**Project Overview**

The Montclair drainage basin, the largest basin in the City and County of Denver, has no open drainage channel and the stormwater infrastructure is extremely undersized. Rainfalls greater than a 2-year storm event cause extensive surface flooding to numerous residences, businesses, railroad tracks and Interstate 70. The City embarked on a project to create a conduit system to alleviate this drainage problem. An ideal approach would have been to construct an open channel with the capacity to convey the 100-year flow to the S. Platte River; however, due to the dense existing development and lack of open space, this was simply not practical or feasible.

The team designed 4,500 linear feet of concrete conduit (8’x8’ to triple 10’x7’ boxes) to carry stormwater in a 100-year event under 17 freight train tracks, two heavy commuter rails, Brighton Blvd., the Pepsi Bottling Co. property and through an existing Superfund site on the Denver Coliseum property. One of the biggest hurdles of the conduit design was the 500-foot-long segment (four 8’ diameter pipes) tunneled under the UPRR yard. The conduit system outfalls in Globeville Landing Park in a key location, where much of the runoff from the Montclair Basin naturally enters the S. Platte River. The existing outfall was an unsightly and unsafe concrete lined channel with a steep chute and double box culverts down to the river.

In order to achieve goals for improved water quality and increased open space area, the City decided to design an open, more natural stormwater outfall, as these systems are nationally recognized as a best practice for moving stormwater, offering opportunities for providing wildlife habitat and ecosystem restoration, environmental education and improving water quality. The outfall is designed to dissipate the high-energy flow of water and features a stable, impermeable lining installed beneath the open channel to separate and protect surface water flows from potentially contaminated groundwater.

The project was a collaboration with Denver Parks and the community to completely renovate and update the existing park as part of the outfall improvements. The reconstructed park features active play areas, expansive lawn areas for recreational activities, multiple bike and pedestrian paths, outdoor seating and shaded gathering places, access to the river, and improved safety and visibility of the park. Globeville Landing Outfall and Park not only conveys stormwater, but it has become a safe and desirable community gathering place.

The project, coupled with related upstream improvements, provides flood protection for over 5,000 residences and businesses. The project was completed in four phases, over three years, at a total project cost of approximately $90 million.

**Response to Judging Criteria**

1. **Does the project enhance the public health, safety, and welfare?**
   - Eliminated large areas of shallow overland flooding for events greater than the 2-yr storm event. (2D modeling showed thousands of homes and businesses in the Montclair Basin were impacted by flooding due to the inadequate stormwater conveyance system.)
   - Eliminated flooding of Union Pacific RR yard and RTD commuter rail near 40th Avenue.
   - Removed large quantities of contaminated fill material in an EPA Superfund Site (located in the Denver Coliseum parking lot and the park).
   - Improved the health of the park by removal of contaminated near-surface soils and replacement with 3 feet of clean imported soil.
   - Removed a dangerous concrete stormwater channel/chute/double box culvert in the park.
   - Provided a wetland/riparian channel for enhancing quality of stormwater runoff, providing ecosystem restoration and wildlife habitat.
   - Provided a UV Treatment Vault to kill bacteria (eColi) and improve quality of stormwater base flows to the S. Platte River.
   - Reconstructed the east bank of the S. Platte River to be more stable and flood resistant, and provided improved and safer public access to the river.
➢ Reconstructed the park to provide a larger, open, and safer environment that encourages community recreation.
➢ Improved S. Platte River Regional Trail to bring it up to current design standards with a wider, safer alignment and separated pedestrian/bike use.

2. Does the project incorporate creative, unique or innovative solutions?
➢ Incorporated a “joint utility trench” in Brighton Blvd., combining numerous competing utilities in a common underground duct bank, which allowed room to construct the large underground box conduits (14’x12’ RCB), 22’ deep, in Brighton Blvd.
➢ Included specialty design of cast-in-place curved bends and transition structures to minimize hydraulic losses in the box conduit system.
➢ Stabilized the subgrade for construction of a cast-in-place triple 10’ x 7’ box conduit over a landfill in the Coliseum parking lot and park, using “compaction grouting” and “stone columns”.
➢ Featured a unique 300-foot long inlet structure in the open channel, with hidden horizontal orifice plates to spread out flow and maintain low velocities for public safety.
➢ Phased construction of triple 11’ x 4’ box culverts under the double 78” Delgany Interceptor sanitary sewers, including replacement of portions of both sewers, to maintain continuous sanitary service.
➢ Separated contaminated groundwater from the open channel using an impermeable LLDPE liner system and ground “strengthening layer” for support over existing landfill.
➢ Used low walls to confine the channel/liner, allowing more woody plantings in park area.
➢ Integrated an “invisible” 100-year overflow spillway seamlessly into the bluegrass park area.
➢ Reduced height of triple 10’x7’ Coliseum conduit using a special CIP structure to transition to 60’x4’ conduit at outfall to improve aesthetics and discourage people from entering the conduit.
➢ Minimized risks of methane gas accumulation in the conduit system by utilizing geonet composite on the sides of conduit for venting gas, installed grated manhole covers to improve air circulation, and specified ACI 350 standards to minimize concrete cracking.
➢ Phased improvements and high level of coordination with adjacent railroad and RTD to avoid construction impacts to their operations.

3. Can the project serve as a model for other communities and/or projects?
➢ Instead of a traditional stormwater conduit to the river, the project is a model for integrating an outfall into an existing park. The wetland channel provides water quality and wildlife habitat benefits, while creating an amenity in the park for the community.
➢ The project seamlessly achieved multiple goals: reduced flooding impacts, increased community connectivity, removed Superfund site contaminants, provided water quality benefits, conserved water through native grasses/plantings, and created a park that meets the needs of the community.
➢ The vision for the project was maintained by regular meetings with staff from the Mayor’s Office and multiple City departments. This allowed the policy makers to continue to have the political will to keep the vision at the forefront while understanding some of the detailed design challenges.
➢ The project exemplifies a collaborative process as numerous federal, state, local and private interests were actively involved: CDOT, CDPHE, CenturyLink, EPA, MHFD, MWRD, NWCO, N. Denver Cornerstone Collaborative, RTD, SHPO, UPRR, USACE, Xcel, and Zayo.
➢ The extensive public process built trust and allowed the project to balance meeting the multiple technical goals while providing a huge amenity for the community that meets their needs and desires. Regular meetings continued during construction to keep the public informed of progress and public health issues such as water quality, air quality, and soil contamination.
➢ The design of the park is a model for how to create a “sense of place” by providing detailed elements that reflect the history and culture of the site and community.
➢ The project utilized the “integrated construction contractor” method to manage design and construction, and to meet the City’s aggressive schedule and accept stormwater from upstream projects.