City of North Port
PURCHASING
Office: 941.429.7170
Fax: 941.429.7173
Email: purchasing@cityofnorthport.com

WORK ASSIGNMENT

CONSULTANT	Ardaman & Associates, Inc.
CONTINUING CONTRACT NO. & TITLE	2020 58 01 Professional Engineering Services Continuing Services Contracts for the City of North Port

THIS WORK ASSIGNMENT

WORK ASSIGNMENT #	2023-11
SHORT TITLE	Warm Mineral Springs Geotechnical Investigation/Survey
DATE SUBMITTED	3/30/2023
AMOUNT (LUMP SUM)	$250,787.00
SCHEDULED COMPLETION	14 Weeks from Notice to Proceed

CONTRACT AND BUDGET OVERVIEW FOR FISCAL YEAR 2023

	DEPARTMENT	CITYWIDE (completed by Purchasing)
TOTAL OF PREVIOUS ASSIGNMENTS	$0	$0
THIS WORK ASSIGNMENT	$250,787.00	$250,787.00
TOTAL WORK ASSIGNMENTS	$250,787.00	$250,787.00
ACCOUNT NO/PROJECT NO	306-3036-572-31-05/WM19BR	306-3036-572-31-05/WM19BR

All work assignments require City Manager approval. In presenting this work assignment, it is understood that:

1. All associated supporting documentation and justification for this work assignment is attached hereto.
2. Unless specified herein, work does not involve watercraft, boat piers and/or other activities requiring additional workers compensation endorsements.
3. Contact or involvement with hazardous materials is not anticipated, should hazardous materials be encountered, the City shall be informed.
4. THIS WORK ASSIGNMENT SHALL NOT EXCEED $500,000 & ANY RESULTING CONSTRUCTION SHALL NOT EXCEED $4,000,000 PER FLORIDA STATUTE 287.055 AS AMENDED.

SUBMITTED BY:

CONSULTANT — DATE: 8/23/23

APPROVED BY:

Sandy Pfundheller — DEPARTMENT DIRECTOR	DATE	Lisa Herrmann — Digitally signed by Lisa Herrmann Date: 2023.08.23 15:26:33 -04'00' — BUDGET ADMINISTRATOR	DATE
Alla V. Skipper — Digitally signed by Alla V. Skipper Date: 2023.08.23 15:36:05 -04'00' — PURCHASING	DATE	Kimberly Williams — Digitally signed by Kimberly Williams Date: 2023.08.24 09:55:06 -04'00' — FINANCE DIRECTOR	DATE
Juliana B. Bellia — Digitally signed by Juliana B. Bellia Date: 2023.08.24 15:49:53 -04'00' — ASSISTANT CITY MANAGER	DATE	CITY MANAGER	DATE

Print Form Clear All Fields

Ardaman & Associates, Inc.

Geotechnical, Environmental and
Materials Consultants

Proposal Number 23-04-07
March 30, 2023
Revised August 21, 2023

City of North Port
Utilities Department
6644 W. Price Boulevard
North Port, Florida 34291

Attention: Mr. Michael Acosta, P.E.

Subject: Scope and Budget Proposal for Geotechnical Engineering Investigation/Survey Related to Future Development of Warm Mineral Springs North Port, Florida

Dear Mr. Acosta:

As requested, we are pleased to present this scope and budget proposal for conducting a geotechnical engineering investigation/survey related to the proposed development around Warm Mineral Springs. We understand based on review of the Warm Mineral Springs Enclave conceptual site plan dated September 2022, that the existing approximate 81-acre area park surrounding Warm Mineral Springs will be developed with numerous buildings, including a resort hotel & spa, wellness center, medical office, museum, restaurant, and multi-family residential buildings.

The purposes of the investigation/survey will be to evaluate the subsurface conditions within the proposed building areas relative to presence of potential underground feeder veins of the spring, cavities, sinkholes, or other conditions that could impact the proposed development.

The following summarizes our proposed scope of work and associated fees for conducting the subject investigation/survey.

PROPOSED SCOPE OF WORK

Our proposed scope of work will include conducting the geotechnical engineering investigation/survey within the proposed building footprint areas using a two-phased approach. Phase I will consist of performing a Ground Penetrating Radar (GPR) study to attempt to identify potential anomalies within the developmental footprint areas. Representative anomalies encountered during the GPR study will be investigated with Standard Penetration Test (SPT) borings to evaluate the nature of the anomalies. If the anomalous areas are indicative of feeder veins, cavities, sinkholes, or other conditions that could impact development, we will notify the design team so that consideration can be given to relocate the building(s). If no adverse conditions to development are found during Phase I of the investigation/survey, we will proceed to Phase II with the concurrence of the design team and City of North Port, which will consist of performing an Electrical Resistivity (ER) survey within the proposed building footprint areas. Anomalous areas identified during the ER survey may need to be further evaluated with additional

SPT borings. We note that Microgravity surveying may be substituted and/or performed in addition to ER in some building areas.

