ADDENDUM NO. 1
BECLABITO COMMUNITY HELIPORT
MARCH 26, 2024

TO: All Planholders

RE: Schedule I - Basic Heliport (Day Operations Only) ACI No. 216767
Schedule II - Access Road (1,650 LF)
Schedule III - Extra Safety Precautions
Schedule IV - Nighttime Helipad (Night Operations Option)

The following Addendum shall be incorporated into the Contract Documents for the above-referenced project and shall supersede all contrary and conflicting information, which are hereby supplemented or revised in certain particulars in the following:

I. CONTRACT DOCUMENTS

A. INVITATION FOR BIDS - A change in Bid dates:

Sealed bids for improvements to the Beclabito Community Heliport, ACI No. 216767, will be received by the Navajo Nation at the Navajo DOT Complex, #16 Old Coalmine Road in TSE Bonito, NM until 3:00 p.m. on April 8, 2024 (local time/Windowrock). The bid evaluation will be held April 9 - 11, 2024 and the bid will be awarded on April 16, 2024.

B. STATE WAGE RATES

Navajo Labor Relations Prevailing Wage Rates Sheets shall be added to the project. See attached sheets.

II. CLARIFICATIONS

Q) Can you add a borrow item?
A.) This is predominantly a fill project approximately 1050 CY of cut and 2650 CY of fill our specifications P-152 states that we will bid the largest quantity which is fill. Please incorporate the cost to haul the material into your embankment item.

Q) Due to Sub invoicing, it may conflict with the way the Navajo tribe pays for mobilization. Can you add a staking item?
A.) In Special Provision SP Section 10 it states that staking and testing will be paid by the Contractor. These costs should be incorporated into your Mobilization cost or within your bid items.

Q) Due to Sub invoicing, it may conflict with the way the Navajo tribe pays for mobilization. Can you add a material testing item?
A.) In Special Provision SP Section 10 it states that staking and testing will be paid by the Contractor. These costs should be incorporated into your Mobilization cost or within your bid items.

Q) Due to Sub invoicing, it may conflict with the way the Navajo tribe pays for mobilization. Can you add a material SWPPP item?

A.) Please see Specification C-102 - it states that the SWPPP and Temporary Air and Pollution Soil Erosion and Siltation control are incidental to the project. Please incorporate these cost within your mobilization or within your bids items.

Q) Can you attach Navajo nation wage type to addendum #1?

A.) The current Navajo Nation wage rates will be attached to this addendum.

Q) Due to Sub invoicing, it may conflict with the way the Navajo tribe pays for mobilization. Can you add a material Seeding item?

A.) We do not have a seeding specification or items for this project. No seeding is needed.

Each Bidder shall acknowledge receipt of this Addendum No. 1, dated March 26, 2024, on Proposal page P-9 in the space provided.

END OF ADDENDUM NO. 1

ARMSTRONG CONSULTANTS, INC.

Tim Archibeque
New Mexico State Program Manager

Attachments: New Mexico Wage Rate sheets (2 pages)
Pre-Bid Sign-In Sheet
Geotechnical Engineering Report

February 31, 2024 AD24-219

Priscilla Lee, Senior Program and Project Specialist
NAVAJO DIVISION OF TRANSPORTATION
Post Office Box 4620
Window Rock, Arizona 86515

RE: BECLABITO CHAPTER HELIPAD & ACCESS ROAD

Dear Ms. Lee:

The Office of Navajo Labor Relations (ONLR) received your request for prevailing wage rates for the above reference project. Please find attached the ONLR wage rates which are applicable to the highway/utilities construction project.

Pursuant to the NPEA Section 607(B)(1) "...In all cases where construction is contemplated for which prevailing wage rates have not been set, the contract letting entity shall submit to ONLR a written request for a project prevailing wage scale. Such request shall be submitted not less than 60 days prior to the scheduled date for bid solicitation and shall include detailed information on the anticipated construction classifications, nature' of the project and completion plans..."

The ONLR respectfully requests that Navajo Division of Transportation to review the requirements of the Navajo Preference in Employment Act (NPEA) before any work begins. If a Pre-Construction Conference is scheduled, the Fort Defiance ONLR Office (928) 871-7429 is to be notified and a representative will explain the applicable laws to the general contractor and subcontractors, where necessary.

Should you have any questions, contact our office at (928) 871-6800. Thank You.

Sincerely,

Michael Armijo, Delegated Program Manager II
OFFICE OF NAVAJO LABOR RELATIONS

CONCURRENCE:

Ronald M. Curtis, Program Manager I

11/3/24
Date

ATTACHMENTS

OFFICE OF NAVAJO LABOR RELATIONS
PREVAILING WAGE

Wage Decision: ONLR24-0665HU Date Issued: January 31, 2024

HIGHWAY / UTILITIES CONSTRUCTION

Highway / Utilities Construction includes the construction, alteration or repairs of roads, streets, highways, runways, parking areas and most other paving work and/or electrical transmission/water lines, substations and site preparations which are part of streets, highway, utility and light engineering projects.

BECLABITO CHAPTER HELIPAD & ACCESS ROAD
NAVAJO DEPARTMENT OF TRANSPORTATION

Effective January 1, 2024

Trade Classifications:	Hourly Rate:
Carpenter	$ 24.18
Cement Mason	$ 21.09
Concrete Finisher	$ 22.18
Electrician	$ 24.54
Flagger	$ 15.69
Ironworker	$ 25.62
Laborer	$ 17.77
Mechanic	$ 22.51
Painter	$ 21.43
Plumber	$ 24.36
Truck Drivers:	**Hourly Rate:**
Dump Truck	$ 20.78
Tank Truck	$ 20.26
Water Truck	$ 20.91
Equipment Operators:	**Hourly Rate:**
Backhoe	$ 22.10
Blade	$ 22.51
Bloom	$ 20.86
Bulldozer	$ 22.51
Compactor (Rubber/Steel)	$ 20.87
Crane	$ 23.69
Driller	$ 24.87

Forklift	$ 20.15
Front End Loader	$ 20.15
Laydown Machine	$ 22.51
Motor Grader	$ 22.51
Paver	$ 21.16
Roller	$ 20.87
Scraper	$ 22.21
Track Hoe	$ 22.21
Trencher	$ 22.21

The rates listed above are required minimum ONLR Prevailing Wage Rates. Contractors may pay rates above these rates. The ONLR Director will add wage rates for unlisted classifications needed for work only after review and approval. Overtime is one and one - half time the basic rate for hours worked over forty hours in one week. Foremen will receive an additional $5.99 per hour. **Where Federal Funds are involved, the Davis-Bacon rates apply.** Other exceptions may apply in accordance with the *Navajo Preference in Employment Act (NPEA),* Section 7(E). Apprentices must be enrolled in a recognized apprenticeship program as required by Section 7(A)(6) of the NPEA. The appropriate apprenticeship program as outlined by the NPEA Section 7(E)(7) will govern wage rates for such apprentices. These wages apply only to the **BECLABITO CHAPTER HELIPAD & ACCESS ROAD** construction project.

