

WORK AUTHORIZATION NO. 02

WILLIAMSON COUNTY ROAD & BRIDGE PROJECT:
ON-CALL MATERIALS TESTING & GEOTECHNICAL ENGINEERING
CR 201 (CR 200 TO UMBRELLA SKY) PHASE 1

This Work Authorization is made pursuant to the terms and conditions of the Williamson County Contract for Engineering Services, being dated **May 5, 2020** and entered into by and between Williamson County, Texas, a political subdivision of the State of Texas, (the "County") and **Fugro USA Land, INC.** (the "Engineer").

Part 1. The Engineer will provide the following Engineering Services set forth in Attachment "B" of this Work Authorization.

Part 2. The maximum amount payable for services under this Work Authorization without modification is \$ **40,643.00**.

Part 3. Payment to the Engineer for the services established under this Work Authorization shall be made in accordance with the Contract.

Part 4. This Work Authorization shall become effective on the date of final acceptance and full execution of the parties hereto and shall terminate on **December 31, 2021**. The Engineering Services set forth in Attachment "B" of this Work Authorization shall be fully completed on or before said date unless extended by a Supplemental Work Authorization.

Part 5. This Work Authorization does not waive the parties' responsibilities and obligations provided under the Contract.

Part 6. County believes it has sufficient funds currently available and authorized for expenditure to finance the costs of this Work Authorization. Engineer understands and agrees that County's payment of amounts under this Work Authorization is contingent on the County receiving appropriations or other expenditure authority sufficient to allow the County, in the exercise of reasonable administrative discretion, to continue to make payments under this Contract. It is further understood and agreed by Engineer that County shall have the right to terminate this Contract at the end of any County fiscal year if the governing body of County does not appropriate sufficient funds as determined by County's budget for the fiscal year in question. County may effect such termination by giving written notice of termination to Engineer.

Part 7. This Work Authorization is hereby accepted and acknowledged below.

Continued next page

EXECUTED this 22 day of June, 2021.

ENGINEER:

Fugro USA Land, INC.

By: [Signature]
Signature

Denton A. Kort, PE

Printed Name

Vice President, General Manager

Title

COUNTY:

Williamson County, Texas

By: [Signature]
Signature

Valerie Covey

Printed Name

County Presiding Officer

Title

LIST OF ATTACHMENTS

Attachment A - Services to be Provided by County

Attachment B - Services to be Provided by Engineer

Attachment C - Work Schedule

Attachment D - Fee Schedule

[Signature]

6/14/2021

Attachment A

Services to be Provided by the County For CR 201 Project

In general, Williamson County and its representatives to their best efforts will render services as follows:

1. Name, business address, and phone number of County's project manager.
2. Assistance to the Engineer, as necessary, with obtaining data and information from other local, regional, State and Federal agencies required for this project.
3. Obtain Rights of Entry from landowners.
4. Provide available appropriate County data on file including plans and specifications that are deemed pertinent to the completion of the work required by the scope of services.
5. Provide available criteria and full information as to the client's requirements for the project. Provide examples of acceptable format for the required deliverables.
6. Provide information on any meetings/discussions held with adjoining property owners that may impact the project.
7. Provide timely reviews and decisions necessary for the Engineer to maintain the project work schedule. Review recommendations offered by the Engineer, progress of work, and final acceptance of all documents.
8. Support project development efforts with stakeholders, coordinate meetings and interface with stakeholders, as needed.
9. Assist with Coordination between the Engineer and the County's other consultants.
10. Provide existing and proposed ROW and easement documents for proposed facilities.
11. Provide an agent as necessary to secure proposed ROW.

Attachment B

Services to be Provided by Engineer For CR 201 Project

PROJECT DESCRIPTION

Project Limits

From CR 200 to Umbrella Sky for approximately 2.0 miles.

Proposed Facility

Reconstruction of an existing 2-lane roadway into part of a proposed ultimate 6-lane roadway with median within the project limits mentioned above as shown in Sheet 1 of 1 of the CR 201 Proposed Right-Of-Way Exhibit dated 04/22/2020 (see attached).

GEOTECHNICAL SERVICES

Scope of Work

The proposed scope of work consists of the following tasks:

Task 1 - Geotechnical Exploration

Task 2 - Laboratory Testing

Task 3 – Engineering & Reporting

Discussed below in brief are the scope of services for each task.

