Central California Municipal Regulatory Update Assistance Program

[MRUAP]

SESSION TWO
WEBINAR PROTOCOL:

• If you have feedback, please use the icon pull down menu in the lower left hand corner of your screen. It looks like a figure of someone wanting to hold his/her hand up.
• To see a larger version of the presentation, select the “fill screen” button on the lower right corner of the whiteboard. You can toggle between full and regular screen size
• Questions can be posed in the chat box

Questions may not be answered during the live webinar, but we will be keeping a complete list of questions that will be responded to afterwards

Copies of the presentation with notes will be made available by Darla Inglis after the session
The MRUAP TRAINING SERIES is intended to:

Provide staff of local jurisdictions with the tools to:

- **review,**
- **revise,** and
- **present** regulatory language addressing hydromodification control practices for consideration and adoption by their elected officials.
SESSION ONE

- Hydromodification Control and LID
- Project Road Map
- Topics for Updates to Codes and Standards
- Wrap Up
SESSION TWO

• Gap Analysis Report
• Developing Draft Regulatory Language and Standards
• Developing/Assembling Documentation to Support the Adoption Phase
• Integrating Maintenance & Enforcement into Development Controls
• Wrap Up
AHBL has assisted nearly 40 Phase II NPDES communities integrate hydromodification control standards and LID into local codes and regulations.

The Central Coast Regional Water Quality Control Board

The UC Davis Extension, LID Initiative
SESSION TWO is intended to discuss the “heavy lifting” involving updating your codes and standards including:

1. Regulatory language hindrances
2. Hydromodification control requirements (performed under Joint Effort)
3. Applicability and Exemptions/Feasibility Criteria (performed under Joint Effort)
4. Non-Structural Practices
   • Site Assessment
   • Clustering
5. Structural Practices/Design Specifications
   • Landscaping and vegetation
   • Streets
   • Parking Lots
6. Maintenance
1. Regulatory language hindrances
2. Hydromodification control requirements (performed under Joint Effort)
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Objective
The intent of this section is to provide local jurisdictions with a background into how other jurisdictions have evaluated their codes and regulations.
Preparation of a gap analysis can serve as an important tool in identifying and prioritizing the wide array of codes and standards that may need to be amended or prepared in order to integrate hydromodification control standards and LID into a jurisdiction’s development controls.

- Illustrate how codes are analyzed for impediments to the integration of hydromodification control and LID standards
- How the gap analysis tool can be used for future code amendments
The value of analyzing the gaps between existing codes & standards and the goals of hydromodification control and LID:

- **IDENTIFYING KEY PROVISIONS** in existing regulatory codes, standards and general plan that may conflict or pose impediments to the adoptions of hydromodification control measures.
The value of analyzing the gaps between existing codes & standards and the goals of hydromodification control and LID:

• Ascertaining amendments and/or new chapters that could be developed to **FILL GAPS** in the existing code and meet project objectives.
The value of analyzing the gaps between existing codes & standards and the goals of hydromodification control and LID:

- **PRIORITIZING** those elements in the engineering, planning, and building codes and standards that represent the greatest opportunities for achieving the hydromodification control standards = “best bang for the buck”
Topics that should be analyzed when performing a gap analysis:

- Landscaping, native soil preservation, street landscaping, etc.
- Impervious surface standards (minimizing)
- Bulk and dimensional standards
- Clearing and grading standards
- Engineering and road standards
- Parking
- Design guidelines/standards
- Stormwater management
<table>
<thead>
<tr>
<th>Code Reference</th>
<th>Category Consideration</th>
<th>LID Aspect</th>
<th>Description</th>
<th>LID Hindrances and Opportunities</th>
</tr>
</thead>
<tbody>
<tr>
<td>13.10.040</td>
<td>LID BMPs</td>
<td>Runoff quality, flow and volume control</td>
<td>In 13.10.040, Newcastle adopts the 1960 King County Surface Water Design Manual and subsequent amendments as the surface water design manual for the city.</td>
<td>Chapter 5 of the 2005 King County manual introduces the concept of LID. The King County manual includes a number of LID strategies for flow control, but includes only 1 LID option for stormwater quality control (filtration). Assuming Newcastle has favorable soil conditions for biofiltration, it would help if Newcastle could add code recommendations to allow use of LID to provide a source for stormwater quality control.</td>
</tr>
<tr>
<td>13.10.060, 13.10.070</td>
<td>General application of LID</td>
<td>Runoff quality, flow and volume control</td>
<td>These Newcastle codes address drainage review thresholds and requirements, and also references the 1969 Draft Washington State Department of Ecology's Stormwater Management Manual.</td>
<td>Overall, the requirements are good. The 2005 Draft manual is the most current and better supports LID approaches than the 1969 Draft manual. References to the 1969 Draft manual should be updated or indicate “as amended.”</td>
</tr>
<tr>
<td>13.10.080</td>
<td>General application of LID</td>
<td>Runoff quality, flow and volume control</td>
<td>This code addresses the concept of special drainage requirements in service areas and areas that drain directly to Lake Washington.</td>
<td>N/A. The code generally supports the concept of LID. Newcastle develops specific LID recommendations in their requirements. For A-1082, a code review, it would be helpful to have a copy of the applicable code. Indirectly, this code generally supports the concept of LID. Newcastle develops specific LID recommendations.</td>
</tr>
<tr>
<td>13.10.010</td>
<td>LID BMPs, Pin Foundations</td>
<td>Runoff volume control</td>
<td>This code adapts the international building code.</td>
<td>N/A. The code generally does not provide much in the way of regulations.</td>
</tr>
<tr>
<td>13.10.050</td>
<td>LID BMP, Vegetation Roofs</td>
<td>Runoff flow and volume control</td>
<td>The code provides roof and ground source load requirements.</td>
<td>N/A. The code does not provide much in the way of regulations.</td>
</tr>
<tr>
<td>17.49.040</td>
<td>General application of LID</td>
<td>Site planning, native vegetation preservation, minimize total imperviousness, runoff volume, flow, and quality control.</td>
<td>This code establishes the permits process and standards for planned unit developments (PUDs).</td>
<td>N/A. The code does not provide much in the way of regulations.</td>
</tr>
<tr>
<td>17.49.050</td>
<td>Site Planning in general</td>
<td>Clustered development, minimize total imperviousness</td>
<td>This code states that there are no minimum site areas required for PUDs.</td>
<td>N/A. The code does not provide much in the way of regulations.</td>
</tr>
<tr>
<td>17.49.060(81)</td>
<td>Site Planning, Minimize Curbs &amp; gutters</td>
<td>Minimize total imperviousness, runoff volume, and flow control.</td>
<td>This code applies to the 2012 King County Code 17.49.090 for PUD project evaluation, NMC 17.46.050 identifies minimum street design standards that are in most cases requirements.</td>
<td>N/A. The code does not provide much in the way of regulations.</td>
</tr>
</tbody>
</table>

