March 13, 2024

WASHINGTON STATE DEPARTMENT OF TRANSPORTATION

Packet A – Geotechnical Engineering & Project Delivery (Area 2)

Contents

HALEY ALDRICH

Haley & Aldrich, Inc. (Haley & Aldrich) has supported the Washington State Department of Transportation (WSDOT) since 2000, providing geotechnical engineering and seismic design and project delivery under several direct contracts. Our staff have become trusted advisors and geotechnical advocates for WSDOT staff through our work on some of the largest and most visible transportation projects in the State of Washington. For the Geotechnical Engineering and Project Delivery (Area 2) contract, we have partnered with two Washington State certified Disadvantaged Business Enterprise (DBE) subconsultants to augment our geotechnical expertise to provide additional depth and flexibility during high workloads, and to help WSDOT meet its 15% DBE utilization goal for this contract: **Ciani & Hatch Engineering** (DBE, Women-owned Business Enterprise [WBE]), and **HWA GeoSciences** (DBE, Minority Women-owned Business Enterprise [MWBE]).

Criterion 1 Qualifications/Expertise of Firms on Team

A. DESCRIBE THREE HIGHWAY PROJECTS IN THE STATE OF WASHINGTON WHERE THE CONSULTANT PROVIDED STAMPED RECOMMENDATIONS FOR 13 GEOTECHNICAL ANALYSES AND DESIGN CATEGORIES

The Haley & Aldrich team brings extensive geotechnical analysis and design experience working on WSDOT projects throughout the State for over 20 years. Table 1 below summarizes some of our recent experience for specific highway projects that Haley & Aldrich and our team members have worked on. The geotechnical analysis and design category descriptions 1 through 13 are abbreviated for presentation purposes but are intended to cover the more detailed category descriptions in the WSDOT Request for Qualifications (RFQ) Criteria Definitions. Detailed descriptions of each numbered project are presented on pages 3-10.

B. DESCRIBE THREE HIGHWAY PROJECTS IN THE STATE OF WASHINGTON WHERE THE CONSULTANT PROVIDED STAMPED RECOMMENDATIONS FOR THE FOLLOWING TYPES OF SEISMIC DESIGN

Our team has been known for our expertise in earthquake engineering for decades. We take pride in our ability to perform advanced seismic analyses, have close relationships with research universities and researchers in multiple countries, and take an active role in advancing the practice of earthquake engineering. Our specialized seismic staff include several senior engineers who are active in the standards communities, such as the ASCE 7 committees for tsunami hazards and seismic source characterization and the ASCE 61 committee, and they have supported implementation of basin effects in the City of Seattle. One of our senior engineering seismologist has direct experience in seismic hazard assessment and monitoring applications for industrial facilities and critical infrastructure, and several are Ph.D. level engineers with published expertise on liquefaction constitutive modeling, dynamic soil behavior, and laboratory testing. Table 1 below summarizes how our specialized seismic staff has applied this experience on specific highway projects that Haley & Aldrich have recently worked on. The seismic highway project experience of our team members is also listed. Detailed descriptions of each numbered project are also presented on pages 3-10.

Table 1. Summary of the Haley & Aldrich team project experience for 1A - Geotechnical Analyses and Design and 1B - Seismic Design

Project #	Project Name	Geotechnical Analyses and Design													Seismic Design					
		1	2	3	4	5	6	7	8	9	10	11	12	13	1	2	3	4	5	6
		Retaining walls	Highway bridges	Spread footings	Driven piles	Drilled shafts	Ground improvement	Slope stability	Landslides	Excavation and shoring	Fill and compaction	Settlement analysis	Laboratory test data	Field test data	Seismic disaggregation	Seismic effects slope stability	Seismic effects foundations	Liquefaction evaluation	Liquefaction effects slope stability	Liquefaction effects foundations
	Haley & Aldrich																			
1	SR 542 UNTs to Mitchell Creek Fish Passage (FP)	■		■			■				■		■					■		
2	I-90 Issaquah Creek Bridge Seismic Retrofit							■		■			■			■				
3	SR 9 Marsh Road to 2nd Street Widening	■	■	■	■	■	■	■		■	■	■	■	■	■	■	■	■	■	■
4	I-90/Cabin Creek Interchange (I/C) to W Easton I/C	■						■			■		■							
5	SR 544 UNT to Fourmile Creek FP	■		■				■			■	■	■	■				■		
6	I-90, SR900 Lewis, West Village Park, Schneider Creek FPs Design Build (DB)	■	■	■				■		■	■		■	■	■	■	■	■		
7	SR 539/Duffner Ditch FP	■		■				■			■							■	■	■
8	SR 169 Ravensdale FP/King County Bridges	■	■	■				■			■		■	■		■	■	■		
9	I-82/SR 14 Plymouth Weigh Station			■							■			■						
10	SR 542 Squalicum Creek FP	■	■	■				■	■			■	■	■		■	■	■		
11	I-90/SR 18 I/C to Deep Creek – I/C Improvements and Widening DB	■	■	■		■		■	■	■	■	■	■	■		■	■			
12	I-405/Renton to Bellevue Widening and Express Toll Lanes DB	■	■		■						■	■		■	■	■	■			
13	I-5 – Portland Ave to Port of Tacoma Road Southbound HOV DB	■	■		■	■	■	■			■	■	■	■	■	■	■	■	■	■
14	US 101/SR 116 North Olympic Peninsula – Remove Fish Barriers DB	■	■	■		■		■			■	■	■	■	■	■	■	■	■	■
15	I-5 Steilacoom-DuPont Road to Thorne Lane Corridor Improvements DB	■	■	■				■		■	■	■	■	■	■	■	■			
	Ciani & Hatch Engineering (CHE)																			
16	US 101 Coffee Creek FP - DB	■		■				■		■	■	■	■	■	■	■	■	■		
17	SR 520 Evergreen Point Floating Bridge DB	■	■	■	■			■		■	■		■	■		■	■	■		■
18	SR 167 Southbound HOT Lanes – DB	■	■	■		■		■		■	■	■	■	■	■	■	■	■	■	■
19	I-405/SR 167 I/C Direct Connector DB	■					■	■		■	■		■	■	■	■		■	■	
20	US-395, NSC Spokane River to Columbia – Shared Use Path DB	■		■				■			■		■	■	■	■	■	■		
	HWA GeoSciences (HWA)																			
21	24 Fish Culverts	■	■	■		■		■		■	■	■	■	■	■	■	■	■	■	■
22	SR 3/SR 16/SR 166 Gorst Vicinity – Remove Fish Barriers	■	■	■		■		■		■	■	■	■	■	■	■	■	■	■	■
23	SR 302 Victor Area Corridor Study	■				■	■	■	■	■	■	■	■	■	■	■	■	■	■	■

1 **SR 542 UNTs to Mitchell Creek FP, Deming, WA.** Haley & Aldrich evaluated several geotechnical design alternatives to mitigate liquefaction and accommodate post-seismic soil strength loss and liquefaction-induced settlements below the new split box buried structure and retaining wingwalls. Haley & Aldrich evaluated several geotechnical design alternatives to mitigate liquefaction and reduce impact of post-seismic soil strength loss and liquefaction-induced settlement below the new fish passage split box buried structure and wingwalls. We managed the subsurface exploration program, evaluated subsurface stratigraphy and soil strengths, estimated liquefaction-induced settlement, analyzed global stability of wingwalls, and developed recommendations for liquefaction mitigation and foundation systems. Our staff successfully designed a soil-cement ground improvement system to mitigate liquefaction below the buried structure and wingwalls, eliminating the need for more costly deep foundations or contractor-designed solutions with higher perceived construction risks. Haley & Aldrich recognized questionable original boring blow counts due to faulty standard penetration test (SPT) hammer and advocated for additional exploration to confirm. Based on the revised field data, the predicted liquefaction-induced settlement was significantly less, allowing for a reduction in the depth of ground improvement from 30 to 17 feet. We worked quickly to update geotechnical design calculations and provided final geotechnical deliverables within a very fast time frame to meet tight WSDOT project advertisement deadline. Principal-in-Charge/Engineer of Record (PIC/EOR) – Mike Schmitz; Project Manager (PM) – Jason Sved; Technical Contributor (TC) – Dan Trisler

2 **I-90 Issaquah Creek Bridge Seismic Retrofit, King County, WA.** Haley & Aldrich staff provided geotechnical recommendations for a seismic retrofit of I-90 Bridge 90/72N, located adjacent to East Fork Issaquah Creek near the bottom of a 300-foot-high steep slope with a historical landslide scarp at the top and several nearby mapped landslides. The proposed seismic retrofit (column steel jackets) required up to 15-foot-deep temporary excavations along the base of the historical landslide slope. We performed a geologic evaluation of mapped historical landslides (Washington Department of Natural Resources and Washington State Landslide Inventory) and historical borings to develop a realistic stratigraphic model of the bluff subsurface for stability analyses. This included an interpretation of likely historical landslide failure plane locations and disturbed/residual soil strength within the historical failure zone for slope stability modeling purposes. Haley & Aldrich performed a statistical slope stability evaluation to evaluate the potential impact on the planned temporary excavations along the steep slope base. Assuming a slot excavation approach, we analyzed the change in slope stability safety factor for varying amounts of base excavation (slot cut width as percentage of total excavation length). Results indicated a slope stability safety factor reduction ranging from 2 to 4% for partial to full excavation length. This allowed the WSDOT design team to assess both the limited overall risk of the planned temporary excavations and how temporary slot cutting could be used to further reduce risk. PIC – Jeff Wagner; EOR – Lorne Arnold; PM/TC – Rolf Hyllseth

3 **SR 9 Marsh Road to 2nd Street Widening, Snohomish County, WA.** Haley & Aldrich staff initially provided geotechnical value engineering (VE) during WSDOT's Cost Estimate Validation Process (CEVP) and then developed a cost-effective exploration program and geotechnical engineering design for two multi-span bridges up to 1,000 feet long across a BNSF railroad and the Snohomish River. Specific design features included up 10-foot diameter drilled shafts more than 200 feet deep and large-diameter driven steel pipe piles to support bridge loads. The project included advanced laboratory testing including constant rate of strain consolidation testing, direct simple shear testing, and cyclic

direct simple shear testing of soft alluvial soil and deep soft lacustrine deposits. Seismic design included a site-specific seismic response analysis with adjustments for two-dimensional basin effects, and an evaluation of potential lateral spreading loads on the drilled shafts along the Snohomish River. A portion of the embankment widening required the use of aggregate stone columns to protect one of the bridge abutments from flow failure loads. Significant road widening embankment fill required careful evaluation of total and differential settlement over the soft and liquefiable flood plain alluvial deposits. Both short-term and long-term embankment fill stability were analyzed, resulting in specifying staged embankment construction to protect the temporary stability of the embankment during construction. Steepened slopes were used to avoid impacting wetlands, resulting in a tiered reinforced slope system. PIC/EOR – Brice Exley; PM – Rolf Hyllseth; TC – Zach Yell