Task 1 - Geotechnical Exploration

- Perform geotechnical exploration borings within the proposed project alignment as detailed on the Client Requested Boring Location Plan (see attached). As provided by the Client, the boring program will include borings within and beyond the existing pavement structure and right-of-way at approximately 1,200-ft intervals. The table below summarizes the boring program based on depths and boring intervals as specified by the Client.

Proposed Boring Plan – CR 201 Project

Structure	No. of Borings*	Proposed Boring Depth (ft.) **	Total Drilling Footage
Pavement	10	15	150
* Additional borings may be needed based on project variability identified during testing. **15-ft from the existing grade; assuming proposed pavement profile will mostly be at-grade.			

- Provide traffic control as needed to support field geotechnical exploration.
- Provide limited clearing to access boring locations for a truck-mounted drill rig.

- Perform geotechnical soil exploration within the existing pavement structure and the natural ground along the project alignment following the request boring log provided by the Client and following general procedures by Williamson County and TxDOT.

Task 2 - Laboratory Testing

- Perform laboratory tests on soil samples recovered from the borings as discussed below. As requested, the geotechnical laboratory testing will include performing moisture content tests, Atterberg limit tests, particle size analysis tests, free swell, soluble sulfate content tests, and lime series analyses. All laboratory testing will be performed in general accordance with applicable TxDOT, ASTM or AASHTO Standards.

Task 3 – Engineering and Reporting

- Provide subgrade preparation recommendations based on the field testing, laboratory testing, and analysis following the Williamson County Design Criteria Manual for the below requested items:
 - Evaluation of sulfate heave and soil swell potential.
 - Subgrade improvement based on TxDOT Potential Vertical Rise (PVR) analysis (Tex-124-E).
 - Recommended percent lime for subgrade improvement.

Pavement design is not included in this scope of work.

- Provide a Geotechnical Report for the project evaluated by a professional engineer licensed in the State of Texas. As requested by the Client, the following items will be included in the report: project overview, scope of work, geology along the project alignment, boring logs (TxDOT Wincore format), field and laboratory test results, description of surface and subsurface conditions, groundwater conditions encountered during the exploration, and subgrade preparation recommendations based on PVR calculations, swell potential evaluations, determination of soluble sulfate content in soil, and percent lime for subgrade treatment. It is understood that the pavement will be designed by others and Fugro is requested to provide recommendations for subgrade preparation.

Deliverables:

- Preliminary and Final Geotechnical Report

Perform 10 borings, spaced at 1170ft
ensure 1 bore at both begin/ end of project. See legend for more information.



LEGEND

PROPOSED ROW (20.18 ACRES)
(55 PARCELS)

