

Preparing Permit Application Submittals

This Chapter outlines the development review process and gives step-by-step instructions for preparing C.3 stormwater submittals for planning and building permit applications.

3.1 The Development Review Process

The municipalities have integrated their review of post-construction stormwater controls into the development review process. If the C.3 requirements for site design measures, source controls, and stormwater treatment measures apply to your project, your planning permit application submittal must show how you have incorporated the required post-construction stormwater controls. Section 3.2 gives step-by-step instructions on how to do this, beginning at the earliest phases of project planning. Some smaller projects may not require planning permits; see Section 3.4 for **simple instructions for small sites**.

Preparing the preliminary design of stormwater controls simultaneously with the **preliminary site plan** and the landscaping plan is advised to achieve the following benefits:

- Maximize the stormwater benefits of project landscaping.
- Reduce overall project costs.
- Improve site aesthetics and produce a better quality project.
- Speed project review times.
- Avoid unnecessary redesign.

Preparing the preliminary design of stormwater controls simultaneously with the **preliminary site plan** and the landscaping plan can help reduce overall project costs.

After the municipality issues your planning permit, you will need to incorporate the required stormwater information into your building permit application submittal. Section 3.3 gives step-by-step instructions for preparing this submittal. A simplified diagram of a sample development review process is shown in Figure 3-1. Please note that the actual development review process in any of the municipalities may differ from the example.

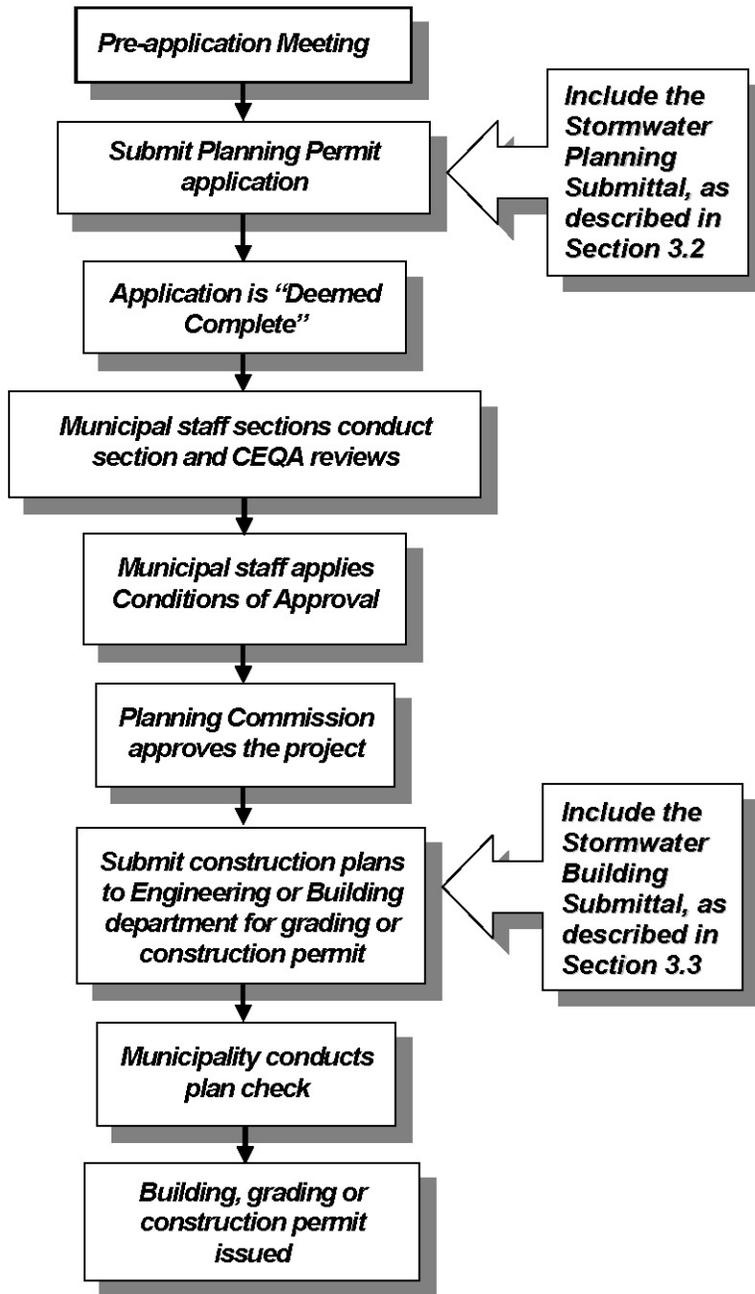


Figure 3-1: Sample Development Review Process for projects subject to Provision C.3 requirements for site design measures, source controls and stormwater treatment measures

Although the development review process may vary from one municipality to the next, Figure 3-1 highlights the steps in the development review process at which municipalities typically require submittals showing how your project incorporates post-construction stormwater controls. These submittals are incorporated into your planning permit and building permit

applications. Remember that the C.3 submittals show how the project will incorporate post-construction stormwater controls, to reduce pollutant loading and prevent increases in creek channel erosion during **long-term project operations**. The municipality will require you to prepare separate documents to show how sedimentation and erosion will be controlled **during construction**. Sections 3.2 and 3.3 present step-by-step instructions for preparing C.3 stormwater submittals for planning and building permit applications.

