

LID ELEMENT #20 : MAINTENANCE STANDARDS & INSPECTIONS

OBJECTIVE

To ensure continued performance of LID stormwater systems through proper and sufficient maintenance.

CONSIDERATIONS

To achieve the objective above, the City is planning to adopt guidelines for maintenance of LID facilities. The purpose of the memorandum is to consider whether or not to adopt the Ecology guideline for LID maintenance (Western Washington Low Impact Development Operation and Maintenance Guidance Document). The discussion below addresses the importance of maintenance and the associated challenges as a demonstration of why maintenance guidelines are necessary. Maintenance needs of LID practices will exceed the maintenance needs for traditional methods of stormwater management.

RELATED ELEMENTS

Element 19 Pre and During Construction Inspections

TRADITIONAL APPROACH TO STORMWATER SYSTEM MAINTENANCE

Maintenance of both public and private projects is subject to specific guidelines provided within the Drainage Design and Erosion Control Manual (DDECM). Maintenance of stormwater management facilities can be challenging. Regular, scheduled maintenance does not always occur with the required frequency. For public facilities, this can be the result of insufficient funding and/or limited staffing to conduct maintenance activities. Some maintenance activities occur with regular frequency, such as cleaning of pipes and catch basins to prevent street flooding. Other maintenance, like pruning plants and trees, requires more rigorous manual labor (staff time intensive) and is usually done on a seasonal or scheduled basis.

For private stormwater facilities, vegetation and stormwater ponds can be challenging to maintain. Underground systems with pipes and catch basins are also challenging. The importance of maintaining these facilities is often not understood by the system owners. Olympia codes (DDECM) contain requirements for recording of stormwater system maintenance agreements. Maintenance agreements

“Maintenance of LID facilities is essential to ensure that designed stormwater management performance and other benefits continue over the full life cycle of the installation. Some maintenance agreements and activities associated with LID practices are similar to those performed for conventional stormwater systems; however the scale, location, and the nature of an LID approach will also require new maintenance strategies.”

*Low Impact Development
Technical Guidance Manual for
Puget Sound, Puget Sound*

have helped improve understanding of the requirements for maintenance, but often this alone is insufficient to ensure all required maintenance occurs regularly. At times, a failed system or City enforcement action is needed to induce system maintenance.

CODES AND STANDARDS REVIEWED

City of Olympia Drainage Design and Erosion Control Manual (DDECM) Volume 1
Western Washington Low Impact Development Operation and Maintenance Guidance Document (Ecology Maintenance Guidance Document)

BENEFITS OF MAINTENANCE

In order for low impact development techniques to be effective, the LID facilities must be properly maintained. Bioretention facilities require management of the vegetation and periodic replacement of soil media. Infiltration facilities need to be monitored for sediment build-up and continued infiltration and drawdown. Permeable pavements need to be cleaned to prevent clogging. Without proper, on-going maintenance the function and benefits of LID facilities will be diminished or lost. The decentralized nature of LID best management practices can make maintenance difficult.

OLYMPIA CODE ANALYSIS

Currently, the requirements for on-going maintenance of stormwater management systems are specified within the City of Olympia Drainage Design and Erosion Control Manual (DDECM Volume 1 Appendices I-G1-G4). Specific checklists for proper maintenance of a variety of stormwater facilities are provided. For public facilities, these maintenance activities are conducted by City staff. Therefore, the ability to provide proper maintenance for all public stormwater facilities is dependent on sufficient funding and staffing by the City.

For private facilities, the requirement for maintenance is established through a recorded maintenance agreement between the facility owner and the City. This agreement requires that a maintenance program be followed, records of maintenance be maintained, and an annual report be provided to the City. This agreement grants the City access to the private stormwater facilities for on-going inspection and authorizes the City to provide maintenance repair if needed (at owner cost). Therefore, the City also has the responsibility of overseeing and enforcing maintenance of private facilities when maintenance is not being performed. This oversight is also subject to sufficient funding and staffing by the City.



