

North American Tunnel Project Update



by Jack Burke

CALIFORNIA

Bakersfield

Kern River Powerhouse Rehabilitation
Merco Western Inc.

This \$13 million project is in two phases, the current work consists of demolition and reconstruction of the Forebay including mechanical work. Concrete liner replacement and repair of eight miles of 8 ft by 8 ft tunnel to be completed in two phases. Phase I started in July 2005 will complete Forebay work and existing tunnel from the Forebay to the access at Stark Flume.

Tunnel rehabilitation work has reached completion on Phase II of the Kern River PH1 Tunnel Rehab Project. Forebay reconstruction concrete work is complete with butterfly valves and slide gates installed, steel platform and electrical work completed. The water to the turbine generators has been turned on and they are generating power. The contractor has de-mobilized and will re-mobilize in September 2007 to complete the project. Phase III work is planned for remobilization in September 2007.

Merco Western Inc. construction manager: Lock Spencer; engineering manager: Bogdan Velcu; tunnel superintendents: Mike Levoy, Ron McKinnon, Joey Jennings; forebay superintendent: Renn Joseph. S.C. Edison project manager: Terry Falleson; construction inspectors: David Oehley, Hank Chavez and John Feeney.

Los Angeles

Eastside Light Rail Transit Project

Traylor/Frontier-Kemper JV

The Eastside LRT Project is part of a plan to provide public transportation to neighborhoods in East Los Angeles. The project is a 5.9 mile-long extension of the current Metro Gold Line, which extends from the city of Pasadena to Union Station in Los Angeles. The joint venture is a subcontractor to Eastside Light Rail Constructors to complete the underground segment of the project. This includes twin-bored tunnels from 1st and Boyle to 1st and Lorena. Other construction includes two sump structures, and six cross passages between tunnels.

The TBM units have both advanced through the open cut station and turned under for the final drive to the surface portal.

Tunnel mining is 54 percent complete (7,583 of 13,944 lf). TBM S-297 EB progress to station 238+95, to date has mined 4,434.2 ft and built 894 rings + 63.6 percent of EB mining is complete. TBM S-298 WB progress to station 226+12 to date has mined 3,149 ft and built 639 rings + 45.2 percent of WB mining is complete. Information: John F.McDonald, (323) 261-0444.

San Bernardino

Arrowhead East and West

Shea/Kenny JV

The Shea/Kenny Joint Venture is currently under contract with the Metropolitan Water District of Southern California to construct the Arrowhead Tunnels Project in San Bernardino. The project continues to make good progress despite some challenges.

East: Strawberry Portal

The Strawberry Tunnel has advanced over 13,950-lf (62 percent) of the drive as of early Aug. 19, after contending with several faults, ground water, and variable geologic conditions.

West: Waterman Canyon Portal

The Waterman Tunnel has advanced 6,600-lf (33 percent) of the drive after contending with loose ground, cavities, ground water and variable geologic conditions. The joint venture expects to reach the half-way point in the overall tunnel drive within one month. Pre-excavation grouting operations continue concurrently as the TBMs advance using micro-fine cement and colloidal silica grout in limited quantities as conditions require.

Brian Fulcher, project director; Bob Gordon, project manager; Mike Belcher, PA; Stuart Lipofsky, assistant project manager; Dana Downs, project engineer; Ron Walton, superintendent on Strawberry; Bob Leslie, superintendent on Waterman; Walkers: Danny Sayre, Don Fulmer, Jeff Bright, Bobbie Briggs, Ron Sammeth, Bradley Leonard, Jim Autry. Daniel Spenser Office East- Joe Nagy, West- Dana Downs.

John Wallace, MWD construction manager; Mike Bell, resident engineer; Ian Ward, McNally deputy resident engineer; Dan McMaster, assistant resident engineer. Information: Brian Fulcher (909) 883-3399.

San Diego

San Vicente Pipeline

Traylor/Shea JV

The San Vicente Pipeline Tunnel is an 11-mile water conveyance being built for the San Diego County Water Authority. The joint venture of Traylor Bros. Inc. and J. F. Shea (TSJV) were low bidder at \$198.4 million on April 20, 2005. Award occurred July 1, and NTP was July 14. Contract completion is scheduled for Dec. 1, 2008. TSJV is presently mobilizing to site, setting up yards, etc.

The 8.5-ft diameter pipeline will connect an existing aqueduct, feeding San Diego County, to the San Vicente reservoir. The system will provide additional storage during wet periods, and another water source during dry periods or when the main aqueduct suffers a catastrophe, such as an earthquake.

The tunnel runs generally east-west across the north end of San Diego County. The west terminus is a shaft 100 ft deep, the east terminus is a portal, and two additional shafts are in between, with depths of around 75 ft. Depth of tunnel varies according to the surface topography, but can be as great as 600 ft. The tunnel encounters varying geology, ranging from extremely hard granitic rock near the ends, to loosely cemented conglomerate in between. Some of the conglomerate may also be tightly cemented. The water table is below the tunnel for approximately half its length, at the 'peaked' middle section of the alignment.

Due to the varying geology, multiple tunneling methods have been chosen. Two open face

shields, equipped with excavator arms, and replaceable road header type attachments, will mine the conglomerates. These shields will be manufactured by Construction Tunneling Service. A refurbished Robbins main beam machine will mine the rock sections at each end. Conventional excavation methods will be used in a section of tunnel which interfaces the rock and conglomerate in an unpredictable fashion. Drill and blast, combined with Sequential Excavation Method type techniques will be used.

On the West Shaft Site/Reach 1, shaft excavation is complete to 115 ft. Excavation of starter tunnel for the rock TBM has progressed to 300 ft. Rock conditions have been generally hard granite, with water inflows of 20 gpm. Support is swellex bolts, with occasional straps. One short section called for ribs.

On the Central Shaft Site/Reach 4 West, a 14-ft starter tunnel was excavated to aid with the installation of the shield. Delivery and installation of the CTS shield is complete. Tunneling has advanced to 750 ft and installation of the shaft rail switches and muck guides is in progress.

On the Slaughterhouse Shaft Site/Reach 5, Reach 5 East is at 1,576 ft, and 5 West at 1,050 ft. West remains in fresh to weathered granite, support is swellex bolts with occasional shotcrete. 5 East has been in mixed face of granite and conglomerate for the last 900 ft. Support consists of lattice girders and shotcrete.