3.2 How to Prepare Planning Permit Submittals

A Planning Permit Submittal Checklist is provided below to help identify the C.3 stormwater-related items that you will need to submit with your planning permit application, but it's important to contact the planning staff of your local jurisdiction to discuss the specific requirements that may apply to your project. After you have a complete list of submittal requirements, you can use the Step-by-Step instructions in this section to prepare your submittal. Applicants with smaller projects are encouraged to read Section 3.4, "**Simple Instructions for Small Sites**," before using the Step-by-Step instructions.

C.3 submittals show how the project will reduce pollutant loading and prevent increases in creek channel erosion during **long-term project operations**. You will need to prepare separate documents to show how sedimentation and erosion will be controlled during construction.

3.2.1 The Planning Permit Submittal Checklist

Table 3-1 presents a checklist of C.3 post-construction stormwater information that is typically submitted with planning permit applications. Please note that if runoff from your site discharges directly to a creek or wetland without flowing through a municipality-owned storm drain, you may need to submit additional information. Municipal staff may use this checklist to determine whether your submittal is complete, or some jurisdictions may use a modified checklist. The items included in this checklist are important to demonstrate that your project will:

- Incorporate **site design measures** to reduce impervious surfaces, promote infiltration and reduce water quality impacts;
- **Apply source control measures** to keep pollutants out of stormwater runoff;
- Use **stormwater treatment measures** to remove pollutants from stormwater; and
- Where applicable, manage **hydromodification (erosion-inducing flows)** by reducing the rate and amount of runoff.

**Table 3-1
Planning Permit Submittal Checklist**

Required? ¹		Information on Project Drawings	Corresponding Planning Step (Section 3.2)
Yes	No		
<input type="checkbox"/>	<input type="checkbox"/>	Existing natural hydrologic features (depressions, watercourses, relatively undisturbed areas) and significant natural resources.	Step 1
<input type="checkbox"/>	<input type="checkbox"/>	Depth to groundwater and soil saturated hydraulic conductivity or soil types.	Step 1
<input type="checkbox"/>	<input type="checkbox"/>	Existing and proposed site drainage network and connections to drainage offsite.	Step 1
<input type="checkbox"/>	<input type="checkbox"/>	For more complex drainage networks, show separate drainage management areas in the existing and proposed site drainage network.	Step 1
<input type="checkbox"/>	<input type="checkbox"/>	Existing condition, including pervious and impervious areas, for each drainage management area.	Step 1
<input type="checkbox"/>	<input type="checkbox"/>	Proposed pervious surfaces, including sensitive natural areas to be preserved and protected from development (for each drainage management area).	Steps 2 and 3
<input type="checkbox"/>	<input type="checkbox"/>	Proposed impervious surfaces, e.g., roof, plaza, sidewalk, street, parking lot (for each drainage management area).	Step 4
<input type="checkbox"/>	<input type="checkbox"/>	Proposed site design measures to minimize impervious surfaces and promote infiltration ² , which will affect the size of treatment measures.	Step 4
<input type="checkbox"/>	<input type="checkbox"/>	Proposed locations and approximate sizes of stormwater treatment measures and (if 1 acre or more of impervious surface is created) hydromodification management measures. Elevations should show sufficient hydraulic head for the treatment measures to work. ²	Steps 5 - 9
<input type="checkbox"/>	<input type="checkbox"/>	Conceptual planting palette for stormwater treatment measures. ²	Step 10
<input type="checkbox"/>	<input type="checkbox"/>	Pollutant source areas – including loading docks; food service areas; refuse areas; outdoor processes and storage; vehicle cleaning, repair or maintenance; fuel dispensing; equipment washing; etc. – and corresponding source controls from the local source control list.	Step 12
Written Information on Municipal Forms or in Report Format			
<input type="checkbox"/>	<input type="checkbox"/>	Completed stormwater requirements form provided by local agency.	Step 4
<input type="checkbox"/>	<input type="checkbox"/>	Preliminary calculations for each treatment and hydromodification management measure.	Step 9
<input type="checkbox"/>	<input type="checkbox"/>	Preliminary maintenance plan for stormwater treatment measures.	Step 11
<input type="checkbox"/>	<input type="checkbox"/>	List of source control measures included in the project.	Step 12

¹ Every item is not necessarily required for every project. Municipal staff may check the boxes in the “Required” column to indicate which items will be required for your project.

² Site design and treatment measures that promote stormwater infiltration should be consistent with recommendations of the project geotechnical engineer based on the soils boring data, drainage pattern and the current requirements for stormwater controls.

3.2.2 Planning Permit Submittals: Step-by-Step

Step-by-step instructions are offered below to help incorporate post-construction stormwater controls into your project from the very beginning of permit planning. The step-by-step instructions are intended to help you **prepare the materials** you will need to submit along with the planning permit application.

PLANNING PERMIT SUBMITTAL

Step 1: Collect Needed Information

Collecting the appropriate information is essential to selecting and siting post-construction stormwater measures. A list of the most **commonly needed information** is provided below, but municipal staff may request additional information as well.

