SHANNON & WILSON, INC.
GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS

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March 1, 2006

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RE: GEOTECHNICAL EXPLORATION PLAN, ONSHORE SITES, EAST SIDE KNIK ARM CROSSING, UPPER COOK INLET, ALASKA

This letter presents our geotechnical exploration plan and proposed schedule in support of the Knik Arm Crossing project in Upper Cook Inlet, Alaska. The work described in this letter is for filling two principal data gaps on approach to the east side of the Knik Arm Crossing. The approach will need to transition through Government Hill and the current concept favored for this portion of the project is a deep braced cut beneath Degan or Erickson Street. The bulk of the explorations proposed herein are focused on characterizing the subsurface conditions of Government Hill for design of this braced cut. The second data gap to be filled by the explorations proposed herein involve the subsurface conditions on the east shore of Knik Arm, north of Cairn Point; we proposed a boring at this location to gather shear wave velocity measurements for seismic design and to extend the geologic profile from the offshore borings at the bridge site to the east bluff.

Shannon & Wilson has been provided with a conceptual alignment that includes a stationed centerline and proposed bridge abutment locations for the Knik Arm Crossing structure and approach causeways. The plan also includes generalized information regarding the landside alignment areas. Assumptions regarding site access and other coordination were made in developing a cost estimate for this work and are described in more detail below. If conditions in the field are encountered that are not consistent with our assumptions (i.e. the site is not accessible with the proposed equipment or private property owners are not amenable to access) additional funding may be required to address these issues.

PROPOSED APPROACH

The following describes our proposed approach for evaluating subsurface conditions for this phase of the project. Our proposed approach is generally consistent with the Alaska

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Department of Transportation and Public Facilities (ADOT&PF) requirements for a major structure study. We envision our field explorations will consist of three major tasks: 1) Government Hill explorations, 2) Knik Arm shoreline drilling, and 3) laboratory testing.

Government Hill Explorations

We propose to explore the subsurface conditions for a braced cut extending through Government Hill with a series of soil borings spaced at 300 foot intervals alternating on the east and west sides of the alignment. The borings will extend from the former Defense Fuel Support Point-Anchorage (DFSP-A) bulk terminal on the north side of Government Hill to the portal structure on the south side of Government Hill, which roughly corresponds with the toe of the 1964 Government Hill Landslide. Our explorations will start with utility locates and procurement of right-of-way permits including provisions for traffic control during drilling. Boring locations will be adjusted as needed to avoid conflicts with buried utilities.

An Erickson Route Profile drawing is attached to provide a summary of existing information along a potential cut following an Erickson Street alignment. Based on our experience with Government Hill soils, the conditions beneath Degan Street would likely be similar to the Erickson Street profile with the principal difference being that a longer cut would be needed, which could require additional borings. As is evident on the Erickson Street profile, the soils typically consist of a cap of sand or sand and gravel overlying silty sand, silt, and clay. The granular soils are recessional outwash deposited during the retreat of the Naptowne glaciation. The deeper fine-grained soils comprise the Bootlegger Cove Formation and are known to extend over 100 feet deep based on prior explorations. Groundwater is typically perched in the outwash close to the clay contact. No bedrock is expected within several hundred to one thousand feet of the ground surface. We plan to advance our borings an average of 60 feet below the ground surface through the outwash and into the clay, which will provide sufficient information for design of a braced cut or potentially for other tunneling schemes as appropriate.