APPROVED:

Ronald M. Curtis, Program Manager I

1/31/24
Date

REVISED 01/02/2043 marmijo

NAVAJO DIVISION OF TRANSPORTATION

POST OFFICE BOX 3690
WINDOW ROCK, ARIZONA 86515

TEL: 505.371.8300
FAX: 505.371.8399

Beclabito Helipad Pre-Bid

BID NO. 24-02-3258LE

March 21, 2024
11:00 AM

NAME	CONTACT INFORMATION
JOSE Lopez	505-304-6939 J.Lopez@MERIDIANCON.NET
Brian Tsingine Navajo DOT	briant@navajodot.org 505-371-8352
Priscilla Lee NavajoDOT	plee@navajodot.org
Hazel Sherman	hsherman@nataanii.org
Daniel Fury	dfury@WCACconstruction.com (970) 749-4734
Derrick Joe	D.Joe@arrowindian.com
Susie John	susie.john@navahochapters.org
Tim Archibegue	tarch.begue@armstrongconsultants.com

GEOTECHNICAL ENGINEERING REPORT
BECLABITO HELIPORT
BECLABITO, NEW MEXICO

Submitted To:

Tim Archibeque, P.E.
Armstrong Consultants, Inc.
2201 Buena Vista Drive SE, Suite 204
Albuquerque, New Mexico 87106

Submitted By:

GEOMAT Inc.
915 Malta Avenue
Farmington, New Mexico 87401

September 6, 2022
GEOMAT Project 222-4082

GEOMAT INC
915 Malta Avenue ◆ Farmington, NM 87401 ◆ Tel (505) 327-7928 ◆ Fax (505) 326-5721

September 6, 2022

Tim Archibeque, P.E.
Armstrong Consultants, Inc.
2201 Buena Vista Drive SE, Suite 204
Albuquerque, New Mexico 87106

RE: Geotechnical Engineering Study
Beclabito Heliport
Beclabito, New Mexico
GEOMAT Project No. 222-4082

GEOMAT Inc. (GEOMAT) has completed the geotechnical engineering study for the proposed heliport located in Beclabito, New Mexico. This study was performed in general accordance with our Proposal No. 222-06-13R, dated June 7, 2022.

The results of our engineering study, including the site plan, boring records, and laboratory test results are attached. Based on the geotechnical engineering analyses, subsurface exploration and laboratory test results, the existing subgrade soils and rock consist of silty sands underlain by sandstone and limestone. Other requested details, based upon geotechnical conditions, are presented in the report.

We have appreciated being of service to you in the geotechnical engineering phase of this project. If you have any questions concerning this report, please contact us.

Sincerely yours,
GEOMAT Inc.

Douglas N. Hood
Staff Professional

Matthew J. Cramer, P.E.
President, Principal

Copies to: Addressee (1)

TABLE OF CONTENTS

GEOTECHNICAL ENGINEERING REPORT
BECLABITO HELIPORT
BECLABITO, NEW MEXICO
GEOMAT PROJECT NO. 222-4082

INTRODUCTION

This report contains the results of our geotechnical engineering exploration and laboratory testing for the proposed heliport located in Beclabito, New Mexico, as shown on the Site Plan in Appendix A of this report.

The purpose of these services is to provide information and geotechnical engineering recommendations about:

- subsurface soil conditions
- groundwater conditions
- laboratory test results
- drainage

The opinions and recommendations contained in this report are based upon the results of field and laboratory testing, engineering analyses, and experience with similar soil conditions, structures, and our understanding of the proposed project as stated below.

PROPOSED CONSTRUCTION

We understand that the project will consist of the construction of a new concrete helipad, base course access road, fencing, and associated improvements. The proposed site is currently undeveloped. Final concrete and pavement section design will be by others.

SITE EXPLORATION

Our scope of services performed for this project included a site reconnaissance by a GEOMAT staff professional, a subsurface exploration program, laboratory testing, and engineering analyses.

Field Exploration:

Subsurface conditions at the site were explored on June 27, 2022 by drilling three (3) exploratory borings at the approximate locations shown on the Site Plans in Appendix A. The number of borings and the boring locations were chosen by Armstrong Consultants, Inc. (Armstrong) prior to our exploration. The borings, designated B-1 through B-3, had planned depths of 15 feet

below existing surface grade. Boring B-1 was drilled near the existing roadway. Borings B-2 and B-3 were drilled in the vicinity of the proposed helipad.

The borings were continuously monitored by a staff professional from our office who examined and classified the subsurface materials encountered, observed groundwater conditions, and maintained a continuous log of each boring. Representative bulk samples of the subgrade soils were obtained from the auger cuttings from each boring.

In addition to the bulk samples, we also obtained drive samples from selected borings using a combination of standard 2-inch O.D. split spoon and 3-inch O.D. ring-lined barrel samplers. The samplers were driven using a 140-pound hammer falling 30 inches. The standard penetration resistance was determined by recording the number of hammer blows required to advance the sampler in six-inch increments.

Groundwater evaluations were made in each boring at the time of site exploration. Soils were classified in accordance with the Unified Soil Classification System described in Appendix A. Logs of the borings were prepared and are presented in Appendix A.

SITE CONDITIONS

The project site is located in Beclabito, New Mexico to the northeast of the Chapter House. The entrance to proposed project site is located on the north side of US Highway 64 approximately 1,225 feet east of the intersection of U.S. Highway 64 and the turnoff to the Chapter House. The existing roadway is single lane with gravel surfacing that leads to a cemetery and water storage area. The site of the proposed heliport is along an offroad trail, that splits off from the existing roadway and goes to the top of a hill. The ground surface for the existing roadway has a slight decreasing slope from U.S. Highway 64 to a drainage channel, then a slight increasing slope away from the drainage channel to the turn off on the offroad trail. From the offroad trail to the site for the heliport, there is a short steep increasing slope then relatively level ground. The site is vegetated with small to medium bushes and small to medium trees, with occasional gravel and cobbles at the surface.

The following photographs depict the typical conditions along the project alignment.

Drill Rig at Boring B-1
View to the North

Drill Rig at Boring B-2
View to the South

SUBSURFACE CONDITIONS

As presented on the Boring Logs in Appendix A, in boring B-1 we encountered a thin surficial layer of sandy soil that was underlain by sandstone that extended to 15 feet below ground surface (bgs). In boring B-2 and B-3, we encountered a thin layer of sandy soils with gravels that were underlain by limestone that extended to approximately 4 ½ feet bgs.

The surficial sandy soils were fine- to coarse-grained, and occasionally contained gravels. They ranged in color from red to brown with a moisture of slightly damp. The sandstone encountered was fine- to medium-grained with weak to moderate cementation and was slightly to highly weathered. The sandstone ranged in color from red to brown to tan, was medium dense to very dense, with a moisture of slightly damp to damp. The limestone encountered ranged in color from black to gray to white and had a moisture of slightly damp.

Groundwater was not encountered in any of the borings, though it should be noted that groundwater elevations can fluctuate over time depending upon precipitation, irrigation, runoff and infiltration of surface water. We do not have any information regarding the historical fluctuation of the groundwater level in this vicinity.

LABORATORY TESTING:

Samples retrieved during the field exploration were transported to our laboratory for further evaluation. At that time, the field descriptions were confirmed or modified as necessary, and laboratory tests were performed to evaluate the engineering properties of the subsurface materials. The following tests were performed on selected samples as requested in the Request for Proposal document provided by Armstrong:

- Moisture-Density of Ring Samples
- Chemical Analyses (soluble sulfate content)
- One-Dimensional Consolidation Properties of Soils (ASTM D4546)

Since rock was encountered at shallow depths in each boring, the samples collected consisted of highly disturbed material were not representative of in-situ conditions of the rock. As such, the classification and parameter tests originally requested in the Request for Proposal document provided by Armstrong were not conducted since the results of those tests would not be representative of the actual in-situ conditions. In addition, insufficient sample sizes of the surficial sandy soils were obtained due to the thin nature of this strata. As a result, the following tests were not conducted as a result of the shallow rock encountered on the site:

- Sieve Analysis (ASTM C136/ C117)
- Atterberg Limits (ASTM D4318)
- Soil Classification (ASTM D2487)

- California Bearing Ratio (CBR) (ASTM D1883)
- Hydrometer (ASTM D422/D7928)
- Moisture-Density Relationship (Proctor) (ASTM D1557)

Results of all laboratory tests conducted are presented in Appendix B.

Frost Susceptibility:

The design of pavements in areas subject to seasonal frost action requires special design consideration and the design of reconstructed pavement sections at the Beclabito Heliport should take into consideration the adverse effects of seasonal frost in accordance with FAA design recommendations (FAA 2016) Advisory Circular (AC) No. 150/5320-6E.

