City of El Centro

Post-Construction Storm Water Best Management Practice Standards Manual for Development Projects

June 2018

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1 Introduction

Post-construction best management practices (BMPs) are permanent features of a project that reduce runoff and/or pollutants discharged from a development project after it has been built. Post-construction BMPs are intended to operate continuously over the life of the completed project. These BMPs are different than the practices used to control discharges of sediment and other pollutants during project construction. Those practices are typically referred to as construction BMPs.

To meet the requirements of Provision E.12 of the Phase II Storm Water Permit (Permit) issued by the State Water Resources Control Board, the City of El Centro requires certain projects to implement post-construction BMPs. This City of El Centro Post-Construction Storm Water Best Management Practice Standards Manual for Development Projects (Post-Construction Storm Water Standards Manual) identifies requirements applicable to projects in the City of El Centro.

2 Requirements Applicability

Different requirements apply depending on the size and type of the project, as discussed below. There are three basic classes of projects:

- Exempt
- Standard
- Regulated

More detailed descriptions of project classes are provided below. Following the descriptions of project classes, Figures 1 and 2 present flow charts that can be used to determine project class and applicable requirements. Table 1 summarizes the requirements for each class of project.

In addition to post-construction BMPs, other requirements may also apply. For example, projects may be subject to the State Construction General Permit. See Section 2 of the City of El Centro BMP Manual for additional information about other potentially applicable requirements.

2.1 Exempt Projects

The following types of projects are exempt from post-construction BMP requirements:

- Interior remodels
- Routine maintenance or repair such as exterior wall surface replacement, pavement grinding and resurfacing of existing roadways or other pavement resurfacing within the existing footprint, applying slurry seal or seal coat to existing pavement, and routine replacement of damaged pavement, including full depth replacement, such as pothole repair or replacement of short, non-contiguous sections of roadway
- Projects that create or replace less than 2,500 square feet of impervious area
- Certain types of work associated with linear underground/overhead projects (LUP) or road or trail projects:

- Sidewalks built as part of new streets or roads and built to direct storm water runoff to adjacent vegetated areas.
- Bicycle lanes that are built as part of new streets or roads that direct storm water runoff to adjacent vegetated areas.
- Impervious trails built to direct storm water runoff to adjacent vegetated areas, or other non-erodible permeable areas, preferably away Imperial Irrigation District drains.
- Sidewalks, bicycle lanes, or trails constructed with permeable surfaces.
- Trenching, excavation and resurfacing associated with LUPs; pavement grinding and resurfacing of existing roadways and parking lots; construction of new sidewalks, pedestrian ramps, or bike lanes on existing roadways; or routine replacement of damaged pavement such as pothole repair or replacement of short, non-contiguous sections of roadway.

2.2 Standard Projects

Standard projects are defined as projects that create or replace between 2,500 and 5,000 square feet of impervious area. In addition to the exceptions listed in Section 2.1, note that LUPs are never standard projects—they are either Regulated Projects (Section 2.3) or are not subject to any post-construction BMP requirements. Also note that single family residences that are not a part of a larger plan of development and create or replace 2,500 or more square feet of impervious area are still considered standard projects. Such single family residential projects are not considered Regulated Projects, even if they create or replace more than 5,000 square feet of impervious area. Standard projects are required to implement what are known as site design BMPs, which are a set of measures designed to reduce runoff from development projects. Site design BMPs required are described in Section 3.

2.3 Regulated Projects

Regulated Projects are projects that create or replace at least 5,000 square feet of impervious area, except for the exempted project categories listed in Section 2.1. Regulated projects may be new development or redevelopment projects. Redevelopment projects involve work on a site on which some past development has occurred. See Section 4.3.2.1 for more details.

As noted in Section 1.2, a single family residence project that creates or replaces 5,000 or more square feet of impervious area and is not part of a larger plan of development is considered a Standard Project, not a Regulated Project.

Replacement of impervious area is not counted toward the 5,000 foot threshold for road projects and LUPs. Road projects and LUPs that create 5,000 square feet or more of newly constructed contiguous impervious surface and that are public road projects and/or fall under the City's building and planning authority are considered Regulated Projects. Section 4 describes the requirements applicable to Regulated Projects.

2.3.1 Additional Requirements for Hydromodification Management

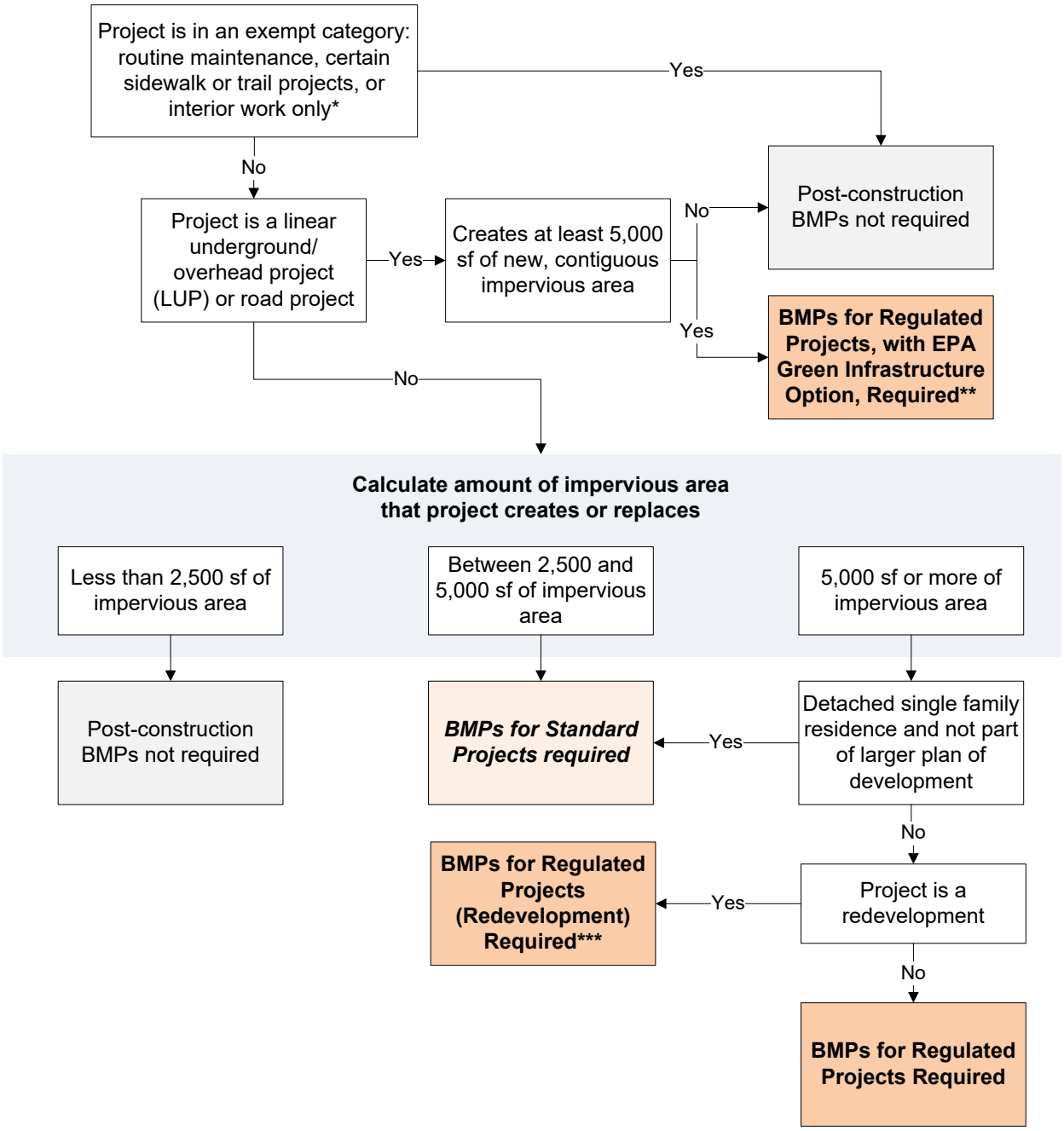
Baseline hydromodification management, as defined in the Permit, is provided by meeting the Low Impact Development (LID) treatment control requirements (see Section 4). Additional

hydromodification management requirements apply to certain projects, referred to as "hydromodification Projects." Hydromodification Projects are Regulated Projects that create and/or replace one acre or more of impervious surface. A project that does not increase impervious surface area over the pre-project condition is not a Hydromodification Project. See Figure 2 for summary of what are and are not Hydromodification Projects.

