**Public Works Project of the Year Nomination Form**

**DEADLINE** September 7, 2012

**PROJECT NAME** Balch Consolidation Conduit Project

**PROJECT COMPLETION DATE** October 6, 2011

Must be substantially complete and available for public use within two calendar years prior to nomination.

**PUBLIC AGENCY** City of Portland, Bureau of Environmental Services

**PROJECT CATEGORY**

- Structures
- Transportation
- Environmental (Water, Wastewater, Stormwater)
- Historical Restoration/Preservation
- Disaster or Emergency Construction/Repair

**PROJECT DIVISION**

- Less than $5 million
- 5 million to less than $25 million
- $25 million to $75 million
- More than $75 million

**MANAGING AGENCY**

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<td>H. Scott Clement, P.E.</td>
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**PRIMARY CONTRACTOR**

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<td>Scott Thibert</td>
<td>Project Manager</td>
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**PRIMARY CONSULTANT**

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<th>Name</th>
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<tr>
<td>Brad Moore, P.E.</td>
<td>Technical Director</td>
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<td>Kennedy/Jenks Consultants</td>
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**Public Works Project of the Year**  
**Nomination Form**

**PLEASE ADDRESS EACH OF THE FOLLOWING AREAS IN YOUR SUPPORTING DOCUMENTATION. ADHERING TO THE BELOW SEQUENCE WHEN POSSIBLE.**

- General description of the project.
- Completion date contained in contract. Any time extensions granted should be addressed in the submittal.
- Construction schedule, management, and control techniques used.
- Safety performance including number of lost-time injuries per 1,000 man hours worked and overall safety program employed during the construction phase.
- Environmental considerations including special steps taken to preserve and protect the environment, endangered species, etc., during the construction phase.
- Community relations—a summary of the efforts by the agency, consultant and contractor to protect public lives and property, minimize public inconvenience and improve relations.
- Unusual accomplishments under adverse conditions, including but not limited to, adverse weather, soil or site conditions, or other occurrences over which there was no control.
- Additional considerations you would like to bring to the attention of the project review panel such as innovations in technology and/or management applications during the project. Include a description of special aspects of the project.

**NOTE:** Supporting documentation is **limited to twenty (20) pages**, exclusive of photographs and nomination form. This **submittal will not be returned**. Include one "hard" copy and one electronic copy of the nomination form and supporting documentation. Submit a separate CD with 10 to 20 photographs of the project.

**NOMINATED BY** *(Can only be nominated by managing public agency or APWA Chapters.)*

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1120 SW Fifth Avenue, Room 1100  
Address (if post office box, include street address)

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**THESE MATERIALS SHOULD BE SENT TO:**

Public Works Project of the Year • Awards Program  
City of Oregon City  
ATTN: John Lewis  
122 S Center Street  
jmlewis@orcity.org
General Description of the Project

The Balch Consolidation Conduit (BCC) Project is part of a group of improvements that the City of Portland Bureau of Environmental Services (BES) completed to reduce the discharge of Combined Sewer Overflows (CSO) to the Willamette River. The project included the construction of gravity pipelines, shafts, and a deep tunnel that collect and intercept overflows from existing combined sewers that discharge to the River from the Northwest Portland Industrial Neighborhood.

Kennedy/Jenks Consultants was hired by BES to manage the design. Led by Portland-based Project Manager Bob Jossis and Technical Director Brad Moore, Kennedy/Jenks oversaw the design, which ultimately involved 6,900 feet of 84-inch and 1,100 feet of 54-inch microtunneled pipeline. Kennedy/Jenks was supported by several key subconsultants including: Robert G. Jossis Consulting, Staheli Trenchless Consultants, Shannon & Wilson, Inc., Lancaster Engineering, Right of Way Associates, Heritage Research Associates, Dave Mills Consulting, JLA Public Involvement, and He-Tech Inc.