For the San Vicente Portal Site/Reach 6, the TBM was delivered and assembled in front of the portal, tested and advanced to the face. Mining began with a fully assembled machine. Currently 2,500 ft is complete. Rock is granite, requiring pattern swellex bolting. Average advance is 45 ft per day.

Fabrication of the second shield for use in Reach 4East is complete. Testing is progressing with delivery to site to immediately follow. Precast concrete segments manufactured by Traylor Shea Ghazi are complete to approximately 19,000 ft.

Project manager: Mike Jatczak. Information: (619) 631-0777; Mobile: (858) 248-9042.

San Diego

Lake Hodges Tunnel Project

Kiewit Pacific Co.

The design-build Lake Hodges to Olivenhain Pipeline Tunnel, Shaft & Site Development project consists of a 5,848 ft long 12ft horse shoe shaped tunnel. Excavation of the tunnel will be completed by drill-and-shoot methods. Additional project scope consists of construction of a 195 vf raise bore shaft, installation of 10-ft diameter steel liner, and placement of cellular grout.

Drill-and-shoot operations completed tunnel excavation on Aug. 1. Excavation completed to date includes 1,870 lf, 0.5 percent incline, 2,062 lf 13.5 percent incline and 1,916 lf 19.6 percent incline. Upon completion, the 12-ft diameter 186 vf shaft excavation operations by means of raise

bore methods were started and completed in August. Currently, crews are completing the surge chamber excavation within the shaft and preparing the tunnel for installation of the 10-ft diameter steel liner. Overall, 2,500 tons of steel will be installed within the tunnel working from the construction shaft towards the portal. Installation is currently scheduled to start in mid-September.

Personnel (Kiewit): Ray Backen – Area Manager; Sean Menge – Project Manager; Brian Barker – Project Engineer; Mike Shough – Tunnel Superintendent; Curt Millsaps – Tunnel Superintendent; Larry Andersen – Equipment Superintendent

Fountain Valley

Ellis Ave. Trunk Sewer

Barnard/Soletanche JV

Orange County Sanitation District. Bid Date: Aug. 8, 2006. Engineer's estimate was \$25,875,000. (1) Barnard/Soletanche JV: \$31,232,600.00 (2) J.F. Shea Co. (3) Kenny Construction Co. Information: Shelley Burg (406) 586-1995.

COLORADO

Parachute

Williams Production Co.

Kiewit Construction Co.

The project scope includes excavation and support of 3,200 lf of tunnel, excavation of a 340,000-cu yd pad and all associated access roads. The purpose of this project is to provide future access for drill rigs. The tunnel geometry is 24-ft wide by 20-ft high with a flat back. Excavation of the shale is being conducted using a road header. Ground support for the tunnel includes #8 pattern rock bolts with welded wire mesh. The project is currently scheduled to be complete in early 2007.

Project manager: Todd Cummings, tunnel superintendent: JD Martin. Information: Todd Cummings (970) 285-7909.

West Elk Creek Coal Transfer Shaft

Frontier-Kemper Constructors Inc.

The contractor continues to prepare for sinking an underground shaft from the E coal seam. A monorail system was installed over the shaft area to facilitate lifting of equipment. The 16-ft 6-inch raise bore shaft was reamed to within 60 vf of the collar and the remaining section was drilled and blasted. The raise boring equipment has been demobilized and the work deck and hoist foundations have been poured.

All equipment has been mobilized underground and is operational except for the form winches. The collar was drilled and blasted and a plug deck has been installed. Stoppings were built in the B and E seams for ventilation control and the collar concrete work has started with the assembly of the curb ring. Information: Todd Richardson, (812) 426-2741

Twenty Mile Coal Intake Shaft

Frontier-Kemper Constructors Inc.

Excavation of the 18-ft diameter shaft with Nordberg Hoist and shaft sinking system continues. The bottom of the shaft was 410 vf below the collar and 402 vf of concrete lining has been placed. A substantial amount of water was encountered in the shaft bottom. Additional ground support and installation of an increased

pump dewatering system was required due to the influx of water.

GEORGIA

Atlanta

West Area CSO Storage Tunnel and Pumping Station

Atlanta CSO Constructors

As of Sept. 18, the Clear Creek Tunnel TBM had excavated 10,450 lf and the North Avenue Tunnel TBM has excavated 9,225 lf. Mining on the North Avenue Tunnel resumed in early September following a six-week main bearing change. Drill and Blast excavation is nearly complete at the Tanyard Vent Shaft, with Chamber top heading work to commence in October. Surface work is ongoing for the diversion structures at Clear Creek, North Avenue and Tanyard. Work on the 85 mgd pump station is being performed by W.L. Hailey as a subcontractor to ACC. Pump Station shaft concrete work is ongoing concurrent with the final 24-ft tunnel pours.

Project personnel: City of Atlanta: construction manager: Ken Johnston. Atlanta CSO Constructors: project manager: Taro Nonaka; assistant project manager: Darrell Liebno; project engineer: Ray Hutton; office engineer: T.J. Kobayashi; tunnel engineers: Adam Stremcha, James McNally, Percy Townsend, Stuart Sullivan, Koichiro Shimomura; Raj Magam; Arash Sayyar; general superintendent: Jeff Early; assistant superintendent: John Dempsey. W.L. Hailey & Co.: project manager: Don Painter; project engineers: Mark Palmieri, Jake Coibion.

JDH joint venture: resident construction manager: Mike Robison; resident engineer: Ed Kennedy; project engineers: Randy Divito, Ron Davis; project controls engineer: James Talley; chief inspectors: Mark Rhodes, Dave Mundis. Information: (404) 352-0701.

Atlanta

Indian Creek Sewer Project

Bradshaw Construction Corp.

Bradshaw has been awarded the remedial work to re-mine and correct grade problems with the sewer pipeline installed by Modern Continental on the Indian Creek Sewer Project. Portions of the pipe "floated" while back filling the tunnel. Mobilization started in January.

Project manager: David Wanhatalo; superintendent: Frank Jones.

ILLINOIS

Chicago

TARP-Calumet Tunnel System,

Little Calumet Leg

Affholder/Jay Dee

The project was awarded on Dec. 2, 2004, and Notice to Proceed was issued on Dec. 22, 2004. The contract amount is \$57,126,600 and the mandated final completion is in June 2008.

