



Project No. 2026-190

West Campus—Hillside Stabilization

Department of Enterprise Services
1500 Jefferson Street SE | Olympia

April 16, 2026

SHANNON & WILSON

April 16, 2026

State of Washington
Department of Enterprise Services (DES)
Facility Professional Service

RE: STATEMENT OF QUALIFICATION FOR DESIGN SERVICES
PROJECT NO. 2026-190: WEST CAMPUS HILLSIDE STABILIZATION

Dear Members of the Selection Committee:

On behalf of Shannon & Wilson, Inc., I would like to express our interest in, and commitment to providing design, cost estimation and design support services for Project No. 2026-190, West Campus Hillside Stabilization.

Established in Seattle in 1954, Shannon & Wilson is a full-service geotechnical consulting firm with the experience and expertise to provide the requested services listed in your request for qualifications. Our relationship with Washington State agencies extends back over half a century and includes completion of numerous projects for DES at the Capitol Campus and throughout the state.

Shannon & Wilson is a recognized leader in geotechnical engineering with a strong history of successfully completing complex slope hazard projects throughout western Washington, as demonstrated by the selection of projects included in our statement of qualifications. Our statement of qualifications also demonstrates the experience of our key personnel, which include subject matter experts in slope stability and mitigation design, cost estimation, and environmental planning and permitting.

We appreciate your consideration of our qualifications and look forward to further discussing our team and project approach with you. If you have any questions regarding the enclosed information, or if you would like additional information about our firm, please contact me at (206) 695-6746 or chris.kemp@shanwil.com.

Sincerely,

Shannon & Wilson



Chris Kemp, LEG
Associate I Engineering Geologist
Project Manager



STATE OF WASHINGTON
DEPARTMENT OF ENTERPRISE SERVICES

1500 Jefferson St. SE, Olympia, WA 98501
PO Box 41476, Olympia, WA 98504-1476

Consultant Selection Contact Form

Designated Point of Contact for Statement of Qualifications
For Design Bid Build, Design Build, Progressive Design Build, GC/CM & Job Order Contracting
(JOC) Selections

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Executive Summary

From our seminal Seattle Landslide Study for the City of Seattle to our award-winning Landslide and Debris Flow Susceptibility Mapping for Puget Sound Energy, and hundreds more slope stability projects in between, Shannon & Wilson has been helping clients identify, understand and stabilize unstable slopes in the Pacific Northwest for more than 70 years.

This SOQ demonstrates our capability to provide DES with outstanding service on the West Campus Hillside Stabilization Project, and we are truly excited to have the opportunity to pursue this project.

Understanding Phase 1

We understand the Phase 1 goal for the project is to provide design services with alternatives analysis for up to three slope stabilization techniques at the Powerhouse, Conservatory and Governor's Mansion slopes. Shannon & Wilson has provided slope stability assessments at two of these locations and we look forward to continuing our work at the campus. We intend to work closely with DES while completing the following Phase 1 tasks:

- A review of existing slope stability and relevant geotechnical reports.
- Site and slope reconnaissance.
- Identification of data gaps and completion of subsurface explorations and instrumentation to supplement existing information, if needed.
- Analysis of existing slope stability and proposed stabilization alternatives.
- Cost estimation for final engineering design and construction.
- Clear, concise descriptions of the alternatives with an accompanying matrix and/or ranking system.

If agreeable by DES, we also recommend completing ground surface change detection using publicly available lidar. This relatively low effort exercise represents a significant observation multiplier that can aid in prioritizing slope hazards by illuminating hot spots and activity rates that can be difficult to discern using traditional field reconnaissance or subsurface investigative methods.

We understand that time is of the essence for Phase 1 and that all tasks must be completed by August 2026 to allow DES staff time to develop budgets in advance of the October legislative session. The Shannon & Wilson team has readily available staff and project partners to deliver the work to meet the DES timeline.

Understanding Phase 2

For Phase 2, we will provide DES with:

- Comprehensive reporting and detailed design criteria for the selected approach.
- Public sector cost estimates.
- AHJ coordination, permitting and SEPA requirements support.



Expertise and Project Management

Our proposed project manager, **Chris Kemp, LEG**, has over 17 years of experience leading complex slope hazard projects for critical and high-profile facilities throughout Washington and the western U.S. Our proposed principal-in-charge, **Kathryn Petek, PhD, PE** has been leading challenging geotechnical projects in Washington, including slope stability projects at the West Campus, for over 20 years. They will be supported by subject matter experts on slope stabilization, coupled seepage-slope stability analyses, exploration, instrumentation and monitoring programs, lidar change detection analyses, design and construction cost estimating and permitting support.

Strong Slope Stabilization Track Record

Shannon & Wilson has completed hundreds of slope stabilization projects throughout Washington. This SOQ includes a selection of projects that demonstrate our technical expertise to complete the West Campus Hillside Stabilization Project, as well as our understanding of multi-phase State projects – an attribute required to provide DES with actionable design recommendations and criteria to execute their plans.

Our team has a long track record of completing projects on time and within budget through numerous projects and repeat on-call contracts with DES, among others. We accomplish these results by emphasizing communication, responsiveness and accurate project tracking.

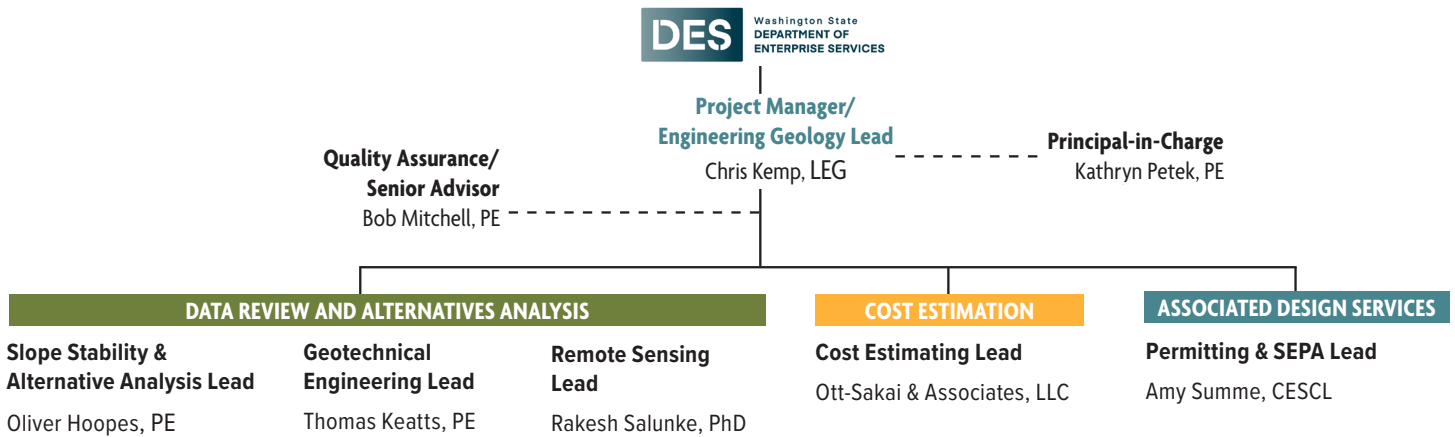
Commitment to Diverse Business Inclusion Strategies

Finally, we highlight our commitment to inclusion of diverse businesses. Our team for this SOQ includes a D/M/SBE, **Ott-Sakai & Associates** who we have a long history of successful project work with. We will continue our commitment after award by evaluating opportunities for additional diverse business inclusion – we routinely work with several diverse businesses through which we have built strong, lasting relationships.

We look forward to the oral interview stage and having the chance to discuss this project and our technical approach with DES.

Qualifications of Key Personnel

Team Organization



Team Expertise

We have selected key personnel that will provide DES with the outstanding leadership, experience and subject matter expertise required to complete the West Campus Hillside Stabilization Project on time and within budget. This team understands how to work with clients to identify and characterize landslide challenges and develop effective solutions under tight deadlines.

Our proposed team will be led by **Chris Kemp, LEG** and **Kathryn Petek, PhD, PE**, who have extensive experience managing complex projects throughout Washington and the greater US. Senior Advisor **Bob Mitchell, PE** will provide quality assurance and additional management support.

- **Project Manager:** Chris has over 17 years of consulting experience identifying, characterizing and mitigating geologic hazards with a focus on large projects for public agencies. He has managed numerous projects and on-call contracts for geohazards services.
- **Principal in Charge:** Kathryn has over 20 years of professional experience in geotechnical design, construction, and research with strong understanding of geotechnical fundamentals, stabilization solutions and retaining wall design, and constructability considerations.
- **Quality Assurance & Senior Advisor:** Bob brings over 30 years of technical expertise and project delivery for geotechnical projects, including significant experience at the Capital Campus.

Supporting Kathryn and Chris are a group of professionals with the experience and subject matter expertise to provide DES with clear assessment of hazards, actionable mitigation alternatives, and responsive permitting support. **Oliver Hoopes, PE** and **Thomas Keatts, PE** have evaluated stability and stabilization solutions for numerous complex and challenging projects and will bring their solution-driven expertise to the project.

We are excited to team with **Ott-Sakai & Associates** (DBE, MBE, SBE), local leaders in construction cost estimating, to provide DES accurate construction cost estimates.

We are also excited to include our ground surface change detection expert, **Rakesh Salunke, PhD**, on this SOQ. Change detection represents a value-added service with considerable potential to provide insights into recent instability of the Campus hillside that complement and supplement information from field reconnaissance, explorations and instrumentation.

Our key staff is further backed up by our multidisciplinary staff of more than 130 professionals based out of our Seattle office. This depth of resources and capabilities provide Chris and the team with resources to rapidly and efficiently deliver projects.

As the **key personnel experience matrix on page 3** and the **resumes on pages 4-17** will demonstrate, our team members have significant experience in all of the critical aspects of the project described in the RFQ.

Key Personnel Experience Matrix

Table 1: Our team members have significant experience in all of the critical aspects of the project described in the RFQ.

Name	Slope Stability Field Reconnaissance	Subsurface Exploration and Instrumentation	Remote Sensing for Slope Stability Applications	Slope Stability Analysis	Groundwater Movement	Soil Percolation Rates	Sustainable Design/Bioengineering	Alternatives Analysis	Phased State Agency Construction	SEPA and Permitting Support	Percent Assigned to Project
Chris Kemp, LEG	●	●	●	●	●		●	●	●	●	50-75%
Kathryn Petek, PhD, PE	●	●		●	●	●	●	●	●		25-50%
Bob Mitchell, PE	●	●		●	●		●	●	●		10-25%
Oliver Hoopes, PE	●	●	●	●	●	●	●	●	●		50-75%
Thomas Keatts, PE	●	●		●	●	●	●		●	●	50-75%
Rakesh Salunke, PhD	●	●	●	●				●			10-25%
Amy Summe, PWS, CESCL		●					●	●	●	●	25-50%
Kevin Sakai, PE				●			●	●	●		25-50%

Key Personnel Resumes

Resumes for the individuals named on the organizational chart can be found on the following pages.



Chris Kemp, LEG

Project Manager & Engineering Geology Lead

Chris Kemp is a Senior Geologist with 17 years of consulting experience focused on identifying and characterizing geologic hazards throughout the United States. His technical experience spans a broad range of geologic disciplines including landslide, seismic, surface fault rupture, and fault displacement hazard investigations, as well as engineering geology, geotechnical, and construction observation investigations. Chris has managed and participated in field- and research-oriented projects for a wide variety of high-profile and critical facilities including water and gas pipelines, gas storage fields, dams, reservoirs, nuclear and geothermal energy generation stations, military installations, and transportation infrastructure.

