



By Jack Burke

CALIFORNIA

Oakland
Caldecott Tunnel 4th Bore Project
Tutor-Saliba Corp.

The three existing Caldecott Highway Tunnels are located on State Route 24 and pass through the Berkeley Hills, connecting the cities of Oakland and Orinda. The Caldecott Tunnel Fourth Bore is a 3,399-lf, horseshoe-shaped tunnel, 50-ft wide and 32-ft high, that will add two additional 12-ft lanes of traffic in the westbound direction. The tunnels will include a 10-ft shoulder on the right and a 2-ft shoulder and 3-ft walkway on the left. Construction began in January 2010 and will take approximately three years. The fourth tunnel will parallel the existing third tunnel and will have seven interconnecting personnel passageways to facilitate maintenance and emergency access. Also included will be construction of a new Operations and Maintenance Center building totaling approximately 6,000 sq ft. The project will also include the construction of retaining walls near the eastern and western sides of the tunnel, and permanent sound walls on the western side.

The Fourth Bore is being constructed by the sequential excavation method (SEM) that provides the required flexibility to construct a wide-span tunnel in weak and variable ground conditions. Excavation is being performed by roadheader, with pre-support measures ranging from spiling to pipe canopies. A waterproof membrane will be placed on the inside face of the initial support, which is a mix of reinforced shotcrete, lattice girders and rock bolts, followed by the construction of a cast-in-place reinforced concrete lining.

The Westbound Tunnel top heading excavation from the East Portal started on Aug. 24, 2010. Double shift excavation started on Aug. 30. The tunnel is being excavated with an Aker Wirth 73-20 Roadheader machine supplied by American Commercial.

As of Aug. 20, 2011, the Westbound Tunnel top heading has reached 2,126 ft (65 percent) from the East Portal. The Eastbound Tunnel top heading excavation has reached 361 ft (11 percent) from the West Portal. Eastbound bench excavation has reached 177 ft (5.4 percent) in from the West Portal. Excavation and support of one of the seven cross passages has started.

Project Manager: Pat Jennings; Tunnel Superintendent: Bill Monahan; Senior Project Engineer: Bryan Lee. Information: (510) 665-3114; bryan.lee@tutorperini.com.

Pacifica
Devils Slide Tunnel
Kiewit Pacific Co.

As of Aug. 28, final lining concrete operations have completed in both tunnels as well as all 10 cross passages. To date, 880 m of the tunnel fire line have been installed in the northbound tunnel and 650 m have been installed in the southbound tunnel; and 900 m of final walkway placed in the northbound tunnel and 1,110 m placed in the southbound tunnel. In the northbound tunnel, 640 m of stainless steel brackets have been installed to hang metal panels and 590 m have been installed in the southbound tunnel.

Textured arch concrete placements are ongoing at the north portal in the northbound tunnel and at the south portal in the northbound tunnel. The textured arch concrete for the southbound tunnel at the north portal is complete. At the north portal, backfill operations are ongoing at the textured northbound and southbound cut-and-cover sections. Work is being performed to install permanent utilities in addition to the mechanical and electrical activities proceeding in the south equipment chamber.

Kiewit Team: Project Manager: Dan Griffin; Tunnel Manager: Bhaskar Bhavsar; Project Engineer: Dawn Dobson; Safety Manager: Brian Smith; and Quality Manager: John Owens. Information: (650) 290-5100.

San Francisco
Central Subway
Barnard/Impregilo/Healy JV

The subway tunnels project for the San Francisco Municipal Transportation Agency was awarded to Barnard/Impregilo/Healy joint venture in August 2011 for \$234 million. The project includes twin tunnels with lengths of 8,233 ft each to be excavated with two EPB TBMs and lined with 18-ft diameter precast concrete segments. Work also includes a launch box and portal structure under 4th Street, a retrieval shaft, and headwalls for future stations that the TBMs will mine through prior to the station construction. Completion is anticipated in 2014.

Project Director: Dan Schall; Project Manager: Jim Nickerson; Assistant Project Manager: Ben Campbell; Project Superintendent: Mike Hanley; Chief Engineer/DPM: Alessandro Tricamo; Staff Engineer and personnel: Matt Paulsich, Glen Strid, Jack Sucilsky, Vik Schdev. Information: Ben Campbell, (404) 586-1995.

CONNECTICUT

Hartford
Grandby
Street Area
Sewer Separation Project
Bradshaw Construction Corp.

Bradshaw Construction Corp. is preparing to perform 2,655 ft of pipe jacking as part of a sewer separation project. The project includes the installation of 1,560 ft of 60-in. RCP and 960 ft of 48-in. RCP via microtunneling, and 145 ft of 42-in. RCP with a conventional TBM. The work will be performed under Granby Street in northwest Hartford, between Burlington Street and Branford Street. The soil conditions consist primarily of very soft silts and clays below the ground water table. Information: Doug Piper, dpiper@bradshawcc.com.

FLORIDA

Cantonment
International Paper
Bradshaw Construction Corp.