- Existing natural features, especially **hydrologic features** including creeks, wetlands, watercourses, seeps, springs, ponds, lakes, areas of 100-year floodplain, and any contiguous natural areas. This information may be obtained by site inspections, a topographic survey of the site, and existing maps such as US Geologic Survey (USGS) quadrangle maps, Federal Emergency Management Agency (FEMA) floodplain maps, and US Fish and Wildlife Service (USFWS) wetland inventory maps.
- Existing site **topography**, including the general direction of surface drainage, local high or low points or depressions, any steep slopes, outcrops, or other significant geologic features. This may be obtained from topographic maps and site inspections.
- **Existing site drainage.** For undeveloped sites, this would be identified based on the topographic information described above. For previously developed sites, information on drainage and storm drain connections may be obtained from municipal storm drain maps, plans for previous development, and site inspections.
- **Soil types** (including hydrologic soil groups) and **depth to groundwater.** If a soils report is not required for the project, planning-level information may be obtained from the Natural Resources Conservation Service (NRCS) Soils Survey. This information is used in determining the feasibility of onsite infiltration of stormwater.
- **Existing impervious areas.** Measuring the area of existing impervious surface is necessary to calculate the amount of impervious surface that will be replaced. The MRP requires that redevelopment projects that replace 50 percent or more of impervious surface treat the stormwater runoff from the entire site, not just the redeveloped area. If less than 50 percent of existing impervious surface is replaced, and the existing development was not subject to stormwater treatment measures, then only the affected portion must be included in treatment measure design.
- **Zoning** information, including but not limited to requirements for setbacks and open space.

Review the information collected in Step 1. Identify the principal constraints on site design and stormwater treatment measure selection, as well as opportunities to reduce imperviousness and incorporate stormwater controls into the site and landscape design. For example, **constraints** might include impermeable soils, high groundwater, steep slopes, geotechnical instability, high-intensity land use, heavy vehicular traffic, or safety

Constraints may include impermeable soils, high groundwater, steep slopes, geotechnical instability, high-intensity land use, or heavy vehicle traffic. **Opportunities** may include existing natural areas, low areas, oddly configured parcels, or landscape amenities.

concerns. **Opportunities** might include existing natural areas, low areas, oddly configured or otherwise unbuildable parcels, landscape amenities including open space and buffers (which can double as locations for stormwater treatment measures) and differences in elevation (which can provide hydraulic head for treatment measures). Prepare a table or brief written summary of constraints and opportunities can prove helpful in selecting and siting stormwater controls.

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Step 2: Minimize Site Disturbance and Protect Sensitive Areas

Design the site layout to minimize changes to the natural topography. Using the information collected in Step 1, identify any existing sensitive natural resources on the site that will be protected and preserved from development. These may include the following types of areas:

- Development should be set back from **creeks and riparian habitat** as required by the local jurisdiction. If your project involves impacts to creeks and riparian habitat, contact the Water Board staff regarding permit and mitigation requirements.
- If the project includes **wetlands** subject to Section 404 of the federal Clean Water Act, or habitat for **special-status species** protected by federal or State laws, these areas should be indicated, and evidence should be provided to demonstrate compliance with the applicable laws.
- The project will need to comply with any local tree preservation ordinances and other policies protecting **heritage or significant trees**. Mature trees offer substantial stormwater benefits, and their preservation is recommended, where feasible, even if it is not required by law.
- The project needs to comply with any local restrictions on development of **steep slopes** and soils that are susceptible to **erosion**. Even where not required by law, the avoidance of such areas is advisable in order to reduce stormwater impacts.

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Step 3: Incorporate Site Design Measures

Design the project to minimize the overall coverage of impervious paving and roofs, with a special focus on reducing the amount of impervious area that is directly connected to the storm drain system.

Using site design measures to reduce impervious surfaces on your site can **reduce the size** of stormwater treatment measures that you will need to install.

Using site design measures to reduce impervious surfaces on your site can **reduce the size of stormwater treatment measures** that you will need to install. But remember: even vegetated areas will generate some runoff. If runoff from landscaped areas flows to a stormwater treatment measure, that treatment measure will need to be sized to handle these relatively small amounts of runoff, as well as runoff from impervious surfaces. The use of self-treating areas (described below) can reduce the size of treatment measures even further.

Some examples of site design measures are shown in Figures 3-2 and 3-3. More information on site design measures is provided in Chapter 4 and Appendix L (Site Design Requirements for Small Projects). A range of site design examples is described in the following list:

- Use **alternative site layout techniques** to reduce the total amount of impervious area. This may include designing compact, multi-story structures or clustering buildings. Some cities may allow narrow streets and (in very low-density neighborhoods) sidewalks on only one side of the street.
- **Minimize surface parking** areas, in terms of the number and size of parking spaces.
- Use **rainwater as a resource**. Capturing and retaining roof runoff in cisterns can be a practical way to reduce the amount of runoff from the site and store rainwater for use in on-site irrigation. Stormwater storage provided by cisterns may be used to reduce the amount of stormwater that must be treated and, where applicable, retained on-site to meet hydromodification management requirements.
- Use **drainage as a design element**. Vegetated swales, depressed landscape areas, vegetated buffers, and bioretention areas can serve as visual amenities and focal points in the landscape design of your site.



