Memorandum

To: Tracy Homfeld, Bridell Miers

From: Brian Reinhardt – BGE, Inc.

Date: November 15, 2023

Subject: Amendment #4 to Agreement No. 2019-210

The purpose of Amendment #4 is to add additional traffic analysis and alternatives analysis, at the request of TxDOT, for the intersection of FM 546 with future SP 399. The current design proposes direct connector ramps between FM 546 and Spur 399 main lanes to handle the future projected traffic demand. However, TxDOT has decided the ramps may cause negative impacts to SP 399 and has requested the additional analyses to determine if the standard intersection alone can handle the future traffic (resulting in removal of the direct connector ramps). TxDOT is requesting a traffic microsimulation (VISSIM software) to look at the corridor as a whole and include existing and future traffic signals (new signals are assumed at this point in coordination with TxDOT and the County) to determine how traffic will flow in 15-minute increments during AM/PM peak hours. BGE will use the results and coordinate a proposed solution with consensus from TxDOT and the County.

In addition, Quality Level A test holes for utility (SUE) investigation have been completed on the current agreement to provide Professional Engineering Services for Myrick Lane and Boorman Lane (PS&E). Less test holes were needed than were scoped. BGE proposes to reduce number of required SUE test holes in the scope to six (6). Additionally, the tree clearing needed to do geotechnical work was less than anticipated, so this amendment reduces the level of effort needed. The fee from these tasks would serve as a credit to the overall supplemental needed and some will go to increase utility coordination services on Myrick Land and Boorman Lane that are needed to complete the project.

Finally, BGE is proposing to move fee between previously contracted tasks/subs in the contract to better align with the actual work completed to-date and cover projected work needed to complete the contract. We are anticipated the contract will extend an additional 5 months to coordinate and finalize a design with TxDOT and gain NEPA environmental clearance. The amendment includes additional management time to finalize the contract and coordinate with TxDOT.

The revised scope and fee for Tasks “IS1. SUE” and “IS2. Utility Coordination” are included in **Attachment A** of this memo and shall replace Agreement # 3 for **Myrick Lane and Boorman Lane Final Design (PS&E)**.

Total amount for *reduced services (credit)* on Myrick Lane and Boorman Lane:	$ -108,669.64
Current Contract Amount:	$ 1,615,859.55
Adjusted Contract Amount Including Reduced Services:	$ 1,507,189.91

The associated scope and sections of revised fee for Phase II Extension (Planning Schematic & Environmental) are included in **Attachment B** of this memo and shall replace Agreements #1 and #3 for the Project.

Total amount for *additional scope & services* on the Project:	$ 374,411.41
Current Contract Amount:	$ 3,034,002.69
Adjusted Contract Amount Including Reduced Services:	$ 3,408,414.10

Total proposed fee for Amendment #4 is $265,741.77. A fee summary table outlining the fee adjustments for each task is included following this memo.

As part of Amendment #4, BGE is requesting rate adjustments for some of our labor categories to keep up with market adjustments. The below rate changes result in a 10.7% increase in the amendment total and is a 1.3% increase based on the total contract fee.

Classification	Current Contracted Rate	Proposed Rate	% Change
BASIC SERVICES			
Clerical	$ 85.00	$ 85.00	0.00%
Environmental Scientist I	$ 95.00	$ 95.00	0.00%
Environmental Scientist II	$ 105.00	$ 105.00	0.00%
Senior Env. Scientist	$ 123.50	$ 135.00	9.31%
EIT/GIS Technician	$ 123.50	$ 140.00	13.36%
Design Engineer	$ 156.00	$ 170.00	8.97%
Environmental Task Leader	$ 169.00	$ 185.00	9.47%
Project Engineer	$ 169.00	$ 185.00	9.47%
Senior Civil Designer	$ 170.00	$ 180.00	5.88%
Senior Engineer	$ 204.75	$ 204.75	0.00%
Subject Matter Expert	$ 245.00	$ 250.00	2.04%
Structural Engineer		$ 210.00	New Title
Sr. Project Manager	$ 260.00	$ 260.00	0.00%
Director		$ 290.00	New Title
SPECIAL SERVICES			
SUE Field Manager	$ 98.00	$ 98.00	0.00%
Survey Tech	$ 102.00	$ 102.00	0.00%
Sr. Survey Tech	$ 112.00	$ 120.00	7.14%
RPLS	$ 198.00	$ 198.00	0.00%
QA/QC Manager	$ 198.00	$ 240.00	21.21%
RPLS Project Manager	$ 214.75	$ 245.00	14.09%
Chief of Parties	$ 143.00	$ 143.00	0.00%
Designer	$ 111.00	$ 111.00	0.00%

A description of the detailed scope revisions proposed for Amendment #4 are below:

Myrick Lane and Boorman Lane (PS&E)

IS1. Subsurface Utility Engineering (SUE)

1. Number of Quality Level A test holes to be provided is reduced to a maximum of six (6).

IS2. Utility Coordination

1. The ENGINEER shall assist the COUNTY in planning, coordinating, and virtually attending up an additional two (2) utility coordination meetings. The total number of estimated utility coordination meetings is twelve (12).

FM 546 Phase II Extension (Planning Schematic and Environmental)

BS3. Corridor Alternatives Analysis

1. The ENGINEER shall analyze up to two (2) additional DC alternatives to consider impacts to Spur 399 from northbound FM 546 to westbound Spur 399 main lanes.
2. The ENGINEER will utilize the preferred DC alignment to evaluate up to three (3) DC entry point locations to Spur 399 main lanes. Median openings, ingress/regress locations and cross street improvements shall be evaluated.
3. Cost-benefit analysis shall be developed.
4. Recommended improvements shall be developed and presented to the County and TxDOT, in KMZ or PDF format.
5. The ENGINEER shall analyze traffic using Vissim for the opening year and 20-year design year for the no-build and up to three build alternatives for AM and PM peak hours. VISSIM traffic analysis in 15-minute increments is proposed to model the oversaturated operations at Spur 399/FM 546 and the queue spillback. The Engineer shall analyze the following intersections:
    1. FM 546 and CR 393 (as ultimate Myrick Lane)
    2. FM 546 and Bridgefarmer Road
    3. FM 546 and CR 324
    4. FM 546 and Spur 399
    5. FM 546 (proposed) and FM 546 (existing)
    6. FM 546 and CR 317 (as a signalized intersection)
    7. Myrick Lane and Beauchamp Boulevard
    8. Myrick Lane and 2nd Street/FM 982
    9. FM 546/Boorman at US 380

    The anticipated build alternatives to be analyzed are:

    - Scenario 1A – Diamond Interchange at Spur 399, dual NBL turn bay, and signalized intersection at FM 546 and CR 317

- Scenario 1B – Diamond Interchange at Spur 399, triple NBL turn bay, and signalized intersection at FM 546 and CR 317
- Scenario 2 – Additional option at the request of TxDOT.
- All scenarios may include bypass lanes along Spur 399 frontage roads and will be considered if requested by TxDOT.

The Engineer shall submit a traffic analysis memo and address up to two (2) rounds of comments.

6. The ENGINEER will develop diversion volumes from US 380 to FM 546 based on the NCTCOG Travel Demand Model. A summary of diversion analysis will be included in the traffic analysis report.

BS4. Schematic Development

1. Refine design and right-of-way limits of project previously developed in FM 546 Phase I, from Bridgefarmer Road to CR 393.
2. Include up to two (2) rounds of reviewing/addressing of TxDOT comments and attending comment resolution meetings.
3. Development of retaining wall layouts is removed from the design schematic phase of the contract.
4. Include up to two (2) options for two-level interchange design.
5. Proposed grade separated crossing to mitigate impacts to identified wetland, located approximately 575' west from proposed intersection of FM 546 and CR 317.
6. Additional required TxDOT deliverables, including:
    a. Annual Scope and Estimate Documentation (ASED), calculated by CSJ
    b. Form 1002
    c. Dallas District Schematic Checklist
    d. Schematic Bridge Layout Checklist

BS5. Hydrologic and Hydraulic Investigation

1. Refine the limits of project previously developed in FM 546 Phase I, from Bridgefarmer Road to CR 393.
2. Inclusion of analysis for up to four (4) minor cross culverts, including up to two (2) driveway culverts and refinement of up to two (2) cross culverts previously developed as part of the FM 546 Phase I project.
3. Inclusion of analysis of up to one (1) major cross drainage due to proximity to FEMA AE Zone at Wilson Creek, to be developed at the request of Collin County/TxDOT.

BS6. Social, Economic and Environmental Studies

1. Due to the refinements and additional analysis needed as part of BS3 and BS4, the environmental technical reports will need to be revised and resubmitted for initial review. The technical reports are as follows:
    a. Community Impact Assessment
    b. Historic Resources Project Coordination Report

c. Historic Resources Research Design
d. Historic Reconn Survey Report
e. Archeological Background Study
f. Archeological Permit Application
g. Archeological Survey
h. WOTUS Delineation Report
i. Surface Water Analysis Form
j. Section 404/10 Impact Table
k. Species Analysis Form
l. Species Analysis Spreadsheet
m. HazMat Initial Site Assessment

2. Traffic Noise Assessment
    a. Revise and rerun traffic noise analysis model
    b. Revise Traffic Noise Report

BS7. Public/Stakeholder Involvement

1. Prepare for and attend up to an additional twenty (20) bi-weekly meetings with TxDOT, as a partner, to coordinate the Project. Coordination is anticipated to end November 2024.

BS8. Project Management

1. Due to the changes associated with this Amendment, the project schedule is anticipated to be extended by an additional five (5) months.
2. Attend up to an additional thirty (30) project team meetings with Collin County. The purpose of these meetings is to discuss project status, plan upcoming events, and discuss and resolve any key project issues. Meeting minutes will be prepared by the ENGINEER and distributed for all meetings.

Coordinate and hold up to an additional thirty (30) internal project team meetings to coordinate critical path schedule items, outstanding tasks, and risk factors to keep the project on track and on budget.

SS1. Survey and Right-of-Way

1. Due to the refinements and additional analysis needed as part of BS4 and BS5, exhibits for up to eighteen (18) developed during FM 546 Phase I shall be revised in coordination with TxDOT.
2. Due to the refinements and additional analysis needed as part of BS4 and BS5, metes and bounds for up to eighteen (18) parcels developed during FM 546 Phase I shall be revised in coordination with TxDOT.

SS2. Utility Investigation (SUE)

1. Complete additional Quality Level B SUE investigation completed to account for new or relocated utilities along FM 546, from west of CR 342 to CR 393. The length of Quality Level B SUE is increased to an estimated 5,000 LF.

2. Quality Level A SUE investigation is reduced to three (3) locations.

SS4. Geotechnical Investigation

1. Scope and fee associated with Geotechnical Investigation is removed from the design schematic phase of the contract.

SS5. 3D Visualization Services

1. Revised design schematic shall be refined and modeled for presentation at the Public Hearing.

FEE SUMMARY TABLE

FM 546 Phase 2											
	Current	Amendment # 4									Contract Total
	Total	BGE, Inc.	LSE	GAI	Terracon	RDV	PIA	AmaTerra	Kimley-Horn	Total	
BASIC SERVICES											
BS1 - Assembly and Review of Data	$ 48,690.00									$ -	$ 48,690.00
BS2 - Corridor Typical Section Eval.	$ 5,908.00									$ -	$ 5,908.00
BS3 - Corridor Alternatives Analysis	$ 513,957.00	$ 14,548.00	$ (28,990.00)						$ 138,505.00	$ 124,063.00	$ 638,020.00
BS4 - Schematic Development	$ 506,404.00	$ 158,598.00	$ (14,601.20)							$ 143,996.80	$ 650,400.80
BS5 - H&H Investigation	$ 120,910.00	$ 42,107.50	$ 61,789.65							$ 103,897.15	$ 224,807.15
BS6 - Soc., Econ., and Env. Studies	$ 381,167.00	$ 65,213.50						$ 13,805.00		$ 79,018.50	$ 460,185.50
BS7 - Public/Stakeholder Involvement	$ 334,285.00	$ 21,820.50	$ (10,720.00)				$ 3,720.00			$ 14,820.50	$ 349,105.50
BS8 - Project Management	$ 183,301.00	$ 77,309.00	$ 6,835.50						$ 13,750.00	$ 97,894.50	$ 281,195.50
BS - Expenses	$ 64,522.77	$ -								$ -	$ 64,522.77
Subtotal	**$ 2,159,144.77**	**$ 379,596.50**	**$ 14,313.95**	**$0.00**	**$ -**	**$ -**	**$ 3,720.00**	**$ 13,805.00**	**$ 152,255.00**	**$ 563,690.45**	**$ 2,722,835.22**
SPECIAL SERVICES											
SS1 - Surveying & ROW Mapping	$ 280,137.00	$ 19,940.00								$ 19,940.00	$ 300,077.00
SS2 - SUE	$ 107,161.00	$ 27,360.00	$ (6,630.00)							$ 20,730.00	$ 127,891.00
SS3 - Aerial and Lidar	$ 47,354.00									$ -	$ 47,354.00
SS4 - Geotechnical Investigation	$ 129,599.87				$ (129,599.87)					$ (129,599.87)	$ -
SS5 - 3D Visualization	$ 32,158.30					$ 10,580.58				$ 10,580.58	$ 42,738.88
SS - Expenses	$ 278,447.75	$ 15,400.00	$ (22,000.00)		$ (105,429.75)	$ 1,100.00				$ (110,929.75)	$ 167,518.00
Subtotal	**$ 874,857.92**	**$ 62,700.00**	**$ (28,630.00)**	**$ -**	**$ (235,029.62)**	**$ 11,680.58**	**$ -**	**$ -**	**$ -**	**$ (189,279.04)**	**$ 685,578.88**
Total	**$ 3,034,002.69**	**$ 442,296.50**	**$ (14,316.05)**	**$ -**	**$ (235,029.62)**	**$ 11,680.58**	**$ 3,720.00**	**$ 13,805.00**	**$ 152,255.00**	**$ 374,411.41**	**$ 3,408,414.10**

Myrick Lane and Boorman Lane						
	Current	Amendment # 4				Contract Total
	Total	BGE, Inc.	ARS	Terracon	Total	
BASIC SERVICES AND SPECIAL SERVICES						
1 - Assembly and Review of Data	$ 39,680.00				$ -	$ 39,680.00
2 - Roadway Design	$ 433,815.00				$ -	$ 433,815.00
3 - Drainage Design	$ 273,625.00				$ -	$ 273,625.00
4 - Traffic Design	$ 72,150.00				$ -	$ 72,150.00
5 - Structural Design	$ 147,790.00				$ -	$ 147,790.00
6 - Project Management	$ 204,000.00				$ -	$ 204,000.00
7 - Bid Phase Services	$ 23,800.00				$ -	$ 23,800.00
SS1 - Survey					$ -	$ -
SS2 - Geotechnical Services				-$56,000.00	$ (56,000.00)	$ (56,000.00)
Subtotal	**$ 1,194,860.00**	**$ -**	**$ -**	**$ (56,000.00)**	**$ (56,000.00)**	**$ 1,138,860.00**
INCREMENTAL SERVICES						
IS1 - SUE	$ 149,375.78		$ (68,919.64)		$ (68,919.64)	$ 80,456.14
IS2 - Utility Coordination	$ 46,100.00	$ 16,250.00			$ 16,250.00	$ 62,350.00
IS3 - Survey	$ 12,100.00				$ -	$ 12,100.00
IS4 - Traffic Signal Design	$ 49,960.00				$ -	$ 49,960.00
Subtotal	**$ 257,535.78**	**$ 16,250.00**	**$ (68,919.64)**	**$ -**	**$ (52,669.64)**	**$ 204,866.14**
Total	**$ 1,615,859.55**	**$ 16,250.00**	**$ (68,919.64)**	**$ (56,000.00)**	**$ (108,669.64)**	**$ 1,507,189.91**

Total Amendment # 4: $ 265,741.77

Attachment A

INCREMENTAL SERVICES

The following incremental services are considered supplemental to basic or special services as described above and are to be billed by the ENGINEER on a time and materials basis as outlined below not to exceed an overall amount. Prior to any incremental services being performed, the ENGINEER shall prepare for the COUNTY a fee proposal based on pre-negotiated rates. The ENGINEER shall not begin any work until written authorization has been provided by the COUNTY.

1. IS1. SUBSURFACE UTILITY ENGINEERING (SUE)

Assumptions

The following assumptions were made for the preparation of this Scope of Services. If these assumptions do not prove correct, a modification to the scope and budget for this project may be required.