Firm

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Education

MS, Geology, Fresno State University

BS, Geology, California University of Pennsylvania

Registrations/Licenses

Licensed Geologist and Engineering Geologist:
WA #22008129

Certified Engineering Geologist:
CA #2727

Professional Geologist:
CA #9562

Professional Geologist:
ID #PGL-1801

Years of Experience

17

Relevant Project Experience

WSDOT, SR 18 Widening Project | Issaquah, WA. For this design-build project to widen a five-mile section of SR 18 over Tiger Summit, Chris managed the geologic characterization of the landslide-prone and geologically complex corridor. He worked with the owner and design team to develop procurement documents, reference documents, assess project construction risk, and provide recommendations to prospective design-builders. He managed the field exploration program consisting of more than 100 borings and extensive instrumentation, borehole geophysics and laboratory programs; developed a project inventory of dozens of landslides mapped from field reconnaissance, aerial photograph and lidar interpretation, and subsurface information; characterized surface and groundwater conditions through field mapping and subsurface information; completed geologic cross-sections and slope stability analyses for proposed walls and bridges; and synthesized data from numerous previous site-specific and corridor-wide investigations by WSDOT and other firms.

Seattle Public Utilities, On-Call Landslide Services | Seattle, WA. Chris is currently serving as Project Manager for this on-call contract for landslide services with SPU. This project includes a variety of investigative techniques including review of historical documents, field reconnaissance, video pipe inspection, aerial photograph and lidar interpretation, lidar change detection analyses, subsurface explorations including slope inclinometer and piezometer instrumentation, and coupled slope stability-seepage analyses.

Swinomish Indian Tribal Communities, Swinomish Channel Slope Stability | La Conner, WA. Chris is currently serving as Project Manager for this project to assess and repair instability along the Swinomish Channel triggered by dredging. This project began with an emergency response site visit and has progressed in a phased approach to optimize the balance between cost and reduction of uncertainty. Work completed for the project includes evaluation of pre- and post-dredge conditions using lidar and hi-res bathymetry, subsurface explorations and instrumentation, a laboratory program including soil strength testing and coupled stability-seepage analyses.

Snohomish County Public Works, Index-Galena Road Construction | Snohomish County, WA. As an Engineering Geologist for this project Chris coordinated with Snohomish County, the general contractor, and project engineers to mitigate hazard from a recurring landslide triggered by new road construction. To characterize the slide and implications for the project, Chris developed and managed an exploration and instrumentation plan, logged borings and performed field mapping, interpreted public and drone-based project LiDAR and aerial photography, characterized geologic and slope stability conditions, performed slope stability analyses, and worked closely with engineers to develop mitigation options and recommendations, all of which included a vegetative component.

**Experience prior to joining S&W.*

Chris Kemp, LEG, Project Manager & Engineering Geology Lead (cont.)

WSDOT, I-405 Renton to Bellevue - GN3 Landslide | Bellevue, WA. As an Engineering Geologist for this project, Chris worked closely with WSDOT to characterize a landslide that activated during the construction phase of this design-build project. He logged project borings, developed a laboratory program, including ring shear strength tests, synthesized existing project and historical information, characterized surface soil and groundwater conditions, and collaborated with engineers to perform slope stability analyses including seepage analysis and develop alternatives analyses for mitigation recommendations.

Snohomish County Parks and Recreation, Whitehorse Trail Design and Improvement Project | Snohomish County, WA. For this project to restore two sections of the 30-mile-long Whitehorse Trail, Chris worked with the design team to characterize two trail sections impacted by slope instability and to assess design compliance with sensitive area regulations. Chris synthesized information from field mapping, lidar interpretation, existing mapping and channel migration information to characterize a landslide that inundated one section of trail, and slope instability driven by fluvial erosion at a second section of trail. To assist the design team with regulatory compliance, Chris worked alongside project ecologists to develop Critical Areas Reports, led the effort to assess geologically hazardous areas, and assisted with SEPA/NEPA compliance checklists.

California Public Utilities Commission, Psuedo-Probabilistic Earthquake-Induced Landslide Hazard Analysis, Honor Rancho Gas Storage Facility | CA.* The California Public Utilities Commission initiated a multidisciplinary study of facility resiliency using the SoCalGas Honor Rancho Gas Storage Facility as a test case for screening-level identification of geologic hazards. In support of this effort, Chris led the development of a LiDAR-based project landslide inventory and a method to evaluate the seismic performance of slopes in the facility. The method used a modified empirical prediction model built around a simplified Newmark sliding-block model. Results of the analysis presented at 475- and 2,475-year return periods, used to assess the vulnerability of wells to seismically induced landslides, and to prioritize mitigation measures for at-risk wells and pads.

Clallam County Public Works, Dungeness Off-Channel Reservoir | Clallam County, WA. For this project to construct a new earthen embankment dam, Chris scoped and managed a surface fault rupture hazard evaluation for a recently mapped and, at one point, poorly understood fault that intersects the project site. This evaluation included a significant data compilation, review and synthesis effort; processing of LiDAR data and development of derivative models; interpretation of LiDAR topographic data to identify areas of surface deformation; Quaternary geologic mapping of alluvial fan deposits; subsurface interpretation of site-specific multichannel analysis of surface waves data and boring logs; and geochronologic relationships of fan and terrace surfaces to constraint the age of deformation. Chris and his team provided the design team with deformation hazard zones and fault displacements to assist with the selection of reservoir location and configuration, and preliminary embankment design.

SoCalGas, Aliso Canyon Gas Storage Facility | Southern California.* For this critical facility, the largest natural gas storage facility in the west, and the source of the largest natural gas leak in U.S. history in 2015, Chris managed periodic investigations tasks to develop an inventory and activity characterization of slope stability hazards, and risks they pose to site infrastructure. In addition to field mapping, Chris developed specifications and coordinated approximately bi-annual airborne lidar and orthophoto collection campaigns from 2008 to 2016. He used data from these campaigns for change detection analyses and remote interpretation of landslide hazards.

SoCalGas, Transmission Pipelines | Southern California.* Chris worked with SoCalGas to monitor and assess landslide hazards on several, large-diameter, high-pressure natural gas transmission lines serving Los Angeles County. The projects involved periodic airborne lidar collection, which Chris used for change detection analyses and interpretation of lidar hazards. For a reach of pipeline that had been exposed by landslide activity, Chris worked with SoCalGas to investigate the site and select mitigation strategies. Additionally, Chris managed the expansion of a subsurface monitoring system that consisted of in-place inclinometers, vibrating wire piezometers, and time-domain reflectometry cables to include solar and battery power systems, high-secure enclosures, a weather station and improved telemetry system. Monthly monitoring reports were developed were provide over an approximately 10-year period.



Kathryn Petek, PhD, PE

Principal-in-Charge

Dr. Kathryn Petek is a Professional Engineer and Project Manager for geotechnical engineering projects, with 20 years of experience in design, construction, and research. Kathryn utilizes her technical expertise, practical engineering, and management skills to deliver projects that balance cost, constructability, and schedule. Kathryn has led numerous transportation infrastructure projects related to roadway, rail, and bridge improvements, widenings, and replacement. Kathryn's broad technical experience encompasses the spectrum of geotechnical engineering with specialty expertise related to foundation analyses, seismic performance, load testing, and construction.

Relevant Project Experience

State of Washington, Capital Campus Conservatory Building Demolition | Olympia, WA. Shannon & Wilson developed conceptual recommendations for potential future development of the former Conservatory Building site on the Washington State Capital Campus. Our team reviewed historical records of adjacent projects, performed site reconnaissance, and performed preliminary stability analyses to develop recommendations for slope stabilization measures for use as a surface parking lot or for future building construction. Kathryn served as Project Manager for this Project

City of Seattle, Elliott Way Reconstruction | Seattle, WA. As Project Manager and Lead Geotechnical Engineer, Kathryn oversaw the new Elliott Way roadway, part of the Seattle waterfront redevelopment. The project included a new 900-foot-long, 40-foot-high tied-back retaining wall founded on steep slopes above the BNSF railroad tracks. Wall design incorporated low-density cellular concrete to reduce seismic loads on the structure. The project also included design of new cut walls at the base of a steep slope with identified historic landslide deposits. In addition, the project included new 6- to 9-foot-diameter drilled shafts bearing in glacially overridden soil for support of the new 300-foot-long railroad bridge and approach structure, along with new embankment fills over liquefiable soils and settlement-sensitive utilities. The design process incorporated extensive stability analyses along with constructability and sequencing considerations for the steep slope urban environment and railroad proximity.

Washington State Department of Transportation, US 2 Bickford Avenue Intersection Safety Improvements | Snohomish County, WA. The US 2 Bickford Avenue project provided much needed transportation safety improvements through construction of a new overcrossing structure and new entrance and exit ramps from Bickford Avenue to US 2. Geotechnical elements included fill walls, cut walls, embankments, and cut slopes along the project alignment. Kathryn managed a team of engineers for selection of wall types and development of design recommendations of structural earth walls, soil nail walls, and reinforced soil slopes accounting slope and wall stability, settlement, and drainage considerations.

Seattle Department of Transportation, Northlake Seismic/Retrofit Retaining Wall Project | Seattle, WA. The existing Northlake Seawall has been identified by SDOT as at risk of failure and in need of replacement due to ongoing deterioration and identified seismic instability. Kathryn is the geotechnical Project Manager for design of the replacement retaining wall system. As part of the project, Shannon & Wilson completed new on-land and overwater explorations consisting of multiple soil borings and cone penetration tests. The team evaluated global stability of the existing wall system and proposed wall alternatives, incorporating ground improvement solutions. Shannon & Wilson participated in the wall alternatives analysis and supported ground improvement and constructability solutions for the selected ground improved wall concept.

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Education

PhD, Civil and Environmental Engineering (Geotechnical), University of Washington, 2006

MS, Civil and Environmental Engineering (Geotechnical), University of Washington, 2001

BS, Civil and Environmental Engineering, University of Michigan, 1998

Registrations/Licenses

Registered Professional Civil Engineer: WA, 45874

Years of Experience

20

Kathryn Petek, PhD, PE, Principal-in-Charge (cont.)

Pike Place Market Preservation and Development Authority, Pike Place Market Waterfront Entrance (PC-1 North) Development | Seattle, WA. As Project Manager and Lead Geotechnical Engineer, Kathryn led the geotechnical engineering studies for the most recent expansion of the Pike Place Market. The project converted an existing surface parking lot into a multi-level building with commercial, residential, and public spaces, along with 4 levels of underground parking. The development helped create the initial connection between the Pike Place Market and the newly redeveloped Seattle Waterfront. The structure bridges over the Burlington Northern Santa Fe (BNSF) tunnel within 15 feet of the north tunnel portal and is supported on drilled shaft deep foundations. As part of the project, Shannon & Wilson performed numerical analysis to evaluate foundation loading and construction impacts to the BNSF tunnel. Recommendations were also provided for shoring, permanent walls, drainage, and seismic design criteria. Kathryn led Shannon & Wilson's construction support services that included shoring and deep foundation installation and BNSF tunnel monitoring.

State of Washington, Pritchard Library Validation Study, Capital Campus | Olympia, WA. Shannon & Wilson performed a conceptual phase study for potential renovation of the Pritchard Library, a designated historic structure. The conceptual study evaluated conceptual foundations for potential building renovations along with conceptual retaining wall recommendations for slope stabilization.