4 **I-90/Cabin Creek I/C to W Easton I/C Phase 3, Kittitas County, WA.** Haley & Aldrich was asked by the State Geotechnical Office (SGO) staff to provide advanced numerical modeling (Plaxis computer analysis) and geotechnical expertise for an up to 50-foot-tall hybrid mechanically stabilized earth (MSE)/tieback soldier pile retaining wall supporting new I-90 eastbound (EB) lanes on the milepost (MP) 55.0-70.1 Snoqualmie Pass East construction project. The tieback soldier pile wall was designed to support an upper MSE wall. The size and complexity of the combined wall structural system required a need for additional modeling to evaluate wall loads and predicted movements, to validate the design tools being used by SGO. Haley & Aldrich performed multiple iterations of a 2-dimensional (2D) Plaxis model to study the performance of traditional geosynthetic and welded wire reinforced MSE structures. Modeling included calibration of constitutive models using historical information, validation of the wall performance based on past case histories and looking at differences in results for varying backfill assumptions. Our staff extracted tieback loads, lateral earth pressure estimates, MSE reinforcement loads, and deformations at multiple locations to allow SGO staff to compare/validate their analysis methods, resulting in higher assurance that the complex hybrid wall system would work. Our modeling included a creative implementation of reinforcement elements to overcome shortcomings of the geosynthetic elements built into PLAXIS, resulting in a new element released to the public by PLAXIS. We helped assess risks of construction staging based on predicted wall performance to increase construction efficiency. PIC – Brice Exley; EOR – Todd Mooney (SGO); PM – Jeff Brice; TC – Brice Exley/Tony Allen (SGO)

5 **SR 544 UNT to Fourmile Creek FP, Lynden, WA.** Haley & Aldrich provided geotechnical recommendations for a 40-foot-long box culvert and associated wing walls. Due to significant SGO drill rig availability backlog during the 2020 pandemic, we relied on preliminary boring information coupled with experienced geologic understanding of consistent subsurface soil stratigraphy and hand borings to confirm peat depth instead of additional drilling for final design, allowing geotechnical design to proceed uninterrupted to maintain the WSDOT construction schedule. The foundation design was complicated by presence of a settlement-sensitive peat deposit below the planned structures. To avoid long-term settlement and the high cost of ground improvement, Haley & Aldrich designed culvert wing walls to be backfilled with Low Density Cellular Concrete (LDCC). Based on consolidation test results, field vane shear testing, and advanced knowledge of peat soil behavior, a 3-dimensional settlement analysis was performed to assess potential long-term settlement, accounting for historical settlement and aging below the existing embankment. Steel reinforcement within the LDCC backfill helped provide overall global stability and allowed for the use of shotcrete fascia in lieu of

conventional cast-in-place concrete wing walls, which would be unstable over the deep peat subgrade. PIC – Jeff Wagner; PM/EOR – Rolf Hyllseth; TC – Luke Kevan/Brice Exley/Michael Liu

6 **I-90, SR 900 Lewis, West Village Park, Schneider Creek FPs, King County, WA.** Haley & Aldrich developed contract documents for this design build FP bundle involving multiple new box culverts and bridge structures along Lewis and West Village Park/Schneider Creeks below I-90 and SR 900. Work was done in close coordination with SGO staff and the Project Engineering Office (PEO). Our staff wrote the Request for Proposals (RFP) Section 2.6 technical requirements and compiled multiple geotechnical baseline and data reports, several geotechnical reference documents, geotechnical interpretive reports, and probabilistic seismic hazard analysis (PSHA) memoranda. To meet WSDOT Critical Corridor requirements, we performed seismic hazard analyses and provided response spectra contract documents for each FP site along I-90. The conceptual project design included re-routing West Village Park Creek 1,300 feet along I-90 to combine with Schneider Creek, requiring a permanent tieback soldier pile retaining wall system. A portion of this wall will be constructed within glaciolacustrine, slickensided clays, requiring use of reduced design shear strengths. Based on an evaluation of advanced soil laboratory testing and a field electrical resistivity array, Haley & Aldrich developed reduced strength parameters and a conceptual tieback soldier pile wall design for project feasibility/planning purposes, which was included in the RFP as a geotechnical interpretive memo. PIC – Mike Schmitz; PM/EOR – Luke Kevan/Michael Chamberlain; TC – Brice Exley/Michael Chamberlain

7 **SR 539/Duffner Ditch FP, Lynden, WA.** Haley & Aldrich staff provided geotechnical recommendations for a 100-foot-long box culvert and associated wing walls. The foundation design was complicated by the presence of potentially liquefiable alluvial soil below the planned structures, resulting in post-liquefaction global instability of the wing walls. Based on global slope stability analysis, Haley & Aldrich used a multi-faceted design approach to provide separate engineering solutions for different wall locations, heights, and orientations. Relatively short walls less than 10 feet tall were aligned to not impact the traveled roadway in case of total seismic collapse. For a longer, taller wall that could not be reoriented, Haley & Aldrich recommended a geosynthetic reinforced structural earth wall with elongated basal reinforcement prevent global instability in the liquefied design case. This design was optimized by incorporating residual liquefied soil shear strength in the analysis and allowing the wall to settle with the culvert and roadway while mitigating risk of punching failure that could potentially impact traveled way. This avoided the need for a more costly ground improvement alternative. PIC – Jeff Wagner; PM/EOR – Rolf Hyllseth; TC – Luke Kevan/Michael Liu

8 **SR 169 Ravensdale FP/King County Bridges, King County, WA.** This project replaced a fish barrier culvert with a 121-foot-long, single-span highway bridge where SR 169 crosses Ravensdale Creek. Design and construction included two cantilever concrete curtain walls, two cantilever concrete wingwalls, and two structural earth walls up to 142 feet long, requiring evaluation of excavation and shoring, embankment and wall fill placement and compaction, cofferdam construction, and dewatering. We reduced the overall amount of earthwork, project timeline, and structural costs by recommending structural earth walls instead of conventional cast-in-place concrete walls. The project also included construction of a 110-foot long, 20-foot-high, single-span pedestrian bridge for King County along a fish barrier railroad embankment. Instead of typical concrete foundation wall abutments, Haley & Aldrich designed less costly MSE wall supported bridge shallow foundations, requiring less construction time. The reinforcement of the planned MSE wall was truncated to reduce amount of

required earthwork and project costs. Haley & Aldrich advocated for allowing the truncated MSE wall design on the dense glacial bearing soil, based on bearing/global slope stability analysis (previously only allowed on bedrock). The project required skillful project management and consistent communication to balance the interests of both WSDOT and King County as primary stakeholders. We managed both bridge projects under one task, providing design efficiency and additional cost savings. PIC – Dan Trisler; PM/EOR – Luke Kevan; TC – Tony Allen (SGO)

9 **I-82/SR 14 Plymouth Weigh Station, Benton County, WA.** Haley & Aldrich staff provided geotechnical engineering for a new weigh station facility, involving construction of new scale house building and stormwater infiltration ponds. We provided geotechnical parameters for shallow foundation design, based on the international building code (IBC). We planned the subsurface exploration program and worked with SGO/PEO to better understand performance expectations and to provide efficient recommendations. This included field pilot infiltration testing (PIT), designed and completed by Haley & Aldrich staff, with the support of a WSDOT excavation crew. We engaged a Haley & Aldrich hydrogeologist to properly assess soil hydraulic conductivity and help the PEO understand the results of the PITs, including the risks associated with selecting appropriate soil infiltration value for final stormwater pond design. PIC/EOR – Mike Schmitz; PM – Jeff Bruce; TC – Roy Jensen (hydrogeologist)

10 **SR 542 Squalicum Creek FP, Whatcom County, WA.** This project replaced a fish barrier culvert with a roughly 55-foot-high, 105-foot-long, single-span highway bridge where SR 542 crosses Ravensdale Creek. SGO assigned this design task to Haley & Aldrich after the subsurface exploration was completed and feasible structure types were being evaluated. We collaborated with the previous SGO project manager (Todd Mooney) and PEO to develop the best solution with respect to geotechnical, structural, scheduling, and cost considerations for this challenging hybrid MSE/LDCC abutment wall system. We performed direct simple shear (DSS), cyclic direct simple shear (CDSS), constant rate of strain consolidation (CRS), and consolidated undrained (CU) triaxial laboratory tests to assess soil strength and consolidation properties for soft, settlement-sensitive Bellingham Drift Clay. LDCC with shotcrete facing was chosen for final design to limit post-construction settlement and to reduce construction schedule. We collaborated with SGO staff to assign appropriate LDCC design parameters for global, internal, and compound stability analyses, based on current LDCC research. A permanent sheet pile cofferdam provided temporary construction excavation support, long-term scour protection, and enhanced global wall stability. Haley & Aldrich worked with SGO to develop a field instrumentation program to monitor LDCC behavior during construction and provide valuable data for future research and design. Haley & Aldrich licensed geologist staff also evaluated stability and potential risk of future reactivation of a mapped landslide near project area. Based on field reconnaissance, soil strength interpretation, slope stability analysis, and debris flow path evaluation, the risk of future landslide activity affecting the new structure was assessed to be low. Slope inclinometers were installed and monitored to provide early warning of potential slide creep movement during construction excavations. During construction, we proactively worked with SGO and the contractor to help foster a strong teaming environment that led to successful delivery of the project. PIC/EOR – Mike Schmitz; PM/EOR – Jeff Bruce; TC – Brice Exley/Todd Mooney (SGO)/Tony Allen (SGO)/Rolf Hyllseth

11 **I-90/SR 18 I/C to Deep Creek – I/C Improvements and Widening, King County, WA.** The project will construct a four-lane diverging diamond interchange at the I-90 and SR 18 interchange in combination with the widening of SR 18 to four lanes. The project aims to

improve traffic operations and safety and reduce congestion at the I-90 and SR 18 interchange and along the SR 18 mainline. It includes two bridges with deep foundations, an MSE wall supported abutment type bridge, the creation of fish-passable structures, and dewatering. Haley & Aldrich is supporting Stantec by providing geotechnical engineering services for the project. These include advanced analyses, such as a finite element analysis of unique hybrid retaining walls below the existing I-90 bridges, as well as traditional analysis such as deep foundation design recommendations. The seismic hazard and disaggregation was closely evaluated, with direct communication with the U.S. Geological Survey (USGS) to understand the cause of differences between different seismic source models. PIC/EOR – Mike Schmitz; PM/EOR – Barbara Thunder; TC – Brice Exley/Jenna Jacoby/Zach Yell/Michael Chamberlain

12 **I-405/Renton to Bellevue Widening and Express Toll Lanes, King County, WA.** Haley & Aldrich's role on the project was focused on the northern extent of the project, including a geosynthetic supported single-span bridge, a new bridge that will be installed on MSE walls supported footings including one with LDCC as backfill to reduce potential loads on an adjacent structure, a narrow infill bridge between the existing north and south overpass bridges over SE 8th, and the new Main Street Bridge. Our original scope also included MSE walls, soil nail walls, a small semi-gravity wall, soldier pile walls, and a unique tiered wall consisting of a partially backfill soldier pile wall supporting an MSE wall. Several of these walls required evaluation of the seismic effects on overall slope stability of the wall, with deformation analyses being used for one of the MSE walls due to site constraints and existing conditions. Site-specific shear modulus values were provided to the structural design teams to evaluate the seismic effects on the bridge foundations. We were also asked to increase our scope to provide additional staffing support at the 112th St intersection. At this intersection, we relied heavily on cone penetration tests (CPTs) to support the analysis of settlement and advanced neutral plane analyses of driven piles for two new single-span bridges. Walls at this location included MSE walls, soldier pile walls, and soil nail walls. One of the pile-supported bridges required particularly close coordination with two separate structural design teams to evaluate the seismic impacts of the interaction between the bridge piles and soldier pile and tieback wall beneath the bridge. Haley & Aldrich's scope was also increased to provide PSHA and disaggregation for the project. Surface wave measurements were collected to refine the site class at one of the bridges. PIC/EOR – Brice Exley and Mike Schmitz; PM – Barbara Thunder; TC – Jenna Jacoby/ Alessandra Connors/Michael Chamberlain

