PROP. 84 REMOVING BARRIERS TO LID: MUNICIPAL CODE UPDATE ASSISTANCE

CASE STUDY: ADDRESSING ALTERNATIVE COMPLIANCE IN MONTEREY

JUNE 27, 2017

CASE STUDY: ADDRESSING ALTERNATIVE COMPLIANCE IN MONTEREY

Monterey is a city in Monterey County that is situated on the southern edge of Monterey Bay, in the northern portion of California's Central Coast. The City has a total area of approximately 12.09 square miles, of which 8.62 square miles is land and 3.47 square miles is water. Elevation ranges from 0 to 683 feet sea level.

Local soil is Quaternary Alluvium. Common soil series include the Baywood fine sand on the east side, Narlon loamy sand on the west side, Sheridan coarse sandy loam on hilly terrain, and the pale Tangair sand on hills supporting closed-cone pine habitat. Monterey is in a moderate to high seismic risk zone, the principal threat being the active San Andreas Fault situated approximately 26 miles to the east.

The climate of Monterey is moderated by its proximity to the Pacific Ocean resulting in a cool-summer Mediterranean climate. Monterey's average high temperatures range from around 57° F in winter to 70° F during the summer months. Average annual precipitation is around 19.5 inches, with most rainfall occurring between October and April. There is an average of 70 days with measurable precipitation annually.

Monterey is an essentially built-out city with typical urban land uses (e.g., residential, commercial, industrial). New development is primarily infill and redevelopment. The development sites tend to be urban in character, with frontage on existing streets. Between 2000 and 2010, Monterey's population has declined by approximately 6.3 percent; however, 202 new dwelling units were created over the period as well as considerable new non-residential development.

Stormwater runoff is routed to a variety of receiving waters including small lakes, streams and the Monterey Bay. This geologic, urban development and receiving water characteristics of Monterey greatly influence the type and feasibility of stormwater quality management actions, including those that comply with the Central Coast Regional Water Board's post-construction stormwater quality control requirements (i.e., PCRs).

In addition to project tasks consistent with other grant participants, the CASQA project team selected Monterey as a project participant because the City was interested in cost-effectively integrating bioretention/biofiltration into street designs and exploring alternative compliance strategies for projects that could not meet the City's post-construction stormwater controls on-site. Monterey was also selected because the redevelopment character of the City's new construction would provide useful lessons on the use of green infrastructure to other municipalities that are essentially built out. The technical framework for alternative compliance is often lacking within a municipal LID strategy and can be a barrier to LID implementation. As described more fully below, the CASQA grant project team performed the following tasks in coordination with the City of Monterey:

- Green Complete Street Sections
- LID street retrofit framework to support Alternative Compliance (drawings, calculations, memorandum)
- Bioretention/Biofiltration Standard Details and Specifications

GREEN COMPLETE STREET STANDARDS

The City of Monterey is in the process of widespread infrastructure improvements to improve accessibility of its streets consistent with the Americans with Disabilities Act (ADA) of 1990. ADA-related improvements include the design and construction of ramps and other features at street intersections. The ongoing construction of these improvements offers the City and opportunity to integrate other stormwater infrastructure into the redesign of the intersections.

Monterey requested that the CASQA grant project team explore the integration of bioretention into street and intersection design. Where feasible and consistent with a Water Board-approved Watershed Plan, the City of Monterey was also interested in building capacity within its rights-of-way for development that could not meet its NPDES stormwater quality post-construction requirements (PCRs) on site.

GREEN/COMPLETE STREET STANDARDS

Green/complete street standards were prepared for multiple street classifications within the City of Monterey. The standards were created with the following objectives:

- Create standards that support post-construction stormwater control requirements under the Stormwater National Pollutant Discharge Elimination System (NPDES) Permits (e.g., stormwater volume retention and water quality treatment using low impact development design).
- Create Standards that integrate transportation and other community objectives associated with Complete Streets (e.g., bike lanes, pedestrian access, and transit).
- Focus on design strategies that provide a cost-effective approach to implement Green/Complete Streets.

