

January 10, 2024

Mr. Brad Ryan
Municipality of Skagway
PO Box 415
700 Spring Street
Skagway, Alaska 99840

RE: REVISED PROPOSAL FOR WINTER 2023 ROCKFALL SAFETY WORK, RAILROAD DOCK LANDSLIDE, SKAGWAY, ALASKA

Dear Mr. Ryan:

We are pleased to submit herein our revised proposal and estimated costs for providing services for the above referenced project. Based on recent meetings with the Municipality of Skagway (MOS), we understand that the current direction of the project is to conduct work over the 2023/2024 winter season that ensures safe operations of the facility into the 2024 tourism season. This work is required to continue operations during the 2024 tourism season under the safety profile for the general public and users of the facility that was established during the 2022/2023 winter season.

SCOPE OF SERVICES

In general, our scope of work includes rockfall safety enhancements to the rock slope above the White Pass & Yukon Route Railway (WPYR) dock (railroad dock). The work will not include design or construction activities associated with new mitigation measures on north or south chutes of the main slide area on the north end of the railroad dock. Proposed activities on the main slide are considered consistent with required safety procedures for a slope of this profile and proximity to public travel ways. Activity on the main slide area also includes required repairs of the existing instrumentation monitoring system at the top of the slope to ensure continued, uninterrupted slope monitoring.

Activities associated with rockfall mitigation are proposed herein to take place on a new, unrelated slide feature that formed on the south end of the railroad dock in the summer of 2022, hereafter referred to as the half-south-south slide. We have also included scope for evaluating rockfall hazards between the main slide and half-south-south slide features and install new monitoring capabilities in this area. The half-south-south slide is a feature that is separate from the main slide area and consists of an entirely separate failure mechanism and

risk profile as the main slide on the other end of the dock. Also note that we have not included effort for design of mitigation that would allow for pedestrian traffic on the dock during 2024. We assume that such effort will likely take place during future phases of the project.

ROCK FALL RISK EVALUATION

We will conduct evaluation of rock fall risks along the dock south of the main slide area. This effort will be supported by the existing topographic information and drone photography we have from the site and observations made during a site visit specifically for this task. Our site visit will include approximately three days on site for our engineers to observe conditions on the slope south of the main slide and the rock formations at the crest of the slope. We will also identify locations for new prisms to be installed on the crest formations and install them (prisms to be provided by the MOS) for inclusion in the total station monitoring. On-slope observations will include identification of initiation zones, surface roughness, and vegetative cover type and density.

We will conduct preliminary rockfall modelling on the slope at up to four slope profiles to characterize the rockfall risk on the dock. The goal of the modelling will be to evaluate the overall rockfall hazard on the dock surface in general terms. The modelling will be supported by the available topographic information and the observations made during our site visit. We assume that this effort will feed into future modelling efforts that will take place once the preferred dock usage scenario is determined. We will model the current dock configuration and geometry and will not evaluate adjustment options including removing dock panels or installing on-dock or on-slope rockfall mitigation measures. We will present the findings of our modelling effort and evaluation in a letter report.

CONSTRUCTION SERVICES

Construction services included in this proposal consist of placing new prisms on the slope south of the main slide, scaling on the half-south-south slide, and rockfall safety activities on the main slide.

Half-South-South Activities

We have included an estimated cost for construction activities for this project to include hand scaling on and around the initiation zone and slide path of the half-south-south slide.

Our construction cost includes mobilization/demobilization for a rock stabilization contractor, clearing and vegetation removal at the top of the slope within the work zone, and scaling within the upper limits of the slope where the current rockfall sources are located as well as along the slide path. The contractor will provide all equipment, materials and labor to conduct the hand scaling. The contractor's costs do not include hauling of rock material away from the toe of the slope after scaling. Shannon & Wilson will provide on-site observations continuously during scaling. We have included an estimate construction duration of two weeks for the hand scaling. If longer durations are required, we will notify you as soon as we are able to discuss additional observation effort.

Main Slide Activities

We have included an estimated cost for rockfall safety activities for main slide. Hand scaling will be conducted as part of the regular safety maintenance program and it will take place at the crests of the north and south chutes of the main slide. Our contractor will also visually inspect the rockfall measures installed on the south chute in the 2022/2023 winter season and conduct minor repairs to mesh materials if needed and release entrained rocks under the draped mesh if present. It is anticipated that mesh panel or anchor/cable replacement will not be needed on the south chute features of the main slide. Based on prior observations, it is apparent that the draped mesh installed by others on the north chute is rusted and has been penetrated by historic rockfall activity and is in need of replacement. We will inspect existing top cable and anchor features of the draped mesh, but our cost estimate assumes that these features will need to be replaced along with the mesh. Our effort assumes that the draped mesh feature will have the same size and general material types as those previously installed (approximately 5,000 square feet), we will not expand the size of this rockfall protection feature. As noted above, these activities are required to ensure that continued safe operation of the railroad dock can be resumed in the 2024 tourism season.