Curb and gutter incorporates surface flows, increasing effective impervious area. Where possible, runoff should be directed to open areas, or diverted to infiltration facilities. Where infiltration is not possible, runoff should be directed to bioretention areas for water quality treatment before final disposal to the stormwater system.
<table>
<thead>
<tr>
<th>Code Reference</th>
<th>Category: Consideration</th>
<th>LID Aspect</th>
<th>Additional Information</th>
</tr>
</thead>
<tbody>
<tr>
<td>13.10.040</td>
<td>LID BMPs</td>
<td>Runoff quality, flow and volume control</td>
<td>In 13.10.040 subsec...</td>
</tr>
<tr>
<td>13.10.060, 13.10.070</td>
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<td>This con...</td>
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<tr>
<td>15.10</td>
<td>Fees</td>
<td>LID incentives</td>
<td>This con...</td>
</tr>
<tr>
<td>15.75.060</td>
<td>LID BMP: Vegetated Roofs</td>
<td>Runoff flow and volume control</td>
<td>This con...</td>
</tr>
<tr>
<td>Description</td>
<td>Chapter 2</td>
<td></td>
<td></td>
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<tr>
<td>-------------</td>
<td>----------</td>
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<td></td>
</tr>
<tr>
<td>In 13.10.040, Newcastle adopts the 1998 King County Surface Water Design Manual and subsequent amendments as the surface water design manual for the city.</td>
<td>LID</td>
<td></td>
<td></td>
</tr>
<tr>
<td>These Newcastle codes address drainage review thresholds and requirements, and also references the 1999 Draft Washington State Department of Ecology’s Stormwater Management Manual.</td>
<td>Overall</td>
<td></td>
<td></td>
</tr>
<tr>
<td>This code addresses the concept of special drainage requirements in erosion hazard areas or in areas that drain directly to Lake Washington.</td>
<td>Indirect</td>
<td></td>
<td></td>
</tr>
<tr>
<td>This code states that parcel owners shall pay fees for stormwater service, whether the property is occupied or vacant.</td>
<td>Dependent</td>
<td></td>
<td></td>
</tr>
<tr>
<td>The code adopts the international building code.</td>
<td>Current</td>
<td></td>
<td></td>
</tr>
<tr>
<td>This code provides roof and ground snow load requirements</td>
<td>The code encourages the LID for stormwater management</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Areas or Scenarios</td>
<td>Details</td>
<td></td>
<td></td>
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<tr>
<td>-------------------</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Overall</td>
<td>The 2005 DOE manual is the most current and better supports LID approaches than the 1999 Draft DOE manual. References to the 1999 Draft DOE manual should be updated or indicate &quot;as amended&quot;.</td>
<td></td>
<td></td>
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<td>Indirectly</td>
<td>This code generally supports the concept of LID. If Newcastle develops specific LID recommendations or requirements, they should be referenced in this code. For AHBL's code review, it would be helpful to have a copy of the map showing the special drainage requirement areas.</td>
<td></td>
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</tr>
<tr>
<td>Current code</td>
<td>Does not preclude use of pin foundations. Code revisions that explicitly include pin foundations would better support the LID approach.</td>
<td></td>
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</tr>
<tr>
<td>The code</td>
<td>is not a hindrance to LID, but if Newcastle wants to encourage use of vegetated roofs, the load requirements may need to be increased. Extensive vegetated roofs generally require an</td>
<td></td>
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</tbody>
</table>
### GAP ANALYSIS EXAMPLES - TWO

#### LID DEVELOPMENT FEATURES REVIEW

<table>
<thead>
<tr>
<th>Development Feature Criteria</th>
<th>Standard</th>
<th>Opportunity to Improve</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Street Width</strong>&lt;br&gt;Is the minimum pavement width allowed for streets in low density residential developments that have less than 500 daily trips (ACT) between 18 and 22 feet?&lt;br&gt;Narrow streets reduce the amount of impervious cover, thereby reducing the volume and rate of runoff generated from the street. Area gained by narrowing street can be used for stormwater treatment and/or absorption.&lt;br&gt;At higher densities, are parking lanes also allowed to serve as traffic lanes?&lt;br&gt;Allow one shared travel lane (about 11 feet in width) to serve traffic flowing in both directions in low volume single family residential neighborhoods.&lt;br&gt;Driveways typically provide gaps in parking adequate to serve as pull-outs, but additional parking restrictions may be required.</td>
<td></td>
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<tr>
<td><strong>Street Length</strong>&lt;br&gt;Do street layout standards promote the most efficient street layouts that reduce overall street lengths?</td>
<td></td>
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</tbody>
</table>
### Development Feature Criteria

<table>
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<tr>
<td>Is the minimum pavement width allowed for streets in low density residential developments that have less than 500 daily trips (ADT) between 18 and 22 feet?</td>
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<td>Narrow streets reduce the amount of impervious cover, thereby reducing the volume and rate of runoff generated from the street. Area gained by narrowing street can be used for stormwater treatment and/or absorption.</td>
</tr>
</tbody>
</table>

At higher densities, are parking lanes also allowed to serve as traffic lanes?

Allow one shared travel lane (about 14 feet in width) to serve traffic flowing in both directions in low volume single family residential neighborhoods.

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Driveways typically provide gaps in parking adequate to serve as pull-outs, but additional parking restrictions may be required.
SECTION TWO
The intent of this section is to show examples that other jurisdictions have adopted to integrate hydromodification control and LID practices into codes and standards.
Impending NPDES Permit requirements will address post-construction stormwater runoff impacts from new and redevelopment.
criteria & applicability

1. Regulatory language hindrances

2. Hydromodification control requirements (performed under Joint Effort)

3. Applicability and Exemptions/Feasibility Criteria (performed under Joint Effort)

4. Non-Structural Practices
   • Site Assessment
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6. Maintenance
Hydromodification control criteria and applicability will be set forth from the Joint Effort that you are currently participating in. The hydromodification control criteria and applicability will address:

- **Design criteria** (e.g., size of storm event that must be managed)

- **Applicability criteria** for large projects, small projects, redevelopment proposals, expansions, etc.