- This proposal and fee are based on the assumption that crews will be able to proceed unimpeded. Down time or additional mobilization or demobilization caused by restricted access, project changes, weather or other factors that are outside of the ENGINEER's control may be charged per the attached payment schedule.
- The ENGINEER will not perform any work outside of the scope of services herein without written authorization.
- Subsurface Utility Engineering services include comprehensive record research/collection of all known existing utility systems, survey of all visible utility surface features, and field designating using various geophysical equipment for detecting underground utilities. The lowest confidence level of data collected is record information and the highest confidence level is utilities found via excavation. All of the collected information is analyzed and combined to prepare a detailed utility map showing utilities of record that could not be found, active/inactive utilities, utilities that were found using geophysical equipment and precise utility locations that were uncovered.
- The accuracy of depth readings of utilities taken from electromagnetic geophysical equipment depends greatly on soil type, soil moisture content, depth of utility, proximity to other utilities, material of the conduit, etc. It is because of this that the equipment manufactures do not warrant and/or guarantee the accuracy of the equipment's depth readings. The only method of ensuring an accurate depth is to expose the utility for measurement.
- Suitability maps show GPR effectiveness is low in the project area. The ENGINEER will utilize GPR during the utility investigation and will note on the deliverables whether the radar had success detecting known utilities or not.
- The ENGINEER may utilize the following geophysical equipment on the project:

    - Radiodetection RD8100
    - Vivax-Metrotech VM-810
    - Sensit Ultra-Trac APL
    - IDS Opera DUO
    - Tonable rodder

- Sonde

- All equipment may not be used on each site as equipment is selected based upon geophysical application necessary to find a target utility
- Normal traffic control, for Subsurface Utility Engineering services, is considered standard placement of traffic cones, freestanding warning signage and vehicle-mounted traffic directional sign. Traffic control requiring lane closures, traffic detouring, flag persons, police, etc., is considered special traffic control. This service will be subcontracted to an approved subcontractor and billed to the Client at cost plus 10%.
- Sanitary and Storm Drain systems will be shown as QL-C based on surveyed invert data.
- It is assumed that no contaminated materials are encountered. If contaminated materials or soils are encountered the COUNTY will be notified immediately and any remediation will be the COUNTY's responsibility and cost.
- Paint markings placed on the ground are to be used for design purposes only and not for construction purposes. The use of QL-B information provided does not relieve any contractor or the COUNTY from the duty to comply with applicable utility damage prevention laws and regulations, including, but not limited to, giving notification to utility owners or the Texas One Call System before excavation.
- Non-metallic piping, inactive electric, and/or communication lines may or may not be found by electromagnetic, sonic, or acoustical designating practices. The ENGINEER does not warrant and/or guarantee that all existing utilities will be found.
- All work will be performed during daytime hours.

The ENGINEER will provide all the following Subsurface Utility Engineering (SUE) services to the standard of care applicable in the SUE profession. The services meet the standard guidelines of ASCE C-I 38-02 circular for "Standard Guideline for the Collection and Depiction of Existing Subsurface Utility Data". Irrigation systems and electrical wiring for landscape lighting are excluded from the scope of this proposal.

Quality Level A (QL-A) Test Hole Services

Test Hole services to locate accurate horizontal and vertical positions of subsurface utilities by excavating a test hole using vacuum excavation techniques and equipment that is non-destructive to utilities. In performing test-hole services, SUE provider will:

- Provide up to six (6) test holes.
- Test hole locations will be chosen by the ENGINEER.
- The ENGINEER will use designating equipment to lay out the test hole locations.
- The test holes will be surveyed by ARS.
- Provide all equipment, personnel and supplies required to perform locating services.
- Excavate test hole to expose the utility to be measured in such a manner that ensures the safety of the excavation and the integrity of the utility to be measured. In performing such excavations, the ENGINEER shall comply with applicable utility damage prevention laws. Excavations will be

performed using specially developed vacuum excavation equipment that is non-destructive to existing facilities.

- Furnish and install survey markers directly above the centerline of utility structure.
- Investigate, evaluate, measure and record:

  - Actual depth to top of utility referenced to a survey marker installed directly above the centerline of the exposed utility structure.
  - Outside diameter of utility and configuration of non-encased, multi conduit systems.

- Backfill around the exposed facility using the excavated materials compacted in six-inch lifts.
- In grass and landscape areas, restoration shall be as reasonably possible to the condition that existed prior to excavation.
- Any permitting fees will be invoiced to the COUNTY at cost plus 10%.

All areas where test holes are required shall be accessible by standard driving with vacuum excavation vehicle plus the range of a 15-ft hose.

Quality Level B (QL-B) Services

Designate utilities which mean to indicate the horizontal location of underground utilities by the application and interpretation of appropriate non-destructive surface geophysical techniques and reference to established survey control. Designate (Quality Level B) Services are inclusive of Quality levels C and D. Quality Level D – Existing Records: Utilities are plotted from review of available existing records. Quality Level C – Surface Visible Feature Survey: Quality level "D" information from existing records is correlated with surveyed surface-visible features.

The Engineer shall:

- Compile "As Built" information from plans, plats and other location data as provided by the utility owners.
- Coordinate with utility owner when utility owner's policy is to designate their own facilities at no cost for preliminary survey purposes. The Engineer shall examine utility owner's work to ensure accuracy and completeness.
- Designate, record, and mark the horizontal location of the existing utility facilities and their service laterals to existing buildings using non-destructive surface geophysical techniques. No storm sewer facilities are to be designated unless authorized by the County. A non-water base paint, utilizing the American Public Works Association (APWA) color code scheme, must be used on all surface markings of underground utilities.
- Correlate utility owner records with designating data and resolve discrepancies using professional judgment. A color-coded composite utility facilities plan with utility locate (test hole) locations, shall be prepared and delivered to the County. It is understood by both the Engineer and the County that the line sizes of designated utility facilities detailed on the deliverable are from the best available records and that an actual line size is normally determined from a test hole vacuum excavation. A note must be placed on the designate deliverable only that states "line sizes are from best available records". All above ground appurtenance locations must be included in the deliverable to the County. This information shall be provided in the latest version of Microstation.

The electronic file will be delivered to the County. A hard copy is required and must be signed, sealed, and dated by the Engineer. The designated utility information must be over laid on the design plans.

- Determine and inform the County of the approximate utility depths at critical locations as determined by the County. This depth indication is understood by both the Engineer and the County to be approximate only and is not intended to be used preparing the right of way and construction plans.
- Provide a monthly summary of work completed and in process with adequate detail to verify compliance with agreed work schedule.
- Clearly identify all utilities that were discovered from quality levels C and D investigation but cannot be depicted in quality B standards. The utilities must have a unique line style and symbology in the designate (Quality Level B) deliverable.
- Comply with all applicable County policy and procedural manuals.

SUE DELIVERABLES

A SUE CAD file depicting the QL-A test hole locations will be prepared for this project as well as a file depicting QL-B, QL-C, and QL-D. A Test Hole Report and a data summary form will be prepared. The Test Hole Report will be signed and sealed by a Registered Professional Engineer. The utilities will be referenced by the type of utility, color coded to American Public Works Association (APWA) standards. A color-coded composite utility facilities plan with utility locate (test hole) locations, shall be prepared and included in the design plan set.

All electronic project files created, and/or modified will be transmitted via email, or delivered on a CD if requested by the COUNTY. All CAD files will be created in AutoCAD / Civil 3D 2015 or Bentley ORD format.

ESTIMATED FEES

The ENGINEER will provide the services as described above on a **time and materials** fee basis based on the payment schedule in Exhibit "C". The estimate of services needed on the project are **not to exceed** $80,456.14.

Local Mobilization/Demobilization Fee Applies at the rate of once per project assignment. Minor/Standard Traffic Control is included (consists of warning signs and cones). Lane Closures requiring Flashing Arrow Board(s) is additional. Complex or Specialized Traffic Control is additional.

It is the client's responsibility to provide a dump site or a vacuum box/containment vessel for removal of Hydro Vac spoils if no dump site is provided by Client.

Paved areas may require coring to perform vacuum excavation services. In such cases the ENGINEER will provide a Core Rig and Operator. Core rig rate includes materials & equipment to replace and set core (keyhole) following vacuum excavation completion.

SPECIAL NOTES FOR HYDRO EXCAVATION SERVICES

Hydro Vac Services will require metered water recharge fees and authorized spoils disposal locations. All excavated material remains the exclusive property of the client or project owner upon whose land, easement or ROW wherein the excavations are performed. The project owner understands and acknowledges that Hydro Excavation indicates and includes the use of water to aid in the vacuum excavation process and that the resulting excavated materials may be oversaturated with water as a result of the hydro vac process.

If the project requires backfilling with material other than the material excavated via the hydro vac process, such as flowable fill or select backfill, the project owner will be required to provide a spoils box, vacuum box, or stockpiling location within or reasonably close to the project site for the purpose of holding the hydro vac excavated materials. BGE can provide a vacuum box/containment vessel from a third-party environmental services company for removal of Hydro Vac spoils if no dump site is provided by Client. BGE will request a fee proposal from environmental services company and the cost of vac box and spoils disposal will be passed through to client at cost plus 10% based on the fee proposal provided by the environmental services company.

The project owner is required to disclose any known or suspected information regarding the project site and its underlying soil conditions such as; chemical, petrochemical, hydrocarbon, asbestos, naturally occurring radioactive materials (NORM) or any other known or suspected contamination within the project site.

When performing hydro excavation in known, suspected or encountered contamination areas, the ENGINEER staff shall don additional Personal Protective Equipment (PPE). All costs associated with the use of additional PPE dictated by the site conditions and deemed reasonable and prudent, including wash-down, decontamination or disposal of said PPE, shall be charged to the client/project owner as a direct pass through cost. Examples of additional PPE may include but not be limited to; dust masks, respirators, face shields, protective coveralls, protective gloves and rubber boots.

Pothole or Test Hole Option:

Potholes are strictly the excavation and exposure of the subject facility with a measurement of depth and notation of facility size, type and composition painted on the ground and/or provided in a non-certified report. This report will be provided by Vac Crew onsite upon completion of potholes and typically is handwritten.

Test holes provide the same level of information as pot holes, and are surveyed for a precision x,y & z coordinate and are provided in a test hole report, signed and sealed by an Engineer. Test Holes require Survey and Engineer review. Vac Crew, Survey and Engineer fees will be in accordance with the rates shown in Exhibit “C”.

2. IS2. UTILITY COORDINATION

Utility Coordination

The ENGINEER shall assist the COUNTY in planning, coordinating, and attending up to twelve (12) utility coordination meetings with the identified affected utility companies within the limits of the project. These meetings will establish the preliminary schedule for the respective utility adjustments performed by others. Up to two (2) team members shall attend each meeting virtually. Provide status updates on design progress, schedule, relocation needs, and meeting minutes. Provide 60%, 90% and 100% design plans to the franchise utilities for review.

Design Exhibits – Prepare any necessary design exhibits in CAD or PDF which may provide clarification and/or assist franchise utilities with understanding project impacts or relocation needs.

Site Visits – Perform up to three (3) site visits with the COUNTY and/or impacted franchise utility representatives.

Utility Agreements

The COUNTY shall prepare and obtain all necessary Utility Agreements for the project. The ENGINEER shall aid the COUNTY in production of exhibits and estimates for the utility agreements.

ESTIMATED FEES

The ENGINEER will provide the services as described above on a **time and materials** fee basis based on the payment schedule in Exhibit "C". The estimate of services needed on the project are **not to exceed** $62,350.00.

3. IS3. SURVEY

Additional survey may be requested due to site changes on a periodic basis. The work performed under incremental services for survey will follow the general standards and deliverables specified under special services survey.

ESTIMATED FEES

The ENGINEER will provide the services as described above on a **time and materials** fee basis based on the payment schedule in Exhibit "C". The estimate of services needed on the project are **not to exceed** $12,100.00.

Local Mobilization/Demobilization Fee Applies at the rate of once per project assignment. Minor/Standard Traffic Control is included (consists of warning signs and cones). Lane Closures requiring Flashing Arrow Board(s) is additional. Complex or Specialized Traffic Control is additional.

New Location Road in Princeton
Prime Provider: BGE, Inc.
Contract No.: TBD
Project Limits: FM 546 to US 380

Task Description	No. of Sheets	Project Manager $250.00	QA/QC Manager $225.00	Senior Engineer $200.00	Project Engineer $175.00	Design Engineer $150.00	Engineer-in-Training $125.00	CADD Operator $140.00	Admin/ Clerical $75.00	Total Labor Hours	Hours / Sheet	Total Labor Costs
IS1. SUBSURFACE UTILITY ENGINEERING (SUE)												
Quality Level B (QL B) Services												
Project Coordination and Management		10								**10**	**#DIV/0!**	**$2,500.00**
Data Processing												
QA/QC			10							**10**	**#DIV/0!**	**$2,250.00**
Quality Level C/D Services (In addition to Level B services)					10		80			**90**	**#DIV/0!**	**$11,750.00**
IS1. SUBSURFACE UTILITY ENGINEERING (SUE) Total Hours		10	10	0	10	0	80	0	0	**110**		
IS1. SUBSURFACE UTILITY ENGINEERING (SUE) Total Cost		$2,500.00	$2,250.00	$0.00	$1,750.00	$0.00	$10,000.00	$0.00	$0.00			**$16,500.00**

IS2. UTILITY COORDINATION												
Utility Coordination										**0**	**#DIV/0!**	**$0.00**
Assist in planning/coordinating			8	16	40		120			**184**	**#DIV/0!**	**$27,000.00**
Develop and maintain Utility Conflict Matrix			8		16		40			**64**	**#DIV/0!**	**$9,600.00**
Attend 12 utility coordination meetings					12		18			**30**	**#DIV/0!**	**$4,350.00**
Provide status updates on design progress schedule and relocation need. Develop design exhibits as needed.				8	24		96			**128**	**#DIV/0!**	**$17,800.00**
Perform up to three (3) field visits					12		12			**24**	**#DIV/0!**	**$3,600.00**
IS2. UTILITY COORDINATION Total Hours		0	16	24	104	0	286	0	0	**430**		
IS2. UTILITY COORDINATION Total Cost		$0.00	$3,600.00	$4,800.00	$18,200.00	$0.00	$35,750.00	$0.00	$0.00			**$62,350.00**

Total Hours		10	26	24	114	0	366	0	0	**540**		
Total Costs		$2,500.00	$5,850.00	$4,800.00	$19,950.00	$0.00	$45,750.00	$0.00	$0.00			**$78,850.00**

BASIC DIRECT EXPENSES					
		Unit	**Rate**	**Quantity**	**Totals**
8.5" x 11" Copies (b&w)		EA	$0.10		$0.00
11" x 17" Copies (b&w)		EA	$0.20		$0.00
11"x17" Copies (color)		EA	$1.25		$0.00
COLOR Roll Plots		SF	$3.20		$0.00
Binding		EA	$20.00		$0.00
USB Thumb Drive		EA	$15.00		$0.00
Postage (express mail)		EA	$2.00		$0.00
Car Mileage		MI	$0.58		$0.00
Miscellaneous Supplies (w/approval from County PM)		EA	$100.00		$0.00
Toll Charges (each)		EA	$5.00		$0.00
SUE Quality Level B (Includes labor and equipment for field designating, engineering, surveying, CADD, and limited Traffic Control.)		LF	$1.65	70000	$115,500.00
					$0.00
					$0.00
TOTAL BASIC DIRECT EXPENSES					**$115,500.00**

Summary	
IS1. SUBSURFACE UTILITY ENGINEERING (SUE)	$16,500.00
IS2. UTILITY COORDINATION	$62,350.00
Incremental Services Labor Costs	**$78,850.00**
Incremental Services Expenses Costs	**$115,500.00**
Incremental Services Total Costs	**$194,350.00**
BGE, Inc - Total	**$194,350.00**

New Location Road in Princeton
Prime Provider: BGE, Inc. **Sub-Consultant: ARS Engineers, Inc.**
Contract No.: TBD
Project Limits: FM 546 to US 380

