INDUSTRIAL PARK RECEIVES 500-YEAR FLOOD PROTECTION

The Dodson Industrial District is a unique mix of industrial, commercial, and retail businesses in the southeast area of Kansas City, MO. It may be the oldest, organized district in the City, dating back well before World War II. The Blue River, generally, is the southern boundary of the district. At one point, the oxbow of the river was cut off, diverting the river to its present course, leading the City to establish a landfill site in the former oxbow.

Due to the excessive and sudden flooding associated with this area, the US Army Corps of Engineers along with the City of Kansas City began a four phase construction program to build a 1.29 mile levee and floodwall system to reduce the flooding risk for this area.

This area received a record flood in 1961, equivalent to a 30-year flood. This resulted in the construction of the Bannister Federal Levee. The Dodson Industrial District is located to the north of the Bannister Federal Complex. The levee being constructed for this Flood Damage Reduction Project will be constructed from the Bannister Federal Complex levee system, just west of Prospect Avenue/Grandview Road, to Highway 71 along the eastern border of the Industrial complex, following the Blue River. This levee is intended to provide 500-year protection for the industrial complex, allowing the businesses to qualify for flood insurance.

The project studied by SVS is Phase 4 of this four phase project on the Blue River. The scope of the Value Study encompassed:

- 5,400 feet of new levee between Hickman Mills Drive Bridge and Prospect Avenue Bridge
- The levee embankment between Phase 3 and the existing Bannister Federal Complex levee system
- The levee embankment between Phase 1 and the northbound Highway 71 entrance ramp
- Three interior drainage structures
- Relocation of a sanitary sewer line and a 30-inch water main

SVS achieves over 70% implemented cost savings

Creating balance between requirements & resources
There were two major cost drivers in this project: foundation preparation and sanitary sewer relocation. Nearly 50% of the project cost was related to foundation preparation due to the old uncontrolled landfill area and the undetermined amount of buried trash. To achieve a positive seepage cutoff and reduce the large volume of excavation and disposal cost associated with removing this buried material, the Value Team recommended the use of a slurry cutoff wall that would improve the seepage control and minimize the required excavation. This concept saved $8.2 million, reducing the project cost by nearly 40%.

The sanitary sewer relocation accounted for 22% of the total project cost to remove the existing sewer line and replace it with a new line located outside the footprint of the levee. To maintain the gravity flow requires up to 30 foot deep excavations. The Value Team recommended replacing the gravity sewer with a shallow excavated force main that is set on an alignment in the city streets instead of the deep excavation at the toe of the levee required by the gravity sewer. This concept saved $3.2 million over the 100-year economic life cycle after factoring in the long term operating cost of the three proposed lift stations.

The Value Team recommended leaving the existing 30-inch water main in place and providing a concrete encasement around that portion of the pipeline underneath the levee footprint. Additionally, isolation valves would be installed for use in the event of a pipe failure. It is the opinion of the Value Team that the pipe is at lower risk of failure in its existing configuration than when four additional joints are added per the original design. This concept maintains the seepage control function while reducing the project cost by $400,000.

The Value Study also made recommendations to change the configuration of the interior drainage structures including replacement of the large flap gates with more reliable duckbill valves, moving the sluice gate to either the inlet works or the outlet works to eliminate the gatewells, and to replace the maintenance prone riprap chutes with a riprap stilling basin. These concepts will save over $400,000 over the life of the project.

Environmentally, the Value Team was concerned about the function and sustainability of the original plan configuration. The team recommended reconfiguring a proposed borrow area for levee material so that it could function as a wooded wetland while obtaining any additional borrow material from the riverbanks. This riverbank excavation would be done in such a manner to reconnect the river to its overbank floodplain. This allows the river to expand and lower the velocity before it begins scouring the channel. The reduced the cost of borrow material for the levee section by $1.9 million but more importantly it results in a more stable and thus sustainable river.