Figure 3-2: Example of a narrow street with parking pull-outs



Figure 3-3: Pleasanton Sports Park includes this turf block fire access road.

of pervious paving or artificial turf. These areas are considered “self-treating” because infiltration and natural processes that occur in these areas remove pollutants from stormwater. Your drainage design may direct the runoff from self-treating areas directly to the storm drain system or other receiving water. See Section 4.1 for more information.

- **Maximize choices for mobility**. Motor vehicles are a major source of pollutants in stormwater runoff. Projects should promote, or at least accommodate, modes of transportation other than the automobile.
- Identify **self-treating areas**. Some portions of your site may provide “self-treatment” if properly designed and drained. Such areas may include conserved natural spaces, large landscaped areas (such as parks and lawns), green roofs and properly designed areas
- Direct **runoff to depressed landscaped areas**. You may be able to design an area within your site to function as a “self-retaining area,” in which the amount of stormwater

runoff that is required to be treated is infiltrated or retained in depressed landscaped areas. A 2:1 ratio of impervious area to the receiving pervious area may be acceptable, where soils permit. See Section 4.2 for more information.

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Step 4: Measure Pervious and Impervious Surfaces

The **Stormwater Requirements Form** (or equivalent form) that is provided by the local jurisdiction must be completed as part of the planning permit application submittal. This form is used to identify project site design measures and source controls, to calculate the amount of impervious surface that will be created and/or replaced, and to determine whether treatment and/or HM measures are required. Impervious surfaces are constructed materials that prevent water from infiltrating into the ground and cause runoff. Impervious surfaces include:

- Footprints of all buildings and structures, including garages, carports, sheds, etc.;
- Driveways, patios, parking lots, decking;
- Streets and sidewalks.

Areas of pervious paving or artificial turf that are underlain with pervious storage material, such as a gravel layer sufficient to hold at least the Provision C.3.d volume of rainfall runoff, are not considered impervious surfaces and can be excluded from the calculation of impervious surfaces.

Review the following thresholds of impervious surface to identify the stormwater control requirements for your project:

- Projects that create and/or replace **10,000 square feet or more** of impervious surface must implement low impact development (LID) stormwater treatment measures (with some exceptions that are listed in Chapter 2)
- Projects in the following categories that create and/or replace **5,000 square feet or more** of impervious surface must implement stormwater treatment measures:
 - Uncovered parking areas (stand-alone or part of another use),
 - Restaurants,
 - Auto service facilities¹, and
 - Retail gasoline outlets.
- Projects that create and/or replace **2,500 to 10,000 square feet** and are not in the four categories above, and **single family home projects that create and/or replace 2,500 square feet or more** must implement one of six site design measures but are

¹ Auto service facilities include the specific Standard Industrial Classification Codes, as follows:
 5013: Wholesale distribution of motor vehicle supplies, accessories, tools, equipment, and parts.
 5014: Wholesale distribution of tires and tubes for passenger and commercial vehicles.
 7532: Repair of automotive tops, bodies, and interiors, or automotive painting and refinishing.
 7533: Installation, repair, or sale and installation of automotive exhaust systems.
 7534: Repairing and retreading automotive tires.
 7536: Installation, repair, or sales and installation of automotive glass.
 7537: Installation, repair, or sales and installation of automotive transmissions.
 7538: General automotive repair.
 7539: Specialized automotive repair such as fuel service, brake relining, front-end and wheel alignment, and radiator repair.

not required to implement stormwater treatment measures (see Section 2.3.3 for more information).

(See Section 2.3.1 for information on projects that are “grandfathered in” under previous permit requirements.)

Hydromodification management (HM) is required for projects that create and/or replace one acre or more of impervious surface, increase the amount of impervious area over the pre-project condition, AND are located in susceptible areas identified in the Hydromodification Management Susceptibility Map (see Appendix I). Section 7.1 describes this map, and Section 7.2 lists exceptions to the requirements.

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Step 5: Determine If Special Project LID Treatment Reduction Credits Apply

LID treatment reduction credits can be applied to smart growth, high density or transit oriented development projects that meet specific criteria for the Special Projects included in Appendix J. Contact municipal staff to determine whether your project meets the criteria to be considered a Special Project.

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Step 6: Select Treatment/HM Measures

Stormwater treatment requirements must be met using low impact development (LID) measures that provide stormwater treatment using evapotranspiration, infiltration, rainwater harvesting and reuse, and/or biotreatment -- except for limited exceptions for Special Projects that meet specific criteria related to pedestrian scale developments, high density developments and transit oriented development (see Appendix J). – Special Projects). There are many different types of treatment measures, each with particular advantages and disadvantages, and new innovative solutions continue to be developed. **Chapter 6** provides technical guidance for specific types of stormwater treatment measures that are commonly used in Alameda County. While other treatment measures may be approved, it may be possible to expedite the review of your project by closely following the guidance provided in Chapter 6.