PROPOSED ROW LINE

PROPOSED ALIGNMENT

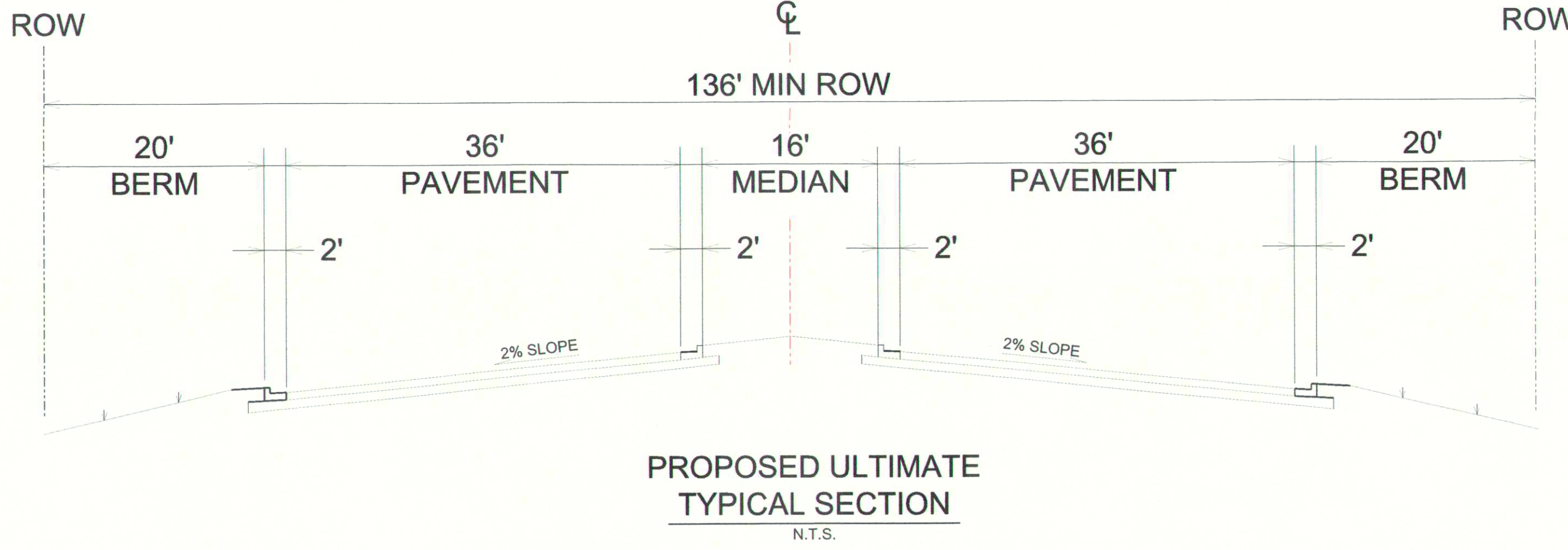
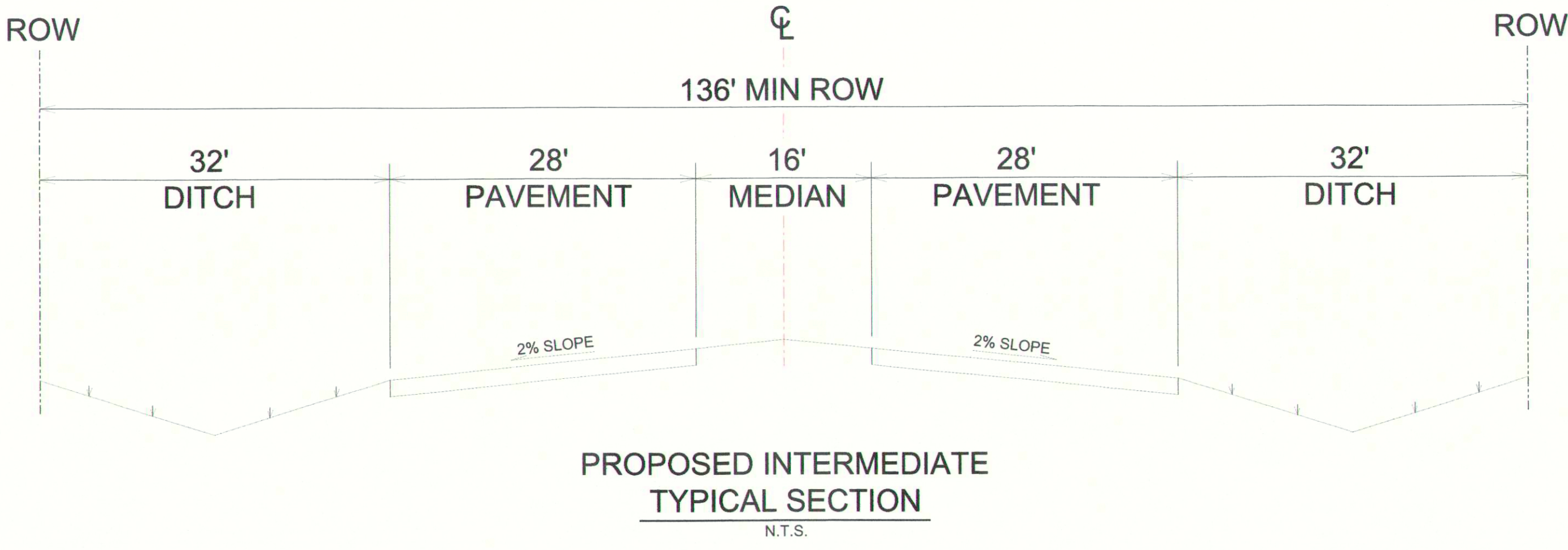
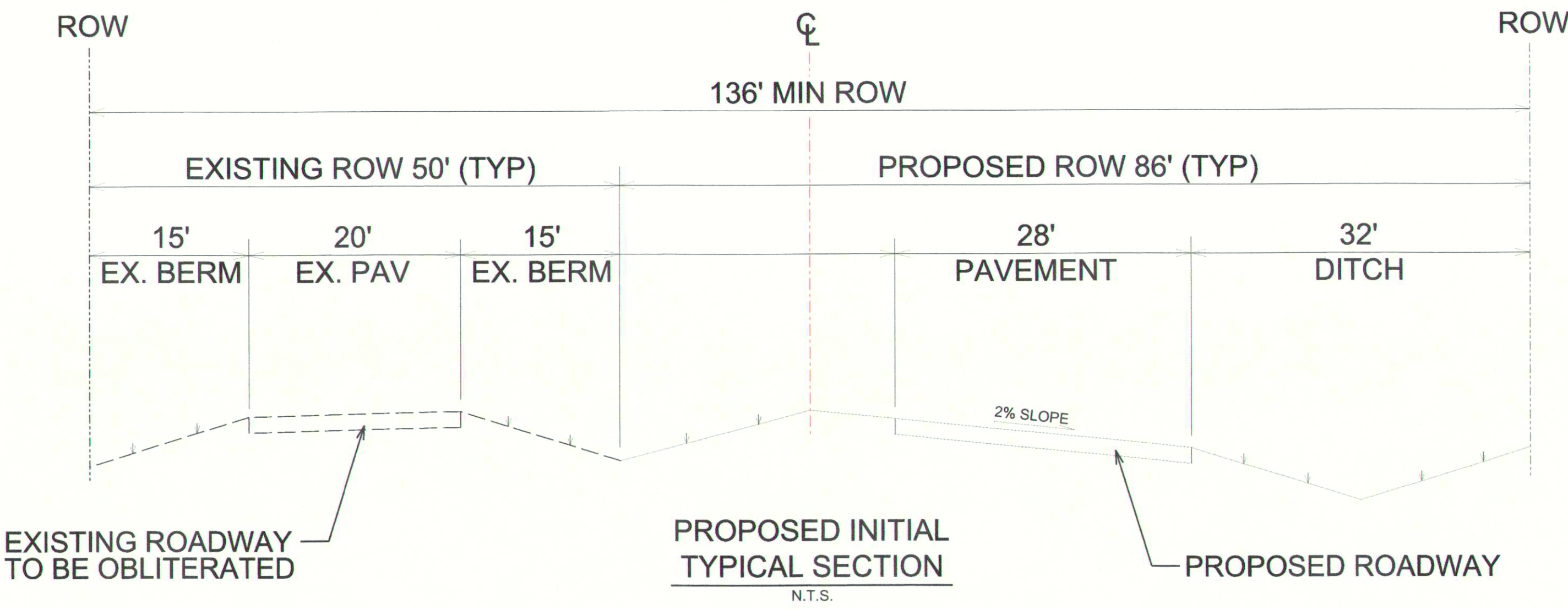
EXISTING ROW LINE