The project was originally intended to be built using a conventional design-bid-build approach, however review of the risks associated with microtunneling and the risks associated with not meeting a federally mandated completion date of December 1, 2011, caused the City to choose an alternate form of contracting for completing the project. The Kennedy/Jenks team assisted the City in contractor selection with the preparation of RFQ, RFP and supporting documents, while concurrently proceeding with design documents from 30% to 60% design stage. Contractor James W. Fowler was ultimately selected to provide pre-construction and construction services. Together, the BES-Kennedy/Jenks-JW Fowler team became a cohesive unit working toward the primary goals of the project which included:

- Complying with the mandated Amended Stipulated and Final Order (ASFO) administered by the Oregon Department of Quality (DEQ) specific to control of the combined sewer outfall
- Having the project in place and operational by the December 1, 2011 deadline to meet requirements of the ASFO
- Identifying project risks and developing mitigation measures
- Minimizing environmental risk and ensuring worker health and safety
- Collaborating and coordinating among multiple project disciplines and affected businesses

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The final project alignment faced significant challenges both above ground in the former Guilds Lake and now mixed-use neighborhood, as well as below ground where varied soil and contaminated media conditions needed to be overcome.

The City, Kennedy/Jenks, and JW Fowler worked as a team to procure microtunneling equipment, conduct constructability reviews, and assess risks and mitigation measures in advancement of the design. This partnering, team-oriented approach resulted in successful completion of the third longest microtunneling drive in U.S. history through extremely aggressive gravels, and completion of one microtunneling drive through extremely soft silts and clays, by implementing innovative ground modification techniques.

With the project now complete, the City meets regulatory requirements to capture stormwater runoff and keep contaminants out of the Willamette River. The teamwork and commitment to working concurrently on design, constructability, risk-mitigation, value-engineering, and cost-saving measures streamlined the overall schedule and reduced construction costs. In fact, the overall cost of the project was reduced by over $15M during the Pre-Construction Services Agreement phase and reduced by over $3.7M in the construction phase. More than that, this challenging stage also used innovative new microtunneling equipment, reduced environmental impact (eliminating 20,200 tons of waste to landfills and reducing fuel consumption my over 12,900 gallons), put local teams to work, and kept businesses in the area operating.
Completion Date Contained In Contract

Scheduled date of completion: December 1, 2011

Actual date of completion: October 6, 2011

The team exceeded the City’s expectations by completing the project nearly 2 months before the regulatory requirements by always keeping project goals at hand. This was accomplished through weekly schedule updates with a 3-week look ahead, bi-weekly schedule updates and reviews, sequencing work to address variations in critical path, real-time monitoring of the microtunneling process, and a team approach to corrective actions to keep the microtunneling machine moving. All design and construction decisions were subject to cost and schedule factors.

The unique contracting partnership created a true team approach to every project challenge. Project schedule was one of these challenges. The partnership arrangement itself assisted in meeting schedule as it allowed for certain tasks such as design and contractor selection to occur concurrently. It also reduced normal administrative time for items such as RFI’s, change orders and RFQ’s for two reasons: first there were less to deal with as the contractor was included in the design process, and second it was more of a team approach during construction.

The partnership resulted in modifications to design and construction techniques that reduced the project time frame. For example, the use of cutter soil mixing techniques/equipment allowed temporary shaft walls and ground modification panels to be construction in situ. Also, project risks were identified during a BCC Risk Workshop held with BES, the Contractor and the Design Team during the design phase. The risk workshop identified risks with project construction along with frequency, probability, and magnitude of occurrence. Design actions were taken and decisions made prior to construction to minimize these risks, while also establishing appropriate levels of construction allowances to provide for any remaining risks. Some of the project risks include ground modification, contaminated media handling, dewatering, and ground settlement. This resulted in significant project savings, reduced risk and project change orders, and reduced impacts to the project area and environment. It also used local teams and resources keeping jobs and dollars in the local economy. The finished project is the collection of stormwater in a manner that is nearly invisible, resulting in a healthier community and cleaner river.

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Construction Schedule, Management, and Control Techniques Used

The project was originally envisioned to be a design-bid-build project; however as design progressed, the risks that had been identified were considered to be significant, due to areas with extremely soft soils, landfill debris, aggressive gravels, cobbles, and boulders. As a result, the City chose to use an alternative contracting mechanism for project delivery that included choosing a contractor through a qualifications-based selection process at the 30% to 60% design stage. From the 60% to 100% design completion level, the contractor, James W. Fowler, participated in final design decisions, made suggestions for modifications to existing design features, and provided input to refine cost parameters. This mechanism was previously coined "The Portland Method" on the West and East Side CSO projects.