It is our opinion, that although the GPR survey has limitations, this phased approach will be more efficient than only performing an ER survey with SPT borings, especially if conditions that pose an impact to development are present within the proposed building footprint areas.

The following sections further describe our proposed scope of work and project approach.

Ground Penetrating Radar Survey

GPR is a geophysical method that detects interfaces between subsurface materials with differing dielectric constants. The GPR system consists of an antenna that houses the transmitter and receiver; a control unit, that processes the received signal and produces a graphic display of the data; and a video display unit that displays the data as a graph of distance versus two-way travel time of the GPR signal.

The transmitter radiates electromagnetic energy in the frequency range of 16 MHz to 2,600 MHz. A trigger pulse is generated at the control unit through the control cable to the antenna, where the pulse is transformed into a bipolar pulse. The pulse is radiated into the subsurface as the antenna moves across the ground surface. In the subsurface, the radar waves are reflected back to the receiver by interfaces where there is a dielectric contrast. The intensity of the reflected signal is a function of the contrast in the dielectric constant between the materials, the conductivity of the material through which the wave is traveling, and the frequency of the signal. Under favorable conditions (sandy soils, deeper groundwater), penetration up to 50 feet may be achieved.

The signal amplitude determines the shade of gray on the display. Subsurface features that commonly cause such reflections are:

1) natural geology, changes in sediment composition such as sand and clay, bedding and cementation horizons, voids and variations in water content; or

2) unnatural changes to the subsurface such as disturbed soils, soil backfill, buried debris, tanks, pipelines and utilities.

The scans are digitally recorded on the control unit for subsequent processing and evaluation. Normal geologic conditions, as viewed on a GPR profile, are frequently characterized by the occurrence of relatively continuous and horizontal GPR reflections representing soil horizons.

The GPR data will be acquired along transects spaced at approximate 20 ft to 40 ft grid lines within the proposed building footprint areas. The GPR data will be analyzed using the computer program RADAN 7, V 7.5 18 23370 or similar program. The depth to which the GPR signal can penetrate is highly site-specific. The depth of investigation decreases due to increases in soil water content, clay content, and electrical conductivity. Depth of investigation is also dependent on the antenna's transmitting frequency. Depth of investigation generally increases as transmitting frequency decreases; however, the ability to resolve smaller subsurface features is diminished as frequency is decreased. Highly conductive soil or groundwater may affect the GPR signal such that the penetration depth is severely reduced. RADAN 7 provides a tool to mark the effective depth of each transect based on the depth at which the Signal to Noise Ratio becomes too small to provide meaningful data.

Electrical Resistivity Testing

Geophysical surveys using electrical resistivity (ER) testing will be performed to obtain additional information relative to the characterization of the subsurface conditions within the proposed building areas. The electrical resistivity testing transmits a small pulse of electrical charge into the ground from one pair of electrodes to another. The current and voltage measurements obtained during the test are used to calculate the apparent resistivity of the soils. The apparent resistivity is a weighted average of different resistivities that the electrical charge is flowing through in a general area under the four electrodes. The apparent resistivity is converted to an inverted resistivity to display the "true" resistivity of the soil profiles by distributing the apparent resistivities so that the model best fits the apparent resistivities. The soil profiles can then be interpreted based on correlations between measured soil resistivity and soil types. Electrical resistivities of typical soils depend on soil mineralogy, soil fabric (soil particle arrangement), organic contents, inclusions, moisture contents, temperature, and pore water chemistry. Generally, clay soils have lower electrical resistivities than sandy soils due to the surface charge of the clay particles. The accuracy, resolution, and depth of the measurements depend on the number of survey points and inter-electrode spacing. A 2.5D model will go beyond the 2D survey to provide a quasi-3D model by interpreting resistivities between parallel surveys, rather than a flat 2D profile.

We propose to conduct the ER geophysical survey along the same transects used for the GPR survey (i.e., approximate 40 ft by 40 ft grid within the proposed building footprint areas). The transects will each consist of 2 parallel runs, which will provide a 2.5D model of the subsurface soils and rock. Each survey "run" will consist of electrical resistivity testing using 56 electrodes spaced at intervals necessary to achieve the desired survey depth.

SPT Borings

The proposed geotechnical engineering investigation program also includes SPT borings to obtain information on subsurface conditions at specific locations and aid in evaluating anomalies encountered in the GPR and ER surveys. For this evaluation, we propose budgeting up to 25 SPT borings to depths of 50 feet (1,250 LF).

