



Packet A

Statement of Qualifications

Geotechnical Engineering & Project Delivery (Area 2)

Washington State Department of Transportation

March 13, 2024

SHANNON & WILSON
400 North 34th Street, Suite 100 | Seattle, WA 98103

Monique Anderson and the Shannon & Wilson Team are Uniquely Qualified to Help the State Geotechnical Office Efficiently and Effectively Deliver WSDOT Projects

The Washington State Department of Transportation (WSDOT) continues to be challenged with an ever-increasing demand to deliver projects related to fish passage, seismic retrofits, and ongoing Megaprograms. Because of this sizeable workload, WSDOT is looking once again to supplement their staff in the State Geotechnical Office (SGO) with a subconsultant team, led by a Senior Level Geotechnical Engineer (SLGE), to provide specialized geotechnical expertise, report development, project delivery, construction support, and related activities on large complex transportation projects statewide.

Shannon & Wilson (S&W) has a long history of successful partnership with WSDOT. Recently, this has included Monique Anderson as the SLGE for two previous SGO staff augmentation contracts. Monique has excelled in this role for the last five years and is S&W's choice to lead the Geotechnical Engineering & Project Delivery (Area 2) contract, supported by S&W's extensive resources.

We look forward to our continued long and successful relationship with WSDOT.

Throughout S&W's statement of qualifications, you'll see several matrices presenting firm and staff experience with Criteria 1 and 2 project elements. In addition, we have included icons (below) indicating five highlighted skill sets to quickly note our ability to support the SGO in successfully delivering these projects.



S&W has geotechnically evaluated more than 200 **fish barrier/fish passage** sites.



S&W is renowned for our **seismic** expertise and is trusted by WSDOT and other agencies.



S&W has performed geotechnical services for 23 **Washington State Ferry** sites.



S&W has been the subject matter expert on more than 30 **design-build** highway projects.

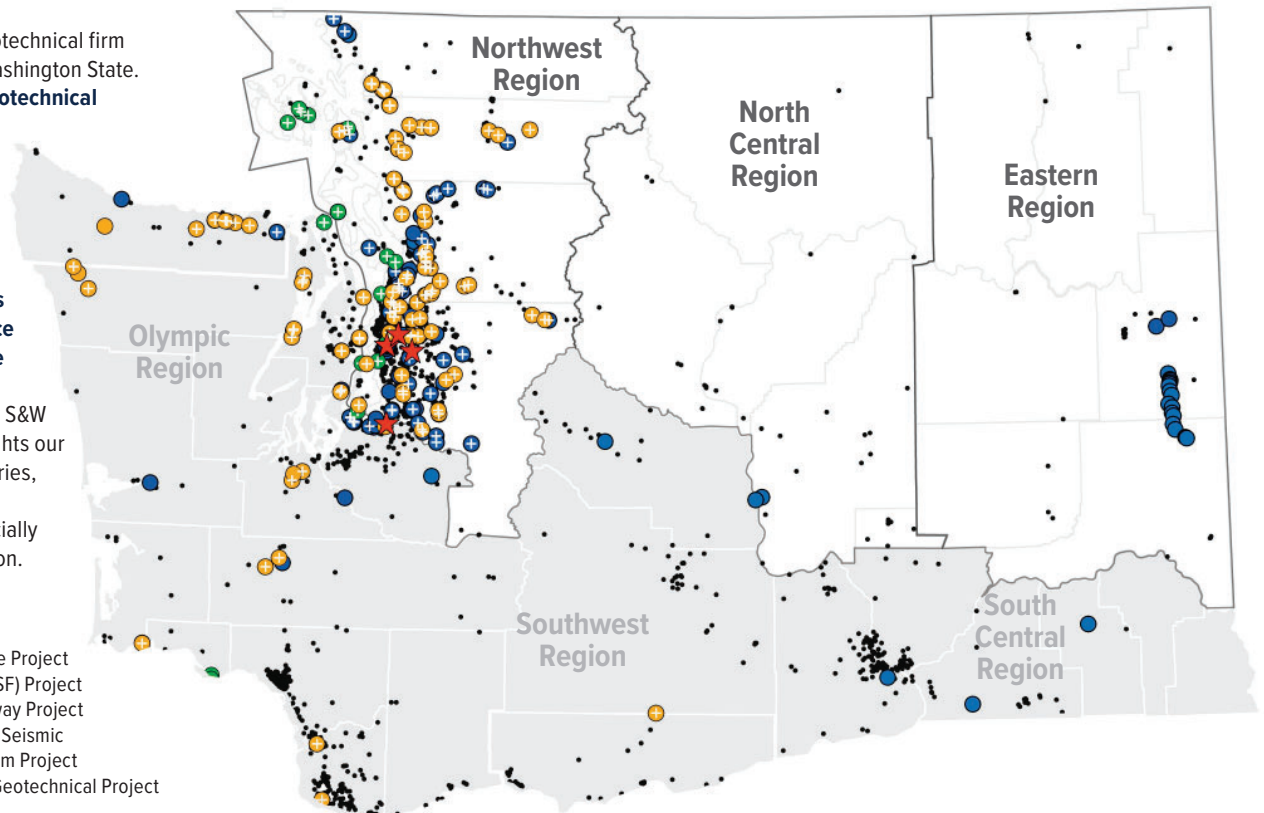


S&W was the geotechnical engineer of record on more than 1,000 **design-bid-build** highway projects.

Figure 1: Map of S&W Relevant Projects

S&W is a premiere geotechnical firm that has its roots in Washington State. **We have provided geotechnical services for more than 800 projects in Washington State which cover all 13 of the requested geotechnical analysis and design experience elements listed in the RFQ.** This map shows projects performed by S&W for WSDOT and highlights our work on highways, ferries, fish passages, and Megaprograms, especially in the Northwest Region.

- KEY:**
- WSDOT Fish Passage Project
 - WA State Ferries (WSF) Project
 - Other WSDOT Highway Project
 - ⊕ WSDOT Project with Seismic
 - ★ WSDOT Megaprogram Project
 - Other Non-WSDOT Geotechnical Project



S&W is Committed to Working with DBE Team Members in Roles of Varying Sizes

Long before the Geotechnical Engineering & Project Delivery (Area 2) RFQ was released, S&W identified several disciplines for this opportunity where supplementing our in-house skills and staff with strong subconsultant firms would provide WSDOT with a more robust team to address project needs. The following WMBE-certified firms will be participating on this project, helping us to provide at least 15% DBE involvement in the contract over its lifetime.

- **Ciani & Hatch Engineering PLLC (CHE) — WBE**
Geotechnical Project Management & Support
- **CADCAB LLC — WBE**
Subsurface Profiles & Drafting
- **Bolima Drafting & Design, Inc. (Bolima) — MBE**
MicroStation Design & Drafting
- **Stell Environmental Enterprises, Inc. (Stell) — WBE**
Geographic Information Systems (GIS)
- **Scarlet Plume LLC — WBE**
Technical Editing

Each firm listed above will have tasks important to the ultimate success of the years-long contract. They'll have the opportunity to work with us virtually, affording them direct access to our SLGE, Monique Anderson, and to the project team, as well as use of our support infrastructure (e.g. templates, Teams). We will provide guidance on the project tasks and management and submit useful feedback on their project scopes, schedules, and submittals.

Ciani & Hatch Engineering Will Hold a Significant Role

S&W has determined that the most efficient way to maintain significant DBE involvement throughout the contract is to trust CHE with the management and support of entire task orders, wherever possible and commensurate with their skills. Whitney Ciani, a current owner of CHE (and former S&W employee), has demonstrated superior skill in managing geotechnical projects. She and her partner, Mikayla Hatch, have over 17 years of experience working with various state agencies and local municipalities on roadway corridor, fish passage/fish barrier removal, bridge replacement, bridge retrofit, multi-use pathway, and slope stabilization projects. The two have participated in the procurement and/or delivery of 15 DB projects for WSDOT, giving them an understanding of WSDOT geotechnical procurement documents and the Geotechnical Design Manual (GDM). CHE understands the importance of defensible design, clear documentation, detailed QA/QC procedures, and will be an unmatched asset to the team.

Our Strategies for Maintaining Inclusion Throughout the Life of the Contract

At the start of the on-call contract, Monique Anderson will meet with the WSDOT Office of Equity and Civil Rights to understand how best to work with our DBEs and show our good faith effort to promote their success and participation. As the project progresses and task orders are released, Monique will be responsible for reviewing DBE participation on a monthly basis and mentoring and providing support to the WMBE firms. If necessary, she'll identify broader opportunities for these firms that arise through new assignments, changes in scope, and additional project work, helping S&W meet or exceed our 15% inclusion goal.

How S&W Supports DBE Team Members

S&W measures success by meeting or exceeding our DBE goals, by providing and receiving feedback on our performance together during the project, and by strengthening relationships with our team members. Enduring relationships benefit us, our team members, and the clients we serve. To that end, S&W frequently:

- Extends invitations (at no cost) to our regular online technical seminars and in-house training workshops.
- Works with DBE firms to provide invoices that meet WSDOT criteria, reducing the number of days until they are paid, knowing that delayed payment of services can strongly impact smaller businesses.
- Offers mentoring to the firms that have expressed interest. For this contract, mentoring would entail:
 - Monique will work with **CHE** as she does with her internal project managers (PMs), providing guidance/direction on design approach and document preparation. This mentorship will help the firm to learn and grow as an emerging small business. Including CHE in client-facing meetings with WSDOT will also aid in building a relationship with their geotechnical team that will continue into the future.
 - Monique will include **Bolima** in kick-off meetings so they get to know the design team, design meetings to give them insight into the future of the project, and she'll introduce them to all the staff they'll be working with throughout the life of the contract.

Other Potential Team Members

S&W is prepared to retain other subcontractors/subconsultants to meet SGO needs for this contract. For example, if a project needs cone penetration testing or geophysical testing, we can retain experienced firms to provide these services. *Where available, we will retain DBE firms to perform these services.*

Criteria 1: Qualifications/Expertise of Firms on Team

A. Highway Projects in the State of Washington Where S&W Provided Stamped Recommendations for Each of the Listed Types of Geotechnical Analysis and Design

The following four Washington state highway projects present S&W’s expertise with geotechnical analysis and design, two of which were managed by Monique Anderson, our proposed SLGE for this contract. For the other two projects, Monique was the SLGE, providing review and oversight. Project descriptions, as well as involvement of our key support staff, are provided on the following pages.

Table 1: Criteria 1A Projects

	Project #1	Project #2	Project #3	Project #4
Geotechnical Analysis & Design Project Elements	<i>US 101 Siebert Creek Fish Passage</i>	<i>US 101 Leland Creek Fish Passage</i>	<i>SR 99 S. Holgate St. to King St. Viaduct Replacement</i>	<i>SR 112 / Jim Creek West Emergency Repair</i>
1. Retaining Walls	■	■	■	
2. Highway Bridges	■	■	■	
3. Spread Footing Foundations		■	■	
4. Driven Pile Foundations			■	
5. Drilled Shaft Foundations	■	■	■	
6. Ground Improvement	■		■	
7. Slope Stability	■	■	■	■
8. Landslide Analysis & Remediation				■
9. Excavation & Shoring	■	■	■	■
10. Fill Placement & Compaction	■	■	■	■
11. Settlement Analysis	■	■	■	
12. Analysis of Geotechnical Lab Test Data	A, B, F	A, B, F	A, C, D, E, F	B, F
13. Analysis of Geotechnical Field Data	G, H, I	G, H, I	G, H, I	G, I

KEY: **A**–Soil shear strength, **B**–Rock shear strength, **C**–Soil consolidation, **D**–Soil compaction, **E**–Soil permeability, **F**–Other lab data
G–Geotechnical field data, **H**–Geophysical data, **I**–Geotechnical instrumentation data

Figure 2: S&W Experience with Geotechnical Analysis & Design Categories

Our geotechnical engineers have experience with all types of geotechnical engineering analyses and data evaluation that can be expected for WSDOT projects.

Figure 2 represents geotechnical projects performed by S&W in Washington State. This graph illustrates our broad range of expertise. For example, 30% of our geotechnical projects include design of retaining walls.

The following pages provide our example projects for Scoring Criteria 1, which focuses on projects that we have performed for WSDOT highway facilities.