Using an alternative contracting method known as the “Portland Method”, Contractor James W. Fowler Co. participated with the Kennedy/Jenks team in risk identification, mitigation, and key design decisions from 60% design through construction completion. As City Project Manager Scott Clement liked to say, it took partnering with a little “p” to achieve so much success on such a large infrastructure project.
Early contractor involvement at the design stage had several project benefits, which included:

- Reducing the time to complete the project by allowing concurrent design and construction.
- Identifying materials and equipment needs and aiding in faster construction sequencing.
- Selecting of equipment based on geotechnical conditions.
- Providing more time to procure specialized equipment, such as the microtunnelling machine.
- Fostering a cooperative working relationship among contractor, design team, and BES during design and construction.

While the non-traditional contracting approach could be sufficient to get a project moving, the BCC project went even further. The team drafted and signed an informal partnering agreement with the goals of the project clearly stated along with a commitment to work together as a cohesive team to overcome project challenges for the good of the project mission and community. While not legally binding, this partnership was vital to project decision-making by all members of the team.

Finally, the Owner, Contractor, Designer cost savings measures through value engineering and constructability reviews prior to construction were calculated at $13.6 million. Some of those gains are represented in the chart below and discussed in other sections of this submittal.
Safety Performance

Safety is an important consideration on all projects. For underground construction projects, such as the Balch Consolidation Conduit Shafts and Pipelines project, it took on an even higher priority. On an OCIP project, it is vital that the contractor has a strong safety program and is diligent about enforcing and monitoring the plan. Contractor James W. Fowler (JWF) maintained a commitment to the City that the goal of no injuries or claims on the project takes priority and that any hazards are mitigated before they occur.

JWF maintained a safe and productive working environment for the City, all JWF employees, subcontractors and the public. JWF implemented a safety program on the Balch Consolidation Conduit from the development of a safe working culture to detailed steps as indicated below:

**Safe Culture**

JWF strives to create, not just a safe occupational working environment, but a safe working culture characterized by high standards of safety. Individual accountability is imperative, and unsafe acts will be addressed immediately. Violation of our Corporate Safety Plan, such as willful disregard for serious hazards or violations of safety rules that could result in serious injury or fatality, will result in immediate termination.

**Substance Abuse Policy**

We have a zero-tolerance substance abuse policy that includes pre-employment drug screen, random testing, and post incident/accident testing.

**Job-Specific Safety Planning**

The safety program for the project begins upon Notice to Proceed and will continue throughout the BCC project. JWF provided BES with a site specific safety manual meeting
the specified requirements, tailored specifically for the BCC project, and founded on JWF’s Corporate Safety Plan.

**Job Hazard Analysis**

Prior to commencement of any work, the project manager, corporate safety manager, and the superintendent jointly conduct a comprehensive Job Hazard Analysis (“JHA”) of the major construction tasks. Potential job hazards and industrial safety risks are identified and analyzed using a risk and severity matrix approach.

After determining the probability of risk and potential severity of the hazard, the proper control methods required will be determined. Mitigation strategies will be assigned to each task including engineering solutions, alternative construction methods, safe sequencing of work, prevention/minimization, training, and personal protection. These recommendations are incorporated into the construction plans for the relevant tasks on the project. Additional hazard analysis is conducted as frequently as necessary to respond the potential risks that may arise as the construction site evolves.

**Emergency Response Planning**

JWF prepared a BCC project specific Emergency Response Plan (“ERP”) that addresses steps to be taken in the event of an emergency or accident on the project. The ERP establishes the personnel, communication protocols, action plans, a response flowchart and checklist with critical contact information, and a specific advance training plan for personnel.

**Preconstruction Safety Meeting**

Prior to commencing construction, a project planning meeting is held with all project personnel where the corporate safety manager will address:

- The ERP, including contact information for the nearest medical facilities, local police and fire departments;

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The phone numbers of the project manager, superintendent, engineers, and foremen;
The date, time and contact for the OSHA and Associated General Contractors ("AGC") Safety Consultation that will be held at the BCC construction site prior to construction;
The on-site safety contacts;
The name of the competent person(s) on the project site;
Any specialized training required; and a
Schedule for the weekly Toolbox Safety Talks.

**Safety Training**

Training was an essential component of JWF’s BCC safety program. Every new employee receives a New Employee Safety Orientation on their first day of work and JWF observes them throughout a probationary period to make sure they understand the importance of safety and JWF’s expectations for safe worksite behavior.