EXISTING PROPERTY LINE

BORE LOCATION NOT
IN EXISTING PAVEMENT

BORE LOCATION IN
EXISTING PAVEMENT

CLEINT REQUESTED BORING PLAN LAYOUT



PROJECT: CR 201 - ROW

DATE: 04/22/2020

DESIGN BY: KOK

DRAWN BY: KOK

CHECKED: KOK

1

OF 1

WILLIAMSON COUNTY
DEPARTMENT OF
INFRASTRUCTURE

CR 201 PROPOSED RIGHT-OF-WAY
EXHIBIT

FROM CR 200 TO UMBRELLA SKY

NO. DESCRIPTION

1 BORING LOCATION NOT IN EXISTING PAVEMENT

2 BORING LOCATION IN EXISTING PAVEMENT

3 BORING LOCATION NOT IN EXISTING PAVEMENT

4 BORING LOCATION IN EXISTING PAVEMENT

5 BORING LOCATION NOT IN EXISTING PAVEMENT

6 BORING LOCATION IN EXISTING PAVEMENT

7 BORING LOCATION NOT IN EXISTING PAVEMENT

8 BORING LOCATION IN EXISTING PAVEMENT

9 BORING LOCATION NOT IN EXISTING PAVEMENT

10 BORING LOCATION IN EXISTING PAVEMENT

Attachment C

Work Schedule For CR 201 Project

Weather and site conditions permitting, initial site operations can occur within 2 weeks after formal authorization to proceed. A summary of our anticipated durations for each activity is presented in the following table along with a general work schedule overview. Some tasks will run concurrently, others sequentially. We will keep you verbally and electronically informed of our findings as they become available.