The project involves the splitting of the two pump rooms at the existing Calumet TARP Pump Station. The project includes the excavation of a 20-ft diameter valve shaft for access to a new valve isolation chamber, where four 4 ft by 7-ft hydraulically operated bonneted gate valves, a canopy system, sump pumps, a ventilation system and a bridge crane will be installed for the separation.

A stair and elevator system will be installed in

the 320-ft shaft along with an access building at the surface after the chamber is completed. The existing wet well for the existing station will be divided by constructing a new dividing wall to full height of wet well shaft.

In addition to the valve chamber access shaft, two 10-ft in diameter utility shafts will be excavated and lined to each of the two existing pump rooms, an additional vent shaft will be constructed along with another 19 ft in diameter West Pump Room Access shaft.

The new access shaft will also include a stairway and elevator with an access building at the surface. Each of the existing bifurcation legs will be isolated with stainless steel inlet and outlet flumes to/from the new isolation valves. The existing pump rooms will be re-configured and upgraded for larger capacity dewatering pumps. Only one of the utility shafts remains to be excavated.

The existing Tarp Tunnel access shaft has been completed. This gives access to the existing Tarp tunnel that flows to the Pump Station. The flow will be diverted to one side of the existing bifurcation so the new valves and flumes can be installed and encased in the vacated side. Concurrent with this operation will be the required demolition in the inactive pump room followed by the installation of the new TARP pumps. Crews have also been working in the existing wet well in preparation for the division of wet well into two separate wet wells for the new divided station.

Ted Budd, tunnel division manager; Mike Surman, project manager; Christian Heinz, project engineer; Ken Dumas, safety manager; Richard Dresser safety, Donn Renfro, senior staff engineer. Information: (847) 541-8200; Fax: (847) 541-8838, e-mail: tedbudd@kennyconstruction.com.

Hodgkins

C.U.P. McCook Reservoir

Kenny Construction Co.

The \$60 Million C.U.P. project being built by Kenny Construction for the Corps of Engineers is in the final stages of completion.

The project consisted of two 11.5 ft and two 8.5 ft ID concrete-lined tunnels approximately 3,320 ft and 850 ft in length, respectively; temporary rock plugs and concrete/steel bulkheads; a 11.5 ft ID concrete-lined access shaft; a 60 ft by 100 ft underground chamber with a 26 ft ID access shaft approximately 340 ft deep, a 12 ft ID shaft approximately 320 ft deep for ventilation; six 60-in. conical plug valves; four 5-ft bonneted slide gates; 4 ft by 60 ft control (service) building at the ground surface; and site work including excavation, site grading, utilities, maintenance of traffic plan, staging and storage area and project signage.

All of the below ground concrete work has been completed along with all the mechanical and electrical work. Final testing is currently taking place. The shaft piping and tie-ins have been completed and the control building at the surface is under construction with an early summer completion anticipated.

Ted Budd, tunnel division manager; Bob Rautenberg, project manager; Paul Lauricella, safety manager; Jack Finn, superintendent; Doug Heinz, project sponsor. Information: (847) 541-8200; Fax: (847) 541-8838, e-mail: tedbudd@kennyconstruction.com.

Hodgkins

MWRD McCook Haul Tunnels

Kenny Construction

The MWRD Haul Tunnel Project associated with the Reservoir portion of the Tunnel and Reservoir Plan (TARP) was awarded on September 2004. The drill-and-shoot haul tunnels for Vulcan Materials are part of the upcoming reservoir expansion of the TARP System.

Crews completed the drill and shoot excavation of the haul tunnels in early December. The paving of the 2,100-ft tunnels was completed the second week of January. Crews demobilized from the completed haul tunnels and have are currently completing a follow-up project for Vulcan Materials that included an access decline to the newly completed tunnel and the development of a starter pit for future quarry development.

Ted Budd, tunnel division manager; Bob Rautenberg, project manager; Paul Lauricella, safety manager; Jack Finn, superintendent; Doug Heinz, project sponsor.

Indianapolis

Indianapolis International Airport

Midwest Mole Inc.

Midwest Mole has the subcontract to excavate a soft ground tunnel 2,100-lf long with a 102-in. gasketed liner plate support. The Akkerman EPB TBM will excavate the tunnel crossing under an active runway and active taxi way. The tunnel will house a chilled water line and steam line for the new Terminal already under construction. With the arrival and assembly of the EPB TBM mining commenced in June 2006 and has advanced 700-ft and double shift operations are in place as they advance under the active runway. Currently the project is on schedule for completion of the 2,000-lf drive in early November. Information: Rob Tumbleson, (800) 533-0386.

Princeton

Gibson County Coal New North

Mine # 2 Shaft

Frontier-Kemper Constructors Inc.

In early May, FKCI was awarded the contract for the construction of a new service shaft at the Alliance Coal/Gibson County Coal North Mine near Princeton Indiana. The shaft will serve as a new portal for the mines expanded operations. The shaft will be 28-ft finished diameter divided shaft, conventionally excavated to a depth of approximately 550 vf. The use of ground freezing techniques will be required to sink through the upper 120-ft of overburden. The work will also include construction of a 30-ft deep sump and a four-way concrete and shotcrete lined station. Shaft sinking is underway and all work is anticipated for completion at the end of 2007. Information: Todd Richardson, (812) 426-2741.

KENTUCKY

Mousie

Jones Fork Raise

Frontier-Kemper Constructors Inc.

In March, FKCI was awarded a project to construct of new ventilation shaft for Consol Energy of Kentucky at the Jones Fork Mine near Mousie. The shaft will be raise bored to a diameter of 15 ft and a depth of 380 ft. The shaft will be concrete lined to a finished diameter of 13 ft, 6 in.

Work also includes station and entry-level development, including shotcrete lining of the entries. Site mobilization and drilling of the pilot hole for the raised shaft is planned for early fall 2006 and scheduled completion February 2007. Information: Todd Richardson, (812) 426-2741.

MASSACHUSETTS

Dorchester

Dorchester CSO

Shank/Barletta JV

This \$140 million project for the Metropolitan Water Resources Authority (MWRA) consists of two miles of 19-ft excavated (17-ft segment lined) tunnel, one-pass lining from a single shaft. The project was awarded at the end of August with notice to proceed to follow.