The instrumentation system at the top of the main slide requires maintenance to ensure continued, uninterrupted operation in future seasons. We will replace instrumentation components that have experienced wear due to exposure to the elements, including power supply cables and other exposed features. We will also reconfigure the power supply and cabling configuration so that the power supply has redundancy and is decentralized.

ESTMATED COSTS AND CONDITIONS FOR SERVICES

Estimated costs for the work outlined above are included on the attached *Summary Cost Estimate*. We assume that this work will be conducted on a time and materials basis in accordance with a mutually agreed-upon contract for professional services. We will not exceed the maximum quoted value in our estimate without your prior approval. We assume that if changes to the rockfall mitigation plans are needed as our rockfall analysis and design progresses, we will be able to work with you to negotiate the appropriate changes to our scope of work and fees. We will keep you appraised of our progress and inform you immediately if such changes are needed. Additionally, the proposed construction work includes scaling activities on an unstable slope. We will take care to maintain the slope configuration and not initiate larger scale failures during our work. However, we cannot guarantee that significant slide events won't occur during our efforts. We assume that you and/or the White Pass & Yukon Route Railway will indemnify and hold Shannon & Wilson, and all of our subcontractors harmless to injury and/or damages to the facilities and site below the project that result from this work. We have attached *Important Information About Your Geotechnical Proposal* to help you understand the nature and limitations of our services.

Should you have questions or comments or wish to revise the scope of our services, please call the undersigned. We look forward to working with you on this project and appreciate the opportunity to be of service to you.

Sincerely,

SHANNON & WILSON

Kyle Brennan, PE
Vice President

Enc. Summary Cost Estimate
Important Information about your Geotechnical/Environmental Proposal

SUMMARY COST ESTIMATE**GEOTECHNICAL SERVICES**

1. Rockfall Risk Evaluation					\$71,895
Site Visit					\$26,045
Vice President (Kyle)	6	hrs. x	\$250 /hr.	=	\$1,500
Associate (Rex including travel)	60	hrs. x	\$200 /hr.	=	\$12,000
Sr. Professional I (including travel)	60	hrs. x	\$140 /hr.	=	\$8,400
Airfare (for S&W personnel)	2	x	\$1,000 each	=	\$2,000
Lodging (total nights in Skagway for S&W)	4	nights x	\$200 /night	=	\$800
Perdiem (for S&W crew including travel days)	5	days x	\$69 /day	=	\$345
Field Consumables	1	x	\$1,000	=	\$1,000
Rockfall Modelling					\$37,100
Vice President (Kyle)	12	hrs. x	\$250 /hr.	=	\$3,000
Associate (Rex)	80	hrs. x	\$200 /hr.	=	\$16,000
Professional IV	140	hrs. x	\$125 /hr.	=	\$17,500
Admin Support	6	hrs. x	\$100 /hr.	=	\$600
Reporting					\$8,750
Vice President (Kyle)	6	hrs. x	\$250 /hr.	=	\$1,500
Associate (Rex)	20	hrs. x	\$200 /hr.	=	\$4,000
Admin Support	30	hrs. x	\$105 /hr.	=	\$3,150
Reproduction	1	x	\$100 each	=	\$100
2. Construction					\$1,030,186
Hand Scaling (Half-South-South, Assume 2 Weeks)					\$358,060
Vice President (Kyle)	6	hrs. x	\$250 /hr.	=	\$1,500
Associate (Rex, including travel)	160	hrs. x	\$200 /hr.	=	\$32,000
Airfare (for S&W personnel)	1	x	\$1,000 each	=	\$1,000
Lodging (total nights in Skagway for S&W)	14	nights x	\$200 /night	=	\$2,800
Perdiem (for S&W crew including travel days)	15	days x	\$69 /day	=	\$1,035
Contractor - Mobilization/Demobilization	1	x	\$217,350 each	=	\$217,350
Contractor - Safety Scaling	2	weeks x	\$51,188 /week	=	\$102,375
Safety Scaling (Main Slide North and South Chutes, Assume 4 Weeks)					\$259,451
Vice President (Kyle)	6	hrs. x	\$250 /hr.	=	\$1,500
Associate (Rex)	8	hrs. x	\$200 /hr.	=	\$1,600
Sr. Professional I (including travel)	300	hrs. x	\$140 /hr.	=	\$42,000
Airfare (for S&W personnel)	2	x	\$1,000 each	=	\$2,000
Lodging (total nights in Skagway for S&W)	28	nights x	\$200 /night	=	\$5,600
Perdiem (for S&W crew including travel days)	29	days x	\$69 /day	=	\$2,001
Contractor - Mobilization/Demobilization	0	x	\$217,350 each	=	\$0
Contractor - Safety Scaling	4	weeks x	\$51,188 /week	=	\$204,750