Each boring will be accomplished using a truck-mounted soil test drill rig equipped with hollow stem auger drilling gear. Standard Penetration Test drive samples will be generally taken at 5-foot intervals in mineral soils. Thin-wall tube (Shelby tube) sampling techniques will be used to collect undisturbed samples of the fine-grained soils of the Bootlegger Cove Formation toward the bottom of the borings. All soil samples will be sealed in air tight containers and transported to our laboratory for testing, as necessary. After each boring is completed, our driller

will remove the auger and backfill the borehole with auger cuttings periodically hand tamped in place. Where borings penetrate through asphalt pavements, the pavement will be repaired with asphalt cold patch material. Note that borings in the former DFSP-A bulk tank farm could encounter soil contaminated with petroleum hydrocarbons. Based on our prior experience at DFSP-A, we believe the soil samples recovered on the former tank farm should be field-screened with a photo-ionization detector as an indicator of potential contamination and a small quantity of environmental samples should be submitted to an analytical laboratory to confirm contaminant type and concentration. We plan to backfill borings on DFSP-A with auger cuttings, which we believe is appropriate for the site under current ADEC regulations.

An experienced geotechnical engineer or geologist will be present on site during drilling to select drilling locations, monitor drill action, classify encountered soils, log the subsurface conditions, and screen and collect soil samples. Classification of soil samples will be consistent with the State of Alaska DOT standards described in the October 2003 Geotechnical Procedures Manual. Actual boring locations will be marked in the field with survey lath and the location will be noted relative to alignment centerline both vertically and horizontally. We assume that the locations are reasonably and safely accessible with the truck mounted drill rigs.

Knik Arm Shoreline Explorations

We propose to explore the subsurface conditions on the beach on the east side of the Knik Arm Crossing with a single boring extending to approximately 200 to 250 feet deep. This boring should define the conditions on the east side of the crossing much like a deep boring in the high beach area on the west side of the crossing did in 2005. The boring location will be accessed from the beach zone on the north side of the Port of Anchorage and traversing the beach north past Cairn Point to a location north of the "elephant cage" antenna on Fort Richardson, Alaska. We will need to coordinate with U.S. Army personnel for permission to access the site and for clearance of possible unexploded ordinance on the beach (an artifact of prior landfill activities). We will also coordinate with the U.A. Army Corps of Engineers for a Nationwide #6 permit prior to drilling.

Prior experience with drilling on the beach south of the planned boring location (Boring A-7 drilled by Shannon & Wilson in October 2003) encountered about 120 feet of hard gravelly, sandy, silty clay or very dense silty, gravelly sand (interpreted to be glacial till) overlying stiff to hard silty clay (interpreted to be glacial lake clay of the Bootlegger Cove Formation). The lateral

and vertical extent of the Bootlegger Formation is uncertain at the east side of the crossing as is the appropriate shear wave velocity for seismic design. Therefore, the proposed boring is intended to penetrate into the Bootlegger Formation, if present, and facilitate installation of a casing for measuring shear wave velocities.

We plan to subcontract the drilling services to Discovery Drilling of Anchorage, Alaska. Discovery Drilling provided crews and equipment for prior drilling programs in 2003 and 2005 and has demonstrated their ability to handle difficult site logistics, recover quality soil samples, and install casing for shear wave velocity testing. Discovery Drilling will provide a track-mounted soil test drilling rig equipped with hollow-stem auger. Soil sampling gear will include standard penetration test (SPT) equipment and thin-wall tube (Shelby Tube) samplers for the granular soils and predominantly fine-grained soils, respectively. All soil samples will be sealed in air tight containers and transported to our laboratory for testing, as necessary. After the boring is completed, our driller will install indexed 75mm Slope Indicator casing through the hollow-stem auger and grout it in place as the auger is being removed to within about 10 feet of the ground surface with a cement-bentonite grout. The remainder of the borehole will be filled with auger cuttings with the excess cutting to be landspread on the beach at the drill site.

An experienced geotechnical engineer or geologist will be present on site during drilling to select the drilling location, monitor drill action, classify encountered soils, log the subsurface conditions, and collect soil samples. Classification of soil samples will be consistent with the State of Alaska DOT standards described in the October 2003 Geotechnical Procedures Manual. The actual boring location will be recorded with a hand-held GPS instrument; the location could be surveyed more accurately at a later date if needed by referencing the seismic casing installed in the hole. We assume that the boring location is reasonably and safely accessible with the track mounted drill rig.