MISSOURI

Viburnum

Doe Run Ventilation Shaft

Frontier-Kemper Constructors Inc.

On July 6, Frontier-Kemper was awarded the contract to construct a new ventilation shaft for Doe Run Mining Companies Southeast Missouri Mining and Milling Division (SEMO) at the Casteel Mine near Viburnum, Missouri.

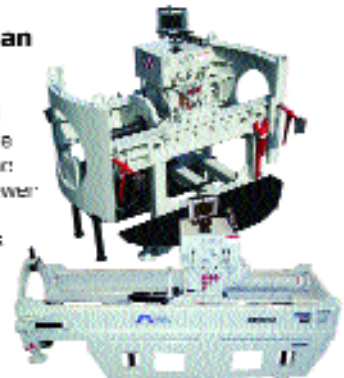
The shaft will be raise bored to a diameter of 6-ft from a depth of approximately 900-ft using a DUR1000 drill rig. It is anticipated the project completion late fall 2006. Information: Todd Richardson, (812) 426-2741.



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Reader Service Number 20

St. Louis

Baumgartner Tunnel

Frontier-Kemper/Gunther Nash JV

Project in final stages of de-mobilization. Project Manager: Jim Nickerson. Information: Jim Nickerson, (812) 426-2741.

NEW YORK

New York City

East Side Access

Dragados/Judlau JV

On July 10, the New York City Transit Authority CC awarded the JV of Dragados/Judlau the East Side Access Manhattan Tunnel Excavations for a contract price of \$427 million. The project is part of the construction program that will allow the Long Island Railroad system into the Grand central Terminal on the east Side of Manhattan.

The project consists of 25,200 lf of 22-ft diameter hard rock TBM excavated tunnels. There are four each tunnel runs two-each are 7,400 lf and two-each 5,200-lf. The tunnels start from the existing 63rd street terminus. The job shaft will be in Long Island City in Queens and crews will have to travel 8,800 feet to the heading. The drill and blast excavation consists of two-each large crossover caverns between tunnels that will be lined with reinforced concrete. Approximately 11,000 ft of excavated tunnel will be concrete lined. The project duration is 48 months. Currently the team is in mobilization mode with preliminary engineering and equipment procurement including two TBMs. Shaft crane, locomotives and other rolling stock, conveyor system and ventilation and dewatering systems. Site setup is underway in anticipation that the first TBM will be onsite in May 2007. Work in the coming months will include shaft setup, starter tunnel excavation and electrical substation installation.

Project executive: Jose Miguel Gonzalez, project manager: Don Hockey, project engineers: Joaquin Fernandez and Julio Velez, superintendent: Denis O'Neill, equipment manager: Louis Sanchez. Information: Don Hickey, (718) 321-1818.

New York

Water Tunnel #3 Stage 2

Schiavone/Frontier-Kemper/Shea JV

East tunnel excavation was completed on Aug. 4 and the TBM backed out from the tunnel, disassembled and hoisted out. Tunnel forms are installed in the South tunnel and the concrete placement was scheduled to start in mid-September. Concrete placement will continue through the 2007 to line 47,770 ft of 10 ft finished diameter tunnel.

Nine shafts up to 550 ft deep are part of the \$658 million project. Seven shafts have been raise bored. Slashing and concrete placement operation are taking place at five shafts while two shafts are completed and are turned over to subcontractor J.P. Picone for installation of final stainless steel piping and fill concrete. Ground freezing operations by Moretrench American Corp. at five south shafts are completed as the final linings have been installed.

Schiavone project manager: Anthony Del Vescovo, general superintendent: Dale Estus, project engineer: Florentino Sison. J.F. Shea shaft manager: Shemek Oginski, shaft superintendent: Mike Jennings; shaft project engineer: Jim Rosteck. Information: (212) 564-8552.

NORTH CAROLINA

Charlotte

Irwin Creek Relief Sewers Contract II

Bradshaw Construction Corp.

This project consists of 20-shafts and 14-tunnels. The tunnels range in length from 40 to 1,400-ft and from 66-in. to 101-in. in diameter. Ground conditions include soft ground, mixed face and rock. The tunnels have been driven with Lovat and Akkerman TBMs. As of Sept. 11, 16 shafts and seven tunnels have been completed. The unanticipated rock conditions have resulted in drilling and blasting in front of the sift ground TBMs for significant reaches of the tunnels.

Bradshaw Construction project manager: Eric Eisold, superintendent: Jerry Simon. Information: (410) 461-4466

Charlotte

Sugar Creek WWTP Pump Station -Tunnel

Bradshaw Construction Corp.

The project consists of a 27-ft deep shaft and a 340-ft long by 114-in. diameter tunnel under Tyvola Road. Ground conditions include mixed face and rock. The tunnel is being advanced with a poling plate shield excavated by drill and blast, and lined with steel liners plate. The tunnel is about 10% complete. The carrier pipe in the tunnel will be 72-in. reinforced concrete pipe.

Bradshaw Construction project manager: Eric Eisold, superintendent: Jerry Simon. Information: (410) 461-4466

OHIO

Cleveland

Mill Creek Contract 3

KM&M&K JV

Concrete final lining to a 20 ft ID has begun and is scheduled for completion in early spring 2007. Shaft construction and connector sewer installation continuous.

Project manager: Robert J. Kassouf, Project Superintendent: Ralph Dodero. Information: Bob Kassouf, (216) 651-3333

Columbus

BWARI

Jay Dee/Michels/Traylor JV

Currently installing ring 3,900 out of a total of 4,156 for 94-percent completion of mining operations. The expected holing through into the reception shaft, which is also the main working shaft for the McNally/Kiewit project will be in the week of Oct. 15 and the removal of the TBM and trailing gear is anticipated to take 30 days.

Currently performing construction of the permanent access manholes that connect to the tunnel two hand mined tunnels are underway to install 36-in. interconnectors to the tunnel. Shook Road Interconnectors is 95-percent complete and the Eastport Connector 40-percent complete. All hand-mining is scheduled to be finished by November. Currently heavily involved in the planning and testing phase of the Linabond installation.

City of Columbus, Division of Sewerage and Drainage: Gary Gilbert, civil engineer; City of Columbus, Division of Sewerage and Drainage: Tanya Arsh, sewer system engineering manager; URS Corp., designer: Douglas Uhren and Tom Richardson; HR Gray construction management: Robert Scott, Sr. Mgr., James Joyce; Lachel & Assoc., geotechnical design: David Chapman and Glen Frank.

