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## Infrastructure – Invisible Importance HOBAS® Pipes Slipline Antiquated Interceptor in Minnesota, US

Minneapolis in 2007 was set and eager for construction to begin on the long-awaited new Minnesota Twins ballpark with adjacent transportation improvements also in the line-up. Deep below the surface, however, lurked one of the oldest sanitary sewers serving the downtown area. Constructed in 1889 this aging infrastructure had city leaders expressing concern. What effect would construction vibrations and additional loads from new downtown growth have upon this antiquated interceptor line? It also served suburban municipalities, which had not been foreseen when the original sewer line was constructed. Once the ballpark and new developments to the north were built, access to the interceptor for repair or rehabilitation would be extremely limited and highly disruptive.

### Assessing Infrastructure

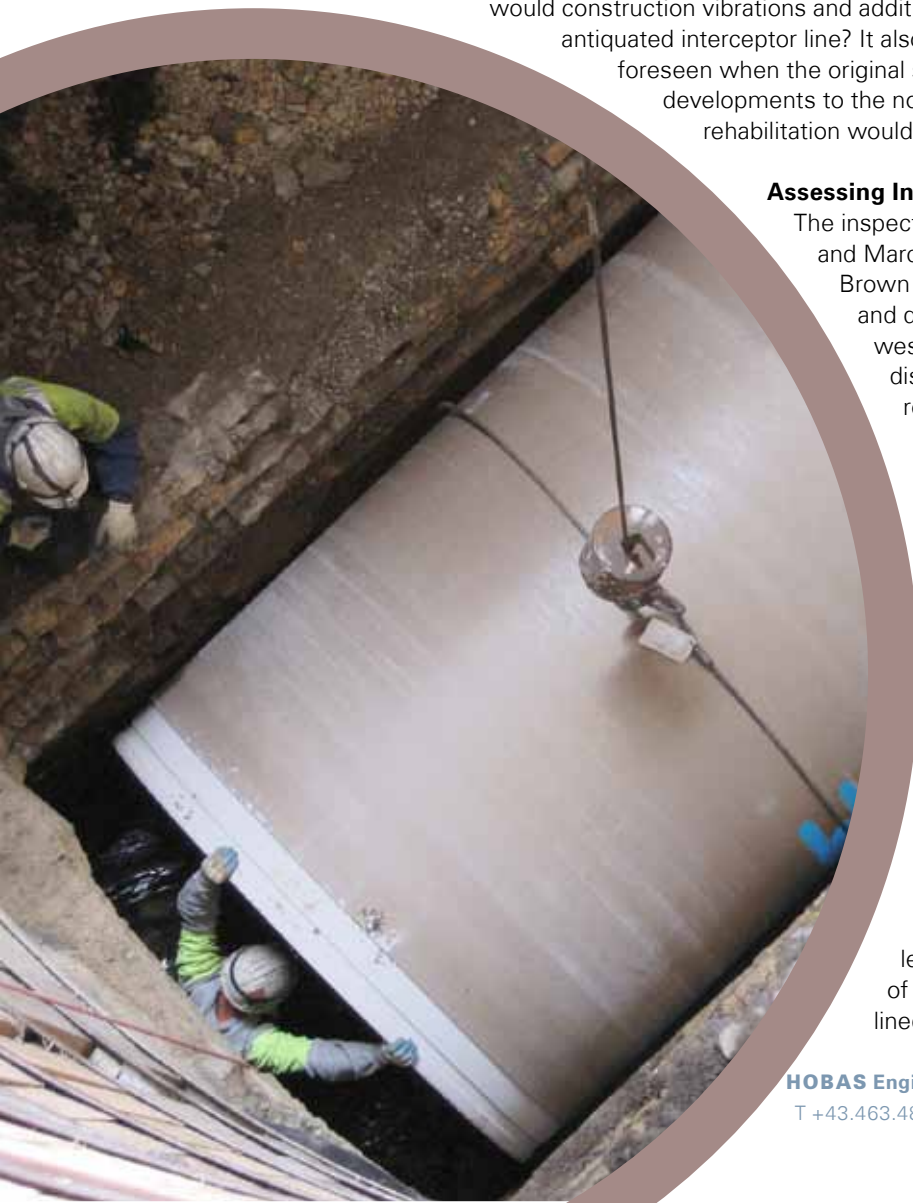
The inspections of the sewer line were conducted in February and March of 2007 by the engineering and consulting firm of Brown and Caldwell (BC) revealed a number of deformities and deposits. Sediment was found in both the east and west reaches along with bricks and stonework that had dislodged from the tunnel invert and walls. The eastern reach of the interceptor was constructed on a curve with a relatively short radius (18 m) and centerline length of 12.3 m radius, posing another challenge for sliplining.