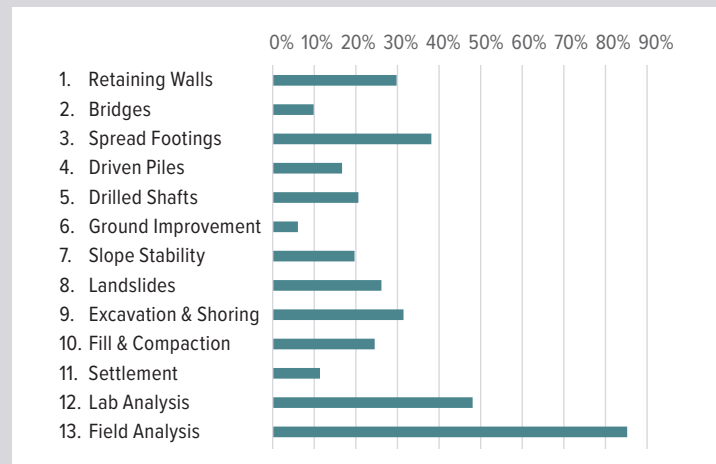




Photo courtesy of WSDOT



WSDOT, US 101 Siebert Creek Fish Passage | Clallam County, WA



Engineer of Record: Monique Anderson, PE // **Senior Advisor:** Stan Boyle, PhD, PE

The project, under our WSDOT Geotechnical Engineering Personnel Augmentation Agreement (Y-12254) with the SGO, involved replacing an existing fish barrier extending under a 70-foot-high highway embankment on US 101 with a new, single-span bridge to restore fish passage. The project included removing a portion of the existing embankment and creating a new stream channel under the bridge. The original roadway embankment was re-graded and stream perimeter walls consisting of closely-spaced drilled shafts were installed to support the embankment and create the opening for the stream channel. The design and construction approach had to consider the presence of an existing adjacent highway bridge. S&W evaluated subsurface data collected by WSDOT and developed geotechnical recommendations for the bridge foundations, approach embankments and associated retaining walls, and stream perimeter walls.

S&W performed complex analyses to evaluate earth pressures on the stream perimeter walls on either side of the new Siebert creek channel for use in structural design by the WSDOT Bridge and Structures office (BSO). S&W performed global stability analyses to evaluate the stability of the existing embankment, which was to remain in place along the bridge approaches, and determined it was not seismically stable. S&W developed a ground improvement approach to construct a series of concrete panels under the new approach embankments to provide a stable system for the bridge approaches.

The removal of the existing fish barrier under the US 101 embankment, and its replacement with a bridge and wide stream channel, opens up about 34 miles of fish passage along Siebert Creek. S&W performed detailed analyses to address geotechnical challenges associated with constructing in and around an existing historic roadway embankment with steep sideslopes that were not

designed to current seismic codes. The complex subsurface conditions, site topography, and high seismicity were evaluated and considered in the analyses for the bridge foundations, the retained approach embankments, the ground improvement system, and the stream perimeter walls.

The project provides a beautiful, wide stream along which aquatic species can travel, as well as access for wildlife crossing under the US 101 highway. This project is an example that can be emulated for other sites that may have similar geometric constraints and geologic conditions.

As the SGO's geotechnical lead for this project, S&W was responsible for managing the geotechnical effort during design and construction, including:

- Evaluating subsurface data (soil, rock, and groundwater) collected by WSDOT.
- Performing geotechnical analyses for the new bridge, retained approach abutments, and stream perimeter walls for static and high seismic conditions.
- Preparing all geotechnical documents for execution of the project, including a geotechnical report, geotechnical summary of conditions, and plans and special provisions for ground improvement.
- Providing support during construction to address contractor questions and changes, as well as redesign of a ground improvement system.
- Evaluating long-term hydrostatic pressures on the stream perimeter walls to confirm that the wall drainage system was functioning.

Throughout the process, S&W worked closely with the WSDOT Project Engineer's office (PEO), the BSO and the WSDOT Construction office (CO) to successfully see the Project through to completion.



Photo courtesy of WSDOT



Photo courtesy of WSDOT

WSDOT, US 101 Leland Creek Fish Passage | Jefferson County, WA



Engineer of Record: Chris Robertson, PE // **SLGE:** Monique Anderson, PE

The project, performed under our WSDOT Geotechnical Engineering Personnel Augmentation Agreement (Y-12254) with the SGO, included replacement of fish barriers at three sites with new fish passable structures on US 101. S&W investigated subsurface conditions at the three sites by performing a field reconnaissance of the sites, field mapping geological features, and coordinating a seismic refraction survey, borings, and installation and monitoring of field instrumentation.

The laboratory testing program included unconfined compressive strength testing of rock core, consolidated-undrained triaxial compression testing, and soil index testing. S&W performed design analyses for two buried structures and a bridge. Our analyses included seismic design, slope stability, bearing capacity, drilled shaft foundation design, and retaining wall design across the three sites. Buried structure analyses accounted for unsuitable subgrade soils, such as liquefiable, low plasticity silt and medium dense sand. The bridge foundation design was complicated by geologic conditions and geometric constraints, including sloping bedrock at a skew from the bridge alignment, very soft/loose fill and fine-grained lacustrine deposits susceptible to liquefaction or cyclic softening due to ground shaking, and tall abutment walls due to deep anticipated scour.

To develop a final configuration for the complex Leland Creek bridge site, S&W coordinated closely with the PEO, including representatives from the BSO, the CO, and SGO, to discuss foundation options and constructability. Numerous alternatives were considered, including multiple foundation types and ground improvement, to develop a cost-effective solution.

The selected solution to support the bridge included a soldier pile wall at the north pier and a secant pile wall at the south pier to protect the bridge from erosion and scour. At the north embankment, construction sequencing required support of the existing roadway embankment and a temporary shoofly embankment to maintain the flow of traffic on US 101. S&W performed preliminary slope stability analyses during design to evaluate the feasibility of a shoofly embankment retained by a temporary WSDOT Standard Plan geosynthetic wall. A portion of the soldier pile wall extending alongside US 101 was designed to be used by the contractor as part of the temporary shoring system required to construct the shoofly. At both piers, the shafts were designed to extend into the bedrock to achieve sufficient resistance under seismic loading. S&W developed lateral earth pressures for static and seismic loading conditions for use in design of the soldier pile and secant pile walls, including recommendations for temporary construction conditions. Due to the height of the north soldier pile wall and the loads expected for the temporary excavation condition, S&W provided recommendations for tieback anchors to reduce lateral deflection and improve global and compound stability of the soldier pile wall system.

During construction, S&W supported WSDOT and the contractor by completing further external global slope stability and settlement analyses to assess the shoofly stability prior to transferring US 101 traffic. The team developed a preload and settlement monitoring program that successfully mitigated shoofly embankment stability and settlement concerns using a gravel preload and a combination of wall target and lidar surveys.



WSDOT/City of Seattle, Alaskan Way Viaduct Replacement Program, SR 99 South Holgate to King Street (H2K) Viaduct Replacement | Seattle, WA



Engineer of Record: Monique Anderson, PE // **Senior Advisor:** Stan Boyle, PhD, PE

The H2K project was part of the larger Alaskan Way Viaduct Replacement Program, for which Monique has provided support to WSDOT since 2001. The H2K project included replacing the existing viaduct south of S. Royal Brougham Way, relocating utilities, constructing temporary detour structures, and building other improvements (e.g., sign bridges, roadways, etc.). S&W performed field explorations, laboratory testing, geotechnical engineering, probabilistic seismic studies, environmental characterization, groundwater and dewatering analyses, preparation of plans and special provisions, construction support, and other geotechnical and environmental support.

The primary geotechnical challenge in the H2K area was the presence of more than 200 feet of sand and silt deposits that are susceptible to strength loss during an earthquake. S&W met these and other project challenges head on.

Elevated Structures: S&W provided deep foundation design recommendations for several temporary and permanent bridges. We evaluated various types of deep foundations, including large-diameter drilled shafts up to 150 feet long and driven pipe piles up to 250 feet long. Several foundations were identified to be at risk during a seismic event due to lateral spreading toward the adjacent waterway. We performed numerical soil-structure-interaction analyses and developed a design configuration for ground improvement consisting of deep soil mixing and jet grouting to mitigate impacts to the foundations due to lateral spreading. All foundation recommendations considered the potential vibration impacts on the adjacent vulnerable elevated structure. During construction we

observed the field activities and evaluated test pile results and geotechnical instrumentation to ensure that the existing viaduct – carrying live traffic during pile driving – was not at risk due to construction vibrations and ground settlement.

Retained Fill Approaches: S&W performed settlement and stability analyses for retained fills up to 25 feet high for the bridge approaches. Because of required staged construction and settlement concerns, we recommended using lightweight fill (expanded polystyrene [EPS]) and soil replacement to mitigate settlement between construction stages, which would be less costly than performing large-scale ground improvement beneath conventional soil retained fills. S&W prepared plans and special provisions for EPS embankments and reviewed installation and embankment settlement during construction.

Retained Cuts: S&W provided geotechnical recommendations for a U-shaped, 1,000-foot-long retained cut with a maximum depth of about 25 feet. We evaluated suitable wall types and lateral earth pressures for static, seismic, and liquefied conditions. We also performed 3D groundwater modeling to design the temporary dewatering and recharge system required for the project.

Utilities: S&W developed excavation, foundation, dewatering, and instrumentation recommendations for utility design and construction. We also performed feasibility analysis for horizontal directional drilling, pipe jacking, and microtunneling under the existing viaduct, adjacent buildings, and active railroad tracks.



Photo courtesy of WSDOT

WSDOT, SR 112 / Jim Creek West Emergency Repair | Clallam County, WA

DBB

Engineer of Record: Neal McCulloch, PE, LEG // **SLGE:** Monique Anderson, PE

On November 15, 2021, a slide occurred on SR 112 near Clallam Bay in a location similar to one the year before. The engineering geology unit asked S&W to assist with responding to an emergency landslide situation under our WSDOT Geotechnical Engineering Personnel Augmentation Agreement (Y-12554) with the SGO. S&W is experienced in responding to similar emergency situations as part of our long history of emergency support to nationwide railroads. The 2021 landslide cracked the highway pavement and created a vertically offset depression in the northbound and southbound lanes of SR 112, which closed the road.

Working closely with the SGO's emergency response personnel, S&W reviewed historic documentation about the site, performed a site reconnaissance, reviewed available subsurface data, performed slope stability analyses, and quickly developed a cost-effective, rapid repair solution to reopen the road. Working directly with PEO and SGO staff, experienced S&W emergency response engineers and geologists produced a geotechnical design, a report, plans, and specifications to repair the slide in tandem with WSDOT under an emergency status while the roadway remained closed.

We quickly vetted several approaches to remediate the slide, including 1) trench drains, 2) horizontal drains, 3) lightweight fill, and 4) drilled shafts with a series of stability analyses designed to capture residual strength of siltstone at the sliding surface. We reviewed remediation options with the SGO before narrowing our design to a drainage-based solution that provided quick construction time while remaining cost-effective.

The final design incorporated trench drains, horizontal drains, and lightweight fill to improve stability. We then partnered with the PEO to produce plans and specifications for the project, including special provisions for drainage and lightweight fill. We supported WSDOT during the bid review and contractor submittal process, particularly regarding QA testing requirements for lightweight fill. Finally, we provided on-site construction support during the grading, drainage installation, and lightweight fill placement portions of the project. SR 112 was restored to service in the spring of 2022.

B. Highway Projects in the State of Washington Where S&W Provided Stamped Recommendations for Seismic Design

S&W is known for providing routine and advanced seismic design services for all types of projects. Through the technical expertise of our engineers and geologists, S&W delivers solutions for a full range of seismic hazard evaluation, design and mitigation services, including site response studies, soil liquefaction evaluations, and seismic hazard analyses for major bridges and other transportation facilities. We have developed project-specific seismic design criteria to correspond to WSDOT, AASHTO, and other state, federal, and international codes. To complete our seismic analyses, we combine results from the subsurface exploration program, laboratory testing, and in situ testing, including downhole suspension logging to measure shear wave velocity. We use the results of our analyses to develop foundation solutions, such as use of ground improvement or use of alternate materials (e.g., lightweight fill for embankment stability).