Task	Activity	Duration
1	Coordination of Rig Access, Staking of Borings, Right of Entry Permitting, and Utility Location	2 to 3 weeks
	Geotechnical Drilling and Sampling	2 to 3 weeks
2	Laboratory Testing	3 to 4 weeks
3	Engineering Analysis and Preparation of Draft Geotechnical Report	4 to 6 weeks
	Review of Client Comments and Preparation of Final Geotechnical Report	2 weeks

Tasks	Months				
	1	2	3	4	5
Task 1 - Geotechnical Exploration and Testing					
Task 2 - Laboratory Testing					
Task 3 - Project Management and Reporting					

ATTACHMENT D - FEE SCHEDULE

Proposed Boring Plan – CR 201 Project

Structure	No. of Borings*	Proposed Boring Depth (ft.) **	Total Drilling Footage
Pavement	10	15	150
* Additional borings may be needed based on project variability identified during testing.			
**15-ft from the existing grade; assuming proposed pavement profile will mostly be at-grade.			

Cost Estimate for Geotechnical Exploration and Ground Improvement Recommendations

CR-201 Project Williamson County, Texas

Task 1 Geotechnical Exploration		Quantity	Unit	Rate	Subtotal
1.1.1	Mobilization/Demobilization of Drilling Rig (3-days)	2	each	\$450.00	\$900.00
1.1.2.1	Drilling Soil (upto 15 ft.) - Continuous sampling to 10 ft.	100	foot	\$22.00	\$2,200.00
1.1.3	Standard Penetration Tests	15	each	\$27.00	\$405.00
1.1.4	TxDOT Cone Penetration Tests	27	each	\$34.00	\$918.00
1.1.5.1	Rock Corings - Soft Rock (Austin Chalk)	50	foot	\$30.00	\$1,500.00
1.1.12	Dozer/Bobcat Service/Tree Clearing	1	day	\$2,500.00	\$2,500.00
1.1.13	Traffic Control Plan	1	each	\$1,100.00	\$1,100.00
1.1.14	Traffic Control Service - Minor Project	2	day	\$2,000.00	\$4,000.00
4.3	Project Manager (Coordination)	4	hour	\$195.00	\$780.00
4.4	Project Engineer (Coordination)	8	hour	\$180.00	\$1,440.00
4.9	Senior Engineering Technician (Staking borings, one-call, field logging, project coordination)	30	hour	\$115.00	\$3,450.00
				Subtotal	\$19,193.00
Task 2 - Laboratory Testing		Quantity	Unit	Rate	Subtotal
2.1.1	Bulk-Sample Pick-Up	10	hour	\$60.00	\$600.00
2.1.3	Natural Moisture Contents	30	each	\$19.00	\$570.00
2.1.4	Sieve Analysis	20	each	\$70.00	\$1,400.00
2.1.5	Atterberg Limit Determinations	20	each	\$75.00	\$1,500.00
2.1.6	Percent Passing No. 200 Sieve (TEX-111-E)	10	each	\$50.00	\$500.00
2.1.12	Soluble Sulfate (TEX-145 -E)	5	each	\$90.00	\$450.00
2.1.14	Soil-Lime pH Series (TEX-121-E, Part III)	3	each	\$750.00	\$2,250.00
2.1.15	Free Swell Test	3	each	\$125.00	\$375.00
2.1.32	Determine Potential Vertical Rise (TEX-124-E)	10	each	\$75.00	\$750.00
3.2	Admin/Clerical/Drafting	4	hour	\$85.00	\$340.00
4.7	Laboratory Manager	4	hour	\$175.00	\$700.00
4.8	Graduate Professional	15	hour	\$125.00	\$1,875.00
				Subtotal	\$11,310.00
Task 3 - Engineering, Project Management, and Reporting		Quantity	Unit	Rate	Subtotal
3.2	Admin/Clerical/Drafting	4	hour	\$85.00	\$340.00
4.1	Project Principal	5	hour	\$295.00	\$1,475.00
4.3	Project Manager	15	hour	\$195.00	\$2,925.00
4.4	Project Engineer	30	hour	\$180.00	\$5,400.00
				Subtotal	\$10,140.00
				Total Cost Estimate	\$40,643.00



