

March 17, 2023

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

RE: PROPOSAL FOR INSTRUMENTATION AND MONITORING PLAN DEVELOPMENT,
RAILROAD DOCK LANDSLIDE, SKAGWAY, ALASKA

Dear Mr. Ryan:

We are pleased to submit herein our proposal and estimated costs for providing services related to instrumentation of the railroad dock landslide. Based on recent meetings between the Municipality of Skagway (MOS), White Pass & Yukon Route Railway (WP), and cruise industry representatives, we understand that the MOS will be taking responsibility for maintenance and monitoring of the instrumentation on the slope. This will include re-establishing the top of slope instrumentation, monitoring the collected data, and developing plans associated with reacting to movements observed in the slope. You have requested that Shannon & Wilson provide support services to facilitate these activities.

SCOPE OF SERVICES

The services described in this proposal consist of tasks associated with the re-establishment of instrumentation on the top of the slope. The general scope items are described below.

- **Review of existing instrumentation and development of new instrumentation plan.** The instrumentation system at the top of the slope was developed by Haley & Aldrich under contract to WP. We will review the system and evaluate if changes should be made to it before re-establishing the instruments. Changes may include realignment of extensometers or addition of new extensometers and/or tilt meters. We will also consider other additional types of instruments and make recommendations as appropriate. We will conduct an evaluation of the remote monitoring system (Sensemetrics) and ensure that an appropriate reading frequency

and notification system is in place, and make adjustment recommendations as needed.

- **Installation of instrumentation.** We will mobilize to the site and oversee the installation of the instrumentation on the top of the slope. The instruments to be installed will include existing instruments that were temporarily decommissioned to facilitate installation of rockfall protection, as well as new instrumentation if deemed necessary. If new instrumentation is deemed necessary, we assume that it will be purchased by MOS or WP. Note that additional power delivery equipment may be needed depending on the system demands and reading frequency needed which we assume would also be purchased by others. We assume that Rock Supremacy (RS) will support establishing instrument anchors and other construction support as necessary. We also assume that the MOS will contract directly with an electrical contractor to provide services to support power distribution from battery backup and solar cells at the instrument locations.
- **Monitoring plan.** We will develop a plan for monitoring the instrumentation installed on the slope, inclusive of the total station that will be installed at the base of the slope. The plan will establish responsibilities and frequencies for observing the instrument data. The plan will also establish trigger limits for various levels of movement that is measured by the instruments. The monitoring plan will include protocols for visual inspection in the event that instrumentation functioning is interrupted or in the event that anomalous readings are recorded. The monitoring plan will also inform the development of the operations plan.
- **Operations plan support.** We will assist the MOS in developing an operations plan related to instrumentation monitoring. Using the trigger limits established in the monitoring plan, we will assist the MOS in establishing action protocols for various slope failure scenarios. We will assist in developing a decision tree on how and when to limit use of the dock and areas below the slope. We will also assist by approximating exclusion zones that should be established for the various action events.

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. Note that the effort included in this proposal is approximated based on current knowledge of the slope and instrumentation system anticipated to be deployed. If, during the course of our work, we determine that additional effort is needed or if an adjustment to our scope is necessary, we will inform you and negotiate the appropriate adjustments. 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. Instrumentation Plan Development						\$7,520
Vice President (Kyle)	8	hrs. x	\$240 /hr.	=	\$1,920	
Associate (Rex)	16	hrs. x	\$190 /hr.	=	\$3,040	
Instrumentation Specialist	16	hrs. x	\$160 /hr.	=	\$2,560	
2. Instrumentation Installation						\$55,606
Vice President (Kyle)	4	hrs. x	\$240 /hr.	=	\$960	
Associate (Rex)	48	hrs. x	\$190 /hr.	=	\$9,120	
Instrumentation Specialist	96	hrs. x	\$160 /hr.	=	\$15,360	
Airfare (for S&W field crew)	2	x	\$1,500 each	=	\$3,000	
Lodging (total nights in Skagway for S&W)	12	nights x	\$200 /night	=	\$2,400	
Perdiem (for S&W crew including travel days)	14	days x	\$69 /day	=	\$966	
Contractor - Construction Support	4	days x	\$3,450 /day	=	\$13,800	
Expendables	1	est.	\$10,000 each	=	\$10,000	
3. Monitoring Plan Development						\$19,120
Vice President (Kyle)	8	hrs. x	\$240 /hr.	=	\$1,920	
Associate (Rex)	40	hrs. x	\$190 /hr.	=	\$7,600	
Instrumentation Specialist	60	hrs. x	\$160 /hr.	=	\$9,600	
4. Operations Plan Support						\$19,400
Vice President (Kyle)	20	hrs. x	\$240 /hr.	=	\$4,800	
Associate (Rex)	60	hrs. x	\$190 /hr.	=	\$11,400	
Instrumentation Specialist	20	hrs. x	\$160 /hr.	=	\$3,200	
5. Meetings/Coordination						\$8,600
Vice President (Kyle)	20	hrs. x	\$240 /hr.	=	\$4,800	
Associate (Rex)	20	hrs. x	\$190 /hr.	=	\$3,800	
						Total = \$110,246



Date: March 2023
To: Mr. Brad Ryan
Skagway Rock Slide Instrumentation

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