SUMMARY COST ESTIMATE

Inspection/Maintenance of Onslopes Mitigation (Main Slide North and South Chute, Assume 3 Weeks)					\$238,468
Vice President (Kyle)	4	hrs. x	\$250 /hr.	=	\$1,000
Associate (Rex)	6	hrs. x	\$200 /hr.	=	\$1,200
Sr. Professional I (including travel)	230	hrs. x	\$140 /hr.	=	\$32,200
Airfare (for S&W personnel)	2	x	\$1,000 each	=	\$2,000
Lodging (total nights in Skagway for S&W)	21	nights x	\$200 /night	=	\$4,200
Perdiem (for S&W crew including travel days)	22	days x	\$69 /day	=	\$1,518
Contractor - Mobilization/Demobilization	0	x	\$217,350 each	=	\$0
Contractor - Draped Mesh Replacement (north chute)	5,000	sq. ft.	\$31 /sq. ft.	=	\$155,400
Contractor - Inspection/Repairs	4	days x	\$10,238 /day	=	\$40,950
Instrumentation Maintenance (3 weeks)					\$156,207
Vice President (Kyle)	20	hrs. x	\$250 /hr.	=	\$5,000
Associate (Rex including travel)	70	hrs. x	\$200 /hr.	=	\$14,000
Instrumentation Specialist (including travel)	230	hrs. x	\$180 /hr.	=	\$41,400
Geology Staff II (including travel)	230	hrs. x	\$105 /hr.	=	\$24,150
Materials (estimate)	1	x	\$50,000 each	=	\$50,000
Shipping (estimate)	1	x	\$5,000 each	=	\$5,000
Airfare (for S&W personnel)	3	x	\$1,000 each	=	\$3,000
Lodging (total nights in Skagway for S&W)	50	nights x	\$200 /night	=	\$10,000
Perdiem (for S&W crew including travel days)	53	days x	\$69 /day	=	\$3,657
Coordination/Meetings					\$18,000
Vice President (Kyle)	40	hrs. x	\$250 /hr.	=	\$10,000
Associate (Rex)	40	hrs. x	\$200 /hr.	=	\$8,000
Total = <u>\$1,102,081</u>					

Assumptions:

- 1 Construction cost items contingent on contractor conducting a site visit prior to mobilization. Configuration and material quantities based on assumed design. Configuration of mitigation may change as design progresses and we assume the cost estimate can be changed accordingly.
- 2 Construction does not include removal of rock debris at base of slide or repairs to dock, infrastructure, or other facilities at the base of the slope.
- 3 Shannon & Wilson and our subcontractors and construction contractor are not liable for injuries or damages resulting from work on the slope or if work results in slope failure.
- 4 Assumes that no permitting effort is required to support the project.
- 5 If disruptions to commercial air or ferry service prevent our field crew from demobilizing from Skagway after field activities, we will bill at the unit rates included above.
- 6 Field activities will take place during the winter and spring of 2023/2024. Delays caused by weather and resultant costs may be experienced and will be billed on a time and materials basis.
- 7 Billing will occur monthly on a time and expense basis. We will notify you immediately if we encounter issues or other circumstances that would require an adjustment to our scope.
- 8 Work will be performed under a mutually agreed upon contract for professional services.



Date: January 2024
To: Mr. Brad Ryan
Skagway Rock Slide 2023/2024 Safety Activities

IMPORTANT INFORMATION ABOUT YOUR GEOTECHNICAL/ENVIRONMENTAL PROPOSAL

More construction problems are caused by site subsurface conditions than any other factor. The following suggestions and observations are offered to help you manage your risks.

HAVE REALISTIC EXPECTATIONS.