Jay Dee/Michels/Traylor JV: Michael DiPonio, project manager; Jeremy Theys, project engineer and Tim Awald, project superintendent. Information: (614) 491-9551

Columbus

BWOAS

McNally/Kiewit JV

This project consists of 167-in. excavated diameter 144-in. ID concrete segment lined 13, 200 lf long excavated 60-ft below surface. One work shaft, four access shafts, one interconnected structure at the end. The geology is glacial clay, tills, and sands with boulders. 5,000 lf of surface sewer with two each 400-ft lengths of pipe jacking included.

The joint venture has completed five shafts, one work shaft 39-ft finished diameter 77-ft deep with a slurry wall completed by subcontractor Soletanche/Moretrench 99-ft deep. A mud slab 15-ft thick was placed at the shaft bottom Four A jet grout area 15-ft deep, 30-ft wide and 27-ft high was placed on one side of the shaft where the tunnel eye will be placed and a similar jet grout area placed on another side where the TBM from BWARI I will breakthrough into this shaft.

Mining operations continue with 25 percent of the total excavation completed. Mining will continue until the Lovat TBM from the Jay Dee/Traylor project arrives at the access shaft and all operations are suspended until the TBM is removed and the shaft rebuilt with guide frames, etc., and mining and mucking operations can resume. Work on the articulation seals will be conducted during this shutdown period. Work on the interconnect structures is ongoing.

Project sponsor: Larry Lenahan, project manager: Tom Szaraz, project engineer: Gary Bulla, project superintendent: John Herward. Information: Scott Lewis., 2488 London-Groveport Road, Groveport, OH 43125; Phone: (614) 491-2800; Fax: (614) 491-2802.

OREGON

Portland

West Side CSO Tunnel,

Shafts, Pump Station & Pipelines

Impregilo/S.A. Healy JV

This \$300 million project for the City of Portland Bureau of Environmental Services includes 18,250 ft of soft ground tunnel mined with two Herrenknecht slurry shield TBMs and lined with 14-ft precast bolted gasketed segments, five 55- to 68-ft diameter shafts, a 137-ft diameter by 160-ft deep pump station shaft with 120 mgd pump station structure and 10,000 ft of microtunnels with 15 access shafts. All work was in very permeable soils below the water table. The project is substantially complete and demobilization activities are under way.

Project director: Giuseppe Quarta; project manager: Jim McDonald; chief engineer: Jim Kabat; City of Portland program manager: Paul Gribbon; Jacobs Associates construction manager: Craig Kolell. Information: Jim McDonald, (503) 595-4400.

Portland

Portland East Side CSO Tunnel Project

Kiewit/Bilfinger Berger JV (KBB)

Construction is well underway on the City of Portland's East Side CSO Tunnel Project by

the joint venture of Kiewit-Bilfinger Berger. Shaft construction at the main mining location continuous with the slurry wall being complete. Excavation of the 70-ft diameter, 140-ft deep shaft will start in mid-September. Crews have mobilized to several other worksites including the second major shaft site where slurry wall operations have begun and other sites where clearing and grading is on-going. Ultimately, a total of seven main shafts will be constructed over the 30,000 lf alignment, each remaining shaft approximately 50 ft in diameter and 150 ft deep.

Installation of the open-cut pipeline construction has also started with several utility relocations in tight urban areas. Over 2,500-lf of pipeline will be installed with another 6,000-lf of 84-in. diameter microtunneling required to start next year. The slurry microtunneling machine has been ordered and is scheduled to arrive in early 2007.

Design of the 25-ft diameter slurry tunnel boring machine is complete and fabrication is continuing by Herrenknecht Tunneling Systems. Fabrication is scheduled to be complete by the end of 2006 with delivery of the TBM set for early 2007. Tunneling operations are set to begin during the second quarter of 2007. In addition design of the slurry separation plant and muck conveyance system is complete and fabrication is also on-going. A 1,400-cubic meter slurry separation system has been ordered from Schauenburg and piling work in the Willamette River for Barge disposal of tunnel muck has been completed.

Set-up of the pre-cast plant facility for production of the 6,000 segmental lining rings is continuing. The first set of moulds has arrived from Euroform — a total of eight rings will eventually be delivered. Arrival and set-up of the batch plant is scheduled for this fall as well as the bridge and gantry crane systems to handle moulds, concrete, and supplies. All utilities and foundation elements required for casting have been completed.

Tom Corry, project manager; Tony O'Donnell, engineering manager; Paul Weisheit, Safety Manager; Glen Tomack, quality manager; Scott Wimmer, site and shaft manager; Christof Metzger, tunnel manager; Scott Cromack, pipeline manager; Dave Craemer, precast manager; Mike Hanley, shaft superintendent; Kevin Young, equipment manager; Shane Yanagisawa, planning manager; Darwin Goodsell, business manager. Information: Bill Mariucci, (503) 849-8189.

RHODE ISLAND

Providence

Deep Tunnel CSO Project

M.L. Shank Co. Inc.

The main Spine Tunnel 26-ft in diameter and 16,215 lf was turned under in March 2004 and the TBM holed through into the foundry shaft on Dec. 1, 2005. The breakthrough came within 1 in. of line and grade for the three miles of tunnel. Using 160 ft of full circle Everest Forms for a finish ID of 26 ft, crews are averaging 128 to 160 lf per day with less than 1,000 lf left to complete the concrete lining. Tunnel contact grouting is 65 percent complete.

The drop shaft (12-ft diameter; 9-ft finish diameter) is complete; The vent shaft (6-ft diameter; 4-ft finish diameter) is complete; and the foundry shaft final liner (26-ft diameter) is complete. The entire project is expected to be completed by the end of 2006.

Project director: Mike Shank, general manager; Gerry Stokes, project manager; Steve Minassian, project engineer; Scott Shylanski, tunnel superintendent; Curtis Bahten, QC manager; Nick Torello, superintendent; Jim Mulkey, PA. Jim Hinashian, safety; Eric Stalman. Information: Steve Minassian, (401) 941-1495.

SOUTH CAROLINA

Charleston

Cooper River Sewer Replacement Phase III

Affholder Inc.