Bradshaw Construction Corp. is currently constructing a tunnel in Escambia County 1,150 ft in length. Construction began in February 2011. To date 705 ft of tunnel has been installed. The primary tunnel liner consists of 75-in. OD Steel Ribs spanned by hardwood lagging. An Akkerman WM-60C TBM is excavating the tunnel. Information: Mark Rybak, 410-977-0955, mrybak@bradshawcc.com.

GEORGIA

Atlanta
South Cobb Tunnel Project
Shea/Traylor JV

Shea-Traylor received NTP on this project for the Cobb County Board of Commissioners on July 14, 2008.

The project consists of approximately 29,000 ft of 24-ft finished diameter tunnel located in rock, with depths ranging from 150 to 400 ft. Most of the tunnel was excavated using a tunnel boring machine. There are three major shafts on the project which consist of two shafts 44-ft, 6-in. in diameter for launching and recovery of the TBM, and one shaft 116-ft in diameter for construction of a pump station, which is currently being constructed under a subcontract with Archer-Western Construction. Several smaller drill-and-blast tunnels connect to five diversion/drop shaft structures that interconnect with the mainline tunnel.

Current work on the project completed to date consists of: TBM hole through on March 14, 2011; excavation of Sweetwater, Silver Creek, Carroll Creek, I-20 and Nickajack tunnels and chambers; subcontractor DMC has completed nine of the 10 raise bore shafts. Chamber concrete is complete in four of the five chambers. Pipe installation in tunnels is complete in the Nickajack, Sweetwater and I-20 tunnels; mainline tunnel concrete has started and approximately one mile is complete to date. Planning for finishing and modified contact grouting are under way. Archer-Western has continued with the pump station structure and is getting close to completing all structural concrete, and are currently installing mechanical and electrical systems. Intake diversion structure work with Carter Concrete Structures is ongoing and should be completed in late fall.

Project Manager: Dan Martz; Assistant Project Manager: Stuart Lipofsky; General Superintendent: Mike Weeks; Project Engineer: John Forero; Field Engineer: Percy Townsend; Surveyor: Bill Currier; Cobb County Water System Engineering and Records Division

Manager: Judy Jones; Parsons/Jacobs Associates Construction Manager: David Rendini; Parsons/Jacobs Associates Assistant Construction Manager: Ted DePooter; JYG Design Engineer: Mike Robison. Information: (770) 941-9021.

ILLINOIS

Chicago 39th Street Bypass Tunnel Kenny Construction Co.

The Notice of Award was issued on Dec. 24, 2008, for the \$146.5 million project consisting of six lined drop shafts with inside diameters from 7-ft, 2-in. to 15 ft varying in depth from 227 to 250 ft; a vent shaft; six connecting structures; three backflow gate structures; entrance conduit structures; manholes; replacement gates at an existing MWRDGC structure; addition of 25 existing louvers at 25 existing drop shafts and 14,740 ft of 15-ft inside diameter lined rock tunnel.

Crews mobilized to the site in April 2009 and started the overburden caisson for the main work shaft. The 75-ft deep caisson was completed, followed by the drilling/shooting of the shaft to the

Deaeration Chamber below and concrete lined back to the concrete caisson leading edge. The 42-ft high x 30-ft wide x 100-ft long Deaeration/Drop Shaft/TBM launch Chamber was excavated and partially concreted. The 17-ft, 6-in. Robbins TBM refurbishment was completed in a shop in Milwaukee by Kenny crews and shipped to the site. The TBM was erected and production mining started in early February 2010. Crews are mining three shifts on a five-day week; the crews averaged well over 1,000 ft per week. The mining was completed in May 2011. Following the removal of the TBM, the tunnel lining was started. Working around the clock, crews cycled more than 200 ft per day and completed the lining in early November. All forms have been removed with the completion of all tunnel grouting and finishing completed in March 2011.

The shaft crews have completed all the drop shaft overburden and rock excavation. All of the boot and connector tunnel excavations were completed with the following concrete work completed in June 2011. Most of the surface structures are complete and concreting is well under way. It is anticipated that all surface





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North American Project Update

structure work will be completed by June 2012 with final connection to the existing TARP tunnel after owner acceptance.

Tunnel Division Manager: Ted Budd; Project Manager: Mike Surman; Project Engineer: Christian Heinz; Senior Staff Engineer: Donn Renfro; General Superintendent: Paul McDermott; TBM Specialist: Tommie Peterson; Equipment Superintendent: Don Smith; Safety Manager: Paul Lauricella. Information: tedbudd@kennyconstruction.com

MARYLAND

Waldorf

Piney Branch Sewer Interceptor Upgrade Phase 1 Bradshaw Construction Corp.

Bradshaw Construction Corp. has completed construction of five tunnels under Piney Branch Stream in Charles County totaling 1,600 ft. Steel casing, 60-in. diameter, will be jacked through soft ground. PVC sewer pipe, 42-in. diameter, will be installed and grouted following the tunneling operation. Information: Mike Wanhatalo, mwanhatalo@bradshawcc.com.