The detrimental effects of frost action may be manifested by non-uniform heave, loss of soil strength during frost melting, development of pavement roughness, and cracking and deterioration of the pavement surface. The conditions for detrimental frost action to occur are: 1) the soil is frost susceptible; 2) free moisture is available in sufficient quantities to form ice lenses; and 3) freezing temperatures penetrate into the frost susceptible soil.

As stated in the FAA AC document, "the frost susceptibility of a soil is dependent to a large extent on the size and distribution of voids in the soil mass. Voids must be of a certain critical size for the development of ice lenses. Empirical relationships have been developed correlating the degree of frost susceptibility with soil classification and the amount of material finer than 0.02 mm by weight. Soils are categorized into four frost groups for frost design purposes as defined in FAA AC150/5320-6F Table 2-2: Frost Group 1 (FG-1), FG-2, FG-3, and FG-4. The higher the frost group number, the more susceptible the soils, i.e., soils in FG-4 are more frost susceptible than soils in frost groups 1, 2, or 3".

For the purpose of frost design, the project site can primarily be categorized as Frost Group FG-1 due to the shallow rock with the small amount of surficial soil being considered FG-2. The samples were given an estimated Frost Group based off their visual classification per the ASTM D2488 the Unified Soil Classification System and their relationship to FAA AC150/5320-6F Table 2-2 below:

TABLE 2-2. Soil Frost Groups

Frost Group	Kind of Soil	Percentage Finer than 0.02 mm by Weight	Soil Classification
FG-1	Gravelly Soils	3 to 10	GW, GP, GW-GM, GP-GM
FG-2	Gravelly Soils Sands	10 to 20 3 to 5	GM, GW-GM, GP-GM SW, SP, SM, SW-SM, SP-SM
FG-3	Gravelly Soils Sands, except very fine silty soils Clays, PI above 12	Over 20 Over 15 - -	GM, GC SM, SC CL, CH
FG-4	Very fine silty sands All Silts Clays, Pi = 12 or less Varved Clays and other fine grained banded sediments	Over 15 - - -	SM ML, MH CL, CL-ML CL, CH, ML, SM

Soluble Sulfates:

Samples of rock from the borings were tested for soluble sulfates. Results of these tests are summarized in the following table.

Soluble Sulfates Test Results			
Sample No.	**Boring No.**	**Sample Depth (ft)**	**Sulfates (%)**
9541	B-1	0.5 to 5	0.41
9542	B-2	0.5 to 4.5	< 0.02

Opinions and Additional Considerations:

Construction of the concrete helipad is likely feasible based upon the geotechnical conditions encountered and tested for in this report. We anticipate that the concrete pad could be constructed directly on the bedrock perhaps with a base course leveling pad constructed between the top of the bedrock and concrete. Pavement sections utilizing aggregate base course over prepared subgrade and/or rock appears feasible based upon the geotechnical conditions

encountered and tested for in this report. As previously noted, final pavement section design for the project will be performed by others.

Site Drainage and Moisture Protection:

Positive site drainage should be provided during construction and maintained thereafter. The ground surface should be sloped away from pavements and concrete surfaces in a manner to allow positive flow away from the surfaces. At no times should water be allowed to pond on or adjacent to the paved or concrete surfaces.

GENERAL COMMENTS

It is recommended that GEOMAT be retained to provide a general review of final design plans and specifications in order to confirm that the recommendations in this report have been interpreted and implemented. In the event that any changes of the proposed project are planned, the opinions and recommendations contained in this report should be reviewed and the report modified or supplemented as necessary.

GEOMAT should also be retained to provide services during the construction phase of the work. Construction testing, including field and laboratory evaluation of fill, backfill, and pavement materials, should be performed to determine whether applicable project requirements have been met.

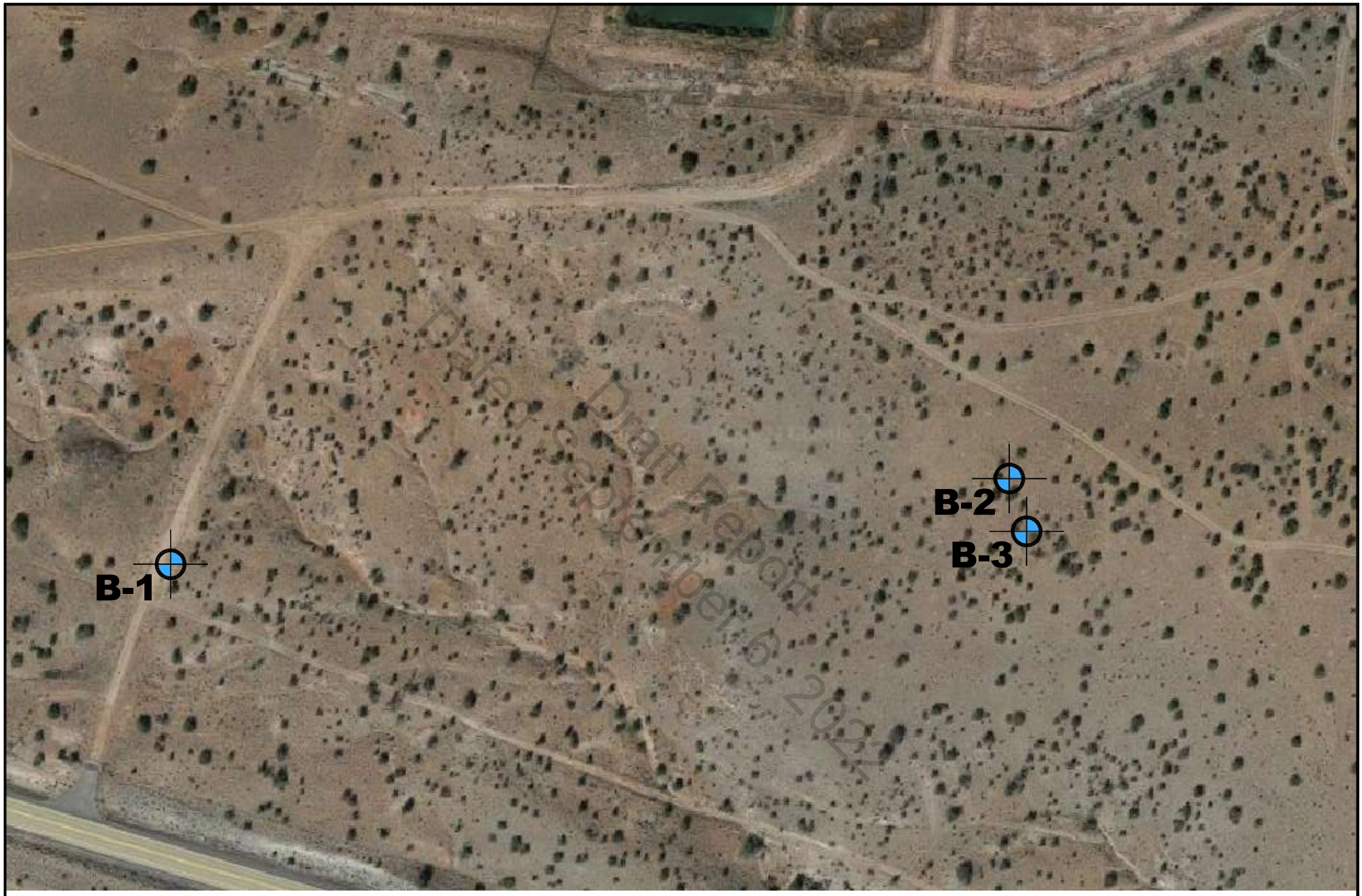
The analyses and recommendations in this report are based in part upon data obtained from the field exploration. The nature and extent of variations beyond the location of test borings may not become evident until construction. If variations then appear evident, it may be necessary to re-evaluate the recommendations of this report.

