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Project Description
The City and County of Denver Globeville Landing Outfall project was intended to improve the storm drainage and flood protection that is replacing a smaller drainage outfall on the South Platte River. This project is a part of the Platte to Park Hill drainage program which is being developed in multiple phases. This project was located along Brighton Boulevard, which is a busy 2 lane road. This road also has many industrial businesses on it, including the Pepsi distribution center, that were needing to stay open and accessible during the construction process. This project stood out due to the size of the RCB products being used, the site conditions and the various unique project needs.

Products
The current phase discussed here is phase 2 and includes the use of 560 linear feet of 15x12, 866 linear feet of 14x12 and 1278 linear feet of 8x8 Reinforced Concrete Box (RCB) sections supplied by Forterra. The 15x12 RCB will be among the largest in service within the Denver network. Due to the weight of the large box, each of the 15x12 RCB sections were reduced to 5 feet wide resulting in each weighing roughly 48,000 pounds. This will provide enough capacity for the system to carry two times the normal flow observed on the South Platte.

Challenges
There were a few challenges that needed to be met during this project. The first included locations of the project site that were in a landfill which was originally built over an old smelter site, and thus has contaminated soils throughout this area. This required the construction crews to take extra precautions while working in these areas and also required additional joints and joint gaps restrictions, which went above and beyond the ASTM C1677 requirements for the RCB installed in those sections. During construction, compaction grouting was also utilized in order to make a stable foundation prior to the installation of the RCB.

Another challenge was the railroad line that is used by Pepsi Bottling Co. was crossing over the proposed 15x12 RCB storm drainage line. By coordinating with Union Pacific Railroad and Pepsi, the contractor had to give a 45 day notice and plan to remove the rail line, install the 15x12 RCB and replace the rail line within a 5 day window. There were time restrictions on when the 5 day window could occur which did not line up with installation scheduled for the remainder of the line. The contractor ended up installing more of the line in the Fall of 2017, then finishing under the railroad in February of 2018.
Finally, one requirement of the project was to keep Brighton Boulevard open throughout the duration of the project. Due to this, cast in place concrete was excluded and the project team continued with precast concrete products. Initially, the project looked into using a twin barrel run of 120 inch and a 96 inch reinforced concrete pipe (RCP) which would have required a trench over 40 feet wide. Due to the site restrictions and feasibility of trucking the backfill material off the site and to a landfill, the design team turned to RCB. Installation of RCB requires much smaller trench boxes and Forterra’s ability to produce large sized boxes allowed for the construction team to install one line in each location, while disturbing the least amount of soil.

**Success**

“Globeville Landing Outfall Phase 2 was the first of several large drainage projects for the City and County of Denver that required the installation of these massive box culverts to convey drainage flows. The City and County of Denver had never constructed anything of this magnitude. Being the first of anything usually poses unique challenges, and this project was no exception. Both Ames and Forterra faced several challenges but both teams worked diligently together to brainstorm ideas, test methodology and ultimately provide a product that both parties can be proud of and the client is more than satisfied with. I personally like to thank Forterra Precast for making this project a success and am looking forward to the next one!” – Shawn Kronebusch AMES Construction

This project was featured in the Denver Post on March 3, 2018.
https://www.denverpost.com/2018/03/03/
denver-globeville-landing-outfall-storm-drainage/
Forterra

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