EXHIBIT D - RATE SCHEDULE

FEES FOR GEOTECHNICAL AND MATERIALS ENGINEERING SERVICES

1. FIELD SERVICES

1.1 Geotechnical

Unit Rate

1.1.1	Mobilization and Demobilization, Local, Each	\$ 450.00 minimum
1.1.1.1	Drill Truck, Water Truck, Pickup, and Crew	\$ 8.00/mile
1.1.2	Drilling and Sampling	
1.1.2.1	Drilling and Sampling with 3-inch, Thin-Walled Tube Sampler, Continuous to 10.0 ft, 5.0-ft Intervals Thereafter	\$ 22.00/foot
1.1.2.2	Continuous Drilling and Sampling with 3-inch, Thin-Walled Tube Sampler or Split-Spoon Sampler	\$ 39.00/foot
1.1.3	Standard Penetration Tests	\$ 27.00/each
1.1.4	TxDOT Cone Penetration Tests	\$ 34.00/each
1.1.5	Rock Coring, NX or Similar Core Barrel	
1.1.5.1	Drilling in Soft Rock (Austin Chalk, Eagle Ford Shale, etc.)	\$ 30.00/foot
1.1.5.2	Drilling in Hard Rock or Cavitated Rock (Edwards, Buda, Glen Rose, Georgetown, and Walnut Formations)	\$ 39.00/foot
1.1.6	Casing of Boreholes	\$ 26.00/foot
1.1.7	Drill Rig Hourly Charges for Boring Layout, Excessive Time Spent Gaining Access to Boring Locations, Move Time, Backfilling Boreholes, Cleaning up Site, Installing Piezometers, and for Other Reasons Beyond our Control	\$ 245.00/hour
1.1.8	Plugging Boreholes with Bentonite	\$ 9.00/foot
1.1.9	Cone Penetrometer Testing	\$3,750.00/day
1.1.10	Wooden Core Boxes (NX)	\$ 75.00/each
1.1.11	Field Personnel	See 4.0: Engineering Consultation

1.2 Geophysics Equipment

Unit Rate

1.2.1	Geophysics Vehicle (including consumables)	\$ 175.00/day
1.2.2	Mileage	\$ IRS RATE
1.2.3	GPR (complete system)	\$ 500.00/day
1.2.4	GPR (extra antenna)	\$ \$85.00/day
1.2.5	EM (EM31, EM61)	\$ 220.00/day
1.2.6	Resistivity (Sting/MiniSting)	\$ 140.00/day
1.2.7	Resistivity (SuperSting)	\$ 775.00/day
1.2.8	Magnetometer	\$ 260.00/day
1.2.9	Seismic Refraction (per 24ch)	\$ 325.00/day
1.2.10	Downhole Seismics	\$ 360.00/day
1.2.11	Crosshole Seismics	\$ 510.00/day
1.2.12	Utility Locating Tools	\$ 190.00/day