Our professional services were performed using that degree of care and skill ordinarily exercised, under similar circumstances, by reputable geotechnical engineers practicing in this or similar localities at the same time. No warranty, express or implied, is intended or made. We prepared the report as an aid in design of the proposed project. This report is not a bidding document. Any contractor reviewing this report must draw his own conclusions regarding site conditions and specific construction equipment and techniques to be used on this project.

This report is for the exclusive purpose of providing geotechnical engineering and/or testing information and recommendations. The scope of services for this project does not include, either specifically or by implication, any environmental assessment of the site or identification of contaminated or hazardous materials or conditions. If the owner is concerned about the potential for such contamination, other studies should be undertaken. This report has also not addressed any geologic hazards that may exist on or near the site.

This report may be used only by the Client and only for the purposes stated, within a reasonable time from its issuance. Land use, site conditions (both on and off site), or other factors may change over time and additional work may be required with the passage of time. Any party, other than the Client, who wishes to use this report, shall notify GEOMAT in writing of such intended use. Based on the intended use of the report, GEOMAT may require that additional work be performed and that an updated report be issued. Non-compliance with any of these requirements, by the Client or anyone else, will release GEOMAT from any liability resulting from the use of this report by an unauthorized party.

Appendix A



Approximate Not to Scale	SITE PLAN Boring Locations (approximate) GEOMAT Project No. 222-4082 Date of Exploration: June 27, 2022	PROJECT Beclabito Heliport Beclabito, New Mexico

GEOMAT INC.

GEOMAT INC.
915 Malta Ave
Farmington, NM 87401
Tel (505) 327-7928
Fax (505) 326-5721

Boring B-1

Project Name: Beclabito Heliport
Project Number: 222-4082
Client: Armstrong Consultants, Inc.
Site Location: Beclabito, New Mexico
Rig Type: CME-55
Drilling Method: 7.25" O.D. Hollow Stem Auger
Sampling Method: Bulk, Ring and Split spoon samples
Hammer Weight: 140 lbs
Hammer Fall: 30 inches

Date Drilled: 6/27/2022
Latitude: Not Determined
Longitude: Not Determined
Elevation: Not Determined
Boring Location: See Site Plan
Groundwater Depth: None Encountered
Logged By: DH
Remarks: None

Laboratory Results											
Dry Density (pcf)	% Passing #200 Sieve	Plasticity Index	Moisture Content (%)	Blows per 6"	Sample Type & Length (in)	Symbol	Material Type	Soil Symbol	Depth (ft)	Soil Description
108.2			3.0	13-29	A R		SM		1	Silty SAND, red/tan, fine- to medium-grained, slightly damp
				16-16-20	SS				2	SANDSTONE interlayered with Shale, red/tan/white, fine- to medium-grained, moderately to highly weathered, weak cementation, medium dense to very dense, slightly damp
									3	
125.3			5.1	16-30	R				4	
				19-26-48	SS				5	
									6	moderately weathered, slightly damp to damp
				33-50/3"	R				7	
							RK		8	
									9	
				50/3"	SS				10	
									11	SANDSTONE, red/brown, fine- to medium-grained, slightly to moderately weathered, moderate cementation, slightly damp
									12	
									13	
									14	
									15	
				50/3"	SS				16	no recovery Total Depth 15 feet
									17	
									18	
									19	
									20	

A = Auger Cuttings R = Ring-Lined Barrel Sampler SS = Split Spoon GRAB = Manual Grab Sample D = Disturbed Bulk Sample SH = Shelby Tube Sampler

GEOMAT INC.
915 Malta Ave
Farmington, NM 87401
Tel (505) 327-7928
Fax (505) 326-5721

Boring B-2

Project Name: Beclabito Heliport
Project Number: 222-4082
Client: Armstrong Consultants, Inc.
Site Location: Beclabito, New Mexico
Rig Type: CME-55
Drilling Method: 7.25" O.D. Hollow Stem Auger
Sampling Method: Bulk, Ring and Split spoon samples
Hammer Weight: 140 lbs
Hammer Fall: 30 inches

Date Drilled: 6/27/2022
Latitude: Not Determined
Longitude: Not Determined
Elevation: Not Determined
Boring Location: See Site Plan
Groundwater Depth: None Encountered
Logged By: DH
Remarks: None

Laboratory Results				Blows per 6"	Sample Type & Length (in)	Symbol	Material Type	Soil Symbol	Depth (ft)	Soil Description
Dry Density (pcf)	% Passing #200 Sieve	Plasticity Index	Moisture Content (%)							
						SM				Silty SAND with trace gravel, red/brown, fine- to medium-grained, slightly damp
				15-18-37	A SS				1	LIMESTONE, gray/black/white, fine- to coarse-grained, calcium carbonation, very dense, slightly damp
109.1			4.9	15-50/6"	R		RK		2	
									3	
				43-40-40	SS				4	
									5	Auger Refusal due to Hard Limestone Total Depth 4 ½ feet
									6	
									7	
									8	
									9	
									10	

A = Auger Cuttings R = Ring-Lined Barrel Sampler SS = Split Spoon GRAB = Manual Grab Sample D = Disturbed Bulk Sample SH = Shelby Tube Sampler

GEOMAT INC.
915 Malta Ave
Farmington, NM 87401
Tel (505) 327-7928
Fax (505) 326-5721

Boring B-3

Project Name: Beclabito Heliport
Project Number: 222-4082
Client: Armstrong Consultants, Inc.
Site Location: Beclabito, New Mexico
Rig Type: CME-55
Drilling Method: 7.25" O.D. Hollow Stem Auger
Sampling Method: Bulk, Ring and Split spoon samples
Hammer Weight: 140 lbs
Hammer Fall: 30 inches

Date Drilled: 6/27/2022
Latitude: Not Determined
Longitude: Not Determined
Elevation: Not Determined
Boring Location: See Site Plan
Groundwater Depth: None Encountered
Logged By: DH
Remarks: None

Laboratory Results: Dry Density (pcf)	% Passing #200 Sieve	Plasticity Index	Moisture Content (%)	Blows per 6"	Sample Type & Length (in)	Symbol	Material Type	Soil Symbol	Depth (ft)	Soil Description
99.3			8.5	14-28	GRAB A R		SM		0	Silty SAND with trace gravel, red/brown, fine- to medium-grained, slightly damp
									1	LIMESTONE, gray/black/white, fine- to coarse-grained, calcium carbonation, very dense, slightly damp
				29-40-50/5"	SS		RK		2	
									3	hard drilling
				32-50/5"	SS				4	
									5	Auger Refusal due to Hard Limestone Total Depth 4 ½ feet
									6	
									7	
									8	
									9	
									10	

A = Auger Cuttings R = Ring-Lined Barrel Sampler SS = Split Spoon GRAB = Manual Grab Sample D = Disturbed Bulk Sample SH = Shelby Tube Sampler