2.3.2 Effective Date for Requirements

By June 30, 2015, the City will require the post-construction BMP standards described in this Post-Construction Storm Water Standards Manual, both private development requiring municipal permits and public projects, to the extent allowable by applicable law. These include discretionary permit projects that have not been deemed complete for processing and discretionary permit projects without vesting tentative maps that have not requested and received an extension of previously granted approvals. Discretionary projects that have been deemed complete prior to June 30, 2015 are not subject to the Post-Construction Standards herein. For City projects, the effective date shall be the date their governing body or designee approves initiation of the project design.

Figure 1. Post-Construction BMP Requirements Applicable to Different Types and Sizes of Projects



Notes

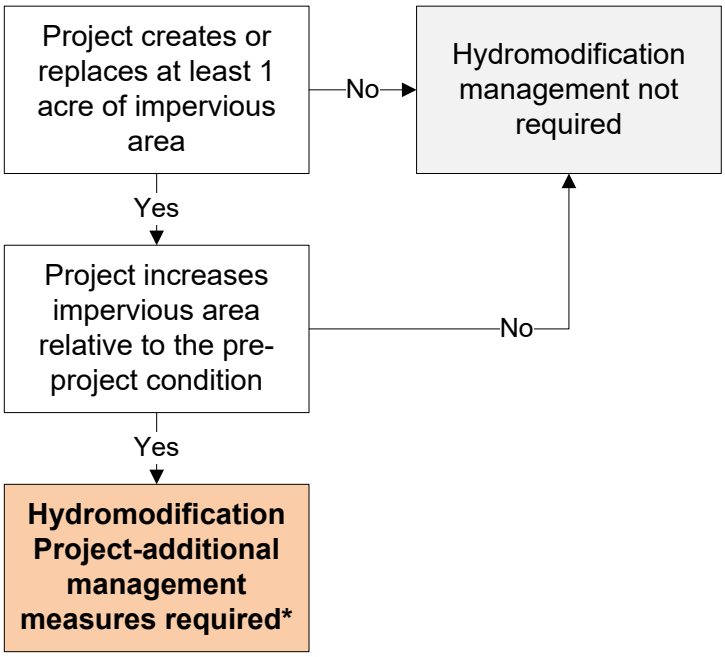
* See Section 2.1 for a detailed description of exempted project types.

** Different numeric sizing and BMP design standards may apply to road projects and LUPs; see sections 4.3.2.2 and 4.3.4.2 for details.

*** Different numeric sizing requirements may apply to redevelopment projects. See Section 4.3.2.1 for details.

sf: square feet

Figure 2. Applicability of Additional Hydromodification Requirements



Note
* See Section 4.4 for additional detail on requirements for Hydromodification Projects.

2.4 Summary of Requirements by Project Classification

Table 1 below summarizes the types of post-construction BMPs required for each project class. Site design BMPs apply to both Standard Projects and to Regulated Projects and are discussed in Section 3. The other BMPs apply only to Regulated Projects. Those BMPs are discussed in Section 4. The section in which more information about a type of BMP can be located is also provided in parentheses in the header row of Table 1. Answers to common questions about requirements applicability are provided in Section 6.

Table 1. Summary of BMP Requirements for Projects, by Project Class

Project Class	Site Design BMPs (Section 3)	Source Control BMPs (Section 4)	Low Impact Development Treatment BMPs (Section 4)	Hydromodification Management Measures (Section 4)
Exempt	*Post-construction BMPs are not required*			
Standard	X			
Regulated	X	X	X*	Potentially. See Figure 2.

Note
* Different numeric sizing requirements may apply for redevelopment projects and for roads and LUPs. See Section 4 for details. Site Assessment, as defined in the Permit, is included as part of the overall Low Impact Development Treatment BMP selection and design process.

3 Site Design BMPs

Projects subject to Site Design BMP requirements shall implement one or more of the following measures to reduce project site runoff:

- Soil Quality Improvement and Maintenance - improvement and maintenance soil through soil amendments, adding topsoil, and similar actions
- Tree Planting and Preservation - planting and preservation of healthy, established trees that include both evergreens and deciduous, as applicable
- Downspout Disconnection - rerouting of rooftop drainage pipes to drain rainwater to rain barrels, cisterns, or permeable areas instead of the storm sewer
- Rooftop Impervious Area Disconnection - rerouting of rooftop drainage pipes to direct runoff to landscaping or other permeable areas
- Impervious Area Disconnection – draining runoff from parking lots, driveways, roads, sidewalks, and other impervious areas to drain to landscaping or other permeable areas
- Porous Pavement System- pavement that allows runoff to pass through it, thereby reducing the runoff from a site and surrounding areas and filtering pollutants. Because the native soil in El Centro typically has a low infiltration rate, such systems must be underlain by a permeable material (typically gravel) to obtain credit.
- Vegetated Swales - a vegetated, open-channel management practice designed specifically to treat and attenuate storm water runoff, in accordance with California Storm Water Quality Association (CASQA) standards.

Note that the above list includes the site design measures that are believed to be most applicable to conditions in the City of El Centro. Project proponents may also incorporate other site design measures allowed by the Phase II Permit into the project design if appropriate to the specific circumstances of a particular project.

Project proponents shall use an approved method of calculating runoff reduction resulting from implementation of site design measures. To receive credit, proposed site design BMPs must be designed in accordance with the standards in the calculator files specified below.

- Projects that are not subject to the State Construction General Permit (typically this is projects that have less than 1 acre of land disturbance): use the Excel file provided at the City's website: http://www.cityofelcentro.org/engineering.[1]
- Projects that are subject to the State Construction General Permit (typically this is projects that have at least 1 acre of land disturbance): use the post-construction calculator integrated into the SMARTS system at https://smarts.waterboards.ca.gov/smarts/faces/SwSmartsLogin.jsp. This calculator can be accessed as part of the process of submitting permit required documents

[1] The calculator spreadsheet on the City's website is an adapted version of the calculator spreadsheet prepared by the State Water Resources Control Board. The City's version has been pre-filled with El Centro specific inputs, but all the calculation formulas are the same as the State's version. The original version from the State is available at http://www.waterboards.ca.gov/water_issues/programs/stormwater/phase_ii_municipal.shtml.

and filing a Notice of Intent for the Construction General Permit. If projects subject to the Construction General Permit have difficulty accessing the online calculator or obtaining the necessary outputs from it, they may use the Excel file provided on the City's website instead.

Note that Regulated Projects should implement Site Design BMPs to the extent feasible, as the calculated runoff reduction from Site Design BMPs reduces the amount of water that needs to be treated using bioretention or other LID treatment measures. Typically site design measures are less costly than bioretention or other LID treatment measures. Section 4.3 and Figure 3 provide more details about how runoff reduction from Site Design BMPs is incorporated into numeric sizing calculations for LID treatment measures.

4 Requirements for Regulated Projects

Regulated Projects shall implement measures for site design BMPs (Section 3), source control BMPS (Section 4.2), and Low Impact Development (Section 4.3), subject to numeric sizing requirements (Section 4.3.2). Note that special numeric sizing considerations apply to redevelopment projects (Section 4.3.2.1) and road projects and LUPs (Section 4.3.2.2). Additional requirements for hydromodification also apply to some, but not all, Regulated Projects, as detailed in Section 4.4.

4.1 Site Assessment

At the earliest planning stages, Regulated Projects shall assess and evaluate how site conditions, such as soils, vegetation, and flow paths, will influence the placement of buildings and paved surfaces.[2] The evaluation will be used to meet the goals of capturing and treating runoff and assuring these goals are incorporated into the project design. Regulated Projects are required to consider optimizing the site layout through the following methods:

- Define the development envelope and protected areas, identifying areas that are most suitable for development and areas to be left undisturbed.
- Concentrate development on portions of the site with less permeable soils and preserve areas that can promote infiltration.
- Limit overall impervious coverage of the site with paving and roofs.
- Set back development from creeks, wetlands, and riparian habitats.
    - This method is expected not to be applicable to most developments in the City.
- Preserve significant trees.
- Conform the site layout along natural landforms.
- Avoid excessive grading and disturbance of vegetation and soils.
- Replicate the site's natural drainage patterns.
- Detain and retain runoff throughout the site.