Montgomery and Prince Georges Counties Chevy Chase

Bi-County Water Tunnel Renda/Southland/SAK JV

This \$112 million project includes 28,147 lf of 10-ft diameter rock tunnel; one main working shaft, 35-ft diameter, 168-ft deep; and two receiving shafts, one 109-ft deep, 18-ft diameter and one 134-ft deep, 22-ft diameter. Tunneling for the second run is under way again after the repairs were made at Robbins Solon, Ohio, facility. Four new gearboxes and a new bull gear were installed and the TBM shipped back to the site. Mining commenced again at the end of June and progress in July was steady; however, progress in August was hampered by bad ground that required support beyond that of the contract. This additional support has been ordered and installed through an approximately 50-ft long zone. Additional grouting to fill the void is still required, but the machine is completely through the area and is performing well.

The tie-in work at the Stoneybrook Drive site has been completed as well as the vault structure and the piping within it. Work is progressing with the shaft piping and annulus grouting within the shaft. Backfilling of the vault excavation and the removal of the SOE are also under way.

The Tuckerman Lane retrieval shaft is down approximately 110 ft with another 50 ft left to complete. Once completed, the shaft will be allowed to flood until the TBM approaches. A shut-down and tie-in will also be required at this site similar to the tie-in at the Stoneybrook Drive site but with the addition of approximately 420 ft of relining. This work is scheduled for fall 2012. Steel liner installation of the first reach will begin later this year. This work consists of installing 84-in. steel carrier pipe within the 10-ft diameter tunnel and grouting the annulus.

John Arciszewski has been reassigned to the Jollyville Transmission Main Tunnel in Austin as the Project Manager and James Grissom will be the Project Manager in Bi-County.

Regional Manager: Kent Vest; Project Manager: James Grissom; Operations Manager: Don Painter; Electrical Superintendent: Estill Clark; WSSC Project Manager: Steve Pinault; Jacobs Associates Resident Engineer: Phil Chandler; Jacobs Associates Assistant Resident Engineer: Jeff Peterson; Black & Veatch Project Manager: Doug Brinkman; Black & Veatch Project Engineer: Ish Hanieh. Information: (585) 545-4050.

NEW YORK

New York

East Side Access Dragados/Judlau JV

The Robbins TBM was disassembled and removed from the tunnel and sent back to Robbins' shop in Solon, Ohio. The SELI TBM completed mining, mined off alignment, and buried after the trailing gear was removed. The lower level TBM tunnels under the GCT cavern are being excavated from circular TBM bores to square with sidewall bolts installation in preparation for the benching down into these tubes. Crews are also drilling and blasting in the GCT 4 West Wye cavern in the lower level. Another blast crew is blasting cross passages and adits from the SELI drive back to the beginning of the GCT cavern. The JV is excavating three of the four tunnel drives. On the upper level of the GCT Caverns, crews are pouring the WB cavern arch in 50 ft lifts and are out in front of the form spread shotcrete for smoothness while subcontractor Wisko is installing waterproofing. Crews have just started building the EB upper GCT cavern forms to begin arch lining. The JV is completing all top level excavation with GCT ½ WB remaining along with one access tunnel. Crews have completed Access Tunnel 1,

GCT ½ EB and 50th Street Tunnel and Access Tunnel 2.

TBM tunnel concrete is under way with an invert first system. The tunnels are prepared for waterproofing and then Wisko follows installing the PVC liner. We are currently placing in the tail tunnels at 37th Street and eastbound upper level TBM tunnel. We mobilized our Arch form and carrier system to start placing concrete in the tail tunnel.

Project Executive: Jose Miguel Gonzalez; Project Executive: Pablo Diez; Project Manager: Don Hickey; Project Engineers: Joaquin Fernandez, Julio Velez; Dave Dorfman is now added as the GCT Cavern General Superintendent. Equipment Manager: Louis Sanchez; Survey Superintendent: Jim Skura; General Superintendent: Dave Dorfman, Equipment Superintendent: Jim Disley. Information: Don Hickey, (718) 943-1400.

Madison Yard Dragados/Judlau JV

At Shaft 5, crews are using an Alimak for access to the Cavern. Shaft 4 has been lined except the last 15 ft adjoining the cavern. Shaft 3 is finished with the invert waterproofed and poured. Shaft 2 is complete and the access tunnel has been excavated from the cavern side. It is currently being used for material access and help with the muck removal from the cavern. Shaft 1 has not yet started. Yonkers is the general contractor working from the street level above. Crews have excavated down to elevation 290 and need to finish and line the shaft to elevation 282 before starting the shaft.

ESC4 waterproofing (WP) installed, rebar installation in progress 40% complete; ESC3 WP has been installed on the incline; ESC2 initial shotcrete has been installed with waterproofing remaining; ESC1 incline has not started, but all transfer work has been completed.

The wellway has been excavated down to elevation 288. Blasting operations have started to expose the face of the escalator. The top part of the escalators have not been fully excavated or finished they still just ramp from the yard to the incline escalator at 12 percent. Information: Adrian Dent, (201) 577-2418.

Second Avenue Subway Schiavone/Shea/Kiewit (SSK) JV

The project is a portion of the Second Avenue Subway. The joint venture of Schiavone/Shea/Kiewit (SSK Constructors) will be building the 72nd Street Station and G3/G4 Tunnels. The value of the project is \$447,180,260.

The following is a summary of the status of the project:

- The mucking systems at both shafts are completed and in operation.