UNIFIED SOIL CLASSIFICATION SYSTEM					CONSISTENCY OR RELATIVE DENSITY CRITERIA		
Major Divisions			Group Symbols	Typical Names			
Coarse-Grained Soils More than 50% retained on No. 200 sieve	**Gravels** 50% or more of coarse fraction retained on No. 4 sieve	Clean Gravels	GW	Well-graded gravels and gravel-sand mixtures, little or no fines	Standard Penetration Test Density of Granular Soils		
			GP	Poorly graded gravels and gravel-sand mixtures, little or no fines	Penetration Resistance, N (blows/ft.)	Relative Density	
		Gravels with Fines	GM	Silty gravels, gravel-sand-silt mixtures	0-4	Very Loose	
			GC	Clayey gravels, gravel-sand-clay mixtures	5-10	Loose	
	Sands More than 50% of coarse fraction passes No. 4 sieve	Clean Sands	SW	Well-graded sands and gravelly sands, little or no fines	11-30	Medium Dense	
			SP	Poorly graded sands and gravelly sands, little or no fines	31-50	Dense	
		Sands with Fines	SM	Silty sands, sand-silt mixtures	>50	Very Dense	
			SC	Clayey sands, sand-clay mixtures	Standard Penetration Test Density of Fine-Grained Soils		
Fine-Grained Soils 50% or more passes No. 200 sieve	**Silts and Clays** Liquid Limit 50 or less		ML	Inorganic silts, very fine sands, rock flour, silty or clayey fine sands	Penetration Resistance, N (blows/ft.)	Consistency	Unconfined Compressive Strength (Tons/ft2)
			CL	Inorganic clays of low to medium plasticity, gravelly clays, sandy clays, silty clays, lean clays	<2	Very Soft	<0.25
			OL	Organic silts and organic silty clays of low plasticity	2-4	Soft	0.25-0.50
	Silts and Clays Liquid Limit greater than 50		MH	Inorganic silts, micaceous or diatomaceous free sands or silts, elastic silts	4-8	Firm	0.50-1.00
			CH	Inorganic clays of high plasticity, fat clays	8-15	Stiff	1.00-2.00
			OH	Organic clays of medium to high plasticity	15-30	Very Stiff	2.00-4.00
Highly Organic Soils			PT	Peat, mucic & other highly organic soils	>30	Hard	>4.0

U.S. Standard Sieve Sizes

>12"	12"	3"	3/4"	#4	#10	#40	#200

Boulders	Cobbles	Gravel		Sand			Silt or Clay
		coarse	fine	coarse	medium	fine	

MOISTURE CONDITIONS	
Dry	Absence of moist, dusty, dry to the touch
Slightly Damp	Below optimum moisture content for compaction
Moist	Near optimum moisture content, will moisten the hand
Very Moist	Above optimum moisture content
Wet	Visible free water, below water table

MATERIAL QUANTITY	
trace	0-5%
few	5-10%
little	10-25%
some	25-45%
mostly	50-100%

OTHER SYMBOLS
R Ring Sample
S SPT Sample
B Bulk Sample
▼ Ground Water

BASIC LOG FORMAT:

Group name, Group symbol, (grain size), color, moisture, consistency or relative density. Additional comments: odor, presence of roots, mica, gypsum, coarse particles, etc.

EXAMPLE:

SILTY SAND w/trace silt (SM-SP), Brown, loose to med. Dense, fine to medium grained, damp

UNIFIED SOIL CLASSIFICATION SYSTEM

TEST DRILLING EQUIPMENT & PROCEDURES

Description of Subsurface Exploration Methods

Drilling Equipment – Truck-mounted drill rigs powered with gasoline or diesel engines are used in advancing test borings. Drilling through soil or softer rock is performed with hollow-stem auger or continuous flight auger. Carbide insert teeth are normally used on bits to penetrate soft rock or very strongly cemented soils which require blasting or very heavy equipment for excavation. Where refusal is experienced in auger drilling, the holes are sometimes advanced with tricone gear bits and NX rods using water or air as a drilling fluid.

Coring Equipment – Portable electric core drills are used when recovery of asphalt or concrete cores is necessary. The core drill is equipped with either a 4" or 6" diameter diamond core barrel. Water is generally used as a drilling fluid to facilitate cooling and removal of cuttings from the annulus.

Sampling Procedures - Dynamically driven tube samples are usually obtained at selected intervals in the borings by the ASTM D1586 test procedure. In most cases, 2" outside diameter, 1 3/8" inside diameter, samplers are used to obtain the standard penetration resistance. "Undisturbed" samples of firmer soils are often obtained with 3" outside diameter samplers lined with 2.42" inside diameter brass rings. The driving energy is generally recorded as the number of blows of a 140-pound, 30-inch free fall drop hammer required to advance the samplers in 6-inch increments. These values are expressed in blows per foot on the boring logs. However, in stratified soils, driving resistance is sometimes recorded in 2- or 3-inch increments so that soil changes and the presence of scattered gravel or cemented layers can be readily detected and the realistic penetration values obtained for consideration in design. "Undisturbed" sampling of softer soils is sometimes performed with thin-walled Shelby tubes (ASTM D1587). Tube samples are labeled and placed in watertight containers to maintain field moisture contents for testing. When necessary for testing, larger bulk samples are taken from auger cuttings. Where samples of rock are required, they are obtained by NX diamond core drilling (ASTM D2113).

Boring Records - Drilling operations are directed by our field engineer or geologist who examines soil recovery and prepares boring logs. Soils are visually classified in accordance with the Unified Soil Classification System (ASTM D2487), with appropriate group symbols being shown on the logs.

Appendix B

LAB NO.	BORING NO.	SAMPLE DEPTH (ft)	ASTM D698		MOISTURE CONT. (%)	DENSITY		ATTERBERG LIMITS			SWELL (%)	CONSOL TEST	% PASS #200 SIEVE	CLASSIFICATION
			Density	Moisture		WET (pcf)	DRY (pcf)	LL	PL	PI				
9541*	B-1	0.5 to 5	-	-	-	-	-	-	-	-	-	-	-	**SANDSTONE** (RK)
9542*	B-2	0.5 to 4.5	-	-	-	-	-	-	-	-	-	-	-	**LIMESTONE** (RK)
9547	B-1	0.5	-	-	3.0	111.5	108.2	-	-	-	-	-	-	**SANDSTONE** (RK)
9548	B-1	3.5	-	-	5.1	119.2	125.3	-	-	-	-	Attached	-	**SANDSTONE** (RK)
9549	B-2	2	-	-	4.9	104.0	109.1	-	-	-	-	Attached	-	**LIMESTONE** (RK)
9550	B-3	0.5	-	-	8.5	91.7	99.3	-	-	-	-	Attached	-	**LIMESTONE** (RK)

NLL = No Liquid Limit
NPL = No Plastic Limit
NP = Non-Plastic
* = Soluble Sulfates Sample

GEOMAT INC.