[2] For additional resources on how to conduct this type of assessment, see the California Stormwater Quality Association LID Port (https://www.casqa.org/resources/california-lid-portal). The Watershed Management Group's *Green Infrastructure for Southwestern Neighborhoods* (http://watershedmg.org/sites/default/files/greenstreets/WMG_GISWNH_1.0.pdf) also has useful examples of measures that are tailored toward use in more arid environments and can be considered in initial site layout.

4.2 Source Control Measures

Regulated Projects shall implement source control BMPs for the activities and sources listed below, as applicable. Where any of the activities and sources below is not applicable to a Regulated Project, the project's submittal shall clearly state the reason why (e.g., the activity or source is not present). Measures for each of the listed pollutant generating activities and sources at Regulated Projects shall be designed consistent with the standards presented in Table 2. These standards incorporate the standards in the current California Stormwater Quality Association (CASQA) Stormwater BMP Handbook for New Development and Redevelopment or equivalent manual where applicable.

Table 2. Summary of Source Control BMP Requirements

Source Control BMP	Description	CASQA Reference[1]
Accidental spills or leaks	Keep a spill kit or other means of responding to spills onsite. Liquid storage containers kept outdoors must be equipped with secondary containment unless the liquid stored contains no pollutants (e.g., purified water). Secondary containment design and spill response materials available onsite may also need to meet the requirements of other standards (e.g., hazardous materials, fire department).	--
Interior floor drains	Plumb indoor floor drains to the sanitary sewer system. Pretreatment is required where necessary to comply with City wastewater regulations.	--
Parking/storage areas and maintenance	Design parking areas to drain to landscaping or LID features where feasible. Complete regular sweeping or other cleaning of parking areas as necessary to remove accumulated trash, sediment, and other pollutants.	--
Indoor and structural pest control	Use integrated pest management to avoid or minimize pesticide use where feasible, and use pesticides only in accordance with manufacturer's instructions. See BMP A-10 in Table 1 of the El Centro BMP Manual.	--
Landscape/outdoor pesticide use	Use integrated pest management to avoid or minimize pesticide use where feasible, and use pesticides only in accordance with manufacturer's instructions. See BMP A-10 in Table 1 of the El Centro BMP Manual. Also use native plants or other plants that require minimal pesticide use as feasible.	--
Pools, spas, ponds, decorative fountains, and other water features	Discharges from water features to the municipal separate storm sewer system (MS4) are only allowed in certain cases. See BMP A-5 in Table 1 of the El Centro BMP Manual for pool and spa discharge regulations. Discharges from ponds, decorative fountains, and other water features to the MS4 are typically not allowed.	--

Table 2. Summary of Source Control BMP Requirements (continued)

Source Control BMP	Description	CASQA Reference[1]
Restaurants, grocery stores, and other food service operations	Provide a covered, contained storage area for used cooking oil. This requirement may be satisfied by storing used cooking oil inside a building (ensure health regulations and fire department regulations are met) or in a "refuse area" designed to meet the requirements described below.	--
Refuse areas	Equip each new trash enclosure with a structural overhead canopy and a four-sided enclosure. Dumpsters and other trash receptacles in existing trash enclosures being protected in place at redevelopments must be provided with functional lids to prevent contact of stored wastes with precipitation. Site drainage should be directed away from the refuse area to prevent run-on. No storm drains are allowed within refuse areas.	SD-32
Industrial processes	Design facilities such that industrial processes are located indoors or in covered areas protected from run-on to the extent feasible. Where applicable, industrial processes must be designed to comply with State of California Industrial General Permit requirements.	SD-31, SD-35
Outdoor storage of equipment	Regularly maintain equipment or vehicles to eliminate leaks. Store equipment or vehicles in covered areas where feasible. Unless vehicles are expected to accumulate significant amounts of pollutants on their exteriors, outdoor storage (e.g., in a parking lot) is acceptable.	--
Outdoor storage of materials	Design facilities such that material storage is located indoors or in covered areas protected from run-on to the extent feasible. Liquid storage shall comply with the standards listed in "Accidental spills and leaks" above. Outdoor material storage must also comply with all applicable planning and zoning requirements.	SD-34
Vehicle and equipment cleaning	Designated wash areas should be designed to drain to the sanitary sewer and covered and bermed or graded to prevent rain water from entering the sanitary sewer drain. See El Centro BMP Manual BMP A-3 for additional information.	SD-33

Table 2. Summary of Source Control BMP Requirements (continued)

Source Control BMP	Description	CASQA Reference[1]
Vehicle and equipment repair and maintenance	Design facilities such that vehicle and equipment repair and maintenance are located indoors or in covered areas protected from run-on to the extent feasible. Pave maintenance areas with Portland cement concrete or equivalent to facilitate spill cleanup and prevent soil contamination. No storm drains shall be located within maintenance areas. Comply with all applicable planning and zoning requirements.	SD-31
Fuel dispensing areas	Cover fueling areas with a structural canopy and design site drainage such that run-on is not directed to fueling areas (e.g., a drainage swale directs runoff around the fueling area rather than through it). Appropriate spill prevention and response measures must also be incorporated in the site's design; see the SD-30 fact sheet for more information. Each fueling area shall be equipped with a dead sump or equivalent to capture fuel in the event of a spill. The dead sump shall be located under the canopy to avoid receiving storm water runoff. Sizing of the sump shall be as directed by the City Engineer.	SD-30
Loading docks	Design loading docks to prevent run-on. Cover loading docks where feasible. Drains in uncovered loading docks, including depressed loading docks, must drain to an appropriate LID treatment BMP or to a dead sump. Pretreatment may be also be required. Drains in covered loading docks must drain to a dead sump.	SD-31
Fire sprinkler test water	Fire sprinkler systems shall be designed to direct test water to the sanitary sewer system where approved by the City. Where discharge to the sanitary sewer system is not feasible, a paved pathway to the MS4 (to prevent erosion) shall be provided. Discharge to the MS4 is only allowed when no additives are present in the fire sprinkler test water.	--
Drain or wash water from boiler drain lines, condensate drain lines, rooftop equipment, drainage sumps, and other sources	Air conditioning condensate shall be managed in accordance with BMP A-6 in Table 1 of the El Centro BMP Manual. Discharges from other sources in this category are generally not allowed. See El Centro BMP Manual Section 3 and El Centro City Code sections 22-703 through 22-705.	--

Table 2. Summary of Source Control BMP Requirements (continued)

Source Control BMP	Description	CASQA Reference[1]
Unauthorized non-storm water discharges	Unauthorized non-storm water discharges are prohibited and should not be included in the site design. See El Centro BMP Manual Section 3 for additional details about non-storm water discharges.	--
Building and grounds maintenance	Water from indoor cleaning activities (mop water) shall not be discharged to the storm drain system. Mop sinks should be included in food service establishments. Water from power washing shall not be discharged to the MS4.	--

Note:

1. Fact sheet may be found in the California Stormwater Quality Association (CASQA) Stormwater BMP Handbook for New Development and Redevelopment, available at www.casqa.org.

4.3 Low Impact Development (LID) Design Standards

All Regulated Projects are required to implement low impact development (LID) standards designed to reduce runoff, treat storm water, and provide baseline hydromodification management to the extent feasible, to meet the Numeric Sizing Criteria for Storm Water Retention and Treatment under Section 4.3.2.

4.3.1 Drainage Management Area Determination

Each Regulated Project shall provide a map or diagram dividing the developed portions of the project site into discrete Drainage Management Areas (DMAs). A drainage management area is a portion of the site that all drains to a single discharge point. Depending on the size of the site and the site's drainage patterns, a site may have only one DMA, or it may have several. Runoff from each DMA shall be managed as follows:

- Implement all applicable source control BMPs (Section 4.2)
- Implement a combination of Site Design BMPs (Section 3) and Low Impact Development measures (Section 4.3) such that numeric sizing standards (Section 4.3.2) are satisfied
    - Additional hydromodification management measures may be needed if required by Section 4.4.