- Both the 69th and 72nd Street shafts have been excavated along with the top center drift heading and crews are currently working on the west top heading slash.

- Crews have ramped down to the existing TBM tunnels on the West tunnel and have started excavation of the G3 cavern, which is 25 percent complete.

- Crews are starting the demolition of the five-story building at Ancillary No. 2, along with some of the rock excavation and decking.

Schiavone Vice President/Project Executive: Anthony Del Vecovo; Project Manager: Andrej Delle; Project Engineer: Sean Menge; Project Coordinator: Frank Townsend; Tunnel Manager: Brian Fulcher; General Superintendent: Mike Jennings. Information: (201) 320-3102.

86th Street Station

Skanska/Traylor JV

The \$302 million, 37-month project includes the rock cavern station construction, associated open cuts, building underpinning, utility relocations and associated building demolition.

Vice President: Mike Attardo; Project Executives: Gary Almeraris, Tom Maxwell; Technical Director: Lars Jennemyr; Project Manager: Tom O'Rourke; Production Manager: Scott Hoffman; Underground Superintendents: Karl Poss, John Kieran; Surface Superintendent: James Sparks; Project Engineer: Steve Vick; Safety Engineer: Joe Mannino.

Slurry Tunnels

Granite/Traylor Brothers/ Frontier-Kemper JV

Two Herrenknecht slurry TBMs are poised to begin the short, but challenging soft ground tunnels on the \$7.3 billion East Side Access project to bring Long Island Rail Road services into Grand Central Station in Manhattan, New York.

Contractor G.T.F., a three-way joint venture comprising Granite Northeast, Traylor Brothers and Frontier-Kemper, won the contract in September 2009 with a bid of \$730 million. The TBMs are standard slurry machines, but that the JV with manufacturer Herrenknecht has over engineered them so as to reach safe havens located about every 1,000 ft along the tunnel alignments and limit the need for compressed air interventions.

One of the three safe havens is where the three-tunnel emergency exit was located, where the A tunnel, as well as

the Yard Lead and the B/C tunnels all meet. The emergency shaft was deleted from the plans, and the safe haven creation originally by jet grouting was replaced by a major ground-freezing project, conducted by freezing specialist subcontractor Moretrench. The machines will be driven into the block of frozen ground, where maintenance will be conducted in free air, and the ground freeze thawed after construction.

The machine launch is about six weeks behind schedule, mainly due to the significant repair work by the contractor to fix the slurry walls around the open launch box structure. These were installed under a separate contract that was terminated for default. The Queens tunnels will link tracks on Long Island to the existing 63rd Street Tunnel under the East River, and to the East Side Access Manhattan tunnels and new terminal under Grand Central station.

Northern Boulevard Crossing

Schiavone/Kiewit

The Northern Boulevard Crossing, or NBX, is a 120-ft long, 60-ft wide and 40-ft tall tunnel passing below an elevated train, Route 25A and a subway line. The tunnel is a crucial link for the East Side Access and, when completed, Long Island Rail Road trains will travel through the tunnel on their way to and from Grand Central Station in Manhattan.

Schiavone/Kiewit JV received the notice to proceed in February 2010. Currently, excavation of the Early Access Chamber has progressed to 80 ft below street level. Preparations for the tunnel excavation are well under way. Underpinning of the elevated track structure was completed in November 2010; Moretrench under a subcontract has installed freeze pipes for the frozen arch support to allow for the tunnel excavation and has mobilized the freeze plant.

The freeze was scheduled to be initiated in September 2011 and once the frozen arch has formed and the dewatering is complete, a three-over-three sequential excavation will commence under the frozen arch. The SEM initial support consists of lattice girders and shotcrete. The final tunnel liner will be constructed with reinforced concrete and ring girders.

Project Manager: Kevin F. Clark; Project Engineer: Natasha Taylor; Quality Manager: Andrey Moor; SEM Engineer: Paul Madsen; Project/Field Engineers/Superintendents: Jesse Sylvestri, Phillip Ruby, Ken Stollenmaier, James McCabe, Jesse Lane, Brian Reckendwald, Joe Caggianelli, Eric Reinertsen, Karen

Ceberek; Safety: Mathew Chasse, Gabrielle Martin.

Croton

New Croton Aqueduct Rehabilitation Frontier-Kemper/Schiavone/Piccone

In October 2008, the Frontier-Kemper/Schiavone/Piccone JV was awarded a contract by the New York City Department of Environmental Protection for the rehabilitation of the New Croton Aqueduct. The scope of work calls for the rehabilitation of the New Croton Aqueduct from the Croton Lake Gate House just north of Westchester County to Shaft 33 in Manhattan; a length of approximately 30 miles. Work includes cleaning the tunnel lining, brick repairs, crack repairs, grouting and epoxy coating. Additional work includes rehabilitation of 32 shafts and associated surface and site structures along the tunnel alignment.