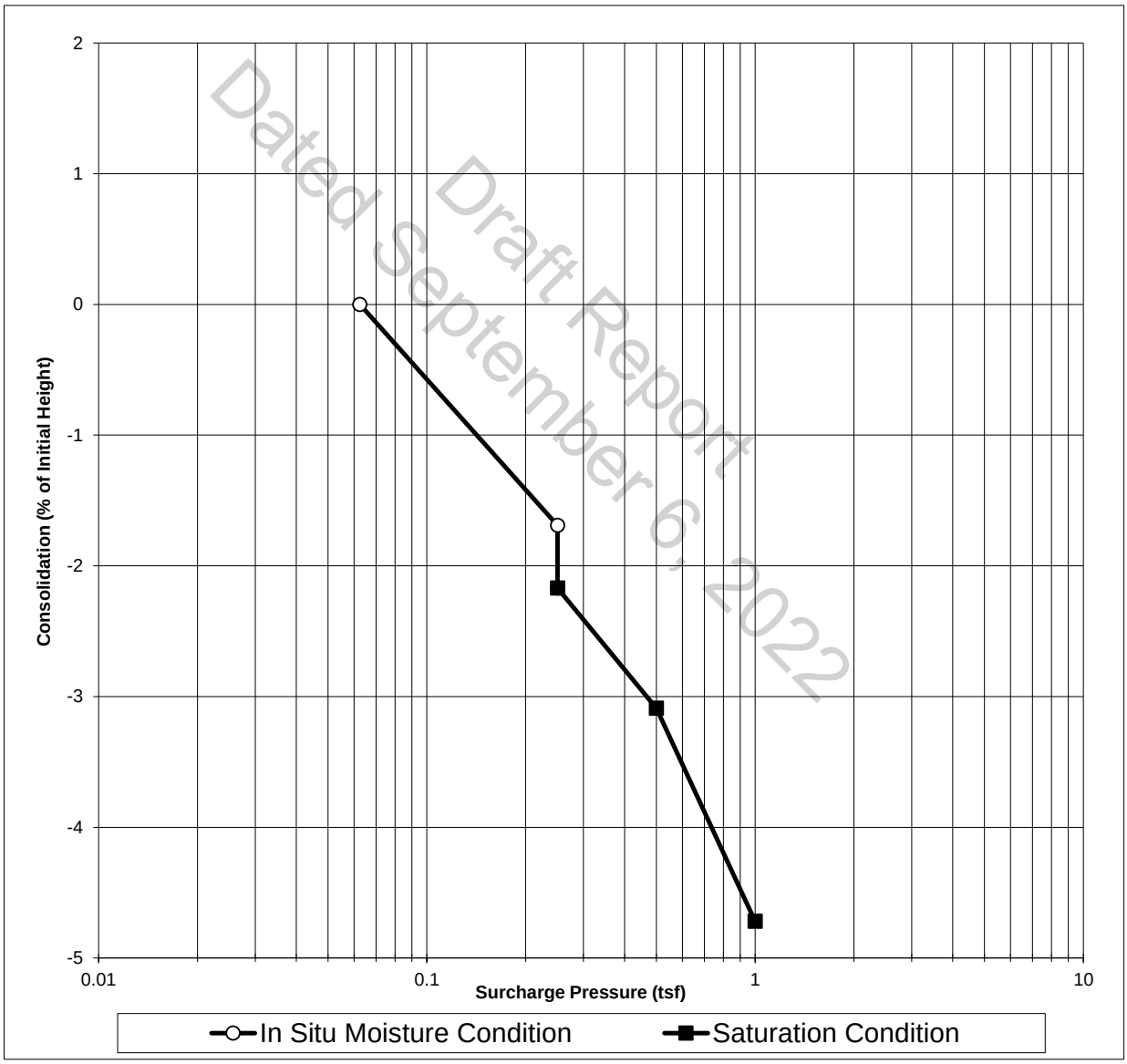
SUMMARY OF SOIL TESTS

Project	Beclabito Heliport
Job No.	222-4082
Location	Beclabito, New Mexico
Date of Exploration	June 27, 2022

PROJECT:	Beclabito Heliport	**JOB NO:**	222-4082
CLIENT:	Armstrong Consultants, Inc	**WORK ORDER NO:**	NA
MATERIAL:	SANDSTONE (RK)	**LAB NO:**	9548
SAMPLE SOURCE:	B-1 @ 3.5'	**DATE SAMPLED:**	6/27/2022
SAMPLE PREP.:	In Situ	**SAMPLED BY:**	DH

ONE-DIMENSIONAL CONSOLIDATION PROPERTIES OF SOILS (ASTM D2435)

INITIAL VOLUME (cu.in)	4.60	FINAL VOLUME (cu.in)	4.39
INITIAL MOISTURE CONTENT	5.1%	FINAL MOISTURE CONTENT	13.6%
INITIAL DRY DENSITY(pcf)	119.2	FINAL DRY DENSITY(pcf)	124.5
INITIAL DEGREE OF SATURATION	23%	FINAL DEGREE OF SATURATION	67%
INITIAL VOID RATIO	0.39	FINAL VOID RATIO	0.33
ESTIMATED SPECIFIC GRAVITY	2.651	SATURATED AT	0.25 tsf

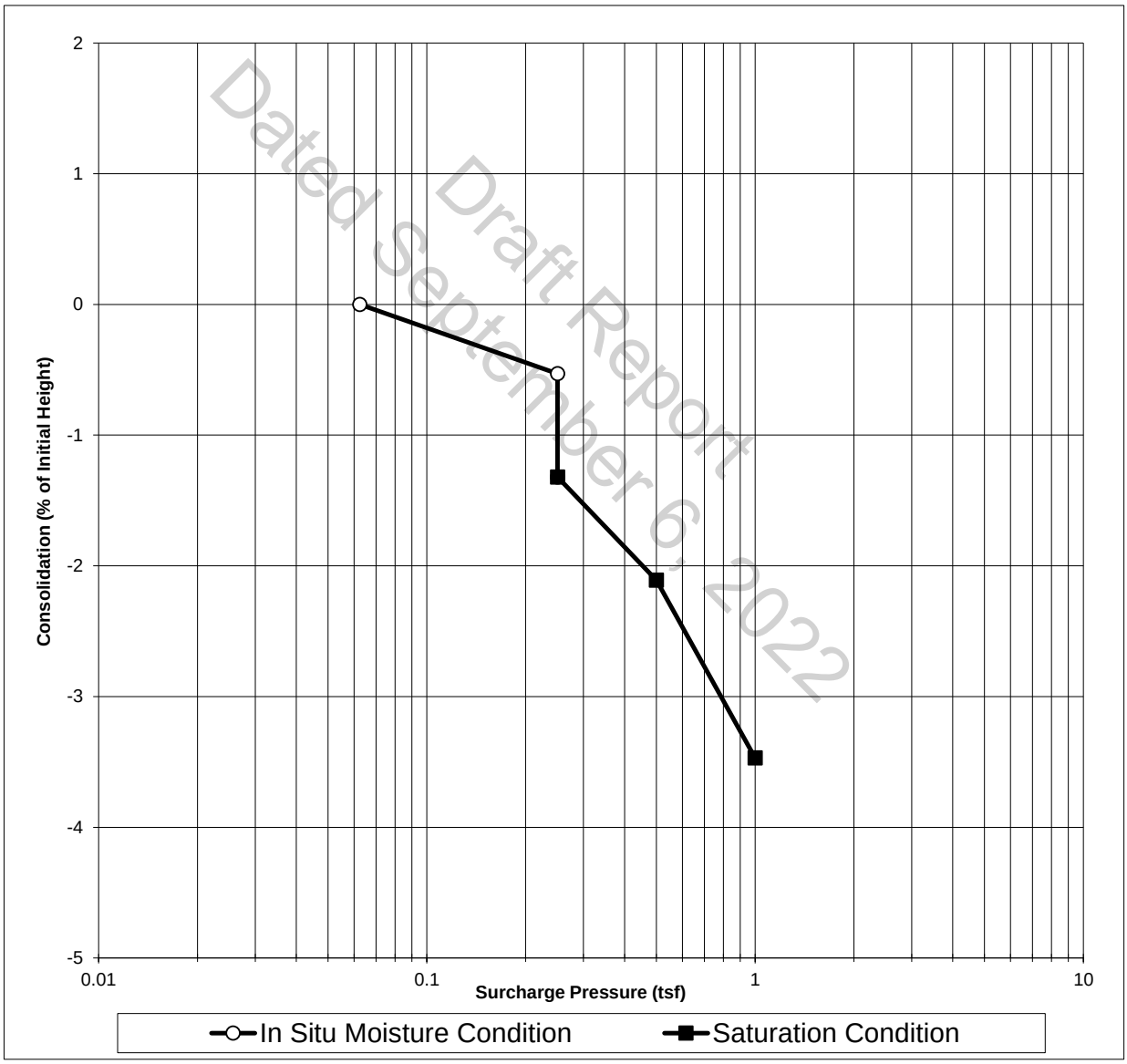


GEOMAT INC.

