

**Cole Creek Culvert Replacement
Conservation Stormwater Management Design**

City of Omaha, Nebraska

In August of 1999, Cole Creek flooded, causing the loss of one life and \$220,000 in private property damages spurring a cooperative effort between the City of Omaha, the Papio-Missouri River NRD (P-MRNRD), the Nebraska Department of Natural Resources and Cole Creek neighbors to develop a hazard mitigation plan. The plan involves a voluntary buy-out program and the replacement of three culverts at Western Avenue, Hillside Drive and Seward Street.



Intuition & Logic performed a geomorphic analysis of over 16,000 feet of stream and collaborated with Kirkham Michael Consulting Engineers in the final culvert and stream design. For flood and debris conveyance, each culvert was initially designed to be 30 feet wide and 10 feet high in a stream with a normal base width of 15 to 18 feet. Intuition & Logic modified the culvert design to establish a 2-stage shape for the culverts and designed stream interventions upstream and downstream of each to transition from the natural channel to the culvert.

The 2-stage conservation culvert solution includes a unique use of waste concrete available as massive concrete blocks from local redi-mix plants. The blocks are installed inside the concrete box structure to create the low-flow channel and shelf.

Construction of the Western Avenue culvert was complete in early spring, 2005. Hillside Drive and Seward Street are scheduled for construction in 2006-2007.