The SPT borings will be drilled using a procedure similar to the procedure outlined in ASTM D-1586. The borings will be sampled at 18-inch intervals to 10 feet deep and at 5-foot intervals below 10 feet. Each sample will be removed from the sampler in the field and then examined and visually classified by our crew chief. Representative portions will be sealed and packaged for transportation to our laboratory for further analysis as required. Water level observations will be made in the boreholes during the drilling operation. The borings will be backfilled with cement grout upon completion.

Survey Location and Land Clearing

We recommend that the project surveyor locate the corners of all proposed building locations, transect gridlines, and SPT boring locations horizontally and vertically (i.e., determine the elevation of the ground surface). This information will increase the accuracy of the data obtained. We assume that the surveyor will be retained by the client/design team to provide these services.

Clearing of paths along the proposed GPR and ER transect grid lines and to the boring locations will be necessary due to the wooded and heavily vegetated nature of portions of the project site. The clearing is intended to be limited in scope and will be performed to provide access to proposed geophysical survey transect lines and drilling locations within the property. We note

that Ardaman & Associates, Inc. cannot be held responsible for potential damage to wetland and/or upland (protected) vegetation, or endangered and/or threatened species of animals. If such concerns exist on the site, we recommend an experienced environmental specialist be present during clearing activities.

REPORT OF FINDINGS

Engineering analysis of data obtained will be made to evaluate the subsurface conditions within the proposed building footprint areas with respect to the presence of underground feeder veins of the spring, cavities, sinkholes, or other conditions that could potentially impact the proposed development. We note that our analysis does not include providing design level recommendations for the proposed development, however, the data produced can be considered in a future evaluation once the building locations and loading information are finalized.

Our findings will be submitted in written reports in general accordance with list of deliverables and schedule outlined in RFLOI No. 2023-11.

BUDGET ESTIMATE

We recommend a budget of **$250,787.00** to perform the scope of work outlined above. This scope is intended to be inclusive of services needed to complete the geotechnical engineering investigation/survey relative to the presence of underground feeder veins of the spring, cavities, sinkholes, or other conditions that could impact the proposed development. We believe that the budget estimate presented herein is appropriate for planning purposes; however, because of the nature of this type of work, we recognize the possibility that the above estimate may be more (or less) than anticipated. We will invoice our services for actual work performed and work within an established budget. We will not exceed the above estimated amount without prior written approval of a change in scope, conditions, or level of service.

Table 1 summarizes the estimated budget for the proposed services. An itemized breakdown of the budget estimate is attached to this proposal. We note that manhour and unit rates are from our Continuing Services Contract #2020-58-01 with City of North Port Utilities, dated October 13, 2020.

Table 1 - Estimated Budget Summary

Description	Budget ($)
Land Clearing	$37,210.00
GPR Field Survey	$34,590.00
ER Field Survey	$135,737.00
SPT Borings	$42,250.00
Total	**$250,787.00**

We appreciate the opportunity to present you with this proposal and look forward to assisting you with these services. Please call one of the undersigned if you have any questions or when we may be of further assistance.

Very truly yours,
ARDAMAN & ASSOCIATES, INC.

JMP for

Virginia Goff, P.E.
Project Manager

Jason Parker, P.E.
Senior Engineer

Attachment: Itemized Budget Estimate

Ardaman & Associates, Inc.

Itemized Budget Estimate
Geotechnical Engineering Investigation/Survey
Warm Mineral Springs, North Port, Florida
Ardaman Proposal No. 23-04-07
3/30/2023 (Revised 8/21/23)