State of Washington, Executive Office Plaza / Heritage Center, Capital Campus | Olympia, WA. Kathryn supported geotechnical engineering studies for the conceptual design phase of a proposed redevelopment of a portion of the State Capital Campus adjacent to a slide-prone slope at Capital Lake. The Heritage Center was proposed be an eight-story structure, daylighting on the slope. A four-story above-grade Executive Office Building is to be constructed adjacent to the Heritage Center with two below-grade levels connecting the structures. Underlying soils consist of soft to medium stiff silty clay/clayey silt underlain by medium dense silty sand/sandy silt, with shallow colluvium observed on the slope. Shallow foundations were recommended for both structures, with improved ground recommended below the Heritage Center to mitigate liquefaction and slope instability during an earthquake. Conceptual slope stability analyses were conducted to assess the geotechnical effects of constructing the Heritage Center on the slope.

Various Private Residence Slope Improvement Projects | Puget Sound Region, WA. Kathryn has served as Project Manager and Lead Geotechnical Engineer for several residential landslide mitigation projects on substantial properties. Projects included landslide reconnaissance, field explorations with limited access equipment, stability assessments, and development of stabilization alternatives. Design solutions have included design and construction of retaining walls, soldier pile shear reinforcement, ground improvement, and catchment walls accounting for difficult access and steep slope stability constraints.

City of Seattle, Seattle Aquarium Ocean Pavilion Project | Seattle, WA. The Seattle Aquarium Foundation constructed a new 48,000 square foot Ocean Pavilion, that is being integrated into the Seattle waterfront redevelopment. The new structure is supported on a mat foundation bearing on deep soil mix (DSM) ground improvement to mitigate the liquefaction and lateral spreading hazards at the site. The north and east building walls were designed to support the new Pine Street roadway, constructed as part of the Seattle Waterfront Program – Elliott Way project. Kathryn led the evaluation of foundation alternatives, retaining wall analyses, and preliminary dewatering studies. As Project Manager, Kathryn managed the geotechnical construction observation, including review and acceptance of the DSM column installation, and subgrade evaluations.

WSDOT, Geotechnical Design Manual (GDM)–Foundation Design | WA. The WSDOT GDM is the primary geotechnical reference for transportation projects in Washington and is utilized by counties and municipalities across the state. As a recognized expert in foundation design, Kathryn is the lead author responsible for comprehensive re-write of the foundation design chapter of the manual. Kathryn is collaborating with the WSDOT State Geotechnical Engineer for chapter re-organization, streamlining content, and incorporating current practices and advancements in foundation design, analyses, and construction.

Oregon Department of Transportation (ODOT), I-205 Abernethy Bridge Seismic Retrofit and Widening, West Lin & Oregon City, OR. ODOT is performing seismic retrofit and widening of the existing I-205 Abernethy Bridge over the Willamette River. The structure is over 2,700 feet long and supported on 14 piers bearing on a combination of spread footings and groups of steel H-piles due to varying depth of basalt bedrock. Kathryn led the foundation evaluation for the initial bridge studies to evaluate performance under current design seismic conditions. Kathryn's team subsequently evaluated 6- to 12-foot-diameter drilled shaft foundations for base isolated overwater piers, along with smaller diameter shaft foundations, micropiles, and ground improvement options for on-land limited access conditions. Foundation evaluation incorporated extensive constructability review for the planned 12-foot-diameter, 220 feet deep drilled shafts.



Bob Mitchell, PE

Quality Assurance and Senior Advisor

Bob serves as a Principal-in-Charge and Project Manager on design-build and design-bid-build geotechnical engineering projects, with approximately 30 years of practical experience. Bob has extensive experience leading geotechnical engineering efforts for a variety of infrastructure projects, including major public facilities, bridges, roadways, and dam improvements. His work encompasses oversight and management of subsurface investigations, slope stability and landslide assessments, and the development of seismic design criteria for both static and dynamic conditions. Bob has managed the evaluation of soil and groundwater conditions, performed site-specific seismic hazard analyses, and provided recommendations for foundation design, earthwork, shoring, and construction support. He is skilled in advanced geotechnical analyses such as effective stress site response modeling, liquefaction and lateral spreading mitigation, and the conceptual development of slope stabilization measures. His comprehensive approach integrates field reconnaissance, laboratory testing, and numerical modeling to address complex geotechnical challenges and support safe, resilient infrastructure development.

Relevant Project Experience

Washington State Department of Enterprise Services, State Legislative Campus Modernization – Predesign Geotechnical Engineering | Olympia, WA. Bob served as technical lead for predesign geotechnical engineering services with a focus on static and seismic slope stability affecting the proposed Legislative Agencies and House (LAH) Building. He oversaw screening-level limit-equilibrium slope stability analyses of a steep, approximately 110-foot-high natural slope located immediately west of the project site within a documented historic landslide complex. His work evaluated both static and pseudo-static seismic loading conditions using WSDOT state-of-practice criteria to develop preliminary building setback recommendations, assess potential seismic slope deformation, and define slope-related constraints on building siting and foundation selection. He also led evaluation and conceptual development of slope mitigation alternatives, including secant pile walls and tied-back systems, and provided recommendations for advanced numerical modeling to better quantify seismic deformation risks during future design phases.

Washington State Department of Enterprise Services, Newhouse Building Replacement – State Capitol Campus, Olympia, WA. Bob served as the senior geotechnical engineer for the Newhouse Building Replacement project, providing technical oversight for subsurface

investigations and geotechnical analyses supporting final design. He contributed to the evaluation of complex glaciolacustrine soil conditions and development of seismic design parameters in accordance with current IBC and ASCE standards. His work included assessment of earthquake-induced hazards, foundation design alternatives, and lateral earth pressure considerations. His team delivered comprehensive geotechnical recommendations for foundations, shoring, earthwork, drainage, and construction support for this critical state government facility.

Washington State Department of Enterprise Services, Landslide Reconnaissance and Slope Stability Assessment – Washington Governor’s Mansion | Olympia, WA. Bob managed this site reconnaissance and initial geotechnical assessment following an active landslide along the Capitol Campus bluff north of the Governor’s Mansion parking area. Our team evaluated surface conditions, assessed likely landslide causes related to oversaturated soils, and provided professional opinions on slope stability and risk of additional movement. We prepared recommendations for debris removal, ongoing monitoring, vegetation management, and surface and groundwater control measures to reduce the potential for further slope instability.

Firm

Shannon & Wilson

Education

MS, Civil (Geotechnical),
University of Illinois, 1988

BS, Civil Engineering, University
of Illinois, 1990

Registrations/Licenses

Registered Professional Civil
Engineer: WA, 35200; OR, CA,
NY, TX, AZ, FL, MO, KS, RI, CT,
DE, RI

Registered Professional
Geotechnical Engineer: CA, OR

Professional Engineer (P. Eng):
BC, AB, NS

Years of Experience

30 years

Bob Mitchell, PE | Quality Assurance and Senior Advisor (cont.)

Washington State Legislative Building Emergency Repairs, Capital Campus | Olympia, WA. Bob served as the Project Engineer who performed the probabilistic seismic hazard analysis (PSHA). The February 28, 2001, magnitude 6.8 Nisqually Earthquake caused damage to the Legislative Building, which was also damaged by the 1949 magnitude 7.1 and 1965 magnitude 6.5 earthquakes. Shortly after the Nisqually Earthquake, Shannon & Wilson was asked to provide an estimation of ground motion that could be expected at the site while temporary shoring and repairs were completed. The seismogenic sources that were considered in the PSHA model included the interplate and intraslab portions of Cascadia Subduction Zone, nine shallow crustal zones, and two shallow crustal faults. Using a logic tree approach containing over 350 branches, the PSHA considered uncertainties in potential earthquake location, recurrence, geometry, and maximum earthquake magnitude. The PSHA was used to estimate ground motions with extremely short return-periods between 2 weeks and 6 months. The potential for ground motions at the site due to aftershocks was deterministically considered in our analysis. Our seismic hazard analysis, which normally requires approximately 3 weeks to complete, was finished in 6 days. The ground motion was used by the structural engineer, the Department of General Administration, and State legislators to decide whether or not to continue sessions in the building during repairs.

Sound Transit, Federal Way to Tacoma Dome Link Extension and Operations and Maintenance Facility SouthPierce County, WA. As the Geotechnical Engineering Principal-in-Charge, Bob leads the team for the Tacoma Dome Link Extension and Operations and Maintenance Facility South project which will add approximately 10 miles of maintenance facility new regional light rail transit service and four new stations between Federal Way and Tacoma. Bob ensures that project tasks and deliverables are completed on time by the Shannon & Wilson team, which is assisting Sound Transit with information for the Final Environmental Impact Statement, conceptual and preliminary geotechnical engineering for the proposed aerial guideway, at-grade track, and Operations & Maintenance Facility South. The Shannon & Wilson team is also providing permitting support, performing subsurface explorations, and developing conceptual and preliminary static and seismic geotechnical engineering recommendations.

WSDOT, I-5 to Everett to SR-528 - Peak Use Shoulder Lane & Interchange Improvements | Marysville, WA. Bob is Principal-in-Charge for the preliminary engineering and design-build contractor geotechnical review. The project will expand the existing interchange at I-5 and SR-529 to add a northbound I-5 off-ramp to SR-529 and a ramp from SR-529 to I-5. For preliminary engineering, Bob and the Shannon & Wilson team performed field explorations, preliminary engineering evaluations for deep foundations, preload and surcharge settlement modeling for the embankment on soft soil, prepared the geotechnical baseline and data reports, and geotechnical-related technical provisions that were used for project procurement. We were retained by WSDOT during construction and revised the design-build contractor submittals.

WSDOT, SR 520 Pontoon Casting Basin | Aberdeen, WA. Bob was the project manager for the design and construction of a pontoon casting facility used as part of the replacement of the SR 520 floating bridge on Lake Washington. The pontoon construction facility was built at the Aberdeen Log Yard site in Grays Harbor County and the overall size of the pontoon casting facility is about 200 feet by 900 feet by 25 feet deep. Shannon & Wilson provided slope stability, aquifer modeling, seepage analysis, well design, geotechnical instrumentation, plans and specification review, construction observation services, seismic site response analysis, geotechnical site evaluation, foundation analysis and embankment design for the project. Our services also included: strong ground motion time history development, driven 18- and 24-inch steel pipe pile recommendations including axial and lateral resistance and pile drivability. Two-dimensional numerical modeling included dynamic, non-linear, effective stress, site response simulations.

US Army Corp of Engineers, Seattle District | Skookumchuck Dam | Centralia, WA. Bob was the Project Manager and Project Engineer. Skookumchuck Dam is a privately-owned water storage and flood control dam that is 160-feet high and 1,340-feet long and retains 35,000 acre-feet of water. Shannon & Wilson conducted probabilistic and deterministic ground motion studies (PSHA and DSHA); Becker Hammer subsurface explorations; field downhole geophysical testing; cyclic triaxial laboratory testing; liquefaction evaluations; and static and post-seismic slope stability analyses. Bob performed static and post-seismic stability analyses to determine if the dam could survive the design seismic event without releasing reservoir water.



Oliver Hoopes, PE

Slope Stability & Alternatives Analysis Lead

Oliver's 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 performed construction observation from the point of view of a general contractor, giving him a unique perspective on issues that arise. He has extensive experience in several standardized laboratory test methods, as well as specialized laboratory devices and methods, including true triaxial testing. In Oliver's 20 years of experience, he has managed several geotechnical projects for WSDOT across the state. 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 Shannon & Wilson's Seattle Office, and is Shannon & Wilson's corporate Practice Lead for risk and reliability design.