PROJECT:	Beclabito Heliport	**JOB NO:**	222-4082
CLIENT:	Armstrong Consultants, Inc	**WORK ORDER NO:**	NA
MATERIAL:	LIMESTONE (RK)	**LAB NO:**	9549
SAMPLE SOURCE:	B-2 @ 2'	**DATE SAMPLED:**	6/27/2022
SAMPLE PREP.:	In Situ	**SAMPLED BY:**	DH

ONE-DIMENSIONAL CONSOLIDATION PROPERTIES OF SOILS (ASTM D2435)

INITIAL VOLUME (cu.in)	4.60	FINAL VOLUME (cu.in)	4.44
INITIAL MOISTURE CONTENT	4.9%	FINAL MOISTURE CONTENT	20.8%
INITIAL DRY DENSITY(pcf)	104.0	FINAL DRY DENSITY(pcf)	107.2
INITIAL DEGREE OF SATURATION	16%	FINAL DEGREE OF SATURATION	73%
INITIAL VOID RATIO	0.60	FINAL VOID RATIO	0.54
ESTIMATED SPECIFIC GRAVITY	2.651	SATURATED AT	0.25 tsf

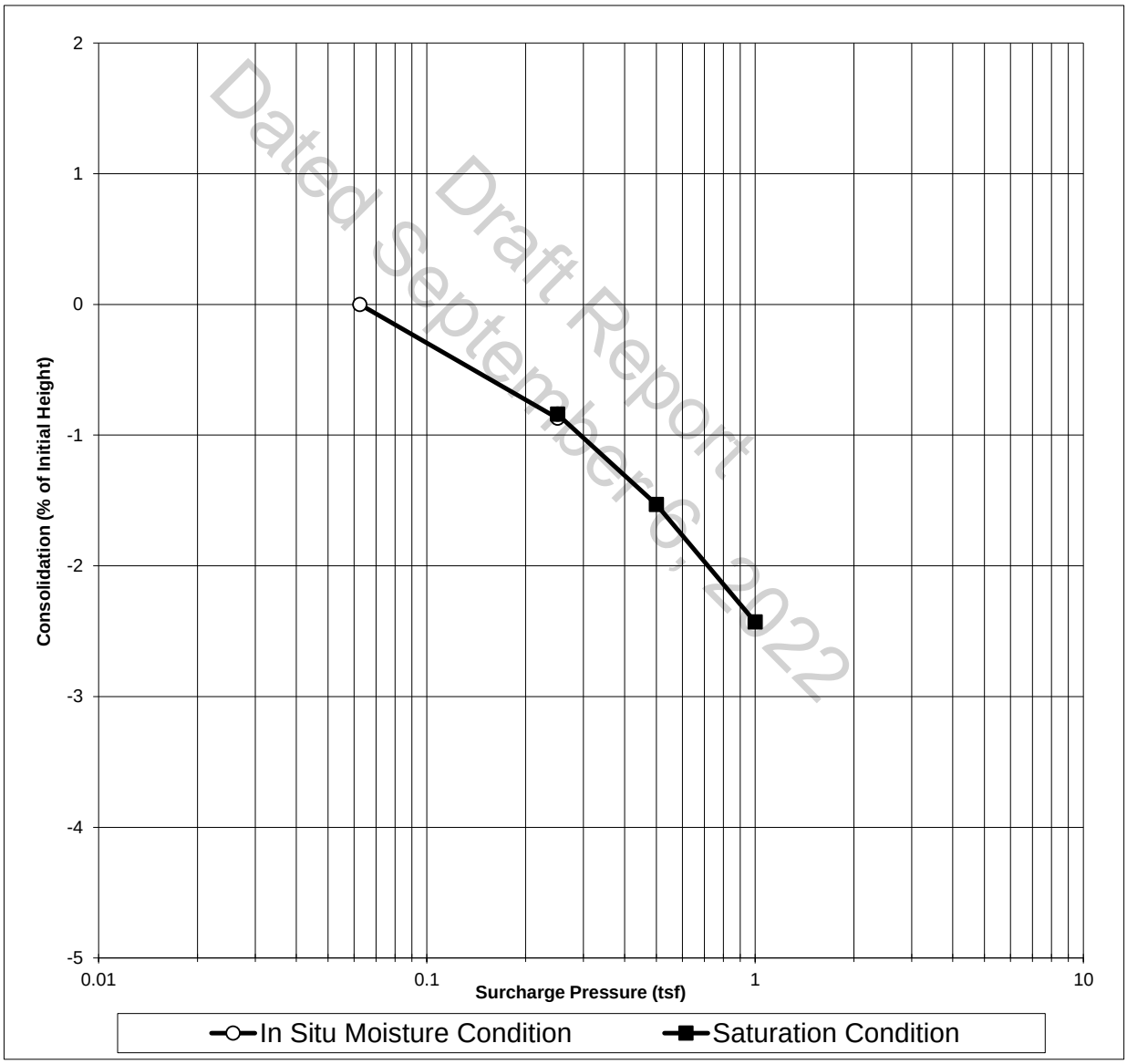


GEOMAT INC.

PROJECT:	Beclabito Heliport	**JOB NO:**	222-4082
CLIENT:	Armstrong Consultants, Inc	**WORK ORDER NO:**	NA
MATERIAL:	LIMESTONE (RK)	**LAB NO:**	9550
SAMPLE SOURCE:	B-3 @ 0.5'	**DATE SAMPLED:**	6/27/2022
SAMPLE PREP.:	In Situ	**SAMPLED BY:**	DH

ONE-DIMENSIONAL CONSOLIDATION PROPERTIES OF SOILS (ASTM D2435)

INITIAL VOLUME (cu.in)	4.60	FINAL VOLUME (cu.in)	4.49
INITIAL MOISTURE CONTENT	8.5%	FINAL MOISTURE CONTENT	29.1%
INITIAL DRY DENSITY(pcf)	91.5	FINAL DRY DENSITY(pcf)	93.3
INITIAL DEGREE OF SATURATION	22%	FINAL DEGREE OF SATURATION	79%
INITIAL VOID RATIO	0.82	FINAL VOID RATIO	0.77
ESTIMATED SPECIFIC GRAVITY	2.651	SATURATED AT	0.25 tsf



GEOMAT INC.

LABORATORY TESTING PROCEDURES

Laboratory testing is performed by trained personnel in our accredited laboratory or may be subcontracted by GEOMAT through a qualified outside laboratory if necessary. Actual types and quantities of tests performed for any project will be dependent upon subsurface conditions encountered and specific design requirements.

The following is an abbreviated table of laboratory testing that may be performed by GEOMAT with the applicable standards listed. Testing for a specific project may include all or a selected subset of the laboratory work listed. Laboratory testing beyond those listed may be available and could be incorporated into the project scope at the discretion of GEOMAT.

PROCEDURE	ASTM	AASHTO
Moisture Content	ASTM D2216	AASHTO T 265
Sieve Analysis	ASTM C136	AASHTO T 27
Fines Content	ASTM D1140	T 11
Hydrometer	ASTM D422	T 88
Atterberg Limits	ASTM D4318	AASHTO T 89/T 90
Soil Compression/Expansion	ASTM D2435	T 216
Soil Classification	ASTM D2487	M 145
Direct Shear	ASTM D3080	T 236
Unconfined Compressive Strength of Soils	ASTM D2166	T 208
Unconfined Compressive Strength of Rock Cores	ASTM D4543	-

Appendix C

Important Information about This

Geotechnical-Engineering Report

Subsurface problems are a principal cause of construction delays, cost overruns, claims, and disputes.

While you cannot eliminate all such risks, you can manage them. The following information is provided to help.

The Geoprofessional Business Association (GBA) has prepared this advisory to help you – assumedly a client representative – interpret and apply this geotechnical-engineering report as effectively as possible. In that way, you can benefit from a lowered exposure to problems associated with subsurface conditions at project sites and development of them that, for decades, have been a principal cause of construction delays, cost overruns, claims, and disputes. If you have questions or want more information about any of the issues discussed herein, contact your GBA-member geotechnical engineer. Active engagement in GBA exposes geotechnical engineers to a wide array of risk-confrontation techniques that can be of genuine benefit for everyone involved with a construction project.

Understand the Geotechnical-Engineering Services Provided for this Report

Geotechnical-engineering services typically include the planning, collection, interpretation, and analysis of exploratory data from widely spaced borings and/or test pits. Field data are combined with results from laboratory tests of soil and rock samples obtained from field exploration (if applicable), observations made during site reconnaissance, and historical information to form one or more models of the expected subsurface conditions beneath the site. Local geology and alterations of the site surface and subsurface by previous and proposed construction are also important considerations. Geotechnical engineers apply their engineering training, experience, and judgment to adapt the requirements of the prospective project to the subsurface model(s). Estimates are made of the subsurface conditions that will likely be exposed during construction as well as the expected performance of foundations and other structures being planned and/or affected by construction activities.