Formal occupational safety training for project-specific safety topics were conducted as needed per the construction plan and JHA findings. These training meetings are delivered by a qualified trainer, and often include a formal syllabus, video training media, industry expert presentation, demonstration, and certification.

Throughout the BCC project the superintendent and craft foremen also conducted informal weekly Toolbox Safety Talks, which highlight contemporaneous safety topics for current tasks.

**Stretch & Flex**

Each morning the crew will participate in Stretch & Flex. This 15-minute program of stretching provides the employees a chance to stretch and warm-up their muscles, resulting in fewer soft tissue injuries. This program is led by crew leaders on a rotational basis, and attended by all staff. This meeting also provides a focused time at the start of the shift to review the tasks, goals, and specific safety issues which may be encountered that day. The “team building” aspect is a valuable additional benefit.

**On-Site Safety Inspections**

Regularly scheduled safety inspections are conducted by the JWF Safety Committee representatives according to OSHA regulation and will conduct independent and frequent
random safety inspections and/or audits to discover and correct unsafe working conditions or at-risk behaviors.

Every employee also plays a role in maintaining a safe project and is directed to immediately report unsafe conditions or acts to any supervisor for immediate attention. All accidents, incidents or near misses that could have resulted in injury or property damage will be reported immediately and the parties involved will immediately be subject to a post-incident drug screening.

**Accident Investigation**

Accident investigation is a key function of the JWF corporate safety program. The Accident Investigation Committee is comprised of employee representatives, management representatives, and the corporate safety manager. In the event an accident occurs, we perform a thorough investigation aimed at reducing the possibility of similar incidents in the future. Surface cause and root cause are determined, trends are analyzed, and recommendations are presented to the Safety Committee for adoption and implementation. Information is also shared with other jobsites to help prevent similar occurrences throughout the company.

**Subcontractor & Vendor Safety**

JWF considers the safety of the jobsite to be of prime importance. The same safety philosophy applies to all subcontractors that are part of the BCC team. As a condition of their contract, they comply with the same standards of safety conduct as our employees and are subject to the same disciplinary actions. On each project, the onsite manager for each subcontractor receives a safety orientation their first day on site which is similar to our New Employee Safety Orientation. Each subcontractor ensures that their crew complies with our safety plan and they will be required to provide us with documentation of all relevant training of their employees.

**Safety Meetings**

In addition to reporting of safety issues in weekly construction meetings, regular safety related meetings were held to safely and successfully construct the BCC project, including:

- Monthly Safety Steering Committee Meetings: Meetings shall be scheduled and conducted by the City’s Safety Manager to ensure coordination of safety activities between JWF and different subcontractors or between a subcontractor and other
agencies. These meetings will be held monthly in accordance with the JWF Safety Provisions and whenever specific construction safety activities need to be coordinated.

- Executive Safety Committee Meeting: This committee; consisting of the BES Program Manager, JWF Executive Vice President, Balch Project Manager and others as determined by the committee; will meet once per month to review overall work progress from a worker safety perspective, analyze project safety statistics, and determine the contract safety incentive award on a quarterly basis.

- JWF Safety Meeting: This monthly meeting of JWF and City staff will be held to discuss and coordinate safety issues and activities. These meetings will be held for the different project areas and will have minutes recorded and distributed to attendees.

As a result of development and implementation of a thorough safety program on the Balch Consolidation Conduit Project, there were only five lost time incidents in 204,792 project hours.
Environmental Considerations

The project itself is an environmental enhancement. The City now meets regulatory requirements to capture stormwater runoff and keep contaminants out of the Willamette River, which has endangered species.

During construction standard steps to reduce and contain erosion were taken. A 1200C permit was obtained from the DEQ that included erosion control measures around the construction site, and protection of storm water runoff.

In terms of environmental sustainability, the Portland Method facilitated making changes to how the team built elements of work, and what materials were used in the construction of this project without any change orders or claims. Soon after the notice to proceed for construction, the Contractor proposed to use Cutter Soil Mixing (CSM) for the temporary support of excavation of the six shafts and for ground improvements outside of the shafts and on one tunneling run where we tunnel through very low strength soils.

The CSM was initially proposed as a cost and schedule savings. Investigation into the details of the method however also revealed that it would reduce the amount of waste that would be generated. CSM had a significant impact eliminating 13,200 tons of waste that would have gone to landfills.
and also reduced fuel consumption by over 8,000 gallons. Re-use of the tunnel tailings for shaft backfill also reduced waste destined for landfills. This translated into over 4,900 gallons of fuel saved, over 7,000 tons of material no longer destined for a landfill, and a corresponding reduction in the transportation of import fill to the project site.