- **Feasibility** of using LID practices versus standard urban stormwater management practices (SUSMPs)
What hydromodification control practices look like from a regulatory perspective:
City of Los Angeles – Criteria

3. The Site shall be designed to manage and capture stormwater runoff, in priority order of infiltration, evapotranspiration, capture and use, and/or treated through high removal efficiency biofiltration/biotreatment system of all of the runoff on site to the maximum extent feasible. The high removal efficiency biofiltration/biotreatment system shall comply with the standards and requirements of the LID Section of the Development Best Management Practices Handbook. A LID Plan shall be prepared to comply with the following:

i. Stormwater runoff will be infiltrated, evapotranspired, captured and used, and/or treated through high removal efficiency Best Management Practices, onsite, through stormwater management techniques allowed pursuant to the LID Section of the Development Best Management Practices Handbook. The onsite stormwater management techniques must be properly sized, at a minimum, to infiltrate, evapotranspire, store for use, and/or treat through high removal efficiency biofiltration/biotreatment system, without any storm water runoff leaving the site to the maximum extent feasible, for at least the volume of water produced by the quality design storm event that results from:
criteria & applicability

(a) The 85\textsuperscript{th} percentile 24-hour runoff event determined as the maximized capture stormwater volume for the area using a 48 to 72-hour draw down time, from the formula recommended in Urban Runoff Quality Management, WEF Manual of Practice No. 23/ASCE Manual of Practice No. 87, (1998); or

(b) The volume of annual runoff based on unit basin storage water quality volume, to achieve 80 percent or more volume treatment by the method recommended in the California Stormwater Best Management Practices Handbook – Industrial/Commercial, (2003); or

(c) The volume of runoff produced from a 0.75-inch storm event.
Ventura County – Goals

The core LID requirements in the Ventura County LID Permit are to:

1. Mimic pre-development runoff
2. Limit effective impervious area (EIA) to 5% for new development and up to 30% for redevelopment (where 5% is not feasible or off-site mitigation is used).
3. If 5% EIA is not feasible, the project must reduce %EIA to as close to 5% as feasible, and no more than 30% of the total project area.
4. Off-site mitigation is required for the volume of stormwater from the design storm that cannot be retained on-site within the 5% EIA limitations.
5. Any design storm volume runoff from the impervious area of the site needs to be treated.
Ventura County – Design Storm

The current Ventura County Storm Water Quality Urban Impact Mitigation Plan (SQUIMP) is used in the new permit. The new permit uses runoff volume:

- 85th percentile 24-hour runoff event using a 48 to 72-hour draw down time, or
- Runoff based on unit basin storage volume per 2002 Technical Guidance Manual, or
- Runoff from 0.75-inch storm

The applicant can choose one of the above listed methods, but must demonstrate how it is applied in LID retention volume and post-construction BMP sizing calculations.
<table>
<thead>
<tr>
<th>#</th>
<th>EXISTING PROJECT CRITERIA*</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>All development projects equal to or greater of disturbed area and adding more than 10,000 square feet of impervious surface area</td>
</tr>
<tr>
<td>2</td>
<td>Commercial strip mall, 10,000 square feet or more of impervious surface area</td>
</tr>
<tr>
<td>3</td>
<td>Retail gasoline station, 5,000 square feet or more of surface area</td>
</tr>
<tr>
<td>4</td>
<td>Restaurants (§ 68113), 5,000 square feet or more of surface area</td>
</tr>
<tr>
<td>5</td>
<td>Parking of 5,000 square feet or more of impervious surface area or with 25 or more parking spaces</td>
</tr>
<tr>
<td>6</td>
<td>Streets, roads, highways, and freeway construction of 10,000 square feet or more of impervious surface area and incorporate USEPA guidelines regarding Managing Storms Weather with Green Infrastructure: Green Streets to the maximum extent practicable</td>
</tr>
<tr>
<td>7</td>
<td>Administrative service facilities (§ 5013, 5014, 5011, 5041, 7533 or 7534) and 5015-7535 or 7536-7538 (10,000 square feet or more of surface area)</td>
</tr>
<tr>
<td>8</td>
<td>Projects located in or directly aligned to, or discharging directly to a Dispersedly Sensitive Area (DSA), where the development will: A) Discharge stormwater runoff that is likely to impact a sensitive biological species or habitat, and B) Create or 5,000 square feet or more of impervious surface area</td>
</tr>
<tr>
<td>9</td>
<td>Single-family residential homes</td>
</tr>
</tbody>
</table>

REDEVELOPMENT APPLICABILITY CRITERIA

Land-disturbing activity that results in the addition or replacement of 3,000 square feet or more of impervious surface area on an already developed site may be exempt under the following conditions:

1. The site is subject to a permit or regulatory activity that requires an environmental impact report or an environmental assessment.
2. The site is subject to a permit or regulatory activity that requires an environmental assessment, or the site is subject to a permit or regulatory activity that requires an environmental impact report.
3. The site is subject to a permit or regulatory activity that requires an environmental impact report and an environmental assessment.
4. The site is subject to a permit or regulatory activity that requires an environmental assessment, or the site is subject to a permit or regulatory activity that requires an environmental impact report and an environmental assessment.

Existing single-family residential development and accessory structures are subject to the Redevelopment requirements unless such projects were not or cannot be subject to the Redevelopment requirements.

REDEVELOPMENT**

Redevelopment does not include building maintenance activities that are conducted to maintain original site and grade, hydraulic capacity, original purpose of facility, or emergency redevelopment activity required to protect public health and safety, impervious surface replacement, or new construction of parking lots and driveways which does not disturb additional area and maintains the original grade and alignment. Development does not include the resurfacing of existing roads to maintain original site and grade.

Was the existing development subject to post-development storm water quality control requirements?

Yes  No

Does the redevelopment result in an alteration > 50% of impervious surface of a previously existing development?

Only the alteration must be mitigated, and not the entire development

Yes  No

The entire project must be mitigated

Only the alteration must be mitigated and not the entire development

*Redevelopment does not include building maintenance activities that are conducted to maintain original site and grade, hydraulic capacity, original purpose of facility, or emergency redevelopment activity required to protect public health and safety, impervious surface replacement, or new construction of parking lots and driveways which does not disturb additional area and maintains the original grade and alignment. Development does not include the resurfacing of existing roads to maintain original site and grade.
Feasibility for the use of LID practices rather than standard urban stormwater management practices (SUMSPs) or off-site practices are typically also addressed.

Technical feasibility is one criteria that is included in the criteria of all jurisdictions, however, other factors are sometimes also included such as how hydromodification control practices may correlate with other urban design plans.
Los Angeles – Feasibility “Off-Ramps”

4. When the onsite LID requirements are technically infeasible, partially or fully, as defined in the LID Section of the Development Best Management Handbook, the infeasibility shall be demonstrated in the submitted LID plan, shall be consistent with other City requirements, and shall be reviewed in consultation with the Department of Building and Safety. The technical infeasibility may result from conditions, that may include, but are not limited to:

- Locations where seasonal high groundwater is within 10 feet of surface grade;
- Locations within 100 feet of a groundwater well used for drinking water;
- Brownfield Development sites or other locations where pollutant mobilization is a documented concern;
Los Angeles – Feasibility “Off-Ramps” (continued)

- Locations with potential geotechnical hazards;
- Locations with impermeable soil type as indicated in applicable soils and geotechnical reports; and
- Other site or implementation constraints identified in the LID Section of the Development Best Management Practices Handbook.