4.3.2 Numeric Sizing Criteria for Storm Water Retention and Treatment

Regulated Projects shall design facilities to evapotranspire, infiltrate, harvest/use, and biotreat runoff to meet at least one of the following hydraulic sizing design criteria. Calculations must be prepared per DMA.

1) **Volumetric Criteria:** The following hydrologic method must be used to calculate the storm water design volume (SDV) resulting from the 85th percentile, 24-hour storm event:

$$SDV = C \times d \times A \times 43{,}560\ sf/ac \times 1/12in/ft$$
$$SDV = 3{,}630 \times C \times d \times A$$

Where:

SDV = Storm Water Design Volume in cubic feet.
C = Runoff coefficient (unitless)
d = 85th percentile, 24-hour storm event rainfall depth (inches)
A = Tributary area (acres) which includes the total area draining to the BMP, including any offisite or onsite areas that comingles with project runoff and drains to the BMP.

a) The runoff coefficient (C) corresponds to the percentage of rainfall that becomes runoff. A value for C may be obtained or estimated in accordance with the Imperial County Hydrology Manual (ICHM). An estimated value for C may be determined from Table 3-2 or Table 3-3 of the ICHM, included herein as Table 3 and Table 4, respectively. Table 3 provides ranges of runoff coefficient values based on land use.

Table 4 provides urban runoff coefficients based on land use and soil type. Two possible methods for soil type determination are soil testing at the site or using the USDA NRCS Web Soil Survey online tool available here:

http://websoilsurvey.sc.egov.usda.gov/App/WebSoilSurvey.aspx

The runoff coefficient can also be estimated based on the percent of impervious area and the percent of open space based on the following formula:

$$C = 0.90 \times (\% \text{ Impervious}) + C_p \times (1 - \% \text{ Impervious})$$

Where:

C_p = Pervious Coefficient Runoff Value for the soil type (shown in Table 4 as Undisturbed Natural Terrain/Permanent Open Space, 0% Impervious). Soil type can be determined as previously described.

Table 3. Runoff Coefficient Values

Land Use	'C' Coefficient Range		Land Use	'C' Coefficient Range
Business			**Lawns, slope**	
downtown areas	0.70 – 0.95		sandy soil, flat, 2%	0.05 – 0.10
neighborhood areas	0.50 – 0.70		sandy soil, avg., 2 – 7%	0.10 – 0.15
Residential			sandy soil, steep, 7%	0.15 – 0.20
single family areas	0.30 – 0.50		heavy soil, flat, 2%	0.13 – 0.17
multi units, detached	0.40 – 0.60		heavy soil, avg., 2 – 7%	0.18 – 0.22
multi units, attached	0.60 – 0.75		heavy soil, steep, 7%	0.25 – 0.35
suburban	0.25 – 0.40		**Agricultural land**	
Industrial			*bare packed soil*	
light areas	0.50 – 0.80		smooth	0.30 – 0.60
heavy areas	0.60 – 0.90		rough	0.20 – 0.50
Parks and Cemeteries	0.60 – 0.90		*cultivated rows*	
Playgrounds	0.60 – 0.90		heavy soil, no crop	0.30 – 0.60
Railroad yard areas	0.60 – 0.90		heavy soil, with crop	0.20 – 0.50
			sandy soil, no crop	0.20 – 0.40
			sandy soil, with crop	0.10 – 0.25
			pasture	
			heavy soil	0.15 – 0.45
			sandy soil	0.05 – 0.25
			woodlands	0.05 – 0.25

Table 4. Runoff Coefficients for Urban Areas

Land Use			Runoff Coefficient ""C""			
			Soil Type			
Structure(s) Utilization	NRCS Elements	% IMPER	A	B	C	D
Permanent Open Space	Undisturbed Natural Terrain (Natural)	0*	0.2	0.25	0.3	0.35
Residential, 1.0 DU/A or less	Low Density Residential (LDR)	10	0.27	0.32	0.36	0.41
Residential, 2.0 DU/A or less	Low Density Residential (LDR)	20	0.34	0.38	0.42	0.46
Residential, 2.9 DU/A or less	Low Density Residential (LDR)	25	0.38	0.41	0.45	0.49
Residential, 4.3 DU/A or less	Medium Density Residential (MDR)	30	0.41	0.45	0.48	0.52
Residential, 7.3 DU/A or less	Medium Density Residential (MDR)	40	0.48	0.51	0.54	0.57
Residential, 10.9 DU/A or less	Medium Density Residential (MDR)	45	0.52	0.54	0.57	0.6
Residential, 14.5 DU/A or less	Medium Density Residential (MDR)	50	0.55	0.58	0.6	0.63
Residential, 24.0 DU/A or less	High Density Residential (HDR)	65	0.66	0.67	0.69	0.71
Residential, 43.0 DU/A or less	High Density Residential (HDR)	80	0.76	0.77	0.78	0.79
Neighborhood Commercial	Commercial/Industrial (N. Com)	80	0.76	0.77	0.78	0.79
General Commercial	Commercial/Industrial (G. Com)	85	0.8	0.8	0.81	0.82
Office Professional/Commercial	Commercial/Industrial (O.P. Com)	90	0.83	0.84	0.84	0.85
Limited Industrial	Commercial/Industrial (Limited I.)	90	0.83	0.84	0.84	0.85
General Industrial	Commercial/Industrial <General I.)	95	0.87	0.87	0.87	0.87

*The values associated with 0% impervious may be used for direct calculation of the runoff coefficient as described in Section 3.1.2 of the ICHM (representing the pervious runoff coefficient, C_p, for the soil type), or for areas that will remain undisturbed in perpetuity. Justification must be given that the area will remain natural forever (e.g., the area is located in Cleveland National Forest).

DU/A = dwelling units per acre

The runoff coefficient can also be obtained or estimated based on the San Diego County Hydrology Manual, the Riverside County Flood Control and Water Conservation District Hydrology Manual, the Caltrans Highway Design Manual, or any other acceptable method which justifies its use for the Imperial County region.

b) The 85th percentile, 24-hour storm event rainfall depth in the City of El Centro is 0.41 inch based on information provided in the post-construction calculator file available at the following online link: http://www.waterboards.ca.gov/water_issues/programs/stormwater/phase_ii_municipal.shtml

Alternative hydrologic analysis that determines a different value for the 85th percentile, 24-hour storm based on validated local rainfall data may be used if approved by the City Engineer.

2) **Flow-Based Criteria:** The flow of runoff produced from a rain event equal to at least 0.2 inches per hour intensity. This is determined using the rational method, where Q = CIA. "A" is the tributary area, "I" is the intensity (0.2 in/hr), and "C" is the runoff coefficient. For flow-based sizing, the same "C" value used for flood control calculations is used to calculate the storm water design flow rate.
   a) Alternatively, if bioretention areas are designed using a flow-based criteria, a sizing factor of 4% of the tributary impervious area may be used, as described in a footnote in Section 4.3.4.

Volumetric sizing criteria is typically used for bioretention, infiltration, retention basins, and detention basins. Flow-based sizing criteria is typically used for media filters and vegetated swales, where such BMPs are allowed. Flow-based criteria may also be instead of volumetric criteria for bioretention areas if desired, as described in a footnote in Section 4.3.4. However, flow-based sizing for bioretention may result in an oversized (larger) bioretention area when compared to volumetric sizing.

Other numeric sizing criteria allowed by the Phase II Permit may also be used where applicable. Applicants should discuss alternative approaches with Engineering staff before proposing them in a submittal.

Note that the City of El Centro requires projects to provide what are typically referred to as "retention basins" sized for the 100-year storm. These basins are typically designed such that during smaller storms little to no runoff is directed to the basin. A common design is that, to meet LID standards, a larger storm drain pipe is connected downstream to a smaller pipe. When the capacity of the smaller pipe is exceeded, water backs up in the system and flows into the basin. When the capacity of the smaller pipe is not exceeded though, runoff does not flow into the basin. Basins designed in that way do not provide a significant water quality benefit for the smaller storms to which the water quality numeric sizing standards described above apply. Basins that capture water for all sizes of storms and allow it to infiltrate or evaporate can be used to meet the water quality numeric sizing standards described above.

