

Chapter 3: Preparing Permit Application Submittals

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3.1 The Development Review Process

Municipalities have integrated their review of stormwater control measures into the development review process. If the C.3 requirements for site design measures, source controls, and stormwater treatment measures apply to the project, the planning permit application submittal must show how the required stormwater control measures have been incorporated. Some agencies will require each project to submit a Stormwater Management Plan or Stormwater Control Plan that contains these details, and/or will issue Stormwater Permits in addition to planning and building permits to manage the process and recover costs for stormwater-related plan check and inspection services.

Key Point

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

Section 3.2 gives step-by-step instructions on how to prepare a planning permit submittal, 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 control measures simultaneously with the *preliminary site plan* and the landscaping plan is advised to achieve the following benefits:

- Maximize the stormwater benefits of project landscaping;
- Improve site aesthetics and produce a better quality project;
- Speed project review times;
- Avoid unnecessary redesign;
- Reduce overall project costs; and
- Allow for the design team to coordinate project documents among disciplines.

After the municipality issues the planning permit, the required stormwater information will need to be incorporated into the 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.

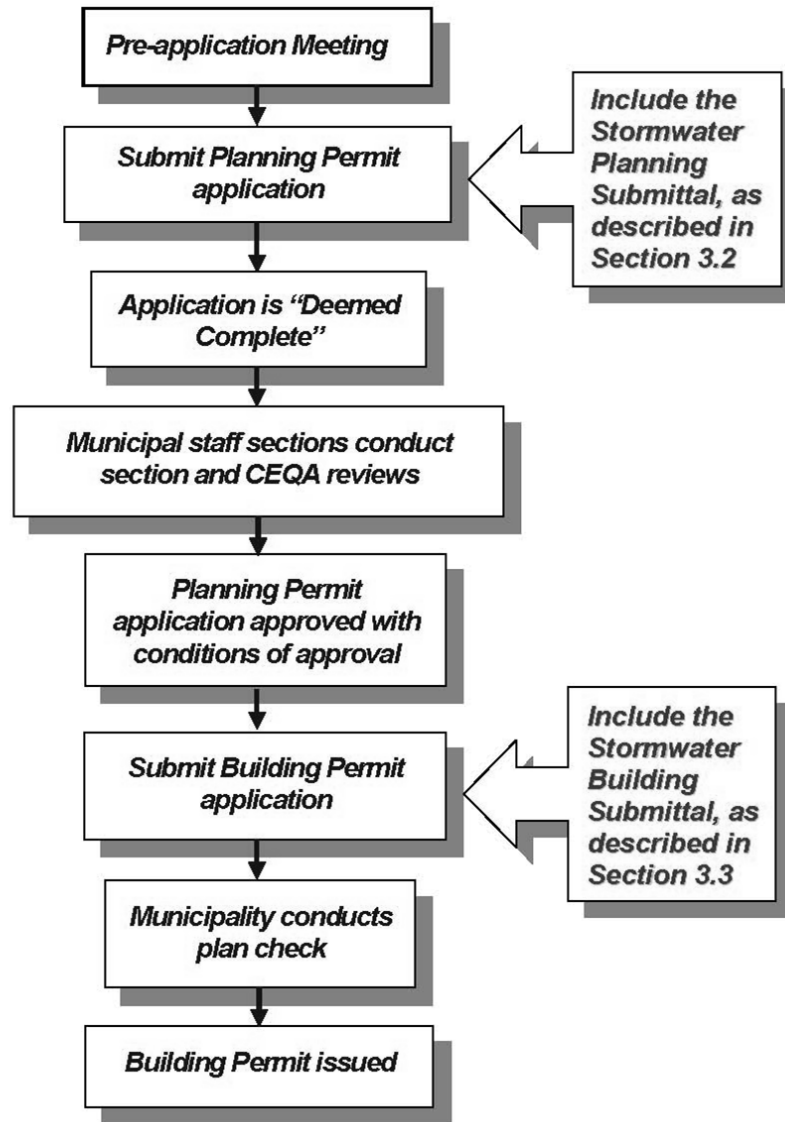


Figure 3-1: Sample Development Review Process for projects subject to Provision C.3 requirements for site design measures, source controls and stormwater treatment measures