Task Description	No. of Sheets	Utilities (Project Manager)	Project Engineer	Design Engineer	Engineer-In-Training	Sr. CAD Operator	Utilities Coordinator	Admin/ Clerical	Total Labor Hours	Hours / Sheet	Total Labor Costs
		$186.74	$159.61	$142.65	$91.68	$103.74	$149.62	$72.62			
IS1. SUBSURFACE UTILITY ENGINEERING (SUE)											
Utility Quality Levels											
Project Management, Coordination, & QA/QC	**N/A**	16	6			16		6	**44**	**N/A**	**$6,041.06**
Digtess Ticket Preparation & Coordination w/ Utility Site Rep's	**N/A**						24		**24**	**N/A**	**$3,590.88**
Subsurface Utility Locate (Test Hole) Service (Quality Level A)											
Develop SUE Level A Test Hole Data Sheets	**N/A**					16			**16**	**N/A**	**$1,659.84**
Unused Labor		-4				-4	-6		**-14**		**-$2,059.64**
IS1. SUBSURFACE UTILITY ENGINEERING (SUE) Total Hours		12	6	0	0	28	18	6	**70**		
IS1. SUBSURFACE UTILITY ENGINEERING (SUE) Total Cost		$2,240.88	$957.66	$0.00	$0.00	$2,904.72	$2,693.16	$435.72			**$9,232.14**

BASIC DIRECT EXPENSES		Unit	Rate	Quantity	Totals
Mileage		EA	$0.56	500	$280.00
Photocopies B/W (8.5"x11")		EA	$0.10	100	$10.00
Photocopies B/W (11"X17")		EA	$0.20	100	$20.00
SUE Mobilization/Demobilization (Compensation for 5 mobilizations. Vacuum excavation truck (non-local))		MILE	$5.10	70	$357.00
SUE Quality Level C (To be completed by BGE)		LF	$0.70	0	$0.00
SUE Quality Level B (Includes labor and equipment for field designating, engineering, surveying, CADD, and limited Traffic Control.)		LF	$1.80	4000	$7,200.00
SUE (QL A - Utility Locate, Test Holes) (Includes labor and equipment for field location, vacuum excavation, engineering, surveying, CADD, and limited Traffic Control.)					
Level A: 0 to 4 ft		EA	$1,200.00	15	$18,000.00
Level A: 4 to 8 ft		EA	$1,500.00	15	$22,500.00
Level A: 8 to 12 ft		EA	$1,900.00	5	$9,500.00
Level A: 13 to 18 ft		EA	$2,400.00	5	$12,000.00
2-Man Designating Crew		HR	$186.95	60	$11,217.00
Traffic Control		EA	$2,500.00	5	$12,500.00
Unused Expenses		LS	-$66,860.00	1	-$66,860.00
TOTAL BASIC DIRECT EXPENSES					**$26,724.00**

Summary	
IS1. SUBSURFACE UTILITY ENGINEERING (SUE)	$9,232.14
Incremental Services Labor Costs	**$9,232.14**
Incremental Services Expenses Costs	**$26,724.00**
Incremental Services Total Costs	**$35,956.14**
ARS Engineers, Inc - Total	**$35,956.14**

FIRM: Terracon Consultants, Inc. **Myrick Lane and Boorman Lane, Collin County**

TASK DESCRIPTION	PROJECT MANAGER	SENIOR ENGINEER	PROJECT ENGINEER	DESIGN ENGINEER	ENGINEER IN TRAINING	ADMIN / CLERICAL	TOTAL LABOR HRS. & COSTS	NO OF DWGS	LABOR HRS PER SHEET
SS2. GEOTECHNICAL SERVICES									
Data Collection and Field Reconnaissance.									
Design Criteria									
Preliminary Cost Estimates									
Design Concept Conference									
Geotechnical Borings and Investigations									
Collection of Existing Data and Training Requirements									
Obtaining Permits	2		4		6		12		
Borehole Layout, Traffic Control Plan, Stake Borings and Utility Clearance	2		4		8		14		
Drilling Coordination and Logging					84		84		
Meetings/Communications/Project Management	4		6		8		18		
Review Samples, Field Logs & Assign Laboratory Testing	2		6				8		
Boring Logs Preparation					8		8		
Review of Wincore Logs	2		4				6		
Foundation Recommendations for Bridge	2		4				6		
LPILE Parameters for Bridge	2		4				6		
Settlements Analysis	4		8				12		
Global Stability Analysis for Retaining Walls Associated with the Culvert Boxe	4		10				14		
External Stability Analysis	4		8				12		
Drainage Requirements			2				2		
Pavement - PVR Calculations									
Pavement - Depth of Coverage Recommendations									
Pavement - Flexible and Rigid Sections Recommendations									
Preparation of Draft Geotechnical Report	16		40			8	64		
Preparation of Final Geotechnical Report	6		8			4	18		
Transfer of remaining labor from FM 546 / CR 400 Phase I Corridor Study							$11,940.25		
HOURS SUB-TOTALS	50	0	108	0	114	12	284		
CONTRACT RATE PER HOUR	$222.10		$150.73			$68.23			
TOTAL LABOR COSTS	$11,105.00	$0.00	$16,278.84	$0.00	$0.00	$818.76	$40,142.85		
% DISTRIBUTION OF STAFFING	17.6%	0.0%	38.0%	0.0%	40.1%	4.2%			
SUBTOTAL LABOR							**$40,142.85**		

FIELD AND LABORATORY	UNIT	RATE	QUANTITY	TOTAL
Direct Expenses				
Mileage	mile	$0.580	360	$208.80
Mobilization of Drilling Rig	per mile	$4.50	360	$1,620.00
Tree Clearing and Mulching at the Site	day	$4,000.00	15	$60,000.00
Tree Clearing and Mulching at the Site (Unused Expenses)	day	$4,000.00	-14	($56,000.00)
Unit Costs				
Standard Penetration Test (SPT)	LF	$30.00	30	$900.00
Unconfined Compressive Strength (Soil)	each	$60.00	42	$2,520.00
Unconfined Compressive Strength (Rock)	each	$70.00	12	$840.00
Soil Boring/Rock Coring with TCP (< 60 ft.)	LF	$36.00	320	$11,520.00
Soil Boring/Rock Coring with TCP (> 60 ft.)	LF	$40.00	20	$800.00
Daily Rig Mobilization/Demob Charges	day	$150.00	6	$900.00
Consolidation Test	each	$500.00	2	$1,000.00
Determining Moisture Content in Soil Materials	Each	$11.50	42	$483.00
Determining Liquid Limits of Soils	Each	$36.00	32	$1,152.00
Determining Plastic Limit of Soils	Each	$36.00	32	$1,152.00
Calculating the Plasticity Index of Soils	Each	$15.00	32	$480.00
Particle Size Analysis (Retained +40)	Each	$65.00	12	$780.00
Hydrometer Analyses	Hour	$114.22	10	$1,142.20
Consolidated Undrained (CU) Triaxial Compression Test for Undisturbed Soils- Single Stage	Each	$780.00		
Texas Cone Penetration	Each	$35.00		
Determining Sulfate Content in Soils - Colorimetric Method	Each	$75.00		
Transfer of remaining expenses from FM 546 / CR 400 Phase I Corridor Study				$15,322.92
SUBTOTAL field and lab				**$44,820.92**

FIRM: Terracon Consultants, Inc.
Myrick Lane and Boorman Lane
Prime Provider: BGE, Inc.
Agreement No. 2019-210, Amendment # 3
Project Limits: FM 546 to CR 456

TOTAL LABOR COSTS	TOTAL EXPENSES	TOTAL COSTS
$40,142.85	$44,820.92	$84,963.77
$40,142.85	**$ 44,820.92**	**$84,963.77**

Attachment B

Agreement No. 2019-210
Amendment 4

EXHIBIT "A"

SCOPE OF SERVICES

FM 546 Phase II Study
Corridor Alignment Analysis, Public/Stakeholder Involvement, Schematic Design, NEPA/Environmental Assessment (EA), Traffic Analysis, Traffic Projections, Subsurface Utility Engineering (SUE), Field Surveying, and Right-of-Way (ROW) Mapping

Limits:
South of McKinney National Airport (Airport Drive) to CR 393 in Lowry Crossing, TX

PURPOSE

The Scope of Work to be performed by BGE, Inc. (the "ENGINEER") under this contract will determine and environmentally clear a feasible alignment for an ultimate 6-lane major arterial, with a minimum of 120 feet of ROW. Limits are from east of the intersection of Airport Drive and Harry McKillop Blvd/Farm to Market (FM) 546 in McKinney, Texas to County Road (CR) 393 in Lowry Crossing, Texas.

FM 546 (the "Project") will include alignment analysis, public/stakeholder involvement, schematic design, NEPA/EA, traffic projections, traffic analysis, SUE, field surveying, and ROW mapping. Collin County (the "COUNTY") serves as the owner of the Project. FM 546 is a State-owned facility. A portion of the existing corridor is currently anticipated to be taken off system, beginning from the proposed Spur 399 and new FM 546 intersection to City of McKinney City Limit, approximately 75 ft east of CR 722. The segment of FM 546 will be replaced with the new location segment identified in this Project. The existing corridor, from FM 546 (S) to CR 393 will be reconstructed and widened to a six (6) lane urban section. The segment of CR 393 will be reconstructed to the east as part of the Myrick Lane currently under construction in Princeton, Texas. Coordination with and review by the Texas Department of Transportation (TxDOT) is required.

NOTES:

1. The project serves as a continuation of the FM 546 / CR 400 study (Phase I), from Bridgefarmer Road in Lowry Crossing, TX to US 380 at Boorman Lane in Princeton, TX. The project limits, from Bridgefarmer Road to CR 393, shall continue as part of the Project for inclusion in the Environmental Assessment (EA) and Design Schematic.
2. Control-Section-Job (CSJ) numbers 1013-01-04 and 1013-03-002 have been issued by TxDOT for the reconstruction and widening of the existing segment and new location principal arterial, respectively. The CSJ's are needed for the EA and schematic development to allow TxDOT to review and approve the Project documents.
3. The western limit of the Project is impacted by two (2) build alternatives concurrently being studied by TxDOT for the Spur 399 Extension. TxDOT's alternatives are identified as the purple and orange alignments for alternatives west and east of McKinney National Airport, respectively. The alignments are noted under this contract as "Purple (West)" and "Orange (East)" alternatives. TxDOT's recommendation of either the Purple (West) or Orange (East) alternative is not anticipated to be final until 2023.
4. To maintain Project schedule, develop three (3) alignment alternatives, in coordination with TxDOT, for each Spur 399 alternative for a total of six (6) alignment alternatives. All six (6) alternatives shall be presented at the Project's first public meeting for public input and analyzed via an alternative comparison matrix. The public meeting is anticipated to be held on April 12, 2022.

5. To minimize schedule impacts to the Project, a single alternative will be recommended would connect to Orange (East). A second alternative will be recommended that would operate independent of Orange (East). The independent alignment will be further studied to tie to existing FM 546 and operate independently regardless of alternative chosen for Spur 399.
6. Develop an Implementation Plan that suggests a logical timeline of long-term improvements with phased cost estimates.
7. Due to the anticipated increase of traffic on FM 546, two (2) additional direct connector (DC) alternatives will be analyzed if the recommended alternative would connect to Orange (East).

The Aerial LiDAR and Ortho-Photogrammetry was flown for the entire limits of this project in Phase I to reduce mobilization costs and delays in Phase II. Only processing of the Aerial Lidar and Ortho-Photogrammetry for Phase II is needed and included as part of this contract.

DETAILS

- The initial phase of the Project will consist of an alternatives analysis, utilizing public/stakeholder outreach and alternatives comparison matrix to assist in the identification and selection of a recommended alternative to move directly into schematic design.
- Design Criteria for the project shall comply with TxDOT guidelines for multilane thoroughfares.
- This Project will be developed utilizing English units of measure and all final schematic exhibits will be provided in roll format.
- The work described in this scope of services will include the following major work tasks: Assembly and Review of Data; Corridor Section Evaluation; Diagrammatic Corridor Refinement; Schematic Development; Hydrologic and Hydraulic Investigation; Environmental Studies; Public Involvement; Project Management; Field Surveys, Right-of-Way Mapping, Geotechnical Investigations, Utility Investigation, and Traffic Projections.

- For the purpose of this contract, "Stakeholders" refers to, but is not limited, to the following:

    - COUNTY
    - Federal, state and local public officials
    - City of McKinney
    - City of Lowry Crossing
    - NCTCOG
    - NTMWD
    - Town of Fairview
    - TxDOT
    - USACE
    - Civic and Community leaders
    - Advisory committees
    - Interest Groups

BASIC SERVICES

BS1. ASSEMBLY AND REVIEW OF DATA

A. Collection of Data, Reports, and Maps

The determination of data requirements, availability, and sources will be coordinated with the COUNTY. Once the data needs and sources are identified, the ENGINEER will contact the appropriate agencies and organizations to obtain the data. Data to be collected will include, but not be limited to:

- Previous studies, exhibits, designs, and reports.
- Stakeholder planning documents (zoning information, thoroughfare maps, preliminary plats, design schematics).
- Utility plans and documents from appropriate municipalities and utility companies.
- Readily available plan sets for crossing or abutting sections within the Project limits.
- Readily available flood plain information and studies from the Federal Emergency Management Agency, FEMA, the Corps of Engineers and/or other governmental agencies.
- The ENGINEER will obtain electronic and/or hard copies from the COUNTY: GIS Data, drainage reports, mapping, survey, and improvement plans within the scoped area. The ENGINEER will acquire from the COUNTY any aerial mapping and soil data for the designated area.
- Obtain desktop level environmental constraints mapping from NCTCOG based on existing environmental databases.

B. Field Reconnaissance

The ENGINEER will perform a corridor site visit to obtain field notes and digital photos along the project corridor. This will include both environmental and engineering staff.

C. Review of Data/Base File Creation

The ENGINEER will review the data collected and from this information will:

- Develop base CAD files (MicroStation Select Series 10) that will be utilized for corridor

evaluation including, but not limited to, existing utilities from visual analysis and additional SUE research; FEMA flood plain limits converted from GIS; and parcels and right-of-way converted from the latest Collin County Appraisal District GIS database.

- Initial environmental constraints mapping will be utilized to refine corridor limits to minimize impacts to known environmentally sensitive areas.

Note: This project will use aerial LiDAR flown in Phase I to create a 3D topographic existing ground surface for use in the corridor evaluation process. The surface will be utilized to create conceptual profile alignments and geometrics to refine corridor location and limits. After the corridor evaluation is completed, the recommended corridor topo will be processed in detail to create design-level survey and will be augmented with field survey to fill void areas as needed.

D. Preliminary Design Conference

The ENGINEER shall prepare and submit a Design Summary Report (DSR) to the COUNTY for review and approval and attend a Kick-Off Meeting to establish and agree on fundamental aspects and concepts, and establish the basic features and design criteria for the project. This DSR will be submitted and coordinated with TxDOT Dallas District for their approval.

Task BS1 Deliverables

1. Field Notes and Site Photographs
2. Design Summary Report (DSR) in TxDOT Format

BS2. CORRIDOR TYPICAL SECTION EVALUATION

The ENGINEER will use typical sections developed in Phase I to prepare ultimate typical sections based on a 6-lane urban major thoroughfare. The ENGINEER will prepare and analyze an interim typical section (4-lane) as deemed appropriate and in coordination with the most recent traffic analysis within and surrounding the corridor. The ENGINEER will analyze and prepare interim and ultimate typical sections for the bridge improvements at Lavon Lake and for one DC alternative, if needed.

The COUNTY will provide selection and approval of any alternate design criteria and typical corridor section.

Task BS2 Deliverables

1. Ultimate and interim typical sections for the corridor.

BS3. CORRIDOR ALTERNATIVES ANALYSIS

The ENGINEER will utilize previously developed alternative alignments and develop additional alignments based on input from project stakeholders and property owners (coordination covered in BS7). Up to eight (8) alignment alternatives will be developed, including three (3) alignment alternatives for each of the Spur 399 alternatives (by others). Each alternative will be scored and inputted into an alternatives comparison matrix for further evaluation.

A recommended alignment will be determined that would connect to Orange (East). A second alignment alternative will be developed to tie to existing FM 546 and operate without constructing the Spur 399 Extension, by others. The alignments for FM 546 Phase II will be further developed to schematic level. An additional two (2) alternatives are reserved for alignment refinements following public meeting # 1

comments.