The following three projects illustrate S&W’s expertise with seismic design for state highway projects, as well as involvement of our key support staff, if applicable:

Table 2: Criteria 1B Projects

	Project #1	Project #2	Project #3
Seismic Design Project Elements	<i>SR 520 West Approach Bridge North</i>	<i>WSF System-Wide Seismic Study</i>	<i>SR 522 Snohomish River Bridge</i>
1. Seismic Deaggregation	■	■	■
2. Seismic Effects on Slope Stability	■	■	■
3. Seismic Effects Upon Foundations	■	■	■
4. Liquefaction Evaluation	■	■	■
5. Liquefaction Effects on Slope Stability	■	■	■
6. Liquefaction Effects on Upon Foundations	■	■	■
Advanced Seismic Studies	■	■	

In addition to the seismic design project elements called out above, S&W has performed the following advanced seismic studies on previous WSDOT projects:

- Probabilistic Seismic Hazard Analysis (PSHA)
- Earthquake Time History Analysis
- Ground Motion Models
- Ground Motion Intensity Analyses (Response Spectra, Arias Intensity, Cumulative Velocity, and Duration)
- Dynamic Soil-Foundation Springs/Stiffness
- Dynamic Soil-Structure Interaction (DSSI) Analysis
- Uniform Hazard Spectra
- Conditional Mean Spectra
- Spectrum-Compatible Time Histories
- Basin Amplification Effects
- Wave Passage Effects
- Fault, Tectonics and Seismicity Evaluations
- Fault Rupture Hazard Analyses

Because of S&W's team of seismic professionals, we also have the expertise in-house to perform several other types of advanced seismic studies, such as:

- Deterministic Seismic Hazard Analysis
- Risk-Targeted Spectra
- Ground Improvement Modeling, Design, Plans and Specifications





WSDOT, SR 520 West Approach Bridge North | Seattle, WA



Engineer of Record: Jeremy Butkovich, PE

The West Approach Bridge North project included constructing a new 6,000-foot-long bridge that connects the SR 520 Evergreen Point Floating Bridge to the Montlake neighborhood of Seattle. WSDOT had determined that the old approach bridge was vulnerable to collapse during an earthquake. S&W was the geotechnical engineer of record (EOR) for this DBB project.

Subsurface conditions along the bridge alignment consist of 5 to 80 feet of very soft peat and clay, over very dense/hard sand and clay. The new bridge is supported by 8- to 10-foot-diameter drilled shafts that extend about 50 feet into the underlying very dense/hard soil. To reduce seismic demands on the bridge superstructure, the bridge design includes a seismic base-isolation system.

Design of the base-isolation system required a dynamic soil structure interaction analysis. To support this effort, S&W performed 1D, 2D, and 3D DSSI analyses and coordinated with the structural designer and structural peer reviewer.

S&W performed a PSHA to characterize the seismic hazard at the site. The PSHA included Seattle Basin effects.

The time histories for the DSSI analyses were spectrally matched to conditional mean spectra consistent with the seismic source of each time history. This method—new to WSDOT projects—led to more realistic demands on the bridge structure.

Other analyses included liquefaction triggering, liquefaction-induced settlement, slope stability, deep foundation axial and lateral resistance, and retaining wall lateral earth pressures.

S&W supported WSDOT during construction, and helped address challenging drilled shaft construction conditions. The project was successfully completed in 2017.



Photo courtesy of WSDOT

WSF, System-Wide Seismic Study | Various Locations, WA



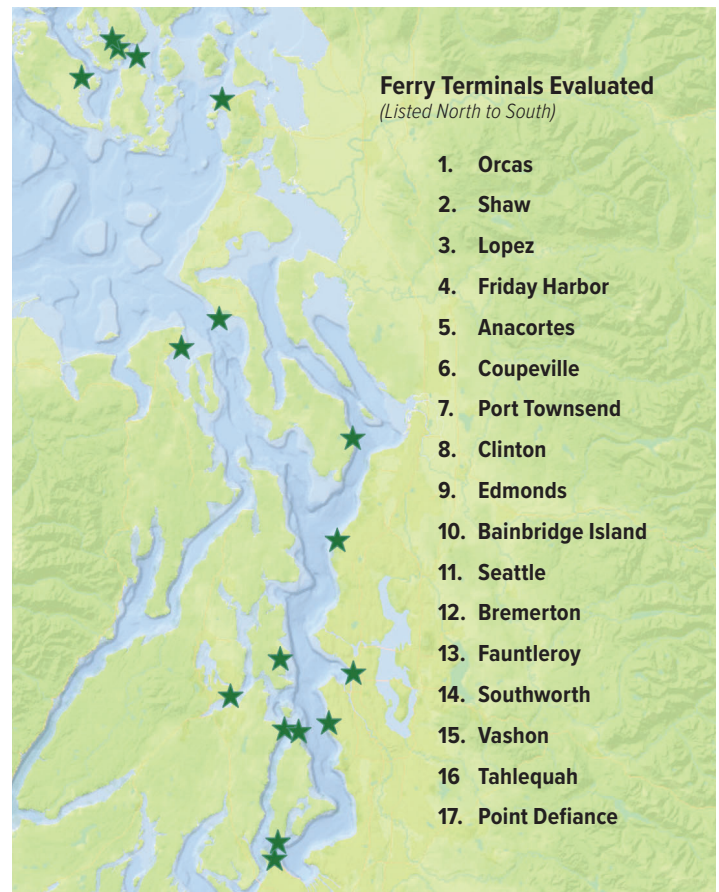
Engineer of Record: Jeremy Butkovich, PE

Washington State Ferries (WSF) is upgrading its ferry terminals to become more seismically resilient. To support this work, S&W evaluated seismic hazards at 17 ferry terminals in the Puget Sound Region.

S&W characterized design acceleration response spectra at each ferry terminal, based on WSDOT (1,033- and 224-year return periods) and ASCE 7 (2,475-year return period) standards. The response spectra were developed using either a code-based general procedure or a site-specific hazard analysis procedure. For sites within six miles of an active fault, S&W performed a PSHA as part of the site-specific procedure. The PSHA included updated attenuation information and near-fault, basin, and fault rupture effects.

S&W reviewed and synthesized historical subsurface data to support seismic hazard analyses. The analyses included liquefaction hazard, lateral spreading hazard, and the effect of liquefaction and lateral spreading on ferry terminal foundations and submarine slopes. Based on the results of these analyses, S&W prepared a seismic evaluation report and coordinated with WSF structural engineers to complete the study and provide information for use by WSF in future terminal evaluations.

The study was successfully completed in 2022. To date, at least four seismic retrofit designs have used the data from the study in their designs.



KEY: ★ WA State Ferries (WSF) Terminal



WSDOT, SR 522 Snohomish River to US 2 Widening | Snohomish County, WA



Engineers of Record: Bob Mitchell, PE (Seismic & Retaining Walls) // Kathryn Petek, PhD, PE (Foundations)

WSDOT widened more than four miles of SR 522 between the Snohomish River Bridge and the US 2 interchange to reduce congestion and improve safety in the corridor. The project included construction of a new Snohomish River Bridge downstream of the existing bridge to allow for two lanes of traffic each in the east and westbound directions. The project required widening of the approach embankments utilizing a series of retaining walls. S&W prepared PS&E level geotechnical recommendations for the bridge and select retaining walls.

The new Snohomish River Bridge is 1,800 feet long and supported on nine piers with 175- and 300-foot long spans over the floodplain and main river channel, respectively. Intermediate piers are supported on groups of 10-foot-diameter drilled shafts and the abutments are supported on 9-foot-diameter shafts. Variable subsurface conditions are present along the alignment, including medium to dense gravels and varying thicknesses of liquefiable silty sand deposits underlain by conglomerate bedrock at the west pier locations transitioning to compressive clay deposits at the east piers.

The bridge foundation design presented challenges related to scour, river channel migration, liquefiable soil, lateral spreading hazards, compressible soil, and artesian pressures. The presence of liquefiable soil resulted in the loss of axial and lateral resistance in portions of the shafts along with seismic-induced downdrag loads. Our analyses also indicated select piers were subject to lateral

spreading effects and design recommendations included lateral forces induced on foundations due to lateral ground movement during a seismic event.

Foundation design also incorporated loss of resistance due to scour associated with the 100-year flood event and loss of ground due to potential channel migration. In order to achieve the axial loading demands, drilled shaft base grouting was incorporated into the foundation design and construction of select piers. This was as the first application of base grouting technology in the state.

Design of retaining walls for the 600-foot-long west approach fill accounted for the presence of two large-diameter natural gas pipelines transverse to the roadway. We analyzed the stress increase and potential settlement of the gas lines due to proposed fill and retaining walls. In order to limit loading and potential settlement of the gas lines, the final solution utilized EPS backfill with a drilled-shaft-supported, precast concrete wall facing within 20 feet of the pipelines.

The 1,100-foot-long east approach included up to 35 feet of new fill and was challenged by the presence of liquefiable soils. Global stability analyses of various retained fill solutions indicated potentially unstable conditions under seismic and post-seismic loading. To that end, our design incorporated stone column ground improvement to mitigate liquefaction and reduce seismic induced settlement.

Criteria 2. Qualifications of the Proposed Senior Level Geotechnical Engineer

A. Qualifications and Expertise of the CONSULTANT’s Senior Level Geotechnical Engineer (SLGE)









28
Years of Geotechnical Project Management

MONIQUE ANDERSON, PE // SLGE & Project Administrator

Firm: Shannon & Wilson

Registration: Professional Engineer-Civil, WA, #30546, 1993

Education:

MS, Geotechnical Engineering, University of California at Berkeley
 BS, Civil Engineering, University of California at Berkeley

Monique Anderson has 35 years of experience (33 with S&W). She has worked on numerous geotechnical projects involving bridges, embankments, buildings, piers, retaining walls, landslides, dams, roadways, shoring systems, and excavations for a variety of clients. For the last five years, Monique has served as an extension of the WSDOT SGO and has coordinated and/or managed more than 80 projects through a staff augmentation contract with WSDOT. She has an intimate knowledge of the administrative and technical processes of the SGO as well as project coordination with other sections of WSDOT, such as the region, project, bridge, environmental, and hydraulics offices. Monique has worked with WSDOT staff to improve internal processes, provide training, and improve efficiency in delivering the aggressive project load currently being experienced by WSDOT. She has served as WSDOT’s geotechnical subject matter expert (SME) for three of WSDOT’s largest transportation projects (SR 99, SR 520, and SR 167 - see Table 3 below).

Monique has written S&W’s corporate Project Management Guide, contributed to the SGO’s project management documents and processes, and provided project management training to both S&W and WSDOT staff. She routinely trains and mentors S&W staff in navigating WSDOT processes, following AASHTO and GDM design requirements, and preparing and writing clear and concise geotechnical memoranda and reports.

Table 3: SLGE Projects & Areas of Expertise

Monique has spent more than 30 years working on WSDOT projects, dedicating her career to providing excellent project management and quality service. Her experience leading projects with Criteria 1A and 1B Areas of Expertise are unmatched.

WSDOT Project Name (Role if not PM)	Criteria 1A												Criteria 1B							
	Retaining Walls	Highway Bridges	Spread Footing Foundations	Driven Pile Foundations	Drilled Shaft Foundations	Ground Improvement	Slope Stability	Landslide Analysis & Remediation	Excavation & Shoring	Fill Placement & Compaction	Settlement Analysis	Analysis of Geotechnical Lab Test Data	Analysis of Geotechnical Field Data, Test Data, & Instrumentation Data	Seismic Deaggregation	Seismic Effects on Slope Stability	Seismic Effects Upon Foundations	Liquefaction Evaluation	Liquefaction Effects on Slope Stability	Liquefaction Effects on Upon Foundations	Advanced Seismic Analysis
WSDOT SGO Staff Augmentation (Y-12254) (SLGE)	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
WSDOT SGO Staff Augmentation (Y-12544) (SLGE)	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
SR 16/SR 302 Purdy Creek–Remove Fish Barriers	■	■			■		■		■	■	■	■	■	■	■	■	■	■	■	■
US 101 Bagley and Siebert Creeks–Remove Fish Barriers	■	■	■		■	■	■		■	■	■	■	■	■	■	■	■	■	■	■
SR 167 I-5 to SR 161 New Expressway	■	■	■	■	■	■	■			■	■	■	■	■	■	■	■	■	■	■



WSDOT Project Name (Role if not PM)