This contract was awarded for \$39 million and consists of approximately 18,100 lf of deep tunnel with carrier pipe 20 to 48 in. in diameter. Three working shafts to be completed as drop shafts, two drop pipes, and one retrieval shaft. Connections to drop shafts and pipes including sewers and odor control; piping. Approximately 1,200-lf of microtunneling and approximately 1,400-lf of open cut excavation with associated shafts, manholes and connections.

The shafts have all been completed using concrete caissons to the marl then ribs and lagging in the clay to tunnel invert. The exception to this method is the Huger Street shaft at the North end of the project, which was completed with a concrete caisson in the soft ground to tunnel invert.

The Ashley River Tunnel is substantially complete with sewer flowing and a little bit of gardening left to complete. The Cooper River Tunnel excavation is over 80 percent complete. All shafts are completed. Surface structures and pipe installation are under way at three sites.

Operations manager: Ross Webb, project manager: John Scheithe, superintendent: Ron Beasley, project engineer: Jason Teuscher, structure superintendent: Harry Gajan, microtunnel superintendent: Roy Windham, tunnel foremen: Vince Cardenas, Jose Rios, safety manager: Howard Jones. Information: Ross Webb, (843) 723-5899.

Charleston

Daniel Island Extension

Affholder Inc.

This new project awarded to Affholder Inc. as a negotiated bid will be getting underway simultaneously with the Cooper River Tunnels. A new Caisson shaft 20-ft ID will be sunk with a concrete caisson full depth 120-ft and a Lovat EPB TBM 96-in. diameter will be assembled to excavate the 11,000-ft to the Huger Street Shaft.

With the completion of the two shafts in October the Lovat TBM will be installed and mining will commence late October 2006. The same personnel and offices will be utilized for this project as Cooper River.

Greer

Bushy Creek Trunk Sewer-Tunnels

Bradshaw Construction Corp.

The project consists of two access shafts and two 120-ft long by 96-in. rock tunnels. The tunnels are being excavated by drill and blast and lined with steel liner plate per South Carolina Department of Transportation (SCDOT) specifications. The carrier pipe consists of 60-in. ductile iron pipe. One tunnel has been completed and other just starting. Project manager: Eric Eisold, project superintendent Frank Jones. Information: (410) 461-4466.

Rock Hill

Sumter Ave. Storm Drain Improvements-Tunnel

Bradshaw Construction Corp.

The 84-in. diameter liner plate tunnel 190-ft long was completed under

ESSENTIAL READING FOR THE TUNNELING PROFESSIONAL — GET IT FAST, EASY, ONLINE.



Going Underground: Tunneling Past, Present and Future

This compendium covers the past and present experiences in tunnels and tunneling, and explores the possibilities for the future.

Produced by: In partnership with the American Public Works Association.

Guide to Best Practice for the Installation of Pipe Jacks and Microtunnels

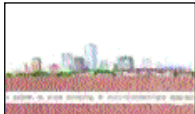
The Guide takes the readers through the problem areas which can adversely affect a pipe jack, provides a checklist, and summarizes associated matters such as contractual considerations, safety, training, and current regulations and standards.

Developed by: the U.K.-based Pipe Jacking Association.



Guide to Pipejacking and Microtunnelling Design

This 24-page guide includes charts and illustrations while providing detailed information on pipe jacking and microtunnelling techniques, applications and benefits.



Practical Guideline for the Application of Microtunnelling Methods

This desktop reference was created with the aim of providing people, who are responsible for the new construction of sewers, with a practically oriented working aid for taking the trenchless construction method into consideration.

Author: Professor, Dr. Dietrich Stein; Stein & Partner GmbH



Trenchless Technology for Installation of Cables and Pipelines

The comprehensive and detailed discussions of the construction methods and all associated fields in this book make this a great addition to your reference library.

Author: Professor, Dr. Dietrich Stein; Stein & Partner GmbH

TUNNELINGONLINE.COM
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a railroad using an Akkerman TBM with steel the project was completed in August 2006. Iner plate support. The 3-in. shotcrete with welded wire reinforcement final lining. Project manager: Eric Eisold, superintendent: Jason Lytle. Information: (410) 461-4466.

VIRGINIA

Chantilly

Dulles West APM

Clark/Shea JV

At the Dulles West APM Project the NATM tunnel crews have completed all mining and are pouring cast-in-place final linings in the four tunnels. Tunnel concrete is planned to be complete at the end of October 2006. Cut-and-cover boxes adjacent to the main Terminal are also wrapping up, with completion of the Crossovers anticipated by late November. Because of future expansion of the International arrivals facility, the Tug Tunnel Structures have been deleted from the contract. This will aid in the plan to complete all work and demobilize the team in early 2007.

Chantilly

Dulles East APM Project

Atkinson-Clark-Shea JV

Over on the east side of the airport, concrete operations under way north of Taxi lane F. With the tunnels having been turned over to the follow-on contractor for installation of plinths and train control systems, the footprint of work has been shortened by 4,000 ft. The Tier 1 Station concrete is in progress, being watched by thousands of airport passengers who cross the pedestrian bridge above the station.

The Tier 3 Station architectural work is underway with the installation of masonry and structural steel. The mechanical and electrical subcontractors are installing their rough-in work. The TBMs both completed mining in September 2006 after a setback due to the 300-year storm event in June. The invert concrete placement is in progress.

NATM mining was completed in August and final lining concrete is underway.

Project sponsor: Allan Sylvester; project managers: Curt Allen, Peter Chase, Ron Gabitzsch and Mark Rybak. Project engineers: Jamie Hart, Todd Parker and Brian Briggs; superintendents John Strong, Dave Andrews, John Strong, Ed Allen and Dan Martz. Parsons management consultants teams are led by COTR's: Dominic Cerulli, Rick Munzer. Information: Allan Sylvester (703) 572-5757.

Project Manager: Mark Rybak, general superintendent: Larry Rigsby, equipment superintendent: Kelvin Sampson, electrical superintendent: Don Magyar, Walker: John Hammer, chief field engineer: Rob White, office manager: Bertha Sampson. Information: Mark Rybak, (202) 345-1087.

WASHINGTON

Seattle

Beacon Hill Tunnel

Obayashi Corp.