Alternate corridor evaluation will include the following:

1. Identification of impacts in each of the following categories:
    a. Enhanced Mobility and Safety
        i. Accessibility
        ii. Safety
    b. Cost-Benefit Ratio
        i. Construction Cost
        ii. ROW Acquisition Impact
        iii. Utility & Infrastructure
    c. Engineering Feasibility
        i. Compatibility with Other Projects
    d. Environmental Impacts
        i. Previous Public Input
        ii. Socio-Economic & Neighborhood Impacts
        iii. Noise Impacts
        iv. Natural Impacts
        v. Cultural Impacts
        vi. Stakeholder Input
        vii. Hazardous Materials
2. Preparation of Scoring Matrix for each impact (shown above)

A. McKinney National Airport/SP 399 Extension Analysis

Review the long-term improvements identified through the Spur 399 Extension, by others, and develop an alignment that connects to existing FM 546 and provides independent utility to the Project. The ROW footprint identified for Orange (East) shall be considered to minimize additional impacts to adjacent properties. The compatibility of alignments with known improvements will be analyzed.The ENGINEER will develop a Draft and Final Implementation Plan at the interchange with Spur 399, in PowerPoint format, that suggests a logical timeline of long-term improvements and phased cost estimates.

The ENGINEER will coordinate and identify a recommended corridor alignment in coordination with City of McKinney, McKinney National Airport, TxDOT (and their Spur 399 consultant), Town of Fairview, and NCTCOG between Airport Road and the East Fork Trinity River bridge. Engineering analysis may include at grade and sub-grade options (cut/cover, open cut/walls, etc.) and will need to be coordinated with TxDOT's latest efforts to develop a SP 399 controlled access facility to either the west or east of the airport. The six (6) different alignment alternatives will include conceptual cost estimates and drainage analysis for each for input into a cost/benefit analysis. Horizontal alignments will be refined and conceptual vertical alignments created for each option. Additionally, templates will be developed in Bentley's OpenRoads (SS4) software and used to create a proposed, conceptual 3D design model for use in conceptual cost estimate development (earthwork, pavement quantities, etc.). Superelevation will be considered, if required, as part of the conceptual effort for each alternative.

Should the Orange (East) alternative be selected as the recommended alignment for the Spur 399 Extension, the ENGINEER shall analyze a single interchange alternative that focuses on relieving congestion under long-term conditions. The ENGINEER shall develop a conceptual layout of a multi-level interchange for TxDOT's review. The ENGINEER shall analyze up to two (2) additional DC alternatives to consider impacts to Spur 399 from northbound FM 546 to westbound Spur 399 main lanes. The ENGINEER will utilize the preferred DC alignment to evaluate up to three (3) DC entry point locations to Spur 399 main lanes. Median openings, ingress/regress locations and cross street improvements shall be evaluated. Cost-benefit analysis shall be developed. Recommended improvements shall be developed and presented to the County and TxDOT, in KMZ or PDF format.The ENGINEER shall develop up to two (2) conceptual arterial alignments in coordination with City staff for consideration with future updates to the City of McKinney's Thoroughfare Plan. The operational efficiencies of these alignments shall be reviewed and considered in the comparison matrix for the Project.

The ENGINEER will coordinate, analyze and identify a recommended corridor alignment along the existing FM 546, from west of CR 324 to the East Fork Trinity River Tributary. Impacts to existing corridor and adjacent properties will be analyzed to the north, from the center and to the south.

B. Crossing of the East Fork Trinity River Tributary to Lake Lavon

The ENGINEER will develop up to two (2) alternative design options for a single alternative alignment, consisting of widening the existing bridge and proposing a new bridge structure and in coordination with TxDOT, City of McKinney, USACE, and/or NCTCOG. Options will take into account environmental, utility, hydraulic, geotechnical, structural, and traffic impacts. These alignments will be developed to a conceptual planning level of effort and include conceptual cost estimates and drainage analysis for input into a cost/benefit analysis. Horizontal alignments will be refined and conceptual vertical alignments created for each option. Additionally, templates will be developed in Bentley's OpenRoads (SS4) software or later and used to create a proposed, conceptual 3D design model for use in conceptual cost estimate development (earthwork, pavement quantities, etc.). Superelevation will be considered, if required, as part of the conceptual effort for each alternative.

The ENGINEER will analyze up to three (3) alternative designs within project limits for flood storage and mitigation in coordination with USACE at the Lake Lavon crossing. Fill within flood storage shall be broken down and mitigated within these three categories:

- Below 492' for water supply
- 492' to 503.5' for main flood storage
- Above 503.5' for surcharge

The ENGINEER shall develop a technical memorandum and shall include results in table format and statement verifying no net loss was found in any of the three categories or as a cumulative.

C. Development of Comparison Scoring Matrix

Develop a matrix-based scoring tool to be used to compare alternatives within each segment of alternative analysis that supports the NEPA (National Environmental Policy Act) process.

Items to be considered, but not limited to, cost, environmental impacts, public/stakeholder input, safety,

mobility, cost/benefit, etc. Alternatives will be scored and the recommended alternative(s) identified through the scoring matrix effort.

D. Public Meeting & Hearing

For public involvement related tasks, see section BS7. The ENGINEER will provide a response to any stakeholder comments to the COUNTY, including engineering backup figures and/or exhibits.

The ENGINEER will provide a response to any stakeholder comments to the COUNTY, including engineering backup figures and/or exhibits.

E. Corridor Presentation

The ENGINEER will prepare up to two (2) technical PowerPoint presentations and present a refined corridor alignment for COUNTY approval.

F. Traffic Projections

The ENGINEER The Engineer will develop traffic projections aAlong FM 546 from Bridgefarmer Road to proposed Spur 399 for the No Build scenario and up to three (3) Build Alternatives. The traffic projections will be developed for Average Daily Traffic, AM Peak Hour Traffic, and PM Peak Hour Traffic for the opening-year, design-year (opening year +20) and pavement design year (opening year + 30). The Engineer will request the consultant information packet from TxDOT's Transportation Planning and Programming (TPP) Division. The Engineer will use historical traffic count data to determine appropriate traffic growth factors using regression worksheets. The Engineer will develop the K-factor, AM and PM peak-hour directional distribution, and truck percentage based on historical information. The Engineer will obtain the regional travel demand model (TDM) from the North Central Texas Council of Governments (NCTCOG) to determine the growth rate for the FM 546 corridor. The Engineer will not run the TDM or update the network or demographics. The Engineer will determine population growth rate using the US Census data. The Engineer will follow TPP's Corridor Planning Standard Operating Procedures to develop traffic growth rates and balance projected volumes. The Engineer will prepare a Traffic Projections Methodology memo. The Engineer will address one round of comments on the memo. The Engineer will submit traffic projections and address one round of comments. The Engineer will prepare the Traffic Analysis for Highway Design (TAHD) table and coordinate with TPP regarding pavement design date in TAHD table.

G. Traffic Analysis

The ENGINEER shall analyze traffic as follows:

1. Using Synchro for the opening year and 20-year design year for the no-build and one build alternative for AM and PM peak hours. The Engineer shall analyze the following intersections:
    - FM 546 and CR 393 (as ultimate Myrick Lane)
    - FM 546 and Bridgefarmer Road

- FM 546 and CR 324
- FM 546 and Spur 399
- FM 546 (proposed) and FM 546 (existing)

The Engineer shall analyze up to one (1) intersection using VISSIM for the opening year and 20-year design year for the no-build and one build alternative for AM and PM peak hours. The Engineer shall submit a traffic analysis memo and address up to two (2) rounds of comments.

2. Using Vissim for the opening year and 20-year design year for the no-build and up to three build alternatives for AM and PM peak hours. VISSIM traffic analysis in 15-minute increments is proposed to model the oversaturated operations at Spur 399/FM 546 and the queue spillback. The Engineer shall analyze the following intersections:
    1. The intersections identified in Section 1 above.
    2. FM 546 and CR 317 (as a signalized intersection)
    3. Myrick Lane and Beauchamp Boulevard
    4. Myrick Lane and 2nd Street/FM 982
    5. FM 546/Boorman at US 380

    The anticipated build alternatives to be analyzed are:
    - Scenario 1A – Diamond Interchange at Spur 399, dual NBL turn bay, and signalized intersection at FM 546 and CR 317
    - Scenario 1B – Diamond Interchange at Spur 399, triple NBL turn bay, and signalized intersection at FM 546 and CR 317
    - Scenario 2 – Additional option at the request of TxDOT
    - All scenarios may include bypass lanes along Spur 399 frontage roads and will be considered if requested by TxDOT.

    The Engineer shall submit a traffic analysis memo and address up to two (2) rounds of comments.

H. Diversion Analysis

The ENGINEER will develop diversion volumes from US 380 to FM 546 based on the NCTCOG Travel Demand Model. A summary of diversion analysis will be included in the traffic analysis report.

Task BS3 Deliverables

1. Preliminary Corridor Exhibit Maps
2. Draft and Final Implementation Plan
3. Results of Comparison Scoring Matrices
4. Technical Report of Alternatives for flood storage and mitigation
5. Final Corridor Exhibit Maps
6. Traffic Projections Methodology Memo
7. Traffic Projections
8. Traffic Analysis for Highway Design (TAHD) table
9. Traffic Analysis Memo
10. All design files and deliverable in electronic format (PDF, DOC, DGN, DWG, etc.)

BS4. SCHEMATIC DEVELOPMENT

The ENGINEER will utilize the recommended corridor alignment from **Task BS3** to develop a detailed design schematic for the ultimate build-out of FM 546 (in coordination with the COUNTY and TxDOT).

The Engineer will prepare a schematic plan and profile layout to a scale of 1"=100' depicting the proposed improvements for the project. The schematic shall include: the location of intersections, grade separations, retaining walls, driveways; the geometric typical sections (pavement cross slopes, lane and shoulder widths, slope rates for fills and cuts); vertical and horizontal geometry; the degree of horizontal curves and vertical curve data, including "K" values, shall also be shown; the lane lines and/or arrows indicating the number of lanes; the existing and proposed ROW limits; the existing and proposed drainage and construction easements; the direction of traffic flow on all roadways; the geometrics of speed change (acceleration, deceleration, climbing) lanes; removal items, and major utility conflicts. The schematic will be prepared using the English system of units. All designs will be prepared in accordance with the latest versions of: Roadway Design Manual (TxDOT), A Policy on Geometric Design of Highways and Streets (AASHTO), Standard Specifications for Construction of Highways, Streets and Bridges (TxDOT), Highway Operations Manual of the Traffic Operations Manual (TxDOT), and Highway Capacity Manual (Transportation Research Board).

In preparing the schematic, the ENGINEER will:

A. General

1. Develop typical roadway sections for proposed FM 546 facility, major cross streets, and other locations with specific design features (bridges, retaining walls, and intersections). Typical sections for future cross streets will be based on best-available data provided by the COUNTY.

2. Produce plan & profile schematic exhibits on roll plots at a scale of 1" = 100' showing proposed features, existing features, title block, and legend.
3. Develop a 3D corridor model of the proposed facility and provide design of roadway templates and end conditions throughout the corridor according to the proposed design.
4. Evaluate potential utility conflicts based on Level C/D/B/A SUE data and label crossings on the schematic.
5. The Engineer shall analyze the begin limits of the recommended alignment as follows:
    a. Begin limits at INTERCHANGE with Spur 399 to consider Project as if Spur 399 were constructed first.
    b. Begin limits at TIE-IN to existing FM 546 to provide an independent utility to the project. The Engineer shall take future Spur 399 design into consideration to maximize ROW and minimize impacts to adjacent properties.
6. The Engineer shall consider the requirements for construction staging and traffic control throughout the development of schematic design to verify the constructability of the proposed design. The Engineer shall provide construction phasing assumptions to the County as requested. A comparative assessment will be provided for up to two (2) TCP alternatives.
    a. TCP Phasing Concept. The Engineer shall develop a TCP phasing concept. TCP Concept layout shall analyze the phasing and traffic detours anticipated to construct the proposed design of the schematic refinements in conjunction with the Geometric Schematic of the Preferred Alternative.
    b. TCP Narrative and Typical Sections. The Engineer shall prepare a Preliminary Construction Narrative and Typical Sections in conjunction with the Geometric Schematic of the Preferred Alternative.
    c. Quantity and Cost Estimate. The Engineer shall prepare a preliminary planning-level cost estimate for the Preliminary Traffic Control Plan.
7. Refine the limits of project previously developed in FM 546 Phase I, from Bridgefarmer Road to CR 393.
8. The ENGINEER shall develop additional TxDOT deliverables as follows:
    a. Annual Scope and Estimate Documentation (ASED), calculated by CSJ
    b. Form 1002
    c. Dallas District Schematic Checklist
    d. Schematic Bridge Layout Checklist
9. Up to two (2) rounds of TxDOT comments and comment resolution meetings are assumed.

<u>B. Intersections, Interchanges & Grade Separated Locations</u>

The ENGINEER will evaluate, in detail, the following major intersections within the corridor:

1. Interchange options at FM 546 and proposed SP 399 South of Airport as follows:
    a. Three-level interchange (up to a single option)
    b. Two-level interchange (up to two options)
2. Proposed grade separated crossing to mitigate impacts to identified wetland, located approximately 575' west from the proposed intersection of FM 546 and CR 317.
3. East Fork Trinity River (proposed waterway bridge widening/new location)
    a. Include Wildlife Crossing for Wildlife Management Purposes. Design Criteria will be coordinated with USACE.
4. Impacted intersections will be analyzed to tie correctly horizontally and vertically as part of the intersection analysis.
5. Any proposed roadways found through data collection and in coordination with stakeholders.

At each location the ENGINEER will:

1. Design preliminary horizontal alignments for the intersections and grade-separated locations based on the approved corridor alignment. Any proposed deviation from this approved alignment will require COUNTY approval and re-design of a non-approved alignment is not included in this scope of services.
2. Design of preliminary profiles for the intersections and grade-separated locations based on preliminary horizontal alignments and vertical clearance requirements.
3. Determine preliminary bridge configuration including overall length, span lengths, and an assumed structure depth. Bridge layouts will be prepared per TxDOT standards and will be based on needed span length, an assumed substructure depth, and proposed profile. Preliminary bridge layouts will be submitted with the schematic to TxDOT for review and approval. Up to two (2) TxDOT reviews are assumed.
4. Design preliminary locations and limits of retaining wall.
5. Show preliminary location of cross culverts including preliminary sizing. Studied floodplain areas within the project corridor will be displayed based on available GIS data.
6. Identify approximate major utility locations based on Level C/D/B subsurface utility engineering (SUE).
7. Design and show preliminary pavement markings.
8. Determine preliminary right-of-way including any necessary easements based on proposed geometric design. Surveyed property boundaries will be developed once a recommended alternative corridor is selected to move forward into schematic design. County Appraisal District GIS parcel data will be used in the alternatives analysis phase of the project and converted to Microstation DGN format.

C. Project Delivery

The schematics will be provided to the County and TxDOT for review at the following stages of completion:

1. Concept (30%) – Plan & Profile Layout
2. Preliminary (60%) – Plan & Profiles; Cross Sections; Cost Estimate
3. Pre-Final (95%)
    a. Plan and Profile Layout
    b. Cross Sections
    c. Cost Estimate
    d. Draft Level of Service Analysis Report
4. Final (100%) – Plan & Profiles; Cross Sections; Cost Estimate
    a. Plan and Profile Layout
    b. Cross Sections
    c. Cost Estimate
    d. Level of Service Analysis Report

Prior to each submission, the ENGINEER will:

1. Log any previous County or stakeholder comments in a Comment Response Log spreadsheet and provide a resolution for each comment.
2. Provide a Quality Control (QC) review of plans, calculations, documents, and other supporting design data, if requested by the COUNTY.
3. Provide a Quality Assurance (QA) audit of the QC review to assure all comments were addressed and/or resolved.
4. Coordinate production of the milestone deliverables including printing, compiling electronic files, and preparation of a transmittal letter.

D. Project Update Presentations

The ENGINEER will prepare and present up to two (2) technical PowerPoint presentations during the schematic design providing a briefing on project schedule, design development, and future tasks.

Task BS4 Deliverables

1. Design Schematic (30%)
2. Design Schematic, Cross Sections, and Estimate (60%)
3. Pre-Final Design Schematic, Cross Sections, Draft TCP Narrative/Construction Sequence, and Estimate (95%)
4. Final Design Schematic, Cross Sections, TCP Narrative/Construction Sequence, and Estimate (100%)
5. QA/QC Documentation for each milestone deliverable, if requested
6. Technical PowerPoint Presentations
7. Final Electronic Design Files placed on USB thumb drive

BS5. HYDROLOGIC AND HYDRAULIC INVESTIGATION

The Engineer shall perform drainage tasks to determine the approximate size and type of cross drainage structures. Cross drainage analysis will include a comparison of existing and future land use based on City of McKinney land uses in the watershed and the cross-drainage structures needed for both conditions. Drainage tasks will be performed in accordance with Collin County and TxDOT requirements.