Although the development review process may vary from one municipality to the next, Figure 3-1 highlights the steps in the development review process where municipalities typically require submittals showing how the project incorporates stormwater control measures. These submittals are incorporated into the planning permit and building permit applications. Remember that the C.3 submittals show how the project will incorporate stormwater control measures, to reduce pollutant loading and prevent increases in creek channel erosion *during the life of the project*. The municipality will require the preparation of separate documents, such as a SWPPP, to show how erosion and sediment will be controlled *during construction*. Sections 3.2 and 3.3 presents step-by-step instructions for preparing C.3 stormwater submittals for planning, building and/or stormwater permit applications.

3.2 How to Prepare Planning Permit Submittals

The Countywide Program has developed two checklists that the municipalities may use to identify the requirements for stormwater control measures that apply to the project at this phase in project development. The ***C.3 and C.6 Development Review Checklist*** may be used to identify specific requirements regarding the types of site designs, source controls, treatment measures and hydrograph modification measures that should be incorporated in the project. Municipal staff also use this checklist to identify erosion and sediment controls that will be required during construction of the project.

Key Point

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

The ***Planning Permit Submittal Checklist*** is provided below to help identify the C.3 stormwater-related items that will need to be submitted with the planning permit application. Please note that it's important to ***contact the planning staff of the local jurisdiction*** to discuss the specific requirements that may apply to the project. After obtaining a complete list of submittal requirements, the Step-by-Step instructions in this section may be used to prepare the submittal. Applicants with smaller projects (between 5,000 sq. ft. up to one acre) are encouraged to read Section 3.4, "***Simple Instructions for Small Sites***," before using the Step-by-Step instructions.

3.2.1 The Planning Permit Submittal Checklist

Table 3-1 presents a checklist of the stormwater control measure information that is typically submitted with planning permit applications. Please note that if runoff from the site discharges directly to a creek or wetland without flowing through a municipally-owned storm drain, additional information may need to be submitted. Municipal staff may use this checklist to determine whether the submittal is complete, or some jurisdictions may use a modified checklist. The items included in this checklist are important to demonstrate that the 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"/>	Soil types and depth to groundwater.	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 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 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 area).	Steps 2 and 3
<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.	Steps 3 and 4
<input type="checkbox"/>	<input type="checkbox"/>	Proposed impervious surfaces, e.g., roof, plaza, sidewalk, street, parking lot (for each drainage area).	Step 4
<input type="checkbox"/>	<input type="checkbox"/>	Proposed locations and approximate sizes of stormwater treatment measures if the project is a regulated project (see Step 5 for determination). Elevations should show sufficient hydraulic head for the treatment measures to work. ²	Steps 5 - 9
<input type="checkbox"/>	<input type="checkbox"/>	Proposed locations, types and approximate sizes of hydromodification management measures, if the project is required to provide them.	Steps 7-9
<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 “C.3 and C.6 Development Review Checklist” (obtain from municipality).	Step 4
<input type="checkbox"/>	<input type="checkbox"/>	Preliminary calculations for each treatment or hydromodification management measure and narrative of treatment approach.	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
<p>¹ Every item is not necessarily required for a project. Municipal staff may check the boxes in the “Required” column to indicate items required for a project.</p> <p>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.</p>			

3.2.2 Planning Permit Submittals: Step-by-Step

Step-by-step instructions are offered below to help incorporate stormwater control measures into the project from the very beginning of permit planning. The step-by-step instructions are intended to help **prepare the necessary materials** 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 and may require applicants to fill out and submit the “C.3 and C.6 Development Review Checklist.”