Relevant Project Experience

SPU, Alki Subsurface Drainage Evaluation, Seattle, WA. In 2000, Seattle Public Utilities (SPU) designed and constructed a subsurface drainage system to mitigate landsliding in a hillside above Alki Avenue in West Seattle. SPU retained Shannon & Wilson, Inc. to evaluate the drainage system's performance and develop long term monitoring and maintenance plans. A significant portion of this scope included evaluating the current global stability of the hillside and the effect of increasing groundwater levels. As Lead Engineer, Oliver led the engineering effort to perform a reliability-based stability evaluation using the Taylor Series method and developed a relationship between trailing rainfall sums and groundwater levels in observation wells to overall probability of failure.

City of Everett, Panaview Landslide | Everett, WA. A deep-seated landslide occurred on a slope behind several houses in the Panaview/ Burl neighborhood of Everett. S&W was retained by the City of Everett's attorneys to investigate to collect physical data from the landslide mass and surrounding soil and to evaluate claims made by the plaintiffs (a group of homeowners) regarding the cause of the landslide. Oliver served as a project engineer in characterizing the engineering behavior of the soil using field and laboratory test data (including ring shear strength testing) and managing the coupled seepage and slope stability analysis effort.

WSDOT, SR 520 Bridge Replacement and HOV Project, Delmar Landslide | Seattle, WA. WSDOT plans to widen and slightly relocate SR 520 when it replaces the Evergreen Point Floating Bridge. Consequently, the adjacent NE Points Drive will need to be moved to the north towards a steep slope. Oliver served as a project engineer in performing slope stability calculations and failure surface modeling for the proposed retaining walls using the modeling software SLOPE/W (Geo-Slope, 2007). He used the results to iteratively develop several retaining structure and slope stabilization alternatives. Oliver also wrote the slope stability analysis section of the geotechnical report.

Rayonier Timber, Deep Creek Harvest Unit | Clallam County, WA. Rayonier is evaluating the feasibility of harvesting several forest units upslope of SR 112 overlooking the Strait of Juan de Fuca. Several landslides have occurred along SR 112 in this area over documented history. As the project geotechnical engineer, Oliver performed a series of coupled finite element seepage and global slope stability analyses to predict the influence of logging and associated changes in rainwater infiltration would have on the groundwater levels in the slope and corresponding changes to Factor of Safety against slope instability.

Firm

Shannon & Wilson

Education

MS, Civil and Environmental Engineering (Geotechnical), University of Washington

BS, Civil and Environmental Engineering, Cornell University
Engineering Minor, Geological Sciences, Cornell University

Registrations/Licenses

Professional Engineer (Civil): WA # 49472; AK #14208

Years of Experience

18

Oliver Hoopes, PE, Slope Stability & Alternatives Analysis Lead (cont.)

City of Seattle, Fire Station No. 9 Replacement | Seattle, WA.

Oliver served as a Project Engineer in developing the final geotechnical report for this project. After Shannon and Wilson submitted a draft report for this project, the City of Seattle planners decided to move the footprint of the proposed fire station within about 5 feet of the 15-foot setback from the crest of a 40-degree slope. Oliver modeled slope stability using computer models as well as hand calculations to evaluate the effect of this move on both the overall slope stability and the bearing capacity of the encroaching footings. In addition, Oliver evaluated the geotechnical impact of leaving the existing foundation slab and basement walls in place and filling them with structural fill. This included estimating the effect on settlements, drainage, and developing temporary shoring recommendations for the existing walls.

Chehalis Basin Work Group, Chehalis Basin Strategy | Pe Ell, WA.

The Chehalis Basin Work Group and Ecology are planning to construct a dam in the Chehalis River basin that will serve as a flood reduction measure and to maintain necessary river flow rates for fish passage. This dam would periodically inundate and drawdown the reservoir and this will influence the stability of the 27 mapped landslides within the inundation zone. Oliver served as the lead geotechnical engineer, directing the global stability and finite element seepage analysis work of a staff geologist and staff engineer. Coupled stability and seepage analyses, including both steady state and transient drawdown analyses, for 11 of the 27 landslides were completed for this study.

Seattle Department of Transportation (SDOT), Golden Gardens Drive NW Washout | Seattle, WA.

In a heavy rainfall event in December 2007, an approximately 45-foot-wide by approximately 18-foot-deep section of Golden Gardens Drive NW was eroded away. As a project engineer, Oliver used soil borings and inclinometer readings to develop soil profiles, ran stability analyses using the modeling software SLOPE/W (Geo-Slope, 2007), and evaluated slope stabilization measures including a reinforced roadway, an MSE wall, and soldier pile walls. He also drafted a large percentage of the report for the project.

WSDOT, Interstate 5 (I-5)/Marine View Drive to State Route (SR) 528 Peak Use Shoulder Lane and Interchange Improvements Project, Marysville, WA.

The project consists of modifying the intersection of I-5 and SR 529 between Ebey and Steamboat Slough to reduce the congestion that currently impacts commuter traffic, the movement of freight in the region, and access to local businesses. The proposed modifications with include adding an off-ramp from the northbound lane of I-5 to SR 529 and adding an on-ramp from SR-529 to I-5, including a bridge over the existing lane of northbound SR 529. Geotechnical challenges for this concept include embankment and overpass bridge foundation construction on very soft estuarine deposits and potentially liquefiable alluvium interbeds. Oliver served as Project Manager for the conceptual design (pre-RFP) geotechnical efforts for this project, which included subsurface explorations, laboratory testing, bridge foundation and embankment engineering analyses, and settlement simulations.

WSDOT, SR-532 Corridor Improvements Project, Island and Snohomish Counties, WA.

As part of the SR-532 Corridor Improvements Project, the General Mark W. Clark Memorial Bridge will be replaced with a new Bridge. Oliver worked as a Project Engineer to evaluate the global stability of the proposed approach embankment reinforced soil slopes (RSS) and mechanically stabilized earth (MSE) walls, and abutment MSE walls. Using the computer program SLOPE/W (Geo-Slope, 2007), he determined the required MSE and RSS reinforcement lengths, stone column ground improvement depths and area replacement ratios for static, seismic, and liquefied conditions. He also drafted the Geotechnical Design Memorandum for this portion of the project.



Thomas Keatts, PE

Geotechnical Engineering Lead

Thomas joined Shannon & Wilson in 2011 as a Geotechnical Intern in our Anchorage, Alaska office where he spent the first 13 years of his career. Thomas transitioned to our Seattle office in 2024 where he has been managing a broad array of projects including building infrastructure, transportation, and water and wastewater. Thomas has significant project management and technical experience working on projects throughout the Pacific Northwest and Alaska. He has worked on numerous projects for federal, state, and local government agencies. Thomas is experienced in leading projects to evaluate slope stability and slope stabilization. Thomas was the lead geotechnical engineer for the Alaska Department of Transportation and Public Facilities earthquake recovery effort after the November 30, 2018 magnitude 7.1 earthquake, which resulted in several slope and embankment failures. He is experienced with subsurface investigations for slope stabilization projects including soil borings, test pits, and geophysical methods, in remote and limited access areas. Thomas has experience with instrumentation for slope stability monitoring including installation of vibrating wire piezometers for groundwater observation and slope inclinometer installation for periodic or continuous slope displacement monitoring. Thomas has provided recommendations or design for slope stabilization including grouted soil nails, spiral nails, mechanically stabilized earth walls, soldier pile walls, cantilever sheet pile walls, gravity walls, deep soil mixing, and stone column reinforcement.

Firm

Shannon & Wilson

Education

MEng, Civil Engineering, Oregon State University, 2011

BS, Geology, Western Washington University, 2009

Registrations/Licenses

Licensed Professional (Civil), WA, 53743, 2016

Years of Experience

17

Relevant Project Experience

Titlow Lagoon Railroad Trestle Design Development | Tacoma, WA. Thomas was the project manager for the design of a new railroad bridge near Titlow Park. The project included geotechnical borings and geophysical studies accessed by a pedestrian path along the shoreline of Puget Sound. The broader project includes reconnecting the existing Titlow Lagoon to the sound by construction of a new channel, which must flow beneath the existing BNSF railroad embankment. The new bridge will be required to carry rail traffic over the channel. The bridge will be supported by H-piles and embankments will be stabilized with rigid inclusion ground improvement and retaining structures due to liquefiable soils and tight right of way constraints.

North Fork Bridge (1221) Bridge Replacement | King County, WA. Thomas was the project manager for the replacement of the North Fork Bridge over the North Fork of the Snoqualmie River in King County. The project included geotechnical explorations up to 250 feet in depth to support foundation design for the bridge. The site soils were generally loose silty sands and soft to medium stiff silts and clays to beyond the depth of our explorations. Recommendations were provided to support the three-span bridge on drilled shafts. Each abutment is supported on a pair of five-foot

diameter drilled shafts, and the intermediate piers are supported by 10-foot diameter mono-shafts. Shafts extend up to 215 feet deep. Thomas also provided recommendations for stabilizing the bridge abutments and embankments using ground improvement and geogrid reinforcement, as well as recommendations for the approach retaining walls, and roadway embankment raises.

City of Wrangell, Dewey Trailhead

Stabilization | Wrangell, AK. Thomas was the project manager and lead geophysicist and engineer for this project. The scope of the project was to evaluate the stability of a large, steep, forested slope above residential housing. The slope is similar to slopes which have failed in recent years in southeast Alaska during periods of excessive rainfall. The project included preliminary field explorations consisting of soil borings along the toe of the slope and seismic refraction lines along the slope face to determine the overburden thickness above bedrock. This information was used to develop preliminary slope stability models, engineering recommendations and recommendations for future studies to better characterize the overall slope stability. During explorations a rock fall hazard was identified in addition to the risk of slope failure on the marginally stable slope.

Thomas Keatts, PE, Geotechnical Engineering Lead (cont.)

Alaska Department of Transportation & Public Facilities (DOT&PF) | Glacier Highway Wall Instrumentation, Juneau, AK. Thomas was the project manager for this project. The project included advancing soil borings within the sidewalk behind a welded wire wall, which had been experiencing settlement since construction. The soil boring was advanced to obtain subsurface soils information. Instrumentation was installed in the boring including an in-place inclinometer and vibrating wire piezometer. The instrumentation was installed with a continuous data logger and an automated data acquisition system to allow real time remote monitoring of the walls performance.

City of Sitka, Pulp Mill Filter Plant Slope | Sitka, AK. Thomas was the project manager and lead geophysicist for this project. The project involved rock outcrop mapping and a geophysical investigation to determine the likely limits of a historic landfill area in a ravine near Sawmill Cove in Sitka, Alaska. Debris from the ravine was eroding into Sawmill Creek due to erosion at the toe of the slope. The investigation looked at magnetometer data in an attempt to delineate the lateral extent of the debris, historical aerial imagery to try to determine the location and extent of the original ravine and dumping activities over the years, and rock outcrop mapping to determine areas where debris does not exist. Recommendations were provided for two alternatives, removing the existing debris, or stabilizing the debris in place using rock anchors and mesh.