Task	Quantity	Units	Unit Cost	Cost
I. Land Clearing				
Skidsteer and Mower (Subcontractor)	10	Days	$2,200.00	$22,000.00
Senior Field Technician	100	Hours	$76.00	$7,600.00
Senior Consultant	10	Hours	$234.00	$2,340.00
Senior Project Engineer	5	Hours	$165.00	$825.00
Project Engineer	10	Hours	$145.00	$1,450.00
Assistant Project Engineer	20	Hours	$134.00	$2,680.00
Technical CADD Operator	5	Hours	$63.00	$315.00
			Subtotal	**$37,210.00**
II. GPR Field Survey				
GPR Equipment	10	Days	$375.00	$3,750.00
GPR Operator - Field Technician V	100	Hours	$101.00	$10,100.00
Vehicle/Trip Charge	10	Days	$85.00	$850.00
Per Diem	10	Days	$66.00	$660.00
Lodging	9	Days	$175.00	$1,575.00
Senior Consultant	10	Hours	$234.00	$2,340.00
Senior Project Engineer	25	Hours	$165.00	$4,125.00
Project Engineer	75	Hours	$145.00	$10,875.00
Technical CADD Operator	5	Hours	$63.00	$315.00
Technical Secretary	5	Hours	$63.00	$315.00
			Subtotal	**$34,590.00**
III. Electrical Resistivity Survey				
AGI Sting R1-IP	55	Days	$318.00	$17,490.00
ER Operator - Field Technician V	550	Hours	$101.00	$55,550.00
ER Assistant - Field Technician III	550	Hours	$78.00	$42,900.00
Per Diem	7	Days	$175.00	$1,225.00
Lodging	7	Days	$66.00	$462.00
Senior Consultant	5	Hours	$234.00	$1,170.00
Senior Project Engineer	10	Hours	$165.00	$1,650.00
Project Engineer	25	Hours	$145.00	$3,625.00
Assistant Project Engineer	80	Hours	$134.00	$10,720.00
Technical CADD Operator	10	Hours	$63.00	$630.00
Technical Secretary	5	Hours	$63.00	$315.00
			Subtotal	**$135,737.00**
IV. SPT Borings				
Mobilization of Drilling Crew and Equipment	10	Hours	$240.00	$2,400.00
25 Borings X 50 LF (1,250 LF)	1250	LF	$20.00	$25,000.00
Grout Boreholes (estimate 500 LF)	1250	LF	$4.00	$5,000.00
Temporary Casing (Estimate 500 LF)	500	LF	$8.00	$4,000.00
Laboratory Classification Testing Allowance (Estimate)	1	NTE	$2,500.00	$2,500.00
Project Engineer	5	Hours	$145.00	$725.00
Assistant Project Engineer	20	Hours	$134.00	$2,680.00
CADD Operator	10	Hours	$63.00	$630.00
Technical Secretary	5	Hours	$63.00	$315.00
			Subtotal	**$43,250.00**
		ESTIMATED TOTAL COST		**$250,787.00**

ATTACHMENT B – FEE SCHEDULE

HOURLY RATES FOR ENGINEERING SERVICES & TESTING SERVICES

ENGINEERING		
Data Evaluation, Engineering Analysis,		
Design, Inspections, Field Supervision, etc.		
Senior Consultant - PhD or equivalent experience	Per Hour	$ 234.00
Senior Project Manager/ Engineer - PE w/10 years experience	Per Hour	$ 165.00
Project Engineer - PE w/3 years experience	Per Hour	$ 145.00
Assistant Project Engineer/Project Manager - PE or EI <3 yrs	Per Hour	$ 134.00
Staff Engineer - EI or <1 year experience	Per Hour	$ 108.00
CONSTRUCTION MONITORING AND FIELD/LABORATORY TESTING SERVICES		
Laboratory/Construction Services Manager - BS or equivalent	Per Hour	$ 95.00
Senior Field/Lab Technician -- 2 years field /lab experience & certs	Per Hour	$ 76.00
Field/Lab Technician 0-2 years field/lab experience & certs	Per Hour	$ 56.00
ENVIRONMENTAL TESTING		
Environmental Technician - 2 years field experience	Per Hour	$ 80.00
Asbestos Surveyor - 2 years field experience + Certs	Per Hour	$ 80.00
Licensed Asbestos Consultant - Prof. License & Certs	Per Hour	$ 180.00
SUPPORT PERSONNEL		
Technical Draftsman/CADD Operator - Autocad Technician	Per Hour	$ 63.00
Technical Secretary - Secretary/clerical	Per Hour	$ 63.00

RATES FOR SUBSURFACE FIELD EXPLORATION

MOBILIZATION		
Standard Mobilization and Demobilization		Quote per Project
Mud Bug Mobilization and Demobilization		Quote per Project
Mileage - Rig (outside 50 mile radius)	Per Rig-Mile	$ 1.00
Mileage - Truck (outside 50 mile radius)	Per Truck-Mile	$ 0.75
Remote Islands		Quote per Project incl. Barge Fees
Portable Barge		Quote per Project
Daily Crew Trip Charge (outside 25-mile radius)	Per Site/Per Day	$ 158.00
STANDARD DRILLING		
Hand Auger	Per Lineal Foot	$ 15.00
Auger Borings (4-inch)	Per Lineal Foot	$ 15.00
Wash Borings - Cuttings Only (up to 3 inch)		
• Soil drilling	Per Lineal Foot	$ 13.00
• Rock drilling	Per Lineal Foot	$ 19.00
Dynamic Cone Penetrometer	Per Lineal Foot	$ 16.00
Standard Penetration Test (SPT) Borings (ASTM D-1586) in soil (N-values <50):		
• from surface to 25 feet	Per Lineal Foot	$ 18.00
• from 25 feet to 50 feet	Per Lineal Foot	$ 20.00
• from 50 feet to 75 feet	Per Lineal Foot	$ 21.00
• from 75 feet to 100 feet	Per Lineal Foot	$ 24.00
• from 100 feet to 150 feet	Per Lineal Foot	$ 33.00
Standard Penetration Test (SPT) Borings in high resistance soil/rock (N-values >50)	Add'l Per Lineal Foot	$ 3.60
Furnish, Install, and Remove Casing (up to 4-inch)	Per Lineal Foot	$ 8.00
Support Water Truck (Time Basis)	Per Day	$ 183.00