However, the proposed design must demonstrate that water will be drawn down within 72 hours to meet vector control requirements.

4.3.2.1 Special Sizing Standards for Redevelopment Projects

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

- Where a redevelopment project results in an increase of more than 50 percent of the impervious surface of a previously existing development, runoff from the entire project, consisting of all existing, new, and/or replaced impervious surfaces, must be included to the extent feasible.
- Where a redevelopment project results in an increase of less than 50 percent of the impervious surface of a previously existing development, only runoff from the new and/or replaced impervious surface of the project must be included.

4.3.2.2 Special Sizing Standards for LUPs and Road Projects

Specific Regulated Project requirements for road projects and LUPs are discussed below. Note that certain types of road projects and LUPs are exempt from post-construction BMP requirements and are not considered Regulated Projects—see Section 2.1 for details.

Any of the following types of road projects and LUPs that create 5,000 square feet or more of newly constructed contiguous impervious surface and that are public road projects and/or fall under the City's building and planning authority shall implement site design BMPs, source control BMPs, and LID BMPs, except that treatment of runoff of the SDV that cannot be infiltrated onsite shall follow U.S. EPA guidance regarding green infrastructure[3] to the extent feasible. Types of projects include the following:

- Construction of new streets or roads, including sidewalks and bicycle lanes built as part of the new streets or roads, except as exempted in Section 2.1.
- Widening of existing streets or roads with additional traffic lanes.
    - Where the addition of traffic lanes results in an alteration of more than 50 percent of the impervious surface of an existing street or road, runoff from the entire project, consisting of all existing, new, and/or replaced impervious surfaces, must be included in the treatment system design.
    - Where the addition of traffic lanes results in an alteration of less than 50 percent (but 5,000 square feet or more) of the impervious surface of an existing street or road, only the runoff from new and/or replaced impervious surface of the project must be included in the treatment system design.

[3] "Managing Wet Weather with Green Infrastructure – Municipal Handbook: Green Streets" (USEPA, 2008). http://water.epa.gov/infrastructure/greeninfrastructure/upload/gi_munichandbook_green_streets.pdf

- Construction of LUPs that have one or more discrete locations that each individually has 5,000 square feet or more of new contiguous impervious surface.
    - When the LUP has one or more discrete locations with 5,000 square feet or more of new contiguous impervious surface, only the specific discrete locations with 5,000 square feet or more of new contiguous impervious surface are subject to the requirements for Regulated Projects.

The EPA guidance focuses primarily on three types of BMPs: minimizing street widths, implementing bioretention areas along street corridors, and implementing permeable pavement. The guidance manual itself provides more detail on these measures, how they may be implemented for road projects, and their limitations.[4] The process for designing projects according to the EPA guidance involves first assessing whether numeric sizing standards (see Section 4.3.2) can be met using the BMPs discussed in the EPA guidance. Where it is not feasible to meet numeric sizing standards, e.g., due to site constraints, the reason why it is not feasible must be documented, and BMPs must be implemented to the maximum extent practicable. The County of Orange has developed a useful process for making this assessment.[5]

4.3.3 Site Design BMPs

Each Regulated Project shall implement Site Design BMPs as defined in Section 3, and in consideration of the site assessment completed per Section 4.1, based on the objective of achieving infiltration, evapotranspiration and/or harvesting/reuse of the SDV. Site design BMPs shall be used to reduce the amount of runoff, to the extent technically feasible, for which retention and runoff is required. The amount of runoff reduced by site design BMPs shall be calculated per the method described in Section 3. Any remaining runoff from impervious DMAs may then be directed to one or more BMPs as specified in Section 4.3.4.

4.3.4 Storm Water Treatment BMPs and Baseline Hydromodification Management BMPs

Site Design BMPs provide a credit that is used to reduce the amount of the SDV to be treated with LID or treatment BMPs, as shown in Figure 3. Any remaining runoff from DMAs that include impervious area[6] that is not treated by site design BMPs shall be directed to one or more facilities designed to infiltrate, evapotranspire, and/or bioretain runoff. The facilities must be demonstrated to be at least as effective as a bioretention system with the following design parameters:

- Minimum surface reservoir volume equal to surface area times a depth of 6 inches
- Minimum planting medium depth of 18 inches. The planting medium must sustain a minimum infiltration rate of 5 inches per hour throughout the life of the project and must maximize runoff

[4] Ibid.

[5] See the Santa Ana Region Technical Guidance Document (TGD), available at http://ocwatersheds.com/documents/wqmp. As of this writing, the discussion on applying EPA green infrastructure guidance is included in Section 2.7 of the TGD.

[6] DMAs that are solely pervious area and that drain directly offsite without their runoff comingling with runoff from DMAs with impervious area must implement site design BMPs to the maximum extent practicable, but are not required to implement LID or treatment BMPs to treat any remaining runoff after implementing site design BMPs.

retention and pollutant removal. A mixture of sand (60%-70%) meeting the specifications of American Society for Testing and Materials (ASTM) C33 and compost (30%-40%) may be used.

- Subsurface drainage/storage (gravel) layer with an area equal to the surface area and having a minimum depth of 12 inches
- Volume that equals or exceeds V_R, as calculated per the process in Figure 3.[7] The bioretention volume is calculated as the sum of the following component volumes:
    - Surface storage = (Average surface ponding depth) x (plan view surface area)
    - Planting medium storage = (planting medium depth) x (plan view surface area) x 0.3
        - Planting medium is assumed to be 30% voids
    - Gravel layer storage = (gravel layer depth) x (plan view surface area) x 0.4
        - Gravel layer is assumed to be 40% voids
- Underdrain with discharge elevation at top of gravel layer.
    - Note that the underdrain pipe must be perforated only with the perforations facing downward. Perforations must not face up toward the ground surface.
- No compaction of soils beneath the facility, or ripping/loosening of soils if compacted
- No liners or other barriers interfering with infiltration
- Appropriate plant palette for the specified soil mix and maximum available water use

Note that bioretention area designs are allowed to vary from the specifications provided above under certain circumstances, as described in Section 4.3.4.3 below. Figure 4 presents a flow chart that provides directions about when alternative bioretention designs, as described in Section 4.3.4.3, should be used based on site-specific factors.

BMPs that retain or store water that may be exposed to vectors must be designed to draw down within 72 hours for vector control purposes. Subsurface storage not exposed to vectors should also be drawn down within 72 hours where feasible. Note that if longer periods of subsurface retention are anticipated, the landscape designer must ensure that selected plants are can tolerate extended periods of saturated soil conditions. Also note that BMPs that store water (including, but not limited to infiltration and bioretention) may pose geotechnical risks when located close to a structure or other infrastructure. Project proponents are responsible for evaluating and appropriately mitigating geotechnical risks associated with BMPs.

Example cross sections and additional design tips for bioretention and other BMPs can be found in other publicly available manuals, such as the following:

- Riverside County Flood Control District *Whitewater River Region Stormwater Quality Best Management Practice Design Handbook for Low Impact Development* (http://rcflood.org/NPDES/WhitewaterWS.aspx)

[7] Alternatively, a maximum surface loading rate of 5 inches per hour, based on the flow rates calculated, may be used in a flow-based sizing approach. A sizing factor of 4% of tributary impervious area may be used in this scenario. For example, a bioretention area with 5,000 square feet of tributary impervious area would need to be (5,000 square feet of impervious area) x 4% = 200 square feet.

- CASQA *California Stormwater BMP Handbook, New Development and Redevelopment* (https://www.casqa.org/resources/bmp-handbooks/new-development-redevelopment-bmp-handbook)
- San Diego County *Low Impact Development Handbook* (http://www.sandiegocounty.gov/content/dam/sdc/dpw/WATERSHED_PROTECTION_PROGRAM/susmppdf/lid_handbook_2014sm.pdf)
- *Low Impact Development Manual for Southern California: Technical Guidance and Planning Strategies* (https://www.casqa.org/sites/default/files/downloads/socallid-manual-final-040910.pdf)

Note that while other manuals may be helpful references, they are generally developed for different requirements than those that apply to the City of El Centro. All submittals to the City of El Centro must be prepared to meet the numeric sizing standards in Section 4.3.2, the BMP performance standards in this section, and the other requirements as provided in this Post-Construction Storm Water Standards Manual. Submittals that do not meet City of El Centro standards, even if they meet standards of other manuals, will not be approved.

