

## **Measure 5: Post-Construction Storm Water Management**

In addition to the temporary controls required during construction, EPA Phase 2 Storm Water Rules require that all new development and redevelopment projects impacting greater than 1 acre include permanent control measures to reduce storm water impacts on receiving water to the 'maximum extent practicable (MEP).'

According to the 2000 UMD Campus Master Plan's Guidelines for Future Campus Development, "UMD, like the City of Duluth, gains character from the streams and ravines that pass through the site." It goes on to say:

- "Sound runoff management and ecological preservation will convey the message of UMD's concern for and appreciation of it's natural amenities" (pg. 64)
- "Bodies of water, including ponds, creeks, and adjacent wetlands: These areas and their shorelines should be protected from runoff effects and building encroachment." (pg. 64)
- "A plan for detention ponding and runoff filtration should be developed in response to hard surfaces." (pg. 70)

While these guidelines were written prior to our need to meet Phase II compliance, and may seem a little bit simplistic, they show that post-construction storm water management is already on the minds of the campus planners.

The newly updated *University of Minnesota Standards & Procedures for Construction's* Basic Design Requirements (<http://www.facm.umn.edu/cons/2002/Prog02.pdf>) # 3.3.3 states: "Permanent controls are based on a goal of no net increase in storm water volume, rate or pollutant loads from new construction and redevelopment that add impervious surfaces. Permanent controls include, but are not limited to, [vegetative] swales, rain gardens, sediment ponds, retention areas, pervious surfaces and other alternatives to direct plumbing."

As part of pre-design for major construction, net assessment of change in impervious surface should be conducted to quantitatively measure the increase or (ideally) decrease in impervious surfaces. Clearly, if there is an increase in impervious surfaces as a result of new development or redevelopment, options to mitigate the increase must be evaluated and included as part of the final design. Similarly, as a goal, any redevelopment project should attempt to mitigate existing impervious surfaces to pre-development levels.

According to the EPA's fact sheet on post construction runoff control, "Post-construction storm water management in areas undergoing new development or redevelopment is necessary because runoff from these areas has been shown to significantly effect receiving water bodies. Many studies indicate that prior planning and design for the minimization of pollutants in post-construction storm water discharges is the most cost-effective approach to storm water quality management." During design, the potential increase in type and quantity of pollutants in storm water runoff and the potential increase in the quantity of water delivered to the water body during storms should be addressed and mitigated to the maximum extent practicable.

Post-construction controls can be particularly difficult in cold weather climates due to frozen soils and ponds, and sand and salt use. The Center for Watershed Protection has a *Stormwater Practices for Cold Climates* manual available on line at <http://www.cwp.org/cold-climates.htm>. Several Minnesota organizations have also put out manuals that have BMP's for post-construction storm water management. Metropolitan Council Environmental Services (MCES) offers guidance on post construction storm water controls in their *Urban Small Sites Best Management Practice Manual* (<http://www.metrocouncil.org/environment/Watershed/bmp/manual.htm>), and the MPCA put out the *Protecting Water Quality in Urban Areas* manual (<http://www.pca.state.mn.us/water/pubs/sw-bmpmanual.html>).

Glensheen has received two grants from the Southern St. Louis County Soil and Water Conservation District (SWCD) and the Great Lakes Commission. The first is a "Low Impact Development Storm Water Demonstration Project". Its goal is to design, construct and test innovative storm control methods near Lake Superior. The project is looking at treating runoff from Glensheen's parking lot. This will be accomplished in the form of small ponds / garden areas between the parking lot and Lake Superior. The second is for a "Low-cost Lake Superior Shoreline Erosion Control Demonstration Project". Its goal is to design, construct and test low cost erosion control methods on the Lake Superior shoreline. The project is looking at a clay area along Glensheen's shoreline. These projects are being design by the SWCD and must be completed by September 2003.

### **Post-construction Storm Water Management Best Management Practice Summaries**

#### UMD 501 – Impervious Surface Review

Review existing impervious surfaces and make recommendations for removal of unnecessary areas, changes to pervious pavements, or disconnections from direct connections.

#### UMD 502 – Infiltration / Retention / Detention centers

Investigate the feasibility of infiltration / retention / detention centers (IRDC) in drainage zones 1, 2, 5, and 6. This would include design and possible modifications to existing wet ponds for retention capabilities, and the design and possible construction of new facilities. The centers should address water temperature, suspended solids, storm surge, floatables, and parking lot oils and greases.

#### UMD 503 – Shoreline protection

Most of the UMD properties have creek or lake shoreline. Develop setback requirements, shade trout streams and protect against erosion.