SAMPLING - Continuous SPT Sampling		
• from 10 feet to 25 feet	Per Additional Sample	$ 34.50
• from 25 feet to 50 feet	Per Additional Sample	$ 37.80
• from 50 feet to 75 feet	Per Additional Sample	$ 41.00
• from 75 feet to 100 feet	Per Additional Sample	$ 45.00
• from 100 feet to 150 feet	Per Additional Sample	$ 54.00
Undisturbed Samples		
• Shelby Tube	Per Sample	$ 153.00
• Fixed-Position Shelby Tube	Per Sample	$ 187.50
Rock Coring (up to 3-inch)	Per Lineal Foot	$ 56.00
OTHER CHARGES		
Site Reconnaissance and Utility locate as required by Chapter 556, FS		Quote per Project
Difficult Access	Per Crew-Hour	$ 200.00
Hole Location and Set-Up	Per Crew-Hour	$ 200.00
Standby Time	Per Crew-Hour	$ 200.00
Decontamination	Per Crew-Hour	$ 200.00
Bore Hole Grouting and Sealing	Per Crew-Foot	$ 4.00
Materials	Per Job	At Cost + 15%
MONITOR WELLS AND PIEZOMETERS (PVC)		
1" to 2" Piezometers in soil (up to 25' deep)	Per Lineal Foot	$ 43.00
• In rock (N >50)	Add'l Per Lineal Foot	$ 6.00
2" Monitor Well in soil (up to 25' deep)	Per Lineal Foot	$ 48.00
• in rock (N >50)	Add'l Per Lineal Foot	$ 18.00
Lockable Security Covers with 2' x 2' x 4" concrete pad		
• 4" x 4" Box Steel (for 2" well)	Each	$ 215.00
• 6" x 6" Box Steel	Each	$ 237.00
• 8" dia. manhole with 2" lockable well cap	Per Set	$ 295.00
• Steel reinforcement for concrete pad (4-#4)	Additional Per Pad	$ 63.00
Development of Well/Piezometer	Per Hour	$ 80.00
Well Construction Permit	Per Permit	Quote per Project
IN SITU SOIL PERMEABILITY		
Double-Ring Infiltrometer (ASTM D-3385)	Per Test	$ 550.00
Air-Entry Permeameter	Per Test	$ 174.00
Slug or Constant Head Test in Monitor Well/Piezometer	Per Test	$ 174.00
SWFWMD Open-Hole Exfiltration Test	Per Test	$ 203.00
Horizontal Permeability Test in Hand Auger Boring	Per Test	$ 203.00
Vertical Permeability Test in Hand Auger Boring	Per Test	$ 290.00
GEOPHYSICAL/ENVIRONMENTAL EQUIPMENT (FIELD USE)		
Methane Detector (Rental)	Per Day	$ 55.00
Organic Vapor Analyzer	Per Day	$ 120.00
Vibration Monitor - Equipment	Per Job	At Cost + 15%
Vibration Monitor Technician	Per Hour	$ 71.00
Sound Level Meter – Equipment Usage	Per Day	$ 53.00
Turbidimeter	Per Day	$ 53.00
Ground Penetrating Radar (includes equipment & report)	Per Day	$2,750.00
Boat Use - 14 foot	Per Day	$ 166.00
Other Equipment	Per Job	At Cost + 15%
PILE MONITORING AND LOAD TEST		
Pile Installation Monitor Technician	Per Hour	$ 73.00
Pile Load Tests - Supply hydraulic jack, Instrumentation and Monitoring		
• Compressive (ASTM D-1143), (up to 200 ton)		Quote per Project
• Tensile (ASTM D-3689), (up to 100 ton)		Quote per Project
• Lateral (ASTM D-3966), (up to 50 ton)		Quote per Project

SPECIAL DRILLING/SOUNDING
Prices for special drilling (barge drilling; air boat sampling; amphibious drilling; NG wire line coring; large diameter borings; drilling in corrosive, contaminated or hazardous materials; drilling at great depths; installing large diameter temporary casing; etc.), field vane testing, and other specialized field tests will be determined per project.

INSTRUMENTATION
Prices for installation of inclinometers, settlement devices and deep (>25'), stainless steel or teflon piezometers/monitor wells will be determined per project.

