

LAKE LENEXA – Providing Recreation from Rain

The focal point of a 240-acre city park, Lake Lenexa, is a new, 35-acre lake currently under construction. As the key component in the City of Lenexa’s “Rain to Recreation” program, the Lake Lenexa project was designed to provide flood control, improve water quality, provide recreation and preserve critical habitat. The project is located between urban areas in the western portion of Lenexa, southeast of the intersection of 83rd Street and K-7 highway.

Because the lake is located in an urban setting with high visibility, the design team had to incorporate local cultural factors into an aesthetically pleasing concept. Community involvement was required at all stages of project planning and design. Design factors to increase the benefit to the community included stream restoration projects, development of fish and wildlife habitat, hiking trails, wetlands areas, fishing, non-motorized boating, parks, and recreational facilities. Existing stream/riparian areas were mitigated with shoreline improvements along the lake. Augmenting the stream flow minimized the impact on downstream habitat. Architectural plans for the spillway structure and bridges, landscaping plans and recreational trails were coordinated to maximize the benefit to the community. Architectural elements in the Lake Lenexa design include curved dam alignment, unusual spillway features, a spillway bridge with viewing structure, and a spout structure.



The original Lake Lenexa dam layout incorporated relatively high, cast-in-place concrete retaining walls to form the spillway structure. The City of Lenexa (owner), Black & Veatch (Dam and Spillway Design/Construction Oversight Engineer), Kleinfelder (Materials Inspection and Testing Consultant) and Max Rieke Brothers (Contractor) performed a Value Engineering (VE) Study to determine cost-effective means to implement architectural features within the spillway. An innovative use of MSE retaining walls, normally used in transportation projects, was designed as an alternative to the original cast-in-place wall systems in the main spillway and stilling basins.



During this VE study, another innovative technology was identified to provide support for the spillway structural slabs and project features. This technology uses cement-kiln dust (CKD) mixed with on-site clay soils to produce a stabilized material. The CKD stabilized material properties include low compressibility, high strength, and low permeability, which reduced seepage and uplift pressures under the spillway slabs. The cost savings provided by the VE alternatives, CKD stabilized fill and MSE walls, reduced total costs to within the budget amount.

Project construction started in the summer of 2004 with general clearing and grubbing, excavation of the dam foundation and core trench, and placement of CKD materials. Currently, the project is in the final phase of construction with the dam and spillway scheduled for completion in the Spring 2006.