Drainage crossings will be classified as major or minor, as follows:
Major Crossing - A culvert that provides an opening of more than 100 SF in single or multiple installations. Culverts are classified as bridge class culverts when they provide an opening measured along the center of the roadway of more than 20 feet between extreme ends of the openings for single and multiple box culverts. All bridges will be classified as major drainage crossings. Major crossings should be analyzed using HEC-RAS.
Minor Crossing - Any drainage crossing not classified as major will be considered a minor drainage crossing and will be analyzed using HY-8 or similar culvert modeling software.

Scour analysis will not be provided as part of this work. Scour countermeasures will be approximated for inclusion in the opinion of probable construction cost. Driveway culverts and cross street culverts will not be designed as part of this work but will be considered in the opinion of probable construction cost.

The following drainage tasks will be performed in the preparation of the schematic layout:

A. Minor Cross Drainage - estimate 13 minor drainage crossings

Minor cross culverts include nine (9) new location cross culverts along FM 546, two (2) driveway culverts, and refinement of two (2) cross culverts previously developed as part of the FM 546 Phase I project.

1. Drainage Area Mapping
   Delineate drainage area boundaries based on Collin County GIS data, North Central Texas Council of Governments (NCTCOG) contour maps, Texas Natural Resources Information System (TNRIS) Lidar, United States Geological Survey (USGS) contour maps, or other suitable topographic maps, if available. A drainage area map exhibit will be presented on 11”x17” plan sheets at maximum 1" = 200' scale with topographic data shown and labeled and

included in the Drainage Design Technical Summary Report.

2. Calculate Discharges
   Determine conveyance paths, channel slopes, time of concentration, Natural Resources Conservation Service (NRCS) curve numbers and other factors as required to determine frequency-discharge relationships using hydrologic models. Determine preliminary design flows for the crossings based on the design frequency and a check of the 100-yr event using the appropriate hydrologic method. Previous studies, including local studies, shall be obtained and considered during the hydrologic analysis. The results of the hydrologic calculations will be tabulated and presented in the Drainage Design Technical Summary Report.

3. Size & Locate Cross Drainage Structures
   Determine approximate cross drainage structure sizes denoting size, type, orientation, flowlines, tailwater, and headwater conditions. Approximate sizing will be shown on the schematic along with needed drainage easements. Evaluate existing cross culverts for extension. HY-8 culvert analysis software will be used to size minor culvert crossings. The results of the hydraulic calculations will be tabulated and presented in the Drainage Design Technical Summary Report. The Engineer will provide opinion of probable construction costs.

B. Major Cross Drainage - 1 crossing (East Fork Trinity River)

Only one major crossing has been identified at East Fork Trinity River. Up to one (1) additional analysis is reserved for proximity to FEMA Zone AE at Wilson Creek and shall be provided at the request of Collin County/TxDOT.

1. Obtain and Review Available FEMA Data & Reports
   The ENGINEER will obtain available Flood Insurance Studies (FIS), Flood Insurance Rate Maps (FIRMs), Letters of Map Revisions (LOMR), and electronic data readily available from FEMA for East Fork Trinity River.

2. Drainage Area Mapping
   Delineate drainage area boundaries based on Collin County GIS data, North Central Texas Council of Governments (NCTCOG) contour maps, Texas Natural Resources Information System (TNRIS) Lidar, United States Geological Survey (USGS) contour maps, or other suitable topographic maps, if available. A drainage area map will be included in the Drainage Design Technical Summary Report with topographic data shown and labeled.

3. Calculate Discharges
   Determine conveyance paths, channel slopes, time of concentration, Natural Resources Conservation Service (SCS) curve numbers and other factors as required to determine frequency-discharge relationships using hydrologic models. Determine preliminary design flows for the crossings based on the design frequency and a check of the 100-yr event using the appropriate hydrologic method. Previous studies, including FEMA and local studies, shall be obtained and considered during the hydrologic analysis. The results of the hydrologic calculations will be tabulated and presented in the Drainage Design Technical Summary Report.

4. Develop Hydraulic Models
   Develop water surface profile models of open channels for existing/pre-project and proposed design conditions in accordance with Collin County, TxDOT, and Federal Emergency Management Agency (FEMA) requirements. All relevant conveyance features, (channels, culverts, slab bridges, encroachments) will be included in the hydraulic analysis using HEC-

RAS, Version 6.1.

5. Develop Alternative Drainage Schemes (up to 2)
   Based on the results of the discharge calculations and water surface profile models, develop alternative schemes to alleviate potential adverse drainage issues (if any) associated with the roadway construction. Determine optimum drainage scheme to be used for schematic design. An alternatives analysis will be performed to determine if cross drainage structures should be bridge class culverts or span bridges. The Engineer will develop preliminary layouts for up to 2 bridge-class culverts and span bridges on the plan and profile of the schematic. The Engineer will provide opinion of probable construction costs.

6. Identify Easement Requirements
   The Engineer shall identify any required drainage easements needed to accommodate drainage facilities at inlet and discharge points along the route.

C. Closed Storm Sewer

The Engineer will provide an approximation of trunk size and inlet spacing for the closed storm sewer system and ensure adequate drainage to an outfall location can be obtained. The Engineer will determine ROW and easement needs and include the system in the opinion of probable construction cost. Summary of findings and associated exhibits shall be included as part of the drainage report.

D. Drainage Design Technical Summary Report

Upon completion of the hydraulic analyses and alternative evaluations of potential improvements for the project drainage system, the ENGINEER shall prepare a Drainage Design Technical Summary Report. A preliminary report will be submitted with the 60% schematic deliverable and the final report will be submitted with the 100% schematic submittal. The report shall include the following sections:

1. PROJECT FEATURES: location, study objectives, general stream and watershed information, and other pertinent facts.
2. HYDROLOGY: watershed description, soil and land use information, source of hydrologic data and methodology/models used to develop flow data, pertinent input data and parameters for hydrologic analyses; summary table of results for full range of peak discharges for 2-, 5-, 10-, 25-, 50-, 100-, yr events.
3. HYDRAULICS: overview of hydraulic modeling process, including data sources, specific model uses, descriptions of existing drainage structures, discussion of design alternatives and the results of respective hydraulic modeling for the scenarios evaluated; hydraulic model output data including existing, hydraulic data sheet, and proposed conditions summary tables; summary of assumptions made in preliminary closed storm sewer design.
4. SUMMARY OF CONCLUSIONS / RECOMMENDATIONS: summary of study objectives, alternatives being considered, opinions of probable costs and identification of preferred design alternatives.
5. PHOTOGRAPHS, FIGURES AND APPENDICES: all items necessary to support the analysis.
6. ELECTRONIC DATA: computer files of hydrologic and hydraulic modeling with appropriate labeling of location, project reference, and submittal date.
7. FINALIZED DOCUMENT: one (1) copy of final report with electronic submittal to include a PDF of the entire report.

Task BS5 Deliverables

1. Plan and Profile depictions of drainage structures on Schematic
2. Drainage Area Map Exhibits
3. Preliminary Drainage Design Technical Summary Report at 60% schematic.
4. Final Drainage Design Technical Summary Report at 100% schematic.
5. Opinion of Probable Construction Costs

BS6. SOCIAL, ECONOMIC AND ENVIRONMENTAL STUDIES

During the alternatives analysis phase, up to five different alignments will be analyzed. Based on the National Environmental Policy Act (NEPA) requirements, a Preferred Alternative will be selected and classified as an environmental assessment (EA) as identified by TxDOT and Federal Highway Administration (FHWA) under the NEPA.

Each deliverable shall be sufficiently detailed to provide satisfactory basis for thorough review by the State, FHWA, and (where applicable) agencies with regulatory oversight. Any deliverable not specifically stated in the scope is excluded from this scope of services. Any additional services required to comply with environmental policies, laws, regulations, or procedures will be performed under a separate scope of services.

Task 1: Constraints Map
This task will include a establishing a Study Area boundary for the route study based on previous studies, existing roadway corridors, and collected traffic evaluations and projections. The established Study Area will be used for the development of the constraints map.

A constraints map for the Study Area will include environmental concerns, known constraints, aerial photography, contour information, and utility information, developed based on research of public databases and sources, and detailed screening measures for eliminating non-viable corridors.

Task BS6.1 Deliverables
1. Preliminary Constraints Map (PDF and up to 2 hardcopies)
2. Final Constraints Map (PDF and up to 2 hardcopies)

Task 2: Environmental Analysis for the Alternatives Analysis
This task will include data collection and field reconnaissance for the Study Area and up to five alternative corridors. Assume no right of entry for the alternative corridors. All field reconnaissance for this task will be conducted from public ROW. Right of entry is reserved for the Preferred Alternative corridor. The results will be included in the NEPA document.

Resources evaluated in the analysis will be in accordance with current Federal and State statutes, regulations and guidelines and the State's latest codes, practices, criteria, specifications, policies, procedures, and Statement of Understanding including but not limited to National Environmental Policy Act (NEPA) (42 U.S.C. 4371, as amended) and TAC Title 43 Part 1, Chapters 2 and 16.

Obtain environmental data from publicly available sources and purchased through GeoSearch. The information will be collected in GIS format and incorporated in the Constraints Map for the Study Area.

Update periodically publicly available information including but not limited to: locations of public buildings (schools, churches, parks), aerial photography, National Wetland Inventory data, Soil Survey data, TCEQ & EPA hazardous materials database information, FEMA floodplain information, vegetation information, and habitat for Federal and State protected species known to occur in Collin County. Available information will be complied into an Alternatives Analysis Matrix.

Task BS6.2 Deliverables:

1. Preliminary Alternatives Analysis Environmental Constraints Technical Memorandum (PDF and up to 2 hardcopies)
2. Final Alternatives Analysis Environmental Constraints Technical Memorandum (PDF and up to 2 hardcopies)

Task 3: NEPA Environmental Studies for Preferred Alternatives

The Engineer will prepare environmental studies following the online TxDOT Environmental Toolkit to accompany the schematic for each corridor. These deliverables will be prepared to link the schematic to the future National Environmental Policy Act (NEPA) document(s). The Engineer will prepare the following assessments:

Community Impact Assessment

- Conduct community impact investigations in accordance with current Federal and State rules, regulations, and guidelines.
- Utilize TxDOT guidance provided in the TxDOT Environmental Toolkit for this task.
- Complete the TxDOT Community Impact Assessment Form Technical Report.

Archeological Resources Assessment

- Prepare a Project Initiation Letter and Texas Antiquities Permit Application based on data collection and field reconnaissance for the Preferred Alternative.
- Conduct a pedestrian survey and report of sufficient intensity to determine the nature, extent, and potential significance of any cultural resources located within the Area of Potential Effect of the Preferred Alternative in accordance with report guidelines as outlined by the Texas Historical Commissions Rules of Practice and Procedures.
- Utilize TxDOT guidance provided in the TxDOT Environmental Toolkit for this task.
- Complete the TxDOT Archeological Background Study Report and TxDOT Archeological Pedestrian Survey Report for the Preferred Alternative corridor.

Historic Properties Assessment

- Prepare a historic building survey report that will follow the Secretary of the Interior's Standards and Guidelines for Archeology and Historic Preservation and document historic buildings and structures within the Area of Potential Effect based on data collection and field surveys of the Preferred Alternative corridor.
- Utilize TxDOT guidance provided in the TxDOT Environmental Toolkit for this task.
- Complete the TxDOT Project Coordination Request for Historical Studies Form, Historic Resources Research Design, and Reconnaissance Survey Report for the Preferred Alternative corridor.

Water Resources Assessment

- Prepare report documenting the project's effects on protected water resources based on data collection and field surveys for the Preferred Alternative corridor.
- Utilize TxDOT guidance provided in the TxDOT Environmental Toolkit for this task.
- Prepare a wetland delineation report identifying: specific impacts to Waters of the United States,

measures to minimize the impacts, and applicable Section 404 options in accordance with current permits and conditions based on data collection and field surveys for the Preferred Alternative corridor.
- Complete the TxDOT "Surface Water Analysis" for each of the Preferred Alternative corridors.

Biological Resources Assessment

- Prepare report documenting the project's effects on protected biological resources based on data collection and field surveys for the Preferred Alternative corridor.
- Utilize TxDOT guidance provided in the TxDOT Environmental Toolkit for this task.
- Complete the TxDOT Species Analysis, Species Analysis Spreadsheet, and Tier I Site Assessment for the Preferred Alternative corridor.

Air Quality Assessment

- Air quality analysis will be in accordance with current Federal and State rules, regulations, and guidelines.
- Utilize TxDOT guidance provided in the TxDOT Environmental Toolkit for this task.
- Complete the TxDOT Air Quality Technical Report for the Preferred Alternative corridor.

Hazardous Materials Initial Site Assessment

- Prepare a Hazardous Materials Initial Site Assessment (ISA) based on the data collection and field survey conducted and identify potential hazardous material sites in the Preferred Alternative corridor.
- Utilize TxDOT guidance provided in the TxDOT Environmental Toolkit for this task.
- Complete the TxDOT Hazardous Materials ISA Form Technical Report for the Preferred Alternative corridor.

Traffic Noise Assessment

- Conduct a preliminary traffic noise analysis in accordance with current Federal and State rules, regulations and guidelines for the Preferred Alternative.
- Utilize TxDOT guidance provided in the TxDOT Environmental Toolkit for this task.
- Prepare a Traffic Noise Technical Report for the Preferred Alternative.

Indirect and Cumulative Impact Assessment

- Conduct an indirect and cumulative impact assessment per current TxDOT guidance and the *AASHTO Practitioner's Handbook 12: Assessing Indirect Effects and Cumulative Impacts Under the National Environmental Policy Act (NEPA)* for the Preferred Alternative corridor.
- Utilize TxDOT guidance provided in the TxDOT Environmental Toolkit for this task.

Section 4(f) of the U.S. Department of Transportation Act De Minimis Evaluations

Prepare up to one Checklist for Section 4(f) *De Minimis* for Public Parks, Recreation Lands, Wildlife & Waterfowl Refuges, and Historic Sites per the TxDOT Environmental Online Toolkit for the Preferred Alternative corridor.

Section 6(f) of the Land and Water Conservation Fund Act

The Engineer will research and review publicly available data to determine if Land and Water Conservation Funds were applied to any properties within the Preferred Alternative and prepare one initial coordination letter with TxDOT.

Chapter 26 of Texas Parks and Wildlife Code

Prepare up to one Checklist for Chapter 26 of the Texas Parks and Wildlife Code and all applicable investigations per TxDOT's online Environmental Toolkit for each of the Preferred Alternative corridors.

Task BS6.3 Deliverables

1. Draft & Final Community Impact Assessment Form Technical Report (up to 2 hard copies of drafts and 1 hard copy of final and electronic PDF of each)
2. Draft & Final Archeological Background Study Report (up to 2 hard copies of drafts and 1 hard copy of final and electronic PDF of each)
3. Draft & Final Archeological Pedestrian Survey Report (up to 2 hard copies of drafts and 1 hard copy of final and electronic PDF of each)
4. Draft & Final Project Coordination Request for Historical Studies (up to 2 hard copies of drafts and 1 hard copy of final and electronic PDF of each)
5. Draft & Final Historic Resources Research Design (up to 2 hard copies of drafts and 1 hard copy of final and electronic PDF of each)
6. Draft & Final Historic Resources Reconnaissance Survey Report (up to 2 hard copies of drafts and 1 hard copy of final and electronic PDF of each)
7. Draft & Final Wetland Delineation Report (up to 2 hard copies of drafts and 1 hard copy of final and electronic PDF of each)
8. Draft & Final Surface Water Analysis (up to 2 hard copies of drafts and 1 hard copy of final and electronic PDF of each)
9. Draft & Final Biological Evaluation Form Technical Report (up to 2 hard copies of drafts and 1 hard copy of final and electronic PDF of each)
10. Draft & Final Air Quality Technical Report (up to 2 hard copies of drafts and 1 hard copy of final and electronic PDF of each)
11. Draft & Final Hazardous Materials Initial Site Assessment Form Technical Report (up to 2 hard copies of drafts and 1 hard copy of final and electronic PDF of each)
12. Draft & Final Traffic Noise Technical Report (up to 2 hard copies of drafts and 1 hard copy of final and electronic PDF of each)
13. Draft & Final Traffic Indirect and Cumulative Technical Report (up to 2 hard copies of drafts and 1 hard copy of final and electronic PDF of each)
14. Checklist for Section 4(f) De Minimis for Public Parks, Recreation Lands, Wildlife & Waterfowl Refuges, and Historic Sites (up to 2 hard copies of drafts and 1 hard copy of final and electronic PDF of each)
15. Section 6(f) of the Land and Water Conservation Fund Act report (up to 2 hard copies of drafts and 1 hard copy of final and electronic PDF of each)
16. Checklist for Chapter 26 Evaluation (up to 2 hard copies of drafts and 1 hard copy of final and electronic PDF of each)

Task 4: NEPA Environmental Assessment (EA) and Finding of No Significant Impacts (FONSI)

The Engineer will prepare a separate environmental assessment (EA) to accompany the schematic.