The ability to provide proper maintenance for all public stormwater facilities is dependent on sufficient funding and staffing by the City.

HURDLES TO LID ADDITIONAL MAINTENANCE REQUIREMENTS

This element presents the following challenges:

Specialized Maintenance Requirements – LID

stormwater facilities have unique features compared to traditional stormwater systems and can have special requirements which make LID facilities more difficult, expensive, and time consuming to maintain.

Specialized training for maintenance might also be necessary. For instance, according to the Ecology Guidance Document, the skills needed to maintain a bioretention facility include: landscaping skills, plant identification skills (the ability to distinguish planted species from weeds and invasive species), erosion control knowledge, and operation of specialized equipment. Further, major maintenance could require involvement of an engineer or landscape architect. The use of fertilizers and herbicides is discouraged.



Specialized training for LID system maintenance might be necessary.

Increased Need for Enforcement – Because proper maintenance of LID facilities is crucial to their function, ensuring regular and proper maintenance occurs is essential. On private property, this will require frequent inspection and stringent enforcement by the City.

Financial Impact to City - The maintenance of LID facilities is expected to require more labor hours, specialized training, and is likely to be more expensive than traditional stormwater systems. In addition, the life cycle costs of LID facilities are not yet well known. Therefore, many of the future costs to the City are uncertain. This uncertainty can make budgeting and financial forecasting difficult.

OPTIONS CONSIDERED

LID facilities have specialized maintenance needs. They will only be effective if the City provides LID specific information on maintenance and subsequently requires its use. The purpose of the options listed below is to discuss whether the City should adopt the already established Ecology Guidance Document with revisions to incorporate Olympia specific requirements or create a new Olympia specific LID maintenance manual, and to determine which City code should include the LID maintenance information.

- Option 1: Adopt Ecology Maintenance Guidance Document as written and edit to be Olympia specific.
- Option 2: Provide select maintenance information from the Ecology Manual as an appendix to the DDECM
- Option 3: Develop new City of Olympia stormwater maintenance manual to address maintenance of LID facilities as well as other traditional stormwater management BMPs.

ANALYSIS

Option 1 (Adopt Ecology Guidance Manual – determine if should be edited). The Department of Ecology has prepared a document for operation and maintenance of the LID facilities. Ecology recommends that Western Washington Municipal Stormwater Permittees (which includes the City of Olympia) use the manual when adopting maintenance standards for their LID BMP facilities. As this manual is written for a broad area (Western Washington), it should be reviewed and edited to address conditions that are unique to Olympia. Much like the previous versions of the DDECM, Olympia has a history of revising guidance documents prepared by Ecology and adding additional requirements specific to concerns of the City.

Option 2 (Provide Maintenance Information in DDECM)

would incorporate new/additional maintenance language from the Ecology Manual into the DDECM. Stormwater maintenance information is currently included within the DDECM Volume 1 Appendix 1G. This option avoids the potential for confusion of the other options by combining all stormwater maintenance information in the same location. New language regarding types of LID facilities that are not addressed in the current regulations would need to be developed.

Option 3 (Develop new Olympia manual) would require the development of a stormwater operation and maintenance manual specifically for Olympia. This would require staff time to research and write such a manual. Any Olympia specific manual would need to comply with existing Ecology requirements. This approach would likely be costly and could duplicate efforts that have already been conducted by Ecology. However, this Option would provide the greatest opportunity to achieve uniformity and set a standard for maintenance of not only LID stormwater facilities, but also for maintenance of the existing infrastructure.

RECOMMENDATION

Staff recommends Option 3. This option would incorporate the updated guidance from the Ecology Manual and allow creation of a new guidance document for operation and maintenance specific to the needs and goals of the City's Storm & Surface Water Utility.



Proper maintenance of LID facilities is essential to their proper function. In order to provide proper maintenance, the City needs to provide maintenance guidance.

