

Urban Stormwater Treatment Solutions Western Michigan University, Kalamazoo, MI

The WMU Lot 23 Stormwater Treatment Project was part of a U.S. EPA Targeted Watershed Grant (Contract #WS 96569601-2), and was administered by the Match-E-Be-Nash-She-Wish Band of Pottawatomi Indians (Gun Lake Tribe). Grant funding from the EPA was used to support implementation of local BMPs to achieve load allocation goals associated with an EPA-approved Lake Allegan/Kalamazoo River phosphorus TMDL.

K&A served as the technical consultant to the Gun Lake Tribe and WMU (the landowner), providing services related to sediment and phosphorus stormwater loading estimates, pre-construction stormwater sampling, conceptual BMP treatment design/engineering, MDEQ floodplain permitting, construction plans and specifications, and construction oversight assistance. Pre-construction stormwater monitoring conducted by K&A included the use of automated ISCO sampling equipment to document actual flows and pollutant loads discharged to Arcadia Creek.

Approximately 32 acres of campus were previously discharging urban stormwater runoff to Arcadia Creek with no pre-treatment. The outfall for this drainage area was located beneath an existing 2-acre parking lot that was rarely in full use. K&A recommended reducing the size of this parking area by 50% to accommodate this new stormwater treatment system. As a result of open-minded WMU leadership, a 1-acre parcel of asphalt with no environmental benefit was converted into a naturalized stormwater treatment area with diverse habitat and water quality value.

The new sediment forebay and wet detention system is capable of treating approximately 110,000 cubic feet (2.5 acre-feet) of runoff, which is associated with a 1.5-inch, 24-hour rainfall event (between 4 to 6-month return frequency). The



captured stormwater is slowly released to Arcadia Creek over a 48-hour period following each rainfall event. Some fraction of stormwater is also infiltrated to groundwater. Construction for the Lot 23 Stormwater Treatment System began in late July 2009 and was completed in early October 2009.

Project Benefits Included:

- Stormwater treatment volume = 110,000 ft³
- Native vegetation = 1.1 acres
- Supplemental vegetative = 3,300 plants
- Photodegradable erosion controls
- Parking lot spillway repairs
- Reduction of ~32 lbs total phosphorus/yr
- Reduction of ~ 7.3 tons sediment/yr

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Project Costs:

\$25,167 (K&A)
\$121,679 (Total)

Project Duration:

2009