5. If partial or complete onsite compliance of any type is technically infeasible, the project Site and LID Plan shall be required to comply with, at a minimum, all applicable Standard Urban Stormwater Mitigation Plan (SUSMP) requirements in order to maximize onsite compliance. For the remaining runoff that cannot feasibly be managed onsite, provide one or a combination of the following.................
Ventura County – Feasibility “Off-Ramps”

4.E.III.2.a To encourage smart growth and infill development of existing urban centers where on-site compliance with post-construction requirements may be technically infeasible, the permittees may allow projects that are unable to meet the Integrated Water Quality/Flow Reduction/Resources Management Criteria in subpart 4.E.III.1, above, to comply with this permit through the alternative compliance measures described in subpart 4.E.III.2.c, below:

Language is similar then to City of Los Angeles
1. Regulatory language hindrances

2. Hydromodification control requirements (performed under Joint Effort)

3. Applicability and Exemptions/Feasibility Criteria (performed under Joint Effort)

4. Non-Structural Practices
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6. Maintenance
Integration of BMPs

Integration of Structural and Non-Structural Practices

Non-Structural Practices
- Site Design/Lot Layout
- Minimizing Site Disturbance
- Maintaining Vegetated Areas
- Road Design (minimizing impervious surfaces through road width)

Structural Practices
- Bioretention
  - Bioretention design
  - Curb design
  - Curb extensions
- Soil Amendment Specifications/Bioretention Soil Mix Specifications
- Porous Pavements
- Vegetated Roofs
- Minimal Excavation Foundations
Methods of various jurisdictions to integrate the need for a site assessment/composite site analysis into local development controls:
14.94.150 Site assessment.

LID site design is intended to complement the predevelopment conditions on the site. The development context shall be established by an initial site assessment consistent with the requirements of this section. The initial inventory and assessment process will provide the baseline information necessary to design strategies that preserve natural resources, preserve areas most appropriate to evaporate, transpire, and infiltrate stormwater, and achieve the goal of maintaining pre-development natural hydrologic conditions on the site. The assessment will result in a series of maps identifying streams, lakes, wetlands, and buffers; steep slopes, and other hazard areas; significant wildlife habitat areas; and permeable soils offering the best available infiltration potential. Maps can be combined as hard copies or as GIS layers to delineate the best areas to direct development. Designated development areas, which will contain all impervious surfaces and landscaped areas on the site, should be configured to minimize soil and vegetation disturbance, buffer critical areas, and take advantage of a site's natural stormwater processing capabilities. Designated development area boundaries shall be delineated on site plans and identified on the site during site preparation and construction. Areas outside of the designated development area envelope shall be designated Native Vegetation Areas or reserve areas.

The site assessment shall be a component of the project submittal. The site assessment shall include, at a minimum, the following:

(a) A survey prepared by a registered land surveyor or registered civil engineer showing existing public and private development, including utility infrastructure, on and adjacent to the site, major and minor hydrologic features, including seeps, springs, closed depression areas, drainage swales, and contours as follows:

1. Up to 10 percent slopes, two-foot contours.
2. Over 10 percent to less than 20 percent slopes, five-foot contours.
3. Twenty percent or greater slopes, 10-foot contours.
4. Spot elevations shall be at 25 foot intervals.

(b) Location of all existing lot lines, lease areas and easements, and the location of all proposed lot lines, lease areas, and easements.

(c) A soils report prepared by a licensed geotechnical engineer or licensed engineering geologist. The report shall identify:

1. Underlying soils on the site utilizing soil pits and soil grain analysis to assess infiltration capability on site. The frequency and distribution of soil pits shall be adequate to direct placement of the roads and structures away from soils that can most effectively infiltrate stormwater.
2. Topographic features that may act as natural stormwater storage or conveyance and underlying soils that provide opportunities for storage and partial infiltration.
3. Depth to groundwater.
4. Geologic hazard areas and associated buffer requirements as defined in 14.08 (VI) LDMC.

(d) A survey of existing native vegetation cover by a licensed landscape architect, arborist, qualified biologist identifying any forest areas on the site, species and condition of ground cover and shrub layer, and tree species, and canopy cover.

(e) A survey of wildlife habitat by a qualified biologist.

(f) A streams, wetland, and water body survey and classification report by a qualified biologist showing
interest in the property included in the LID project and a legal description that describes the exterior boundary of the LID project and lists all encumbrances affecting land within the LID project.

(b) A statement that confirms the ownership or control of the land within the boundaries of the proposed LID project and the nature of the applicant's interest in the same and the owners. If the development area has multiple owners, then all owners of record shall consent in writing to the LID project review process.

(c) Description of the proposed LID project including:
1. Project narrative showing how the project fulfills the overall goals and each purpose statement in Section 14.94.010;
2. Total gross area of the site;
3. Total project area (total gross site area minus total reserve area);
4. Total area of designated development area;
5. Total area of Native Vegetation Area;
6. Total units proposed;
7. Proposed number of dwelling units by type;
8. Conventional impervious surface assumptions used for volume reduction calculations;
9. Maximum impervious surface proposed for each lot;
10. Lot sizes and dimensions;
11. Total area of impervious surfacing;
12. Proposed ownership of land areas within the LID project both during and after construction;
13. Gross density of dwelling units;
14. Proposed density modifications;
15. Development schedule indicating the approximate date when construction of the LID project or stages of the LID project can be expected to begin and be completed.

(d) Copy of all existing deeds, restrictive covenants, or other legal restrictions which apply to the project site. The applicant may submit a copy of any proposed restrictive covenants that have been drafted.

(e) The names and addresses of all property owners within 300 feet of the site taken from the latest equalized tax roles.

(f) Preliminary drainage report as described in the Lake Stevens site development standards. The report should clearly state the assumed conventional storage volume and LID storage volume in the introduction.
14.94.170 Site plan and supporting maps and graphics.

An initial site plan and any supporting graphics, narrative descriptions and maps to show existing conditions and major details of the proposed LID project. The initial site plan and supporting graphics and maps in combination shall provide a level of detail appropriate to the scale of the project and sufficient to demonstrate how the project complies with the provisions of this chapter.

(a) Proposed name of the development, north point, scale, date and address, and telephone number of the preparer of the site plan/supporting maps.

(b) All information included in the site assessment in Section 14.94.170 LSMC, should be provided at a legible scale appropriate to the area covered by the proposal at the discretion of the administrator.

(c) Designated development areas.

(d) Native Vegetation Areas.

(e) Reserve areas.

(f) Areas of disturbed soils to be amended.

(g) The existing and proposed circulation system of arterial, collector and/or local streets, including right-of-way street widths, off-street parking areas, and major points of access to public rights-of-way (including major point of ingress and egress to the development). Notations of proposed ownership, public or private, shall be included where appropriate.

(h) Location and width of existing and proposed sidewalks and trails.

(i) Proposed lots and dimensions.

(j) For residential structures, provide the type and number of residential units in each structure or the range of residential structures proposed together with the range of the type and number of units per structure.

(k) For nonresidential buildings, the gross floor area of each building.