After the borehole is completed and the casing grout has set, we will remobilize to the drill site with Northland Geophysical to conduct a downhole seismic velocity survey that will determine the in-situ shear-wave velocities of the subsurface soils to a depth of approximately 150 feet below the ground surface. Shear waves will be generated by striking the end of a beam placed on the ground close to the borehole location. Downhole seismic wave arrivals will be recorded by a triaxial geophone transducer indexed to the casing with data recorded on a 24-channel digital seismograph.

Laboratory Testing

Laboratory tests will be performed on soil samples to evaluate the material and foundation behavior characteristics of the material encountered. We anticipate that soil samples will be tested for natural water content, grain-size distribution, Atterberg Limits, unconfined compressive strength, and unconsolidated-undrained triaxial compression tests as appropriate. We will plan to adjust the types of tests and the testing program based on the actual conditions encountered. AASHTO procedures will generally be followed for all soils and rock testing.

SCHEDULE

We anticipate that we can begin work on this phase of the project, including coordinating with subcontractors listed above, within 1 to 2 weeks of notice to proceed. For planning purposes, we selected the beginning of April for explorations on Government Hill. The Knik Arm shoreline boring cannot be drilled under winter conditions when ice cake litters the beach and prevents access to the drill site. However, we anticipate that the boring location can be accessed on or around the beginning of May, which we used for planning purposes. Assuming that all site access and permits are acquired in a timely manner, the table below indicates an approximate schedule assuming a September 6 start date for the tasks outlined above.

Task	Start Date	Duration	End Date
Government Hill	April 3	12 days	April 18
Knik Arm Shoreline	May 1	10 days	May 12
Laboratory Testing	April 10	NA	June 2
Draft Data Report	April 24	60 days	June 30
Final Data Report	July 31	14 days	August 14

Laboratory testing will be conducted concurrently with explorations and should be completed roughly two to three weeks after explorations are complete. Throughout this project, we will work closely with your engineers and provide preliminary information on a continuing basis as it is developed by our studies. We will also notify you if unexpected conditions are encountered in the field so that the scope of services and/or the budget can be adjusted accordingly.