Frontier-Kemper/Schiavone/Piccone JV (FKSP) has been working on the New Croton Rehabilitation project since the notice to proceed in January 2009. The project consists of shaft and gatehouse rehabilitation in Westchester, and shaft and tunnel rehabilitation in NYC. Tunnel work includes grouting behind the tunnel liner and replacing deteriorated sections of the 130-year-old aqueduct's brick liner. FKSP must also install a concrete plug within the aqueduct, to redirect the flow of water to the new water treatment plant currently under construction. To date the majority of work in Westchester and NYC has been completed. Architectural finish work is wrapping up, the Westchester shafts are being demobilized and preparations are being made to begin work on the concrete plug and a new distribution tap this autumn.

Project Manager: Leon "Lonnie" Jacobs; Project Engineer: Paul Dixit; Superintendents: Clyde Purdue, John Beasley and Greg Sisto; Engineers: David Daddario, Derek Powers, Kevin Sisto, Kevin Dean, Anthony Thomaselli, Andrea Narino, Kumar Gopalsamy, David McMahon; Site Safety: Jon Ridens; Business Manager: Tom Berger. Information: (914) 375-3513.

Rochester

East Side Water Supply Raw Water Intake Tunnel

Southland Contracting Inc.

This \$34.9 million project for the Monroe County Water Authority includes one 45-ft diameter shaft 170-ft deep; 6,000 lf of 114-in. tunnel under Lake Ontario with a 4-in. thick shotcrete liner; six 60-in. drilled pump shafts 100-ft deep; 220 lf of 12-ft

North American Project Update

main pump adit tunnel; and two marine intakes (114-in. and 36-in. diameter, 60-ft deep in 60-ft of water) on Lake Ontario.

The 45-ft diameter 170-ft deep riser shaft was excavated by drill-shoot and has been completed. During the shaft excavation, the 220 lf main pump adit tunnel was excavated by drill-shoot and has been completed. The six 60-in. drilled pump shafts have been drilled and connected to the main pump adit. The 6,000 lf tunnel under Lake Ontario is completed along with the connections to the drilled Marine Shafts. The final lining of the tunnel will require a 4-in. thick layer of shotcrete the entire length. The shotcrete lining is currently under way.

Regional Manager: Kent Vest; Project Engineer: Chris Davis; Project Superintendent: Maynard Haynes; Design Consultant: Brierley Associates; Resident Engineer: Jenny Engineerin-Chris Orlandi, Design Engineer: O'Brien & Gere-Thomas Bold; O'Brien & Gere-Jennifer Olivo; Construction Manager: Christa Construction-Jim Finnell. Information: (817) 538-1062.

NEVADA

Las Vegas

Lake Mead Intake No. 3 Shafts and Tunnel Vegas Tunnel Constructors (Impregilo/Healy JV)

This design-build project for the Southern Nevada Water Authority was awarded to Vegas Tunnel Constructors in March 2008, for \$447 million. The work includes an access shaft 600 ft deep and 15,000 ft of rock tunnel to be mined with a convertible 7.2-m Herrenknecht TBM, capable of operating as a hard rock machine in open mode and as a full Mixshield in poor rock and/or with high water inflows, and lined with 20-ft diameter precast gasketed segments. TBM operating pressures of up to 14 bars are expected, requiring an extensive hyperbaric safety program. Also included is a new intake riser structure constructed 300 ft below the surface of Lake Mead, and miscellaneous site and ancillary work.

Project design has been performed by Arup USA in conjunction with Brierley Associates. The design of the project is substantially complete.

Shaft sinking and lining is complete. The TBM erection chamber and an 85-ft long tail tunnel are complete.

The realigned TBM starter tunnel with length of 380 ft has been completed. After placing the concrete invert, the TBM and backup will be installed to begin

tunneling. Installation of the TBM was scheduled to start in early September.

Underwater excavation at the intake site, by blasting with specially designed and shaped charges, is continuing. Mucking by air lift and clamshell continues. Construction of the concrete intake riser structure has been completed on a barge offshore. This structure is designed to receive the TBM in dry conditions.

Project Director: Fulvio Castaldi; Project Manager: Jim McDonald; Deputy Project Manager: Jim Nickerson; Construction Manager: Renzo Ceccato; Chief Engineer: Dana Downs; Senior TBM Engineer: Nicola Donadoni; Staff Engineers: Lance Waddell, B.G. Kunz, Mariachiaro di Nauta, Erik Hornaday; General Superintendent: Jim Hyatt; Walkers: Neto Jacques, Mike Revis, Brian Comfort; Offshore Manager: Giovanni Pireddu; Marine Superintendent: Casey Graham; Plant Manager: Greg Cook; Safety Manager: Jackie Owens; QC Manager: James Grayson. For SNWA, Construction Manager: Greg Colzani. Information: Jim McDonald, (702) 893-2300.

Lake Mead Intake No. 3 Connector Tunnel Project Renda Pacific Inc.

This project is a part of the SNWA Intake No. 3 Program being constructed in response to the declining Lake Mead water level. The design-bid-build tunneling project includes drill-and-blast excavation of a 450 ft deep by 26 ft diameter surge shaft, and 2,700 ft modified horseshoe-shaped tunnel sections ranging from 30 ft by 30 ft to 14 ft by 16 ft. The shaft and shaft-tunnel transition structure are concrete lined, and final support in the tunnels includes traditional ground support elements including rock bolts, fiber-reinforced shotcrete and steel sets. The project was designed by MWHill JV. Construction management services are provided by Parsons Corporation Inc. The project was awarded to Renda Pacific Inc. in May 2009 and construction began in July 2009.