The culmination of these geotechnical-engineering services is typically a geotechnical-engineering report providing the data obtained, a discussion of the subsurface model(s), the engineering and geologic engineering assessments and analyses made, and the recommendations developed to satisfy the given requirements of the project. These reports may be titled investigations, explorations, studies, assessments, or evaluations. Regardless of the title used, the geotechnical-engineering report is an engineering interpretation of the subsurface conditions within the context of the project and does not represent a close examination, systematic inquiry, or thorough investigation of all site and subsurface conditions.

Geotechnical-Engineering Services are Performed for Specific Purposes, Persons, and Projects, and At Specific Times

Geotechnical engineers structure their services to meet the specific needs, goals, and risk management preferences of their clients. A geotechnical-engineering study conducted for a given civil engineer will not likely meet the needs of a civil-works constructor or even a different civil engineer. Because each geotechnical-engineering study is unique, each geotechnical-engineering report is unique, prepared *solely* for the client.

Likewise, geotechnical-engineering services are performed for a specific project and purpose. For example, it is unlikely that a geotechnical-engineering study for a refrigerated warehouse will be the same as one prepared for a parking garage; and a few borings drilled during a preliminary study to evaluate site feasibility will not be adequate to develop geotechnical design recommendations for the project.

Do not rely on this report if your geotechnical engineer prepared it:

- for a different client;
- for a different project or purpose;
- for a different site (that may or may not include all or a portion of the original site); or
- before important events occurred at the site or adjacent to it; e.g., man-made events like construction or environmental remediation, or natural events like floods, droughts, earthquakes, or groundwater fluctuations.

Note, too, the reliability of a geotechnical-engineering report can be affected by the passage of time, because of factors like changed subsurface conditions; new or modified codes, standards, or regulations; or new techniques or tools. *If you are the least bit uncertain* about the continued reliability of this report, contact your geotechnical engineer before applying the recommendations in it. A minor amount of additional testing or analysis after the passage of time – if any is required at all – could prevent major problems.

Read this Report in Full

Costly problems have occurred because those relying on a geotechnical-engineering report did not read the report in its entirety. Do not rely on an executive summary. Do not read selective elements only. *Read and refer to the report in full.*

You Need to Inform Your Geotechnical Engineer About Change

Your geotechnical engineer considered unique, project-specific factors when developing the scope of study behind this report and developing the confirmation-dependent recommendations the report conveys. Typical changes that could erode the reliability of this report include those that affect:

- the site's size or shape;
- the elevation, configuration, location, orientation, function or weight of the proposed structure and the desired performance criteria;
- the composition of the design team; or
- project ownership.

As a general rule, *always* inform your geotechnical engineer of project or site changes – even minor ones – and request an assessment of their impact. *The geotechnical engineer who prepared this report cannot accept*

responsibility or liability for problems that arise because the geotechnical engineer was not informed about developments the engineer otherwise would have considered.

Most of the "Findings" Related in This Report Are Professional Opinions

Before construction begins, geotechnical engineers explore a site's subsurface using various sampling and testing procedures. *Geotechnical engineers can observe actual subsurface conditions only at those specific locations where sampling and testing is performed.* The data derived from that sampling and testing were reviewed by your geotechnical engineer, who then applied professional judgement to form opinions about subsurface conditions throughout the site. Actual sitewide-subsurface conditions may differ – maybe significantly – from those indicated in this report. Confront that risk by retaining your geotechnical engineer to serve on the design team through project completion to obtain informed guidance quickly, whenever needed.

This Report's Recommendations Are Confirmation-Dependent

The recommendations included in this report – including any options or alternatives – are confirmation-dependent. In other words, they are not final, because the geotechnical engineer who developed them relied heavily on judgement and opinion to do so. Your geotechnical engineer can finalize the recommendations *only after observing actual subsurface conditions* exposed during construction. If through observation your geotechnical engineer confirms that the conditions assumed to exist actually do exist, the recommendations can be relied upon, assuming no other changes have occurred. *The geotechnical engineer who prepared this report cannot assume responsibility or liability for confirmation-dependent recommendations if you fail to retain that engineer to perform construction observation.*

This Report Could Be Misinterpreted

Other design professionals' misinterpretation of geotechnical-engineering reports has resulted in costly problems. Confront that risk by having your geotechnical engineer serve as a continuing member of the design team, to:

- confer with other design-team members;
- help develop specifications;
- review pertinent elements of other design professionals' plans and specifications; and
- be available whenever geotechnical-engineering guidance is needed.

You should also confront the risk of constructors misinterpreting this report. Do so by retaining your geotechnical engineer to participate in prebid and preconstruction conferences and to perform construction-phase observations.

Give Constructors a Complete Report and Guidance

Some owners and design professionals mistakenly believe they can shift unanticipated-subsurface-conditions liability to constructors by limiting the information they provide for bid preparation. To help prevent the costly, contentious problems this practice has caused, include the complete geotechnical-engineering report, along with any attachments or appendices, with your contract documents, *but be certain to note conspicuously that you've included the material for information purposes only.* To avoid misunderstanding, you may also want to note that "informational purposes" means constructors have no right to rely on the interpretations, opinions, conclusions, or recommendations in the report. Be certain that constructors know they may learn about specific project requirements, including options selected from the report, *only* from the design drawings and specifications. Remind constructors that they may perform their own studies if they want to, and *be sure to allow enough time* to permit them to do so. Only then might you be in a position to give constructors the information available to you, while requiring them to at least share some of the financial responsibilities stemming from unanticipated conditions. Conducting prebid and preconstruction conferences can also be valuable in this respect.

Read Responsibility Provisions Closely

Some client representatives, design professionals, and constructors do not realize that geotechnical engineering is far less exact than other engineering disciplines. This happens in part because soil and rock on project sites are typically heterogeneous and not manufactured materials with well-defined engineering properties like steel and concrete. That lack of understanding has nurtured unrealistic expectations that have resulted in disappointments, delays, cost overruns, claims, and disputes. To confront that risk, geotechnical engineers commonly include explanatory provisions in their reports. Sometimes labeled "limitations," many of these provisions indicate where geotechnical engineers' responsibilities begin and end, to help others recognize their own responsibilities and risks. *Read these provisions closely.* Ask questions. Your geotechnical engineer should respond fully and frankly.

Geoenvironmental Concerns Are Not Covered

The personnel, equipment, and techniques used to perform an environmental study – e.g., a "phase-one" or "phase-two" environmental site assessment – differ significantly from those used to perform a geotechnical-engineering study. For that reason, a geotechnical-engineering report does not usually provide environmental findings, conclusions, or recommendations; e.g., about the likelihood of encountering underground storage tanks or regulated contaminants. *Unanticipated subsurface environmental problems have led to project failures.* If you have not obtained your own environmental information about the project site, ask your geotechnical consultant for a recommendation on how to find environmental risk-management guidance.

Obtain Professional Assistance to Deal with Moisture Infiltration and Mold

While your geotechnical engineer may have addressed groundwater, water infiltration, or similar issues in this report, the engineer's services were not designed, conducted, or intended to prevent migration of moisture – including water vapor – from the soil through building slabs and walls and into the building interior, where it can cause mold growth and material-performance deficiencies. Accordingly, ***proper implementation of the geotechnical engineer's recommendations will not of itself be sufficient to prevent moisture infiltration. Confront the risk of moisture infiltration*** by including building-envelope or mold specialists on the design team. ***Geotechnical engineers are not building-envelope or mold specialists.***

GEOPROFESSIONAL BUSINESS ASSOCIATION

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