EXHIBIT D - RATE SCHEDULE

1.3 CMT Field Technicians⁽¹⁾		Unit Rate
1.3.1	Technician (NICET Level I, ACI Grade 1, or TxDOT SB 102).....	\$ 60.00/hr
1.3.2	Technician (TxDOT HMAC Level 1A/1B or equivalent)	\$ 68.00/hr
1.3.3	Senior Technician (NICET Level II or TxDOT HMAC Level II).....	\$ 82.00/hr
1.3.4	Certified Welding Inspector	\$ 90.00/hr
1.4 Field Testing and Equipment		
14.1	Transportation (Local)	\$ 80.00/trip
1.4.2	Nuclear Density Tests (Equipment Charge)	\$ 19.00/test
1.4.3	Torque Wrench	\$ 35.00/day
1.4.4	Ultrasonic Testing Equipment	\$ 35.00/hr
1.4.5	Asphalt Coring Equipment	\$ 45.00/hr
1.4.6	Concrete Coring Equipment	\$ 45.00/hr
1.4.7	Concrete Core Bit Charges	
1.4.7.1	3 inch-diameter Core	\$ 9.00/inch
1.4.7.2	4 inch-diameter Core	\$ 12.00/inch
1.4.7.3	6 inch-diameter Core	\$ 18.00/inch
(Other sizes quoted upon request)		
1.4.8	FACE® Dipstick Floor Flatness/Floor Levelness Equipment.....	\$ 250.00/day
1.4.9	Air Content of fresh concrete (ASTM C173, C231)	\$ 23.00/ea
1.4.10	Unit Weight of fresh concrete (ASTM C138)	\$ 23.00/ea
1.4.11	Soil-Lime Field Gradation (TEX-101-E).....	\$ 50.00/ea

2. LABORATORY TESTING

2.1 Soil		Unit Rate
2.1.1	Bulk Sample Pick-Up.....	\$ 60.00/hr
2.1.2	Sample Preparation (TEX-101-E).....	\$ 120.00/ea
2.1.3	Natural Moisture Content.....	\$ 19.00/ea
2.1.4	Sieve Analysis (TEX-110-E)	\$ 70.00/ea
2.1.5	Atterberg Limits (Liquid and Plastic Limits).....	\$ 75.00/ea
(TEX-104-E, TEX-105-E, TEX-106-E)		
2.1.6	Percent Passing No. 200 Sieve (TEX-111-E).....	\$ 50.00/ea
2.1.7	Bar Linear Shrinkage of Soils (TEX-107-E)	\$ 50.00/ea
2.1.8	Moisture Density Relationship (ASTM D 698), (ASTM D 1557), (TEX-113-E), (TEX-114-E).....	\$ 275.00/ea
2.1.9	Wet Ball Mill (TEX-116-E)	\$ 225.00/ea
2.1.10	Texas Triaxial Compression test on base material (TEX-117-E Part II).....	\$2,300.00/ea
2.1.11	Soil Specific Gravity (TEX-108-E)	\$ 75.00/ea
2.1.12	Soluble Sulfates (TEX-145-E)	\$ 90.00/ea
2.1.13	Soil pH (TEX-128-E)	\$ 70.00/ea
2.1.14	Soil-Lime pH Series (6 points, TEX-121-E, Part III).....	\$ 750.00/set
2.1.15	Free Swell Test.....	\$ 125.00/ea
2.1.16	Pressure Swell test.....	\$ 175.00/ea
2.1.17	Uniaxial Pressure-Strain test.....	\$ 90.00/ea
2.1.18	Hydrometer Analysis.....	\$ 225.00/ea
2.1.19	Unit Dry Weight Determination and Natural Water Content	\$ 30.00/ea
2.1.20	Unconfined Compression Test, Soil	\$ 65.00/ea



EXHIBIT D - RATE SCHEDULE

2. LABORATORY TESTING

2.1 Soil (Continued)

	<u>Unit Rate</u>
2.1.21 Unconfined Compression Test, Rock.....	\$ 75.00/ea
2.1.22 Unconsolidated-Undrained Triaxial Compression Test.....	\$ 90.00/ea
2.1.23 Consolidation Test, 7-load Increments.....	\$ 850.00/ea
Additional Load Increments.....	\$ 125.00/ea
2.1.24 Permeability of Silt or Clay.....	\$ 395.00/ea
2.1.25 Sample Remolding.....	\$ 68.00/ea
2.1.26 Volumetric Shrinkage.....	\$ 95.00/ea
2.1.27 California Bearing Ratio (CBR).....	\$ 240.00/ea
2.1.28 Box Resistivity of Soils (TEX-129-E).....	\$ 115.00/ea
2.1.29 Swell or Settlement Potential-Cohesive Soil (ASTM D 4546).....	\$ 275.00/ea
2.1.30 Crumb Test of Clayey Soils (ASTM D 6572).....	\$ 48.00/ea
2.1.31 Organic Content (ASTM D 2974).....	\$ 72.00/ea
2.1.32 Determine Potential Vertical Rise (TEX-124-E).....	\$ 75.00/ea