WSDOT Project Name (Role if not PM)	Criteria 1A											Criteria 1B								
	Retaining Walls	Highway Bridges	Spread Footing Foundations	Driven Pile Foundations	Drilled Shaft Foundations	Ground Improvement	Slope Stability	Landslide Analysis & Remediation	Excavation & Shoring	Fill Placement & Compaction	Settlement Analysis	Analysis of Geotechnical Lab Test Data	Analysis of Geotechnical Field Data, Test Data, & Instrumentation Data	Seismic Deaggregation	Seismic Effects on Slope Stability	Seismic Effects Upon Foundations	Liquefaction Evaluation	Liquefaction Effects on Slope Stability	Liquefaction Effects on Upon Foundations	Advanced Seismic Analysis
SR 167 I-5 to SR 509–New Expressway	■	■	■	■	■	■			■	■	■	■	■	■	■	■	■	■	■	■
SR 20 Coupeville Trm–Agent's Office			■									■	■	■		■				
SR 20 Olson Creek and Unnamed Tributary to Skagit River–Fish Passage	■	■	■		■		■		■		■	■	■	■	■	■	■	■	■	■
SR 20 SpurAnacortes Trm–Tollbooth Replacement			■									■	■	■		■				
SR 526 Corridor Improvements	■	■	■		■		■		■		■	■	■	■	■	■				
SR 106 Skobob Creek Restoration and Bridge	■	■			■		■		■	■	■	■	■	■	■	■	■	■	■	■
SR 519 Intermodal Access Project	■	■			■	■	■		■	■	■	■	■	■	■	■	■	■	■	■
SR 520 Floating Bridge and Landings	■	■	■	■	■		■		■			■	■	■						
SR 99 Bored Tunnel Project	■		■		■	■		■		■	■	■	■	■		■	■			
SR 99 Viaduct Demolition Project				■							■	■	■							
SR 99 South Access Connection Project	■	■			■		■		■	■	■	■	■	■	■	■	■	■	■	■
SR 99 Alaskan Way Viaduct and Seawall Replacement Project	■	■	■	■	■	■	■		■	■	■	■	■	■	■	■	■	■	■	■
SR 101 Sequim Bypass Project	■	■	■		■		■		■	■	■	■	■	■	■	■	■	■	■	■
SR 101 Dosewallips Bridge Replacement	■	■		■	■		■		■	■	■	■	■	■	■	■	■	■	■	■
SR 99 S. Holgate to S. King Street Viaduct Replacement Project	■	■		■	■	■	■		■	■	■	■	■	■	■	■	■	■	■	■
US 101 Hoh River Fish Passage	■		■						■	■	■	■	■	■	■	■				■

B. Familiarity with STATE Design and Construction Standards

We agree with WSDOT that it is extremely important that the SLGE for this contract have a comprehensive understanding of WSDOT and AASHTO manuals and standards. Monique Anderson has this deep knowledge and experience.

Monique will serve as the primary resource for guidance to our team when using these manuals and standards in our delivery of geotechnical projects. For DBB projects, she will confirm that our geotechnical tasks are completed in accordance with WSDOT requirements. For DB projects, she has held the role of SME for large projects, such as the SR 99 Bored Tunnel, SR 520 Floating Bridge, and SR 167 Completion Project. In this role, she has successfully and quickly identified where design-builders were not meeting WSDOT requirements in their submittals. The next page includes a chart (Figure 3) showing her comparative familiarity with WSDOT standards and descriptions of her supporting experience for two of the most important manuals that govern geotechnical design.

WSDOT Geotechnical Design Manual (GDM)

Most of Monique’s career has been spent working on transportation projects in Washington State that required use of the WSDOT GDM. Through her experience on small to large WSDOT projects, Monique knows many of the GDM requirements off the top of her head.

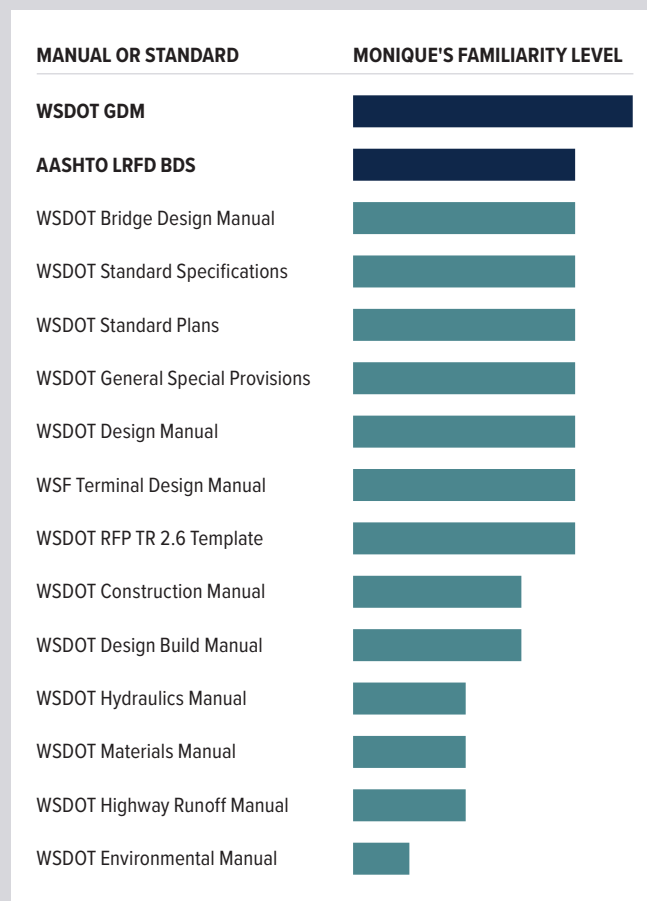
In 2021, in support to the WSDOT State Geotechnical Engineer, Monique began an effort to revise and update the GDM based on historic comments, needed clarification, lessons learned, WSDOT and AASHTO updates, and state of the practice advancements. Through the next two years, she began rewriting several chapters based on her expertise and provided team coordination over the larger GDM update projects. This work is ongoing and continues to add to Monique’s knowledge and understanding of the SGO’s goals for providing clear guidance to geotechnical designers inside and outside of WSDOT.

AASHTO LRFD Bridge Design Specifications (BDS)

Monique routinely uses the AASHTO BDS and keeps up to date on changes to help her understand how they may affect WSDOT projects.

In addition to these two important standards, Monique has contributed to updates to the WSDOT Standard Plans (buried structures and retaining walls), the geotechnical Technical Requirements for DB projects, Special Provisions, and other documents used by WSDOT. Monique’s broad experience with WSDOT manuals and standards is a significant benefit to WSDOT in her role as the SLGE for this contract.

Figure 3: Monique's Comparative Familiarity with WSDOT's Design and Construction Standards



C. Familiarity with Project Management

The last 20 years of Monique’s career has been almost solely focused on supporting WSDOT and the SGO on contracts with multiple overlapping contracts and task orders, including the following major programs.



Alaskan Way Viaduct (AWV) Program (2004–2018)

Over five different contracts, Monique managed more than 100 different task orders for both DB and DBB delivery of all phases of the program to replace the aging viaduct in downtown Seattle.



SR 520 Floating Bridge (2012–2015)

Monique was WSDOT’s geotechnical SME for the DB delivery of this complex project to construct a floating bridge over Lake Washington. Her work included developing a new condensed standard for geotechnical baseline reports.



SGO Augmentation (2019–2024)

Monique served as the SLGE for two staff augmentation contracts to support the SGO. These contracts included over 120 separate task orders, often with more than 40 task orders active at any one time.

The following narrative provides an example of how Monique has successfully managed geotechnical projects and teams for WSDOT. Under Monique's leadership, S&W has received performance evaluation scores from WSDOT and other consultants ranging from 9 to 10 out of 10.

Monique is extremely skilled at managing multiple projects with overlapping schedules. The AWW Program included over 100 task orders over the program's 20-year lifetime, many of which overlapped as different project phases of the program were initiated at the same time. Similarly, for our SGO augmentation, Monique has prepared and coordinated task orders for more than 80 projects. For each task order, Monique prepares comprehensive scopes of work and cost estimates and then oversees the subsequent work. She manages some projects herself and assigns and oversees the PMs for other projects. Prior to preparing the scope, she meets with WSDOT to fully understand project needs and goals. She uses this knowledge to appropriately identify S&W resources to complete the work considering project expertise needs and schedules. During execution of each task order, regardless of who is assigned as the PM, Monique tracks project schedule, budget, and deliverables, and submits detailed monthly progress reports to WSDOT. Through this careful monitoring of all active task orders and her close working relationship with WSDOT personnel, Monique identifies and trains S&W staff, prepares changes to task orders quickly when a new scope is identified, and communicates clearly with internal and external clients. **Monique is excellent at multi-tasking and keeping projects on track to meet ad dates.**

Monique's experience has a unique ability to prioritize limited resources and optimize project delivery.

Through Monique's management experience with both the AWW Program and her current leadership of our SGO augmentation services, she has a unique understanding of how WSDOT and the SGO approach delivery of projects and geotechnical design. She knows the ins and outs of working with the WSDOT field exploration unit, the State materials laboratory, the project offices, and project teams. This gives her the ability to quickly identify where schedule or resource availability can affect project schedule. She keeps a close eye on each project so that she can quickly respond to WSDOT questions, such as "which site is

the most important to drill this month?", "which project should we prioritize for lab testing?", "which deliverable should I review first?", etc. Inside of S&W, she effectively coordinates with company leaders to assign staff for project management, engineering, or other support roles. **Monique has successfully employed many tools in her arsenal of knowledge and relationships to achieve WSDOT's project schedules and needs.**

Monique is well-known and valued in the local industry as a geotechnical SME for complex projects with multidisciplinary teams. Clear communication is one of

Monique's top priorities and is one of the most important skills that is needed when working with a multidisciplinary team. Examples of her successful role as an SME include her work for the AWW Program, the SR 520 Floating Bridge project, and the SR 167 Completion project. Through these projects, she has been able to cooperatively work with project staff, including WSDOT managers, civil, geotechnical, and structural engineers, environmental managers, public involvement coordinators, and construction specialists to achieve project goals. She has developed a skill for clearly communicating geotechnical information to the public, agencies, and other stakeholders. Monique loves to talk to people about the work she is passionate about. She even participated in and coordinated geotechnical education booths for the SR 520 Floating Bridge project and the SR 99 Bored Tunnel project.

Monique's Top Ten Project Management Tips

1. Understand the scope and budget
2. Get to know your client and their preferences
3. Communicate clearly, early, and often
4. Be responsive to your client and staff
5. Track/monitor project progress weekly
6. Clearly document decisions/changes
7. Confirm quality requirements are met
8. Meetings/calls are better than emails
9. Remove technical or schedule roadblocks
10. Learn and grow for the next project!



Monique teaching young people about the soil conditions along the SR 99 Bored Tunnel

D. Familiarity with DB Team Leadership/Membership

S&W has been involved with many DB projects, either as the Owner's representative or as part of the design-builder's team. In her career, Monique has served almost exclusively as the Owner's representative and SME for geotechnical studies, which makes her an excellent representative for WSDOT. She has served in this role from the start of DB procurement and through completed DB implementation. Most of her firsthand experience is from the SR 99 Bored Tunnel Project, the SR 519 Intermodal Access Project, the SR 520 Floating Bridge Project, and the SR 167 Completion Project.

Throughout the procurement process, Monique prepared the geotechnical requirements for the RFP, developed and implemented subsurface exploration programs for geotechnical data, performed conceptual design, and thoughtfully developed baselines. She prepared geotechnical data reports (GDRs), reference memoranda, and geotechnical baseline reports. During DB implementation of these projects, Monique coordinated technical review of the submittals through staff within S&W, and then performed the final review herself to confirm that technical requirements were met. She has also coordinated staff for field quality verification and other needs. An example of this was for the AWV Program, where the design-builder was not appropriately observing tieback installation for a large retaining wall associated with the launching pit for the bored tunnel (see photo below). The retaining walls were surrounded by critical infrastructure including important utilities and BNSF railroad tracks. The design-builder's inexperienced inspectors were not addressing loss of soil through tieback holes below the groundwater table, which resulted in settlement behind the wall. Under S&W's quality verification role, Monique assigned an experienced S&W technician to observe further tieback installation and provide observations and recommendations to WSDOT to address with the design-builder. Monique also supported WSDOT in a major claim

related to the underdesign of the tunnel boring machine. She prepared materials for dispute review board hearings and also testified as a fact witness in a subsequent trial. Through her and S&W's support, WSDOT was successful in winning the dispute and achieving the monumental goal of a new tunnel under downtown Seattle. Currently, Monique is currently serving the Gateway Program as the SME for the DB delivery of the SR 167 Completion Project.

Monique's deep knowledge of WSDOT requirements and goals makes her an excellent representative for the SGO and WSDOT in DB projects.

Through her work on these major DB projects, Monique has set the standard for geotechnical documents required for DB procurement. She continually looks for ways to make WSDOT processes in DB delivery more efficient and clear, to reduce contractor claims. Examples of this include:

- For the SR 520 Floating Bridge Project, Monique developed a new approach for the content of a WSDOT geotechnical baseline report that has set the precedent for subsequent baseline reports prepared by WSDOT, S&W, and other consultants for WSDOT DB projects.
- Monique has developed recommended changes to RFP geotechnical requirements (TR 2.6) to incorporate lessons learned from DB projects. These changes include improving the clarity of the TR language and adding or revising language related to apparent cohesion, consideration of live load in slope stability analyses, well decommissioning, pre- and post- construction settlement, and settlement analyses and monitoring.
- Monique is developing a new chapter for the GDM update that will include clear requirements for deliverables, data, calculations, and other geotechnical requirements. This new chapter will set new standards for to follow in documenting geotechnical work.