- **Introductory narrative** of the stormwater management plan and summary of the site/project.
- 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, US Fish and Wildlife Service (USFWS) wetland inventory maps, and the Oakland Museum of California Creek & Watershed Maps (www.museumca.org/creeks).
- 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) Web Soil Survey¹². This information is used in determining the feasibility of onsite infiltration of stormwater. For additional information on soil types, see Appendix E – Infiltration Guidelines.
- **“Retained”, “Replaced” and “Created” impervious surfaces**. The “C.3 and C.6 Development Review Checklist” includes an “Impervious and Pervious Surfaces Table” that summarizes the square footage of pre-project and post-project impervious and pervious surfaces. As defined in the Checklist, “Retained” means existing impervious surfaces that are left in place unchanged; “Replaced” means new impervious surface that is installed where existing impervious surface is removed anywhere on the same property; and “Created” means the amount of new impervious surface being constructed which exceeds the total existing amount of impervious surface at the property. For example, if a portion of the pre-project impervious parking lot is to be left untouched and used as is on the post-project site, that impervious surface would be considered “Retained”; when a building is constructed in an area that used to be an impervious surface parking lot, the

¹² <https://websoilsurvey.sc.egov.usda.gov/App/HomePage.htm>

building roof impervious surface has “Replaced” the parking lot impervious surface and is not considered “Created” even though it is a new roof; and finally, if some landscaped area (considered pervious) on the site was paved over for new post-project impervious parking spaces, then that new impervious area would be considered “Created”. The data in the table are required for several calculations including determining whether treatment measures apply to the project.

- **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 on the whole site treat the stormwater runoff from the whole site - not just the redeveloped area. If less than 50 percent of existing impervious surface is being replaced, then only the area within the scope of the activity for which a permit is currently being applied must be included in treatment measure design.
- **Zoning** information, such as setback and open space requirements.

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 concerns. **Opportunities** for siting stormwater controls 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 moving stormwater runoff through treatment measures). Preparing a table or brief written summary of constraints and opportunities can prove helpful in selecting and siting stormwater controls.

Key Point

Constraints for siting stormwater controls may include impermeable soils, high groundwater, steep slopes, or geotechnical instability.

Opportunities may include existing natural areas, low areas, or landscaping.

Planning Permit Submittal - Step 2: Minimize Site Disturbance and Protect Sensitive Areas

Design the site layout to minimize changes to the natural topography. Using information collected in Step 1, identify any existing sensitive natural resources on the site to protect and preserve 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 the project involves impacts to creeks and riparian habitat, the approvals may need to be obtained from a number of resource protection agencies, including but not limited to the San Francisco Bay Regional Water Quality Control Board and the California Department of Fish and Wildlife. Guidance for obtaining these approvals is provided in San Mateo County’s *Guide to Creek and Wetland Project Permitting*, at <http://flowstobay.org/files/construction/creekwetland.pdf>.
- 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. See the above reference to the *Guide to Creek and Wetland Project Permitting* and the Joint Aquatic Resource Permit Application (JARPA) website at www.bcdc.ca.gov/forms/forms.html.

- 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.
- The project will need to obtain coverage under the Construction General Permit from the State Water Resources Control Board if the project will be disturbing one acre or more of soil. See: www.waterboards.ca.gov/water_issues/programs/stormwater/construction.html.

Planning Permit Submittal - Step 3: Incorporate Site Design Measures

Design the project to minimize the overall coverage of 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 the site can **reduce the size of stormwater control measures** that will need to be installed. 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. Using self-treating areas (described below) can reduce the size of treatment measures even further.

Key Point

Using site design measures to reduce impervious surfaces on the site can reduce the size of stormwater control measures that will need to be installed.

Figure 3-2 provides an example of a site design measure. More information on site design measures is provided in Chapter 4, along with technical guidance for green roofs, pervious pavement, unit pavers and turf block. A range of site design examples are 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.
- **Minimize surface parking** areas, in terms of the number and size of parking spaces. See Chapter 3 of the GI Design Guide for guidance on efficient parking lot design.
- Use **rainwater as a resource**. Capturing 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. Rainwater storage in 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**. Bioretention areas, depressed landscape areas, vegetated buffers, and flow-through planters can serve as visual amenities and focal points in the landscape design of the site.