13 **I-5 – Portland Avenue to Port of Tacoma Road Southbound HOV, Pierce County, WA.** Haley & Aldrich provided geotechnical engineering services for this design build project covering multiple bridges and a variety of wall types and fills including the use of a geofoam wall. Much of the project was located over liquefiable and soft material, necessitating evaluating the impacts of potential long-term settlement, seismic-induced settlement, and seismic-induced strength loss, particularly at the new Southbound Bridge over the Puyallup River. During construction of the recently built Northbound Bridge, WSDOT installed stone columns near the river that were also installed at the anticipated location of the Southbound Bridge. However, new evaluation methods suggested the ground improvement may perform differently than originally designed for, resulting in the need to evaluate the impacts of liquefaction strength loss on the stability of the walls and loads on the drilled shafts. We also performed peer reviewed site-specific hazard, disaggregation, and ground motion response analyses that received positive feedback from WSDOT. PIC/EOR – Barry Chen and Mike Schmitz; PM/EOR – Jenna Jacoby; TC – Brice Exley

14 **US 101/SR 116 North Olympic Peninsula – Remove Fish Barriers, Clallam and Jefferson County, WA.** Haley & Aldrich is proving geotechnical engineering for this project which includes four stream crossings. The first crossing that has been released for construction is a 40-foot-long box culvert with a clear span of approximately 70 feet that will be constructed over soft soils. We specified seismic CPTs to supplement the existing borings to meet a tight design schedule while collecting additional subsurface information. Our EOR leveraged a deep knowledge of CPT to better refine design parameters, and even used them to identify inaccuracies in prior laboratory testing, which was confirmed with additional laboratory testing. The additional tests confirmed the CPT interpretation, fundamentally changing the design approach for that soil layer, identifying that it is not liquefiable. However, this resulted in needing to consider long-term settlement and the undrained shear strength of the layer. Our design mitigated liquefaction impacts on overall stability of abutment walls and the bearing capacity of the culvert by specifying that the liquefiable soil is excavated and removed. Site-specific racking analyses accounting for the anticipated shear modulus reduction curves of the backfill material were provided for the culvert design. On this same project we specified multichannel analysis of surface waves (MASW), horizontal to vertical spectral ratio (HVSR), and 2-dimensional resistivity geophysical tests to help supplement the borings and CPTs to reduce the potential for unanticipated changes in the subsurface conditions between exploration locations and where access with a drill rig was not feasible. The other sites in the bundle include bridges, drilled shafts, and retaining walls. PIC/EOR – Brice Exley; PM – Barbara Thunder

15 **I-5 Steilacoom-DuPont Road to Thorne Lane Corridor Improvements DB, Pierce County, WA.** To relieve chronic traffic congestion and improve mobility along I-5 near Joint Base Lewis-McChord, WSDOT rebuilt the interchanges and added lanes to I-5. The project widened I-5 to accommodate four through-lanes in each direction and construct new northbound I-5 auxiliary lanes. The Berkeley Street and Thorne Lane interchanges were reconstructed, which included grade separation over the Sound Transit railroad. Other major work included utility relocation, earthwork grading, highway bridge construction and demolition, spread footings, settlement analysis, retaining walls, slope stability, excavation and shoring, stormwater management facilities, paving, noise walls, and overhead and sign structures. PIC/EOR – Mike Schmitz; PM/EOR – Mike Schmitz; TC – Jenna Jacoby

16 **US 101, Coffee Creek Remove Fish Barrier DB, Shelton, WA.** The RFQ design concept was to replace the existing deep culverts with a nearby deep structure that would impact wetlands, cause large construction-related traffic delays, and leave in place approximately 0.5 mile of degraded fish habitat between the US 101 crossing and Coffee Creek's confluence with Goldsborough Creek. The design build team developed an innovative alternative technical concept (ATC) to re-route the Coffee Creek channel to a new confluence with Goldsborough Creek, restoring the degraded fish habitat and saving WSDOT approximately $3 million. Whitney managed geotechnical design for the team and acted as the geotechnical special inspector for the project. Geotechnical-related portions of the project include recommendations for culvert bearing resistance, wing wall design, temporary and permanent cut slopes, static and seismic slope stability, new embankments reusing on-site material, consolidation settlement analysis and monitoring, drainage and infiltration facilities, luminaires, and temporary erosion control. PM – Whitney Ciani

17 **SR 520 Evergreen Point Floating Bridge DB, Medina, WA.** Considered a "mega" design build transportation project, the project included design and construction of the world's longest floating bridge and approach structure on the east side of Lake Washington. Whitney provided geotechnical design and managed construction of the east approach bridge structure and landward components of the project. The geotechnical team redesigned the preliminary foundation concept for the approach structure, switching from drilled shafts to three approximately 40-foot by 160-foot shallow spread footings, two constructed within sheet pile cofferdams below the static groundwater table. The steep glacial bluff and limited site footprint required implementation of 17 temporary and permanent retaining walls, including soil nail walls, soldier pile and tieback walls, structural earth walls and cast-in-place retaining walls, to construct the maintenance facility, access road, and the Pier 2 and 3 bridge foundations into the existing bluff. Temporary and permanent dewatering were necessary to stabilize the hillside during construction of the shoring walls, maintenance facility, and access road. Geotechnical analysis included static slope stability, seismic slope stability considering wave scatter effects, anchored shoring wall design, MSE wall design, driven pile design to support a new dock structure, and shallow foundation design using load and resistance factor design (LRFD) and allowable strength design (ASD) methodology. PM/TC – Whitney Ciani

18 **SR 167 Southbound HOT Lanes DB, Auburn, WA.** The project included design and construction to widen an 8-mile stretch of SR 167 over highly variable soil conditions. The project included 125 geotechnical explorations and geotechnical recommendations for drilled shaft foundations to support a new two-span bridge at the SR 167/SR 18 interchange, static and seismic slope stability and foundation design for approximately 1.2 miles of noise wall considering liquefaction; static and seismic slope stability and settlement analysis for new embankment construction over settlement-sensitive soils (peat and organic silt); shoring, foundation support, and retaining wall design for a fish passage structure; pole foundation design for signs, signals and luminaires; and design of three stormwater detention ponds. Whitney provided geotechnical design support, project management, and acted as geotechnical special inspector during construction. She prepared the final geotechnical documentation package and substantial completion of the project. PM/EOR – Whitney Ciani

19 **I-405/SR 167 I/C Direct Connector DB, Renton, WA.** CHE engineers provided geotechnical engineering support during procurement and final geotechnical design for this $116-million design build contract. The project included redesigning an existing bridge interchange, design of a new 13-span flyover structure, a culvert crossing below a four-lane state highway, and realignment or widening of approximately 4 miles of roadway. Whitney led design and comment resolution for the geotechnical drainage design elements, which included the fish passage crossing at approximately MP 25.9 on SR167. The culvert is approximately 250 feet in length and passes below four lanes of traffic. The project site has challenging soil conditions, including compressible and liquefiable soil. Temporary slope cuts for the culvert crossing required the use of rigid inclusion ground improvement to meet global stability requirements. Construction of the culvert crossing required staged MSE and soldier pile walls to maintain traffic during construction. TC – Whitney Ciani

20 **US 395, NSC Spokane River to Columbia – Shared Use Path DB, Spokane, WA.** CHE engineers provided senior technical review and served as interim project manager for geotechnical design of three pedestrian bridges and 2.6 miles of Children of the Sun (COTS) multimodal pathway in Spokane, WA. The project included two single-span and one two-span pedestrian bridge and approach embankments comprised of tall (> 25-foot) back-to-back MSE walls and back-to-back cast-in-place (CIP) retaining walls. Geotechnical analysis included shallow foundation capacity analysis, global stability analysis of approach embankments (incorporating groundwater modeling to assess impact of stormwater dispersion at the top of embankment slopes), global stability analysis to assess compound stability of MSE and CIP walls, internal stability evaluation of MSE walls, lateral earth pressures, and hydraulic conductivity/infiltration. PIC/EOR/TC – Whitney Ciani

21 **24 Fish Culverts, Olympic Region, WA.** HWA is serving as the project manager and is currently providing geotechnical engineering services for the construction of eight culverts in support of the OR-24FP project that will deliver a total of 24 fish passage barrier removals. These fish barriers will be replaced with a combination of bridges and four-sided box structures. Engineering services included evaluating liquefaction potential, anticipated long-term and liquefaction settlement, and slope stability, design recommendations for retaining structures, drilled shaft foundations, temporary shoring, stormwater facilities, and pavement design. Additionally, engineering services for seismic deaggregation, slope, and foundation stability are being provided to assist with the successful completion of this project. PIC/EOR/PM/TC – Sandy Brodahl

22 **SR 3/SR 16/SR 166 Gorst Vicinity – Remove Fish Barriers, Gorst Vicinity, WA.** The SR 3/SR 16/SR 166, Gorst Vicinity Remove Fish Barriers project will be delivered as a DB project and includes five locations within the Gorst vicinity. To prepare DB RFQ and RFP documents and assist WSDOT in support of the DB procurement process, HWA coordinated a geotechnical site investigation and related geotechnical evaluations for the barrier removals included in this project/bundle. The types of structures to be advanced to a preliminary design as part of this project include three single-span bridges, one three-span bridge, and one prestressed slab girder bridge. As part of the exploration program, 15 geotechnical borings were drilled within WSDOT right of way and required extensive coordination with WSDOT to ensure their safe completion. Analysis and recommendations for this project included American Association of State Highway and Transportation Officials (AASHTO) seismic design parameters, settlement evaluation, liquefaction analysis, global stability evaluations, drilled shaft foundations, retaining walls, slope stability, and preliminary infiltration rates for stormwater facilities. PIC/EOR/PM/TC – Sandy Brodahl

23 **SR 302 Victor Area Corridor Planning Study, Victor, WA.** For decades, landslides and roadway collapses near Victor have resulted in partial or full closures of SR 302, causing significant impacts to communities spanning both Mason and Pierce County. The goal for this project was to evaluate potential mitigation options for slides along the coastal roadway that could also support improvements to safety, multimodal mobility, and resiliency within the communities. The project required HWA to perform an extensive historical data review of decades worth of reports for the area and to implement a field exploration program to monitor. Geotechnical engineering services included retaining wall design, drilled shaft foundations, ground improvement, slope stability, excavation and shoring, fill placement and compaction, laboratory testing and

geophysical data. Additionally, seismic deaggregation and effects on slope and foundation stability were key factors in the successful completion of this project. PIC/EOR/PM/TC – Sandy Brodahl

Criterion 2 Qualifications of the Proposed Senior Level Geotechnical Engineer

A. QUALIFICATIONS AND EXPERTISE OF THE CONSULTANT'S SENIOR LEVEL GEOTECHNICAL ENGINEER

Haley & Aldrich has selected Rolf Hyllseth, P.E., L.G., to be our contract manager and Senior Level Geotechnical Engineer (SLGE) for this contract. Rolf has over 34 years of experience working as a consulting geotechnical engineer on a wide range of commercial developments and public infrastructure projects, including WSDOT transportation projects. Over the years, Rolf has worked closely with various private and public clients and design teams to develop practical, innovative, and cost-effective geotechnical solutions.