RATES FOR LABORATORY TESTING SERVICES

CLASSIFICATION TESTS		
Moisture Content (ASTM D-2216)	Each	$ 17.00
Organic Content		
• Loss on Ignition (ASTM D-2974, AASHTO T267)	Each	$ 39.00
• Wet Combustion (AASHTO T194)	Each	$ 133.00
Unit Weight/Classification (Undisturbed Sample)	Each	$ 69.00
Sieve Analysis		
• Soil (ASTM D-6913)	Each	$ 60.00
• Soil Aggregate Mixture or Aggregate (up to 1-in.) (ASTM C-136, AASHTO T27)	Each	$ 150.00
• Soil Aggregate Mixture or Aggregate (greater than 1-in.) (ASTM C-136, AASHTO T27)	Each	$ 190.00
Percent Fines Soils (ASTM D-1140)	Each	$ 36.00
Percent Fines Aggregates (ASTM C-117 or AASHTO T11)	Each	$ 36.00
Hydrometer Analysis (ASTM D-7928)	Each	$ 122.00
Particle Size Analysis (AASHTO T88)	Each	$ 75.00
Atterberg Limits (ASTM D-4318)		
• Plasticity Index less than 150	Per Set	$ 119.00
• Plasticity Index greater than 150	Add'l Per Set	$ 73.00
Shrinkage Limit (ASTM D-427)	Each	$ 99.00
Specific Gravity of Fine Aggregate (AASHTO T84)	Each	$ 180.00
Specific Gravity of Coarse Aggregate (AASHTO T85)	Each	$ 120.00
Carbonate Content (FM 5-514)	Each	$ 180.00
Mohs Hardness	Each	$ 6.00
Munsell Color	Each	$ 6.00
Visual Soil Classification (ASTM D-2488)	Each	$ 7.00
Deleterious Substances of Graded Aggregate	Per Hour	Hourly Technician Rate
Sample Preparaton	Per Hour	Hourly Technician Rate
COMPACTION TESTS		
Standard Proctor (ASTM D698, AASHTO T99) or Modified Proctor (ASTM D1557, AASHTO T180)		
• Soils	Each	$ 125.00
• Soil Aggregate and Base Materials	Each	$ 155.00
Limerock Bearing Ratio (LBR) - 5 Point (FM 1-T180/FM 5-515)	Per Set	$ 380.00
CONSOLIDATION TESTS		
Incremental Consolidation Test (ASTM D-2435)		
• Up to Ten Load-Unload Increments	Per Test	$ 640.00
• More than Ten Load-Unload Increments	Per Add'l Increment	$ 57.00
Constant Rate of Strain Consolidation Test (ASTM D-4186)	Each	$ 655.00
PERMEABILITY TESTS		
Permeability Test on Sand	Each	$ 269.00
Permeability Test on Fine Grained Soil		
• $k > 10^{-5}$cm/sec	Each	$ 344.00
• $k < 10^{-5}$cm/sec	Each	$ 485.00
Permeation with Fluids Other Than Water	Add'l Per Test	$ 215.00

STRENGTH TESTS		
Strength Index Test (Torvane, Penetrometer, etc.)	Each	$ 6.75
Unconfined Compression Test (ASTM D-2166)		
• Strength Only	Each	$ 61.50
• With Stress-Strain Curve	Each	$ 113.50
Direct Shear Tests (Coarse Grained Soils)		
• Conventional Box Shear	Per Normal Load	$ 327.00
• With Stress Reversals	Per Normal Load	$ 495.00
Angle of Repose	Each	$ 57.50
Split Tensile for Rock Cores (ASTM 3967)	Each	$ 158.00
CHEMICAL TESTS		
Water pH	Each	$ 15.00
Water Specific Conductance	Each	$ 15.00
Turbidity (EPA 180.1)	Each	$ 30.00
Soil pH (FM 5-550)	Each	$ 47.50
Soil Specific Conductance	Each	$ 47.50
Soil Resistivity (ASTM G-57)	Each	$ 53.00
Soil Corrosivity Series (FM 5-550, 551, 552, 553)	Per Set	$ 200.00
GEOSYNTHETICS		
Geomembrane Thickness (ASTM D-751, D-5199 or D-5994)	Per Sample	$ 18.25
Geomembrane Asperity Height (ASTM D-7468)	Per Sample	$ 39.25
Geomembrane Density (ASTM D-792)	Per Sample	$ 34.50
Carbon Black Content (ASTM D1603)	Per Sample	$ 37.50
Geomembrane Tensile Strength (ASTM D-638 or D-6693)	Per Set	$ 87.75
Geomembrane Tear Resistance (ASTM D-1004)	Per Sample	$ 77.50
Geomembrane Seams (ASTM D-4437 or D-6392)		
• Extrusion Weld (5 Peel/5 Shear)	Per Set	$ 51.50
• Double -Weld Fusion Weld (10 Peel/5 Shear)	Per Set	$ 77.00
Geotextile Grab Tensile Strength (ASTM D-4632)	Per Set	$ 87.50
Geotextile Trapezoidal Tear (ASTM D-4533)	Per Set	$ 103.00
Geotextile Wide-Width Tensile (ASTM D-4595)	Per Set	$ 133.00
Geotextile Mass/Unit Area (ASTM D-3776 or D-5261)	Per Sample	$ 35.50
Geotextile Thickness (ASTM D-1777 or D-5199)	Per Sample	$ 18.50
Geotextile Seam Strength (ASTM D-4884)	Per Sample	$ 67.00
Geocomposite Bond Strength (ASTM D-7005)	Per Set	$ 109.50
Geonet Breaking Force (ASTM D-7179)	Per Set	$ 64.50
GCL Bonding Peel Strength (ASTM D-6495)	Per Set	$ 64.50
GCL Tensile Strength (ASTM D-6768)	Per Set	$ 64.50
Interface Indirect Shear (ASTM D-5321)		
• Geosynthetic to Geosynthetic	Per Normal Stress	$ 298.00
• Geosynthetic to Soil	Per Normal Stress	$ 405.00
Sample Shipping	Per Job	At Cost + 15%
RADON TESTING		
Gamma Radiation Testing with Ludlum Scintillometer	Per Hour	$ 85.00
Sample Shipping	Per Job	At Cost + 15%
Radium-226 Assay, including packaging and transport	Per Sample	$ 155.00