- **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.
- Include alternative, pervious surfaces. **Green roofs** can partially or fully replace traditional roofing materials. **Pervious pavement** such as crushed aggregate, turf block, unit pavers, or other types of pervious pavement may be appropriate for sidewalks, parking lots, and low-volume residential areas.
- Identify **self-treating areas**. Some portions of the site may provide “self-treatment” if properly designed and drained. Such areas may include conserved natural spaces, large landscaped areas, and areas of turf block. These areas are considered “self-treating” because infiltration and natural processes that occur in these areas remove pollutants from stormwater. As long as the self-treating areas do **not receive runoff from impervious areas** on the site and integrated pest management is used, the drainage design may direct the runoff from self-treating areas directly to the storm drain system or other receiving water. More information on self-treating areas is given in Section 4.2.
- Direct **runoff to depressed landscaped areas**. An area may be designed within the 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. Much higher ratios are possible if the runoff is directed to a bioretention area or other landscape-based treatment measures. More information is provided in Section 4.3.



Figure 3-2: Turf block fire access road, Santa Clara University, Santa Clara

Planning Permit Submittal - Step 4: Measure Pervious and Impervious Surfaces to Determine Project C.3 Regulation Status and MRP Requirements

The **C.3 and C.6 Development Review Checklist** that is provided by the **local jurisdiction** must be completed as part of the planning permit application submittal (some jurisdictions also use a “Small Projects Checklist”). These documents are used to calculate the amount of impervious surface that will be created, retained and/or replaced, and to determine whether treatment and/or HM measures are required. Impervious surfaces are those areas in which development prevents water from infiltrating into the ground and results in runoff. Impervious surfaces include but are not limited to:

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

Contact

Contact the local jurisdiction with any questions about the C.3 and C.6 Development Review Checklist.

Remember

Areas of pervious pavement that infiltrate water into the ground and are underlain with storage aggregate, such as a gravel layer sufficient to hold at least the Provision C.3.d volume of rainfall runoff are not considered impervious surfaces; these areas are excluded from the calculation of impervious surfaces.

Review the thresholds in Section 2.3.1 to identify the stormwater control requirements for the project.

Also see Section 2.3 for information on projects that are “grandfathered in” under the previous permit requirement.

Hydromodification management (HM) is required for projects that create and/or replace one acre or more of impervious surface, increase the amount of impervious surface over the pre-project condition, AND are located in susceptible areas identified in the Hydromodification Management Susceptibility Map (see Appendix H). Section 7.3 describes this map and lists exceptions to the requirements.

Planning Permit Submittal - 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 the project meets the criteria to be considered a Special Project.

Planning Permit Submittal - Step 6: Determine if Rainwater Harvesting Will Be Used

Rainwater harvesting and use can be complicated to implement as a means of compliance with C.3 treatment requirements as it requires a high demand for stormwater use. Appendix I provides guidance on sizing and designing systems for rainwater harvesting.

Planning Permit Submittal - Step 7: Select Treatment/HM Measures

Stormwater treatment must be accomplished with LID, i.e., with infiltration, evapotranspiration, rainwater harvesting and use, and/or biotreatment measures. **Chapter 6** provides technical guidance for specific types of stormwater treatment measures that are commonly used in San Mateo County. While other treatment measures may be approved, it may be possible to expedite the review of the 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.

- Systems with high flow rate media in cartridges or in tree well filters are allowed only on Special Projects -see Appendix J.
- Is Hydromodification management (HM) required? If the project needs to meet both treatment and HM requirements, to the extent feasible, it is recommended that stormwater control measures be designed to meet both

Warning

It is important to consider soil suitability, especially for treatment measures that rely primarily on infiltration.

treatment and HM needs. HM detention requirements are likely to exceed the volume required for treatment and may also need to be coordinated with separate requirements for flood control detention.

- 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. Treatment measures that rely primarily on infiltration, such as infiltration trenches, are generally unsuitable for use in group D soils (clay loam, sandy clay and clay) and have the potential to fail in some 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 terraced bioretention cells using check dams for projects on sites with some slope constraints. See Section 6.1 for more guidance.
- Considerations for larger sites. Some sites may have sufficient space to use one or more cisterns to use rainwater for non-potable uses, such as irrigation or flushing toilets. Alternatively, smaller stormwater treatment measures may be dispersed throughout the site.
- 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, a maintenance plan for stormwater treatment measures will need to be prepared and submitted with the building permit application. Section 8.2 provides information about the maintenance requirements for various treatment measures.
- Avoid mosquito problems. Mosquito control guidance provided in Appendix F needs to be implemented for all stormwater treatment measures, with special consideration given to treatment measures that are designed to include standing water. Underground mechanical systems can be particularly problematic because many retain water that is not visible from the surface. Project plans that include stormwater treatment measures (and their maintenance plans), may be routed to the San Mateo County Mosquito Abatement District for review. Mosquito Abatement District staff may be consulted for guidance.
- 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 E to protect groundwater from contamination by pollutants in stormwater runoff.



