

Meeting the Challenges of Upgrading an Aging Railyard Stormwater System

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Buried stormwater and sewer system upgrades that take place during rail yard improvement projects can face many challenges. Difficult groundwater and soil conditions, erosion control, and environmental compliance issues must be managed proactively. Satisfying the requirements of numerous stakeholders while protecting water quality and sensitive ecosystems creates additional complications.

On Behalf of CN Railway, TRC provided permitting, design, and construction management for a stormwater improvement project which included a new lift station, approximately 4,700 linear feet of 24" HDPE force main, and an outfall to the Grand Calumet River located in the Lake Michigan watershed. The design involves installation of the force main through open cut, jack-and-bore, and slip-line methods. A significant portion of the project is within the Indiana Department of Natural Resources (IDNR) Pine Station Nature Preserve. This nature preserve includes sensitive species and ecosystems requiring protection during all phases of construction.

Slip-lining of an existing brick stormwater line was utilized for a large portion of the force main. In many places, attempts to slip-line failed due to the brick sewer's poor conditions and a high groundwater table causing a constant influx of sand and debris. To avoid causing extensive collapse of the brick sewer or damage to equipment, it was agreed that portions of the force main would be installed using open-cut methods instead of slip-line. Because of the unexpected need to open cut through the Nature Preserve, strict attention was given to preventing erosion and sedimentation issues. To further complicate matters, buried fly ash was encountered in a portion of the Nature Preserve during the open-cut installation. The fly ash was separated and placed on top of and covered with poly sheeting. Following laboratory testing of the fly ash, it was disposed of at a properly licensed facility. To prevent erosion and sedimentation issues, additional silt fence and erosion logs were installed, and dewatering treatment systems were placed at each area of dewatering. The dewatering systems focused on the use of bags that filtered sediment placed within geotextile lined straw bale settlement basins. Impacts to the nature preserve were minimized through the use of Best Management Practices (BMPs) and compliance with the Indiana Storm Water Quality Manual (OCT 2007) to control soil erosion and handle the dewatering activities.

The new force main was installed by jacking and boring in order to pass underneath existing railroad tracks. This includes main-line and yard tracks owned by CN and two (2) other Class 1 railroads. Main-line tracks remained in service during construction. Groundwater levels and poor soil conditions presented additional difficulty installing these portions of the force main.

Additional challenges were presented by the existence of utility lines along the project alignment. These include natural gas pipelines, compressed gas (oxygen, nitrogen, and hydrogen) pipelines, petroleum pipelines, overhead and buried electrical distribution lines, and telecommunication lines.

The project was completed successfully and on time, providing CN's rail facility with a new stormwater outfall. In order to help re-establish some of the native plants that thrived in the disturbed areas, a selection of herbaceous and woody plants were salvaged and transplanted. After completion of final grading, re-seeding with native species was also conducted. A three-year monitoring and management

program will be conducted to assure successful stabilization and restoration of sensitive soil conditions and ecosystems.