$100.00 Minimum Fee for Testing Samples Delivered by Client

SAMPLE PREPARATION AND SPECIAL TESTS

Preparation of Laboratory Samples for Testing (e.g., sedimented or compacted) will be charged at $20.00 per sample. Prices for Visual Classification, for Special Sample Preparation, for Special Laboratory Tests (Slurry Consolidation, Leaching Tests, Settling Tests, Triaxial Compression Tests, Geotextile Strength Tests, etc.), and for testing contaminated soils or hazardous materials will be determined per project based upon technician man-hours and other considerations. In addition, a daily charge of $12.00 per day will be assessed for special long-term laboratory tests (i.e., slurry consolidation, leaching tests, etc.)

RATES FOR MATERIALS TESTING SERVICES

CONCRETE SAMPLING & TESTING

Fresh Concrete

Travel Time	Per Hour	Hourly Technician Rate
Concrete Cylinders, Compressive Strength (ASTM C-39)	Per Set	$ 100.00
Concrete Cylinders, Compressive Strength Cast by Others	Each	$ 28.00
• Additional cylinders from the same sample (more than 5/set)	Each	$ 17.00
Concrete Beams, Flexural Strength (ASTM C-78)	Set of 3	$ 275.00
• Additional Beams (more than 3/set)	Each	$ 60.00
Concrete Beams, Flexural Strength Cast by Others	Each	$ 55.00
Air Content Determination (ASTM C-173 or C-231)	Per Test	$ 22.00
Additional Slump Tests (ASTM C-143)	Per Test	$ 18.00
Unit Weight Determination (ASTM C-138)	Per Test	$ 34.00
Stand-by Time (in excess of 1/2 hour per set) and/or Continuous Monitoring of Concrete Placement	Per Hour	Hourly Technician Rate
Sample Pick-up/Processing	Per Hour	Hourly Technician Rate

Hardened Concrete (including specimens cast by others)

Travel Time	Per Hour	Hourly Technician Rate
Drilled Concrete Cores, Compressive Strength (ASTM C-42)	Per Core	$ 32.00
Rebound (Swiss) Hammer Test (not including Technician Time	Per Trip	$ 150.00
Shotcrete Test Panel (includes coring and compressive strength testing)	Per Core	$ 65.00
Concrete Slab Moisture Vapor Emission Test (ASTM F-1869)		Quote per Project
Concrete Slab Relative Humidity Testing (ASTM F-2170)		Quote per Project
Sample Pick-up/Processing	Per Hour	Hourly Technician Rate

MASONRY SAMPLING & TESTING

Travel Time	Per Hour	Hourly Technician Rate
Stand-by Time (in excess of 1/2 hour per set)	Per Hour	Hourly Technician Rate
Grout Prism, Compressive Strength (prepared in cardboard forms)	Set of 4	$ 100.00
Mortar/Grout 2-inch Cubes, Compressive Strength	Set of 3	$ 105.00
Clay/Concrete Brick and Pavers, Absorption & Net Area Compressive Strength	Set of 6	$ 240.00
Concrete Masonry Units, Gross Area Compressive Strength	Each	$ 93.00
Concrete Masonry Units, Absorption & Net Area Compressive Strength	Set of 6	$ 490.00
Sample Pick-up/Processing	Per Hour	Hourly Technician Rate