Municipality of Anchorage, Kincaid Park Sand Dune Slopes FEMA | Anchorage, AK. Thomas was the project manager and lead engineer for this project. The project involved explorations and analysis for the repair of tension cracking and slope displacements on a steep bluff near the motocross track in Kincaid Park. The slope distress was caused by the November 30, 2018, Anchorage earthquake. The repair included excavation of the upper section of the slope and re-establishment of the slope as a reinforced soil slope using layers of geogrid. The repair had to consider the impacts of a pond that sits at the top of the bluff and has a history of overtopping the bluff and causing sudden bluff erosion.

Municipality of Anchorage, Christensen Drive Retaining Wall | Anchorage, AK. Thomas was the project manager for this project. The project included observation and analysis of a recently constructed approximately 24-foot tall, cantilevered sheet pile wall. The wall appeared to be failing based on significant tension cracking in the Municipality of Anchorage owned street above the wall. Thomas conducted a site visit and conducted geotechnical stability analysis of the wall that showed the wall was not stable. He also reviewed submittals from the wall owners' engineers for additional explorations plan, analysis, and remediation design. The design included the installation of tie backs to provide additional lateral support for the wall.

White Pass Yukon Route Railroad, Wall 15A Replacement | Skagway, AK. Thomas was the project manager for this project. The project consisted of replacing an existing bridge, which had failed, with a retaining wall to reduce future maintenance and inspection demands. The project included field explorations for assessment of the soil and rock conditions to aid in design of the replacement wall. To assess the rock mass, rock coring was conducted and Thomas was responsible for conducting optical and acoustic borehole logging and interpreting the geologic structure of the rock. This data was used to evaluate the stability of the rock mass and to estimate anchor capacities for the design of the wall. The bridge was replaced by a combination cast-in-place anchored concrete wall and a mechanically stabilized earth wall approximately 60 feet in height. Thomas provided engineering analysis and recommendations for the anchored portion of the wall and was the lead designer for the MSE portion of the wall.

Strata Constructors, Mirror Lake Ground Improvement | Eklutna, AK. Thomas was the project manager for this project. Thomas was the designer for this design-build ground improvement project to repair a damaged highway embankment slope along the Glenn Highway in Eklutna, Alaska. The slope failed during the November 30, 2018 Anchorage earthquake resulting in a closure to the southbound Glenn Highway. The design consisted of approximately 1,200 stone columns 3-feet in diameter to varying depths. The project was designed to take advantage of the reinforcement provided by the columns to stabilize the slope and did not required densification of the existing silty embankment soils. Thomas also managed the construction observation effort for the installation of the stone columns.

Anchorage Water & Wastewater Utility, Briggs Bridge Slope Investigation | Eagle River, AK. Thomas investigated a slope failure related to a water line separation that occurred as a result of the November 30, 2018, Anchorage earthquake. Thomas evaluated subsurface boring data and data from inclinometer readings and conducted slope stability analysis to determine the likely failure mechanism and to evaluate the risk of continued and future slope movement.

Western Federal Lands, FHWA, South Chickaloon Cut Geophysics | Chickaloon, AK. Thomas was the field manager in charge of geophysical studies for an approximately 150-foot compound soil and rock cut along the Glenn Highway near Chickaloon, Alaska. Thomas developed the field program including seismic refraction line placement and spacing to optimize coverage. He also supervised data collection in the field and led the processing and interpretation effort. Thomas provided final profiles for use by the Western Federal Lands team and assisted in establishing cut slope profiles for design and right-of-way acquisition.



Firm

Shannon & Wilson

Education

PhD, Civil Engineering
(Geotechnical Engineering),
Jackson State University, 2023

MS, Civil Engineering, University
of Alabama, 2011

Certifications

Remote Pilot Part 107 (sUAS)
United States Federal Aviation
Administration (FAA), Cert. #
4527685

Rakesh Salunke, PhD

Remote Sensing Lead

Rakesh is a remote sensing and geotechnical scientist with expertise in LiDAR and UAV photogrammetry-based change detection, InSAR time series analysis, geophysical surveys, geospatial analytics, and AI/ML applications in geo-hazard monitoring. He has a proven track record in developing automated change detection workflows and delivering actionable intelligence for critical infrastructure protection. He also has a strong background in geotechnical applications with demonstrated expertise remote sensing-based infrastructure monitoring, Structure-from-Motion processing, and terrain-informed data segmentation for diverse environmental conditions. His expertise lies in delivering cutting-edge remote sensing solutions for geo-hazard monitoring, slope stability, and resilient infrastructure asset management.

Technical Skills & Core Competencies

- Remote Sensing: Photogrammetry, Structure-from-Motion (SfM), Airborne and Terrestrial LiDAR, UAV/drone operations, Hyperspectral, Thermal Imagery, InSAR (SNAP), Change Detection
- Algorithms: M3C2 point cloud comparison, ICP registration, sub-pixel image correlation, vegetation filtering, atmospheric noise reduction
- Software Platforms: Pix4D, SimActive Correlator 3D, Trimble Realworks and Business Solutions, CloudCompare, MintPy, ISCE, SNAP
- Programming & Analysis: Python, MATLAB, GIS Python libraries,
- GIS/Visualization: ArcGIS Pro, QGIS, ENVI, AutoDesk AutoCAD, Civil 3D
- Registration Algorithms: ICP with stable area masking, sub-pixel image correlation, multi-stage registration excluding changed areas to prevent deformation smearing
- Processing Workflows: GPU-accelerated M3C2/ICP pipelines, multi-temporal point cloud generation with adaptive parameter optimization

Multi-Sensor Integration

- UAS Photogrammetry & LiDAR: Experienced in operating commercial platforms for emergency response with decimeter-level accuracy, integrated with ground point classification workflow
- Terrestrial Laser Scanning: Experienced in conducting high-precision surveys with Gaussian statistical modeling of surface change distributions and multi-campaign temporal analysis
- Satellite InSAR: Experienced in processing Sentinel-1 for wide-area deformation with integration to terrestrial datasets through common spatial reference systems

Change Detection & Photogrammetry

- Software Platforms: Pix4D, SimActive Correlator 3D, Trimble Realworks and Business Solutions, CloudCompare, MintPy, ISCE, SNAP

Relevant Project Experience

Alyeska Pipeline Service Company, Lidar Change Detection - Trans Alaska Pipeline System | Alaska. Rakesh is involved in the lidar change detection (LCD) project to monitor ground surface changes at several key sites along the Trans Alaska Pipeline System using multi-epoch aerial lidar data acquired in 2011, 2021/2022, and 2025. The project involves determining 3D surface variations to quantify displacement due to creep movement, settlement, erosion, landslides, and other

geohazards that could significantly impact pipeline operations. Rakesh works with SWLC3D, Shannon & Wilson's proprietary LCD software that integrates both Iterative Closest Point (ICP) registration and the Multiscale Model-to-Model Cloud Comparison (M3C2) algorithm for this study. The LCD analysis involves lidar point cloud data alignment, classification, extraction of bare-earth points, registration, change analysis, QA/QC, rasterization, and reporting.



Amy Summe, CESCL

Permitting & SEPA Lead

Amy Summe is a senior biologist and permitting specialist with nearly 28 years of experience in the Puget Sound region, with an emphasis on public infrastructure such as transportation, utilities, recreation, and restoration. A thorough knowledge of Washington's environmental regulations coupled with wetland and shoreline expertise gives Amy skills to help bring projects into compliance with state and federal mandates and facilitate smooth permitting. Amy has proven experience in the permitting requirements and timelines for federal, state, and local permits, including local critical areas and shoreline permits, Endangered Species Act compliance, State and National Environmental Policy Acts (SEPA/NEPA) compliance, WDFW Hydraulic Project Approval, Section 10 and Section 404 Corps permits, and 401 Water Quality Certification. Her education and background as a biologist complement her work as an environmental planner.

At the project level, Amy has extensive experience preparing permit applications and supporting studies, performing wetland delineations, developing mitigation and restoration plans, and writing biological assessments. In addition, Amy has participated in Comprehensive Plan updates, led Shoreline Master Program updates, and updated local critical areas regulations for a number of cities and counties.

Relevant Project Experience

Seattle Public Utilities Pump Station 80 Security Fencing, City of Seattle, WA. SPU operates a pump station on a Lake Washington-waterfront property sandwiched between single-family residences and a road. Due to trespassing and safety concerns, SPU proposed to install security fence and a gate on three sides of the property within shoreline jurisdiction and on and in the buffer of a steep slope. The proposed action required a Shoreline Substantial Development Permit and a Shoreline Variance. As the Shoreline Permit Lead, Amy prepared and submitted the City applications and a detailed supporting analysis demonstrating consistency of the project with the City's shoreline/critical areas codes and the variance review criteria. The Shoreline Variance was approved by the City and Ecology and then the MUP was issued by the City less than 10 months after initial permit application submittal.

Residential Post-Landslide Slope Stabilization on Seattle Waterfront, Seattle, WA. Following a severe landslide on a marine waterfront residential property triggered by frozen water pipes that burst while the owners were on vacation, Shannon & Wilson prepared plans for slope stabilization and site repair that included a series of walls. The entire project was in shoreline jurisdiction and required a Shoreline Variance due to the type and scale of the work. Amy worked with the owner, engineers, and City to prepare a submittal package

demonstrating project consistency with the SMP and the Shoreline Variance criteria and to obtain City and Ecology approval.

City of Mountlake Terrace, Ballinger Park Viewing Platform and Trails, Mountlake Terrace, WA. As Project Manager, Amy led the natural resources and permitting implements of this project to implement a phase of the Ballinger Park Master Plan that includes a trail network and over-water viewing platform at Ballinger Park on Lake Ballinger. Amy assisted the design team and the City with locating new trails, boardwalks, and the over-water lake viewing platform to avoid and minimize impacts to critical areas; developed the permit strategy; worked with the team to design mitigation for unavoidable impacts (which include lakeshore revegetation and wetland creation/rehabilitation/enhancement); and finalized the SEPA checklist, critical areas and mitigation reports, and shoreline applications and analysis for a Shoreline Variance and Shoreline Conditional Use Permit, USACE Section 404 Nationwide Permit, and WDFW Hydraulic Project Approval. Shannon & Wilson coordinated closely with Ecology during early site investigations and preliminary design to set the stage for a smooth Ecology approval process for the two shoreline permits. The project received all approvals within months of submittal, and construction started in June 2025.

Firm

Shannon & Wilson

Education

BS, Zoology, Washington State University, 1997

BS, Environmental Science, Washington State University, 1997

Registrations/Licenses

Professional Wetland Scientist, No. 3112, 2019

Certified Senior Biological Assessment Writer, WSDOT, 2026

Years of Experience

28

Amy Summe, CESCL, Permitting & SEPA Lead (cont.)

WDFW Ebey Island Recreation Access Redevelopment, Snohomish County, WA. WDFW submitted applications and supporting documents to Snohomish County in pursuit of permits for improving and expanding a parking lot, installing two hand-carry boat launches, and creating new pedestrian trails and a viewing blind for non-motorized recreation on Deadwater Slough. WDFW received significant comments from the County and sought Shannon & Wilson's assistance in preparing an updated submittal package. As the Shoreline Permit Lead, Amy made substantial revisions and added new analysis to address County comments in the shoreline consistency analysis and critical area report, including demonstration of consistency with Shoreline Variance criteria required due to proposed fill in the floodplain.

Puget Sound Energy, Lower Baker Dam Seepage Reduction Project, Concrete, WA. As the Shoreline Permit and ESA Compliance Lead. Amy prepared the Endangered Species Act Biological Assessment evaluating PSE's seepage reduction project at Lower Baker Dam, and also participated in delineation of 26 wetlands and a stream and development of local, state, and federal permit application documents. The BA was submitted to the Federal Energy Regulatory Commission and then to NMFS and USFWS for review, and was approved with no comments. Amy prepared the SMP consistency analysis and worked with the Town of Concrete and Ecology to obtain a Shoreline CUP, Shoreline Variance, and Shoreline Substantial Development Permit. She also supported SEPA Checklist preparation and JARPA preparation.