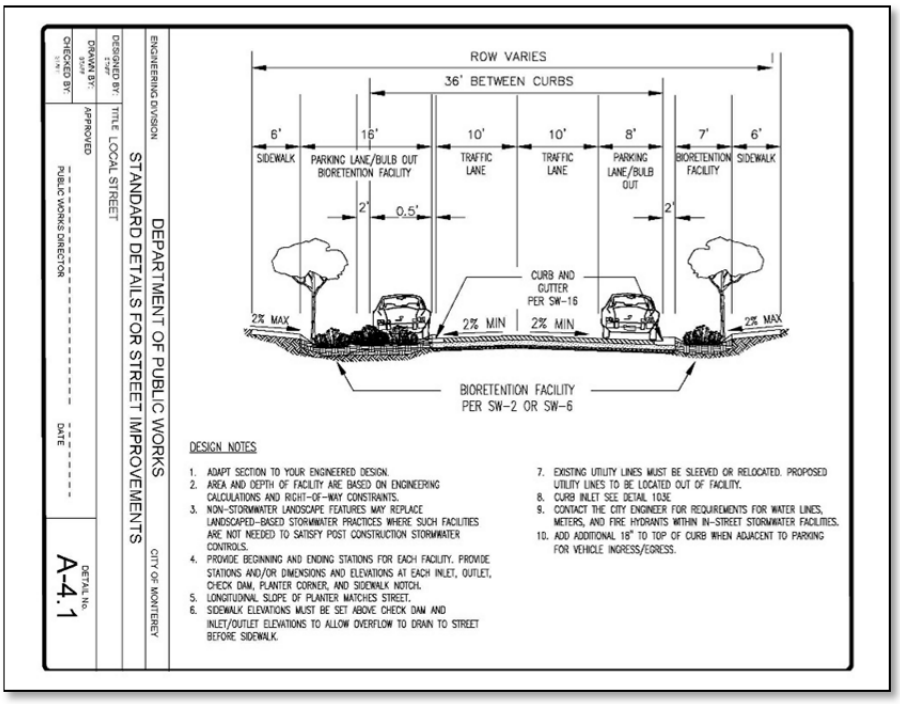
Conventional street designs often dictate wide, paved streets, which generate high volumes of stormwater runoff and associated pollutants and require expensive drainage and treatment systems to protect downstream water quality and prevent flooding. Low Impact Development (LID), sometimes referred to as green infrastructure, uses methods to capture, slow and treat or infiltrate stormwater at the source similar to a natural, pre-urban landscape. Integrating green infrastructure principles within the urban right-of-way helps to reduce flooding, protect natural waterbodies and provides a safer, healthier and more aesthetically pleasing environment for all users including drivers, pedestrians and bicyclists.

Fundamental to green street design is optimizing the use of trees, plants, and soil to provide stormwater management and other community and multiple benefits (e.g., aesthetics, habitat, air quality, and shade). Bioswales, biofiltration, bioretention, and drought-tolerant landscaping are examples of green street elements that mimic natural pre-urban hydrology to reduce stormwater runoff, treat pollutants, and provide additional community and natural resource protection benefits. These features can be incorporated into many places within the right-of-way including traffic islands, planting strips, medians and curb extensions; but one of the

challenges to green street implementation is that many communities have barriers within their own existing codes and ordinances that inhibit, discourage, or prohibit the use of green infrastructure practices.

In order to implement the use of LID practices within City rights-of-way, the CASQA grant project team prepared sections for various street classifications. Figure 1 depicts a section for a local street classification that was prepared for Monterey.

Figure 1: Section for a Monterey Local Street



To review the street sections that were prepared for the City of Monterey, please visit the California LID Portal under the Standard Details & Specifications tab or through the current link:

https://www.casqa.org/resources/california-lid-portal

ALTERNATIVE COMPLIANCE

Monterey, like many municipalities, has objectives to improve urban greening to support environmental, social and economic goals. Additionally, NPDES stormwater quality post-construction requirements (PCRs), which are generally implemented on a parcel-by-parcel basis, are intended to mitigate new and/or address existing urban impacts to watershed processes and associated receiving waters. In some instances, an Alternative Compliance approach is used to comply with the PCRs when compliance cannot be achieved on-site or in cases where the municipality can show that a different approach can meet or exceed the water quality benefits of implementing PCR requirements onsite and perhaps provide ancillary benefits for the community. Street retrofits are

increasingly viewed as an attractive approach to address stormwater quality compliance and urban greening objectives.

ALTERNATIVE COMPLIANCE

A concept design for retrofit of a collector street was prepared to provide Monterey with a promising design option that would provide stormwater management and water quality benefits within the context of a collector street right-of-way. The Stormwater Control Measures (SCMs) (i.e., bioretention or biofiltration facilities) can be integrated into street retrofits based on actual site-specific opportunities and objectives. The concept design is a thoughtful integration of bioretention infrastructure into a collector street classification at mid-block and intersection locations.

Figure 2: Alternative Compliance Concept Design

Facility	Total Footprint Square Feet	Functional Footprint Square Feet	A/B Soils Retain/Treat (ft²)	C/D Soils Retain/Treat (ft²)
1	229	112	168	105
2	229	112	168	105
3	179	96	126	84
4	179	96	126	84
5	229	112	168	105
6	229	112	168	105
7	229	112	168	105
8	229	112	168	105

Four assumptions were undergirded the development of the concept design:

1. The concept design was created for a collector street classification with a curb-to-curb width of 40 feet and parking on both sides of the street. The City identified that opportunities within this street classification likely provide a cost-effective and technically feasible approach versus less cost-effective efforts on local or arterial streets.
2. The concept design focused on an LID or Green Street "lite" approach meaning, the concept design integrated elements of LID that are realistic related to cost, technical feasibility, parking constraints,

etc. This design approach avoids the cost and impact of a full street retrofit, which typically is economically infeasible.