(l) The location and square footage or approximate location and square footage or acreage of all areas of all areas to be conveyed, dedicated or reserved as common open spaces, public parks, recreational areas, school sites, and similar public and semi-public uses with notations of proposed ownership included where appropriate.

(m) Landscaping and open space improvements plan or concept.

(n) The proposed treatment of the perimeter of the LID project, including materials and techniques used such as screens, fences and walls.

(o) The location of existing and proposed utilities including sanitary sewers, water lines and storm drainage facilities intended to serve the development.

(p) Existing zoning and Comprehensive Plan boundaries for the site and adjacent property.

(q) Information of contiguous properties within 300 feet of the proposed LID project including:

   i. Existing and, if known, proposed land use and streets; and

   ii. Existing structures excluding accessory buildings, ownership, tracts and unique natural features of the landscape, if readily accessible

(r) A vicinity map showing the location of the site and its relationship to surrounding areas, including existing streets, major physiographic and cultural features such as railroads, lakes, streams, shorelines, schools, parks or other prominent features.

(s) Landscape plan including a tree planting plan for Native Vegetation Areas.
integration of BMPs

1. Regulatory language hindrances

2. Hydromodification control requirements (performed under Joint Effort)

3. Applicability and Exemptions/Feasibility Criteria (performed under Joint Effort)

4. Non-Structural Practices
   - Site Assessment
   - Clustering

5. Structural Practices/Design Specifications
   - Landscaping and vegetation
   - Streets
   - Parking Lots

6. Maintenance
PLANT LISTS

A Sample Project

PLANT LISTS

Central California Coast
Technical Assistance Memo (TAM)

LID Plant Guidance for Bioretention
Low Impact Development

Plants specially selected for use with low impact development (LID) systems provide function. Under a 100% runoff, high-elevation system, plants are selected for their ability to retain and slow runoff, providing aesthetic value and water conservation benefits. In addition, many species are native to the LID region, providing additional ecosystem benefits.

This Technical Assistance Memo (TAM) provides plant selection guidance for the most common bioretention features, such as swales, flow-through planters, and raingardens. Under an LID system, plants are selected for their ability to retain and slow runoff, providing aesthetic value and water conservation benefits. In addition, many species are native to the LID region, providing additional ecosystem benefits.

The intent of this TAM is to offer designers, municipalities, developers, and homeowners with examples of plant species and strategies they can easily use to design and construct regionally appropriate bioretention planting areas. The plants proposed here were selected because they meet multiple criteria including an ability to tolerate or thrive in wet and drought conditions, availability for purchase at plant nurseries, low maintenance characteristics and non-invasive nature. Although most of the plants on this list are California native species, there are also some non-native species included. These non-natives were screened to exclude potentially invasive species and are included because they provide beneficial characteristics for use in bioretention facilities, are readily available and they serve to broaden the plant palette available for LID projects.
methods

PLANT LISTS

Bioretention Facility Types
Bioretention facilities can be configured in nearly any shape. They work by trapping runoff in a reservoir before filtering it through plants and a biologically active soil mix and when feasible infiltrating it into the ground. Where native soils are shallow or impermeable or when constructed as part of a building, an underground ceramic treated runoff to the approved storm drain or surface drainage system.

Bioretention Swale: Similar to a channel, a swale is a natural or constructed depression located along a roadway. They are typically planted with grasses and other vegetation. A porous pipe or underground tank is used to convey the water to a storm drain or to storage areas that treat and clean the water.

Rain garden: A rain garden is a landscaped area that diverts or reduces stormwater runoff. These areas are typically planted with native plants and grasses. Rain gardens are effective in treating smaller amounts of runoff and are often used as part of a larger stormwater management system.

Stormwater Planter: A rain garden is a landscaped area that diverts or reduces stormwater runoff. These areas are typically planted with native plants and grasses. Rain gardens are effective in treating smaller amounts of runoff and are often used as part of a larger stormwater management system.

Plants for Bioretention Areas

<table>
<thead>
<tr>
<th>Common Name</th>
<th>Scientific Name</th>
<th>Growth Zone</th>
<th>Height</th>
<th>On-Center Spacing</th>
<th>Notes</th>
<th>Category, Zone</th>
<th>Plant Characteristics</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sedum</td>
<td>Sedum</td>
<td>Zone A</td>
<td>6&quot;</td>
<td>1'</td>
<td>2&quot;</td>
<td>Low maintenance, drought resistant</td>
<td>Zone A</td>
</tr>
<tr>
<td>Euonymus</td>
<td>Euonymus</td>
<td>Zone A</td>
<td>8&quot;</td>
<td>1'</td>
<td>2&quot;</td>
<td>Moderate growth rate, drought resistant</td>
<td>Zone A</td>
</tr>
<tr>
<td>Magnolia</td>
<td>Magnolia</td>
<td>Zone A</td>
<td>12&quot;</td>
<td>1'</td>
<td>2&quot;</td>
<td>Ornamental, slow growth, drought resistant</td>
<td>Zone A</td>
</tr>
<tr>
<td>Japanese Maple</td>
<td>Acer</td>
<td>Zone A</td>
<td>14&quot;</td>
<td>1'</td>
<td>2&quot;</td>
<td>Ornamental, shade tolerant, drought resistant</td>
<td>Zone A</td>
</tr>
</tbody>
</table>

Plant selection, layout, and quantities can be determined by following the bioretention swale example. For this project, a developer is installing a 100 feet long bioretention swale along one edge of a parking lot.

The swale is 110 feet long and 14 feet wide. The design features include:

- A 10-foot wide bioretention zone, which is 80 feet long.
- A 5-foot wide area for stormwater management, which is 80 feet long.

The swale is designed to treat and clean stormwater runoff before it enters the storm drain system. The swale is also planted with a combination of native plants and grasses to provide aesthetic value and improve the local ecosystem.
methods

CURB DESIGN

STORMWATER MANAGEMENT MANUAL TYPICAL DETAILS

- Green Streets -
Concrete Inlet, Type SW
For Local Service Streets

SW-330

NOTES:
1. Concrete splash pad necessary where water enters and/or exits facility.
2. For stormwater facility, install washed pea gravel or river rock to transition from splash pad to topsoil.
CURB DESIGN

GENERAL NOTES

1. CURB INLET SHALL BE CONSTRUCTED IN ACCORDANCE WITH ASTM C 478/AASHTO M 199 & ASTM C 950 UNLESS OTHERWISE SHOWN ON PLANS OR NOTED IN THE PROJECT SPECIAL PROVISIONS.

2. TOP SURFACE TO BE GROOM FINISHED.

3. ALL EXTERNAL EDGES NOT LABELED SHALL BE TROWELED WITH 1/4" RADIUS EDGER.

4. INLETS SHOULD BE SPACED CONSISTENT WITH CATCH BASIN SPACING REQUIRED IN THE STORM WATER MANUAL.

5. WHERE CURB INLETS ARE USED, APPROXIMATELY 6 INCHES OF ROCK OR OTHER EROSION PROTECTION MATERIAL SHOULD BE USED TO DISSIPATE ENERGY AND/OR FLOW DISPERSION.