ASPHALT SAMPLING & TESTING

Travel Time	Per Hour	Hourly Technician Rate
Sample Pick-up/Processing	Per Hour	Hourly Technician Rate
In-Place Density Test (ASTM D2950)	Per Test	$ 28.00
Drilled Core, Bulk Specific Gravity (Density)	Per Test	$ 42.00
Bitumen Extraction and Aggregate Gradation (FM 5-563, FM 1-T030)	Per Sample	$ 210.00
Laboratory Density by Marshall Method with Stability & Flow Determinations (FM 5-511)	Per Sample	$ 170.00

SOIL CEMENT (CEMENT-TREATED BASE)

Mix Design		Quote per Project
Field Technician (sampling, portal-to-portal)	Per Hour	Hourly Technician Rate
Field Pills (includes molding & strength testing)	Each	$ 50.00
Drilled Base Cores, Compressive Strength	Each	$ 45.00

CORING SERVICES

Mobilization of Coring Equipment	Per Site	$ 250.00
Coring Crew Time On-site	Per Man/Per Hour	Hourly Technician Rate
Concrete Slab Coring, up to 8 inches of depth (does not include mobilization or crew time)	Per Core	$ 40.00
Asphalt Pavement Coring	Per Core	$ 35.00
Base Coring/Depth Verification	Per Core	$ 42.00
Shotcrete Test Panel (made by others) (includes coring and compressive strength testing)	Each	$ 65.00
Sample Pick-Up and Handling	Per Hour	Hourly Technician Rate

IN SITU COMPACTION DETERMINATION

Travel Time	Per Hour	Hourly Technician Rate
In-Place Density Test (Minimum of 5 per trip)	Per Test	$ 28.00
Stand-by Time (in excess of ¼ hour per test)	Per Hour	Hourly Technician Rate
Field Moisture Content with "Speedy" Tester (FM 5-507)	Per Test	$ 10.00
Sampling/Processing of Materials for Laboratory Testing	Per Hour	Hourly Technician Rate

SINGLE FAMILY RESIDENCE – COMPACTION TESTING (BUILDING PADS, FOUNDATIONS AND STEM WALLS)

Includes one trip per lot, up to 4 density tests and reporting	Lump Sum	$ 250.00
Additional Trips (up to 2 density tests)	Lump Sum	$ 125.00
Additional density tests (if required)	Each	$ 28.00

MINIMUM TRIP FEE:
Failure to notify our office in advance of schedule changes or cancellations will result in a minimum trip fee of $90.00.

MINIMUM LABORATORY FEE:
Samples delivered by the Client will be subject to a minimum fee of $100.00 for reporting and administrative fees.

OVERTIME & HOLIDAY:
Charges will be increased by 50% for work performed outside normal business hours (7:00 am to 5:00 pm) and during weekends, official holidays or over 40 hours per week. A minimum laboratory testing fee may also apply in such cases. $100.00 Minimum Fee for Testing Samples Delivered by or Sampled by Client or Others.

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RATES FOR ENVIRONMENTAL SERVICES

LABORATORY ANALYTICAL TESTING (includes sample handling and transport)

Sample Kit	Per Well	$ 25.00
Filter	Per Sample	$ 35.00
EPA 8021 (1 or 2) water only	Per Sample	$ 90.00
EPA 8021 (1 & 2) water only	Per Sample	$ 150.00
EPA 8021 (soil, low level, aromatic or halogenated w/encore)	Per Sample	$ 300.00
EPA 8310	Per Sample	$ 150.00
EPA 8260 Water	Per Sample	$ 225.00
EPA 8270	Per Sample	$ 375.00
RCRA 8 Metals	Per Sample	$ 180.00
FL PRO	Per Sample	$ 130.00
Virgin Preburn (EPA 8021, FL PRO, RCRA-4	Per Sample	$ 435.00
Non-Virgin Preburn (EPA 8021, FL PRO, RCRA, PCB, & TOX)	Per Sample	$ 620.00
EPA 8021 (aromatics only) soil w/syringe	Per Sample	$ 200.00
EPA 8260 soil w/syringe	Per Sample	$ 375.00
EPA 1311 TCLP Extraction (analysis additional)	Per Sample	$ 150.00
EPA 8081 Organochlorine Pesticide	Per Sample	$ 225.00
EPA 8141 Organophosphorus Pesticide	Per Sample	$ 225.00
EPA 8151 Herbicide	Per Sample	$ 260.00
EPA 8082 (PCB)	Per Sample	$ 115.00
Individual Metals	Per Sample	$ 35.00
Groundwater Sampling per FDEP/SOP	Per Hour	$ 110.00
Additional Methods (not listed)		Quote Per Project
Multiple Analysis Discount		Quote Per Project

ASBESTOS SERVICES

Bulk Sample by Polarized Light Microscopy (PLM)		
• standard 48 hour turnaround time	Per Sample	$ 22.00
• 24-hour turnaround	Per Sample	$ 24.00
Point Count Analysis	Per Sample	$ 42.00

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