4.3.4.1 Alternative Designs

Facilities, or a combination of facilities, of a different design than in Section 4.3.4 may be permitted if all of the following measures of equivalent effectiveness are demonstrated:

- Equal or greater amount of runoff infiltrated or evapotranspired
- Equal or lower pollutant concentrations in runoff that is discharged after biotreatment
- Equal or greater protection against shock loadings and spills
- Equal or greater accessibility and ease of inspection and maintenance

In some cases, bioretention areas may not be feasible due to a combination of lack of hydraulic head and low soil infiltration rate. Bioretention facilities in these areas would require an underdrain due to the low soil infiltration rate, but cannot be equipped with an underdrain due to insufficient hydraulic head (e.g., there is no nearby underground storm drain system, and the bioretention area underdrain invert would be below the flow line elevation of the curb and gutter along streets adjacent to the property). In these situations, the design should first verify that it is not possible to implement additional site design BMPs that would treat the SDV. If site design BMPs have been implemented to the extent practicable, and the SDV has still not been fully treated, a rock retention/storage area may be used, as described below. These BMPs are considered to be as effective as bioretention would be if bioretention was implemented in this limited set of circumstances.

Retention/storage BMPs are typically designed as rock filled trenches. Water is stored in the voids and eventually infiltrates or evaporates. The volume credit for a retention/storage BMP is determined by calculating the volume of the rock filled area and multiplying it by a void percentage of 40%.

These retention/storage BMPs are not the same as flood control "retention" basins. A retention BMP stores captured water until it infiltrates or evaporates. The water is not released back into the storm

drain system after high flow rates subside. Also, water from all storm sizes, not just large storms, must be directed to the retention BMP for credit to be given. Finally, for vector control purposes, retention BMPs must be designed such that there is no above ground water 72 hours after a storm. If any initial surface storage is proposed for a retention BMP, the designer must show how all water initially stored above ground will be infiltrated or evaporated within 72 hours based on saturated soil infiltration rates and on winter evapotranspiration values. Site specific infiltration test information must also be submitted as part of this explanation; see Section 4.3.4.5 for additional details. Retention/storage systems are also subject to the same adjustments as bioretention areas for special site circumstances described in Section 4.3.4.3, except for underdrains, since retention/storage systems do not have underdrains.

BMPs that store water, including, but not limited to infiltration and retention BMPs, may pose geotechnical risks when located close to a structure or other infrastructure. Project proponents are responsible for evaluating and appropriately mitigating geotechnical risks associated with BMPs.

4.3.4.2 Alternative Designs for Road Projects and LUPs

Road projects and LUPs may implement BMPs per the EPA green infrastructure guidance, as described in Section 4.3.2.2.

4.3.4.3 Allowed Variations for Special Site Conditions

The bioretention system design parameters in Section 4.3.4 may be adjusted for the following special site conditions:

- Facilities located within 10 feet of structures or other potential geotechnical hazards established by the geotechnical expert for the project may incorporate an impervious cutoff wall between the bioretention facility and the structure or other geotechnical hazard.
- Facilities with documented high concentrations of pollutants in underlying soil or groundwater, facilities located where infiltration could contribute to a geotechnical hazard, and facilities located on elevated plazas or other structures may incorporate an impervious liner and may locate the underdrain discharge at the bottom of the subsurface drainage/storage layer (this configuration is commonly known as a "flow-through planter").
- Facilities located in areas of high groundwater (less than 6 feet depth to groundwater[8]), highly infiltrative soils (greater than 0.5 inch/hour[9]), or where connection of underdrain to a surface drain or to a subsurface storm drain are infeasible, may omit the underdrain.
- Facilities serving high-risk areas such as fueling stations, truck stops, auto repairs, and heavy industrial sites may be required to provide additional treatment to address pollutants of concern unless these high-risk areas are isolated from storm water runoff or bioretention areas with little chance of spill migration. Additional treatment is typically provided via a sand filter or other media filter, such as a proprietary cartridge filter. The pretreatment device selected must

[8] Per fact sheet TC-32 in the California Stormwater Quality Association (CASQA) Stormwater BMP Handbook for New Development and Redevelopment, available at www.casqa.org

[9] Ibid. Note that this infiltration rate is the rate after applying the safety factor, as described in Section 4.3.4.5.

be demonstrated to be effective for the anticipated pollutants associated with activities or material storage in the high-risk area.

Figure 4 presents a flow chart summarizing the scenarios in which bioretention designs may be adjusted based on site conditions.

4.3.4.4 Exceptions to Requirements for Bioretention Facilities

Contingent on a demonstration that use of bioretention or a facility of equivalent effectiveness is infeasible, other types of biotreatment or media filters may be used for the following categories of Regulated Projects:

- Projects creating or replacing an acre or less of impervious area, and located in a designated pedestrian-oriented commercial district (i.e., smart growth projects), and having at least 85% of the entire project site covered by permanent structures. Downtown El Centro, in the area bounded by State, Broadway, 4th, and 8th, is considered a pedestrian-oriented commercial district. Contact Engineering staff for more information on this potential exemption if your project is located in this area and at least 85% of the proposed project site will be covered by permanent structures.
- Facilities receiving runoff solely from existing (pre-project) impervious areas
- Historic sites, structures or landscapes that cannot alter their original configuration in order to maintain their historic integrity

BMPs that may be considered acceptable when bioretention or other equally effective BMPs are infeasible include tree-box-type biofilters, modular wetlands, in-vault media filters, or sand filters, or other BMPs that can be demonstrated to be as effective as these methods to the satisfaction of the City Engineer. To demonstrate equal effectiveness, the factors included in Section 4.3.4.1 must be considered, but the standard of comparison is tree-box-type biofilters, modular wetlands, in-vault media filters, or sand filters rather than bioretention. Alternative BMPs shall be sized to treat the flow rate or volume of runoff as provided in Section 4.3.2. Sizing of these BMPs shall follow guidance provided by the manufacturer or CASQA, as applicable.

4.3.4.5 Infiltration BMPs

Infiltration BMPs can be used in place of bioretention or biofiltration BMPs when feasible. To be feasible, the BMP must meet all of the following criteria at a minimum:

- The infiltration rate, after safety factor adjustment (see below), must be at least 0.5 inch/hour.
- The depth to groundwater, as measured from the bottom elevation of the proposed BMP, must be at least 6 feet.
- A geotechnical professional must certify that the proposed placement of the BMP will not result in negative geotechnical impacts (impacts to building foundations, liquefaction, slope stability, etc.). Project proponents are responsible for evaluating and appropriately mitigating geotechnical risks associated with BMPs.

- No contaminated soils or groundwater are present in the immediate vicinity, and infiltration in the proposed location will not result in mobilizing pollutants in contaminated soils or groundwater.
- infiltration BMPs must not be used for areas of industrial or light industrial activity, and other high threat to water quality land uses and activities as designated by the City, unless source control BMPs to prevent exposure of high threat activities are implemented, or runoff from such activities is first treated or filtered to remove pollutants prior to infiltration.
- Infiltration BMPs must be located a minimum of 100 feet horizontally from any water supply well.

Note that because most soils in El Centro have low infiltration rates, using infiltration may be difficult. A site-specific infiltration test completed by an appropriately licensed professional will be required whenever an infiltration BMP is proposed, and an appropriate safety factor must be used. Infiltration tests shall meet the following standards:

- In situ infiltration/ percolation testing shall be conducted at a minimum of two locations within 50-feet of each proposed storm water infiltration/ percolation BMP.
- In situ infiltration/percolation testing shall be conducted using an approved method listed in Table D.3-1 in Attachment 1-A.
- Testing shall be conducted at approximately the same depth and in the same material as the base of the proposed storm water BMP.