Clallam County, Lower Dungeness River Levee Setback and Floodplain Restoration, Clallam County, WA. Shannon & Wilson provided services for the realignment of a 1-mile-long reach of the Lower Dungeness River levee and the restoration of about 100 acres of associated floodplain. As the team's Biologist/Environmental Permitting Lead, Amy prepared permit applications and supporting documents and obtained permits or approvals for all local and state, and federal agencies, including Corps 404 Individual Permit, Shoreline Substantial Development and Shoreline Conditional Use Permit, SEPA Determination of Nonsignificance, Hydraulic Project Approval from WDFW, 401 Water Quality Certification from Ecology, and U.S. Fish and Wildlife Service and National Marine Fisheries Service ESA consultation. Extensive coordination with the Corps, Ecology, WDFW, the County, and Tribes was necessary throughout design, permitting and construction. This project won the 2024 ACEC Engineering Excellence Gold Award for Washington State and the ACEC National Recognition Award.



Firm

Ott-Sakai

Education

BS, Civil Engineering, University of Washington, 1987

Certifications

Professional Engineer: WA, 1996, #33051

Years of Experience

30

Kevin Sakai, PE

Cost Estimation

Kevin has 30 years of experience in the construction management of transportation infrastructure. Kevin has served as a construction specialist providing Critical Path Method (CPM) schedules, estimating, and constructability input for high-profile projects and programs around the Seattle area, including the City of Seattle's Seawall Replacement program, Sound Transit's ST3 Cost Risk and Cost Validation, replacement of the SR 520 floating bridge and others.

Relevant Project Experience

Sound Transit West Seattle to Ballard Link Extension | Seattle, WA. Kevin and his team is provided constructability and cost estimating support on the light rail extension which includes several slope stabilization segments at Pigeon Point located at West Seattle and Queen Anne Hillside.

WSDOT, SR 520 Portage Bay Bridge | Seattle, WA. Kevin has provided construction cost estimating, scheduling and risk assessment on the 520 Bridge Replacement and HOV Program, specifically on the replacement of the Portage Bay Bridge where there is slope instability within the project limits.

City of Everett, Edgewood Bridge Replacement | Everett, WA. Kevin and his team have provided construction cost estimating, constructability reviews, and a construction working day schedule and risk assessment for a bridge replacement project where there is slope instability within the proximity where the bridge spans over a deep ravine of Edgewater Creek.

City of Everett Merrill and Ring Bridge Replacement | Everett, WA. Kevin and his team have provided construction cost estimating, constructability reviews, and a construction working day schedule and risk assessment for a bridge replacement project where there is slope instability within the proximity where the bridge spans over a deep ravine.

Seattle City Light, Charles St Electrical Upgrades | Seattle, WA. Kevin has provided construction cost estimating and risk assessment. The primary objective of the Charles Street Electrical Upgrade is to implement necessary electrical service modifications. These modifications are essential to meet both current and future electric vehicle charging requirements and realize substantial carbon and cost savings in the process.

Seattle City Light, SSC Shops Dust Collection & Paint Booth Upgrades. KPFF, Prime. Seattle City Light, Owner. Kevin has provided construction cost estimating and risk assessment. The project provides upgrades to the existing dust collection and paint booth and includes demolition, electrical work, duct work, mechanical equipment installation, structural work and architectural finishes.

City of Seattle, RapidRide J Line | Seattle, WA. HDR, Prime. Kevin provided constructability review and developed the project schedule and cost estimate. SDOT and King County Metro (KCM) are partnering to enhance transit connections and upgrade existing bus routes to Metro RapidRide service. The project upgrades the current Route 70 to a RapidRide level of service, improving transit connections to Downtown, Belltown, South Lake Union, Eastlake, and the University District neighborhoods.

City of Seattle, Pine Streetscape & Bicycle Improvement | Seattle, WA. Kevin is providing constructability review and developing the project schedule and cost estimate. The Pike and Pine Streetscape Improvements Project will design and construct pedestrian improvements on Pike and Pine Streets between First Avenue and Melrose Avenue on Capitol Hill, including new sidewalks or sidewalk extensions, curb bulbs, intersection treatments, and lighting.

City of Seattle, Central Waterfront | Seattle, WA. Kevin is providing constructability review and developing the program schedule. Waterfront Seattle is a \$700 million, multi-year program to rebuild Seattle's waterfront after removal of the Alaskan Way Viaduct. The program spans the waterfront from Pioneer Square to Belltown and includes a rebuilt Elliott Bay seawall; a new surface street providing access to and from downtown; and new parks, paths, and access to Elliott Bay.

Relevant Experience

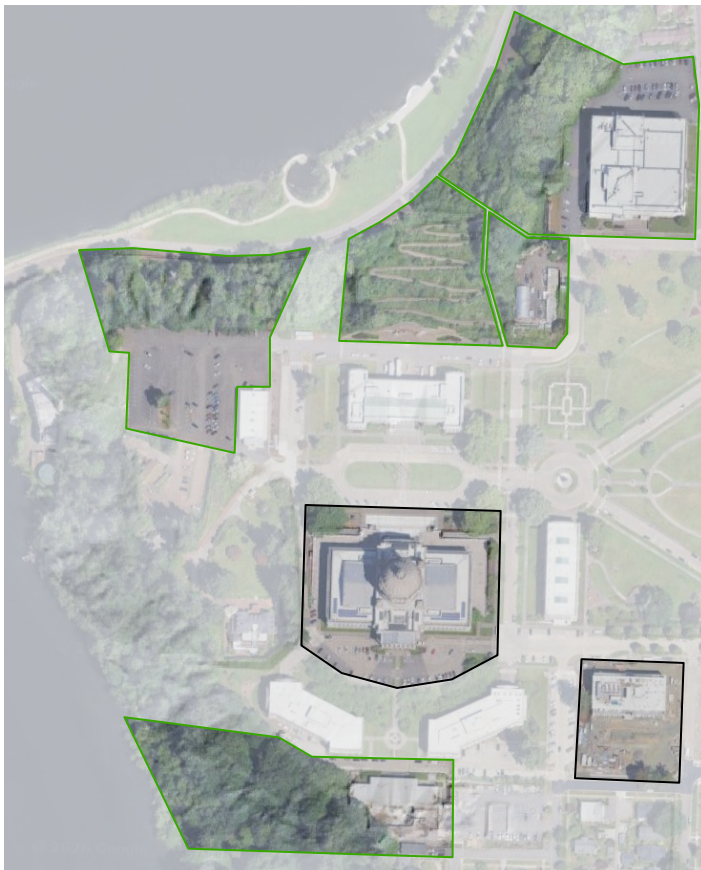
Shannon & Wilson has evaluated stability and developed slope stabilization solutions for more than a thousand landslides in the Puget Sound region and across the western U.S. for public and private clients. Our experience ranges from the Seattle Landslide Study, PSE Landslide and Debris Flow Susceptibility Mapping, and Oso Landslide expert witness services to numerous slope stabilization projects for bridges, roads, buildings, and residential structures.

Our team has worked extensively with Washington State agencies like DES, WSDOT and DNR, as well as federal agencies like USACE and NAVFAC, to provide predesign, preliminary and final design geotechnical engineering recommendations for multi-phased construction projects that commonly include complex slope stability issues.

Through repeat on-call contracts with state agencies like DES, WSDOT and DNR, we understand the impacts and potential limitations of the capital budget process at various stages of project planning, design and construction. We have worked on the owner and contractor sides of numerous design-build and design-bid-build projects for local, state and federal agencies.



S&W is very experienced with preparing complete permit submittal packages, assisting public agencies to coordinate with Authorities Having Jurisdiction (AHJs), and conducting environmental review under the State Environmental Protection Policy Act (SEPA).



Map (above) illustrates the footprints of Shannon & Wilson's recently completed projects on the Capitol Campus. Projects with significant slope stability elements are highlighted in green

A Long History of Service to DES

Shannon & Wilson has provided DES with geotechnical engineering and slope hazard evaluation services for dozens of projects at the Capitol Campus and throughout Washington. Through our history of work at the Campus, which spans over 50 years, we understand the challenging slope and subsurface and surficial drainage conditions of the site. **Projects we have completed at the West Campus since 2020 include:**

- **Preliminary Slope Stability Evaluation – Capitol Campus Conservatory Demolition**
 - Key staff: Kathryn Petek
- **Landslide Assessment – Governor’s Mansion Parking Lot**
 - Key staff: Bob Mitchell
- Geotechnical Engineering Report and Recommendations – Newhouse Building Replacement
 - Key staff: Bob Mitchell
- **Predesign Geotechnical Engineering Recommendations – Legislative Agencies and Houses and Senate Building**
 - Key staff: Kathryn Petek, Bob Mitchell
- **Predesign Geotechnical Engineering Recommendations – Insurance Commissioner Office Building:**
 - Key staff: Bob Mitchell

Projects in bold include a significant slope stability component

Project Experience

Table 2 illustrates several examples of Shannon & Wilson’s similar experience on projects within the last five years. The project summaries on pages 19-24 expand upon these skills and experience.

Project Title	Slope Stability	Groundwater Movement	Soil Percolation Rates	Sustainable Design/Bioengineering	Phased State Agency Construction
WA DES, Preliminary Slope Stability Evaluation – Capitol Campus Conservatory	●	●		●	●
WA DES, Predesign Geotechnical Engineering Services – Legislative Agencies and Houses and Senate Building	●	●		●	●
Private Owner, Slope Stability Improvements – Perkins Lane West	●	●		●	
WSDOT, GN3 Landslide	●	●	●	●	●
WSDOT, On-Call for Geotechnical Engineering	●	●	●	●	●
WSDOT, SR 18 Widening Project	●	●	●	●	●
Rayonier, Harvest Unit Geotechnical Evaluation	●	●	●		●
Seattle Public Utilities, Alki Subsurface Drainage and Stability Evaluation	●	●	●		●

Project Examples

WA STATE DEPARTMENT OF ENTERPRISE SERVICES
Predesign Geotechnical Engineering Services
– Legislative Agencies and Houses and Senate Building
Olympia, WA

This project supported the State Legislative Campus Modernization project at the State Capitol Campus in Olympia, Washington, focusing on the planned Legislative Agencies and House (LAH) building and Senate building to replace the Pritchard Library. The proposed building pads are relatively flat, however, the LAH site is immediately adjacent to a steep, approximately 110 foot high vegetated slope with inclinations approaching about 1.5H:1V. This slope lies within a historic landslide with documented shallow instability, making slope performance a primary constraint on building siting and early cost estimating. Predesign recommendations were developed from prior investigations and a supplemental boring near the proposed Senate building, with the intent to guide layout alternatives and identify where additional exploration and analysis are needed as design advances.

Slope stability was evaluated at a screening level using limit equilibrium analyses along a representative cross section through the natural slope west of the LAH site under static and pseudo

CLIENT CONTACT

Majid Jamali
 majid.jamali@des.wa.gov

ORIGINAL BUDGET
 \$230,000

ACTUAL COMPLETED COST
 \$207,000

DELIVERY METHOD: GC/CM

static (seismic) loading. Consistent with WSDOT Geotechnical Design Manual practice, we targeted minimum factors of safety of 1.5 for static conditions supporting structures and 1.1 for seismic/post seismic conditions, and translated these results into preliminary building setbacks. We recommended LAH building setbacks to meet static stability and seismic criteria.