2.2 Concrete and Cement

2.2.1 Aggregate Gradation Analysis (ASTM C136, TEX-200-F).....	\$ 75.00/ea
2.2.2 Specific Gravity of Aggregate (ASTM C127, C128).....	\$ 75.00/ea
2.2.3 Absorption of Aggregate (ASTM C127, C128).....	\$ 75.00/ea
2.2.4 Unit Weight of Aggregate (ASTM C29).....	\$ 75.00/ea
2.2.5 Abrasion Test (TEX-410-A).....	\$ 245.00/ea
2.2.6 Decantation (TEX-406-A).....	\$ 45.00/ea
2.2.7 Organic Impurities (TEX-408-A).....	\$ 60.00/ea
2.2.8 Sodium Soundness of Aggregate (ASTM C88).....	\$ 425.00/ea
2.2.9 Concrete Cylinder Compressive Strength (ASTM C 39).....	\$ 22.00/ea
2.2.10 Beam Flexural Strength (ASTM C 78).....	\$ 90.00/ea
2.2.11 Mortar Cube Compressive Strength (ASTM C780).....	\$ 22.00/ea
2.2.12 Grout Specimen Compressive Strength (ASTM C1019).....	\$ 50.00/ea
2.2.13 Concrete Masonry Unit Strength (ASTM C780).....	\$ 115.00/ea
2.2.14 Drilled Core Compressive Strength (ASTM C42).....	\$ 80.00/ea

2.3 Asphaltic Concrete / Fireproofing

2.3.1 Bag Sample Pick-Up.....	\$ 68.00/hr
2.3.2 Obtaining Field Cut Specimens (6-inch diameter, Min. 3/location).....	\$ 70.00/ea
2.3.3 Molding Test Specimens, Bulk Density, and Stability (3 per set).....	\$ 155.00/set
2.3.4 Determine Maximum Theoretical Density.....	\$ 75.00/ea
2.3.5 Asphalt Content and Gradation (TEX-236-F, 200-F).....	\$ 275.00/ea
2.3.6 Asphalt Oven Correction Factors (TEX-236-F, 200-F).....	\$ 1,300.00/ea
2.3.7 Bulk Specific Gravity of Asphalt Core.....	\$ 48.00/ea
2.3.8 Sand Equivalent.....	\$ 175.00/ea

3. REPORT PREPARATION

Special requests for archived report retrieval, re-distribution, faxing, hard-copy mailing, and preparation of engineered reports and submittals will be invoiced at the following rates:

3.1 Word Processing.....	\$ 75.00/hr
3.2 Drafting.....	\$ 85.00/hr
3.3 Reproduction.....	\$ 0.20/copy



Fugro USA Land, Inc.
8613 Cross Park Drive
Austin, Texas 78754
Phone: 512-977-1800
Fax: 512-973-9966

EXHIBIT D - RATE SCHEDULE

4. ENGINEERING CONSULTATION AND MANAGEMENT

4.1	Senior Consultant/Project Principal	\$ 295.00/hr
4.2	Senior Project Manager/Senior Engineer	\$ 250.00/hr
4.3	Project Manager	\$ 195.00/hr
4.4	Project Engineer	\$ 180.00/hr
4.5	Project Geologist/Geophysicist.....	\$ 180.00/hr
4.6	Senior Geophysicist.....	\$ 210.00/hr
4.7	Laboratory Manager	\$ 175.00/hr
4.8	Graduate Engineer/Geologist/Professional	\$ 125.00/hr
4.9	Senior Engineering Technician.....	\$ 115.00/hr

Notes:

- 1) Minimum call-out charge for CMT technician and equipment or sample pick-up is 2 hours. Minimum call-out charge for CWI technician is 4 hours. Charges are accrued portal to portal.
- 2) Laboratory test prices are FOB Fugro laboratory unless noted otherwise. Sample pick-up charges are additional.
- 3) Services required and not listed above would be negotiated at the time of proposal request.
- 4) Charges for field testing equipment do not include personnel or travel charges.
- 5) Transportation charges are applicable for all field testing assignments, meetings and site visits.