The measured infiltration rate or percolation rate based on test results is divided by the safety factor to give the infiltration rate used for design purposes. For example, if the measured infiltration rate is 1.0 inch/hour, and the safety factor is 4.0, then the design infiltration rate is 0.25 inch/hour. Infiltration rates and safety factors are determined using the procedures in Appendix D of the San Diego Region Model BMP Design Manual,[10] which is included as Attachment 1-A to this document.

4.4 Hydromodification Management

Hydromodification management projects are Regulated Projects that create and/or replace one acre or more of impervious surface. A project that does not increase impervious surface area over the pre-project condition is not a hydromodification management project. The pre-project condition is defined as the condition of the site proposed for development at the time of the permit application submittal. Post-project runoff for Hydromodification Projects shall not exceed estimated pre-project peak flow rate for the 10-year, 24-hour storm. For the El Centro area, the 10-year, 24-hour storm is approximately 1.93 inch.[11]

[10] The San Diego Region Model BMP Design Manual is available at http://www.projectcleanwater.org/index.php?option=com_content&view=article&id=250.

[11] NOAA Atlas 14, Volume 6, Version 2. El Centro data was obtained from the following: http://hdsc.nws.noaa.gov/hdsc/pfds/pfds_printpage.html?lat=32.7893&lon=-115.5671&data=depth&units=english&series=pds

Hydromodification Projects shall submit hydrologic analyses that show the 10-year, 24-hour flow rate for the pre-project (existing) condition and for the post-project (proposed) condition. The calculations shall demonstrate that the combination of BMPs implemented for the project is sufficient to meet the performance standard described above. Projects connecting to IID drains must also meet all IID standards for flow control and all City of El Centro standards for flood control.

5 Required Submittals

5.1 Submittals for Standard Projects

Standard projects are required to submit the following:

1. Plan sheets that specifically identify where at least one of the site design BMPs listed in Section 3 will be implemented for the proposed project.
2. Complete the City's standard project worksheet to estimate runoff volume reduction credit for the proposed site design BMPs. The worksheet, which is available from the Building and Safety Division, is a simplified tool based on the spreadsheet calculator tool described in Section 3.

5.2 Submittals for Regulated Projects

Regulated projects are required to submit the following:

1. Plan sheets that
    a. Show the location and size, as applicable, of all site design BMPs, source control BMPs, LID measures, and if applicable, additional controls for hydromodification (as specified in Section 4.4).
    b. Include cross sections and details as necessary to demonstrate compliance with BMP sizing standards.
2. A Water Quality Management Plan (WQMP) demonstrating compliance with the requirements of the Post-Construction Storm Water Standards Manual. A WQMP template is available on the City's website at http://www.cityofelcentro.org/engineering/. The WQMP must include an operation and maintenance plan (O&M Plan) for proposed BMPs, as described below.
    a. At a minimum, the O&M Plan must describe operation and maintenance procedures for each of the following BMPs, if proposed for the project: retention/storage, bioretention, and any other LID or treatment BMP; any hydromodification flow control BMP, such as detention basins; vegetated swales; porous pavement. The O&M Plan must include the following components:

        i. Specific maintenance indicators and actions for proposed BMP(s). Example descriptions of operation and maintenance actions that can be used are provided in the the *Whitewater River Region Stormwater Quality Best Management Practice Design Handbook for Low Impact Development (*http://rcflood.org/NPDES/WhitewaterWS.aspx) prepared by Riverside County Flood Control District and the CASQA *California Stormwater BMP Handbook,*

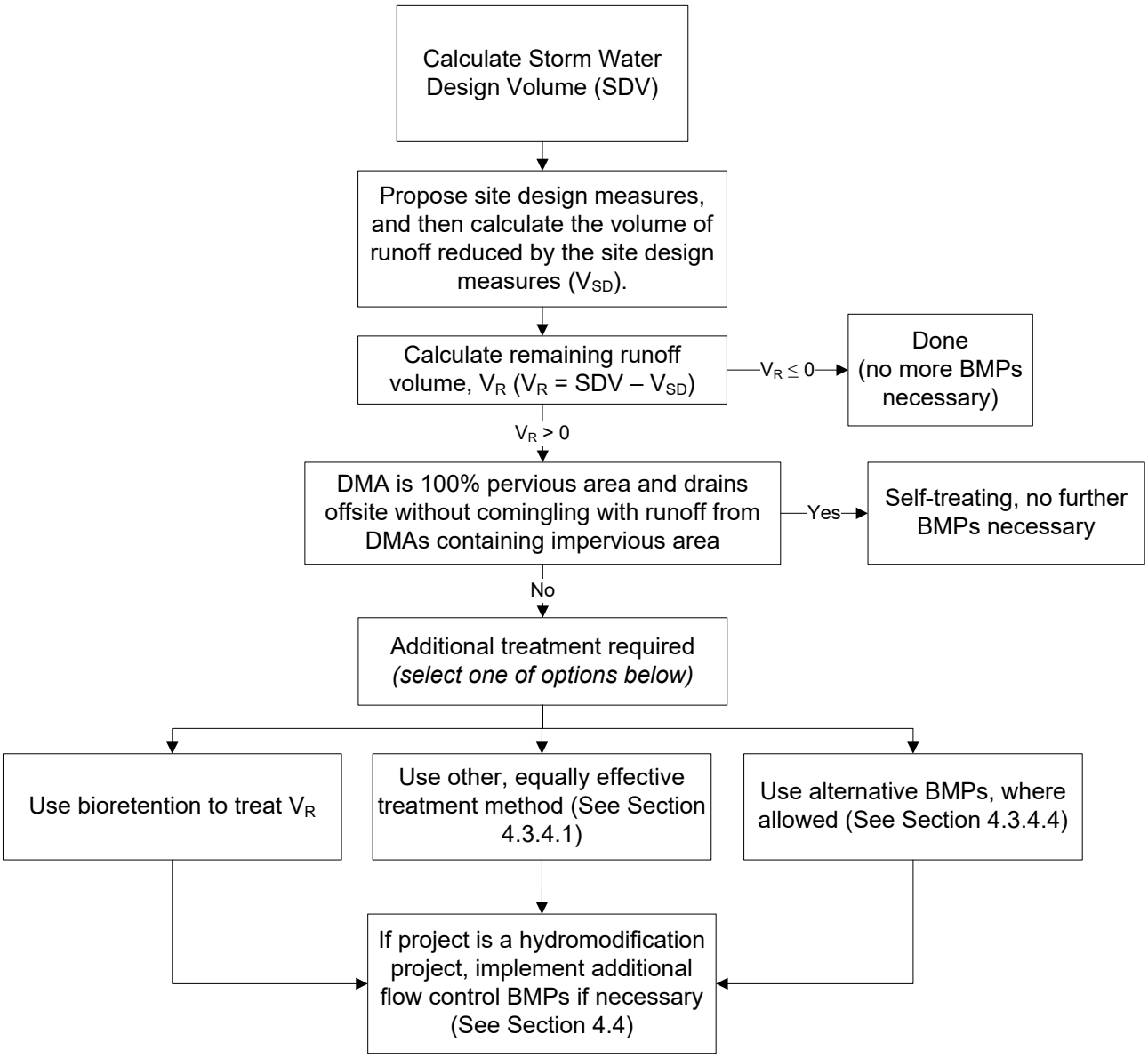
New Development and Redevelopment (https://www.casqa.org/resources/bmp-handbooks/new-development-redevelopment-bmp-handbook).

ii. How to access the BMP(s) to inspect and maintain them
iii. Features that are provided to facilitate inspection (e.g., observation ports, cleanouts, silt posts, or other features that allow the inspector to view necessary components of the structural BMP and compare to maintenance thresholds)
iv. Recommended equipment to perform maintenance
v. When applicable, necessary special training or certification requirements for inspection and maintenance personnel such as confined space entry or hazardous waste management

3. The project owner is also required to record a maintenance agreement that runs with the land prior to project completion. The maintenance agreement shall be submitted for City review along with the WQMP before it is recorded.