To manage seismic slope demands and reduce potential slope setback distances, we provided alternative foundation and slope stabilization recommendations including deep foundations (e.g., drilled shafts), a large diameter secant pile wall (possibly with tiebacks) and/or terraced, tieback anchored retaining systems. We recommended further future design phase work including additional explorations and advanced numerical modeling (e.g., FLAC) to better estimate seismic slope deformation and resulting impacts to the proposed structures.



WA STATE DEPARTMENT OF ENTERPRISE SERVICES
Capitol Campus Conservatory Demolition –
Preliminary Slope Stability Evaluation
Olympia, WA

This project consisted of a preliminary slope stability evaluation for the former Conservatory Building site on the Capitol Campus to support conceptual planning for future site use following demolition. project relied on an extensive review of existing reports, boring logs, site reconnaissance observations, and cross-section development to model slope stability. Slope stability was assessed under static and seismic loading to screen potential hazards and identify the relative effectiveness of conceptual mitigation alternatives. Deliverables included conceptual design alternatives consisting of soldier pile and tieback wall system and/or regrading with fill removal, cost estimates and recommendations for additional analyses and explorations to advance to final design.

approach, which included data collection, fieldwork, geologic analysis, and slope stability modeling, allowed us to make informed recommendations for the safe and sustainable management of the harvest area.

CLIENT CONTACT

Zain Aldahlaki (now at City of Seattle)
 Zain.Aldahlaki@seattle.gov

ORIGINAL BUDGET **ACTUAL COMPLETED COST**
 \$10,000 \$10,000

DELIVERY METHOD: DES On-Call Services Contract

PRIVATE OWNER

Slope Stability Improvements, Perkins Lane West
Seattle, WA

Shannon & Wilson has performed dozens of slope stabilization projects along the landslide-prone Perkins Lane area of Seattle. Our most recent project involved multi-phase geotechnical engineering, design, permitting and construction support for slope stability improvements for a shoreline-adjacent property in Seattle, Washington, following a landslide in December 2021 that damaged local structures. Services performed included:

- Site reconnaissance and documentation of observed conditions
- Review of historical geotechnical information and investigations
- New geotechnical explorations and instrumentation for groundwater pressure monitoring
- Laboratory testing
- Development of cross-sections
- Global slope stability analyses under static and seismic loading
- Alternatives analyses.
- Preparation of design-level geotechnical recommendations to support construction in a constrained-access, steep-slope environment.
- Construction observation
- Regulatory support, including preparation and submittal of City of Seattle Environmentally Critical Areas (ECA) and shoreline exemption applications.

Based on the analyses and constructability constraints, the recommended stabilization approach combined a tiered, anchored retaining wall system in the primary landslide area with an anchored high-strength steel Tecco® mesh slope protection system and planting on an adjacent slope. The wall concept included four reinforced concrete/shotcrete retaining walls (approximately 4 to 8 feet tall) structurally connected to rows of grouted steel ground anchors, with lightweight foamed glass aggregate backfill and integrated drainage to reduce hydrostatic pressures and route collected water to a designated drywell. Recommendations also addressed anchor testing/verification, monitoring during construction, wet-weather and erosion-control measures, planting and irrigation practices. Alternative concepts were evaluated as part of a landslide repair and slope stability improvements alternatives analysis and the anchored wall-plus-mesh concept was advanced as the preferred alternative for design and permitting.

CLIENT CONTACT

John Hoedemaker (Owner’s Representative),
 Johnhoedemaker1@gmail.com

ORIGINAL BUDGET **ACTUAL COMPLETED COST**
 \$700,000 \$695,000

DELIVERY METHOD: Design-Bid-Build



WSDOT
Geotechnical Personnel Augmentation
Washington State

Shannon & Wilson is providing senior-level geotechnical engineering support to WSDOT under a statewide Geotechnical Engineering & Project Delivery on-call contract. The contract has a total authorized value of \$13 million, with approximately \$4.9 million in services completed to date across 37 task orders from July 2024 through April 2026. Services include geotechnical study oversight, report development, design and construction support, and technical review for a wide range of transportation projects delivered through both design-bid-build and design-build methods. Task orders have supported fish passage culvert replacements, highway widening projects, bridge replacements, emergency response efforts, and design-build geotechnical oversight. In addition, the scope includes ongoing technical support and chapter-level revisions to the WSDOT Geotechnical Design Manual, incorporating lessons learned, current practice, and updates to WSDOT and AASHTO requirements.

CLIENT CONTACT

Ioanna Kladou
 ioanna.kladou@wsdot.wa.gov

ORIGINAL BUDGET

\$13,000,000 (estimated contract value)

ACTUAL COMPLETED COST

In-progress

DELIVERY METHOD

On-Call Task Order

WSDOT
I-405 Renton to Bellevue - GN3 Landslide
Renton to Bellevue, WA

Shannon & Wilson provided WSDOT with contractor submittal review, comment resolution, site visits and observation and program meeting attendance for the I-405 Renton to Bellevue Project. This investigation, included as part of the larger project task order, involved our evaluation of a historically active, deep-seated landslide that was reactivated during the construction phase of this design-build project. Shannon & Wilson provided oversight of project borings and logging, developed and managed a laboratory program consisting of soil index property and strength tests, synthesized existing project and historical information, reviewed lidar topographic data and historical aerial photos, characterized surface soil and groundwater conditions, and performed coupled slope stability-seepage analyses to understand the hazard. We evaluated several mitigation alternatives including buttressing and structural solutions to provide WSDOT with conceptual recommendations for hillside stabilization.

CLIENT CONTACT

Ioanna Kladou
 ioanna.kladou@wsdot.wa.gov

ORIGINAL BUDGET

\$110,000 (total I-405 Renton to Bellevue Project)

ACTUAL COMPLETED COST

\$725,000 (total I-405 Renton to Bellevue Project; includes several client-requested scope and budget increases for additional site visits, contractor submittal reviews and comment resolution)

DELIVERY METHOD

On-Call (S&W services); Design-Build



WSDOT
SR 18 Widening
Issaquah, WA

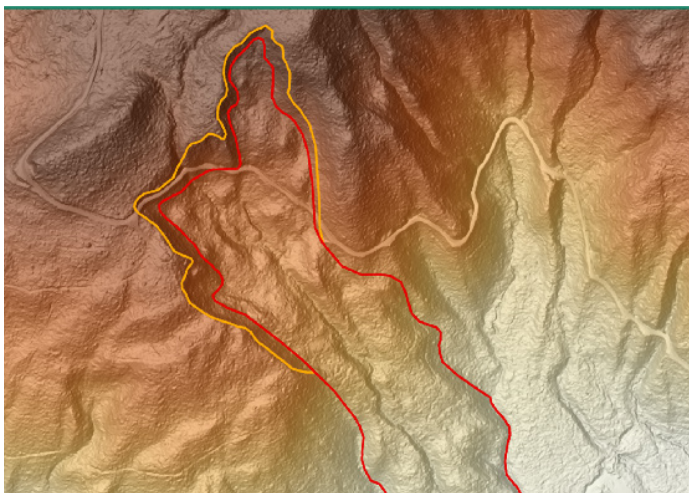
WSDOT plans to widen approximately 5.4 miles of SR 18 from Issaquah-Hobart Road to Deep Creek, which provides a critical transportation connection between I-5 and I-90. The Project extends through the Tiger Mountain State Forest and currently consists of two lanes with alternating truck climbing lanes on either side of the Tiger Mountain Summit.

The project corridor is characterized by challenging geotechnical and geologic conditions that will impact design and construction, including slope instability, high groundwater, and large volume of surface water runoff from the mountain. Because of the large amount of subsurface and surface water and high groundwater, an extensive system of subsurface drains has been installed below the highway.

Preliminary design for the project consists of approximately 100 retaining walls, 19 bridges, two box culverts, and five stormwater detention ponds. Retaining wall types include mechanically stabilized earth, cantilever soldier pile, anchored soldier pile, cylinder pile, and rock anchored walls. The project was divided into two phases.

S&W provided geotechnical engineering and geologic characterization services to WSDOT through a staff augmentation agreement, with S&W working as an extension of the WSDOT State Geotechnical Office.

S&W prepared several contract and reference documents for the DB procurement process, including the Geotechnical Data Report, Geotechnical Baseline Report, General Geologic Conditions and Geologic Hazards Report, Historical Geotechnical Reference Documents Memorandum, Engineering Stratigraphic Units Memorandum and several geotechnical memoranda containing slope stability, lateral earth pressure, seismic and liquefaction analyses for project walls and bridges.



CLIENT CONTACT

Ioanna Kladou
 ioanna.kladou@wsdot.wa.gov

ORIGINAL BUDGET

\$660,000

ACTUAL COMPLETED COST

\$1,200,000 (completed on-budget with client-requested scope and budget increases to accommodate extensions and changes of alignments, and advancement of design)

DELIVERY METHOD

On-Call Task Order (S&W services)
 Design-Bid-Build (East Phase)
 Design-Build (West Phase)

To support the analyses and characterizations in the procurement documents, and make geotechnical recommendations for preliminary design, S&W scoped and coordinated 105 boreholes and installation of 70 open-well piezometers, 20 vibrating wire piezometers and 11 slope inclinometers. The laboratory testing program consisted of more than 1,000 soil and rock tests including grain size, Atterberg limit, hydrometer, specific gravity, water content, pH, resistivity, organic content, slake durability, uniaxial compression (soil and rock), ring shear, and rock direct shear. Acoustic televiwer imagery was collected for ten of the 29 borings that encountered rock. These data supplemented nearly 200 existing historical borings and numerous reports and records of maintenance, repair and improvement projects along the corridor.

Slope stability is the primary geotechnical concern for the project. To assist the design team and provide information for prospective Design-Builders, S&W prepared an inventory of nearly 150 landslide hazards consisting of new hazards mapped in the field and interpreted from project-specific LiDAR and aerial imagery, and hazards compiled from existing maps. The inventory development followed the Washington Geological Survey's Landslide Inventory Mapping Protocol and was aided by project data, historical subsurface information, and historical reports and records. We qualitatively assessed the risk of hazards for the project based on their age/recency, size and proximity to project elements.

We evaluated surface drainage and existing subsurface drainage systems for their potential impacts on slope stability and design. Variable drainage conditions were considered in our analyses of slope stability.

S&W also reviewed preliminary design plans and contract documents and participated in WSDOT's Cost Estimate Validation Process and construction risk analyses.

SEATTLE PUBLIC UTILITIES

Alki Subsurface Drainage Evaluation

Seattle, WA

The Alki Subsurface Drainage Evaluation project was initiated to address the persistent issue of landslides in the Alki area, located at the north end of West Seattle. This area has a long history of instability, with significant landslide events recorded in 1915, 1974/1975, and 1996/1997. The primary objective of our work was to evaluate the effectiveness of the drainage system installed by Seattle Public Utilities in 2000, which aimed to lower groundwater levels (GWLs) and mitigate landsliding. Our evaluation involved:

Data Collection and Instrumentation. We installed observation wells, slope inclinometers, and drain flow meters to measure GWLs, water volume collected by the drains, and slope movement. This instrumentation provided critical data for our analysis.

Historic Data Compilation. We gathered and reviewed historical data related to the site and the drainage systems from internal files and SPU records. This included previous studies and reports that provided valuable context for our evaluation.