Rolf Hyllseth, P.E., L.G.
Haley & Aldrich

WA: Professional Civil Engineer (Reg. No. 31760)

WA: Licensed Geologist (Reg. No. 1615)

34 years of experience

Over his 34-year career, Rolf has worked on a multitude of public transportation projects involving fish passage replacement box culverts, roadways and bridges, buried structures, and shoring walls. His design and construction geotechnical expertise includes shallow and deep foundations (including drilled shafts and driven piles), soil nail and tieback soldier pile retaining walls, steep slope and landslide analysis and stabilization, levees and fill embankments stability, liquefaction analysis and seismic design, excavation shoring and dewatering, pavement design, surface erosion, and surface/subsurface drainage. His project management experience includes geotechnical exploration and engineering review, cost-benefit analyses, constructability evaluations, review of construction plans and specifications, permitting support, and geotechnical construction quality control.

For the last four years, Rolf has served as contract manager and a team leader for Haley & Aldrich under our current Geotechnical Engineering Personnel Augmentation Contract (Agreement Number Y-12335) with SGO. In this role, he has been responsible for overall management and deliverable quality control (QC) for over 60 Haley & Aldrich assigned design projects and geotechnical support tasks. He has worked closely with Haley & Aldrich task and project managers, senior SGO management, regional WSDOT (PEO) engineers, and WSDOT design team consultants to help deliver dozens of successful geotechnical design projects to almost all WSDOT regions. He has also been geotechnical EOR and directly managed SGO project delivery of several highway improvement and fish passage projects, such as ***SR 9 Marsh Rd to 2nd Street Multi-Bridge Improvements*** and ***SR 544/546 Fourmile Creek/SR 539 Duffner Ditch Fish Passages***. With this recent experience working as an extended member of SGO, Rolf has intimate knowledge of the WSDOT Geotechnical Project Delivery system and processes and is uniquely suited and qualified to serve as SLGE for this contract.

Professional Licensures and Years of Experience Managing Geotechnical Projects

As shown in the graphic above, Rolf is licensed in the State of Washington and has over 34 years of experience working as a consulting geotechnical engineer with decades spent managing geotechnical projects.

B. INFORMATION THAT DEMONSTRATES FAMILIARITY WITH STATE DESIGN AND CONSTRUCTION STANDARDS

Rolf has over 30 years of direct experience designing for private clients and public agencies using both state and federal design and construction standards, including the WSDOT Standard Specifications for Road, Bridge, and Municipal Construction (WSS), WSDOT Standard Plans, WSDOT Geotechnical Design Manual (GDM), WSDOT Bridge Design Manual (BDM), AASHTO LRFD Bridge Design Specifications (AASHTO LRFD); and various Federal Highway Administration (FHWA) Design Manuals and Geotechnical Engineering Circulars.

Because all State transportation projects require familiarity with both the WSDOT GDM and AASHTO LRFD, we are presenting Rolf's combined experience with these geotechnical design standards in this section.

Over the years, Rolf has used and referenced various versions of the GDM and AASHTO LRFD manuals on both commercial and public infrastructure projects, including complicated WSDOT highway and bridge design projects. This started with the ***Port of Seattle Terminal 18 Redevelopment*** project, where he was the QC manager for the design build team on a two-year infrastructure project, working with the geotechnical design engineer to ensure appropriate construction QC procedures for several bridge overpass structures. In 2007, he attended a week-long ***FHWA Workshop on AASHTO LRFD Design*** presented by Joe DeMaggio. In 2008, Rolf provided senior engineering review and geotechnical design using AASHTO LRFD and GDM procedures for the City of Tukwila ***Tumwater Boulevard & I-5 Interchange Improvements*** project, involving a bridge widening with several significant MSE and CIP retaining walls, bridge pier foundation design over liquefiable soil (residual shear strength design), and liquefaction mitigation using ground improvement (compaction grouting).

Rolf led the Haley & Aldrich slope stability analysis team for 40-foot-wide submarine gravity anchor and 10-foot-diameter drilled shaft bridge foundations on the ***SR 520 Floating Bridge and Landings Replacement*** project. This involved lateral foundation soil loads and sliding resistance analysis and evaluation of low-strength submarine soil parameters under 40 feet of water and significant artesian water pressures. Rolf evaluated drilled shaft shear pile resistance contributing to overall slope stability and seismic loading on drilled shafts from potential post-liquefaction soil/slope flow failures at both ends of the bridge. This all required an intimate understanding of both AASHTO bridge design procedures (LRFD) and the GDM. He worked with the design build team to identify risk-based design solutions, including identification of the seismic lateral loads on the shafts from potential slope failure, which was used to optimize the drilled shaft design.

On the ***I-5 M Street to Portland Avenue – HOV (CRIP)*** project, Rolf was lead soil nail wall designer, evaluating the influence of existing upper walls and foundation surcharge and reduced pseudo-static loading on the new 70-feet high permanent soil nail wall system, referencing both the GDM and AASHTO seismic design standards. The cost-saving design took advantage of incorporating support from a partially buried, existing upper soil nail wall into the new wall design, allowing elimination of about 1,000 feet of cast-in-pace retaining walls.

As the geotechnical EOR for the ***King County Foothills Trail Phase 2 (White River Crossing to 252nd Ave SE)*** project, Rolf worked with a multidisciplinary design team for a 2-mile-long trail project involving foundation design for a 240-foot bridge span over the White River. In addition to bridge foundations, he designed MSE Ultrablock retaining walls, soil nail walls, and a micropile shear reinforcement system for a 30-foot vertical creek erosion bluff. Rolf worked closely with the structural engineer to develop an AASHTO micropile LRFD shear pile design that was consistent with the ASD slope stability analysis approach.

Over the past four years Rolf has gained an even deeper understanding of both the GDM and the AASHTO LRFD through his full-time work as lead Senior Level Geotechnical Personnel (SLGP) for Haley & Aldrich under our current SGO Staff Augmentation Consultant Contract. He has also been referencing GDM and AASHTO LRFD as part of his design work as EOR on several contract tasks. This has included review and discussion of GDM and AASHTO LRFD design requirements with the State Geotechnical Engineer and other SGO geotechnical staff, as part of Haley & Aldrich assigned projects such as ***SR 9 Marsh Rd to 2nd St Multi-Bridge Improvements*.**

Finally, Rolf has over the past year been deeply involved with the development of the ***next edition of the GDM.*** As manager of the Haley & Aldrich team assigned by SGO to update/rewrite several of the new GDM chapters, he has reviewed, edited, and helped write many of the new chapters. This has involved extensive discussions with Haley & Aldrich chapter authors, the State Geotechnical Engineer, SGO staff, and other geotechnical consultants, including how much design direction/guidance and construction risk management is appropriate for the GDM.

C. INFORMATION THAT DEMONSTRATES FAMILIARITY WITH PROJECT MANAGEMENT

Rolf has over 30 years of direct experience with project management at all stages of the project delivery process, including scope development, budgeting, scheduling, engineering design, and final document deliverable production. He understands the importance of clear and frequent team/client communications and work prioritization to meet project schedule and budget goals, especially when these are controlled by outside factors beyond the engineering design. Examples of this include client-driven priorities or permitting restrictions, such as in-water fish window construction limitations.

As Haley & Aldrich Augmentation Contract SLGP Team Lead for our team of three principal engineers, four geotechnical task managers, and many other Haley & Aldrich professional staff, Rolf has been responsible for managing consultant contractual matters and overall WSDOT project delivery aspects on all Haley & Aldrich assigned tasks. He has also directly managed several project tasks, such as the ***SR 9 Marsh Rd to 2nd St Multi-Bridge Improvements*** project. As a result, he has intimate knowledge of all WSDOT project management procedures, including project scoping (scope of work and cost estimate [SOWCE]) and project budget/schedule tracking for SGO and the WSDOT regional Project Engineering Offices (PEOs), to name a few. As such, he knows what is required to be an effective project manager within the WSDOT work environment.

Rolf has also served as design build QC manager for the ***Port of Seattle Terminal 18 Redevelopment*)**, a two-year project that included significant repaving, utility upgrades, and construction of new flyover bridge for the largest container facility in the Pacific Northwest (almost 200 acres). He also served as owner's representative and QC manager for ***General Metals of Tacoma Site Improvements***, a five-year construction project involving installation of a low-permeable asphalt capping layer over a continuously operating, 22-acre ferrous scrap metal recycling facility. As a result of serving in these various roles, Rolf has a unique perspective of seeing the value of good project management and communication skills from the viewpoint of all stakeholders in the building design and construction process. This varied

experience has given Rolf the ability to effectively manage and prioritize his project work considering the interests of all design team members and project stakeholders.

1. Experience managing multiple projects with overlapping schedules

Throughout his long career as consulting engineer, Rolf has continuously managed multiple projects and deadline-driven tasks at any given time. This has given him a keen understanding of the importance of task prioritization and proactive engagement with various internal and external project design team members and clients to meet deliverable deadlines and achieve design/project goals.

Over the past four years, Rolf has continuously tracked and coordinated scoping, design, and general project delivery for several dozen contract tasks/projects assigned to Haley & Aldrich, all with overlapping exploration planning and design schedules. With detailed planning, proactive communication, and careful coordination with internal design staff, SGO staff, and WSDOT design teams, Rolf has been able to ensure that Haley & Aldrich has successfully delivered each of their assigned geotechnical design tasks within the time frame required for each PEO to include in the WSDOT project advertisement package.

Rolf was SGO Staff Augmentation SLGP and Haley & Aldrich project manager for the ***SR 9 Marsh Rd to 2nd St Multi-Bridge Improvements*** geotechnical design project under our current SGO consultant contract. As such, he was responsible for tracking and coordinating all aspects of the SGO geotechnical project delivery to the regional PEO. His project management included overseeing scope development and budget tracking; field exploration; engineering design; plans, specifications, and cost estimates (PS&E); document review; PEO design team coordination; WSDOT value engineering; and timely delivery of all required geotechnical engineering documentation. This was a complicated, multi-bridge highway project that required careful planning and coordination of many different, time-sensitive, and overlapping exploration/design tasks. Prioritizing and providing timely, reliable, preliminary geotechnical design information to a multidisciplinary design team was key to keep the overall project on schedule.

2. Experience prioritizing limited resources to optimize project delivery

After 34 years of experience as a geotechnical engineer practicing good project management practices, Rolf understands the importance of prioritizing use of limited resources to achieve project design and schedule goals. He has developed the ability to recognize ways to do the work smarter, quicker, and more cost-effectively, whenever possible. A few examples of this are discussed below.

As Haley & Aldrich Augmentation Contract SLGP Team Lead, Rolf has been overseeing and coordinating internal staff assignment, scoping, exploration activities, engineering milestones, and preparation of geotechnical deliverables for all contract tasks assigned to Haley & Aldrich. In this role, he is constantly juggling and prioritizing multiple required tasks to meet various deliverable timelines and deadlines of varying importance. This can at times put significant strain on one of the most valuable limited resources – availability of time itself. When this happens, Rolf steps in to work with our staff to prioritize and reassign tasks as necessary to fulfill contractual obligations and optimize delivery of time-critical engineering design and documentation.

During the 2020 pandemic, WSDOT exploration drilling operations were put on hold for many months, resulting in a backlog of scheduled drilling projects. Boring explorations were required to supplement previous preliminary exploration for final culvert design for ***SR 544 UNT to Fourmile Creek FP***. Waiting for availability of drill rigs to collect subsurface data for final design would have significantly delayed the overall project. Instead, Rolf reprioritized available resources and devised an alternate approach relying on previous boring information and hand borings to confirm peat depth, supplemented with

experienced geologic interpretation of soil stratigraphy. This allowed geotechnical evaluation to proceed uninterrupted using a reasonably conservative design approach without the need for additional exploration drilling.