Figures 3 and 4 provide additional guidance for Regulated Projects on calculations to demonstrate compliance with BMP sizing and on justifying the type of bioretention design used, respectively. These figures are expected to be applicable to most Regulated Projects, but different requirements may apply to some Regulated Projects, as detailed in Section 4.

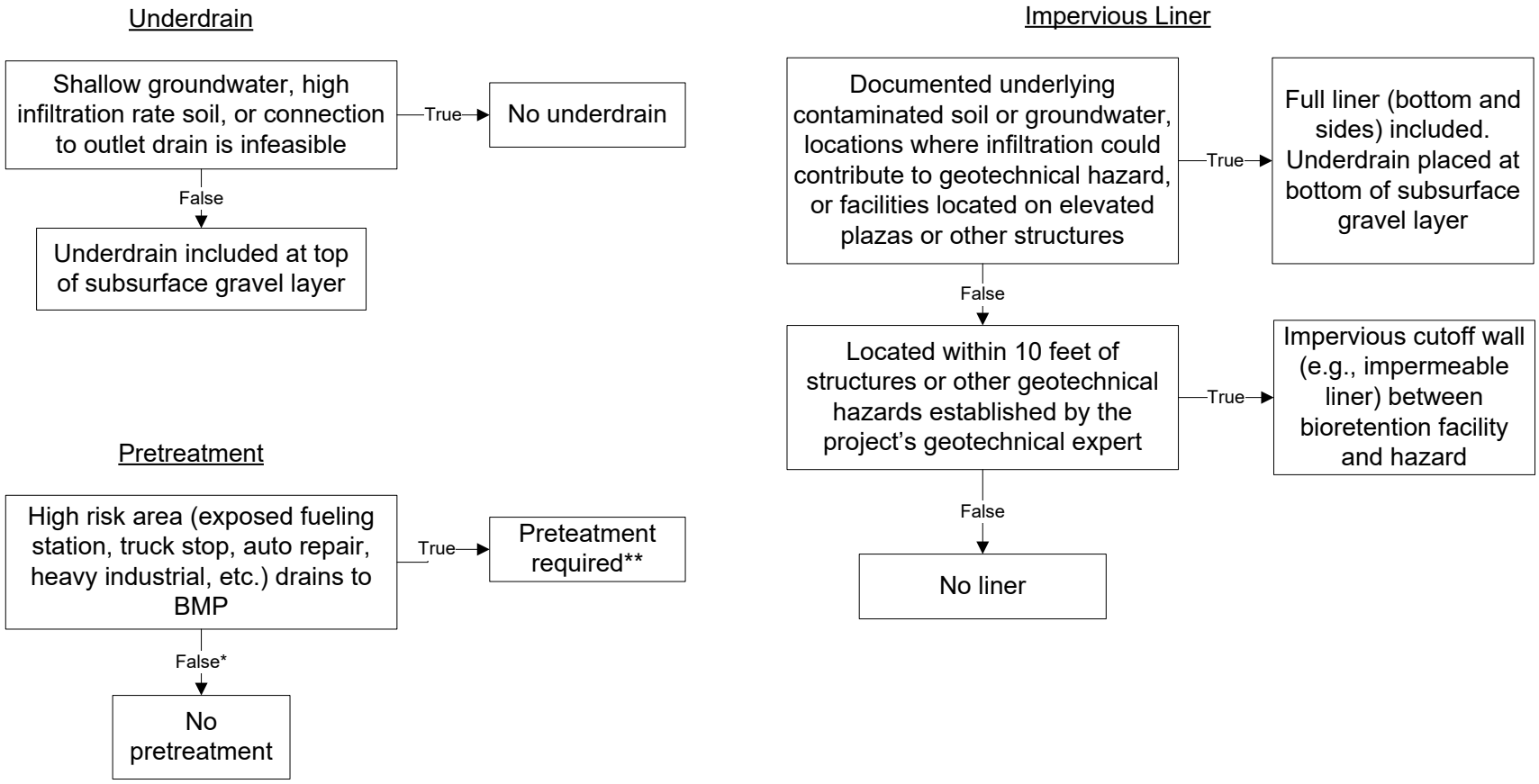
Figure 3. Site Design and Storm Water Treatment Sizing Guidance Summary



Notes

- This flow chart assumes a volumetric sizing approach. A flow-based sizing approach is also allowed per Section 4.3.2, but this flow chart is not directly applicable to that method.
- This flow chart is a summary of relevant requirements that should apply to most projects. Different sizing and BMP design standards may apply to some projects—see Section 4.3 for details
- See Section 3 for more detail on calculating V_{SD}.

Figure 4. Bioretention Design Guidance



Notes:
*Also mark as false if the high risk area(s) are all isolated from storm water runoff, with minimal spill risk (e.g., a covered fueling area graded to prevent run-on)
**See Section 4.3.4.3 for additional information about pre-treatment.

6 Common Questions and Answers about Applicability

What counts as "impervious surface"?

The most common examples of impervious surfaces are rooftops and concrete or asphalt pavement. Impervious surfaces are any surface covering or pavement of a developed parcel of land that prevents the land's natural ability to absorb and infiltrate rainfall/storm water. Impervious surfaces include, but are not limited to, rooftops, walkways, patios, driveways, parking lots, storage areas, impervious concrete and asphalt, and any other continuous watertight pavement or covering. Landscaped soil and pervious pavement, including pavers with pervious openings and seams, underlain with pervious soil or pervious storage material, such as a gravel layer, are not impervious surfaces.

Does pervious pavement count toward the total impervious area?

No, pervious asphalt, pervious concrete, pavers with pervious openings, and other types of pervious pavement do not count as impervious area as long as the pavement is underlain with pervious soil, gravel, or other pervious material. For example, a site with 1,000 square feet of rooftop and 2,000 square feet of standard concrete paving would have 3,000 square feet of impervious area. If the same site kept the 1,000 square feet of rooftop but used 1,000 square feet of standard concrete paving and 1,000 square feet of pervious pavement, it would only have 2,000 square feet of impervious area.

How is the amount of impervious area calculated for a redevelopment project?

The requirements ask for the amount of impervious area created or replaced, not only the amount newly created. If existing impervious area is removed and replaced with new impervious area, that new impervious area counts toward the total project impervious area, even though the area was already impervious in the existing condition. If a redevelopment leaves existing area undisturbed, that impervious area is not counted toward the total project impervious area.

Example 1: an existing 20,000 square foot developed property that is being redeveloped currently has 12,000 square feet of impervious area. All existing impervious area is demolished. The project then constructs a 7,000 square foot parking lot and 3,000 square foot building. This project would have a total project impervious area of 10,000 square feet and would be a Regulated Project. Because the development results in an increase of less than 50 percent of the pre-project impervious area (since pre-project impervious is 12,000 square feet and post-project impervious is 7,000 + 3,000 = 10,000 square feet, it actually is a slight decrease), only runoff from the new and/or replaced impervious surface must be treated. See section 4.3.2.1 for details.

Example 2: the same property in Example 1 is redeveloped. This time, instead of completely demolishing all impervious area, the existing 7,000 square foot parking lot is retained, and the remaining 5,000 square feet of building and other impervious areas is demolished. The project does some minor resurfacing to the 7,000 square foot parking lot but does not completely remove the pavement and replace it. A new 3,000 square foot building is constructed, as in the example above. Since the parking lot was not completely removed and replaced, it does not count toward the total project impervious

area. For Example 2, the total project impervious area is 3,000 square feet. The project is required to do Site Design BMPs but is not a Regulated Project.

Example 3: A 20,000 square foot property with 5,000 square feet of existing impervious area is redeveloped. The existing impervious area is retained as is. A new building and parking lot totaling 8,000 square feet of impervious area is built. Because more than 5,000 square feet of impervious area is created or replaced, this is a Regulated Project. The increase in impervious area is more than 50 percent (8,000/5,000 = 160%), so the project must treat runoff the runoff from both the addition (8,000 square feet) and the existing impervious area (5,000 square feet) to the extent feasible. See Section 4.3.2.1 for details.

What is a linear underground/overhead project (LUP)?

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

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Attachment 1-A

Approved Infiltration Rate Assessment Methods for Selection and Design of Storm Water BMPs

(Appendix D of the San Diego Region Model BMP Design Manual)

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