Currently the 450-ft shaft's excavation and cast-in-place concrete lining have been complete. The excavation of the wide-span shaft-tunnel transition area is fully complete. The constructor has already excavated about 600 ft of the connector tunnels. Due to proximity to Lake Mead resulting high hydrostatic pressures of up to 125 psi, the project continuously faces high water inflows and water control challenges. A jointly developed pre- and post-grouting program is implemented by the CM and contractor using ultrafine cement, Type III cement,

and polyurethane chemical grouting for intensive water control during subsurface excavation.

Renda Pacific – Project Manager: Joe Savage; Project Superintendent: Rick Leever; For SNWA – Project Manager: Erika Moonin; For CM/Parsons – Construction Manager: Shimi Tzobery; Grouting Manager: Jerry Ostberg; Assistant CM: Noah Hoefs; Information: shimi.tzobery@parsons.com, phone: (702) 306-2613.

MISSOURI

St. Louis

Lemay WWTP Wet Weather Expansion Outfall Sewer SAK Construction LLC

Excavation of a 381 lf, 11-ft diameter TBM tunnel has been completed on this project currently being constructed for Metropolitan St. Louis Sewer District. Hole-through of this hard rock tunnel occurred on May 4, 2011. Tunnel excavation started just beyond an existing TBM launch pit (excavated by others under a separate contract) and terminated at an existing junction chamber designated at JC-9. Temporary tunnel support was provided by liner plates installed during TBM excavation.

Non-explosive and explosive rock excavation methods to widen the TBM excavated tunnel to a 16-ft diameter horseshoe shape is scheduled for completion in November 2011. After the tunnel is enlarged, the TBM will be pulled back through the tunnel and removed at the TBM launch pit.

Jacking methods will be used to install 132-in. diameter by 12-ft long sections of PCCP within the tunnel. Final connections between the tunnel liner, JC-9, and the TBM launch pit will be made, which will complete this new outfall for the existing Lemay WWTP. The project is currently on schedule and final completion is expected to occur during the 1st quarter, 2012.

Project Manager: Dave Koehmstedt; Tunnel Superintendent: Perry Dreckshage; Safety Manager: Gary Palivoda.

For more information, please call Brent Duncan at (636) 385-1043.

OHIO

Columbus OARS

Kenny/Obayashi JV

Kenny/Obayashi was awarded the OSIS (Olentangy Scioto Interceptor Sewer) Augmentation Relief Sewer, known as OARS, for \$264 million in September 2010.

North American Project Update

The project consists of three large shafts ranging from 42 to 52 ft in diameter and from 161 to 215 ft deep along with 23,000 lf of tunnel mined in rock using a TBM and 20-ft ID precast concrete segments for support. The overburden soils average 95 ft from the surface. In addition to the shafts and tunnel, there are several surface structures to be constructed. There will be a follow-up project (Phase 2) that will include three additional drop shafts and other surface facilities.

Mobilization has been completed along with the drilling and grouting for the first phase of the shaft pre-excavation grouting program. This was followed by the completion of a CSM wall around Shaft 1 for the Pump Station. In March, Nicholson started the installation of the slurry wall panels for both the Pump Station Shaft (Shaft 1) and the Screen Shaft (Shaft 2). After the slurry walls were completed in June, JV shaft crews completed the overburden excavation of Shaft 2 and are currently performing overburden excavation in Shaft 1. Rock excavation is under way in Shaft 2 but progress has been hampered by water inflows requiring additional grouting. After the shaft rock excavation of both shafts, crews will pre-grout the connecting tunnel and the erection chamber before rock excavation. When complete the shafts and erection chamber will be prepared for TBM erection.

The manufacture of a Herrenknecht Mixshield TBM that is convertible between slurry, EPB and open mode is under way and on schedule for a January 2012 site delivery.

Tunnel Division Manager: Ted Budd; Project Manager: Bob Rautenberg; QA/QC and Engineering: Tom Plinke and Tony Hupfau; Equipment Procurement Manager: Mark Saylor; Safety Officer: Chip Graeber; Office Manager: Marsha Rautenberg; Home Office Sponsor: Mike Smithson. Information: Ted Budd, (847) 541-8200 or tedbudd@kennyconstruction.com.

OREGON

Portland

East Side CSO

Kiewit/Bilfinger Berger (KBB) JV

Work on the East Side CSO tunnel project is winding down with completion of the outfall tie-ins along the alignment. The main CSO tunnel was put into operation in June 2011 upon which it accepted flows from the existing CSO system. Final completion activities include site restorations, which are scheduled for completion by the end of 2011.

Project Director: Bill Mariucci; Project Manager: Niels Kofoed; Project Engineer: Karla Brawner; Safety Manager: Stephen Kendall; Quality Manager: Randy Thomas. Information: (503) 290-7000.