### Choosing a Rehabilitation Method

The interceptor had no parallel pipe to redirect flow. Therefore, the chosen repair method needed to be implemented “in the wet” with wastewater flowing in the pipe. That left only two possible repair methods:

- Crown Repair involving excavating the entire length of the pipe, removing the brick arch and reconstructing the crown using cast-in-place concrete or precast concrete sections.
- Sliplining pipe within the interceptor sewer.

The option of crown repair was discarded because of the public disruption that excavation of the entire length of the pipe would cause, along with the length of time that would be needed to manufacture coated or lined precast sections, excavation and installation. Sliplining



the pipe would require opening up sections of the existing brick arch for installation of the slipline pipe in segments.

BC recommended sliplining the interceptor with GRP Pipe that would resist corrosion, stabilize the interceptor during construction activities, and extend its service life another 50 years. It would need to be corrosion resistant and fabricated quickly. Two prospective pipe manufacturers were contacted to provide prices.

### Design Criteria Outlined

HOBAS Pipe USA was chosen to supply CC-GRP (Centrifugally Cast, Glass Fiber Reinforced Plastics) Pipe to slipline 396 m of the existing 2130 mm in diameter pipe. It was determined that DN 1800 pipe could be sliplined in the reach east of Bassett Creek, and DN 2000 in the reach to the west. Per requirements, HOBAS proved the best choice to resist corrosion, stabilize the interceptor, and be delivered on time. The pipe included a combination of ~ 6 m, 3 m and 2.5 m long pipe sections to fit into the existing line. Several custom pieces were fabricated as well including elbows, risers and T-base manholes.

When hydraulically modeled, the DN 1800 GRP Pipe showed a capacity of approximately 477 MLD (million liters per day), indicating surcharging of the pipe during peak flows. However, the draw-down due to the drop would minimize or eliminate the surcharging; bringing it in line with the capacity computed using Manning's Equation of 628 MLD. The DN 2000 fiberglass liner pipe created a capacity of 700 MLD, exceeding the 568 MLD design flow.

### Construction Challenges

Lametti and Sons, Inc. could commit to meeting the aggressive deadlines required to keep Caldwell, in conference with Lametti and HOBAS, determined that at least six access pits would be necessary. The depth from the surface to the crown of the interceptor ranged from 5.5 m to 15.2 m below grade. In order to maintain grade and work with the close tolerance between ID of the interceptor and OD of the new pipe, each pipe was placed individually. The new pipe was blocked into place and grouted in two lifts with cellular concrete.

The interceptor rehabilitation work was completed on schedule in December 2007 for just under 2.8 million euros and Target Field was also completed in time for the Minnesota Twins to play their opening game in 2010.

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Year of construction  
**2007**  
Total length of pipeline  
**396 m**  
Diameter  
**DN 1800, 2000**  
Pressure class  
**PN 1**  
Installation  
**Sliplining**

Application  
**SewerLine®**  
Client  
**Metropolitan Council  
Environmental Services**  
Contractor  
**Lametti and Sons, Inc.**  
Advantages  
**High corrosion re-  
sistance, excellent  
hydraulic properties,  
long lifetime deliveries  
on time**

