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mid-year review/environmental

Low impact development can result in lower infrastructure development


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Low Impact Development (LID) is currently receiving substantial interest at the federal, state and Local governing levels within Massachusetts. With the goal of promoting increased LID awareness and use within the region, various organizations are providing incentives and programs to the general public, in order to garner the benefits of LID practices. The EPA has been sponsoring LID workshops and providing grants to municipalities and non-profit groups, while the Mass. Executive Office of Environmental Affairs (EOEA) has been committing significant resources to educating engineers, scientists, environmental organizations, and the general public on LID benefits. On a broader scale, the DEP is considering amending its own Stormwater Policy, in order to encourage the use of LID techniques. Over the past few years, many communities within Mass. have implemented LID projects, in an attempt to improve the quality of stormwater run-off, and several cities and towns have already, or are considering, implementing LID bylaws at the local level.

LID practices utilize structural and non-structural Best Management Practices (BMPs) in an attempt to recreate the natural hydrological cycle at the lot level, for the purpose of minimizing the amount of both peak and total run-off from a site, while improving the quality of run-off to streams, ponds, rivers, estuaries, and other water bodies. With a movement towards implementing LID bylaws, substantial opportunities will arise during site planning and design to not only improve water quality, but to provide developers and land owners with the opportunity to develop environmentally friendly projects. At the same time, properly implemented LID practices will reduce the overall costs linked to the infrastructure and opportunities associated with a site.

One of the basic strategies associated with LID is to minimize the amount of impermeable surfaces within a development. How many times have we seen a new subdivision with a 22 to 24 wide road located off of a rural collector, which may only be 18 to 20 feet wide? By reducing the pavement width, total run-off volumes can be substantially reduced, requiring smaller

diameter pipes, fewer catch basins and manholes, and smaller and shallower detention facilities.

Open roadside drainage can also provide opportunities to minimize or eliminate the need for subsurface infrastructure and large detention/retention ponds. Open drainage or vegetated swales located along the road side provide several benefits, if properly implemented. The swales can provide on-site detention, increase the opportunity for infiltration, provide substantial treatment, provide a location for snow storage, and reduce the need for subsurface infrastructure.

Bioretention facilities, more commonly referred to as "raingardens," utilize the biological interactions of the soil and plants to treat, store and infiltrate stormwater run-off.

A raingarden is a landscaping feature planted with appropriate trees, shrubs and/or perennials in a slightly depressed planting bed. An underlying mix of engineered soil, typically 2 to 3 feet thick, allows the run-off to infiltrate the ground and result in a significant reduction in pollutants. Run-off from rooftops, driveways and roadways enter the raingardens and are stored in the soil, as well as the slight surface depression, allowing for the complete infiltration within 24 to 72-hours. The raingardens provide an attractive landscape feature while collecting, storing and infiltrating the run-off, thereby reducing the need for a piped collection system. In a commercial/retail setting, raingardens can be incorporated into the parking lot and roadway de-

signs, in order to provide for the collection and treatment of the run-off, as well as to improve the aesthetic quality of the site.

Site design strategies can also have a significant effect on not only reducing stormwater run-off volumes, but also on reducing site development costs. By selecting the locations of individual houses based upon site specific issues, substantial cost savings can be obtained. Site clearing and erosion control activities can be reduced by maintaining areas of a site in their existing natural vegetation. Making use of open spaces and cluster development options can result in substantial decreases in infrastructure investments, while providing the opportunity for additional units.

The initial engineering, permit-

ting and planning processes of a site may be somewhat different from what we are experiencing, as more attention and investigation is needed to explore the soils, topography and natural resources located at a particular location. By utilizing various combinations of LID techniques, economic benefits can be achieved. A recent subdivision in the northeastern part of the state, which utilized many of the above-mentioned techniques, eliminated 90% of the subsurface drainage infrastructure, and all of the large detention facilities, resulting in an additional building lot.







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