Each EA shall be in accordance with current Federal and State rules, regulations, and guidelines and utilize TxDOT guidance provided in the TxDOT Environmental Toolkit.

The EA content shall be in sufficient detail to meet regulatory requirements for legal sufficiency and include all items listed in the Environmental Document Review Checklist and the Administrative Completeness Review Checklist.

Prepare Finding of No Significant Impacts (FONSI) forms and notice of availability (NOA) forms based on the TxDOT guidance provided on the TxDOT Environmental Toolkit.

Task BS6.4 Deliverables

1. Draft Environmental Assessment (up to 2 hard copies of drafts and 1 hard copy of final and electronic PDF of each)
2. Final Environmental Assessment (up to 2 hard copies of drafts and 1 hard copy of final and electronic PDF of each)
3. FONSI Form (up to 2 hard copies of drafts and 1 hard copy of final and electronic PDF of each)
4. NOA for FONSI Form (up to 2 hard copies of drafts and 1 hard copy of final and electronic PDF of each)

Task 5: U.S. Army Corps of Engineers (USACE) Coordination

For the portion of the Preferred Alternative that crosses the Lake Lavon, the Engineer will prepare a pre-application meeting request to the USACE Fort Worth District.

The Engineer will also attend up to seven (7) meetings with the Lake Manager and up to three (3) meetings with the USACE Fort Worth District. The Engineer will prepare exhibits, maps, or other needed materials required for the meetings and support needed coordination to get USACE project concurrence.

Nationwide Permit 14 Pre-Construction Notification
This task will include preparing and submitting a Pre-Construction Notification (PCN) under Nationwide Permit (NWP) 14 (Linear Transportation Projects). Requirements for the submittal of a PCN to USACE Fort Worth District include documentation and evaluation of impacts to waters of the U.S., threatened and endangered species (and/or their habitats), and cultural/historic resources. The PCN will also include a mitigation plan documenting the proposed mitigation to off set impacts from the proposed project.

Tree Survey
This task will include conducting a tree survey within the proposed ROW to be acquired from the USACE. The survey will include all trees with a diameter of three (3) inches or greater measured at a height of four and one-half feet above ground level within the proposed ROW to be acquired from the USACE.
The following will be recorded for each tree identified:

- Species
- Diameter
- Location (GPS Collected)
- Tree tag issuing unique identifier

Lavon Lake Real Estate Packet
This task will include preparing and submitting the real estate packet required to purchase ROW from the USACE owned property along Lavon Lake. The packet will include items required to receive

approval to acquire ROW from the USACE based on the email from Steve Perrin, USACE Lead Ranger, on March 22, 2022.

Task BS6.5 Deliverables

1. USACE Pre-application Meeting Request and Meeting Notes (1 hard copy of final and electronic PDF of each)
2. Meeting minutes/documentation for all other USACE meetings
3. Nationwide Permit 14 Pre-Construction Notification
4. Tree Survey Map and Table identifying trees by size, species, remove/keep status, location within the project area, and elevation bracket.
5. Lavon Lake Real Estate Packet

BS7. PUBLIC/STAKEHOLDER INVOLVEMENT

Due to the COVID-19 Pandemic and limiting of in-person gatherings, virtual meetings may be held. Alternatively, one-on-one coordination may be needed to review or address specific stakeholder/property owner requirements or improvements.

A. Public Involvement Plan

The project team will develop a comprehensive Public Involvement Plan (PIP) that will include communications with stakeholders and the general public. Key items will include:

The project team will revise the Stakeholder Identification (includes the creation of a database for elected/public officials and business/community leaders along the corridor) to include but not limited to, officials in Collin County, TxDOT, City of McKinney, Town of Fairview, USACE, NTMWB, and NCTCOG.

- Public and Stakeholder Definitions
- Outreach Timeline
- Goals
- Stakeholder Meetings Methodology
- Public Meetings Methodology
- Public Hearings Methodology
- Quality Assurance Protocols

B. Public Involvement Management

This task provides for the monthly management of tasks and activities, as well as internal project team meetings. In addition, the project team will utilize publicinput.com or similar for public and stakeholder involvement management. The system will track stakeholder progress from kick-off through the end and assist with identifying and managing stakeholder input throughout the corridor area.

The task includes the utilization of Facebook and Twitter ad space for up to 20,000 residents along the corridor. Each ad placement is approximately $300. For each public meeting and public hearing, as well as general information updates, we estimate the number of ad placements to be 12.

C. Stakeholder Coordination/Involvement

Prior to following the TxDOT protocols for an Environmental Assessment, the project team will work

with identified stakeholders to ensure that the right participants are at the table and to conduct a series of policy briefings and technical briefings. Task 3 is divided into 2 stages:

1. **Stage A:** Policy briefings will be conducted with the elected/public officials, while technical briefings will be conducted with county, city and state staff. It is estimated that each stakeholder meeting will not exceed 12 participants.

   The following stakeholder meetings are identified:

   City of McKinney/Airport & Town of Fairview
   Up to two Policy and two Technical Stakeholder Meetings Prior to the First Public Meeting
   Up to six Policy and six Technical Stakeholder Meetings Throughout Project

   Representatives from the county, TxDOT, USACE, NCTCOG and NTMWD will be invited to each of the above meetings, if applicable.

   The project team will coordinate these meetings, as well as RSVPs, identify appropriate venues, create sign-in sheets, take notes and develop summaries for each meeting.

2. **Stage B:** The project team will conduct two additional stakeholder meetings that bring the technical, policy and business stakeholders together for facilitated discussions to build consensus and identify appropriate project goals.

   The project team will coordinate these meetings, as well as RSVPs, identify appropriate venues, create sign-in sheets, take notes and develop summaries for each meeting, as well as assist with facilitation.

D. Additional Property Owner/Stakeholder Coordination: It is anticipated that the following, additional meetings may be needed to coordinate and gain consensus for the recommended alternative in the early stage of the project. Each will include time to prepare for and document each meeting.

- For our current, worst-case alignment scenario, there are thirty-nine (39) possible properties to be impacted along the corridor. It is assumed that we would plan for and attend up to thirty-five (35) meetings with affected property owners along the corridor throughout the alignment analysis stage of the project.
- Prepare for and attend up to seventeen (17) monthly meetings with TxDOT to coordinate the SH 399 alignment surrounding the McKinney National Airport, estimated from August 2021 to December 2022.
- Prepare for and attend up to sixty (60) bi-weekly meetings with TxDOT, as a partner, to coordinate the Project, estimated from May 2022 to November 2024.
- Prepare for and attend a separate meeting (1) with NCTCOG to discuss their Collin County Strategic Roadway Initiative, projected traffic volumes within the project limits, demographics, and development of traffic numbers for use in microsimulations for the corridor.
- Prepare for and attend up to two (2) meetings with bicycle groups that utilize the corridor. Identified are the following: Bike DFW, Plano Bicycle Association, Shawnee Trail Cycling Club.
- Prepare for and attend up to one (1) separate meeting/work session with Lowry Crossing early in the project to discuss concerns, options, impacts, etc. (EDC; City Secretary; Mayor; Mayor Pro Tem; Fire Chief)

1) Public Meetings

For Environmental Assessment purposes, the project will require two (2) in-person and virtual public meetings. All public meeting materials for the first public meeting shall discuss or clearly portray two separate sets of alignment alternatives corresponding to the Spur 399 Purple (West) or Orange (East) alternatives by others. Materials shall be submitted to TxDOT and COUNTY for review and approval. Public Involvement coordination for each meeting includes the development of the following:

- TxDOT Public Meeting Checklist
- EO/PO Database
- APO Database
- Public Notice (English/Spanish)
- Location Map
- Venue Coordination
- Newspaper Ad Placement and Schedule Matrix
- Public Meeting Materials
- Comment Cards (English/Spanish)
- Sign-in Sheets
- Public Meeting Photography
- Public Meeting Registration
- Coordination of All Public Meeting Comments & Responses
- Public Meeting Summary
- Project Website
- Interactive Project Map
- Interactive Project Virtual Room

2) Public Hearings

For Environmental Assessment purposes, the project will require one (1) public hearing to adhere to NEPA requirements.

Public Involvement coordination for each public hearing includes the development of the following:

- TxDOT Public Meeting Checklist
- EO/PO Database
- APO Database
- Public Notice (English/Spanish)
- Location Map
- Venue Coordination
- Newspaper Ad Placement and Schedule Matrix
- Public Meeting Materials
- Comment Cards (English/Spanish)
- Sign-in Sheets
- Public Meeting Photography
- Public Meeting Registration
- Coordination of a Court Reporter and Report
- Coordination of All Public Meeting Comments & Responses
- Public Hearing Summary

Task BS7 Deliverables

1. Public Meeting sign-in sheets, comment sheets, project information handout, and meeting summary report.
2. Public Hearing sign-in sheets, comment sheets, project information handout, PowerPoint presentation, and meeting summary report.

BS8. PROJECT MANAGEMENT

The ENGINEER's project manager, in coordination with the County's Director/Assistant Director of Engineering, will be responsible for directing and coordinating all activities and personnel associated with this project.

A. Schedule, Progress Reports, and Invoices

The ENGINEER will prepare a graphic milestone schedule indicating completion dates of major work items, deliverables, and reviews.

The schedule will be adjusted to include traffic projections and accommodations for Spur 399 schedule, which impacts FM 546 Phase II schedule.

The ENGINEER will submit monthly progress reports to the County. Invoices for all work completed during the period will be submitted monthly to the County and will be time and material based (Specified Rate). Monthly progress reports will include verbal description of all activities ongoing or completed during the reporting period, problems encountered and action required to remedy them. The progress report will include a tabulation of percent complete by task.

B. Progress/Coordination Meetings

Attend an estimated fifty-four (54) project team meetings with Collin County. The purpose of these meetings is to discuss project status, plan upcoming events, and discuss and resolve any key project issues. Meeting minutes will be prepared by the ENGINEER and distributed for all meetings.

The ENGINEER will coordinate and hold fifty-four (54) internal monthly team meetings to coordinate critical path schedule items, outstanding tasks, and risk factors for the project to keep the project on track and on budget.

The ENGINEER will prepare subcontracts for subconsultants, direct and monitor subconsultant activities, and review and recommend approval of subconsultant work and invoices.

Task BS8 Deliverables

1. Monthly Progress Reports and Invoices
2. Design Schedule
3. Meeting Sign-In Sheets and Minutes (Up to 54 Meetings)

SPECIAL SERVICES

SS1. SURVEY AND RIGHT-OF-WAY

General Standards

All surveys shall meet or exceed the standards set in the Professional Land Surveying Practices Act, the General Rules of Procedures and Practices promulgated by the Texas Board of Professional Engineers and Land Surveyors (TBPELS), and TxDOT's Survey Manual, latest edition, and shall be accomplished in an organized and workman-like manner, subject to the approval of the COUNTY.

TxDOT's Right-of-Way Procedures Preliminary to Project Release, Volume 1, (online at: http://manuals.dot.State.tx.us/) and TxDOT's Survey Manual, latest edition, will serve as a guide for the format and preparation of all right-of-way documents produced, including Right-of-Way maps, property descriptions (including parcel plats), and other Right-of-Way work products, unless otherwise directed by the COUNTY.

The North American Datum of 1983 (NAD83), Texas Coordinate System of 1983 (State Plane Coordinates), with an applied combined scale factor utilized by TXDOT for Collin County, with values in U.S. Survey Feet, will be used as the basis for all horizontal coordinates derived, unless otherwise directed by the COUNTY.

Elevations will be based on the North American Vertical Datum 88 (NAVD88), unless otherwise directed by the COUNTY.

All GPS work, whether primary control surveys or other, shall meet or exceed the current TxDOT's Survey Manual, latest edition, to the order of accuracy specified in the categories listed below or in a work authorization. If the order of accuracy is not specified in this contract or in a work authorization, the work shall meet or exceed the order of accuracy specified in the publications listed in this paragraph.

All conventional horizontal and vertical control surveys shall meet or exceed the current, TxDOT's Survey Manual, latest edition, and the Texas Society of Professional Surveyors (TSPS) Manual of Practice for Land Surveying in the State of Texas, latest edition, to the order of accuracy specified, and in the categories listed below or in a work authorization. If the order of accuracy is not specified in this contract or in a work authorization, the work shall meet or exceed the order of accuracy specified in the publications listed in this paragraph.

In order to ensure accuracy and accountability of the services provided under this contract, the Surveyor may be required to certify work performed under this contract as true and correct according to, TxDOT's Survey Manual, latest edition or the TSPS Manual of Practice for Land Surveying in the State of Texas, as may be applicable.

The Surveyor shall provide temporary signing and traffic control in and around survey operations. All signs, flags and safety equipment shall be provided by the Surveyor. The COUNTY shall be notified at least 48 hours in advance of any lane closures.

The Surveyor shall provide all personnel, equipment, and survey supplies necessary for the performance of the activities required by this agreement or by any work authorization.

Data (original and processed) shall be provided to the COUNTY on a compact disk or other approved medium and shall be in the following formats: Microsoft Word for word processing, MicroStation, Geopak V8i for graphics applications.

Variations from these software applications or other requirements listed above shall only be allowed if requested in writing by the Surveyor and approved by the COUNTY.

The Surveyor shall perform Quality Control/Quality Assurance on all procedures, field surveys, data, and products prior to delivery to the COUNTY. If, at any time, during the course of reviewing a submittal of any item it becomes apparent to the COUNTY that the submittal contains errors, omissions, and inconsistencies, the COUNTY may cease its review and return the submittal to the Surveyor immediately for appropriate action by the Surveyor. A submittal returned to the Surveyor for this reason is not a submittal for purposes of the submission schedule.

The Standards for services that are not boundary-related but that relate to surveying for engineering projects may be determined by the project Engineer, construction specifications, or design specifications.

Survey Location

Survey will be performed along the approved corridor determined in **Task BS3**.

Specific Work to Be Performed (Survey)

1. The Surveyor shall use the Horizontal and Vertical Control Monuments established in Phase I.
2. Provide cross-sections of any existing public roadways in the corridor with shots being taken at the ROW, ditch line, edge of shoulder, edge of travel lane and centerline.
3. Provide structure details of all visible cross culverts including flow line elevations, inside top of slab elevations, top of road profile and structural dimensions, and downstream channel cross sections within the project limits.
4. Locate existing visible improvements within the project limits, including but not limited to, manholes, water valves, concrete, fences, buildings and other visible utilities.
5. Surveyor shall obtain Right-of-Entry permission prior to physically accessing any private property. Surveyor will utilize public records to determine ownership data and secure permission to enter private property for purposes of performing Land Surveying. A right-of-entry (ROE) letter will be prepared on County letterhead and mailed to each property owner in the project limits. A written response will be requested either confirming or denying ROE. The Surveyor will make reasonable attempts to contact each landowner verbally prior to conducting any fieldwork if written correspondence is not successful. A log of all contact with landowners will be maintained.
6. Prepare a final design and topographic drawing in MicroStation, Geopak V8i showing all features located in the field, an ASCII coordinate file of the associated points located in the field and a hard copy of all field notes and field sketches.
7. Determine boundary lines and rights-of-way lines for approximately 84 parcels and/or rights-of-way that are within or adjacent to the technically preferred alignment.
8. All Surveying shall be performed under the direct supervision of a Professional Land Surveyor licensed and in good standing with the State of Texas.