Selecting the appropriate treatment measure(s) for a specific site is a matter of professional judgment. Some general factors to consider are offered below:

- **LID treatment measures are required**, except for a limited number of locations and types of development, referred to as Special Projects, as described above.
- Is **Hydromodification management (HM)** required? If your project needs to meet both treatment and HM requirements, it is recommended, to the extent feasible, that stormwater control measures be designed to meet both treatment and HM needs.
- **Soil suitability.** Soils are classified into four hydrologic soil groups – A, B, C, and D – with the soils in each group having similar runoff potential under similar storm and cover conditions. Group A soils generally have the lowest runoff potential, and group D have the greatest.² Treatment measures that rely primarily on **infiltration**, such as *infiltration*

² Details of this soil classification can be found in the National Soil Survey Handbook, Part 618.35 (USDA, 2006), <http://soils.usda.gov/technical/handbook>.

trenches, are unsuitable for use in group D soils (clay loam, sandy clay and clay) and have the potential to fail in group C (silt loam) soils. Bioretention areas installed in group C and D soils typically require subdrains.

- **Site slope.** LID treatment measures need to be carefully selected and designed for use on steep slopes, because infiltration of stormwater runoff can cause geotechnical instability. Depending on site conditions, it may be possible to design **bioretention areas** using check dams for projects on sites with some slope constraints.
- **Considerations for larger sites.** For larger sites that can be divided into separate drainage areas, a variety of smaller stormwater treatment measures may be dispersed throughout the site. It may also be possible to route the stormwater runoff from an individual drainage area to a cistern for non-potable use, such as irrigation or flushing toilets (see Section 4.4, **Rainwater Harvesting and Use**).
- Consider **maintenance requirements.** The amount of maintenance that a stormwater treatment measure will require should be considered when selecting treatment measures. As described in Section 3.3, you will need to prepare and submit a **maintenance plan** for

The **mosquito control guidance** (Appendix G) needs to be implemented for all stormwater treatment measures, with special consideration given to treatment measures that are designed to include standing water.

stormwater treatment measures with the building permit application. Section 8.2 provides information regarding the maintenance requirements for various treatment measures. Maintenance plan templates are provided in **Appendix H**.

- **Avoid mosquito problems.** The mosquito control guidance provided in **Appendix G** needs to be implemented for all stormwater treatment measures, with special consideration given to treatment measures that are designed to include standing water.
- Potential for **groundwater contamination.** Before selecting an infiltration device, such as an infiltration trench, infiltration basin, or French drain, review the infiltration considerations presented in **Appendix F** to protect groundwater from contamination by pollutants in stormwater runoff.

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Step 7: Locate Treatment/HM Measures on the Site

Review the existing and proposed site drainage network and connections to drainage offsite, which were collected in Step 1. Selecting appropriate locations for treatment and HM measures involves a number of important factors, including the following:

- **Design for gravity flow.** If at all possible, treatment/HM measures should be designed so that drainage into and out of the treatment measure is by gravity flow. This promotes effective, low-maintenance operation and helps avoid mosquito problems. Pumped systems can be feasible, but they are more expensive, require more maintenance, and can introduce sources of underground standing water that attract mosquito breeding.
- Determine **final ownership and maintenance responsibility.** Treatment measures should be available for ready access by maintenance workers, municipal inspectors, and staff from the Alameda County Mosquito Abatement District or the Alameda County Vector Control District. If the property will be subdivided, be sure to locate shared treatment measures in a common, accessible area – not on a private residential lot.

- Incorporate **treatment measures in the landscape design**. Almost every project includes landscaped areas. Most zoning districts require a certain amount of open space, and some require landscaped setbacks or buffers. It may be possible to locate some or all of your projects' treatment/HM measures within required landscape areas.
- **Plan for maintenance**. Stormwater treatment measures will need to be accessible to the largest piece of equipment that will be needed for maintenance. For example, bioretention areas and vegetated swales need access for the types of machinery used for landscape maintenance. Large extended detention basins need to have a perimeter access road accessible by heavy vehicles for sediment removal and controlling emergent vegetation. Underground treatment measures and media filters may require special equipment for periodic cleanout and media replacement.



Figure 3-4: This sports field in Dublin also functions as a stormwater detention area.

PLANNING PERMIT SUBMITTAL

Step 8: Preliminary Design of Treatment/HM Measures

Perform preliminary design of the stormwater treatment measures you have selected using the hydraulic sizing criteria in Section 5.1 and the technical guidance for specific types of treatment measures in Chapter 6. The technical guidance in this handbook is compatible with the **Bay Area Hydrology Model** (BAHM), a tool for sizing HM measures, developed by the Clean Water Program in cooperation with the Santa Clara Valley Urban Runoff Pollution Prevention Program and the San Mateo Countywide Stormwater Pollution Prevention Program. The BAHM may be downloaded at www.bayareahydrology.com. See Chapter 7 for more information on the BAHM and the design of HM measures.

Detailed construction drawings are typically not required for planning permit submittals, but drawings or sketches need to be included to illustrate the proposed design and sizing information based on runoff calculations.

PLANNING PERMIT SUBMITTAL

Step 9: Consider Planting Palettes for Treatment Measures

The selection of appropriate plant materials is an important part of designing a successful landscape-based stormwater treatment measure. Plants need to be hardy, low-maintenance, tolerant of saturated soils, and selecting plants that can survive long periods with little or no rainfall will **help reduce irrigation requirements**, although irrigation systems are typically required for landscape-based stormwater treatment measures. At the planning permit phase of the project a detailed planting plan is typically not required, but many municipalities require a conceptual planting palette. Appendix B provides guidance regarding the selection of plant materials for landscape-based treatment measures.