3. Experience as a subject matter expert on multidisciplinary teams delivering complex transportation projects

Rolf has provided geotechnical subject matter expert (SME) support for multidisciplinary design teams on many WSDOT projects, most recently as part of our current SGO Staff Augmentation Consultant Contract. One example of this is ***SR 9 Marsh Road to 2nd Street Widening,*** a multi-year, multi-bridge, complex roadway widening project where Rolf was responsible for overall project management and overseeing geotechnical design. As such, he provided valuable geotechnical input to the WSDOT design team during the initial value engineering (VE) and subsequent cost estimate validation process (CEVP) phases. This included both technical and cost-related information for several proposed cost-saving measures considered as part of the WSDOT VE process. Rolf proposed and presented detailed conceptual design approach to the CEVP group for the use of LDCC and Geofoam fill to reduce anticipated embankment settlement over soft, fine-grained, alluvial soils.

Other examples include the ***SR 520 Floating Bridge and Landings Replacement*** and ***I-5 M Street to Portland Avenue – HOV (CRIP)*** projects, where Rolf provided geotechnical SME advice for complex submarine gravity anchor/drilled shaft slope stability and tall soil nail walls involving seismic slope effects. For the City of Tukwila ***Tumwater Boulevard & I-5 Interchange Improvements*** and ***King County Foothills Trail Phase 2 (White River Crossing to 252nd Ave SE)*** projects, Rolf provided geotechnical SME support to multidisciplinary design teams involving bridge foundation and MSE wall design on ground improved subgrade, and micropile shear pile stabilization of a 30-foot-high vertical erosional bluff.

D. INFORMATION THAT DEMONSTRATES FAMILIARITY WITH DESIGN BUILD PROJECT TEAM LEADERSHIP/MEMBERSHIP

Rolf has been involved with multiple design build projects in various roles as geotechnical design engineer, geotechnical SME, and QC manager. He has assisted design build teams developing cost-effective proposals on the pre-award side and he has managed geotechnical design and provided construction support after award.

1. Experience preparing geotechnical documents for design build contracts

As Haley & Aldrich Augmentation Contract SLGP Team Lead, Rolf has been responsible for overseeing development and QC review of all Haley & Aldrich deliverable documents. As such, he has guided and assisted Haley & Aldrich staff developing contractual geotechnical documents required to develop RFP packages for several WSDOT design build projects, including ***I-90/SR 161/SR 202/SR 203 FP Bundle, SR 161 Hylebos Creek FP, I-90/SR 900 Lewis/West Village Park/Schneider Creek FP Bundle,*** and ***SR 3/SR 104/SR 303-308 Kitsap Co 29 FP Bundle*** (progressive design build)**.** These documents have included geotechnical data reports, geotechnical baseline reports, geotechnical reference documents (historic data and interpretive design memoranda), site-specific seismic hazard memoranda, seismic response spectra contract documents, and Section 2.6 geotechnical requirements.

2. Experience as a subject matter expert on teams supporting design build contracts

Rolf has provided geotechnical SME support for multidisciplinary design teams on various design build projects over the past 25 years. Some examples include the ***SR 520 Floating Bridge and Landings Replacement*** and ***I-5 M Street to Portland Avenue – HOV (CRIP)*** projects, where Rolf provided geotechnical SME advice for complex submarine gravity anchor/drilled shaft slope stability and tall soil

nail walls involving seismic slope effects. Another example is the ***Sound Transit – Downtown Redmond Link Extension (DRLE)*** project, where Rolf provided geotechnical SME design and advice for 21 permanent and 5 temporary soil nail walls up to 25 feet high and located at various cut areas along the alignment. Rolf was the lead soil nail wall designer for the pre-design phase of this design build project, which included evaluation of lateral loading from rail system pole foundations on the soil nail wall fascia. He provided valuable geotechnical design and construction input to the multidisciplinary design team and his soil nail wall design was incorporated into the final post-award construction plans.

E. INFORMATION THAT DEMONSTRATES FAMILIARITY WITH CONSTRUCTION SUPPORT

Rolf has provided geotechnical construction support on virtually every project he has designed over his 34-year career. This includes a wide range of commercial developments and public infrastructure projects, as well as WSDOT transportation projects. He has worked closely with various private and public clients and design teams to develop an appropriate level of geotechnical construction oversight. Rolf's various roles as on-site inspector, project manager overseeing field inspection, and QC manager for complex private and public transportation projects, have given him a complete understanding of the whole QC/QA construction process.

1. Experience that demonstrates familiarity with the WSDOT Standard Specifications for Road Bridge and Municipal Construction

Rolf has been applying the WSDOT Standard Specifications for Road, Bridge, and Municipal Construction (WSS) to both private infrastructure and public transportation projects since he started his geotechnical career over 30 years ago. More specifically, his work as design build QC manager on the ***Port of Seattle Terminal 18*** and ***General Metals of Tacoma*** projects, as well as geotechnical EOR for the ***King County Foothills Trail Phase 2 (White River Crossing to 252nd Ave SE)*** project, were all based on the WSS. Over the past four years, Rolf has been applying the current WSS to several WSDOT projects, including ***SR 9 Marsh Rd to 2nd Street Multi-Bridge Improvements***, ***SR 544/546 Fourmile/Kamm/Pepin Creek FP***, and ***SR 539 Duffner Ditch FP****, to name a few*. As Haley & Aldrich SLGP Team Lead, Rolf is also responsible for ensuring consistent application of WSS to all Haley & Aldrich assigned projects/tasks.

2. Experience evaluating/reviewing contractor submittals, requests for information, and cost reduction incentive proposals

Rolf has over 30 years of experience evaluating contractor submittals, requests for information (RFI), and other construction support documentation on a wide range of commercial developments and public infrastructure projects, as well as WSDOT transportation projects. He has reviewed construction documents from a variety of perspectives, including as geotechnical EOR, QC manager, and owner's representative on both design bid build and design build projects (**reference project examples listed under subsection 1 above**). On the ***I-5 M Street to Portland Avenue – HOV (CRIP)*** project, Rolf helped the design build team evaluate a cost reduction incentive proposal to eliminate need for 1,000 feet of cast-in-pace retaining wall, as part of his soil nail wall design.

As the Haley & Aldrich Augmentation Contract SLGP over the past four years, Rolf has provided geotechnical SME support and contractor submittal/RFI reviews for multiple WSDOT projects across the state, giving him a thorough understanding of SGOs role within the WSDOT construction support process (including coordinating reviews with the WSDOT Bridge & Structures Office). He is also the lead SME reviewer coordinating all Haley & Aldrich geotechnical submittal reviews and RFI responses within the Primavera Unifier Construction Document Review System WSDOT has recently started using.

3. Experience evaluating change of condition claims and plans errors

Rolf has over 30 years of experience evaluating contractor claims of changed conditions and plan errors on behalf of various clients and stakeholders, including Washington State Department of Enterprise Services (DES) and multiple Washington State cities and counties. This includes his work as owner representative on the ***General Metals of Tacoma*** project, where he administered the contract, reviewed/approved contractor change orders (change of conditions claims), managed the QC testing program, reviewed construction material submittals, and facilitated interpretation and verification of contractor compliance with project plans and specifications (including plans error resolution). As geotechnical EOR for the ***King County Foothills Trail Phase 2 (White River Crossing to 252nd Ave SE)*** project, Rolf managed geotechnical QC inspections for all aspects of the project, including pavement/wall subgrade verification, soil nail wall installation, and micropile (shear pile) bluff stabilization installation and load testing. He assisted the design team with contractor submittal and RFI geotechnical review, evaluated contractor changed condition claims, addressed plans errors, and provided construction (as-built) plan modifications and QC documentation.

Criterion 3 Qualifications/Expertise of Selected Consultant Staff

A. QUALIFICATIONS AND EXPERTISE OF THE CONSULTANT'S SELECTED SENIOR STAFF. PROVIDE A LIST OF FIVE SELECTED SENIOR STAFF WITH 10 YEARS OF EXPERIENCE WHO WILL BE WORKING ON STATE PROJECTS

Haley & Aldrich has selected the following five senior staff geotechnical engineers to support this contract, in collaboration with Rolf Hyllseth as SLGE. Each selected senior staff has extensive experience working on WSDOT projects and bring various specialized geotechnical skills. Along with Rolf, our five senior staff geotechnical engineers will be working as a team, to solve the geotechnical challenges WSDOT may face under this contract. They will all be supported by a wide range of geotechnical staff engineers and professionals assigned do manage tasks and do the day-to-day contract work, including several technical experts.

Mike Schmitz, P.E.
Haley & Aldrich
WA: Professional Engineer (Reg. No. 54223)
20 years of experience

Brice Exley, P.E.
Haley & Aldrich
WA: Professional Engineer (Reg No. 55274)
14 years of experience

Dan Trisler, P.E.
Haley & Aldrich
WA: Professional Engineer (Reg No. 38279)
31 years of experience

Madan Karkee, Ph.D., P.E.
Haley & Aldrich
WA: Professional Engineer (Reg No. 49586)
29 years of experience

Whitney Ciani, P.E.
Ciani & Hatch Engineering
WA: Professional Engineer (Reg No. 48245)
17 years of experience

1A. Area of Expertise based on Scoring Criterion 1A – Geotechnical Analysis and Design

The geotechnical analysis and design expertise of our proposed senior level staff is summarized in the sections below.

Mike Schmitz – Mike has worked on several projects which encompass a wide range of geotechnical analysis, as can be seen in Table 1 and in the project descriptions. ***I-90/SR 18 to Deep Creek***, ***I-405 Renton to Bellevue***, **I-*5 Steilacoom-DuPont Road to Thorne Lane Corridor Improvements***, included retaining walls, highway bridges, shallow and deep foundations, slope stability, excavation and shoring, fill placement and compaction, settlement analysis, advanced laboratory testing, and instrumentation. Mike has also completed landslide analysis and remediation on ***I-90/SR 18 to Deep Creek*** and ***SR 542 Squalicum Creek FP*** projects from the table along with a landslide repair on the ***SR 518 Embankment*** in SeaTac, WA. As part of the ***SR 542 UNTs to Michell Creek FP*** ground improvements were necessary to mitigate seismic hazards at the site.

Brice Exley – Brice has a wide variety of technical project experience, including delivering both routine and complex projects covering all the areas of expertise listed in Table 1, Geotechnical Analysis and Design, except for landslide analysis and remediation. In addition to providing geotechnical recommendations for both driven and drilled foundations of various sizes, he has been responsible for a significant amount and variety of load testing. Throughout his career, Brice has focused significant effort on the collection and interpretation of geotechnical data for use in design. He has been responsible for advancing the laboratory capabilities of Haley and Aldrich's Seattle office with a variety of advanced laboratory tests, and is often leveraging a combination of CPTs, geophysics, and borings to better understand site subsurface conditions. Brice has installed, specified, and been responsible for a wide variety of geotechnical instrumentation since the ***SR 99 Tunnel***. He was responsible for the instrumentation monitoring the award-winning ***Rainier Tower*** and ***Climate Pledge Arena*** projects during the excavation and shoring of these structures.