Figure 3-3: Playing Fields/Detention Area, Pacific Shores, Redwood City (Credit: Pacific Shores, www.pacificshores.com)

Warning

The **mosquito control guidance** (Appendix F) needs to be implemented for all stormwater treatment measures, especially treatment measures designed to include standing water.

Planning Permit Submittal - Step 8: 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 should be considered the last design resort, as they are more expensive, require more maintenance, and can create hidden underground areas of standing water and mosquito breeding.
- Determine **final ownership and maintenance responsibility.** All treatment measures should be available for ready access by maintenance workers, inspectors from the local municipality, and staff from the San Mateo County Mosquito Abatement 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/all of the 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 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 control of emergent vegetation. Underground treatment measures and media filters may require special equipment for periodic cleanout and media replacement.

Remember

Plan ahead for future maintenance needs.

Planning Permit Submittal - Step 9: Preliminary Design of Treatment/HM Measures

The preliminary design of the selected stormwater treatment measures should be performed using the hydraulic sizing criteria in Section 5.1 and the technical guidance for specific types of treatment measures in Chapter 6.

If the project is required to include HM measures, these measures should be sized using the **Bay Area Hydrology Model** (BAHM) developed by SMCWPPP in cooperation with the Santa Clara Valley Urban Runoff Pollution Prevention Program and the Alameda Countywide Clean Water Program. The BAHM results should be provided with the planning permit submittal. The BAHM 2013 may be downloaded at <http://www.clearcreeksolutions.info/> under Downloads. See Chapter 7 for more information on the BAHM and the design of HM measures.

Detailed construction drawings may not be 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. Enough information should be provided to allow verification that the proposed treatment measures will work for the site and that sufficient space is allocated for installation of these measures, to avoid major modifications after planning approval. The level of information needed will vary depending on

site context and complexity of the proposed treatment concept. For example, if the treatment concept relies on the use of infiltration, representative soil permeability testing should be performed.

Planning Permit Submittal - Step 10: Consider Planting Palettes for Treatment Measures

The selection of appropriate plant materials is an important part of designing a successful LID stormwater treatment measure. Plants need to be hardy, low-maintenance, and tolerant of saturated soils. Although irrigation systems are typically required for landscape-based stormwater treatment measures, selecting plants that can survive long periods with little or no rainfall will **help reduce irrigation requirements**. 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 A provides guidance regarding the selection of plant materials for landscape-based treatment measures, including information about Bay-Friendly Landscaping. Bay-Friendly Landscaping Guidelines are available at www.rescapeca.org.¹³

Try this

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

Planning Permit Submittal - Step 11: Prepare a Preliminary Maintenance Plan (if Required)

Contact

Contact the local jurisdiction for more specific maintenance requirements for the project.

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 preliminary maintenance plan as part of the planning permit submittal. Otherwise, a maintenance plan is required only as part of the building permit submittal. **The local jurisdiction should be contacted** regarding the requirements for the project.

A preliminary 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. As part of the building permit submittal, applicants will also need to provide additional 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 (O&M), including guidance on how to prepare a maintenance plan. Maintenance plan templates for various types of stormwater treatment measures are included in Appendix G. Chapter 6 of the GI Design Guide also has helpful information on O&M of stormwater measures.

Planning Permit Submittal - Step 12: Use Applicable Source Control Measures

Pollutants may be generated by the activities that will occur on the site after construction is completed. The Countywide Program created a model Source Control List, and local jurisdictions may have additional or modified requirements for projects that include landscaping, swimming pools, vehicle washing areas, trash/recycling areas, and other potential sources of pollutants. Some jurisdictions may prohibit the use of pesticides and synthetic fertilizers and/or require sustainable landscaping practices such as

Contact

Be sure to obtain the current list of Local Source Control Measures from the permitting jurisdiction.

