

1. **Responsibilities of Consultant.**

- A. **Project Location.** Services provided under this Agreement shall apply to various projects located throughout the State of Wyoming. The individual project locations shall be identified in each Project Work Directive to be issued by WYDOT on an as-needed basis throughout the term of this Agreement.
- B. **Project Work Directives.** WYDOT's Geology Program may engage the Consultant by issuing a Project Work Directive to provide the necessary geotechnical design services for various projects located throughout the State. An individual Project Work Directive shall be executed for each specific project or group of projects assigned to the Consultant, and will thereby become a part of this Agreement.

The required deliverables and timeframes shall be outlined in each Project Work Directive.

- C. **Scope of Work.** The professional services to be provided by the Consultant under this Agreement includes options to provide subsurface investigations; installing groundwater monitoring wells and inclinometers; laboratory testing of samples; and final Geology Report with written recommendations. This work shall be completed in accordance with WYDOT Geology Manual, WYDOT Materials Testing Manual, WYDOT Policies and procedures, and applicable federal or Wyoming State Laws, Guidelines and Standards. The scope of work for individual projects shall be identified in the Project Work Directive from the options below.

Option 1: Subsurface Investigation

Provide subsurface investigations which may include, but not limited to, roadway profiles, drainages, structures (bridges, sign structures, retaining walls, box culverts etc), and borrow sources in addition to installing, sampling and testing groundwater monitoring wells and inclinometers. The consultant may be responsible for performing laboratory testing or may only be responsible for providing subsurface investigations for WYDOT laboratory testing as specified in the project work directive. If WYDOT laboratory testing is specified, a WYDOT Geologist will assist in the subsurface investigations.

The subsurface investigations shall be completed in accordance with WYDOT Geology Manual and latest edition of the AASHTO LRFD Bridge Design Specifications as applicable. Drill hole depths may exceed 100 feet and may encounter unconsolidated deposits and variable types of bedrock. Sampling and drilling shall include coring in soil and rock, Standard Penetration Testing, and Shelby tube sampling. Test holes shall be sampled for the presence of soil contaminants in known areas of contamination, as determined by WYDOT.

Obtain alkali samples for all drainage locations and structures in accordance with the WYDOT Materials Testing Manual, and submit samples to the Consultant's project materials lab.

Instrumentation to be installed shall include PVC groundwater monitoring wells, and 1.9-2.75 inch outside diameter inclinometer casing.

A consultation meeting shall be held with the Geology Program at the request of the Consultant to determine scope of investigation(s) and testing requirements prior to performing geotechnical investigations.

Coordinate Traffic Control with WYDOT Geology Program and WYDOT District Offices in advance of anticipated investigations. Conduct utility locates prior to investigations.

Equipment for mobilizing, drilling, sampling, testing, installing groundwater monitoring wells, installing inclinometers and accessing the sites shall be provided by the Consultant including necessary water trucks for drilling operations.

Option 2 – Laboratory Testing

Provide geotechnical testing of soils and bedrock samples collected during field investigations in accordance with WYDOT Geology Manual and in accordance with industry standards. Testing may be required from samples collected from consultant Subsurface Investigations or samples collected by WYDOT Subsurface Investigations as noted in the project work directive. Laboratory testing shall be capable of performing Consolidation Tests (ASTM D2435 and AASHTO T216); Settlement Potential and Swell Testing (ASTM D 4546-90); Direct Shear Test (ASTM D 3080-90 and AASHTO T236); Unconfined Compression Test (ASTM D 2166-91 and AASHTO T208); Triaxial Compression Tests including Unconsolidated Undrained Test (ASTM D 285-87 and AASHTO T296), Consolidated Undrained Test (ASTM 4767 and AASHTO T297), and Consolidated Drained Test (ASTM D 4767 and AASHTO T297)

Soil classifications shall be determined using both the AASHTO and ASTM systems. In addition to classification, swell potential and moisture sensitivity, soils profiles shall include "R" values.

Option 3 – Final Geology Report and Log Boring Sheet.

Provide written recommendations for proposed structure work; grading recommendations including specific recommendations for backslope design, subgrade repair, and other miscellaneous Geology tasks.

Recommendations for structures shall be determined using latest edition of

AASHTO LRFD Bridge Design Specifications including applicable resistance factors. Recommendations for box culverts and pipes shall include provisions for obtaining at least 1 TSF of allowable bearing capacity. (Normal site preparation or subexcavation)

Provide log boring sheets for bridge structures and retaining walls. Final reports and log boring sheets shall be directed to the Chief Engineering Geologist for review and approval. Upon final review and editing, the Final Geology Report shall be sealed by a Professional Geologist or Professional Engineer registered in the State of Wyoming.

2. Responsibilities of WYDOT.

A. Data Available from the State. The State shall furnish to the Consultant all pertinent data necessary to perform the contract work as described in this Agreement including, but not limited to:

- (i) Plan view of proposed drill locations.
- (ii) Photos of proposed drill locations.
- (iii) Any known drill hole information from test holes close to drill location.

B. Services Provided by the State. The State shall provide the following:

- (i) Any necessary traffic control during the placement of the drill and during drilling operations as needed.
- (ii) Water sources necessary for drilling operations.