TEXAS

Austin

Downtown Wastewater Tunnel, Phase 1 & 2 SAK/Quest JV

Three of the four tunnel legs on this project being constructed by SAK/Quest JV have been completed. Hole through for the 121-in. diameter, 6,453-lf Comal leg occurred on Jan. 8, 2011. Hole through for the 121-in. diameter, 6,878-lf Riverside leg occurred on May 4, 2011. The third leg, from Riverside to Toomey, was completed on Aug. 5, 2011. Preparations are now occurring to excavate the remaining leg; an 83-in. diameter, 1,400-lf TBM excavated tunnel from Lamar to Toomey.

A combination of 78-in. and 54-in. diameter Hobas tunnel liner pipe is currently being installed in the completed tunnels and it is anticipated that final grouting of the tunnel liner would start mid-September 2011.

This project, being completed for the City of Austin, consists of 18,600 lf of both soft ground and rock tunnel construction. Four access shafts with diameters of 20 ft were also excavated. Secant piles were installed to provide shaft support down to the rock interface. A Webster rock excavator along with rock bolts for support was used to excavate the remaining rock portion of the shafts down to tunnel invert.

The project is currently on schedule and final completion is expected to occur during the fourth quarter of 2012.

Senior Project Manager: James Byrd; Project Manager: Loren Goens; Project Engineer: Len Postregna; General Superintendent: Roger Lynch; Safety Manager: Howard Jones; Project Surveyor: Darrell Bartley. Information: Brent Duncan, (636) 385-1043.

VIRGINIA

Fairfax

Corbalis to Fox Mill 54-in. Water main Kassouf/Clinton Road Equipment JV

The project consists of 8,400 ft of 99-in. TBM excavated rock tunnel and 2,400 ft of open-cut, which was subcontracted to Casper Colosimo & Son Inc. of Pittsburgh. The tunnel will be lined with American Spiral Weld Pipe cement coated 54-in. pipe.

The project for Fairfax Water includes construction of four shafts, two tunnels and open-cut sections for new water main installation in a diabase rock formation. To date, all four shafts have been excavated, and a 42-in. water main has been installed and two shafts have risers installed and backfilled on Tunnel B. The focus of the project is currently on the 99-in. main tunnel excavation for the 54-in. water main installation. The progress of this 8,745-ft section has been plagued by equipment failures, repairs and loss of anticipated production. To date, the TBM has advanced 1,694 ft (21 percent) of the 8,475 ft of tunnel. JB crews continue to struggle against the adverse rock conditions and equipment problems, but expects to complete the mining in March 2012. Subcontractor Casper Colosimo & Son Inc. anticipated beginning the open-cut section of work for the 42-in. water main in October. Project Manager: Jim Foley. Information: (216) 409-3416.

WASHINGTON, D.C.

Blue Plains Tunnel

Traylor/Skanska/Jay Dee JV

The Blue Plains Tunnel (BPT) project for DC Water is part of the Clean Rivers Project, which includes long-term control plans (LTCP) to upgrade the agency's combined sewer overflow system as part of a Federal Consent Decree agreement. The BPT is one component of a system of tunnels which will store and convey combined sewer flows to the Blue Plains Advanced Wastewater Treatment Plant (BPAWWTP).

The design-build project includes planning, designing and constructing the BPT, associated shafts, and structures from BPAWWTP to DC Water's Main Pumping Station at 2nd Street and Tingey Street SE.

The 23-ft inside diameter tunnel runs for 24,000 ft generally northward from the BPAWWTP, following the Potomac River. Two connected shafts (figure-eight) start the alignment, with two intermediate shafts and one end shaft further along. Tunnel depth is approximately 150 ft, and varies between under the river and shoreline. A Herrenknecht EPB will be used to mine and install the precast concrete liner. Shaft construction will use diaphragm walls, with excavation and CIP lining to follow.

Current activities include design, permitting and mobilization. The designer for the project is Halcrow.

11th Street Bridge Corridor Bradshaw Construction Corp.

Bradshaw Construction Corp. is preparing to perform 320 ft of pipe jacking as part of the 11th Street Bridge project. The project includes the installation of 320 ft of 54-in. RCP in order to accommodate future sewer work in the vicinity of the new 11th Street bridges. The soil conditions are primarily soft, wet, clayey sand below the groundwater table. Information: Doug Piper, dpiper@bradshawcc.com.

Utility Duct Bank Bradshaw Construction Corp.

Bradshaw Construction Corp. is preparing to construct liner plate supported shafts and a 104-in. horseshoe tunnel under a road. The tunnel will be hand mined and supported with lattice girders and shotcrete using the sequential excavation method. Information: Sean McIntee, smcintee@bradshawcc.com

WASHINGTON

Seattle

University Link Light Rail, TBM Tunnel UWS to CHS, Contract U220 Traylor/Frontier-Kemper JV

The job for Sound Transit consists of a large slurry wall excavation at the University of Washington station, from which two side-by-side EPB TBM tunnels will be mined. Each tunnel is approximately 11,400 lf long, with 16 cross passages connecting the running tunnels. The TBM will erect the final lining of bolted, gasketed, precast concrete segments. Once mining is complete, a concrete invert and sidewalk will be placed.