CLOSURE AND LIMITATIONS

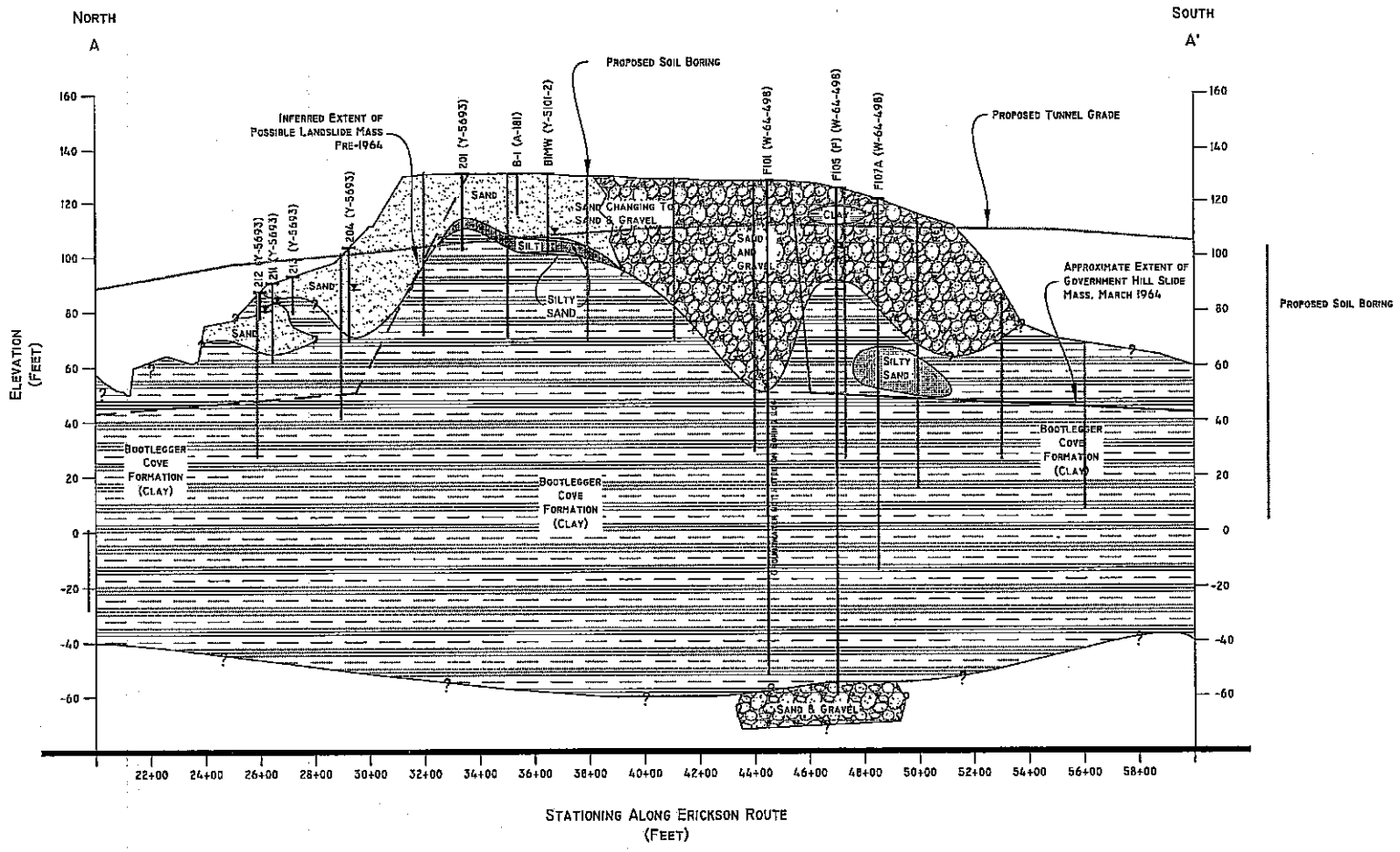
The geotechnical exploration plan and schedule included herein are contingent upon assumptions described above should be considered approximate. As this is a relatively large project, there is a significant possibility that some of the assumptions made in the planning stages may not be accurate. These conditions will only be discovered in the field by conducting the work and some adjustments should be expected as the work unfolds. We will strive to maintain communication with you as the work proceeds so that if unexpected conditions arise, the above plan can be adjusted so that the project needs are met and the work is completed within the approved budget limitations.

If you have any questions or comments or wish to revise this exploration plan, please contact the undersigned or Stafford Glashan. We look forward to the opportunity to work with you on this project and believe that our firm can provide you with the necessary geotechnical information to support the ongoing development of this project.

Sincerely,

SHANNON & WILSON, INC.

William S. Burgess, P.E.
Senior Associate



NOTES

1. PROFILE ADAPTED FROM DRAWINGS PROVIDED BY PND, INC.
2. STATIONING ALONG ERICKSON STREET IN 200-FOOT INTERVALS.
3. BORING NUMBER FOLLOWED BY SHANNON & WILSON, INC. PROJECT NUMBER IN PARANTHESES.
4. GROUNDWATER LEVELS NOTED DURING 1964 INVESTIGATIONS MAY VARY DUE TO ENVIRONMENTAL CHANGES AND/OR SEASONAL VARIATIONS.

0 200 400 800
APPROXIMATE SCALE IN FEET

KNIK ARM CROSSING
ANCHORAGE, ALASKA

ERICKSON ROUTE BORING LOCATION

MARCH 2006 32-2-03298

SHANNON & WILSON, INC. Geotechnical & Environmental Consultants

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