Deliverables (Survey)

1. ROE Contact Log, copies of ROE permission letters
2. DGN file containing planimetrics, contours, break lines, and property lines and ownership information
3. Microstation GeoPak DTM file
4. ASCII file of points, field notes and field sketches

Specific Work to Be Performed (Right-of-Way)

1. The Surveyor will prepare overall Parcel Exhibit Map. The Surveyor shall use the previously established Aerial mapping image as a backdrop for the new parcel configuration that comprises the length of the new Right-of-Way corridor. The overall Parcel Exhibit Map will show the new right-of-way lines, parcel boundaries, current ownership, bearings and distances and set or found monumentation for the new right-of-way corridor. Each 22"x 34" sheet will cover approximately 5,600 feet of length of the new right-of-way corridor.
2. The Surveyor will prepare up to 39 Parcel Exhibits. In addition, up to 18 Parcel Exhibits developed during FM 546 Phase I shall be revised in coordination with TxDOT. These will show the individual configurations that comprise the new right-of-way corridor. These will show new right-of-way lines, parcel boundaries, current ownership, bearings and distances and set or found monumentation. They will be reviewed by COUNTY and ENGINEER representatives for correctness and parcel configuration. These will include area designations for any determined prescriptive easement areas within the boundaries of the Parcel Exhibits and shown for appraisal purposes. There are approximately 39 Parcels that need Right-of-Entry permission within the Right-of-Way corridor. If Right-of-Entry can't be obtained, the Surveyor will be unable to set the new Right-of-Way monuments on those Parcels. The Surveyor could prepare Parcel Exhibits omitting the new Right-of-Way monumentation to be set. New Right-of-Way monuments can be set after Collin County obtains title to these parcels.
3. The Surveyor will prepare up to 39 Metes and Bounds descriptions that describe the Parcel boundaries. In addition, up to 18 Metes and Bounds developed during FM 546 Phase I shall be revised in coordination with TxDOT. These will be signed and sealed by a Texas Registered Professional Land Surveyor and will become part of each Parcel Exhibit and suitable for acquisition purposes. These will be prepared after Parcel Exhibits have been reviewed and approved by others.
4. The Surveyor shall research public records to obtain names, physical addresses, mailing addresses, and telephone numbers, if available, of all property owners that adjoin and are within the ROW Mapping project limits. The surveyor shall fill out an Excel Spreadsheet with the found information. The Surveyor shall obtain copies of all parent tract recorded deeds and current subdivision plats within the project limits.
5. ABSTRACT MAP (Working Sketch): The Surveyor shall create an Abstract Map (Working Sketch) of up to 39 properties (assumed from worst case scenario alignment) for the ROW Mapping Project. The final Micro-Station shall be a scale drawing prepared from record documents depicting the approximate locations of existing right-of-way lines, easement lines, and private property lines with relevant grantee names, recording data, and recording dates. The Abstract Map (working sketch) shall not depict right-of-way, easement, or private property lines resolved through found monumentation and evaluation by a Registered Professional Land Surveyor and will not be suitable as a land survey document for right-of-way or easement parcel document creation. Easement research shall span no earlier than 1945 (75 years).

1. All Surveying shall be performed under the direct supervision of a Texas Registered Professional Land Surveyor licensed and in good standing with the State of Texas.

Deliverables (Right-of-Way)

1. DGN files containing bearings, distances, monumentation of each parcel configuration (with easements) required to reproduce the overall Parcel Exhibit Maps.
2. Three (3) copies of signed and sealed Parcel Exhibits that include the associated Metes and Bounds for approximately thirty-nine (39) Parcels with PDF copies, plus up to eighteen (18) Parcels that were previously developed during FM 546 Phase I.
3. Two hard copies (22"x34" & 11"x17") and PDF copies of the overall Parcel Exhibit Map.
4. Excel Spreadsheet that includes information of all property owners within the described limits.
5. PDF copies of all pertinent property records.
6. An electronic file of the Abstract Map shall be provided in MicroStation V8i format.

SS2. UTILITY INVESTIGATION (SUE)

Subsurface Utility Engineering (SUE) includes utility investigations subsurface and above ground prepared in accordance with AASHTO standards [ASCE C-1 38-02 (http://www.fhwa.dot.gov/programadmin/asce.cfm)] and Utility Quality Levels.

A. Utility Quality Levels

Utility Quality Levels are defined in cumulative order (least to greatest) as follows:

1. Quality Level D - Existing Records: Utilities are plotted from review of available existing records.
2. Quality Level C - Surface Visible Feature Survey: Quality level "D" information from existing records is correlated with surveyed surface-visible features. Includes Quality Level D information.
3. Quality Level B - Designate: Two-dimensional horizontal mapping. This information is obtained through the application and interpretation of appropriate non-destructive surface geophysical methods. Utility indications are referenced to established survey control. Incorporates quality levels C and D information to produce Quality Level B.
4. Quality Level A - Locate (Test Hole): Three-dimensional mapping and other characterization data. This information is obtained through exposing utility facilities through test holes and measuring and recording (to appropriate survey control) utility/environment data. Incorporates quality levels B, C and D information to produce Quality Level A.

B. Designate (Quality Level B)

Designate means to indicate the horizontal location of underground utilities by the application and interpretation of appropriate non-destructive surface geophysical techniques and reference to established survey control. Designate (Quality Level B) Services are inclusive of Quality levels C and D.

The Engineer shall:

1. As requested by the Client compile "As Built" information from plans, plats and other location data as provided by the utility owners.

2. Coordinate with utility owner when utility owner's policy is to designate their own facilities at no cost for preliminary survey purposes. The Engineer shall examine utility owner's work to ensure accuracy and completeness.

3. For the alignment options being considered, correlate utility owner records with designating data and resolve discrepancies using professional judgment. A color-coded composite utility facility plan with utility owner names, quality levels, line sizes and subsurface utility locate (test hole) locations, shall be prepared and delivered to the Client. It is understood by both the Engineer and the Client that the line sizes of designated utility facilities detailed on the deliverable are from the best available records and that an actual line size is normally determined from a test hole vacuum excavation. All above ground appurtenance locations must be included in the deliverable to the Client. This information shall be provided in the latest version of Microstation or Geopak used by the Client.

4. After a final alignment has been selected, designate, record, and mark the horizontal location of the existing utility facilities and their service laterals to existing buildings using non-destructive surface geophysical techniques.

5. Revise the utility facility plan by incorporating the Level B utility information collected along the selected final alignment. Clearly identify all utilities that were discovered from quality level B or what cannot be depicted in quality level B standards (levels C and D). These utilities must have a unique line style and symbology in the designate (Quality Level B) deliverable.

C. Subsurface Utility Locate (Test Hole) Service (Quality Level A)

The ENGINEER shall complete a Quality Level B subsurface utility engineering (SUE) investigation (exclusive of Quality Levels C and D) for 200 LF at up to three (3) locations within the full project limits, as requested by the Engineer, estimated at up to 5,000 LF of Quality Level B. The ENGINEER shall complete up to three (3) Quality Level A test holes as needed at potential utility conflict locations as identified by others.

Locate means to obtain precise horizontal and vertical position, material type, condition, size and other data that may be obtainable about the utility facility and its surrounding environment through exposure by non-destructive excavation techniques that ensures the integrity of the utility facility. Subsurface Utility Locate (Test Hole) Services (Quality Level A) are exclusive of Quality Levels B, C, and D.

The Engineer shall:

1. Review requested test hole locations and advise the COUNTY in the development of an appropriate locate (test hole) work plan relative to the existing utility infrastructure and proposed highway design elements.

2. Coordinate with utility owner inspectors as may be required by law or utility owner policy.

3. Neatly cut and remove existing pavement material, such that the cut not to exceed 0.10 square meters (1.076 square feet) unless unusual circumstances exist.

4. Measure and record the following data on an appropriately formatted test hole data sheet that has been sealed and dated by the Engineer:

    a. Elevation of top and/or bottom of utility tied to the datum of the furnished plan.
    b. Identify a minimum of two benchmarks utilized. Elevations shall be within an accuracy of 15mm (.591 inches) of utilized benchmarks.
    c. Elevation of existing grade over utility at test hole location.
    d. Horizontal location referenced to project coordinate datum.
    e. Outside diameter of pipe or width of duct banks and configuration of non-encased multi-conduit systems.
    f. Utility facility material(s).
    g. Utility facility condition.
    h. Pavement thickness and type.
    i. Coating/Wrapping information and condition.
    j. Unusual circumstances or field conditions.

5. Excavate test holes in such a manner as to prevent any damage to wrappings, coatings, cathodic protection or other protective coverings and features.

6. Be responsible for any damage to the utility during the locating process. In the event of damage, the Engineer shall stop work, notify the appropriate utility facility owner, the Client and appropriate regulatory agencies. The regulatory agencies include, but are not limited to the Railroad Commission of Texas and the Texas Commission on Environmental Quality. The Engineer shall not resume work until the utility facility owner has determined the corrective action to be taken. The Engineer shall be liable for all costs involved in the repair or replacement of the utility facility.

7. Back fill all excavations with appropriate material, compact backfill by mechanical means, and restore pavement and surface material. The Engineer shall be responsible for the integrity of the backfill and surface restoration for a period of three years. Install a marker ribbon throughout the backfill.

8. Furnish and install a permanent above ground marker (as specified by the COUNTY, directly above center line of the utility facility.

9. Provide complete restoration of work site and landscape to equal or better condition than before excavation. If a work site and landscape is not appropriately restored, the Engineer shall return to correct the condition at no extra charge to the COUNTY.

10. Plot utility location position information to scale and provide a comprehensive utility plan sign and sealed by the responsible Engineer. This information shall be provided in the latest version of Microstation or Geopak format used by the COUNTY.

11. Return plans, profiles, and test hole data sheets to the County. If requested, conduct a review of the findings with the County.

DELIVERABLES

The Engineer shall provide the following:

- Utility Records/As-Builts obtained from utility owners
- Level C/D Microstation File depicting utility line work for four alignments under consideration
- Level B Microstation File depicting utility line work for final selected alignment
- PDF of SUE Level A Test Hole Data Sheets
- Utility Layout Sheets are not included in this scope

SS3. Aerial Photography and LiDAR Acquisition

A. Feasibility Study

N/A. The ENGINEER will utilize aerial photography and LiDAR acquisition obtained for the Project during Phase I.

B. Design Schematic

Upon approval of the recommended alternative, the ENGINEER will perform digital mapping of the Project. The corridor will have 1400-foot width (700 feet each side of centerline). Aerial mapping will use the previously acquired 5cm GSD imagery and helicopter LiDAR. Aerial photography and LiDAR will suitable for ASPRS Class I 1" = 50' scale mapping specifications and to generate 1-foot contours. Aerial mapping photogrammetry will hold to 0.167-foot vertical RMSE on hard surfaces in well-defined areas and 0.33-foot vertical RMSE on soft surfaces. Aerial LiDAR will hold a 0.15-foot vertical RMSE on hard surfaces and 0.33-foot on soft surfaces.

DELIVERABLES

- 1"-50' scale 2D planimetrics of the Project in PowerGeopak V8i format

SS4. GEOTECHNICAL INVESTIGATION (This section is removed in Agreement 4.)

~~The geotechnical engineering services will consist of field and laboratory investigations, engineering analysis and development of a pavement geotechnical report prepared by a Licensed Professional Engineer.~~

~~**A. Field Investigation**~~

~~The field investigation will consist of eighteen (18) pavement borings, spaced evenly along the proposed roadway alignment and drilled to 15 feet below proposed grade elevations. In addition, four (4) bridge borings will be drilled to depths of approximately 90 feet at the northern tributary of Lake Lavon. Up to two (2) retaining wall borings will be drilled approximately south of McKinney National Airport. The ENGINEER will provide alternative recommendations for the proposed retaining wall(s) along the approaches to Lake Lavon. ENGINEER will provide soil design parameters for sheet pile design.~~

~~Spacing and depths will follow TxDOT's Geotechnical Manual and may be adjusted by the Geotechnical Engineer's recommendations. A boring and TCP plan will be developed and submitted to the COUNTY for review and approval.~~

~~The ENGINEER will assist the COUNTY in obtaining the right-of-entry of the properties and assumes that the boring locations will be accessible to a conventional truck-mounted drilling equipment during normal working hours.~~

~~The ENGINEER shall include traffic control during field operations.~~

~~B. Laboratory Investigation~~

~~Laboratory tests will be conducted to classify the soil to evaluate the volume change potential and strength of the soil and rock present at the site per TxDOT standards, Atterberg limits, sieve analysis and moisture contents will be performed on every stratum within each of the pavement borings. The volume change potential of the soils will also be evaluated by swell tests. The strength of the soil will be estimated using hand penetrometer tests and unconfined compressive strength tests. Unconfined compressive strength testing will also be performed on the rock cores. Sulfate testing will be performed at 0 to 2 feet and 2 to 4 feet per TxDOT standards. Lime/PI series tests will also be performed on selected clay samples.~~

~~C. Geotechnical Report~~

~~Results and field and laboratory work will be presented in a geotechnical engineering report. The report will consist of recommendations to guide design and construction of the new roadway and shall include the following:~~

- ~~Generalized soils stratigraphy and groundwater levels~~
- ~~Results of classification and TCP testing with Wincore format boring logs~~
- ~~Site Condition and Geology~~
- ~~Visually classify the soil samples by an engineer in the laboratory~~
- ~~Pavement PVR Calculations~~
- ~~Recommended Depth of Pavement Coverage~~
- ~~Recommendations for Flexible and Rigid Pavement Sections~~
- ~~Recommendations for bridge foundation system~~
- ~~Recommendations for L-Pile parameters~~
- ~~Seismic site classifications~~
- ~~Geotechnical design recommendations for earth retaining walls and/or sheet piles~~
- ~~Comments on the presence and effect of expansive soils on pavement construction will be provided. Up to two (2) alternative methods of reducing any anticipated shrink/swell movements associated with expansive clays will be included for pavement construction, if required.~~

~~Task SS4 Deliverables~~

1. ~~Draft Geotechnical Report~~
2. ~~Final Geotechnical Report~~

SS5. 3D VISUALIZATION SERVICES

The ENGINEER will develop and deliver a 3-D project model that shows a three-dimensional

representation of the proposed designs superimposed on the surrounding existing conditions within the approximate Area of Modeling defined above. Model development services will be based on the tasks described below.

A. Modeling of Existing Conditions (Feasibility Study)

The 3-D project models will depict the existing conditions within the Area of Modeling by draping aerial photographs onto 3-D terrain surface models and simulating selected surface features. Modeling of existing conditions within the Areas of Modeling will include:

- Aerial photography draped onto the terrain surface models developed from the initial wide-area topographic data;
- Infill of areas underneath bridge structures that are obscured on aerial photography;
- Simplified three-dimensional representation of the existing FM-546 corridor and associated bridge structures, similar in quality and level of detail to the example shown in Figure 1;
- Simplified and approximate representation of existing buildings located within the Area of Modeling, consisting of building footprints extruded to form shapes with generic facades and roofs, similar in quality and appearance to the buildings shown in Figure 1;
- Approximation of existing trees and foliage within the Areas of Modeling based on visual inspection of aerial and street-level photography, similar in quality and appearance to the examples shown in figures below;
- Floating "billboard" labels identifying primary points of interest, similar to those shown in Figure 1;
- Overlay of street name labels on primary roads.

Except as listed above, the 3-D project model will not include any other existing topographic features such as existing signs, signals, utility poles and cables, curbs, islands, lights, barriers, railings, or mailboxes.

Figure 1 - Example of Representation of Existing Rural Highway, Existing Buildings, and Trees

B. Initial Modeling of Alignment Alternatives (Feasibility Study)

The 3-D project model will depict simplified representations of the proposed designs of FM 546 on up to four different alignments including:

- Simplified three-dimensional representation of the corridor alternatives including pavement textures, basic striping and markings, medians, curbs, gutters, and sidewalks, similar in quality and level of detail to the examples shown in Figure 2;
- Simplified three-dimensional representation of bridge and causeway structures crossing the wetland area;
- Simplified traffic consisting of vehicles moving in both directions on each roadway at constant speeds and on non-conflicting paths, similar to the traffic that can be seen on the video found at https://www.mass.gov/north-washington-street-bridge-replacement

Except as listed above, the 3-D project model will not include driveway openings, roadside and way-finding signs, traffic signals, utility poles and cables, and other features not specifically described.

Figure 2 - Example of Simplified Representation of Proposed Roadway

C. Modeling of Preferred Alternative (Design Schematic)

After detailed designs for the preferred alignment alternative have been developed the 3-D project model will be updated to depict a more detailed representation of the selected corridor, including:

- Updating the existing conditions to include more detailed survey data collected for the selected corridor;
- Removal of the representations of the rejected alternatives;
- Detailed three-dimensional representation of the roadway for the selected alignment including pavement textures, detailed striping and marking, medians, curbs and gutters, driveway openings, traffic signals, and other relevant roadway details, similar in quality and level of detail to the examples shown in Figure 3 and Figure 4;
- Detailed three-dimensional representation of the causeway and bridge structures used to cross the wetland area, similar in quality and level of detail to the example shown in Figure 5;

- Simplified traffic consisting of vehicles moving in both directions on each roadway at constant speeds and on non-conflicting paths, similar to the traffic that can be seen on the video found at https://www.mass.gov/north-washington-street-bridge-replacement;

Figure 3 - Example of Detailed Representation of Proposed Rural Highway

Figure 4 - Example of Detailed Representation of Proposed Rural Highway

Figure 5 - Example of Detailed Representation of Wetland Crossing Bridge

D. Other / Miscellaneous (Feasibility Study and Design Schematic)

1. The 3-D project model will include the following features that can be used to facilitate review and presentation of the proposed improvements in both phases:

- Shortcuts to critical viewpoints;
- Up to ten camera animations along paths to be designated by the COUNTY, such as flyovers and drive-throughs.
- Predefined controls to easily show different view states such as Existing and Alternatives conditions.