Dan Trisler – As one of Haley & Aldrich's geotechnical principals in the Pacific Northwest, Dan has broad responsibility for managing, executing, and reviewing technical work. He is well-versed in all of the areas of expertise listed in Criteria 1A, though he is a go-to resource for retaining walls, single-span bridges, spread footings, driven piles, ground improvement, earthwork and shoring, and field investigations. Dan has recently overseen all areas of Criteria 1A expertise (excluding shafts and landslides) on these projects: ***SR 104 Lyon Ck FP***, ***SR 169 Ravensdale Creek FP***, ***SR 20 Fish and Lorenzan Creeks FP***, ***SR 4 Cathlamet Luminaries***, ***SR 7/SR 161 UNT to South Creek FP***, ***SR 542 UNT to Mitchell Creek FP***, and ***Boeckman Road Corridor Improvements*** (Oregon).

Madan Karkee – Madan has worked on many projects requiring a wide range of geotechnical engineering analyses and development of design recommendations – for example, design build projects like ***Sound Transit Downtown Redmond Link Extension (DRLE)*** and ***I-405 Bellevue to Lynnwood***, which included various types of retaining walls, aerial guideway and highway bridges, shallow and deep foundations, embankment and slope stability, excavation and shoring, fill placement and compaction, settlement analysis, ground improvement, advanced laboratory testing, and instrumentation. As part of the ***DRLE*** project, Madan completed a load testing program with Brice Exley and Jeff Bruce on fully instrumented drilled shafts using the bi-directional load testing method to develop design considerations for the design of drilled shafts supporting the aerial guideway structures. Madan also has extensive experience in the geotechnical design of multistory buildings

with deep excavations into various geologic and hydrogeologic conditions, such as ***Lincoln Square South*** in Bellevue, ***2030 Eighth Avenue*** in Seattle.

Whitney Ciani – Whitney provided engineer of record services for the ***Children of the Sun Trail*** project, which included geotechnical design and analysis to support construction of two single-span and one two-span pedestrian bridges and approach embankments comprised of tall (> 25-foot) back-to-back MSE walls and back-to-back CIP retaining walls. Geotechnical analyses included shallow foundation design, global stability analysis of approach embankments, global stability analysis to assess compound stability of MSE and CIP walls, internal stability evaluation of MSE walls, lateral earth pressures, and hydraulic conductivity and infiltration. Evaluation and monitoring of consolidation settlement were significant components of the ***SR 167 Southbound HOT Lanes*** and ***Coffee Creek Remove Fish Barrier*** projects. For these projects, Whitney completed back-analysis of historical consolidation data and utilized 1D consolidation laboratory test data to evaluate total magnitude of consolidation settlement and anticipated time to reach 90 percent of primary consolidation. During construction Whitney monitored settlement to recalibrate settlement estimates to confirm when milestone values (t90) were reached and construction activities could advance. Whitney provided slope stability analysis and landslide mitigation services in support of the WSDOT ***SR 99 Demolition, Decommissioning, and Surface Street*** project for a sensitive, marginally stable slope below the existing SR99 viaduct structure. She evaluated stability of the slope under various construction loading scenarios and developed a slope protection system plan to monitor and manage performance of the slope during demolition of the viaduct structure.

1B. Area of Expertise based on Scoring Criterion 1B – Seismic Design

Mike Schmitz – For the ***SR 542 UNTs to Michell Creek Fish Passage***, seismic effects on slope stability and foundations along with liquefaction effects on slope stability and foundations were a major design component which led to the design decision to utilize ground improvements. As can be seen in Table 1, most of our projects include seismic design for slope stability and foundations.

Brice Exley – Brice shares leadership in Haley & Aldrich's seismic engineering and modeling group with Doug Lindquist and Michael Chamberlain. In 2022, Brice was invited to present and participate in the Pacified Earthquake Engineering Research (PEER) center sponsored workshop on liquefaction susceptibility (PEER Report No. 2023/02) and had an accepted poster to CPT'22 in Bologna, Italy on the interpretation and liquefaction susceptibility of silt in the Pacific Northwest. While working for WSDOT Brice has peer reviewed the ***SR 520 I-90 Interchange*** dynamic FLAC model, is providing senior guidance and review of the ***I-405/Brickyard to SR527 Improvement*** FLAC models and has peer reviewed advanced dynamic time history numerical models in multiple states on the West Coast. He regularly manages 1- and 2-dimensional site response and soil-structure interaction (SSI) models overseeing Ph.D. level staff who have published on constitutive modeling and soil dynamics and testing.

Dan Trisler – Dan's assessment of seismic hazards, including liquefaction, and their effects on slopes, foundations, and walls, have been a part of many hundreds of infrastructure and development projects, such as the recent ***SR 500 Pedestrian Overcrossing*** project and a ***half dozen school seismic retrofits for the state Office of the Superintendent of Public Instruction*** (OSPI). He relies on our seismic experts to conduct advanced site ground response analyses, for which he provides technical oversight and review, such as on the recent OSPI projects and a ***USCG Fast Response Cutter*** (Oregon) project.

Madan Karkee – Madan completed his Ph.D. in Japan with focus on seismic geotechnical engineering and has a substantial record of publications in seismic design, deep foundations, ground response to earthquake shaking, and post-seismic field observations including the ***1995 Kobe Earthquake*** in Japan and 2001 Bhuj Earthquake in India. At the Ports 2022 conference in Honolulu, Madan presented the paper on the seismic design of ***Mukilteo Ferry Terminal*** that he coauthored. Madan regularly collaborates with Haley & Aldrich's seismic engineering team including Doug Lindquist, Brice Exley and Michael Chamberlain for the seismic design in various projects, including the performance based seismic design (PBSD) and peer-review of high-rise structures in Seattle and Bellevue. This year, ***Madan and Michael Chamberlain are scheduled to present a paper on the seismic peer review at the Eighth International Conference on Earthquake Geotechnical Engineering (8ICEGE)*** in Osaka.

Whitney Ciani – Whitney has provided geotechnical seismic design support for numerous projects across the Puget Sound. The ***South Lander Grade Separation*** project for Seattle Department of Transportation (SDOT) utilized geophysical testing, cyclic direct simple shear testing, and site response analysis to evaluate seismic design of the new bridge structure. The project site is approximately 0.6 kilometers from the northern-most trace of the Seattle Fault and the site response analysis included development of basin and directivity factors. Effective stress liquefaction analysis and cyclic DSS testing were used to evaluate liquefaction susceptibility of deep, estuarine silt deposits. Whitney evaluated seismic slope stability in support of the ***SR 520 Floating Bridge and Landing*** project, which required design of permanent soldier pile tieback walls to stabilize the steep glacial bluff and create space for new infrastructure and the ***SR 167 Southbound HOT Lanes*** project, which required evaluation of liquefaction effects on slope stability and shaft foundations for approximately 1.2 miles of noise wall.

2A. Professional Licensures and Years of Experience Managing Geotechnical Projects

Haley & Aldrich selected a team of experienced geotechnical engineers to support this Geotechnical Engineering and Project Delivery (Area 2) contract. Each of these staff brings more than 10 years of experience managing geotechnical projects and are licensed in the State of Washington as shown in each engineer's profile on page 17.

2B. Familiarity with State Construction Standards

Our senior staff geotechnical engineers have all worked on are large number of projects required to follow State construction standards, often involving design and construction procedures using both state and federal standards. The following sections provide responses to the specific subcategories listed in the RFQ under Criterion 2B for each senior staff engineer.

Because the WSDOT Geotechnical Manual and AASHTO LRFD Bridge Design Manual are so closely intertwined on the work we will perform under this contract, we have provided below combined responses that demonstrate our senior staff's familiarity with, and successful implementation of, both design manuals.

Mike Schmitz – Mike has over 20 years of experience working on transportation projects. His first project using LRFD design was for a bridge in Missouri while he was working in Kansas City. Mike moved to Washington in 2016 and began familiarizing himself with the WSDOT GDM. He started using the manual in practice in 2017 during pursuit of the ***I-5 Steilacoom-DuPont Road to Thorne Lane Corridor Improvements*** project. Since then, he has continuously worked on WSDOT projects using the WSDOT GDM and the AASHTO LRFD Bridge Design Manual. His reliance of both documents continued to increase as he was tasked with being the SME for WSDOT on a design build project. For this role, Mike had to review other geotechnical engineering reports for conformance with contract documents which

include the GDM and AASHTO manuals. He has also worked on the next revision of the GDM, both writing and reviewing chapters.

Brice Exley – Since starting work with Haley & Aldrich (formerly Hart Crowser), Brice has nearly continuously worked on WSDOT projects and projects for other authorities having jurisdiction that rely on the WSDOT Geotechnical Design Manual and AASHTO LRFD Bridge Design Manual. Brice has served as a subject matter expert for WSDOT reviewing other geotechnical engineering reports for conformance with contract documents which include the GDM and AASHTO manuals. ***He has also worked on the next revision of the GDM, both writing and reviewing chapters.***

Dan Trisler – Since working on his first WSDOT project, ***I-205/Mill Plain Interchange Improvements***, more than 20 years ago, Dan has used both manuals for his work on well over 100 infrastructure projects. Over the last three years, Dan has been the principal-in-charge of approximately 30 WSDOT and local agency transportation projects, including bridge, culvert replacement, and road widening projects, such as those listed in Criteria 1A. Dan also ***provided significant technical input, review, and content for the ongoing rewrites of GDM Chapters 14 (Stormwater Facilities) and 16 (Ground Modification)***.

Madan Karkee – Madan has over 20 years of experience working on transportation projects in U.S. and Canada. After he moved to Seattle in 2008 to join Haley & Aldrich (formerly Hart Crowser), Madan has developed a deep understanding of WSDOT GDM and the AASHTO LRFD Bridge Design Manual as he worked on various WSDOT projects such as the ***SR 99 Tunnel***, ***SR 520 Floating Bridge,*** and ***I-405 Bellevue to Lynnwood***. Over the years, he has followed through with version updates and upgrades in these documents to reflect the state of practice and newer research. ***Madan has also worked on the review of GDM revision in the past and is a reviewer of GDM Chapter 14.***

Whitney Ciani – Whitney has provided geotechnical engineering on transportation projects in Washington for the past 13 years. Her experience with WSDOT began as a design engineer on the ***SR 520 Floating Bridge and Landings*** project in 2011 and continues today. On the WSDOT Children of the Sun Trail design build project Whitney worked alongside Mike Schmitz and Brice Exley, who were acting as WSDOT's representative, to resolve comments and confirm geotechnical design documents were in compliance with the AASHTO LRFD Bridge Design Manual and the WSDOT GDM. Whitney has provided geotechnical project management, design support, and construction support on nine design build projects and acted as geotechnical special inspector for landward components of the ***SR 520 Floating Bridge and Landings*** and the ***Coffee Creek Fish Barrier Removal***, ***SR 167 HOT Lanes***, and ***I-405 Hard Shoulder Running*** projects.

2C. Familiarity with Project Management (Criterion 2C)

At Haley & Aldrich, CHE, and HWA, project management requires the ability to manage multiple projects with overlapping schedules while prioritizing limited resources to optimize project delivery. Haley & Aldrich puts significant effort into emotional intelligence informed project management, with a goal of all staff attending an internally managed multi-day emotional intelligence training that includes several project management tools. We also provide Lean consulting services that support teams internally and externally with improving project delivery through a variety of tools and processes beyond the traditional lean techniques.