6. PERVIOUS PAVING MAY BE USED FOR INLET WITH CITY APPROVAL.

CITY OF KENT
ENGINEERING DEPARTMENT

LID TYPICAL DETAIL
CURB & GUTTER INLET

SPECIFICATION
LID 6-5 (c)
CURB EXTENSIONS

NOTES:
2. Width of curb extension: 8 ft. outside of curb is gutter elevation, 10 ft. outside of curb is sidewalk.
3. Length of curb extension: 6 in. for each increase of 10 ft. in gutter elevation.
4. Special requirements may be necessary on steep slopes & for facilities designed to include discharge.
5. Stormwater inlets and outfalls are required to provide a 2-in. drain pipe at each station.
6. Stormwater extension must be set above inlets and outlet extensions to allow overflow to drain into street before overtopping.
10. Special requirements for water lines, motors, and the remainder: See sheet SW-356 for details.
11. Depending on location, utility lines may need to be considered.
13. Where feasible, width of stormwater facility may equal the width of the street.
14. See Green Street Planting details SW-430 through SW-432.

For more information contact:
PCOT (503) 823-7994
PBES (503) 823-7001
PWS (503) 823-7365
PBES (503) 823-4125

STORMWATER MANAGEMENT MANUAL TYPICAL DETAILS
- Green Streets -
  Curb Extension
  In-Planter Plan

SW-321

PLANT LEGEND
SYMBOL  BIOTIC NAME  COMMON NAME
CAMASSIA QUAMASH  COMMON CAMAS
CAREX DENSEA  DENSE SEDGE
CORNEAL SERECA "KELSEYI"  KELSEY DOGWOOD
DESCHAMPSIA CESPITOSA  TUFTED HAIR GRASS
JUNCUS PATENS  SPREADING RUSH

STORMWATER MANAGEMENT MANUAL TYPICAL DETAILS
- Green Street Landscape Information -
  Vegetated Curb Extension
  Example Landscape Template

SW-431
methods

Curb Extensions

Portland, OR
CURB EXTENSIONS

Los Angeles, CA
methods

PARKING LOTS – STANDARD DETAILS

PARKING LOTS – STANDARD DETAILS

NOTED:
1. UNDERPLAIDS ARE ONLY PERMITTED IN SOILS WITH INFILTRATION RATES INADEQUATE TO MEET MAXIMUM POUR AND SUBDRAIN RATES.
2. WHERE PERFORATED CURBS, OR WHEEL STOP S FLUSH WITH THE PAVEMENT, ARE USED, APPROXIMATELY 6 INCHES OF ROCK OR OTHER EROSION PROTECTION MATERIAL SHOULD BE USED TO DISSIPATE ENERGY AND/ON FLOW DISPERSION. SEE PLAN NO. LID A.

Oxnard, CA
methods

PARKING LOTS

Portland, OR

Fremont, CA
PARKING LOTS

Downey, CA

Caltrans – San Diego, CA
methods

PARKING LOTS

Spokane, WA
methods

TREE FILTER BOXES

Los Angeles, CA
STREETS

NOTES
1. CURB AND SIDEWALK JOINTS AS PER EVERETT STANDARDS.
2. REFER TO EVERETT STANDARDS FOR DRIVEWAY DETAILS.
3. FOR CURB RAMP DETAILS SEE EVERETT STANDARDS.
4. SIDEWALKS MAY BE PERVIOUS WHERE SITE AND SOIL CONDITIONS MAKE LID FEASIBLE. SIDEWALKS SHALL BE A MIN. OF 5'-0" IN WIDTH. SEE LID-10 FOR PERVIOUS PAVING DETAILS.
5. FOR LID BIOTRETENTION SWALE DETAIL SEE LID-08.
Urban swale systems are a hybrid of standard urban curb and gutter with a more rural or suburban swale drainage system. It provides a rigid pavement edge for vehicle control, street sweeping, and pavement protection, while still allowing surface flow in landscaped areas for stormwater quality protection.

Characteristics
- Runoff travels along the gutter, but instead of being emptied directly into catch basins and underground pipes, it flows into surface swales.
- Stormwater can be directed into swales either through conventional catch basins with outfall to the swale or notches in the curb with flowline leading to the swale.
- Surface runoff, downhill pollutants, suspended solids (including heavy metals, nutrients), oil and grease by infiltration.

Applications
- Residential developments, commercial office parks, arterial streets, concave medium islands.
- Swale system can run either parallel to roadway or perpendicular to it, depending on topography and adjacent land uses.

Design
- Site curb opening or catch basin for design storm.
- Multiple curb openings closely spaced are better than fewer openings widely spaced because it allows for greater dissipation of flow and pollutants.
- Provide energy dissipators at curb notches or catch basin outfall into swale.

Bay Area Design Guidance Manual
URBAN SWALE DESIGN GUIDANCE

1. BIOTRETENTION SOIL, COMPOSITION AND PH LEVELS SHALL MEET THE STANDARDS SET FORTH IN THE LID TECHNICAL GUIDANCE MANUAL FOR PUGET SOUND (CURRENT EDITION).  

2. PLANTING SHALL CONSIST OF NATIVE SPECIES ABLE TO TOLERATE VARIABLE SOIL MOISTURE CONDITIONS, PONDING WATER FLUCTUATIONS, AND VARIABLE SOIL MOISTURE CONTENT. SEE APPENDIX 3 IN THE LID TECHNICAL GUIDANCE MANUAL FOR PUGET SOUND (JANUARY 2005, OR AS AMENDED) FOR A "BIOTRETENTION PLANT LIST".

3. AT LEAST 18 INCHES OF BIOTRETENTION SOIL MIX IS REQUIRED BELOW THE DESIGN WATER ELEVATION. ABOVE THIS ELEVATION AT LEAST 6 INCHES OF BIOTRETENTION SOIL MIX IS REQUIRED. COMPACT SOILS MUST BE SCARRIED AT 4 INCHES BELOW THE AMENDED LAYER.

4. UNDERDRAINS ARE REQUIRED IN SOILS WITH INFILTRATION RATES INADEQUATE TO MEET MAXIMUM POOL AND SYSTEM DEWATER RATES.

5. SEE STR 02-LID FOR CURB INLETS.

6. ZONE 1 PLANTINGS SHOULD BE USED BELOW THE DESIGN WATER ELEVATION.
methods

CONCAVE MEDIAN DESIGN GUIDANCE

Bay Area Design Guidance Manual
methods

CONCAVE MEDIAN EXAMPLE

Downey, CA
methods

BIORETENTION PLANTER BOX – STANDARD PLAN

Figure 1-1
October 2008

Typical Alternative Concept
Infiltration Planter/Bioretention
methods

BIORETENTION PLANTER BOX – STANDARD PLAN

Figure 1-1
February 2009

Typical Alternative Concept Planter Box
methods

CODE EXAMPLES

LID PLAN: STORMWATER PLANTER

CODE EXAMPLES

drafting regulatory language & standards
methods

BIORETENTION PLANTER BOX

Los Angeles, CA
POROUS PAVEMENT DETAILS

NOTES:
1. Geotextile for underground separation required only on Type "C" and "D" soils.
2. Subgrade should not be compacted.