Field Program Execution. During the 2015/2016 field program, we conducted extensive fieldwork, including the installation of new observation wells and slope inclinometers. This allowed us to monitor changes in GWLs and slope stability over time.

Geologic and Subsurface Conditions Analysis. We conducted a detailed analysis of the geologic setting and subsurface conditions at the project site. This included identifying and characterizing geologic units such as the pre-Vashon Olympia beds, Lawton Clay, Esperance Sand, and landslide deposits.

Drainage System Performance Evaluation. Our evaluation focused on assessing the performance of the drainage system compared to its original design. We analyzed the effect of drain cleaning on GWLs and drain flow rates to determine the system's effectiveness in mitigating landslides.

Slope Stability Analysis. We performed slope stability analyses to understand the relationship between GWLs and slope stability. This involved using data from our instrumentation to model potential slope failure scenarios and assess the risk of future landslides.

Precipitation and Groundwater Level Relationship Analysis. We analyzed the correlation between GWLs and cumulative rainfall sums to estimate GWL probabilities and the likelihood of slope

Past Performance

Managing Scope, Schedule & Budget

Our approach to project success centers on successful management of scope, schedule and budget. To accomplish this, we emphasize:

- Communication
- Responsiveness
- Collaboration
- Utilization of available expertise, experience, and resources

CLIENT CONTACT

Edith Hadler, HDR, Inc.
edith.hadler@hdrinc.com

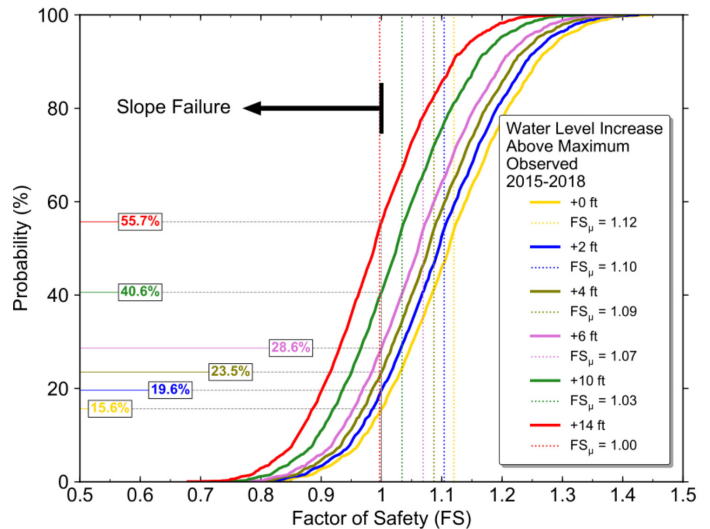
ORIGINAL BUDGET

\$105,000

ACTUAL COMPLETED COST

\$56,000

DELIVERY METHOD: On-Call Task Order



failure. This helped us understand how precipitation impacts slope stability in the Alki area.

Our evaluation revealed that the drainage system installed by SPU has been effective in lowering GWLs and reducing the risk of landslides in the Alki area. However, regular maintenance and monitoring are essential to ensure the continued effectiveness of the system. We provided several recommendations for long-term maintenance and monitoring, including periodic drain cleaning and ongoing GWL and slope movement measurements.

The Alki Subsurface Drainage Evaluation project provided valuable insights into the effectiveness of the drainage system in mitigating landslides. Our comprehensive approach, which included data collection, fieldwork, geologic analysis, and slope stability modeling, allowed us to make informed recommendations for the long-term management of the Alki landslide area. These findings will be instrumental in guiding future efforts to ensure the safety and stability of the region.

Shannon & Wilson has the capability, availability, and commitment to undertake and complete all of our projects within a specified period of performance and cost. We understand the implications of timeliness to project delivery and that the State has a commitment to its community to deliver projects within authorized budgets.

Managing Project Scope

Our proposed Project Manager, Chris, views the scoping process as a chance to collaborate, discuss technical and administrative needs and arrive at an efficient project plan that provides owners with answers and actionable recommendations. He believes these results can always be achieved with close communication and sharing of information, uncertainties and goals. As a recent example for a slope stability investigation, Chris completed scope, fee and schedule negotiations for a work order with Seattle Public Utilities that meets the City's budget and schedule constraints, yet will provide a level of investigation needed to advance the project with clear information and recommendations.

Addressing the Unexpected and Staying on Budget: On a recent King County bridge project, Principal-in-Charge Kathryn and team members developed an initial exploration program for an established budget. When conditions were different than expect during field explorations and deeper borings were required, Kathryn and team worked with the County to modify the exploration plan and exploration methods to achieve the project needs but stay within the established budget.

Project Management Tools and Methods

Shannon & Wilson's project management system was developed to assure the successful completion of our projects and to support our clients and the decisions they need to make. Active management of scope, schedule, and budget is performed throughout each project using. Following successful negotiation and notice to proceed, our Project Manager will identify critical path tasks, technical milestones and budget milestones needed to keep the project on track.

Chris will use management tools like BST Business Management Software (BST11), Microsoft Project, and in-house spreadsheets

to ensure to track progress. Additionally, our PMs are provided a detailed weekly summary of the hours spent and direct costs applied on each task or subtask through the end of the preceding week. The PM assesses the work remaining on the task order based on progress to date and reallocates resources required to complete each task. The advantages of this system are:

- **Early Identification of Resource Needs:** By planning the project needs early and regularly, resource demands are clear and can be anticipated.
- **Timeliness:** Data from the previous week are available at the start of each week, allowing real-time resource allocation.
- **Continuous Adjusting:** The PM focuses on schedule, budget, and scope each week, constantly monitoring and updating progress.
- **Emphasis on Tasks and Effort:** This system places emphasis on task completion and effort rather than costs, ensuring that the needs of the task and project receive priority over the status of the budget.
- **Prompt Problem Identification and Resolution:** Allows early identification—and early resolution—of potential problems.

Our team firmly believes that project management excellence is a function of quality communications with our clients and internally. We employ a variety of communication tools, typically centered on the Microsoft Office products like Teams and Outlook, to hold conference calls and regular check-in meetings. At the outset of a project, we identify client preferred communication methods and work to utilize the methods enable partnership and collaboration.

The above process allows Chris, our PM, to track the scope, confirm scope creep is not occurring, monitor the project schedule and maintain communication both internally and with clients. We have a demonstrated, tenured history of completing projects on-time and within budget for DES and numerous other public agencies. This includes the examples projects described in this SOQ.

Diverse Business Inclusion Strategies

Shannon & Wilson is committed to the meaningful inclusion of diverse businesses in our projects. Our team includes **Ott-Sakai & Associates**, a certified D/M/SBE with whom we have a long-standing history of successful project collaboration. This established partnership reflects our approach to building durable, trust-based relationships that deliver consistent quality and value to our clients.

Following award, Shannon & Wilson will continue to actively evaluate opportunities for additional diverse business inclusion throughout the life of the project. We routinely engage a broad range of diverse businesses to support our work, including firms that provide:

- Subsurface explorations (geotechnical drilling)
- Geophysical investigations
- Geotechnical laboratory testing
- Surveying services
- Drafting and CAD support
- Technical writing and document review

We have built strong, lasting relationships with our diverse business partners and value the opportunity to collaborate with them, mentor their staff, and support their professional growth. Through intentional engagement, mentorship, and equitable access to project opportunities, Shannon & Wilson remains committed to advancing diverse business inclusion while delivering high-quality, responsive, and innovative professional services.

ARCHITECT-ENGINEER QUALIFICATIONS


PART II - GENERAL QUALIFICATIONS *(If a firm has branch offices, complete for each specific branch office seeking work.)*

2a. FIRM (OR BRANCH OFFICE) NAME SHANNON & WILSON			1. SOLICITATION NUMBER <i>(If any)</i> 2026-190	
			3. YEAR EST'D 1954	4. UNIQUE ENTITY IDENTIFIER SAM #: KJZTRPLEXUN9 CAGE Code: 5A336
2b. STREET 400 North 34th Street, Suite 100			5. OWNERSHIP	
2c. CITY Seattle			2d. STATE WA	2e. ZIP 98103
6a. POINT OF CONTACT NAME AND TITLE Mike Harney Vice President and Seattle Office Manager			a. TYPE Employee-owned Corporation	
6b. TELEPHONE NUMBER 206-632-8020			6c. EMAIL ADDRESS mike.harney@shanwil.com	
8a. FORMER FIRM NAME(S) <i>(If any)</i>			b. SMALL BUSINESS STATUS Large	
			7. NAME OF FIRM <i>(If block 2a is a branch office)</i>	
			8b. YR. EST.	8c. UNIQUE ENTITY IDENTIFIER

9. EMPLOYEES BY DISCIPLINE				10. PROFILE OF FIRM'S EXPERIENCE AND ANNUAL AVERAGE REVENUE FOR LAST 5 YEARS		
a. Function Code	b. Discipline	c. No. of employees		a. Profile Code	b. Experience	c. Revenue Index Number (below)
		(1) FIRM	(2) BRANCH			
02	Administrative	52	27	A06	Airports; Terminals; Hangars	5
07	Biologist	10	7	A07	Arctic Facilities	1
08	CADD Technician	2	2	A12	Instrumentation	1
11	Chemist	3		B02	Bridges	7
12	Civil Engineer	7	4	C10	Low-rise Structures	3
14	Computer Programmer	10	10	D02	Earth Dams, Levees, Dikes	7
23	Environmental Engineer	10	7	E09	Environmental Studies	6
24	Environmental Scientist	27	8	E12	Environmental Remediation	6
27	Foundation/Geotechnical Engineer	145	43	H01	Harbors; Port Facilities	6
29	Geographic Information System Specialist	2	2	H02	Hazardous Waste Management	1
30	Geology	59	12	H07	Highways; Streets	7
32	Hydraulic Engineer	6	6	M06	Mining & Mineralogy	4
57	Structural Engineer	1		P02	Petroleum & Fuel	4
58	Technician/Analyst	32	8	P04	Pipelines	4
	Hydrogeology	7	7	P12	Power Generation, Transmission	6
	Seismic Engineer	7	6	R03	Railroad; Rapid Transit	8
	Underground Engineer	6	5	R11	Rivers, Canals; Waterways	5
				S04	Sewage Collection; Treatment	5
				S05	Soils & Geologic Studies	8
				S07	Solid Wastes; Incineration	4
				T02	Testing & Inspection Services	5
				T06	Tunnels; Subways; Underground	5
				W02	Water Resources, Hydrology	4
Total		386	154	W03	Water Supply, Treatment	6

11. ANNUAL AVERAGE PROFESSIONAL SERVICES REVENUES OF FIRM FOR LAST 3 YEARS		PROFESSIONAL SERVICES REVENUE INDEX NUMBER	
<i>(Insert revenue index number shown at right)</i>		1. Less Than \$100,000	6. \$2 million to less than \$5 million
a. Federal Work	8	2. \$100,000 to less than \$250,000	7. \$5 million to less than \$10 million
b. Non-Federal Work	10	3. \$250,000 to less than \$500,000	8. \$10 million to less than \$25 million
c. Total Work	10	4. \$500,000 to less than \$1 million	9. \$25 million to less than \$50 million
		5. \$1 million to less than \$2 million	10. \$50 million or greater

12. AUTHORIZED REPRESENTATIVE - The foregoing is a statement of facts.

a. SIGNATURE 	b. DATE 14 Apr 2026
c. NAME AND TITLE Mike Harney, Vice President and Seattle Office Manager	