1. Experience managing multiple projects with overlapping schedules

Mike Schmitz – While working as a reviewer on several design build projects and senior geotechnical engineer on design bid build projects for WSDOT over the last few years, Mike has also been the geotechnical principal on several design build projects. Over the last year alone, he has been the WSDOT SME on a progressive design build (***Olympic 29 Fish Barrier Removal***), design build (***I-90, SR 161, SR 202 & SR203 – Fish Passage***, ***I-405/Brickyard to SR527 Improvement***, and the ***SR 167 Corridor Improvements*** projects), as the Geotechnical Group Manager (GGM) on the Deep Creek design build project, and as the principal geotechnical engineer on portions of the ***I-5 - Mounts Road to Steilacoom-DuPont Road Corridor Improvements***.

Brice Exley – Brice is regularly involved with multiple projects. An example of this is over the last year he has been the senior engineer responsible for the technical delivery of three large federal infrastructure projects each requiring advanced seismic soil structure interaction models and has been very involved with several WSDOT projects over the course of the last year including ***Olympic 29 Fish Barrier Removal***, ***US 101/SR 116 North Olympic Peninsula – Remove Fish Barriers DB***, and the ***Deep Creek DB*** project.

Dan Trisler – Dan is the principal-in-charge for multiple projects for local, state, and national agencies. As such, he is used to managing projects with overlapping schedules, staff with overlapping project commitments, and clients with varied project expectations and goals. He maintains continuity and progress on his projects by having weekly meetings with his project managers and several of his clients to review project and staff commitments. These meetings allow prioritization of project needs. Project managers track work using appropriate calendars, spreadsheets, or PM software (such as Microsoft Planner).

Madan Karkee – Madan regularly and actively managed multiple projects simultaneously, including design build as well as design bid builds project deliveries for over a decade before moving to principal geotechnical engineer position. While he was managing the ***Mukilteo Ferry Terminal*** project, he was simultaneously managing two high-rise building projects and two Port of Seattle projects. He managed the Sound Transit ***DRLE*** design build project spanning over several years while concurrently managing Port projects and building projects. He has extensive hands-on experience managing overlapping schedules and project priorities through proactive planning, having project teams aligned to meet project goals, and effective communication.

Whitney Ciani – Whitney has more than nine years of cumulative experience in managerial roles, including responsibility for workload planning and scheduling for teams of up to 36 geotechnical engineers, geologists, and field technicians. She proactively managed staff resources to meet project deadlines both for projects she managed and for projects managed by others. Whitney's ability to deliver multiple projects with overlapping schedules is demonstrated by her experience managing the ***I-405 Hard Shoulder Running*** and ***Coffee Creek Remove Fish Barrier*** WSDOT design build projects while also leading procurement efforts for ***Wildcat Creek Bridge***, ***South Union Gap Interchange***, and ***Renton to Bellevue Corridor Widening*** concurrently.

2. Experience prioritizing limited resources to optimize project delivery

Mike Schmitz – Mike is not only a principal engineer of Haley & Aldrich in the Seattle office, but he is also the geotechnical group leader for the Pacific Northwest and Hawaii. This role enables him to control the staffing of projects and redirect resources when necessary. Projects often have limited duration

intensive resource needs, which can be met while other projects are winding down. Utilizing this method often keeps project delivery on time, but he is also able to pull in resources from the California and East Coast offices to complete project delivery when resources are not locally available. These geotechnical engineers are well-versed in AASHTO methodologies, but when we pull them in for Washington projects, we pair them with a local engineer who is familiar with WSDOT manuals and specifications.

Brice Exley – Brice manages both overlapping schedules and limited resources by working to understand which project activities are on the critical path for a project, which project is on a critical path for his staff, and reallocating resources as needed. In addition, he works with staff to pre-mortem projects and analyses to minimize rework and allow them to focus on project risks, while working with project managers to identify whether directing, coaching, supporting, or delegating is the correct leadership model for the situation. As Haley and Aldrich's National Geotechnical Practice Leader, Brice is focused on providing staff with integrated tools that reduce rework and improve our quality of work.

Dan Trisler – As noted above, Dan holds weekly meetings with project managers to review project schedule and resource conflicts. These conflicts are assessed as a group, so that appropriate prioritization for the projects and staff can be implemented cooperatively. These practices have allowed Dan's teams to successfully deliver multiple concurrent projects for ***Tillamook County***, including landslide evaluations, culvert and bridge replacements, and a rural waterline replacement by identifying and addressing the County's critical needs, while relegating other resources to a non-critical pathway.

Madan Karkee – As a principal geotechnical engineer with extensive experience in managing multiple projects simultaneously, Madan cooperates with project managers for optimal use of available resources while providing technical oversight and review of work products related to project delivery. The majority of the ***DRLE*** project design occurred during the initial phases of the COVID-19 pandemic. Despite the sudden changes in work situation and a huge strain in resources, Madan successfully coordinated with the project team under limiting circumstances for timely project delivery.

Whitney Ciani – Whitney excels at delivering on a timeline that does not compromise quality, which requires continual resource management and communication with internal and external team members. She provided procurement, project management, geotechnical design, and geotechnical special inspector services for the ***Coffee Creek Remove Fish Barrier*** and ***I-405 Hard Shoulder Running*** design build projects.

3. Experience as a subject matter expert on multidisciplinary teams delivering complex transportation projects

Mike Schmitz – Mike has been a subject matter expert of several design build projects which can be seen in Table 1. He has also been a part of several complex projects on both the State and design builder side. An example project while working for the State would be the ***Olympic Region 29 Fish Barrier Correction*** progressive design build project. This project included sites that are often too far away from concrete batch plants, so majority precast elements had to be utilized. This project includes coastal sites, soft soil sites, sites with bedrock, and often complex geometry. He has also been acting as the GGM on the ***Deep Creek*** design build project. This project includes re-working the existing ***I-90/SR 18 interchange*** into a diverging diamond interchange, multiple culverts for fish passage improvement, two multi-span bridges, and a landslide repair. The geometry at several locations was complex due to the presence of wetlands

along the project and adjacent to the bridges. The high groundwater in the area required lining the detention ponds to mitigate infiltration while also providing a system under the liner to mitigate high pressures from building up.

Brice Exley – As a subject matter expert, Brice has a wide range of experience working with multidisciplinary teams on projects such as those listed previously and in Section 1, including ***Olympic Region 29 Fish Barrier Removal*** project. He has found that the most common thread to success in any of these is actively listening to other disciplines, understanding their challenges, and working to communicate in a way that the various disciplines understand the tasks and risks.

Dan Trisler – Dan strives to educate teams about the geotechnical considerations for each site to help them make informed decisions about design and construction and allow geotechnical approaches to best mesh with the overall project strategy. The ***10th Avenue Creek Crossing*** project for Clark County contained weak soils that necessitated the use of ground improvement for liquefaction and global instability. However, County roadway and drainage engineers, environmental and permitting specialists, hydrologists, and construction staff were unfamiliar with the recommended deep soil mixing (DSM). Dan coordinated with a specialty contractor to host field trips for the team to observe the DSM process in action. Dan then developed performance-based specifications for the DSM, which were now more readily understandable by County staff.

Madan Karkee – As a subject matter expert reviewer, Madan has diverse experience ranging from high-rise buildings with deep excavations (e.g., ***SIXO Highrise Towers*** in Seattle), ports and other waterfront projects (e.g., ***Terminal 46 Cruise Terminal Site Development***), navy projects (e.g., ***NBK Manchester Fuel Pier Repairs*** project), and transportation projects (e.g., ***Fluke Anchors for SR 520 Floating Bridge***) including both the design bid build and design build project delivery methods. In this role, he has extensive experience interacting with multidisciplinary teams to develop optimal solutions to complex project delivery challenges.

Whitney Ciani – Through her extensive experience working on design build transportation projects for WSDOT, Whitney has honed her geotechnical engineering expertise working with multidisciplinary teams to solve complicated engineering problems. She is relied on for senior technical review and has acted as geotechnical subject matter expert in design task meetings, comment resolution meetings, and during procurement efforts. Whitney served as the geotechnical SME working with multidisciplinary teams on the SDOT ***South Lander Grade Separation*** project, and WSDOT's ***Coffee Creek Remove Fish Barrier*** and ***I-405 Hard Shoulder Running*** design build projects.

2D. Familiarity with Design Build Project Team Leadership/Membership (Criterion 2D)

Our senior staff geotechnical engineers have all worked on design build projects in varying capacities, as described below.

1. Experience preparing geotechnical documents for design build contracts

Mike Schmitz – Mike has prepared geotechnical documents including geotechnical baseline reports, geotechnical data reports, geotechnical reference documents, and Section 2.6 of the technical requirements for the following design build projects: ***I-90, SR 161, SR 202 and SR 203 – Fish Passage***, ***I-90 – Lewis, West Village Park, Schneider and Unnamed Tributaries to Tibbetts Creeks – Fish Passage***, ***I-***

405/Brickyard to SR 527 Improvement, ***SR 167 Corridor Improvements***, and ***SR 3/SR 104/SR 303/SR 307/SR 308 Kitsap County – Remove Fish Barriers Project*** – progressive design build.

Brice Exley – Brice has 13 years of experience delivering design build projects both working for the design builder and as an owner's representative. Given the rising cost of design build contracts, he has worked to identify areas in which the pre-award documents can provide additional certainty to the design builders bidding and having intentional discussions around risk allocation on projects. An example of this has been to provide design builders a design seismic spectrum that they were able to leverage with confidence in pre-award for contracts which would otherwise require a site-specific hazard analysis and peer review on ***I-90, SR 900 Lewis, West Village Park, Schneider Fish Passages; I-405/NE 85th Street***; and ***Brickyard to 527*.**

Dan Trisler – Since 2012, Dan has been involved with design build projects for transportation, waterfront, and building projects. For the ***Chehalis River Overflow Bridge*** in Oakville, he prepared geotechnical data, baseline, and preliminary design reports, in conformance with GDM Chapter 22. He is the geotechnical lead for a progressive design build bridge project (***Boeckman Road***). For these and other projects, Dan's teams have prepared multiple geotechnical documents, including subsurface investigation plans, basis of design memos, geotechnical instrumentation plans, risk assessments, soil and rock properties memo, and various technical memoranda and calculation packets.

Madan Karkee – Madan has substantial experience delivering design build projects such the ***DRLE***, ***I-405 Bellevue to Lynnwood (BTL) express toll lanes*** project, ***Sound Transit Operations and Maintenance Facility East*** (OMFE), etc. He is experienced in developing and reviewing geotechnical documents for design build projects on behalf of the owner as well as the design builder.

Whitney Ciani – Whitney has participated in the procurement and delivery of 16 design build projects for WSDOT between 2011 and 2023. She has prepared and overseen the QA/QC of dozens of geotechnical documents to support delivery of design build contracts. Her experience primarily includes preparing geotechnical design reports and providing geotechnical review of plans and specifications as part of the design build contractor team. Whitney has experience preparing geotechnical data reports for large complex projects. For example, she managed the geotechnical field investigation, laboratory testing, geotechnical data, and ***preparation of the Geotechnical Data Report for approximately 10 miles of levee in Grays Harbor County***. The project advanced over 70 explorations and completed geotechnical soil testing comprising 324 index tests and 148 secondary tests, including triaxial strength, 1-dimensional consolidation, and flexible wall permeability testing.

2. Experience as a subject matter expert on teams supporting design build contracts

Mike Schmitz – Mike has served as the SME or one of the SMEs on the projects listed in Item 1, along with the ***Olympic Region 29 FP Barrier Correction*** project. As a SME during design build general procurement, he attended 1:1 meetings at the project team's request and reviewed ATC submittals. During the implementation phase of the projects, Mike attended weekly task force meetings, over the shoulder meetings, and reviewed geotechnical and structural submittals for compliance with the contract documents and mandatory standards. After review of the submittals and providing comments, he reviewed the comment responses and participated in comment resolution meetings. During progressive design build projects Mike has been part of the integrated team. This delivery method

allows a unique ability to contribute to the success of the design builder by being open to new ideas that create a better end product or saves the state money.