PERVERSIVE CONCRETE SIDEWALK

4" MIN. DEPTH 1-1/2" TO 3" WASHED ROCK

PERVERSIVE CONCRETE SURFACING

4" MIN. DEPTH 1-1/2" WASHED ROCK

GRASS PAVING

NOTES:
1. Geotextile for underground separation required only on Type "C" and "D" soils.

MODULAR PLASTIC GRID SYSTEM (E.G. GRASS PAV OR EQUIVALENT)
FILL GRID WITH SANDY LOAM TOPSOIL MIX
4" MIN. COMPACT DEPTH CRUSHED SURFACING TOP COURSE
4" MIN. COMPACT DEPTH CRUSHED SURFACING BASE GRAVIE

TOP OF GRID 1" BELOW TOP OF ASPHALT
3" MIN. COMPACT DEPTH CLASS "A" ASPHALT 2 LIFTS REQUIRED
1. Regulatory language hindrances

2. Hydromodification control requirements (performed under Joint Effort)

3. Applicability and Exemptions/Feasibility Criteria (performed under Joint Effort)

4. Non-Structural Practices
   - Site Assessment
   - Clustering

5. Structural Practices/Design Specifications
   - Landscaping and vegetation
   - Streets
   - Parking Lots

6. Maintenance
Maintenance of Low Impact Development Facilities

Revised December, 2008

Prepared by: Washington State University

For: Puget Sound Partnership

Ahbl
Protection of Low Impact Development IMPs During Construction

Purposes.
Protection of Low impact development (LID) integrated management practices (IMPs) from sediment and compaction requires appropriate construction planning and sequencing to minimize exposure to damaging activities and comprehensive temporary erosion and sediment control. Once installed, LID IMPs are susceptible to sedimentation and compaction until all construction is complete and the project site has been permanently stabilized. Briefing contractors before and during construction, as well as installation of temporary erosion and sediment (TES) controls and protective fencing during all phases of construction is necessary to assure the long-term function of the LID IMPs.

In the event of transitions between construction site management, TES controls and protective fencing shall be installed by the outgoing contractor prior to the transition. A site plan drawing indicating locations of LID IMPs, TES controls and protective fencing shall be provided by the outgoing contractor to the site owner. The site owner shall furnish copies of this site drawing to the incoming contractor. The incoming contractor shall maintain and repair the TES controls as necessary until job completion or subsequent contractor transition. In the event of delays between contractor transitions, it shall be the site owner’s responsibility to regularly inspect and repair TES controls. This may be accomplished via contractual agreements with the outgoing contractor.

General Protection Measures.
Storage or staging of construction and landscaping materials and equipment is prohibited on pervious pavements and within vegetated LID IMPs. Pervious pavements, vegetated IMPs, their side slopes and entrance and exit structures shall remain free of all materials and equipment during all phases of construction excluding materials installed for protection purposes.

Access in pervious areas shall be limited or prohibited as follows:
- Vehicular and heavy equipment access over pervious pavement subgrades shall be limited to activities necessary for subgrade preparation and approved by the engineer.
- Vehicular and heavy equipment access over wearing courses is prohibited until pavement is sufficiently cured.
- Vehicular and heavy equipment access through vegetated IMPs is prohibited.
- Pedestrian access into vegetated IMPs shall be limited to necessary activities including subgrade preparation, under-drain, flow entrance and outfall installation and planting operations.
- All other pedestrian access into vegetated IMPs is prohibited unless approved by the Engineer.

Debris, chemicals, sediment or sediment-containing runoff shall not be directed toward pervious pavements. Temporary erosion and sediment controls shall be used to prevent construction or sediment containing runoff from entering vegetated IMPs. Where no practical method to direct sediment laden construction flows away from vegetated BMP’s exists, an approved plan for sediment removal, soil rehabilitation, infiltration verification and completion shall be provided by the engineer.

Airborne dust shall not be allowed to deposit or collect on pervious pavements.
SECTION THREE
The importance of establishing clear maintenance criteria that can be understood by staff during the preparation of the amendments to the regulatory standards:

- By elected officials for policy purposes such as budgeting
- By applicants making application for new development
- Property owners
Maintenance Code Example:

18.72.090 LID features protection and maintenance.

A. All low impact development projects shall record a legal instrument acceptable to the City against the land title to ensure that the low impact development features are protected and maintained.

B. All LID projects shall provide a maintenance plan/program to the City that has been approved by the City, including source control BMPs.

1. The maintenance plan/program shall address the following:
   a. How all of the elements of the LID system will be maintained, including
      i. Structural and drainage maintenance;
      ii. Vegetation management; and
      iii. Establishment and appropriate long-term irrigation.
   b. The schedule for ongoing maintenance of all LID project facilities.
   c. The responsible party for ongoing maintenance of all LID project facilities.

2. The agreement must include wording that if all or part of any LID approach ceases to function or is removed, equivalent LID approach(es) must be installed and all other stormwater management requirements met, prior to removal.

3. Declaration that failure to maintain all LID project facilities as established in the maintenance plan/program may result in the City performing the necessary maintenance and billing the responsible property owner(s) subject to Chapter 18.71 LFPMC.
Performance vs. maintenance standards:

**Performance:** a warranty that the system operates as it was designed

**Maintenance:**
- Short Term – ensures that the system becomes established in order to function properly long term
- Long Term – ensures the system continues to operate as it was intended to over time
What types of tools exist for ensuring short and long term performance? And how might they be integrated into local controls?

- Performance Bond
- Approved by certified engineers or other qualified professionals at regular intervals and as needed

How might maintenance provisions be integrated into local development controls?

- Permit conditions
- Enforcement procedures
What types of educational materials should be prepared for use with property owners after completion of design?

• Maintenance manuals and guidebooks & brochures
• LID Manuals
• Interpretive Signage
General Maintenance Guidelines

In addition to providing beauty, the storm garden is specially designed to capture storm flows from the street. Each component is carefully placed to ensure that the stormwater that needs to be treated (the first flush) is collected in the garden, while excess flows continue to the existing drain system.

- Do not block any flows from entering the garden. Low flows and nuisance flows are designed to enter this garden and some pools within the storm garden (especially the first flush) may remain well for extended periods of time.

- It is important that water can freely enter the garden for treatment. The concrete entrance and drainage are designed so that they can be swept clean with a hose or a garden hose at a high pressure. Please do not remove any sediment build-up that can allow water to pass through. High pressure and sediment flows from these areas should be cleaned and placed in the trash. Do not place them in the street or in the storm garden.