¹³ The Bay-Friendly Landscaping Coalition changed its name in 2016 to ReScape California.

those described in the Bay-Friendly/ReScape program¹⁴. These requirements are identified in the agency’s **Source Control Measures List** that may be attached to conditions of approval.

Be sure to obtain the current list from the local jurisdiction. The lists typically focus on **structural source controls**: 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. The municipality may also require the project to commit to implementing operational source controls: “good housekeeping” activities that must be conducted routinely during the operations phase of the project, such as street sweeping, Bay-Friendly landscaping maintenance and cleaning storm drain inlets.

Key Point

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

- **Review** structural source controls in the local list and compare this list to the 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 the 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 the local list that apply to the project. Table 3-2 is a Table of Example Source Controls.

Table 3-2: Table of Example 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 or a medallion.	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, multi-family dwelling projects and many commercial projects shall provide a roofed and enclosed area for trash, compost, 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.	Keep trash area clean, bins closed, and make sure bins are appropriately sized.
<i>NOTE: This is included as an example only and is not intended for use in an actual submittal.</i>		

¹⁴ www.rescapeca.org

Planning Permit Submittal - 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 the site. In the construction staging plan, protect and limit operation in those portions of the site that will be used for self-treatment 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 an adequate drop in elevation 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. Otherwise they may settle more than the surrounding ground, creating depressions that can hold standing water and contribute to nuisances such as mosquito breeding.
- **Prevent Erosion.** There is potential for erosion to occur at points where the stormwater runoff flows from impervious areas into landscape-based treatment measures. Include in project plans any proposed erosion controls, such as splash blocks and flow spreaders.
- **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



Figure 3-4: Splash block/box and flow spreaders help prevent erosion as stormwater enters treatment measure. (Credit: EOA, Inc.)

Warning

Be aware of potential elevation control requirements.

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. More information on this topic is provided in Section 5.6. The local jurisdiction should be consulted 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 the 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, particularly if curbs are designed to be flush with the pavement. Traffic striping may not be practical for pervious pavement such as crushed aggregate and unit pavers. In these areas signs and bollards may be needed to help direct traffic.

Contact

Contact the local jurisdiction to learn more about signage requirements.

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 the project, and include them as attachments to the planning permit application for the project.

3.3 How to Prepare Building Permit Submittals

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

- **Construction level detail**, rather than preliminary plans, are submitted;
- Changes are **highlighted and explained**, if plans differ from the planning permit submittal; and
- **Detailed maintenance plans** are included, along with documentation to support the maintenance agreement.

Key Point

If the project **does not require a planning permit**, then the building permit application submittal will need to include some items from Tables 3-1 and 3-3.

The list of materials that may be required at this stage in the project is shown in Table 3-3, and brief step-by-step instructions follow.

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:

Contact

Contact the local jurisdiction to learn more about specific requirements for the project

- Incorporate all **stormwater-related conditions of approval** that were applied as part of planning permit approval;
- Include a “Stormwater Management Plan” sheet in the civil and/or landscape plans summarizing the control measures, drainage management areas, and other related features;
- 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 and Sections 7.5-7.6; and
- 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 the project, the 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 identify the specific items needed for the submittal.

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 planning 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 for regulated projects and hydromodification management measures, if required.	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 O&M Agreement.	Step 2
		Written Information on Municipal Forms or in Report Format	
<input type="checkbox"/>	<input type="checkbox"/>	Updated C.3 and C.6 Development Review Checklist (or Small Projects Checklist), showing any changes since planning permit submittal.	Step 1
<input type="checkbox"/>	<input type="checkbox"/>	Detailed hydraulic sizing calculations and map of drainage management areas for each treatment and/or hydromodification management measure and narrative of treatment approach.	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 O&M 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 2: Prepare Maintenance Documentation