Currently, the bracing, excavation and permanent invert for the southern station box has been completed as well as the northern slurry wall construction. The northern portion of the site has been turned over to the station finish contractor. Both TBMs have been launched and have successfully mined under the Lake Washington Ship Canal. The Southbound running tunnel is approximately 11 percent complete and the Northbound running tunnel is approximately 6 percent complete. Cross-passage mining is scheduled to commence in the fall.

Project Director: Dave Ferguson; Project Manager: Michael Krulc, PE. Information: Mike Krulc, p: (206) 285-8888, m: (323) 633-0609.

Kenmore Brightwater-Central Vinci/Parsons/FKCI JV

VPFK is 33 months into the construction of the 4-year, \$210 million Brightwater Central Conveyance Tunnel Project. Work includes two 14.33 ft diameter segmental lined tunnels – one 21,100 lf (BT-3) and the other 11,600 lf (BT-2) – both using slurry TBMs. As of August 2011, the BT-3 TBM completed its drive and was dismantled and removed from the tunnel. The adjacent contractor has broken into the TBM shield that remained. Preparation for the pipe installation in the BT-3 tunnel is under way.

Project Manager: Thierry Portafaix; Project Engineer: Yvonnick Rescamps; Contract Administrator/Scheduler: Terry Yokota.

Richmond Brightwater-West and BT 3 Completion Jay-Dee/Coluccio JV

Jay Dee/Coluccio/Taisei JV (JCT) was the general contractor on the Brightwater West project (BT-4 tunnel) for King County. The 21,000-lf, 13-ft ID segmentally lined tunnel was nearly mined out in January 2010 when the owner, King County, directed the contractor to stop pending ongoing discussions regarding the completion of the BT 3 Tunnel under the Central Contract. A new cost plus-fixed fee contract was negotiated to allow Jay Dee/Collucio JV (JDC) to complete the BT-3 contract.

By mining out of the Ballinger Way Shaft on Sept. 30, 2010, JDC met Milestone 1 under the contract, and earned the incentive payment established by the contract. On Oct. 1 and 2, JDC replaced the full face of cutters with a new dressing, since the old worn cutters had been used to go through the seal and mine the initial few sets East of the shaft. In addition, the shaft seal was grouted solid.

Through October 2010 JDC continued mining out of the frozen ground and moving forward, to the East until all of the trailing gear was past the BWS. All muck continued to be transported thru the tunnel to Point Wells, a distance at the completion of the drive of over 31,000 lf. The TBM reached the “parking station” about 100 ft from the stalled Central Contract TBM on July 12, 2011. This was 50 days ahead of the target schedule.

JDC then waited until the freeze system installed around the TBM had sufficiently frozen the soil to allow the Central Contractor to remove the TBM cutterhead. This took several weeks and on Aug. 10 crews mined the last 50 ft of tunnel to the start of the frozen ground, 50 ft in front of the now abandoned TBM. On Aug.

15, JDC mined through the frozen ground and the aluminum freeze pipes to the face of the concrete plug and removed all the gage cutters from the TBM. On Aug. 16, 2011, at approximately 2:26 pm, the JDC TBM Elizabeth poked its center cutter into the Central Tunnel directly on target. The TBMs were then grouted together by placing a steel bulkhead between the outer skin of Elizabeth and the interior of the Central TBM and grouting the annulus and entrance seal.

JDC Project Manager: Greg Hauser; General Superintendent: Thomas McMahon; Project Engineer: Gregg Olsen; Tunnel Engineer: Mina Shinouda; Heading Engineers: Peter Wang and Will Hodder; Walkers: Martin Valles and Edgar Valles; Office Engineer: Curtis Roselle; Safety Superintendent: Rick Sutton; Office Manager: Renee Halley-Hauser; Clerk: Diana Fleming; Master Mechanic: Will Yoho.

The Project Representative for King County is Judy Cochran. The Resident Engineer is Mike Cole and the Chief Inspector is Ken Rossi, both of EPC Consultants. Shift Inspectors are Carl Neagoy of Jacobs Engineering and Stan Burns of King County. John Gidronie is the Design Engineer with Jacobs Associates. Information: Greg Hauser, (206) 542 2865.

Seattle Alaska Way Bored Tunnel Tutor-Perini/Drageados JV

The \$1.4 billion TBM bored 57.4-ft diameter tunnel in abrasive soils has been approved by the voters, received NTP as of Aug. 24, 2011, and is commencing with final design. The TBM purchase has been awarded to Hitachi Zosen of Japan and is proceeding with design and manufacturing. Coluccio has been selected as the utilities relocation subcontractor and the project is proceeding with field office mobilization and identifying early onset subcontractors and suppliers.

Project Manager: Chris Dixon; Deputy Project Manager: Manuel Ruiz; Construction Managers: Javier Varela and Josh Randall; Commercial Manager: Reggie Smith; Engineering Manager: Clyde Joseph; Quality Assurance Manager: Craig Hansen; HNTB Design Director: Dan Dixon; Design Manager: Rich Johnson; Design QC Manager: Laura Smith. For WSDOT, Program Manager: Linea Laird; Construction Manager: Pat McCormick; Design Manager: Susan Everett; Administration Manager: Brian Nielsen.

Jack Burke is a regular contributor to *TBM: Tunnel Business Magazine*.