Selecting plants that can survive long periods with little or no rainfall will **help reduce irrigation requirements**.

PLANNING PERMIT SUBMITTAL

Step 10: Prepare a Preliminary Maintenance Plan (if required)

A stormwater treatment measure maintenance plan describes how stormwater treatment measures will be maintained during the years and decades **after construction is completed**. In some cases a municipality may require the submittal of a maintenance plan as part of the planning permit submittal. Otherwise, a maintenance plan is required as part of the building permit submittal. **Check with your local jurisdiction** regarding the requirements for your project.

A maintenance plan identifies the **proposed maintenance activities**, and the intervals at which they will be conducted, for each stormwater treatment measure included in the project. Applicants will also need to provide information that will be included in a maintenance agreement between the local municipality and the property owner. Chapter 8 provides more information about stormwater treatment measure operation and maintenance. Maintenance plan templates for various stormwater treatment measures are included in Appendix H.

PLANNING PERMIT SUBMITTAL

Step 11: Use Applicable Source Control Measures

Pollutants are generated by many common activities that will occur after construction is completed. Each local jurisdiction has specific pollutant source control requirements for projects that include landscaping, swimming pools, vehicle washing areas, trash/recycling areas, and other sources of pollutants. These requirements are identified in the agency's **Local Source Control Measures List**. Be sure to obtain the current list from your local jurisdiction. The lists are typically divided in two parts: Part I - Structural Source Controls and Part II – Operational Source Controls. These two types of source controls are described as follows:

Source control measures are site planning practices, or operational activities, that aim to prevent runoff pollution by reducing the potential for contact with runoff at the source of pollution.

- **Structural Source Controls** - Structural source controls are permanent features that are designed and constructed as part of a project, such as sanitary sewer connections for restaurant wash areas that are large enough to wash the largest piece of equipment.
- **Operational Source Controls** – Operational source controls are “good housekeeping” activities that must be conducted routinely during the operations phase of the project – such as street sweeping and cleaning storm drain inlets.

Projects must incorporate the applicable source controls for any project activity that is included in the local source control lists. The following methods may be used to accomplish this.

- **Review** structural source controls in Part I of the local list and compare this list to your site plan. Identify any areas on the site that require structural source controls. Remember that some activities may not have been sited yet. For example, the Model List includes a requirement for enclosing and roofing refuse storage areas. If a designer was unaware of this requirement, it may not be shown on the project plans.
- **Incorporate** all the required structural source controls on your project drawings.
- **If required by the municipality**, prepare and submit a table, listing in three columns the potential sources of pollutants, the permanent source control measures, and any

operational source control measures from Part II of the local list that apply to the project. Table 3-2 is an example Table of Source Controls.

Table 3-2: Example Table of Stormwater Source Controls		
Potential Source of Pollutants	Structural Source Controls	Operational Source Controls
On-site storm drains	On-site storm drains shall be marked with the words “No Dumping! Flows to Bay” (or applicable water body) applied with thermoplastic.	All on-site storm drain inlets shall be cleaned at least once a year immediately prior to the rainy season.
Refuse areas	New or redevelopment projects, such as food service facilities, recycling facilities or similar facilities, shall provide a roofed and enclosed area for dumpsters and recycling containers. The area shall be designed to prevent water run-on to the area and runoff from the area and to contain litter and trash, so that it is not dispersed by the wind or runoff during waste removal.	None
<i>NOTE: This table is included as an example only and is not intended for use in an actual submittal.</i>		

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Step 13: Coordinate with Other Project Requirements

When submitting the C.3 stormwater drawings with the planning permit submittal, the stormwater site design, source control, treatment and HM measures may be shown on a separate stormwater plan, or combined with the site plan, landscaping plan, or drainage plan – depending on the complexity of the project. Whether plans are combined or separate, there are a number of issues that must be carefully coordinated with other aspects of the project design. Some typical coordination considerations are listed below.

- **Balance of Cut and Fill.** When calculating the overall project balance of cut and fill, be sure to include the excavation of stormwater treatment measures (including the need to replace existing clay soils with group A or B soils).
- **Soil Compaction during Construction.** Compaction from construction traffic can severely restrict the infiltration capacity of soils at your site. In the construction staging plan, protect and limit operation in those portions of the site that will accommodate self-treating areas or stormwater treatment measures that rely on infiltration.
- **Building Drainage.** Building codes require that drainage from roofs and other impervious areas be directed away from the building. The codes also specify minimum sizes and slopes for roof leaders and drain piping. Any stormwater measure located in or on the building, or that may affect building foundations, must be designed to meet the minimum building code requirements. Stormwater treatment measures are also required to meet the requirements for detention or flow described in Section 5.1.
- **Control of Elevations.** Getting runoff to flow from impervious surfaces to landscaped surfaces may require greater attention to detailed slopes and elevations in grading and landscaping plans. For example:
 - **Provide Adequate Change in Elevation** between the pavement and vegetated areas. The landscaped area needs to be low enough so that runoff will flow into it

even after the turf or other vegetation has grown up. If adequate reveal is not provided, runoff will tend to pond on the edge of the paved surface.

