turf block), open pavers with gravel, or solid pavers with open (non-grouted) joints. This measure is specifically for bike lanes, driveways, uncovered parking lots, sidewalk, walkways, and patios.

Show on your site plan:

- Location, extent and types of pervious pavements.



Figure 2: Examples of Permeable Pavement

Interlocking/Porous pavers and turf block

Confirm the following standard specifications are met:

- No erodible areas drain on to permeable pavement.
- Subgrade compaction is minimal.
- Reservoir base course is of open-graded crushed stone. Base depth (3-inches or more) is adequate to retain rainfall and support design loads (more depth may be required).
- No subdrain is included or, if a subdrain is included, outlet elevation is a minimum of 3 inches above bottom of base course.
- Subgrade is level and slopes are not so steep that subgrade is prone to erosion.
- Rigid edge is provided to retain granular pavements and unit pavers.
- Solid unit pavers, if used, are set in sand or gravel with minimum 3/8-inch gaps between the pavers. Joints are filled with an open-graded aggregate free of fines.
- Permeable concrete or porous asphalt, if used, are installed by industry-certified professionals according to the vendor's recommendations.
- Selection and location of pavements incorporates Americans with Disabilities Act requirements (if applicable), site aesthetics, and uses.

Runoff Reduction Measure 3: Cisterns or Rain Barrels

Use of cisterns or rain barrels to comply with this requirement is subject to City approval. Planning and Building Permits may be required for larger systems.

Show on your site plan:

- Impervious areas tributary to each cistern or rain barrel.
- Location of each cistern or rain barrel.

Confirm the following standard specifications are met:

- Rain barrels are sited at or above grade on a sound and level surface at or near gutter downspouts.
- Gutters tributary to rain barrels are screened with a leaf guard or maximum ½-inch to ¾-inch-minimum corrosion-resistant metallic hardware fabric.
- Water collected will be used for irrigation only.
- Openings are screened with a corrosion-resistant metallic fine mesh (1/16 inch or smaller) to prevent mosquito harborage.
- Lids are secured to prevent entry by children.
- Rain barrels and gutters are to be cleaned annually.

Step-by-Step Instructions

Step 1: Delineate existing and proposed impervious area(s).

On a site plan or sketch, show the existing and new/replaced impervious area(s)—for example, a roof, or portion of a roof, or a paved area. Figure 3 is an example sketch depicting an existing parking lot and lawn area (i.e. impervious and pervious areas, respectively), and new and replaced impervious areas.

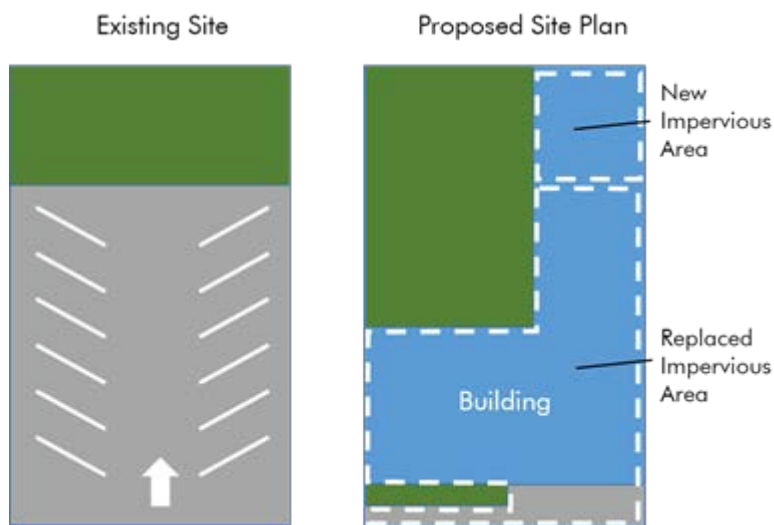


Figure 3. Replaced Impervious Area

Step 2: Select the Runoff Reduction Measure(s).

The impervious area(s) described in Step 1 will drain to the runoff reduction measure(s) you'll need to select for your site design. Typically the drainage

delineations follow roof ridge lines or grade breaks. Select from the three runoff reduction measures and show those facilities on the site plan.

Step 3: Complete Runoff Reduction Measure Checklist.

Once you've identified which runoff control measure(s) will be incorporated into the site design, complete and include the appropriate checklist(s) in the Tier 1 Stormwater Control Plan.

Step 4: Complete the Project Data Form.

Fill out the Project Data Form (Appendix A) the project data from Steps 1 thru 3. The Project Data Form requires the following information:

- **Name of Owner or Developer and Contact Information.** Provide the name of the owner and the name of the primary contact (if different). Provide a phone number and email address for the primary contact.
- **Project Name/Number.**
- **Application Submittal Date.** To be verified by City staff.
- **Project Location.** APN and/or Street address, if available, or intersection
- **Project Type/Description.** Brief description of the project and parcel type (i.e. single-family residence, parking lot addition or expansion, retail and parking, etc).
- **Total Project Site Area.** Provide area in square feet or acres, as appropriate.
- **Total Pre-Project Impervious Area.** Provide the total impervious area (in square feet) for the existing conditions (i.e. rooftops, driveways, parking, patios, walkways, etc.)
- **Total Post-Project Impervious Area.** Provide the total proposed impervious area (in square feet) for the project site (i.e. rooftops, driveways, parking, patios, walkways, etc.).
- **Total New Impervious Area.** Sum of currently pervious areas (in square feet) that will be covered with new impervious surfaces.
- **Total Replaced Impervious Area.** Sum of currently impervious areas (in square feet) that will be covered with new impervious surfaces.
- **Selected Runoff Reduction Measure.** Indicate which of the four runoff reduction measures will be implemented.

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SECTION 4

REFERENCES

The following references may be useful for design. Designs must meet the minimum standard specifications herein.

City of Capitola Public Works Design Standards, available at <http://www.cityofcapitola.org/>

California Stormwater Quality Association (CASQA) "Stormwater Best Management Practice Handbooks"

Santa Barbara Project Clean Water Stormwater Technical Guide, Available at <http://www.sbprojectcleanwater.org>

Start At the Source: Design Guidance Manual for Stormwater Quality. Bay Area Stormwater Management Agencies Association, 1999.

Interlocking Concrete Pavement Institute <http://www.icpi.org/>

Porous Pavements, by Bruce K. Ferguson. 2005. ISBN 0-8493-2670-2

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