During the construction of ground improvements in one section of the project, concerns arose with using the CSM equipment and its impacts to the limbs of very large significant oak trees. As a result of the Owner and Contractor working with the City Forester, the ground improvements were constructed as specified using CSM and none of the oak tree limbs were impacted. The Portland Method and the relationship it fostered allowed these discussions to take place.

Dewatering methods and issues were identified and coordinated among BES, the Contractor, the Design team and DEQ, along with the possible effects of dewatering on existing groundwater contamination. Based on the results of those discussions, field and office activities were initiated to characterize the lateral extent of a known groundwater plume that exists in the vicinity of Shaft B. This groundwater contamination plume is related to historical releases on private properties, located southwest of the Shaft B location. Those subject private property sites were under evaluation by others. Additional field and office evaluation by the BCC Project team was undertaken to determine the effects of various dewatering methods and withdrawal rates of on potential groundwater plume migration.
Community Relations

Each of the Bureau’s Combined Sewer Overflow projects has included general public information and education on the City’s 20-year CSO program, as well as a tailored approach for providing timely information and coordination with the parties directly affected by the individual construction activities. The BCC project was similar, addressing a broader stakeholder area as well as individual stakeholder issues.

The focus of outreach prior to and during construction of the BCC was to convey site specific construction information and build on working relationships with the businesses and property owners most affected by construction activities. Thoughtful and continuous outreach during construction helped to minimize community impact and disruption. The plan used mailings, meetings, public workshops, and even door-to-door visits to describe plans and address concern for things such as large deliveries, equipment, street closure, parking, noise, and safety for all modes of transportation. The outreach effort prepared stakeholders for the various phases of construction, allowed the project team to quickly identify and resolve stakeholder issues, and provide a collaborative venue to find ways to minimize impact to stakeholders.

The following key stakeholder Issues became evident during design and construction:

- Ability to conduct business
  - Access to/from individual properties for businesses—employees, customers, deliveries, large trucks, etc.
  - Movement of traffic and ability to move goods; ease of travel through and around construction areas via simple alternate routes and good signage
  - Accommodation of special shipments, special events, etc.
- Accessibility and safety for alternate transportation modes—bikes, pedestrians, buses
- Area parking
- Maintaining utilities during construction—water, electrical, phone
- Noise
- Vibration, building settling
- General safety around the area
- Being kept updated on the project

The outreach efforts during construction:

- Informed businesses and residents with information materials and mailings
• Maintained good working relationships and two-way communication with the businesses and residents along the project alignment and around construction locations (small group meetings, scheduled one-on-one meetings, and door-to-door site visits)
• Responded to individual citizen or business concerns

Public outreach and stakeholder involvement, education, and celebration were performed throughout the project.

The Balch Consolidation Conduit extended public understanding of sustainability in engineering and construction by communicating the reasoning behind project decisions. This was accomplished through tours, newspaper articles, open houses, media events and newsletters distributed electronically and hardcopies. The Project Team hosted two different media events where we highlighted two major elements of construction and the impacts of these decisions. The first was in February 2010 for the selection of Cutter Soil Mixing for construction of the temporary support of excavations and ground support where the environmental benefits of this method were presented. The second was in April 2010 and had over 250 in attendance. Here the team presented the details of Micro Tunneling Boring Machine, tunneling, the risks and the benefits of this methodology including the environmental benefits of the re-use of tunnel spoils.

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At both of these events and in others, the contractual relationship resulting from the use of the Portland Method was presented as the tool that allows us to work collaboratively to benefit the public and the environment. Over the course of this 42 month project, over 40 project updates were sent to over 200 local businesses and residents. Four times a year comprehensive newsletters were sent to over 2,300 local businesses, residents and interested parties. Project staff, including the contractor attended and participated in community meetings with the Northwest Industrial Neighborhood Association (NINA) throughout the project and provided updates to the Balch Creek Partners organization.