3. Permeable paving was not evaluated as a design option as the associated operations and maintenance requirements were not considered an attractive option for Monterey at this time. Moreover, the Regional Water Board has expressed a preference for vegetated SCMs for NPDES compliance thereby guiding the CASQA team's development of a concept design emphasizing the use of bioretention/biofiltration SCMs.
4. The quantitative stormwater runoff volume and quality performance of the LID SCMs are based on assumed depths of bioretention soil, aggregate, etc. that were considered reasonable from an engineering retrofit perspective. Adjustments to these variables would vary performance.

The County of Santa Barbara's Stormwater Control Measure Sizing Calculator (Calculator) (http://www.sbprojectcleanwater.org/development.aspx?id=76) was used to estimate stormwater volume and treatment performance for the SCMs. The Calculator is consistent with the Region 3 Water Board approved sizing calculations and provides the user the ability to iteratively work with the SCM area footprint and depth to arrive at a design appropriate for the specific street right-of-way.

The PCRs for the City may include biofiltration (treatment only) or bioretention (treatment and retention) performance requirements, so the concept design reflects either approach. The Calculator was manipulated so that the assumed depth of bioretention soil media and aggregate was applied for either a bioretention or biofiltration system.

The Calculator was used to back-calculate the volume of stormwater that would be retained and/or treated. One can iteratively adjust the SCM depth, area footprint and volume routed to the SCM. By setting the SCM depth and footprint, the volume that can be managed by the facility is also set. This performance quantification via volume allows the City to create a stormwater "bank" that can be used for Alternative Compliance.

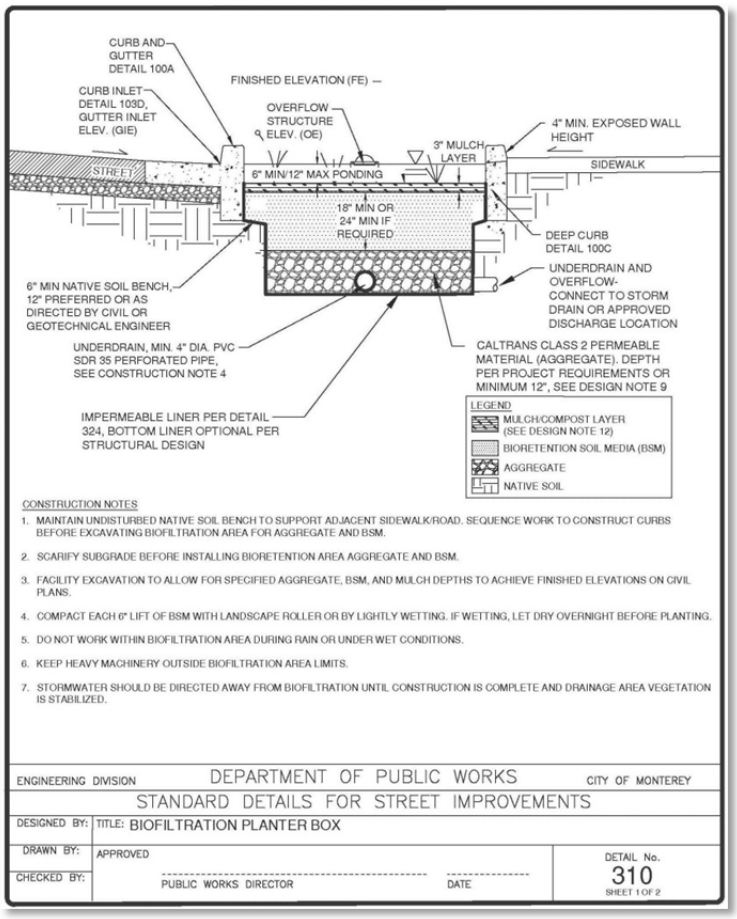
IMPLEMENTING STANDARDS

BIORETENTION/BIOFILTRATION STANDARD DRAWINGS AND SPECIFICATIONS

In order to implement the use of LID practices within the City, there is a need for design standards and details to ensure proper construction and installation. Standard drawings for bioretention facilities were assembled by the grant project team for the City based standards originating from LIDI to maintain consistency with Statewide NPDES and Region 3 PCR requirements. The standard drawings and specifications originated out of work that was performed by the Central Coast Low Impact Development Initiative (LIDI). The LIDI details were then modified through this grant based on extensive input from the participating municipalities, stormwater design professionals, and peer review by a design team not associated with the initial development of the details.

The refinements to the bioretention and biofiltration standard drawings addressed various edge conditions (with variations for facilities within the landscape strip adjacent to travel lanes or on-street parking and within a parking lot), pervious pavements, edge conditions such as curb inlets and flat curbs, overflow structures and planting palates for landscaping frequently inundated areas of the facilities. After the drawings were completed, the numbering for the drawings was changed to reflect the adopted numbering conventions for the City of Monterey, and the drawings were placed within the City's standard title block.

Figure 5: Bioretention Standard Drawings



To review the bioretention standard plans prepared for the City of Monterey, please see the California LID Portal under the Standard Details & Specifications tab or through the current link:

https://www.casqa.org/resources/california-lid-portal