



**Clean Michigan Initiative
Clean Water Fund Grant
2002-0212**



City of Battle Creek

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City of Battle Creek LaVista Storm Drain Project

April 2004 through August 2007

The LaVista Storm Drain Project was undertaken by the City of Battle Creek to help improve storm water runoff quality to its largest lake, Goguac Lake. The City applied several low impact development (LID) techniques to control runoff from three separate storm sewer systems in the project area. The largest drainage area, LaVista at 150 acres, had the most LID techniques employed. A small bioretention basin, perforated piping, a grass swale, a large bioretention basin, and a structural vortex device were installed. Native plantings were incorporated to promote phosphorus removal and water infiltration. The two other drainage areas, Meno at 4 acres and Hulbert at 14 acres, utilized structural vortex devices only.

The primary goals of the project were to reduce storm water runoff volume and phosphorus pollutant loadings to the lake. The reduction target for both was 50 percent. Another aspect of the project was to promote the use of the LID in the Battle Creek area.



Grant Amount: \$407,676.90

Match Funds: \$512,714.94

Total Amount: \$920,391.84



Kalamazoo River Watershed

Best Management Practices:

- Enhancement of an existing drainage pond on Circle Drive (small bioretention basin)
- Boulevard retrofit with perforated piping on LaVista Boulevard.
- Large bioretention basin construction on Arbor Street.
- Grass swale area with a small rain garden at inlet.
- Pre-constructed, sub-surface screening devices at three outfalls.

Annual Pollutant Load Reductions:

- Sediment - 57.3 tons
- Nitrogen - 744 lbs
- Phosphorous - 105 lbs
- Volume Reduction - 80%



Partners involved:

- City of Battle Creek
- Goguac Lake Board
- Goguac Lake Association
- Leila Arboretum Society
- Area Master Gardeners
- Michigan Department of Transportation

I&E Activities:

- Public Meetings
- Presentations to Service Groups
- Newspaper Articles
- Goguac Lake Annual Water Quality Report & Newsletters
- Storm drain marking





Project Area Before: The aerial photo shows the 168-acre drainage area to Goguac Lake, the largest lake within the City of Battle Creek. Observed water quality concerns for Goguac Lake include periodic algal blooms and turbid and cloudy water following rain events.



Enhancement of an existing drainage pond on Circle Drive: The drainage pond was constructed with a low-grade slope with Wet to Mesic prairie plants to create a small bioretention basin.



Boulevard retrofit with perforated piping on LaVista Boulevard: Storm water was diverted to the boulevard areas where plastic perforated pipe was installed.

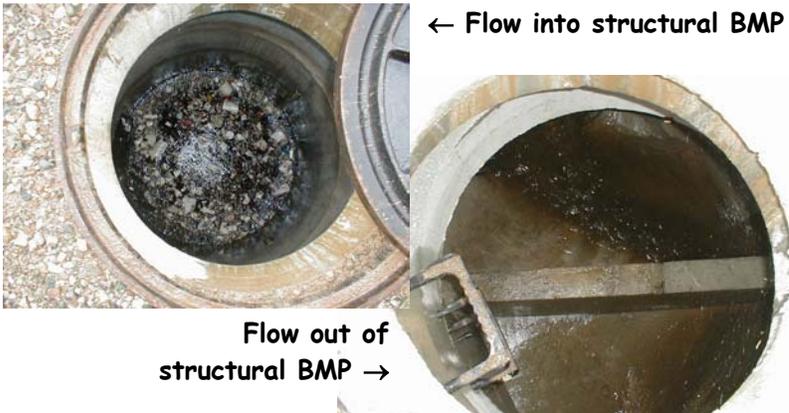


← Bioretention Basin - North Cell



Bioretention Basin - South Cell →

Bioretention basin on Arbor Street: Flow from 39 acres of a primarily commercial area was routed to a bioretention basin. The basin was planted with Wet to Mesic prairie seed. The basin was constructed in two cells: a north cell and a south cell.



← Flow into structural BMP

Flow out of structural BMP →

Pre-constructed, sub-surface screening devices at the LaVista, Meno Place, and Hulbert outfalls: Non-blocking and non-mechanical screening vortex devices were installed at the outlets from these areas to Goguac Lake. They were used because portions of the storm water sewer system could not geographically be diverted to any of the natural treatment areas.



LaVista Outfall before and after construction