Monique is a person who continually seeks to improve, help, and develop clear guidance for her staff, WSDOT staff, and the geotechnical community.



E. Familiarity with Construction Support

Monique has been providing geotechnical construction support services for most of her career. Early in her career, she performed construction inspection of various geotechnical construction activities, including fill placement and compaction, drilled shaft installation, pile driving, instrumentation installation and monitoring, and spread footing subgrade evaluation. For the last 20 years, her construction support has been focused on the typical construction-related needs for WSDOT projects, including:

- Incorporating Geotechnical Requirements into PS&E or RFP documents
- Writing Special Provisions and editing RFP Technical Requirements
- Reviewing PS&E documents prior to Advertisement
- Providing Inspection Training
- Performing Quality Verification Inspection
- Participate in Pre-Construction Meetings
- Reviewing Submittals and Cost Reduction Incentive Proposals (CRIPs)
- Answering RFIs
- Assessing Change of Condition Claims

Because Monique's career has been focused on WSDOT projects, she is very familiar with the WSDOT Standard Specifications for Road Bridge and Municipal Construction (Standard Specifications), which is updated each year, and associated General Special Provisions. She knows what is and is not covered by these documents and has participated in writing Special Provisions for large-diameter open-end composite pipe piles, lightweight fill, dewatering, instrumentation, and ground improvement. **Her knowledge and experience allows her to successfully maintain SGO interests when interfacing with construction office representatives, design-builders, and contractors during construction for both DBB and DB projects.**

Monique's skills in this area are best described by the following examples for DBB and DB projects.

DBB // SR 99 S. King St to S. Holgate Viaduct Replacement

As PM, Monique led our team and had boots on the ground for many construction activities related to this project (see Page 6). The primary geotechnical-related construction elements for this project included:

- Drilled shafts ranging from 6- to 10-feet in diameter, extending to depths of 170 feet.
- Open-end pipe piles with diameters of up to 5 feet, extending to depths of 240 feet.

- Ground improvement cells consisting of deep soil mixing and jet grouting.
- Approach fill embankments up to 30 feet high using a combination of mechanically stabilized earth walls and lightweight fill.
- Instrumentation systems to monitor embankment settlement.

The project had to be constructed in sequences to allow for maintenance of traffic on SR 99.

During preparation of the PS&E documents, Monique prepared special provisions to include the unique aspects of this project relating to deep drilled shafts and composite steel piles. She assisted WSDOT in meetings with the Association of Drilled Shaft Contractors to confirm that oscillators could be specified for shaft installation, and that removal of oscillator casing up to a given depth was feasible, considering the very deep nature of the shafts. She also participated in preparing a new special provision for installation of EPS, which has subsequently been adapted for other WSDOT projects. Prior to ad, she coordinated review of the geotechnical elements of the plans and special provisions to confirm that geotechnical considerations were appropriately incorporated.

Once the contractor was selected by WSDOT, Monique attended pre-construction meetings related to geotechnical activities, including pile and shaft installation, ground improvement, and embankment construction. She coordinated staff to provide just-in-time training for WSDOT inspectors to confirm construction observation requirements and observed construction activities related to these items. When critical field activities occurred or construction difficulties were encountered, she (and/or other S&W staff) made site visits to observe conditions and provide recommendations. She also reviewed submittals and contractor field design changes and CRIPs.

One unique aspect of the project was a detailed test pile program performed for 5-foot-diameter open-end pipe piles and composite open-end pipe piles with a 5-foot-diameter outer section and a 3-foot-diameter inner section. These piles extended up to 240 feet below grade and had ultimate resistance requirements of about 1,500 tons.

Under Monique's direction, S&W staff observed the test pile program, monitored pile driving, and performed vibration monitoring. Using the results of dynamic testing performed during driving and the vibration monitoring results, she confirmed that the piles met the axial resistance requirements and that vibrations on the adjacent SR 99 viaduct bents (some as close as 25 feet to pile driving activities) did not exceed allowable levels. Monique prepared summary letters including clear charts



The purpose of the test pile program was to confirm pile capacities and check that vibrations caused by pile driving were below target levels for the nearby active SR 99.

and tables to present the monitoring results and provide recommendations for driving of production piles.

Throughout construction, Monique reviewed and evaluated contractor submittals, WSDOT observation records, and special reports related to construction issues. For one of the large shafts, an anomaly was indicated in crosshole sonic logging tests and subsequent coring and video inspection. The contractor claimed a differing site condition relating to groundwater flow. Monique assisted WSDOT construction managers in providing substantive data that contradicted the contractor's claim.

During construction of the south approach embankment, the contractor submitted a CRIP to complete the embankment in two stages instead of three, and to replace a portion of the lightweight fill with soil fill. We evaluated the results of settlement monitoring and performed additional analyses to assist WSDOT with evaluating the merits of the CRIP. The settlement monitoring results indicated that the first embankment phase settlement was less than estimated. This, combined with our settlement and slope stability analysis results, indicated that the contractor's approach was acceptable.

DB // SR 99 Bored Tunnel Project

Monique was the geotechnical PM for the SR 99 Bored Tunnel Project and served as an extension of WSDOT's geotechnical staff from 2008 to 2018 for this DB project to construct a the 54-foot-diameter bored tunnel under downtown Seattle. Monique coordinated all field and design services, and prepared the numerous reports included in the design- build contract package. These reports included a large GDR, a geotechnical baseline report, and numerous preliminary design memoranda. During the DB phase, Monique coordinated the review

of design and construction submittals, coordinated field quality verification, reviewed instrumentation data, and participated in numerous design and construction task force meetings as the geotechnical representative for WSDOT.

Under Monique's management, our staff reviewed geotechnical-related submittals during the design phase of the design-builders' efforts, including GDRs, groundwater monitoring reports, static and seismic design for tunnel approach walls, structure foundations, and geotechnical portions of the tunnel design. During the construction phase, we reviewed construction submittals related to utility relocations, excavation support, dewatering, jet grouting, shaft installation, pile installation, and other geotechnical factors.

“

Monique provides exceptional service, essentially acting as an extension of me in my job duties; oversight of state geotechnical policy on these projects...Monique has a good combination of technical capability and communication skills. She has a very interesting ability to analyze and present information in a way that really gets to the bottom of underlying trends or causes of what is being observed in the data. This is currently and will continue to be of great help in explaining complex technical issues to non-geotechnical project managers for WSDOT; particularly with issues that surround contractor claims.”

– Jim Struthers, WSDOT Geotechnical Manager
Alaskan Way Viaduct Replacement Program

Monique also coordinated quality verification during construction for secant pile, jet grouting, and tieback installation for approach excavations and below-grade walls, dewatering installation and operation, instrumentation installation and monitoring, and general earthwork observation. The results of our observations were provided to WSDOT in Field Activity Reports. She also reviewed selected portions of the Contractor's Inspection Reports and participated in the weekly Construction Monitoring Task Force as WSDOT's geotechnical representative. Between 2012 and 2017, our engineers, engineering geologists, hydrogeologists or environmental scientists made over 450 field visits.

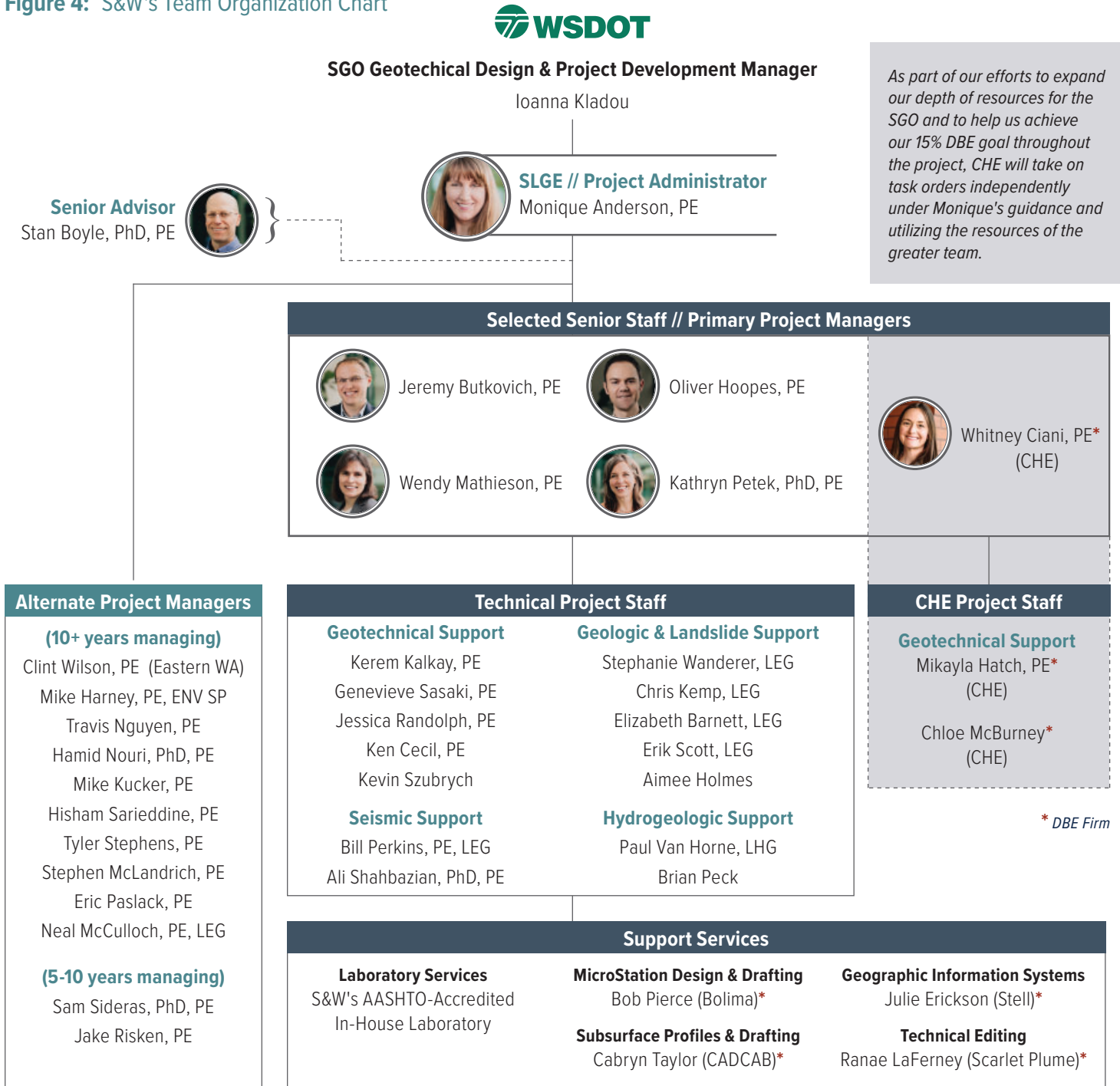
Several differing site conditions assertions were made during construction. Monique supported WSDOT in evaluating these claims. She and several of our specialists participated in two dispute review board hearings, including research of conditions leading to the dispute, contributing to position papers, preparing presentation materials, and testifying during the hearing.

Criteria 3. Qualifications/Expertise of Selected CONSULTANT Staff

A. Qualifications and Expertise of the S&W Team's Selected Senior Staff

S&W has a strong, effective, and seasoned set of project leaders. The following pages describe in detail our Selected Senior Staff's skills, abilities, and familiarity with WSDOT's project elements and criteria. These PMs are more than qualified to take on any task the SGO requests of us. However, there may be times where it's necessary to bring in a PM with a specific skill set, a more efficient location (e.g. Richland, Portland) or additional availability. To ensure that WSDOT's SGO always has a top-notch PM to lead a task order, we have provided 10 alternate managers with more than 10 years of geotechnical project management and two alternate managers with 5-10 years.