As of Sept. 1, ancillary shaft excavation is complete, breakout for east vent adits has begun. South and North Concourse Cross Adit (41-ft in diameter) excavation is complete. South Platform tunnels (31 ft in diameter) West Heading is complete. Waterproofing and concrete invert work has begun. East Heading excavation

finished by Oct. 10, while 2996-North Platform Tunnel West heading excavation has begun. East Portal development work is completed. The Mitsubishi EPB TBM arrived at Station. Work on the 1,400-lf aerial structure and station is 65 percent complete.

Major subcontractors and suppliers currently working on the project include Elcon (permanent Electrical Work); Luwa (mechanical work); J. P. Francis (plumbing); Thunderbird (temporary electrical work); Rebar International (rebar); Technopref (precast segments); and Wisco (waterproofing).

Sound Transit jobsite personnel: Rick Capka, resident engineer; Zeph Varley, station project engineer; Clement Wiggins, tunnel project engineer; Roger Smith, resident engineer structures.

Obayashi jobsite personnel: Masaki Omote, project manager; Steve Redmond, tunnel manager; Rohit Shetty, SEM manager; Nestor Garavelli, TBM project engineer; Bob Lucas, structural manager; Russell Nash, building manager; Gregg Olsen, project engineer; Billy Hahn, safety manager; Jon Kirk, business manager; Richard Boutelle, tunnel superintendent; Leif Nordell, tunnel structural superintendent; Rob Stark, equipment superintendent; Duke Wilhite, surface superintendent; Satoshi Akai, SEM engineer; Yoshi Sawamoto, equipment manager; Tomo Kudo, EPB tunnel engineer; Nezihi Turkalp, surface engineer; Mat Matsumoto, structural/building engineer. Information: Paul Zick, project director (206) 262-0665.

Bothell

Brightwater Conveyance System

(East Contract)

Kenny/J.F. Shea/Traylor JV

King County awarded the Brightwater Project to the Joint Venture of Kenny Construction (Sponsor) / J.F. Shea Company and Traylor, on Dec. 29, 2005, after a lengthy protest by the second bidder, Jay-Dee/Coluccio, JV. The mobilization for the \$130.85 million project got underway in February 2006 after the Jan. 30 Notice to Proceed. The scheduled completion date is Aug. 28, 2009.

The project is the first of the major projects scheduled by King County to complete the Brightwater System. The East Contract consists of the following major elements: 14,050 ft of 18 ft, 10 in. EPB TBM mined tunnel using 16-ft, 8-in. ID bolted, gasketed, precast concrete segments for a primary liner; installing and grouting 14,200 ft each of 48-, 66-, 27-, and 84-in. diameter pipes inside the tunnel along with three runs of fiber-optic cable; 2,430 ft of 72-in. diameter microtunnel including three shafts including structures; one Intercepting Structure (IS) to mine from that is 74-ft deep and 80-in. diameter with 130-ft deep slurry diaphragm walls, tremie slab and final concrete wall lining; one Inflow Pump Station shell (IPS) 83 ft deep, twin 84-ft ID cells, with 160-ft deep slurry diaphragm walls, tremie slab, and final lining; two short 12 ft in diameter connector tunnels; one extraction shaft 40 ft deep by 40 ft wide and 140 ft long for connection to new treatment plant piping.

The site utilities and screen/sound wall fence were completed and the slurry wall construction is well underway in spite of a six-week setback due to an Operator's strike against the ready-mix concrete suppliers in King County. The 84-ft diameter IS shaft with 130 ft deep by 48 in. thick

slurry wall panels is nearly complete. Bencor, the slurry wall Subcontractor, will start the binocular twin 84 ft in diameter shafts and center wall using 160-ft deep panels as soon as the IS shaft is complete. The IS shaft excavation will start after Hayward Baker completes portal jet grouting. The IS shaft excavation is anticipated to start by early November. Following the installation of a 13-ft thick tremie slab in the bottom of the IS shaft, a microtunnel drive from the IS (mining) shaft must be completed before the 19 ft, 4 in. diameter Lovat EPB TBM will be assembled in the shaft. A late-summer 2007 TBM launch is expected.

Ted Budd, tunnel division manager; John Kennedy, project manager; Jake Taylor, project engineer; Luminita Calin, cost and schedule manager; Mark Saylor, equipment manager; Mickey Aliff, general superintendent; Dale Wold, electrical superintendent; Terry Walls, warehouse manager; Mike Sarlitto, safety manager; safety; Austin Cooney, home office sponsor.

Inquiries can be directed to Ted Budd at Kenny Construction Company at 250 Northgate Parkway, Wheeling, IL 60090. Phone (847) 541-8200, Fax (847) 541-8838, email: tedbudd@kennyconstruction.com; or jmkennedy@kennyconstruction.com.

WISCONSIN

Milwaukee

Elm Road Generating Plant -

Cooling Water Intake System

Kenny Construction Co.

The project is a design-build subcontract for Bechtel Corp. who is the design/build contractor for the \$2 billion plant for W.E. Energies (Wisconsin Electric) consisting of a lake water intake tunnel excavated in rock approximately 9,200 ft long, 27 ft, 4 in. in diameter of which 930 ft is to be lined to a finished diameter of 25 ft. Also included are two land-based upshafts at 25 ft, 18 in. in finished diameters as well as a temporary construction shaft at 30-ft diameter.

In addition, there are four offshore water intake shafts, 12 ft in diameter, along with ancillary intake piping. These shafts are 8,000 ft out in Lake Michigan. Part of the Intake System includes a 250 ft long dike wall with an emergency bypass backup surface water intake system and an estimated 50,000 cu yds of channel dredging.

Marine crews have completed the drilling of the four drilled Intake shafts. Shaft piping is being installed in the risers along with dredging and installation of manifold piping. This will be followed by the installation of the intake screens to complete at least two of the shafts.

The overburden excavation using a 32-ft ID caisson method to the rock (80 ft deep) for the first of three land based shafts was completed and the rock drilled and shot to the top of the tunnel and TBM erection chamber. The 200-ft deep shaft was lined followed by the drilling and shooting of the 30-ft horseshoe erection chamber. The 27-ft, 4-in. diameter TBM was erected and is currently mining.

The dredging operation in the Intake channel was completed and steel sheeting work in the existing inlet channel is nearly complete. When complete Dyke Wall construction concrete will get underway along with the second deep land based shaft that will intercept the mined tunnel.