- **Provide for Differential Settlement.** While the soil in landscaped-based stormwater treatment measures and self-treating areas must be left loose and uncompacted, concrete structures (such as inlets and outlets) must be supported on a firm foundation. If not, they may settle more than the surrounding ground, creating depressions that can hold standing water and contribute to mosquito breeding.
- **Prevent Erosion.** Erosion may occur at points where the stormwater runoff flows from impervious areas into landscape-based treatment measures. Include in the project plans any proposed erosion controls, such as cobbles or splash blocks.
- **Drainage Plans.** The local building or engineering department may require a drainage plan, which typically focuses on preventing street flooding during a 10-year storm and demonstrating that flooding from 100-year storms can be managed. To meet the drainage plan requirements it may be necessary to include **high flow bypasses** in the design of stormwater treatment measures, in order to route **flood flows** directly to the storm drain system. Check with your local jurisdiction regarding the need to prepare a drainage plan, and whether it is required only as part of the building permit submittal, or if a preliminary drainage plan is needed with the planning permit submittal.
- **Signage for Traffic and Parking.** If your project includes depressed landscaped areas next to parking lots, driveways or roadways, it may be necessary to include bollards, striping or signs to guide traffic, especially if curbs are flush with the pavement. Traffic striping may not be practical for pervious pavements such as crushed aggregate and unit pavers. In these areas, signs and bollards may be needed to help direct traffic.



Figure 3-5: Drain rock is used to prevent erosion of this vegetated swale at Zone 7 Water Agency's office building.

PLANNING PERMIT SUBMITTAL

Step 14: Submit Planning Permit Application

Assemble all the items listed in Table 3-1 that municipal staff indicates are required for your project, and include them as attachments to the planning permit application for your project.

3.3 Building Permit Submittals

Except for projects on small sites, the principal differences between planning permit submittals and building permit submittals are:

- **Construction level detail** is needed, rather than preliminary plans;
- **Highlight and explain changes**, if plans differ from the planning permit submittal;

If your project **does not require a planning permit**, submit items from both Tables 3-1 and 3-3 with the building permit application.

- Include **detailed maintenance plans** and documentation for maintenance agreement.

Table 3-3 provides a list of materials that may be required at this stage in the project, followed by brief step-by-step instructions.

Table 3-3: Building Permit Submittal Checklist			
Required?		Information on Project Drawings	Corresponds to Building Step (Sect. 3.3)
Yes	No		
<input type="checkbox"/>	<input type="checkbox"/>	Sensitive natural areas to be preserved and protected from development. – highlighting any changes since the planning permit submittal.	Step 1
<input type="checkbox"/>	<input type="checkbox"/>	Proposed impervious surfaces, e.g., roof, sidewalk, street, parking lot (for each drainage area) – highlight any changes since the planning permit submittal.	Step 1
<input type="checkbox"/>	<input type="checkbox"/>	Site design measures to minimize impervious surfaces and promote infiltration – construction level detail.	Step 1
<input type="checkbox"/>	<input type="checkbox"/>	Construction level detail of stormwater treatment measures and (if 1 acre or more of impervious surface is created) hydromodification management measures.	Step 1
<input type="checkbox"/>	<input type="checkbox"/>	Pollutant source areas and corresponding structural source controls from local source control list – construction level detail.	Step 1
<input type="checkbox"/>	<input type="checkbox"/>	Landscaping plan for stormwater treatment measures–construction level detail.	Step 1
<input type="checkbox"/>	<input type="checkbox"/>	Letter- or legal-sized conceptual or site plan showing locations of stormwater treatment measures, for inclusion in the Maintenance Agreement.	Step 2
		Written Information on Municipal Forms or in Report Format	
<input type="checkbox"/>	<input type="checkbox"/>	Completed Stormwater Requirements Checklist, showing any changes since planning permit submittal.	Step 1
<input type="checkbox"/>	<input type="checkbox"/>	Detailed hydraulic sizing calculations for each treatment and/or hydromodification management measure.	Step 1
<input type="checkbox"/>	<input type="checkbox"/>	List of source control measures included in the project, showing any changes since planning permit submittal.	Step 1
<input type="checkbox"/>	<input type="checkbox"/>	Detailed maintenance plan for stormwater treatment measures, including inspection checklists, as appropriate.	Step 2
<input type="checkbox"/>	<input type="checkbox"/>	A standard treatment measure O&M report form, to be attached to the Maintenance Agreement	Step 2

BUILDING PERMIT SUBMITTAL

Step 1: Update Project Documentation

Information regarding the design of stormwater measures that was submitted with the planning permit application must be updated, as necessary, for submittal with the building permit application. Specific requirements may vary in the various jurisdictions, but this is anticipated to include the following:

- Incorporate all **stormwater-related conditions of approval** that were applied during planning permit review.
- Highlight and explain any **other stormwater-related changes** that have been made since the planning review. This may include, but is not limited to, changes in the boundaries of sensitive areas to be protected, changes in the amount of impervious surface to be created/replaced, changes in the stormwater pollutant source areas, changes in the location or design of stormwater measures, etc.
- Prepare **construction level detail** for all stormwater measures included in the project.
- Prepare detailed **hydraulic sizing calculations** for stormwater treatment and HM measures, using the hydraulic sizing guidance provided in Section 5.1.
- Prepare construction-level **planting plans** for landscape-based stormwater treatment measures.

