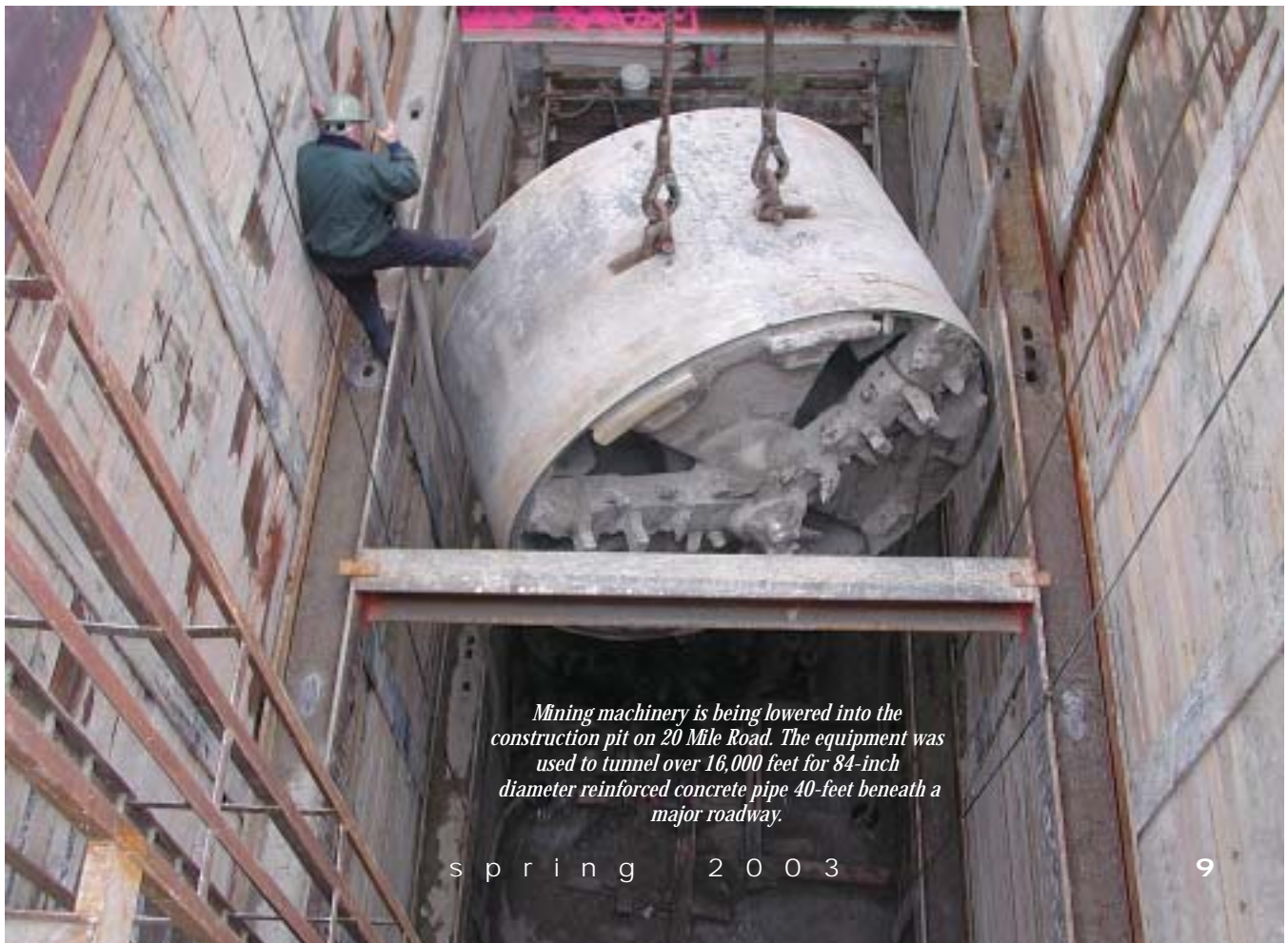


FORCE MAIN REPLACED WITH REINFORCED CONCRETE PIPE INTERCEPTOR TUNNEL

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Three miles of 84-inch diameter gravity sewer has replaced three miles of 24-inch diameter force main in Northern Macomb County, Michigan. The new Romeo Arm Interceptor, along with two metering facilities, provides sanitary sewage collection for Shelby, Macomb and Washington Townships. By replacing the force main installed in 1974, there is now considerably more capacity to service this fast-growing area of the county. With less maintenance and the elimination of pump power outages, there is now reduced potential for system failure resulting in sewer backups and overflows. The new interceptor, completed in December 2002, provides energy savings, lower operational costs, and reduces odors.

Construction began in July 2000 when Jay Dee Contractors, Inc. of Livonia, Michigan, was awarded the contract for tunneling 16,108 feet of 84-inch diameter reinforced concrete pipe 40-feet beneath the heavily traveled Garfield Road. It was determined that open cut trenches would not be feasible due to excessive depths, environmental impact on the roadway, costs



Mining machinery is being lowered into the construction pit on 20 Mile Road. The equipment was used to tunnel over 16,000 feet for 84-inch diameter reinforced concrete pipe 40-feet beneath a major roadway.

of relocating existing utilities and the negative impact on residents and businesses in the area. The size of the interceptor was based on the flow requirements, the depth of the existing sewer at 18 Mile Road and the required elevation to meet existing sewers at 21 Mile Road.