Figure 4: S&W's Team Organization Chart





JEREMY BUTKOVICH, PE // Project Manager

Firm: Shannon & Wilson

Registration: Professional Engineer-Civil, WA, #45197, 2009

Education:

MS, Civil Engineering, University of Illinois at Urbana-Champaign

BS, Civil Engineering, University of Illinois at Urbana-Champaign

BS, Mathematics, University of Illinois at Urbana-Champaign

Jeremy, one of S&W’s lead seismic engineers, has 19 years of experience with a wide range of geotechnical and seismic engineering projects. His areas of expertise include nonlinear time history analyses (e.g. dynamic soil-structure interaction and site response), liquefaction triggering evaluation, slope stability and deformations, and analyzing large geotechnical datasets using modern computing tools. He has a proven track record of managing complex, multidisciplinary transportation projects for WSDOT, providing high quality deliverables, and meeting project schedules and budgets. As Geotechnical Manager for the SR 520 Bridge Replacement and HOV Program, Jeremy demonstrated his ability to simultaneously manage multiple projects (both DB and DBB), design for challenging subsurface conditions, and effectively communicate with the SGO. As S&W’s waterfront lead, Jeremy also has extensive experience in design and construction of waterfront structures. Under our previous staff augmentation contract, Jeremy managed several WSF terminal seismic upgrade projects, providing his expertise to help WSF keep its facilities more resilient to earthquakes. Jeremy has used WSDOT design and construction standards for most of his career. **For this contract, Jeremy will primarily serve as S&W’s PM for WSF projects and provide his seismic expertise for other projects and to staff within the SGO.**

Table 4: Selected Senior Staff Projects & Areas of Expertise

Jeremy has managed multiple WSDOT projects that involve the areas of expertise listed in Criteria 1A and 1B. The matrix below provides example projects that illustrate his knowledge and management of different geotechnical areas of expertise.

WSDOT Project Name (Role, if not PM)	Criteria 1A												Criteria 1B								
	Retaining Walls	Highway Bridges	Spread Footing Foundations	Driven Pile Foundations	Drilled Shaft Foundations	Ground Improvement	Slope Stability	Landslide Analysis & Remediation	Excavation & Shoring	Fill Placement & Compaction	Settlement Analysis	Analysis of Geotechnical Lab Test Data	Analysis of Geotechnical Field Data, Test Data, & Instrumentation Data	Seismic Deaggregation	Seismic Effects on Slope Stability	Seismic Effects Upon Foundations	Liquefaction Evaluation	Liquefaction Effects on Slope Stability	Liquefaction Effects on Upon Foundations	Advanced Seismic Analysis	
SR 520 Bridge Replacement and HOV Program	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
WSF, System-Wide Seismic Study				■			■							■	■	■	■	■	■	■	■
Vashon Ferry Terminal Slip 2 Seismic Evaluation		■		■			■							■	■	■	■	■	■	■	■
Eagle Harbor Maintenance Facility Slip F Seismic Evaluation				■			■							■	■	■	■	■	■	■	■
Kingston Ferry Terminal Seismic Retrofit	■	■		■			■		■			■	■	■	■	■	■	■	■	■	■
Bremerton Ferry Terminal Slip 1 & 2 Vehicle Transfer Span and Dolphin Replacement		■		■			■					■	■	■	■	■	■	■	■	■	■

JEREMY BUTKOVICH, PE –continued**2B: Familiarity with STATE Design and Construction Standards**

Over Jeremy's 19-year career at S&W, Jeremy has used the WSDOT GDM, the WSDOT BDM, and AASHTO LRFD BDS extensively in his work for WSDOT and Sound Transit. Notable projects are listed in the matrix on the previous page. Jeremy is a leader at S&W in making sure we are incorporating the latest seismic approaches approved by AASHTO and WSDOT. He is currently leading the effort to update the Seismic Design Chapter for the 2024 rewrite of the WSDOT GDM and incorporating updated approaches to seismic design.

2C: Familiarity with Project Management

Jeremy's day-to-day work involves managing many projects that often have competing schedules. Recently, when the SR 520 Portage Bay Bridge and Roanoke Lid project faced unexpected delays in procurement, he quickly reassigned engineers to tackle urgent engineering analyses to inform design. He collaborated with other S&W PMs to shift resources from less time-sensitive projects to mitigate delay. He works closely with Owners and Client Representatives to prioritize tasks and set achievable schedules, tapping into his network of PMs to adjust resources as needed.

Jeremy's expertise extends to his role as an SME for the SR 520 Bridge Replacement and HOV Program. He played a crucial role in coordinating with multidisciplinary teams for projects like the West Approach Bridge – North DBB project, where Jeremy coordinated with structural engineers to perform dynamic soil-structure interaction analyses to design the bridge, civil engineers to determine the locations of key project features where drilling would be needed, stormwater engineers to determine design parameters for detention facilities, and environmental engineers to determine hazardous waste disposal criteria.

2D: Familiarity with DB Project Team Leadership/Membership

Jeremy has prepared multiple geotechnical documents for DB contracts. For example, for the Portage Bay Bridge and Roanoke Lid project, he developed the project GDR, GBR, and other contractual documents. He worked closely with the PEO and SGO to address unique challenges brought on by the challenging subsurface conditions at the site. This project included a unique contract structure that contractually identified the locations and engineering parameters of critical geologic units.

Jeremy has served as a SME on several DB projects related to the SR 520 Bridge Replacement and HOV Program. His SME role included participating in task force meetings, reviewing submittals, and addressing geotechnical questions from the design-builder's geotechnical group manager.

2E: Familiarity with Construction Support

Jeremy has managed many projects that used the WSDOT Standard Specifications. Jeremy's experience has resulted in his excellent advocacy for WSDOT and other clients throughout construction. He carefully reviews RFIs and submittals to assure that geotechnical requirements are not compromised. For the SR 520 I-5 Interchange project, he reviewed items related to testing of permanent ground anchors, soil nail installation, and the extents of lightweight embankment fill. The contractor proposed a reduction in cost by reducing the amount of lightweight fill in a critical area. Jeremy and his team carefully considered the proposal, but ultimately rejected it due to the importance of the lightweight fill and the extensive engineering done to determine its extents.

Jeremy has wide-ranging experience evaluating change claims as both the Geotechnical EOR and as an expert witness in project litigation. His experience working with attorneys and seeing how claims can develop has profoundly influenced how he approaches his role as a Geotechnical EOR or SME. For example, during the Strander Boulevard Extension project (City of Renton), voids opened under a railroad track where the contractor had been installing tiebacks. Facing potential claims from both the railroad and the contractor, Jeremy convinced the client and owner to act in collaboration with both potential claimants to resolve the situation. This approach led to a successful resolution without any claims.



WHITNEY CIANI, PE // Project Manager

Firm: Ciani & Hatch Engineering (WBE)

Registration: Professional Engineer-Civil, WA, #8245, 2011

Education:

MS, Civil Engineering, University of Texas, Austin

BS, Civil Engineering, University of Washington

Whitney has more than 17 years of progressive experience in geotechnical design and 14 years of project management experience. Whitney has managed geotechnical scope in design and construction for WSDOT, Idaho Transportation Department, Seattle Department of Transportation (SDOT), King County, City of Redmond, City of Bellevue, and many other cities and counties across Washington. As PM, Whitney completes earned value tracking, budget tracking with burn rates, is responsible for quality control, and ensures projects are delivered on schedule and within budget for her clients. She has broad experience developing geotechnical investigation, instrumentation, and laboratory testing programs, evaluating feasible bridge foundation support alternatives, mitigating seismic hazards (liquefaction and lateral spreading), evaluating the static and seismic stability of slopes to support modifications for roadway corridor widenings, and designing roadway corridor improvements through soft, settlement sensitive soils. Whitney’s design expertise includes soil property determination, slope stability analysis, LRFD shallow foundation design, driven pile design, drilled shaft design, consolidation settlement analysis, net-zero load design, ground improvement analysis, temporary and permanent shoring design, retaining wall design, seismic hazard analysis, and pavement design. **Whitney started her geotechnical career at S&W, working with Monique (our SLGE) and other S&W staff. We are excited to work with her as one of our PMs and support her WBE team for this contract.**

Table 5: Selected Senior Staff Projects & Areas of Expertise

Whitney has participated in many WSDOT DB projects that involve the areas of expertise listed in Criteria 1A and 1B. The matrix below provides example projects that illustrate her experience with these different geotechnical areas of expertise.

WSDOT Project Name (Role, if not PM)	Criteria 1A												Criteria 1B							
	Retaining Walls	Highway Bridges	Spread Footing Foundations	Driven Pile Foundations	Drilled Shaft Foundations	Ground Improvement	Slope Stability	Landslide Analysis & Remediation	Excavation & Shoring	Fill Placement & Compaction	Settlement Analysis	Analysis of Geotechnical Lab Test Data	Analysis of Geotechnical Field Data, Test Data, & Instrumentation Data	Seismic Deaggregation	Seismic Effects on Slope Stability	Seismic Effects Upon Foundations	Liquefaction Evaluation	Liquefaction Effects on Slope Stability	Liquefaction Effects on Upon Foundations	Advanced Seismic Analysis
I-405 Brickyard to SR 527 Improvement (Geotechnical Design Support)	■	■	■		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
US-395, NSC Spokane River to Columbia – Shared Use Path (Interim PM)	■		■				■			■		■	■	■	■		■			
Coffee Creek Remove Fish Barrier	■		■				■		■	■	■	■	■	■	■	■				
I-405 Hard Shoulder Running	■				■		■			■		■	■	■	■	■				
I-405/SR 167 Interchange Direct Connector (Procurement, Design Task Lead)	■		■			■	■		■	■	■	■	■	■	■	■	■	■	■	■
SR 167 Southbound HOT Lanes (Design Task Lead & Construction PM)	■	■			■		■			■	■	■	■	■	■	■	■	■	■	

WHITNEY CIANI, PE –continued**2B: Familiarity with STATE Design and Construction Standards**

Whitney has participated in the procurement and/or delivery of 16 DB projects for WSDOT between 2011 and 2023. All of these projects required conformance to WSDOT standards, including the GDM, BDM, and AASHTO LRFD BDS. This long tenure in the WSDOT arena has given her a strong familiarity with these standards.

2C: Familiarity with Project Management

Whitney has over 10 years of cumulative experience in managerial roles. At her previous firm, she was responsible for workload planning and scheduling for teams of up to 36 geotechnical engineers, geologists and field technicians. She proactively managed staff resources to meet project deadlines. Whitney's ability to deliver multiple projects with overlapping schedules is demonstrated by her experience managing the I-405 Hard Shoulder Running and Coffee Creek Remove Fish Barrier WSDOT DB projects while concurrently leading procurement efforts for Wildcat Creek Bridge, South Union Gap Interchange, and Renton to Bellevue Corridor Widening. Delivering on a timeline that does not compromise quality requires continual resource management and communication with internal and external team members – this is something Whitney excels at. Through her extensive experience working on DB transportation projects for WSDOT, Whitney has honed her geotechnical engineering expertise working with multidisciplinary teams to solve complicated engineering problems. She has acted as geotechnical SME in design task meetings, comment resolution meetings, and during procurement efforts.

2D: Familiarity with DB Project Team Leadership/Membership

Whitney has prepared and overseen the QA/QC of dozens of geotechnical documents to support delivery of DB contracts. She has acted as geotechnical SME in design task meetings, comment resolution meetings, and during procurement efforts to support DB contracts. Whitney proves herself as a key asset through her ability to convey critical geotechnical concerns in a clear and accessible manner to contractors and multidisciplinary team members.

Whitney has experience preparing GDRs for large complex projects. For example, she managed the geotechnical field and laboratory testing and prepared the GDR for approximately 10 miles of levees in Grays Harbor County. The project advanced more than 70 explorations and completed geotechnical soil testing comprising 324 index tests and 148 secondary tests, including triaxial strength, 1D consolidation, and flexible wall permeability testing.

Her experience with WSDOT began as a design engineer on the SR 520 Floating Bridge and Landings (FB&L) project, completing geotechnical services for the design-builder. Whitney worked alongside WSDOT's SME and our SLGE, Monique Anderson, to resolve comments and confirm geotechnical design documents were in compliance with Technical Requirements. Whitney has provided geotechnical project management, design support, and construction support on nine DB projects in her career.

2E: Familiarity with Construction Support

Whitney's familiarity with WSDOT Standard Specifications is exemplified by her extensive involvement in WSDOT DB project delivery for over a decade. Notably, her role as a geotechnical special inspector for projects such as the WSDOT SR 167 HOT Lanes, Coffee Creek Remove Fish Barrier, SR 520 FB&L, and I-405 Hard Shoulder Running underscores her deep understanding of applying project plans and specifications in construction. This position demands meticulous adherence to WSDOT standards throughout construction and requires attention to detail and thorough documentation.