The project team hosted a third event in August 2010. At this event the project engaged City Commissioners to participate and go door to door in the project area meeting the local businesses and handing out ice cream and discussing the project.
Unusual Accomplishments Under Adverse Conditions

The project had lofty goals, especially for one with multiple phases and a plan to build a conduit to ultimately convey up to 390 cfs of CSO. The Balch portion of the overall project had many of the challenges of previous phases of the overall CSO project. However, it also faced some unique issues of its own. These included the technical challenges, such as using microtunneling equipment that had not been widely used, or used on a project of this size. Added challenges included dealing with ground modification, presence of contaminated media, dewatering, settlement monitoring, permits and easements acquisition, and utility relocation. Add to that the invisible challenges, like the need to mitigate contract risks, reduce disruption to the neighborhood, public interaction, garnering project support, and completing the project on budget and on time to meet the regulatory requirements.

Implementation of innovative ground modification techniques (cutter soil mixing) allowed for the completion of one microtunneling drive through extremely soft silts and clays. Collaboration by the Owner, Designer, and Contractor on microtunnel boring machine features resulted in the successful completion of the third longest microtunneling drive in U.S. history.
Additional challenges were faced underground. Prior to construction of the first tunnel segment, the project team identified extremely soft soils that would need to be modified to effectively support the microtunnel boring machine (MTBM). Innovative CSM ground modification techniques were proposed to install multiple low strength concrete panels at designed spacings to support the MTBM, while also avoiding significant trees as previously discussed. Final panel spacings and locations were established by the project team in consideration of microtunneling, geotechnical and arborist needs.

During construction of the third microtunnel segment, a large object, likely a large boulder, was encountered that caused the operator to lose control of the tunnel steering and resulted in major deviations to the tunnel alignment. On a conventional design-bid-build project, this would likely have been considered a differing site condition that would have resulted in a significant change order and possible claims. However, since the alternative contracting delivery method included a collaborative engineering team, the Contractor, the City, and the Design Engineer were able to work together to mitigate the problems caused by the obstruction. Instead of abandoning the microtunnel drive and retrieving the machine in an emergency shaft, all parties worked together to develop a compromise that allowed continued tunneling at a significant cost savings to the City. This included a number of creative and challenging microtunneling operations to install the pipe beyond the boulder while balancing the hydraulic requirements of the system.
Additional Considerations

Due to the size, conditions, and location of the project there were several challenging aspects to the project. Including:

- Long Project Drives: with shaft depths ranged from 35 to 75 feet deep (11 to 23 m) in soil zones with high groundwater where dewatering had to be minimized to prevent the movement of contamination plumes. All microtunnel drives were a minimum of 1,100 feet (335 m), with the longest drive on the project of 1,690 feet (515 m) traversing beneath heavily traveled U.S. Highway 30.

- Settlement Monitoring: an overall settlement monitoring program was prepared with respect to baseline determinations, monitor spacing, frequency of recording, information to be recorded, and lead entity for conducting the program. Surface and utility settlement estimates were prepared. The BES Materials Testing Lab managed

Balch Consolidation Conduit – Alignment Plan View
the settlement monitoring program with PBOT survey assistance. This work was conducted in coordination with building video survey and project public involvement staff.

- **Difficult Ground Conditions:** soils varied widely from extremely soft silts that would not provide adequate bearing capacity for the microtunneling machine without ground improvement, to extremely abrasive open-graded gravels. An extensive multiple-phase geotechnical investigation was conducted to carefully evaluate the soil conditions along the alignment. The Design Team worked together to analyze the soils, and from this information the City worked with the contractor to procure a new microtunneling machine for the project.

- **Equipment and Construction Agility:** due to the presence of highly variable soft soils, an extended zone of microtunnel break-out ground modification was recommended around Shaft B, and for the microtunnel drive between B and GLI. The modified zone extended for a distance of 60 feet in the direction towards Shaft GLI. Along the drive from GLI to B, ground modification was recommended in the form of grout column panels for support of the microtunneling machine. The recommended panel spacing was 15 feet clear space between each panel. This spacing was based upon the machine proposed for the BCC project that included a secondary steering joint and an air lock cylinder.

- **Providing Work Locally:** beyond just completing the job also had large social and economic gains. The contracting approach afforded the opportunity for the prime contractor to maximize local involvement in the project. As a result, 106 Minority, Women, and Emerging Small Business (MWESB) awards were made during the project, and the overall MWESB participation exceeded 427% (over $14,500,000) of the goal set at the start of construction.

![Over 35 Contracts Issued to MWESB Firms](chart.png)