Low Impact Development Process (MR #5)
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Background on LID in Western WA

- PCHB Requirements from 2007 Permits
- Two LID Advisory Committees
- Expanded MR #5
  - LID Performance Standard
  - List Option
  - More than just on-Site BMPs

Evaluate Site Conditions (Vol. I, 3.1.1)

- Survey
- Site Layout
- Soils Report
  - Infiltration Rate(s)
  - Soil Suitability Criteria
- Distance to Ground Water
Recommended Infiltration Testing

- Small PIT Test
- Large PIT Test
- Grain Size
  - $D_{10}$, $D_{50}$, $D_{90}$
- Local jurisdictions can accept other

Permanent Stormwater Control Plan (Vol. I, 3.1.5)

- Level of detail depends on MRs
- Specific Discussion on items to include in submittals for review
  - LID
  - Water Quality
  - Flow Control

Paths to Requirements

- Flow Control Exempt Basins
- Small Projects MR #1 - #5 only
- Large Projects MR #1 - #9
  - Inside UGA
  - Outside UGA
    - < 5 acres
    - => 5 acres

Flow Chart for Determining LD MR #5 Requirements

1. Does the project discharge to Flow Control Exempt Waters (per Minimum Requirement [MR] #7)?
   - Yes
   - No

2. Does the project trigger only MRs #1 - #5? (Per Figure 3.2 or Figure 3.3 in Appendix 1 of the 2013-2018 WWQA Phase II Permit & Phase I Permit.)
   - Yes
   - No

3. No, the project triggered only MR #2
   - No additional requirements

REQUIRED: Implement the following BMPs where feasible:
- BMP T5.13: Post-Construction Soil Quality and Depth
- BMP T5.10A, B, or C: Downspout Full Infiltration, Downspout Dispersion Systems, or Perforated Stub-out Connections
- BMP T5.11 or T5.12: Concentrated Flow Dispersion or Sheet Flow Dispersion

NOT REQUIRED: Achievement of the LID Performance Standard. Applying the other BMPs in List #1 or List #2.

Paths to Requirements

- Flow Control Exempt Basins
- Small Projects MR #1 - #5 only
- Large Projects MR #1 - #9
  - Inside UGA
  - Outside UGA
    - < 5 acres
    - => 5 acres
Does the project trigger only MRs #1 - #5? (Per Figure 3.2 or Figure 3.3 in Appendix 1 of the 2013-2018 WWA Phase II Permit & Phase I Permit.)

Yes

Projects subject only to MR #1 - #5

List #1

Lawn and landscaped areas:

- Soil Quality and Depth

Glacial till: high in runoff and poor turf quality

Same soil with 30% compost added. Up to 50% less runoff. Turf still healthy 4 years later

Photos: UW Test Plots

A Brief Interlude on Infeasibility Criteria

- BMP Specific
- Listed with BMP Design Criteria
- Applicable to List Options Only

List #1

- Soil Quality and Depth

REQUIRED: Meet the LID Performance Standard through the use of any BMP(s) in the 2012 SWMWW or the LID Technical Guidance Manual for Puget Sound except for Rain Gardens (the use of Bioswales is acceptable).

REQUIRED for Projects Triggering MR #1-9:
Apply BMP T5.13 Post-Construction Soil Quality and Depth.


NOT REQUIRED: Applying the BMPs in List #1 or List #2.
Roofs: Consider in order listed; use first feasible

- Full Dispersion or Downspout Full Infiltration
- Rain Gardens or Bioretention
- ≥ 5% of drainage area
- Downspout Dispersion Systems
- Perforated Stub-out Connections

List #1

Paths to Requirements

- Flow Control Exempt Basins
- Small Projects MR #1 - #5 only
- Large Projects MR #1 - #9
  - Inside UGA
  - Outside UGA
    - < 5 acres
    - ≥ 5 acres

Other Hard Surfaces (driveways, roads, patios, walks, parking lot) consider in order listed; use first feasible

- Full Dispersion
- Permeable pavement, or Rain Gardens, or Bioretention
- ≥ 5% of drainage area
- Sheet Flow Dispersion, or Concentrated Flow Dispersion
Flow Chart for Determining LID MR #5 Requirements

Projects subject to MR #1 - #9 inside the UGA or outside the UGA on < 5 acres

1. Does the project trigger only MRs #1 - #5? (Per Figure 3.2 or Figure 3.3 in Appendix 1 of the 2013-2018 WWQWA Phase II Permit & Phase I Permit.)
   - Yes
   - No, the project triggered MRs #1 - #9.