Whitney's experience in evaluating contractor submittals, contractor requests for information, and cost reduction incentive proposals and navigating changed conditions is exemplified by her work on the South Lander Grade Separation Bridge project for SDOT. Whitney acted as PM, oversaw geotechnical design, and provided engineering services during construction for the project. The contractor proposed to modify a temporary work platform foundation from pile support to shallow foundation support immediately adjacent to two large-diameter utilities classified as sensitive structures. Through geotechnical peer review and open discussion with the contractor and the City, the proposed revision was approved. Whitney's collaborative approach resulted in a cost-effective option that was technically sound and complied with design and construction requirements for the project.



OLIVER HOOPES, PE // Project Manager

Firm: Shannon & Wilson

Registration: Professional Engineer-Civil, WA, #49472, 2012

Education:

MS, Civil & Environmental Engineering (Geotechnical), University of Washington
 BS, Civil & Environmental Engineering, Cornell University

Oliver’s 16 years of technical experience encompasses slope stability analysis, risk assessment and mitigation of landslide hazards, soil characterization, geosynthetics, soil improvement design, liquefaction analysis, experimental soil mechanics, and geotechnical report preparation. He has extensive experience in multiple standardized laboratory test methods, as well as specialized laboratory devices and methods, including true triaxial testing. Oliver continues to advance in his career and expertise and has managed several geotechnical projects for WSDOT. His recent work with innovative 3D thermal modeling techniques and geothermal applications to mitigate landslide threats for the Alyeska Pipeline Services Company won a 2022 National Gold Award from ACEC. Oliver currently serves as the Technical Director of the geotechnical laboratory in S&W’s Seattle Office, and is S&W’s corporate Practice Lead for risk and reliability design. **For this contract, Oliver will serve as one of our PMs and provide his laboratory test analysis and risk/reliability expertise for other projects and to staff within the SGO.**

Table 6: Selected Senior Staff Projects & Areas of Expertise

Oliver has participated in or managed projects that involve many of the areas of expertise listed in Criteria 1A and 1B. This matrix provides example projects that illustrate his experience with these different geotechnical areas of expertise.

WSDOT Project Name (Role, if not PM)	Criteria 1A											Criteria 1B								
	Retaining Walls	Highway Bridges	Spread Footing Foundations	Driven Pile Foundations	Drilled Shaft Foundations	Ground Improvement	Slope Stability	Landslide Analysis & Remediation	Excavation & Shoring	Fill Placement & Compaction	Settlement Analysis	Analysis of Geotechnical Lab Test Data	Analysis of Geotechnical Field Data, Test Data, & Instrumentation Data	Seismic Deaggregation	Seismic Effects on Slope Stability	Seismic Effects Upon Foundations	Liquefaction Evaluation	Liquefaction Effects on Slope Stability	Liquefaction Effects on Upon Foundations	Advanced Seismic Analysis
WSDOT & Yakima County, Cascade Mill Parkway Undercrossing Bridges	■	■	■	■	■		■		■	■	■	■	■	■	■	■	■	■	■	■
SR 92, SR 204, SR 528 Fish Passage														■	■	■	■	■	■	
I-5/Marine View Drive to SR 529 Interchange (Conceptual Design PM)	■	■	■		■		■	■	■	■		■	■	■	■	■	■	■	■	■
SR 520/I-5 Interchange Improvements (PM/Geotechnical Lead)	■	■		■	■	■		■	■	■	■	■	■	■	■	■	■	■	■	■
SR 18 Widening (XL5966) (Project Engineer)	■	■		■		■	■	■	■	■		■	■	■	■	■	■	■	■	■
Alaskan Way Viaduct and Seawall Replacement Program (Project Engineer)	■	■	■		■	■	■	■	■	■	■	■								
SR 520 Bridge Replacement and HOV, Delmar Landslide (Project Engineer)											■	■	■	■	■	■				■
SR 520 Bridge Replacement and HOV, NE Points Wall (Project Engineer)	■	■	■		■		■	■	■	■		■	■							

OLIVER HOOPES, PE –continued**2B: Familiarity with STATE Design and Construction Standards**

Oliver has used the WSDOT GDM as a key guidance document for all of his transportation-related projects. In his roles as a project engineer and a PM, he has used the requirements in the GDM to perform geotechnical analyses, review submittals, and prepare documents for DBB and DB projects. The GDM often refers to the AASHTO LRFD BDS; therefore, Oliver has made it a priority to become familiar with AASHTO requirements, especially those related to foundation design, retaining walls, and slope stability.

2C: Familiarity with Project Management

Oliver has shown an aptitude for managing geotechnical projects that have concurrent schedules. This is a common situation, and it can have some advantages, especially with regards to lessons learned that can be transferred from one project to another. For instance, in Oliver's role as the geotechnical SME for the I-5 Marine View Drive to SR 529 project helped him understand where design-builders were inappropriately interpreting language in the RFP Technical Requirements. Oliver used this knowledge to make recommended changes to the Technical Requirements during procurement for the SR 92, SR 204, SR 528 Fish Passage project.

Oliver's skills in prioritizing limited resources to optimize project delivery is evidenced by the fact that he does not miss deadlines. He makes sure he has a good understanding of the project schedule requirements and works with S&W's extensive resources to get the help he needs. On the SR 92, SR 204, SR 528 Fish Passage project, he was asked to deliver geotechnical procurement documents, including three GDRs, three GBRs and RFP technical requirement input less than three months after field explorations were completed. Oliver was able to effectively coordinate with the PEO, the consultant team, and the SGO to communicate reasonable deadlines, identify roadblocks, and prepare draft documents for use by the team prior to the RFQ Ad date.

2D: Familiarity with DB Project Team Leadership/Membership

Oliver has been the geotechnical SME for two projects (I-5 Marine View Drive to SR 529 and SR 92, SR 204, SR 528 Fish Passage) and has assisted other S&W SMEs for multiple other WSDOT DB projects. In these roles, he has performed conceptual design analyses and prepared reference memos, prepared GDRs and GBRs, and provided recommendations for edits to the Technical Requirements.

The I-5 Marine View Drive to SR 529 showcases his ability to identify key geotechnical issues during the procurement phase. The project included construction of embankments on deep, very soft estuarine deposits with liquefiable alluvium interbeds. To address the high settlement risk, Oliver developed unique settlement criteria for the RFP that focused on projected long-term differential settlements. The criteria required the design-builder to prepare peer-reviewed models that needed to be calibrated using the first several months of settlement data. This approach reduces WSDOT's long-term settlement risk by ensuring the design-builder adequately assesses long-term settlements in their design, even if some of the settlement happens after completion. Oliver also created a new lightweight fill section for that RFP that provides technical requirements for several types of lightweight materials as well as a new General Special Provisions focused on Geofoam.

2E: Familiarity with Construction Support

Before Oliver became a PM, he spent several years in the field, much of which was providing construction observation services. His time in the field covered the full range of geotechnical construction, from soil nail walls and permanent ground anchors to mechanically stabilized earth walls and backfill compaction. This has given Oliver valuable insights on construction operations, constructability, and common issues that can arise. Oliver uses the WSDOT Standard Specifications when preparing construction considerations and reviewing construction submittals for DBB projects. He is experienced in using these specifications as well as the requirements of the plans and specifications to identify where submittals are incomplete or incorrect. The quality of contractor submittals ranges from very poor to excellent and both extremes of this range help him improve how he writes geotechnical requirements for future projects. Oliver has provided support to the WSDOT construction office in addressing change claims.



WENDY MATHIESON, PE // Project Manager

Firm: Shannon & Wilson

Registration: Professional Engineer-Civil, WA, #39518, 2002

Education:

MSCE, Civil Engineering, University of Washington
 BS, Civil Engineering, Carnegie Mellon University

Wendy has 25 years of experience with a wide variety of geotechnical engineering projects. Her technical expertise areas are retaining wall design, slope stability, ground improvement, frozen ground engineering, and soil property evaluation. She has worked on many large and complex transportation projects, using both DB and DBB delivery methods. Wendy started off in DB projects as S&W's PM for I-405 /I-5 to SR 169 Stage 1 Widening and I-405/NE 195th Street to SR 527 Northbound Auxiliary Lane. She was later WSDOT's geotechnical SME for the SR 520 Eastside and I-405 NE 132nd Street Interchange DB Projects during construction and is currently one of WSDOT's representatives for the I-405 Renton to Bellevue Express Toll Lanes (ETL) Project. She is a skilled manager of both people and projects. She currently serves as S&W's corporate technical director, leading efforts in keeping S&W at the forefront of geotechnical design. **For this contract, Wendy will continue to serve as PM and geotechnical SME for complex DB projects and provide her geotechnical expertise to assist other S&W and SGO staff.**

Table 7: Selected Senior Staff Projects & Areas of Expertise

Wendy has managed or played a major geotechnical role in multiple WSDOT projects that involve the areas of expertise listed in Criteria 1A and 1B. This matrix provides example projects that illustrate her knowledge and management for WSDOT projects.

WSDOT Project Name (Role, if not PM)	Criteria 1A												Criteria 1B							
	Retaining Walls	Highway Bridges	Spread Footing Foundations	Driven Pile Foundations	Drilled Shaft Foundations	Ground Improvement	Slope Stability	Landslide Analysis & Remediation	Excavation & Shoring	Fill Placement & Compaction	Settlement Analysis	Analysis of Geotechnical Lab Test Data	Analysis of Geotechnical Field Data, Test Data, & Instrumentation Data	Seismic Deaggregation	Seismic Effects on Slope Stability	Seismic Effects Upon Foundations	Liquefaction Evaluation	Liquefaction Effects on Slope Stability	Liquefaction Effects on Upon Foundations	Advanced Seismic Analysis
I-405 Renton to Bellevue Widening and ETL Project (Geotechnical SME)	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
I-405 NE 132nd Street Interchange Project (Geotechnical SME)	■	■	■				■		■			■	■	■	■	■	■	■		
SR 18/Issaquah Hobart Rd to Deep Creek Vicinity – Widening & Fiber Ext	■	■	■		■		■	■	■	■	■	■	■	■	■		■	■		
SR 520 Bridge Replacement and HOV Program, Eastside Transit and HOV Project (Geotechnical SME)	■	■	■		■	■	■	■	■		■	■	■	■	■	■	■	■	■	■
I-405/NE 195th Street to SR 527 Northbound Auxiliary Lane	■			■			■		■	■	■	■	■							
I-405 / I-5 to SR 169 Stage I Widening	■	■	■	■	■	■	■		■	■	■	■	■	■	■	■	■	■	■	■
Alaskan Way Viaduct and Seawall Replacement Program (Project Engineer)	■						■				■	■	■							

WENDY MATHIESON, PE –continued**2B: Familiarity with STATE Design and Construction Standards**

As the Owner's representative on multiple complex DB projects (SR 520 Eastside, I-405 Renton to Bellevue, I-405 NE 132nd Street Interchange), Wendy has reviewed hundreds of DB submittals for contract compliance, and this role cannot be successfully achieved without extensive knowledge of WSDOT standards. The design-builders on several projects are often either unfamiliar with these standards or they try to circumvent them. Because of Wendy's extensive knowledge of the GDM and AASHTO LRFD BDS, she can quickly identify where contractor submittals are not in compliance.

2C: Familiarity with Project Management

Wendy excels at managing complex projects and juggling demands from multiple clients with multidisciplinary teams and concurrent schedules. She manages staff within S&W and also manages some of our most complex projects. An example of her SME DB ability to work within tight schedules and prioritize limited resources is in her SME role to review submittals for the I-405 Renton to Bellevue Project. During the busiest times of the project, she received 5 to 10 submittals per week, many of which had less than two weeks of review time, and were of poor quality, requiring extensive comments, revisions, and follow-up to confirm project requirements were met. This effort is an excellent example of Wendy's ability to handle overlapping schedules and prioritize heavy project and client demands. Furthermore, while Wendy is providing this support for the I-405 projects, she is concurrently handling complex data collection and conceptual design for the SR 18 Widening project and working on preparing geotechnical deliverables for the RFP.

2D: Familiarity with DB Project Team Leadership/Membership

For the last five years, Wendy has managed geotechnical activities and served as WSDOT's geotechnical SME on two complex DB projects: the SR 18 Widening Project (in procurement) and the I-405 Renton to Bellevue project (in design-construction). Wendy effectively works with the multidisciplinary I-405 team to review submittals, review comment responses and revised submittals, participate in task force, over-the-shoulder, and comment resolution meetings with the DB contractor and five different DB geotechnical firms. Previously, for the SR 520 Eastside project, she edited Technical Requirements and prepared the project GDR and GBR, which included complex soil and construction conditions. She is currently in progress for preparation of the GDR and GBR for the SR 18 Widening Project. This project includes an extremely complex exploration program and will require conceptual design for numerous retaining walls.