Brice Exley – Brice has reviewed finite element models on multiple projects including actively supporting our ***I-405 Brickyard*** reviews of 2-dimensional and 3-dimensional FLAC models. He and Mike Schmitz worked as the geotechnical SMEs for the WSDOT ***Children of the Sun Trail*** and are currently representing WSDOT on the ***US 101 SR 109 Olympic 29 FP Progressive DB*** contract.

Dan Trisler – Dan's work as a geotechnical SME has ranged from pre-design pursuits for the WSDOT ***SR 530/Trafton Creek and Schoolyard Creek fish passages*** and the ***SR 167 and 70th Avenue improvement*** projects, to design of the ***Boeckman Road Corridor***, and the design and construction of multiple buildings for the ***Veteran's Affair Vancouver Medical Center*** and a pier and building for the ***USCG Fast Response Cutter*** project. He helped the DB teams assess deep shoring, driven piles and drilled shafts, spread footings, ground improvement, earthwork, settlement, liquefaction, slope and abutment stability, lightweight fill, CIP and MSE (single- and two-stage) wall design and stability, pavements, and seismic hazards.

Madan Karkee – Madan has served as subject matter expert during pursuit phase, as well as during actual implementation of various design build projects including ***I-405 Bellevue to Lynnwood***, ***OMFE***, ***SR 520 Montlake***, ***DRLE***, etc.

Whitney Ciani – Whitney has acted as geotechnical SME in design task meetings, comment resolution meetings, and during procurement efforts to support design build contracts. Whitney proves herself as a key asset through her ability to convey critical geotechnical concerns in a clear and accessible manner to contractors and multidisciplinary team members on projects such as WSDOT's ***SR 99 Demolition and Surface Street Improvements*** and ***I-405 Hard Shoulder Running*** design build projects and the Cities of Aberdeen and Hoquiam ***North Shore Levee East and West Segments*** project.

2E. Familiarity with Construction Support (Criterion 2E)

Each of our engineers has significant experience supporting construction with specifications and special provisions.

Mike Schmitz – Mike has become very familiar with the WSDOT Standard Specifications for Road Bridge and Municipal Construction through his project work from ***I-5 Steilacoom-DuPont Road to Thorne Lane Corridor*** to the more recent ***Deep Creek I-90/SR 18 interchange*** as they are necessary for construction observation and often intertwined with the GDM. As a design build reviewer, he also needs to be well-versed in the Standard Specifications for contractor submittals.

Brice Exley – Brice started working on WSDOT projects in 2011 with the ***SR 99 Tunnel*** and ***SR 520 Floating Bridge*** projects, for which he was both a staff engineer for design and provided geotechnical special inspections. Over this time, he has worked to identify which of the standard specifications are appropriate for the task at hand, and where they need to be supplemented, and has prepared special provisions on projects such as ***I-405 Renton to Bellevue*** and ***SR 9***.

Dan Trisler – Dan has been working in the Pacific Northwest for more than 20 years and uses the Standard Specifications on a near daily basis. He has filled out multiple General Special Provisions and prepared Special Provisions for local agency and WSDOT projects, including for structural earth walls,

special fills, ground improvement (deep soil mixing, aggregate piers, and compaction grouting), embankment surcharging, settlement monitoring, settlement plate construction, and vibration monitoring. He recently oversaw preparation of special provisions for soil mixing (***SR 542 UNT to Mitchell Creek FP***). Previously he prepared the special provisions for settlement monitoring at the ***SR 20/Fish Creek and Lorenzan Creek FP*** projects.

Madan Karkee – Madan has worked on various WSDOT projects since 2011 starting with the ***SR 99 Tunnel*** and ***SR 520 Floating Bridge*** projects. He is thoroughly familiar with WSDOT standards.

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

3. Experience evaluating and reviewing contractor submittals, RFIs, and cost reduction incentive proposals

Mike Schmitz – Mike has reviewed many contractor submittals during his time working on design build projects both for the State and for Haley & Aldrich. During his work with contractors on design build projects, he will often review and answer RFIs within the project team. These RFIs are often for technical questions from the contractor and other SMEs. He has also taken part in several practical design workshops for cost reduction where the design builder and the State share in the savings. As a reviewer for the State on design build projects, Mike has taken part in answering RFIs from the design build team where an interpretation of the GDM or contract is needed.

Brice Exley – He has been actively supporting the ***US 101 SR 109 Olympic 29 FP Progressive DB*** contract with submittal review for multiple years now including at times taking a collaborative approach to work with the design build team to resolve issues with their submittals when they are stuck or on a critical path for the project schedule. Brice has not evaluated or reviewed a cost reduction incentive proposal; however, he did provide initial engineering support for the contractor on the ***I-5 M Street or Portland Avenue – HOV NBN-A Wall CRIP***.

Dan Trisler – Dan's has provided geotechnical construction support on hundreds of projects, including reviewing and responding to contractor submittals and RFIs. Dan does not consider these actions as only a strict compliance check, but as an opportunity to provide value. For the ***Ocosta School*** in Westport, Dan identified the contractor did not have automated data recording equipment called for in the specifications. Instead of blindly rejecting the submittal, Dan worked with the owner and contractor to develop more rigorous QA/QC specifications that allowed use of non-automated equipment. Dan has been involved in development and review of several CRIPs, including alternative shoring systems, temporary embankment configurations, and changes from spread footings to driven pile foundations.

Madan Karkee – Over his more than 25 years of professional practice as geotechnical engineer, Madan has reviewed and addressed many contractor submittals and request for information, a recent one being the ***DRLE*** design build project. He is experienced in participating in cost reduction discussions and

value engineering sessions (e.g., for ***Mukilteo Ferry Terminal project***) and developed alternate technical solutions for design build team review and submittal (e.g. ***I-405 Bellevue to Lynnwood*** project)

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

4. Experience evaluating change of condition claims and plans errors

Mike Schmitz – Mike has been a part of change of condition claim evaluation while working as a SME for the State, specifically on the ***I-90, SR 161, SR 202 and SR 203 FP*** project. He has also prepared a change of condition claim for evaluation while working for a design builder.

Brice Exley – Brice has worked with authorities having jurisdiction on evaluating change of condition claims for a variety of projects including a tunnel for the Climate Pledge Arena, offshore pile driving change of condition claims, and claims on various shoring systems for deep foundations.

Dan Trisler – Dan has completed reviews of innumerable plan sets and calculation packets for many varied types of projects (roadway, bridge, culvert, rail, building, piers/wharves, stormwater, etc.) for both internal team QA and external third-party peer review. In plan sets, he has identified errors associated with stormwater infiltration systems (too close to the groundwater table), utility and structure foundation conflicts, constructability issues, earthwork and excavation impacts to nearby structures, and numerous miscellaneous details. Dan's attention to detail in reviewing submittals is exemplified by his more than 10 years of work as a ***third-party reviewer for the City of Vancouver***. Dan recently assisted a sewer district with a change claim associated with a directional drilling project that developed sinkholes requiring repair. Based on the documentation and the clear guidance in the geotechnical report, the district rejected the contractor's claim, but also engaged the specialty designer to contribute to the mitigation costs incurred by the district because of the inadequate specifications.

Madan Karkee – Madan has evaluated several change of condition claims on behalf of the owner as well as of the design builder. For example, he evaluated the change of condition claim in the ***Mukilteo Ferry Terminal*** project on behalf of the owner and contributed to change of condition claim for evaluation by the owner for ***DRLE*** project.

Whitney Ciani – Whitney has substantial experience reviewing plans and specifications for errors, omissions, and full incorporation of geotechnical recommendations. She has been able to avoid plan errors on her projects, and attributes that outcome to strictly following QA/QC procedures of checking, backchecking, and verifying project documents. Her attention to detail, understanding of WSDOT technical requirements, and experience following and enforcing Design Quality Management Plans for

WSDOT design build projects will supplement Haley & Aldrich's team and contribute to the successful delivery of project documents.

B. CURRENT AVAILABILITY OF KEY STAFF AND RESOURCES FOR EACH FIRM ON THE HALEY & ALDRICH TEAM

Rolf Hyllseth is dedicated as our SLGE to working for WSDOT full-time five days per week, as he has done on the Haley & Aldrich current Geotechnical Engineering Staff Augmentation contract. The monthly available hours for our senior staff and DBE team members, along with our proposed project managers and technical specialists that will do the day-to-day contract work are presented in the Table 2. In addition to key staff, both Haley & Aldrich and HWA have significant advanced laboratory capabilities.

Table 2. Staff availability per month

Personnel Name	Project Role	Hours per month*	Personnel Name	Project Role	Hours per month*
Haley & Aldrich					
Rolf Hyllseth, P.E., L.G.	SLGE	149	Bethany Jackson, P.E.	Project/Task Manager	112
Mike Schmitz, P.E.	Senior Staff (10+ yrs)	75	Barbara Thunder, P.E.	Project/Task Manager	37
Brice Exley, P.E.	Senior Staff (10+ yrs)	37	Jenna Jacoby, P.E.	Project/Task Manager	37
Dan Trisler, P.E.	Senior Staff (10+ yrs)	37	Micah Hintz, P.E.	Project/Task Manager	37
Madan Karkee, Ph.D., P.E.	Senior Staff (10+ yrs)	37	Jeff Bruce, P.E.	Project/Task Manager	37
Doug Lindquist, P.E.	Principal	15	Michael Chamberlain, P.E.	Sr. Technical Specialist	37
Jean Louis Locsin, Ph.D., P.E. (MA)	Sr. Technical Specialist	15	Long Chen, Ph.D.	Technical Specialist	20
Luke Kevan, P.E.	Project/Task Manager	112	Emrah Yenier, Ph.D.	Engineering Seismologist	20
Zachary Yell, P.E.	Project/Task Manager	112	Steve Xu, Ph.D.	Technical Specialist	20
Jason Sved, P.E.	Project/Task Manager	112	Ali Segaghat, Ph.D.	Technical Specialist	75
HWA GeoSciences					
Sandy Brodahl, P.E.	Senior Staff (10+ yrs)	60	Carson Wall, P.E.	Project/Task Manager	60
			Saul Cortez, P.E.	Project/Task Manager	60
Ciani & Hatch Engineering					
Whitney Ciani, P.E.	Senior Staff (10+ yrs)	50	Mikaela Hatch	Project/Task Manager	75

1. *These numbers represent average available work hours for WSDOT contract work, based on full-time employee (FTE) annual workload (1,790 hrs/year, discounting vacation, holidays, etc.)*
2. *The total number of hours above represent a workload effort equivalent to meet the required $13 million workload over four years using the anticipated staff support personnel listed in the table. We will supplement these staff with other engineers and support staff for project delivery.*

Rolf will continue to co-locate in the SGO office in Tumwater as requested for project related work, SGO staff meetings, and other SGO staff collaboration. When not physically present in a WSDOT office, Rolf and all of our Haley & Aldrich/DBE team staff will use all available technology to maintain communication with SGO/PEO/WSDOT staff and other appropriate stakeholders during the entire WSDOT project delivery process, from inception through completion. This will include telephone, email, teleconferencing tools, and collaboration software (e.g., Microsoft Teams, OneNote, ProjectWise, or similar).