Superior joints, competitive prices, as well as the ability to provide on-time deliveries prompted Jay Dee Contractors to choose the Premarc Corporation of Durand, Michigan to supply the reinforced concrete pipe. A major concern was the assurance of a soil and watertight joint for all pipe units. Stormwater inflow and groundwater infiltration had added to the sanitary flows that exceeded the capacity of the pump station in the old force main. Grinding the groove for the rubber compound gasket joint after the pipe has cured is one way to guarantee joint performance. The Premarc Corporation is Michigan's largest precast concrete pipe manufacturer and the only manufacturer in Michigan to grind all of its pipe joints for sanitary installations, thereby ensuring a soil and watertight joint.

By using diamond-tipped grinding wheels, Premarc is able to produce exact dimensional tolerances during the manufacturing of the gasket seating surface. In so doing, Premarc ensures dimensional control over the pipe joint. Construction crews are then able to accurately install gaskets and home the pipe.



Excavated spoils being loaded and removed from construction pit following bore for 84-inch reinforced concrete pipe.

Mike DiPonio, Vice President of Jay Dee Contractors commented, "The pipe supplied by Premarc Corporation was excellent quality concrete pipe, and it should provide superior service to the Macomb area for many decades."

Construction of the interceptor was no easy task and designers of the sewer (Spalding DeDecker Associates, Inc.) had to overcome several challenges. The 84-inch diameter sanitary sewer was constructed by tunneling through difficult soil conditions created by retreating glaciers at the end of the last ice age some eight to ten thousand years ago. The glaciers left behind deposits of compressed clay soils nearly as hard as concrete, layers of fine sands that became charged with water under pressure, pockets of soft sticky clays and occasional boulders which had to be blasted for removal.

Underlying bedrock along the line and grade of the tunnel was a source of natural gas deposits that had migrated into the sand deposits. These methane gas pockets had to be vented during tunnel construction to prevent the possibility of fire or explosion.

In addition to the difficult soil conditions, there were other significant challenges that confronted the



Superior joints and on-time delivery were two factors that influenced the contractor to select precast reinforced concrete pipe for the Romeo Arm Interceptor Tunnel Project.

designer and contractor. The route of the sewer required complex navigation over three drain crossings including the Gloede and Utica Drains. Due to the heavy concentration of utilities on each side of the five-lane roadway, the decision was taken to align the sewer beneath the pavement. Neighborhood traffic, totaling 40,000 to 50,000 vehicles per day, limited construction during rush hours. To minimize the impact of construction on local traffic and businesses, tunnel alignment was adjusted to the center of Garfield Road. This enabled access manholes to be built within the center left-turn lane, which minimized traffic congestion. The location of each individual access manhole was coordinated with representatives of the local businesses so that customer access to these businesses was not impacted. The project staging area had to be relocated from a congested site to a more remote location. While this reduced the impact of the construction activities of the project to the general public, it required two miles of the project to be tunneled downhill. And this direction is the most challenging to a contractor when tunneling through water bearing soils.

The \$23 million precast concrete sanitary interceptor is a buried structure that will service the residents and businesses in Northern Macomb County for decades to come. During ribbon cutting ceremonies on October 1, 2002,

many of the stakeholders from the project were present to see their hard work acknowledged. Macomb County Public Works Commissioner Anthony V. Marrocco, who manages the county wastewater disposal district, commended the City of Detroit, Jay Dee Contracting, Spalding DeDecker Associates and the Premarc Corporation for doing “an outstanding job on a very challenging project.” A boulder pulled from the tunnel during construction was presented to Macomb County. On the boulder is a plaque which states the sentiments of all parties; “This boulder is but one of many impediments that were overcome by the determination and teamwork of the men and women who built the Romeo Arm Interceptor Tunnel on Garfield Road.” The boulder may also be viewed as symbolic of the durability and performance of the concrete pipe that is the interceptor tunnel. ☺

Photos courtesy of Spalding DeDecker Associates, Inc.

Project:	Romeo Arm Interceptor Tunnel
Owner:	Detroit Water & Sewerage Department
Designer:	Spalding DeDecker Associates, Inc. Rochester Hills, Michigan
Contractor:	Jay Dee Contractors, Inc. Livonia, Michigan
Quantities:	16,108 feet of 84-inch diameter RCP 29 manholes, 36-inch to 72-inch interior diameter
Producer:	Premarc Corporation Durand, Michigan



84-inch diameter reinforced concrete pipe being set inside of the steel rib and wood lagging sets as part of the bore and pipe jacking operation.

The Premarc Corporation is a leading manufacturer of concrete products for the construction industry. Founded in 1927 in Durand, Michigan by the Marsh family, the company operated primarily in the Flint and Lansing area. In the past 15 years, it has expanded its sales territory with facilities in Cadillac, Traverse City, Grand Rapids, and Clarkston. Premarc’s delivery fleet supplies the entire lower peninsula of Michigan and extends into Indiana. Premarc’s manufactured product line includes all shapes and sizes of precast reinforced concrete sanitary and storm sewer pipes, manholes, catch basins, wet wells, and pump stations. Bridge products include concrete box culverts, prestressed bridge beams and CON/SPAN™ bridge systems. For more information, see www.premarc.com.