Remember

Property owners are responsible for assuring the long-term O&M of a project's stormwater control measures, unless the applicable municipality approves other specific arrangements. Details may vary from one jurisdiction to another, but **O&M 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, and Mosquito Abatement 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, as its option, 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 and/or templates** 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, Bioretention Area 1, Bioretention Area 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 G features maintenance plan templates to use when preparing a maintenance plan. The GI Design Guide contains additional O&M guidance and checklists. 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 O&M **Inspection Report Form**, which some municipalities require the property owner to complete and submit to the municipality each year. The purpose of 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 G.
- **As-built details** of all installed treatment and hydromodification management controls, including cross-section and plan view details and the installed plant palette, are very useful later when maintenance is required.
- Typically, the O&M Agreement is recorded with the property deed at the County when project occupancy is granted.

Building Permit Submittal - Step 3: Submit Building Application

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

3.4 Simple Instructions for Small Sites Subject to Stormwater Treatment Requirements

Remember

Some developers of smaller projects may be less familiar with requirements to incorporate stormwater treatment measures. A qualified engineer, architect or landscape architect may be able to prepare the entire C.3 submittal themselves. If none of these experts is available to prepare the entire submittal, then a **qualified civil engineer, architect or landscape architect** should be hired to prepare 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 the project does not require a planning permit, then the building permit application submittal will need to include the appropriate items listed in Table 3-1 (Planning Permit Submittal Checklist) and in Table 3-3 (Building Permit Checklist). But remember, not every item in the checklists is required for every project. **An appointment should be made with a member of the Building Department staff** (or the Planning or Public Works Department, as appropriate) to review the checklists, and to generate a **reduced list** of the items that will be needed for the small site. The list should be in writing, for future references to it, if necessary, in conversations with municipal staff. If the project requires a planning permit, then this same approach should be used to generate 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 the stormwater treatment measures will need to be. Chapter 4 lists many strategies for reducing impervious surfaces, and it offers guidance for using self-treating areas (for example, landscaped areas, 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 described in Appendix L.
- **Use LID treatment measures.** All regulated projects – even small ones – must use LID treatment measures, except for Special Projects that may receive LID treatment reduction credits (described in Appendix J). Chapter 6 includes technical guidance for many treatment measures, such as bioretention areas, and flow-through planters, which are well suited for small sites in **densely developed areas**. Bioretention areas that maximize infiltration to the underlying soils are encouraged even if it is infeasible to infiltrate the full C.3.d amount of runoff, if there are no conditions that would make infiltration unsafe. If infiltration is precluded due to on-site conditions (such as proximity to buildings, high groundwater or

Contact

Contact the appropriate local department to review the checklists for small sites.



Figure 3-5: Flow-through planter in an urban setting (Credit: EOA, Inc.)

contaminated soils), flow-through planters, such as shown in Figure 3-5, may be a good option.

- **Avoid vault systems.** Vaults with high-flow-rate media filters are only allowed for qualifying Special Projects (see Appendix J). However, these systems in general are not as effective nor as easy to maintain as landscape-based biotreatment measures.
- **Consider using simplified sizing methods.** The technical guidance in Chapter 6 includes simplified sizing methods for several types of stormwater treatment measures, including flow-through planters, and bioretention areas. The technical guidance for each of these treatment measures highlights the easy-to-follow calculations for sizing the treatment measures. Please note, however, that there is a trade-off for simplicity. The simplified sizing calculations may result in treatment measures that are conservatively large. If space is at a premium, it may be cost-effective to hire a civil engineer with experience sizing stormwater treatment measures and use the more detailed sizing calculations, in order to potentially reduce the amount of land needed for stormwater treatment.
- **Use the planting guidance.** Appendix A provides guidance for selecting appropriate plantings for landscape-based stormwater treatment measures. Municipal staff will confirm that the plants included in the design meet the criteria set forth in this guidance.
- **Avoid the use of pumps for moving stormwater.** Whenever possible, it is better to use gravity and surface flow to convey stormwater to treatment measures. Pumps can malfunction and since they are typically out of sight, operation and maintenance issues may not be noticed. If pumps are necessary, ensure frequent maintenance checks will be performed to confirm proper operation and that backup power will be provided to the pumps when power outages occur to avoid flooding.