NOTE: Some **smaller projects** may not require a planning permit. If this is true for your project, your building permit application submittal will need to include items listed in both Table 3-1 and Table 3-3. Ask the building department staff to help you identify the specific items needed for your submittal.

BUILDING PERMIT SUBMITTAL

Step 2: Prepare Maintenance Documentation

Property owners are responsible for assuring the long-term operation and maintenance of a project's stormwater treatment measures, unless the applicable municipality approves other specific arrangements. Details may vary from one jurisdiction to another, but **maintenance agreements** generally require the property owner to assure that all stormwater treatment measures receive proper maintenance in accordance with an approved maintenance plan; that municipal, Water Board, Mosquito Abatement District, and Vector Control District staff be granted access, as needed, to ensure proper maintenance and operation; and if the property owner fails to maintain the treatment measure, municipal staff be allowed to enter the property, perform necessary emergency repairs, and charge the property owner for the necessary emergency repairs. Project applicants are typically required to provide the following documentation to support the maintenance agreement:

- A **conceptual plan or site plan** that is legible on letter- or legal-sized paper (8.5-by-11 inches or 8.5-by-14 inches) and shows the locations of the stormwater treatment measures that will be subject to the agreement. **Some municipalities have specific requirements** for these plans, such as requiring a conceptual plan that includes only the stormwater treatment measures. If more than one stormwater treatment measure is used, the treatment measures should be numbered for ease of identification (for example, Swale 1, Swale 2, etc.)
- A **maintenance plan** that includes specific long-term maintenance tasks and a schedule. Section 8.2 provides guidance for preparing a maintenance plan, and Appendix H features maintenance plan templates to use when preparing a maintenance plan. If a preliminary maintenance plan was submitted with the planning permit application, this plan should be

updated to respond to municipal staff comments and include a sufficient level of detail for implementation.

- A Standard Treatment Measure Operation and Maintenance ***Inspection Report Form***, which some municipalities require the property owner to complete and submit to the municipality each year. The purpose the annual report is to help the municipality verify that appropriate O&M is occurring. A template for preparing this report form is included in Appendix H.

BUILDING PERMIT SUBMITTAL

Step 3: Submit Building Permit Application

Assemble all the items listed in Table 3-3 that municipal staff has indicated are required for your project, and include them as attachments to your building permit application.

3.4 Simple Instructions for Small Sites Subject to Stormwater Treatment Requirements

Some developers of smaller projects may be less familiar with requirements to incorporate stormwater treatment measures. If you are a qualified engineer, architect or landscape architect, you may be able to prepare the entire C.3 submittal yourself. If not, you will probably need to hire a ***qualified civil engineer, architect or landscape architect*** to prepare the submittal – or at least some of the more technical aspects of the submittal. Some tips for smaller projects are provided below:

- ***Review submittal checklists with municipal staff.*** If your project does not require a planning permit, you will need to include in your building permit application submittal some of the items that are listed in Table 3-1 (Planning Permit Submittal Checklist) and some from Table 3-3 (Building Permit Checklist). But remember, not every item in the checklists is required for every project. Make an appointment with a member of the building department staff to sit down and go through the checklists with you, to give you a ***reduced list*** of the items you will need for your small site. And make sure to get the list in writing, so you can refer to it, if necessary, in future conversations with municipal staff. If your project requires a planning permit, use this same strategy to get a list of required items from the planning staff.
- ***Maximize the use of site design measures.*** The less impervious surface area on the site, the smaller your stormwater treatment measures will need to be. Chapter 4 lists strategies for reducing impervious surfaces, and it offers guidance for using self-treating areas (for example, landscaping, areas paved with turf block, or green roofs) to further ***reduce the size*** of treatment measures. Projects that create and/or replace at least 2,500 but less than 10,000 square feet of impervious surface are required to incorporate site design measures, using specifications that are included in Appendix L.
- ***Use LID treatment measures.*** Even on small sites, LID treatment measures are required, except for projects that may receive LID treatment reduction credits as a Special

Project (described in Appendix J). Chapter 6 includes technical guidance for some treatment measures, such as bioretention areas and flow-through planters, which are well suited for small sites in ***densely developed areas***. Where on-site conditions, such as proximity to buildings, high groundwater or contaminated soils prohibit infiltration, flow-through planters may be a good option.

- ***Use simplified sizing methods.*** The technical guidance in Chapter 6 includes simplified sizing methods for flow-through planters and bioretention areas. The technical guidance for these treatment measures highlights the easy-to-follow calculations for sizing the treatment measures. In locations where infiltration is precluded by steep slopes, high groundwater, or proximity to building foundations, and the project is an infill or redevelopment project, the combination flow and volume sizing method may be used to potentially reduce the amount of land needed for stormwater treatment (see Chapter 5).
- ***Use the planting guidance.*** Appendix B provides guidance for selecting appropriate plantings for landscape-based stormwater treatment measures. Municipal staff will check to confirm that the plants included in your design meet the criteria set forth in this guidance.



Figure 3-6: Flow-through planters are incorporated into the landscaping in a dense, urban setting in Emeryville.