Ted Budd, tunnel division manager; Paul McDermott, project manager; Jon Isaacson, project engineer; Tom Plinke, QA/QC manager; Mike Smithson, D/B coordinator; Mark Saylor, equipment manager; Joe Johnson, electrical superintendent; Tom Peterson, TBM specialist; Dave Kuepper, site equipment manager; Chuck Hartman, warehouse manager; Rich O'Neil, survey manager; Terry Beesley, general superintendent; Matt Hadaway, site safety manager; Phil Harris, safety; Austin Cooney, home office sponsor.

Ted Budd, Kenny Construction Co. 250 Northgate Parkway, Wheeling, IL 60090. Phone: (847) 541-8200, Fax: (847) 541-8838, email: tedbudd@kennyconstruction.com or acooney@kennyconstruction.com.

Milwaukee

Harbor Siphons Project

Shea/Kenny JV

The project consists of approximately 2,100 ft and 2,400 ft of 17-ft horseshoe drill-and-blast tunnel, with two 20-ft drop shafts and one 30-ft riser shaft. The shafts range from 250 to 300 ft deep with approximately 190 ft of overburden which has to be frozen into the bedrock by contract. Also a frozen cofferdam of 80 ft by 250 ft for the various pipe connections. The contract was awarded on May 22 and Notice to Proceed May 23.

Freeze hole drilling on Jones Island has been completed and the freeze plant installed and turned on Sept. 25. At present, 220 pipe piles 90 to 100 ft long have been driven in the Jones

Island cofferdam structure and freeze hole drilling for the cofferdam is in progress. On the Scott and Barclay drop shaft, the freeze holes have been completed and the installation of the freeze pipes, freeze plant and headers is currently underway. Also on Scott and Barclay, the excavation of the Diversion Structure Shaft and the splitting chamber shaft has been completed.

On the Erie Street Drop shaft and Valve Chamber site the removal of existing concrete foundations and the removal of approximately 200 wooden foundation piles is currently in progress.

Martin (Dutch) Vliegenthart, vice president, Carl Christensen, project manager, Bonnie Senkowski, office manager, Jerry Straube, structure superintendent, Darrell Vliegenthart, shaft superintendent. Information: (414) 258-2510.

CANADA

British Columbia

North Vancouver

Seymour-Capilano Filtration Project

(SCFP) Biffinger Berger (Canada) Inc.

The Seymour Shaft and shaft bottom chambers were completed in May 2006, after approximately 65 m of drill and blast tunneling in each TBM tunnel and 80m in a tail tunnel adjacent to the shaft. Services installed in the 180 m deep shaft by the end of June were, Main Hoist, TBM Mucking, Alimak man-riding, electrical, pumping and ventilation systems. The "Seymour TBM" was set up in the Raw Water Tunnel, which is the south-

ernmost of the two tunnels by June 30.

The Seymour TBM commenced the Phase 1 tunneling stage on June 1 and stopped after 136 m at station 0+196m from the Seymour Shaft for a scheduled stand down in late July to allow installation to commence of the second TBM the "Capilano TBM" in the Treated Water Tunnel, which is scheduled to commence tunneling in Late August. The two TBMs are scheduled to be built to full length in three excavation/construction phases occurring between July and October.

After this period the TBM will be 240 m long with an excavated diameter of 3.8 m. Both TBMs will then continue Tunneling in October on a 2.33 percent downgrade, under the North Shore Mountains of Vancouver towards the Capilano stop point some 7,130 m distant from the Seymour Shaft. Three tenders for steel liner pipe to be installed by the tunnel contractor in on the surface, in the shafts and in parts of the tunnels in 2008 were received in July 2006; evaluation of the package is underway.

GVRD-Tom Morrison, senior project engineer tunnels; Doug Neden, manager water treatment engineering, Goran Oljaca-senior engineer. PLA - Andy Saltis- area manager tunnels, Jeff Spruston-PM for SCFP, Brian Gardner-project director & VP project services. HMM Dean Brox- RE, Joe Rotzien-ARE (geology-Golder as sub to HMM-Grant Bonin). BBC- Christian Genschel-PM, Joseph Messner-CM. Information: Andy Saltis, (604) 982-3197.

Events Calendar

November 2006

- 29 *Underground Infrastructure Management Conference*
Series: Asset Management for Water and Wastewater Systems, Washington, D.C., Benjamin Media Inc., Ph: (330) 467-7588, Fax: (330) 468-2289
E-mail: info@benjaminmedia.com.

January 2007

- 22-26 World of Concrete 2007, Las Vegas
Ph: (414) 289-4141; Web: www.worldofconcrete.com
30 George A. Fox Construction Conference, New York, UCA of SME, Ph: (303) 973-9550; Web: uca.smenet.org.

February 2007

- 11-14 Utility Construction EXPO '07, Las Vegas, NUCA, Ph: (703) 358-9300; Web: www.nuca.com
12-15 American Rental Association (ARA) Annual Convention, New Orleans, ARA, Web: www.ararental.org

April 2007

- 15-20 No-Dig 2007, San Diego, Benjamin Media, Ph: (330) 467-7588; Fax: (330) 468-2289

May 2007

- 5-10 ITA-AITES World Tunnel Congress 2007, Prague, Czech Republic, ITA Web: www.ita-aites.org

June 2007

- 10-13 RETC, Toronto, SME, Ph: (303) 973-9550; Fax: (303) 979-3461; E-mail: davis@smenet.org

October 2007

- 11-13 32nd Annual Conference on Deep Foundations, Washington, D.C., Deep Foundations Institute Ph: (973) 423-4030; Fax: (973) 423-4031
16-19 ICUEE 2007, Louisville, Ky, Ph: (800) 867-6060; Fax: (414) 272-2672; E-mail: info@icuee.com; Web: www.icuee.com

January 2008

- 22-26 World of Concrete 2008, Las Vegas, Ph: (414) 289-4141; Web: www.worldofconcrete.com

March 2008

- 11-15 CONEXPO-CON/AGG, Las Vegas, (800) 867-6060, Fax: (414) 272-2672; Web: www.conexpoconagg.com.

June 2008

- 7-11 2008 North American Tunneling Conference, San Francisco. Ph: (303) 973-9500; E-mail: meetings@smenet.org; Web: www.smenet.org

September 2008

- 22-27 ITA-AITES World Tunnel Congress 2008, New Delhi, India, ITA, Web: www.ita-aites.org