2. Is the project inside the UGA?
   - Yes
   - No, project triggered MRs #1 - #9.

3. Did the project developer choose to meet the LID Performance Standard?
   - Yes
   - No, project developer chose List #2.

   REQUIRED: Meet the LID Performance Standard through the use of any BMP(s) in the 2012 SWMWW or the LID Technical Guidance Manual for Puget Sound except for Rain Gardens (the use of Bioretention is acceptable).

   REQUIRED for Projects Triggering MR #1-9*: Apply BMP T5.13 Post-Construction Soil Quality and Depth.

   NOT REQUIRED: Applying the BMPs in List #1 or List #2.

   REQUIRED: For each surface, consider the BMPs in the order listed in List #2 for that type of surface. Use the first BMP that is considered feasible.

   NOT REQUIRED: Achievement of the LID Performance Standard.

List #2

**Lawn and landscaped areas:**

- **Soil Quality and Depth**
  - Glacial till: high in runoff and poor turf quality
  - Same soil with 30% compost added. Up to 50% less runoff. Turf still healthy 4 years later

Photos: UW Test Plots

**Roofs:** Consider in order listed; use first feasible

- Full Dispersion or Downspout Full Infiltration
- Rain Gardens or Bioretention
- > 5% of drainage area
- Downspout Dispersion Systems
- Perforated Stub-out Connections
Other Hard Surfaces consider in order listed; use first feasible

- Full Dispersion
- Permeable pavement, or Rain Gardens, or
- Bioretention
  * > 5% of drainage area
- Sheet Flow Dispersion, or Concentrated Flow Dispersion

Paths to Requirements

- Flow Control Exempt Basins
- Small Projects MR #1 - #5 only
  - Large Projects MR #1 - #9
    * Inside UGA
    * Outside UGA
      - < 5 acres
      - >= 5 acres

Flow Chart for Determining LID MR #5 Requirements

Projects subject to MR #1 - #9 outside the UGA on a parcel ≥ 5 acres

Does the project trigger only MRs #1 - #5? (Per Figure 3.2 or Figure 3.3 in Appendix 1 of the 2013-2018 WWA Phase II Permit & Phase I Permit.)

Is the project inside the UGA?

No, the project is outside the UGA

Is the project on a parcel of 5 acres or larger?

REQUIRED: Meet the LID Performance Standard through the use of any BMP(s) in the 2012 SWMMWW or the LID Technical Guidance Manual for Puget Sound except for Rain Gardens (the use of Bioretention is acceptable).

If the project can’t meet the LID Performance Standard, it must be redesigned to meet the LID performance standard or an exception / variance must be approved.

REQUIRED: Apply BMP T5.13 Post-Construction Soil Quality and Depth.

NOT REQUIRED: Applying the BMPs in List #1 or List #2.
Projects Triggering MR #1 - #9

<table>
<thead>
<tr>
<th>Project Type &amp; Location</th>
<th>Requirement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Development (new or redevelopment) on any parcel inside the UGA, or development outside the UGA on a parcel less than 5 acres</td>
<td>LID Performance Standard and BMP T5.13 OR List #2 (applicant option)</td>
</tr>
<tr>
<td>Development (new or redevelopment) outside the UGA on a parcel of 5 acres or larger</td>
<td>LID Performance Standard and BMP T5.13</td>
</tr>
</tbody>
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LID Performance Standard vs Flow Control Standard

- LID Performance Standard addresses the lower, more frequent stormwater flows (8% of 2-year through 50% of the 2-year).
- Flow Control Standard addresses the higher, less frequent stormwater flows (30% of the 2-year through the full 50-year).

Flow Control Standard

MR #7

LID Standard

Control durations from 8% of 2-year through 50% of 2-year.
Don’t forget Minimum Requirements #6 (Water Quality Treatment) and #7 (Flow Control) during the review.

Additional Jurisdictional Requirements
- Inspections and Maintenance
- Covenants for On-site BMPs
- Right-of-entry for O&M
- Tracking of new BMPs

Training on Manual by Ecology is Coming.