Wendy is ready to support WSDOT with any needs they may have during DB projects. For the I-405 project, Wendy was asked to conduct a design review of more than 60 walls, identifying higher-risk walls based on size, height, and risk to adjacent infrastructure. She then coordinated slope stability analyses for 15 of the most critical walls to assess the risk of failure and potential displacement, aiding the project office in determining whether the design-builder's deviation from the contract posed significant safety concerns.

2E: Familiarity with Construction Support

As described in Sections 2C and 2D, Wendy makes it a priority to fully understand the WSDOT Standard Specifications as well as related Special Provisions. This understanding is critical in her review role as a geotechnical SME on DB projects.

Wendy also has direct experience with construction support for DBB projects where she supervised staff performing field observations, reviews contractor submittals, change claims, and cost reduction proposals. A notable example of this experience is Wendy's project management role during Sound Transit's East Link Project. Wendy's experience included evaluating change claims (heaving soil during shaft installation) and providing information for use by Sound Transit in successfully disputing the claim.

The East Link project included deep soil mixing to improve subgrade and slope stability for at-grade track and deep soil mixing (DSM) for slope stability for retaining walls. An example of a cost reduction proposal was related to reuse of the large amount of spoils generated from the DSM installation. The contractor proposed to reuse the spoils created from the deep soil mixing approach as fill for project embankments. Wendy worked with the project team to evaluate this proposal and work with the contractor to achieve an acceptable approach. The contractor tried out different mixtures of DSM spoils and native soil to achieve a mix design that had suitable strength and workability to be used in project embankments. Given the high cost of disposing of the DSM spoils (due to high pH), this approach resulted in a significant cost reduction that was shared between the contractor and Sound Transit. Wendy brings this same collaborative and creative approach in all her projects.



KATHRYN PETEK, PHD, PE // Project Manager

Firm: Shannon & Wilson

Registration: Professional Engineer-Civil, WA, #45874, 2010

Education:

PhD, Civil & Environmental Engineering (Geotechnical), University of Washington
 MS, Civil & Environmental Engineering (Geotechnical), University of Washington
 BS, Civil & Environmental Engineering, University of Michigan

Kathryn is a Professional Engineer and PM for geotechnical engineering projects for WSDOT, Oregon Department of Transportation (ODOT), SDOT, and other transportation agencies. She has more than 18 years of experience in design, construction, and research. Kathryn has led numerous transportation infrastructure and fish passage projects that include design and construction of bridges and approach structures and complex constructability considerations. Her practice includes a focus on drilled shaft and driven pile deep foundations, including design, execution, and evaluation of numerous large-diameter deep foundations and load testing. Kathryn recently served as Principal Investigator for a FHWA research project on bearing resistance of large-diameter open-end piles. **For this contract, Kathryn will serve as PM for some of the more complex geotechnical projects and will provide her unique geotechnical expertise related to foundations to assist other S&W and SGO staff.**

Table 8: Selected Senior Staff Projects & Areas of Expertise

Kathryn has managed some of our more complex projects that involve the areas of expertise listed in Criteria 1A and 1B. This matrix provides example projects that illustrate her geotechnical expertise and project management roles.

Project Name (Role, if not PM)	Criteria 1A												Criteria 1B							
	Retaining Walls	Highway Bridges	Spread Footing Foundations	Driven Pile Foundations	Drilled Shaft Foundations	Ground Improvement	Slope Stability	Landslide Analysis & Remediation	Excavation & Shoring	Fill Placement & Compaction	Settlement Analysis	Analysis of Geotechnical Lab Test Data	Analysis of Geotechnical Field Data, Test Data, & Instrumentation Data	Seismic Deaggregation	Seismic Effects on Slope Stability	Seismic Effects Upon Foundations	Liquefaction Evaluation	Liquefaction Effects on Slope Stability	Liquefaction Effects on Upon Foundations	Advanced Seismic Analysis
WSDOT, I-5 Thornton Fish Passage	■	■	■	■	■	■	■	■	■	■	■	■				■				
WSDOT, I-5, SR 522, SR 524 Fish Passage Bundle	■	■	■	■	■	■	■	■	■	■	■	■				■				
WSDOT, SR 522 Snohomish River Bridge (Project Engineer & Assistant PM)	■	■		■					■	■	■	■				■		■		
SDOT, Waterfront Seattle Program	■	■	■	■	■	■	■		■	■	■	■	■			■	■		■	■
WSDOT & ODOT, Columbia River Crossing (PM for Main River Crossing Bridge)	■	■		■		■						■	■		■	■	■	■	■	■
ODOT, I-205 Abernethy Bridge Seismic Retrofit and Expansion (Lead Geotechnical Engineer for Foundations)	■	■		■	■	■						■	■		■	■	■	■	■	■
Multnomah County (OR), Burnside Bridge (Lead Geotechnical Engineer for Foundations)	■	■		■	■	■						■	■		■	■	■	■	■	■

KATHRYN PETEK, PHD, PE –continued**2B: Familiarity with STATE Design and Construction Standards**

For the last decade, Kathryn's practice has focused on transportation infrastructure projects where the WSDOT GDM and AASHTO specifications are project standards. This includes projects for WSDOT, along with municipalities and agencies including King County, Pierce County, Snohomish County, the City of Seattle, and the City of Marysville, that also follow AASHTO and reference the WSDOT standards. In her experience on ODOT projects, Kathryn has also brought in content from the WSDOT GDM and WSDOT Standard Specifications for additional guidance and comparison. Kathryn is participating in multiple ongoing efforts for updating foundation design manuals and standards (AASHTO, ASCE, North Dakota Department of Transportation) and is leading the effort to update the Foundations Chapter for the 2024 rewrite of the WSDOT GDM.

2C: Familiarity with Project Management

Kathryn currently manages multiple transportation projects for WSDOT, King County, Pierce County, and the City of Seattle and is frequently addressing overlapping schedules and prioritization of resources. Her goal is to meet or exceed her client's goals with S&W's work and her progress. For each project, Kathryn tracks deliverable dates and details intermediate steps to achieve project timelines. Kathryn then uses tracking tools to balance workload and maintain progress. Throughout her projects, Kathryn works closely with team members to provide time-sensitive geotechnical inputs to help support the project schedule. Whenever possible, Kathryn utilizes experienced staff to promote task efficiency. Where staffing needs and/or conflicts arise, Kathryn works with her office manager to leverage staff and resources, including sharing staff with other S&W offices when needed.

Kathryn excels and enjoys working with multidisciplinary teams. Since 2016, she has served as the deep foundation SME on the ODOT I-205 Abernethy Bridge Retrofit and Widening project that recently completed construction of large-diameter shafts up to 12 feet in diameter and 240 feet deep. As an SME, Kathryn collaborated with the structural team on the foundation design. Kathryn participated in contractor outreach meetings with the Association of Drilled Shaft Contractors to evaluate constructability considerations of shafts that are the largest to be constructed to date in North America. Kathryn also worked with the permitting team to enable and support in-water work. Kathryn led the load test program for the project that helped to mitigate additional costs when unexpected conditions were encountered during construction.

2D: Familiarity with DB Project Team Leadership/Membership

Kathryn is new to providing her technical and project management skills for WSDOT DB delivery. In 2023, Monique assigned Kathryn to be WSDOT's geotechnical PM for the I-5, SR 522, and SR 524 fish passage bundle located in WSDOT's Northwest Region. During her tenure thus far on this project, she has effectively identified geotechnical considerations, planned a field exploration and laboratory testing program that provides important information for DB bidders, and prepared several draft GDRs. She has participated in meetings with the multidisciplinary team, and as the geotechnical SME, has identified geotechnical considerations that have resulted in changes to the conceptual design at the SR 522 site. She understands the importance of developing a feasible design and has the technical expertise to evaluate when geotechnical conditions may make a certain approach problematic. She has also participated in editing the technical requirements and is on track to prepare and submit GBRs for each site.

2E: Familiarity with Construction Support

Kathryn is the PM for the ongoing City of Seattle Waterfront Redevelopment Program that has constructed large roadways, embankments, retaining walls, vehicular and pedestrian bridges, and a new pier along the Seattle Waterfront. The City uses the WSDOT Standard Specifications as a basis for their construction activities. Kathryn has provided review for geotechnical related submittals and RFIs, along with cost reduction incentive proposals, throughout the project with the goal of fulfilling the project objectives, requirements, and standards. In this process, Kathryn's goal is to enforce contractual requirements to achieve the best possible outcome for the Owner while balancing schedule and cost implications.

Recently during project construction, an error in the structural load calculations was identified that resulted in undersized footings in a portion of the project. Kathryn presented associated risk and performance considerations to the project team and Owner. Working with the structural team, Kathryn refined the foundation recommendations to help reduce the magnitude of the foundation modification and limit construction schedule impacts.

B. Current Availability of Key Staff and Resources for the S&W Team in Hours per Month

The table below shows the availability of our proposed SLGE and Selected Senior Staff. With Monique committed full-time to WSDOT, we're confident we can meet all SGO task requests with our team and our deep bench of experts.

Table 9: Availability of SLGE & Selected Senior Staff in Hours per Month

Month	2024							2025							2026-2028						
	MA	JB	KP	OH	WC	WM	OR	MA	JB	KP	OH	WC	WM	OR	MA	JB	KP	OH	WC	WM	OR
January	<i>Hours below do not include ongoing support of the current SGO staff augmentation contract.</i>							176	132	88	88	106	>500	176	132	88	88	106	>500		
February								144	108	72	72	86	>500	144	108	72	72	86	>500		
March								176	132	88	88	106	>500	176	132	88	88	106	>500		
April								160	120	80	80	96	120	>500	160	120	80	80	96	120	>500
May	101	59	17	25	84	17	>500	168	126	84	84	101	126	>500	168	126	84	84	101	126	>500
June	109	84	17	25	67	50	>500	168	126	84	84	101	126	>500	168	126	84	84	101	126	>500
July	118	84	17	25	67	67	>500	168	126	84	84	101	126	>500	168	126	84	84	101	126	>500
August	138	92	18	28	74	74	>500	184	138	92	92	110	138	>500	184	138	92	92	110	138	>500
September	134	84	17	25	84	84	>500	168	126	84	84	101	126	>500	168	126	84	84	101	126	>500
October	143	109	17	25	84	101	>500	168	126	84	84	101	126	>500	168	126	84	84	101	126	>500
November	122	94	29	22	72	86	>500	144	108	72	72	86	108	>500	144	108	72	72	86	108	>500
December	152	104	48	24	64	120	>500	128	120	80	80	96	120	>500	160	120	80	80	96	120	>500

KEY: MA Monique Anderson JB Jeremy Butkovich KP Kathryn Petek OH Oliver Hoopes WC Whitney Ciani WM Wendy Mathieson OR Other Resources

Shannon & Wilson's Statement of Qualifications has Demonstrated

Our Team's Ability to Provide WSDOT's SGO with the Following Benefits:

- **A broad base of engineering management and support from engineers in multiple S&W offices that have performed hundreds of geotechnical projects** throughout the state of Washington and particularly in the Northwest, North Central, Eastern, and Headquarter regions.
- **A team you can trust to understand the contract's specialized needs** by utilizing staff with experience at 32 WSF terminals, participation in several segments of the Gateway Program, and five years of direct support of the SGO through two staff augmentation contracts.
- **Immediate understanding and manual compliance** from engineers with frequent day-to-day usage of the WSDOT GDM and the AASHTO LRFD BDS, and team members whose contributions to the industry are so valued they've been invited to update eight chapters of the GDM.
- **Leadership that needs no ramp-up time** from a current SLGE, who already knows how to successfully work as an integrated member of WSDOT's SGO staff, and who is supported by Selected Senior Staff and 10 Alternate PMs, each with more than a decade of geotechnical management experience.
- **Adaptable processes that knowingly correspond to traditional or alternate delivery methods** as needed, by professionals who have participated in the design and construction support of both DB and DBB projects.
- **An integrated team of historically underutilized DBE firms with significant roles** from support to management, thanks to an SLGE that recognizes the importance of growing smaller businesses within WSDOT's consultant pool and providing them with guidance and mentoring along the way.

“

Monique continues to set the standard for staff augmentation contract managers at the Geotechnical Office. I have heard very positive feedback concerning Monique's work as a project manager, as well as how she manages the S&W work completed under the contract. This feedback has been provided from staff within the WSDOT Geotechnical Office, as well as other headquarters subject matter experts and Region clients. Monique truly is an extension of our staff.”

– Andrew Fiske, State Geotechnical Engineer
WSDOT Geotechnical Office
10/17/22