If you have never before dealt with geotechnical or environmental issues, you should recognize that site exploration identifies actual subsurface conditions at those points where samples are taken, at the time they are taken. The data derived are extrapolated by the consultant, who then applies judgment to render an opinion about overall subsurface conditions; their reaction to construction activity; appropriate design of foundations, slopes, impoundments, and recovery wells; and other construction and/or remediation elements. Even under optimal circumstances, actual conditions may differ from those inferred to exist, because no consultant, no matter how qualified, and no subsurface program, no matter how comprehensive, can reveal what is hidden by earth, rock, and time.

DEVELOP THE SUBSURFACE EXPLORATION PLAN WITH CARE.

The nature of subsurface explorations—the types, quantities, and locations of procedures used—in large measure determines the effectiveness of the geotechnical/environmental report and the design based upon it. The more comprehensive a subsurface exploration and testing program, the more information it provides to the consultant, helping to reduce the risk of unanticipated conditions and the attendant risk of costly delays and disputes. Even the cost of subsurface construction may be lowered.

Developing a proper subsurface exploration plan is a basic element of geotechnical/environmental design, which should be accomplished jointly by the consultant and the client (or designated professional representatives). This helps the parties involved recognize mutual concerns and makes the client aware of the technical options available. Clients who develop a subsurface exploration plan without the involvement and concurrence of a consultant may be required to assume responsibility and liability for the plan's adequacy.

READ GENERAL CONDITIONS CAREFULLY.

Most consultants include standard general contract conditions in their proposals. One of the general conditions most commonly employed is to limit the consulting firm's liability. Known as a "risk allocation" or "limitation of liability," this approach helps prevent problems at the beginning and establishes a fair and reasonable framework for handling them, should they arise.

Various other elements of general conditions delineate your consultant's responsibilities. These are used to help eliminate confusion and misunderstandings, thereby helping all parties recognize who is responsible for different tasks. In all cases, read your consultant's general conditions carefully and ask any questions you may have.

HAVE YOUR CONSULTANT WORK WITH OTHER DESIGN PROFESSIONALS.

Costly problems can occur when other design professionals develop their plans based on misinterpretations of a consultant's report. To help avoid misinterpretations, retain your consultant to work with other project design professionals who are affected by the geotechnical/environmental report. This allows a consultant to explain report implications to design professionals affected by them, and to review their plans and specifications so that issues can be dealt with adequately. Although some other design professionals may be familiar with geotechnical/environmental concerns, none knows as much about them as a competent consultant.

OBTAIN CONSTRUCTION MONITORING SERVICES.

Most experienced clients also retain their consultant to serve during the construction phase of their projects. Involvement during the construction phase is particularly important because this permits the consultant to be on hand quickly to evaluate unanticipated conditions, to conduct additional tests if required, and when necessary, to recommend alternative solutions to problems. The consultant can also monitor the geotechnical/environmental work performed by contractors. It is essential to recognize that the construction recommendations included in a report are preliminary, because they must be based on the assumption that conditions revealed through selective exploratory sampling are indicative of actual conditions throughout a site.

Because actual subsurface conditions can be discerned only during earthwork and/or drilling, design consultants need to observe those conditions in order to provide their recommendations. Only the consultant who prepares the report is fully familiar with the background information needed to determine whether or not the report's recommendations are valid. The consultant submitting the report cannot assume responsibility or liability for the adequacy of preliminary recommendations if another party is retained to observe construction.

REALIZE THAT ENVIRONMENTAL ISSUES MAY NOT HAVE BEEN ADDRESSED.

If you have requested only a geotechnical engineering proposal, it will not include services needed to evaluate the likelihood of contamination by hazardous materials or other pollutants. Given the liabilities involved, it is prudent practice to always have a site reviewed from an environmental viewpoint. A consultant cannot be responsible for failing to detect contaminants when the services needed to perform that function are not being provided.

ONE OF THE OBLIGATIONS OF YOUR CONSULTANT IS TO PROTECT THE SAFETY, PROPERTY, AND WELFARE OF THE PUBLIC.

A geotechnical/environmental investigation will sometimes disclose the existence of conditions that may endanger the safety, health, property, or welfare of the public. Your consultant may be obligated under rules of professional conduct, or statutory or common law, to notify you and others of these conditions.

RELY ON YOUR CONSULTANT FOR ADDITIONAL ASSISTANCE.

Your consulting firm is familiar with several techniques and approaches that can be used to help reduce risk exposure for all parties to a construction project, from design through construction. Ask your consultant, not only about geotechnical and environmental issues, but others as well, to learn about approaches that may be of genuine benefit.

The preceding paragraphs are based on information provided by the
ASFE/Association of Engineering Firms Practicing in the Geosciences, Silver Spring, Maryland