- The rock pads are to filter sediments and prevent erosion. Do not remove the rocks and please place them back into the pads if a larger stone causes them to move.

(continued on back of brochure)

MAINTENANCE MANUAL

The project makes use of three different plant palettes, depending on sun exposure. Use these pictures to determine which plants are on your section of street and follow these simple maintenance guidelines.

Partial Sun / Shade

1. Hemerocallis 'Stella d'Oro' - 'Stella d'Oro Daylily

2. Spirea japonica 'Little Princess' - Little Princess Japanese Spirea

3. Peonia lactiflora - Blue Flowers

4. Mahonia repens - Creeping Mahonia

(See "Foliage" guidelines)

Full Shade

1. Hosta fortunei 'Albo-marginata' - White Variegated Hosta

2. Iris missouriensis - Western Blue Iris

3. Arctostaphylos uva-ursi - Kinnikinic

4. Mahonia repens - Creeping Mahonia

(See "Full Sun" guidelines)
Slow it. Spread it. Sink it!
A Homeowner’s Guide to Greening Stormwater Runoff

Practical and Eco-Friendly Ways to Protect Your Property and the Environment from the Effects of Stormwater Runoff

Conservation District of Santa Cruz County
examples

**INTERPRETIVE SIGNAGE**

**WHAT IS A STORM GARDEN?**

- Shallow landscaped depressions with a designed soil mix and plants adapted to the local climate and soil moisture conditions that receive stormwater from a small contributing area.
- Facilities designed to more closely mimic natural conditions, where healthy soil structure and vegetation promote the infiltration, storage, and slow release of stormwater flows.
- Small-scale, dispersed facilities that are integrated into the site as a landscape amenity.
- Storm gardens can be used as a stand-alone practice on an individual lot; for example, however, best performance is achieved when integrated with other LID practices.

**THE BENEFITS**

- **PROVIDE HABITAT** for beneficial insects & birds
- **REDUCE FLOODING** on neighboring property, overflow in sewers, and erosion in streams by absorbing water from impervious surfaces
- **FILTER** oil and grease from driveways, pesticides and fertilizers from lawns, and other POLLUTANTS before they reach the storm drain and eventually streams, wetlands, lakes and marine waters
- **Increase the amount of water that soaks into the ground & RECHARGE LOCAL GROUNDWATER**

For more information about storm gardens, call 509.392.5019

Washington State University and Nevada-Las Vegas Neighborhood

RMG

Integrating Maintenance Enforcement into Development Controls
What are the maintenance and educational strategies related to chain of title that should be considered?

- Title Notification
- Easements
The role of studies, pilot projects, and other “findings of fact” that can aid staff during the adoption phase of the regulations and standards.

Solicit feedback as to those external resources that would be most helpful to local staff during the adoption phase.

The adoption of hydromodification control requirements can be a challenging exercise even in the most supportive of legislative settings.
When should external resources be collected?

- Timing of collecting these resources and the value they may hold when working with a stakeholder or other technical working group.
Studies and resources that have provided support during the adoption phase in jurisdictions that have integrated hydromodification controls into codes:

- Cost studies (including capital and maintenance)
- Maintenance procedures (especially important for stakeholders & elected officials)
- Listings of nearby practices
- Identification of other areas (preferably in California) that have adopted hydromodification control requirements that include LID.
Reduction of Stormwater Costs through Low Impact Development (LID) Strategies and Practices
Low Impact Development mimics the natural water cycle of the landscape, reducing the negative impacts of storm water runoff pollution on streams and rivers.

Communities first learning about Low Impact Development (LID) often ask, “Does it cost more than conventional development?”

Decision makers may ask “How can we communicate the costs and benefits of LID to developers and citizens?”

The purpose of this factsheet is to provide basic economic information on Low Impact Development. This simplified overview of a complicated topic is intended to help citizens, developers, and policy-makers have an informed discussion about the costs, benefits, and trade-offs of LID in their community.

The importance of recognizing long-term benefits of LID and those benefits that are not easily monetized are also highlighted.

The factsheet is a summary of information from multiple sources, including some examples of LID economic studies. We are thankful for the original researchers’ and writers’ time and effort.

Every LID site will have different costs and benefits based on many things including the site itself, the development design, and construction costs. There is a perception that any change to traditional development norms, including new technology will have higher costs and less profit. Numerous examples in this factsheet prove otherwise. In addition, protecting natural ecosystems through sound LID practices provides numerous benefits to communities.

This fact sheet results from a project in Transylvania County, NC. A US Environmental Protection Agency grant provided through the NC Division of Water quality allowed NC Cooperative Extension and other partners to work with the Transylvania Natural Resources Council to involve the community in open discussions about the use of Low Impact Development to allow growth and protect natural resources.
Maintenance of Low Impact Development Facilities

Revised December, 2008

Prepared by:
WASHINGTON STATE UNIVERSITY
PIERCE COUNTY EXTENSION

For:
Puget Sound Partnership
our sound, our community, our chance
The importance of cataloging local examples that can be found within a few hour drive of the local jurisdiction:

- Allowing decision makers to understand what the practices look like in the ground.
- Providing comparable examples so that decision makers understand that the practices are not only applicable and used elsewhere. This will allow decision makers to rest assured that they are not out on a limb adopting untested standards.

A valuable resource that is continually evolving with new information about hydromodification control and LID practices can be found on the LID portal at the California Stormwater Quality Association website (http://www.casqa.org)
What materials would you find most useful during the preparation process?

What materials do you anticipate would be most useful during the adoption phase?
CONCLUDING REMARKS:

The gap analysis will be an important tool for systematically determining where your heavy lifting should be prioritized.

Other communities, such as San Mateo County and the cities of Los Angeles, Portland, and San Diego (among many) have already modified many of their existing codes and standards, so you can assemble examples from these jurisdictions to save in time and effort. Other excellent examples to draw from can be found from the City of Santa Barbara.

In addition to your code language, engineering details should include provisions that allow for the use of LID BMPs as a hydromodification control practices.
Central California Municipal Regulatory Update Assistance Program (MRUAP)

**SESSION ONE**
1a: Wed Jan 12 2011 9-11 a.m.
1b: Thu Jan 13 2011 9-11 a.m.
1c: Tue Jan 18 2011 9-11 a.m.

**SESSION TWO**
2a: Thu Jan 20 2011 9-11 a.m.
2b: Fri Jan 21 2011 9-11 a.m.
2c: Mon Jan 24 2011 9-11 a.m.
TRAINING PARTICIPANTS:

After the full training is complete, please email Darla Inglis dinglis@ucde.ucdavis.edu with the name and organization (e.g., city, county, university, firm, etc.) of each participant.
Central California Municipal Regulatory Update Assistance Program

[MRUAP]

SESSION THREE PREVIEW