2. The ENGINEER will also provide the following services related to usage of the 3-D project visualization model:

- Assistance in the development of a Virtual Tour hosted on the 123bim.com web collaboration systems using camera viewpoint locations selected by the COUNTY (for an example of a virtual tour see http://vtour.123bim.com/AAIY/);
- One hour of introductory training via web meeting to project team members on the use of the various 123BIM applications;
- One hour of assistance via web meeting for optimal use of the 3-D project model for specific public and stakeholder outreach events;
- Assistance in the development of "storyboard" videos with titles and captions developed from animated video clips exported from the 3-D project model, similar in quality to the example that may be seen at https://www.mass.gov/north-washington-street-bridge-replacement.

Note: One-year subscription period to 123BIM.com was purchased for Phase I. A second year will be included as part of this contract and will used

EXHIBIT "C" - FEE SCHEDULE (AMENDMENT 4 - PHASE 2)
BGE, Inc.
Corridor Analysis and Schematic Design

From: Airport Drive in McKinney, TX To: County Road 393 in Lowry Crossing, TX	Director	Subject Matter Expert	Structural Engineer	Senior Engineer	Project Engineer	Design Engineer	EIT/GIS Technician	Senior Civil Designer	Clerical	TOTAL HRS PER TASK	TOTAL PER TASK
RATE	**$290.00**	**$250.00**	**$210.00**	**$204.75**	**$185.00**	**$170.00**	**$140.00**	**$180.00**	**$85.00**		
BASIC SERVICES											
TASK BS3 - CORRIDOR ALTERNATIVES ANALYSIS											
A. AIRPORT/SP399 ALIGNMENT ANALYSIS											
Analyze NW Direct Connector Alternatives at Spur 399											$ -
Alternative Alignment Evaluation for NWDC (Up to 2)	2			4	20		20			46	$ 7,899.00
Develop Cost-Benefit Analysis	2				2		8			12	$ 2,070.00
Analyze DC entry point locations (Up to 3)	4			4	8		8			24	$ 4,579.00
TASK BS3 TOTALS (HOURS)	**8**	**0**	**0**	**8**	**30**	**0**	**36**	**0**	**0**	**82**	**$ 14,548.00**
TASK BS3 TOTALS (COST)	**$ 2,320.00**	**$ -**	**$ -**	**$ 1,638.00**	**$ 5,550.00**	**$ -**	**$ 5,040.00**	**$ -**	**$ -**		

EXHIBIT "C" - FEE SCHEDULE (AMENDMENT 4 - PHASE 2)
BGE, Inc.
Corridor Analysis and Schematic Design

From: Airport Drive in McKinney, TX To: County Road 393 in Lowry Crossing, TX	Director	Subject Matter Expert	Structural Engineer	Senior Engineer	Project Engineer	Design Engineer	EIT/GIS Technician	Senior Civil Designer	Clerical	TOTAL HRS PER TASK	TOTAL PER TASK
RATE	**$290.00**	**$250.00**	**$210.00**	**$204.75**	**$185.00**	**$170.00**	**$140.00**	**$180.00**	**$85.00**		
TASK BS4 - SCHEMATIC DEVELOPMENT											
A. GENERAL (TxDOT Requests)											
Design Adjustments in Phase I/Phase II overlap area	2			12	24	40				78	$ 14,277.00
Re-evaluation of NW Direct Connector at Spur 399	4			8	24	24				60	$ 11,318.00
Evaluate NWDC extension past CR 317	2			4	8	8				22	$ 4,239.00
Develop ASEDs for TxDOT, per CSJ	2			8	8					18	$ 3,698.00
Recut Schematic Layouts		4		4	20		40	40		108	$ 18,319.00
Evaluate and Develop Intersections at Spur 399 (Up to 2 Options)	16			24	100		100			240	$ 42,054.00
B. INTERSECTIONS, INTERCHANGES & GRADE SEPARATIONS											$ -
Incorporate bridge to mitigate wetland impacts											
Horizontal and Vertical Geometry and Modeling	4		4	8	24		40			80	$ 13,678.00
TxDOT Preliminary Bridge Design and Layouts for Wetland Bridge		4	24	8			80	60		176	$ 29,678.00
Coordinate, Respond to, and Address TxDOT Bridge Comments											$ -
Wetland Bridge (Up to 2 Comment Resolution Meetings - TxDOT)	2	8	16	6			32			64	$ 11,648.50
East Fork Trinity River (Up to 2 Comment Resolution Meetings - TxDOT)	2	8	12	6			24			52	$ 9,688.50
TASK BS4 TOTALS (HOURS)	**34**	**24**	**56**	**88**	**208**	**72**	**316**	**100**	**0**	**898**	**$ 158,598.00**
TASK BS4 TOTALS (COST)	**$ 9,860.00**	**$ 6,000.00**	**$ 11,760.00**	**$ 18,018.00**	**$ 38,480.00**	**$ 12,240.00**	**$ 44,240.00**	**$ 18,000.00**	**$ -**		
TASK BS5 - HYDROLOGIC AND HYDRAULIC INVESTIGATION											
A. MINOR CROSS DRAINAGE											
Review, respond to and coordinate TxDOT comments (up to 2 sets)				12	24					36	$ 6,897.00
Review and coordinate 3 additional culvert crossings				6	6					12	$ 2,338.50
	Completed by Lamb-Star, LLC.										
B. MAJOR CROSS DRAINAGE (ONE FEMA ZONE AE IMPACT AT WILSON CREEK)											
Obtain and Review Available FEMA Data & Reports				4						4	$ 819.00
Drainage Area Mapping											$ -
Calculate Discharges				4		20	20			44	$ 7,019.00
Develop Hydraulic Models				4		20	20			44	$ 7,019.00
Identify Easement Requirements											$ -
Size Cross Drainage Structures				4		16				20	$ 3,539.00
OPCC - Scour Countermeasures											$ -
C. CLOSED STORM SEWER SYSTEM											
	Completed by Lamb-Star, LLC.										
D. DRAINAGE DESIGN TECHNICAL SUMMARY REPORT											
Prepare Drainage Design Technical Summary Report				4			16			20	$ 3,059.00
QA/QC				4			16			20	$ 3,059.00
Address TxDOT Comments (up to 2 rounds)				8			48			56	$ 8,358.00
											$ -
											$ -
TASK BS5 TOTALS (HOURS)	**0**	**0**	**0**	**50**	**30**	**56**	**120**	**0**	**0**	**256**	**$ 42,107.50**
TASK BS5 TOTALS (COST)	**$ -**	**$ -**	**$ -**	**$ 10,237.50**	**$ 5,550.00**	**$ 9,520.00**	**$ 16,800.00**	**$ -**	**$ -**		

EXHIBIT "C" - FEE SCHEDULE (AMENDMENT 4 - PHASE 2)
BGE, Inc.
Environmental Studies

From: Airport Drive in McKinney, TX To: County Road 393 in Lowry Crossing, TX	Sr. Project Manager	QA/QC Manager	Senior Engineer	Environmental Task Leader	Senior Env. Scientist	EIT/GIS Technician	Environmental Scientist II	Environmental Scientist I	Clerical	TOTAL HRS PER TASK	TOTAL PER TASK
RATE	**$260.00**	**$240.00**	**$204.75**	**$185.00**	**$135.00**	**$140.00**	**$105.00**	**$95.00**	**$85.00**		
BASIC SERVICES											
TASK BS6 - SOCIAL, ECONOMIC, AND ENVIRONMENTAL STUDIES											
1. CONSTRAINTS MAPS										0	$ -
2. ENVIRONMENTAL TECHNICAL MEMORANDUM FOR ALTERNATIVES ANALYSIS											
Miscellaneous Engineering Input/Documentation	4	2	6	10	10	20	10	10		72	$ 10,748.50
Coordination Meetings				40	10	4				54	$ 9,310.00
3. TASKS FOR RECOMMENDED ALTERNATIVE (2 REPORTS)											
Community Impact Assessment	2	2		8	8	10	6	6	5	47	$ 6,585.00
Historic Properties Assessment (PCR) (AMA Lead)	2			2						4	$ 890.00
Archeological Background Study (AMA Lead)	2			2						4	$ 890.00
Water Resources Assessment	2	2		6	8	8	6	6	5	43	$ 5,935.00
Biological Resources Assessment	2	2		6	8	8	6	6	5	43	$ 5,935.00
Air Quality Assessment										0	$ -
Hazardous Materials Assessment	2	2		6	8	6	6	6	5	41	$ 5,655.00
Traffic Noise Assessment	2	2		16	64	16	20	20	5	145	$ 19,265.00
Section 4(f) de minimis										0	$ -
Chapter 26 Checklist										0	$ -
Section 6(f)										0	$ -
Indirect and Cumulative Assessment										0	$ -
4. ENVIRONMENTAL ASSESSMENT AND FONSI (2)										0	$ -
SUB-TOTAL ENVIRONMENTAL ASSESSMENT										**453**	**$ 65,213.50**
5. USACE COORDINATION											
USACE Real Estate Packet											
Task 1: Nationwide Permit 14 Pre-Construction Notification										0	$ -
Task 2: Tree Survey										0	$ -
Task 3: Lavon Lake Real Estate Packet										0	$ -
TASK BS6 TOTALS (HOURS)	**18**	**12**	**6**	**96**	**116**	**72**	**54**	**54**	**25**	**453**	**$ 65,213.50**
TASK BS6 TOTALS (COST)	**$ 4,680.00**	**$ 2,880.00**	**$ 1,228.50**	**$ 17,760.00**	**$ 15,660.00**	**$ 10,080.00**	**$ 5,670.00**	**$ 5,130.00**	**$ 2,125.00**		

EXHIBIT "C" - FEE SCHEDULE (AMENDMENT 4 - PHASE 2)
BGE, Inc.
Public Involvement

From: Airport Drive in McKinney, TX To: County Road 393 in Lowry Crossing, TX	Director	Sr. Project Manager	Subject Matter Expert	Senior Engineer	Project Engineer	Design Engineer	Senior Civil Designer	EIT/GIS Technician	Environmental Task Leader	Clerical	TOTAL HRS PER TASK	TOTAL PER TASK
RATE	**$290.00**	**$260.00**	**$250.00**	**$204.75**	**$185.00**	**$170.00**	**$180.00**	**$140.00**	**$185.00**	**$85.00**		
BASIC SERVICES												
TASK BS7 - PUBLIC/STAKEHOLDER INVOLVEMENT												
C Stakeholder Involvement												
Coordinate Re-evaluation of NWDC	8			8	4						20	$ 4,698.00
Bi-weekly Meetings with TxDOT (Up to 20 Additional Meetings)	20			30	16				12		78	$ 17,122.50
TASK BS7 TOTALS (HOURS)	**28**	**0**	**0**	**38**	**20**	**0**	**0**	**0**	**12**	**0**	**70**	
TASK BS7 TOTALS (COST)	**$ 8,120.00**	**$ -**	**$ -**	**$ 7,780.50**	**$ 3,700.00**	**$ -**	**$ -**	**$ -**	**$ 2,220.00**	**$ -**		**$ 21,820.50**
TASK BS8 - PROJECT MANAGEMENT												
A. SCHEDULE, PROGRESS REPORTS, AND INVOICES (5 additional months)												
Schedule and Updates	12			30					10		52	$ 11,472.50
Progress Reports	4			8							12	$ 2,798.00
Preparing Invoices	4			8							12	$ 2,798.00
B. PROGRESS/COORDINATION MEETINGS												
Bi-Weekly Meetings with Collin County (30 meetings)	24			40							64	$ 15,150.00
Prepare for/attend Internal Coordination Meetings (30 meetings)	16			88	40				30		174	$ 35,608.00
Prepare subcontracts, direct & monitor sub activities, review sub work and invoices	8			30						12	50	$ 9,482.50
												$ -
TASK BS8 TOTALS (HOURS)	**68**	**0**	**0**	**204**	**40**	**0**	**0**	**0**	**40**	**12**	**296**	
TASK BS8 TOTALS (COST)	**$ 19,720.00**	**$ -**	**$ -**	**$ 41,769.00**	**$ 7,400.00**	**$ -**	**$ -**	**$ -**	**$ 7,400.00**	**$ 1,020.00**		**$ 77,309.00**
TOTAL BGE HOURS (BASIC SERVICES)	**28**	**60**	**12**	**68**	**172**	**262**	**340**	**182**	**538**	**125**		**1,759**
	1.59%	**3.41%**	**0.68%**	**3.87%**	**9.78%**	**14.89%**	**19.33%**	**10.35%**	**30.59%**	**7.11%**		**523**
TOTAL BGE LABOR COST (BASIC SERVICES)	**$ 8,120.00**	**$ 16,860.00**	**$ 2,880.00**	**$ 15,009.00**	**$ 33,220.00**	**$ 45,553.50**	**$ 59,660.00**	**$ 27,430.00**	**$ 73,430.00**	**$ 20,125.00**		**$ 379,596.50**

Reimbursable Direct Expenses	**Unit**	**Quantity**	**Rate**	**Total**
8.5" x 11" Copies (b&w)	EA		$ 0.10	$ -
Deed Copies	SHEET		$ 5.00	$ -
Map Records	SHEET		$ 5.00	$ -
Photcopies B/W (8.5x11)	EA		$ 0.10	$ -
BASIC SERVICES TOTALS (BGE)				**$ 379,596.50**

EXHIBIT "C" - FEE SCHEDULE (AMENDMENT 4 - PHASE 2)
BGE, Inc.
Corridor Analysis/Public Involvement/Schematic Design/Environmental/Geotech/SUE_Utilities/ROW Mapping/Traffic Projections

From: Airport Drive in McKinney, TX To: County Road 393 in Lowry Crossing, TX	RPLS Project Manager	QA/QC Manager	RPLS	Chief of Parties	Sr. Survey Tech	Survey Tech	TOTAL PER TASK
TASK SS1 - ROW MAPPING							
Develop Right of Way Maps, Deed Descriptions and Plats							
Parcel Plat & M&B (approx. 18 additional parcel revisions due to removal of TCE's)	8	16		20	60	40	$ 19,940.00
ROE Permission & Tracking (approx. 18 additional parcel revisions due to removal of TCE's)s)							$ -
TASK SS1 - ROW MAPPING TOTALS (HOURS)	**8**	**16**		**20**	**60**	**40**	**144**
RATE	**$ 245.00**	**$ 240.00**	**$ 198.00**	**$ 143.00**	**$ 120.00**	**$ 102.00**	
TASK SS1 - ROW MAPPING TOTALS (COST)	**$ 1,960.00**	**$ 3,840.00**	**$ -**	**$ 2,860.00**	**$ 7,200.00**	**$ 4,080.00**	**$ 19,940.00**
Reimbursable Direct Expenses and Unit Costs							
Task Description	**Per Item Rate**	**Number of Items**	**Unit**				
Survey Crew (2 person crew)	$ 175.00	80	HR				$ 14,000.00
							$ -
Direct and Unit Cost Totals							**$ 14,000.00**
Project Totals SS1 - Survey and ROW (BGE)							**$ 33,940.00**

EXHIBIT "C" - FEE SCHEDULE (AMENDMENT 4 - PHASE 2)
BGE, Inc.
Corridor Analysis/Public Involvement/Schematic Design/Environmental/Geotech/SUE_Utilities/ROW Mapping/Traffic Projections

From: Airport Drive in McKinney, TX To: County Road 393 in Lowry Crossing, TX	Sr. Project Manager	Subject Matter Expert	EIT/GIS Technician	Designer	RPLS	Survey Tech	SUE Field Manager	TOTAL PER TASK
TASK SS2 - Utility Investigation (SUE)								
Utility Investigation (SUE)								
A. Project Management, Coordination, & QA/QC								0
TxDOT Coordination		24	24					48
E. Field Locating (Locate new Utilities in Field) - Level B							12	12
F. Mapping of Level B Line Work			8			8		16
G. Address QA/QC Comments, File Cleanup, Deliverables			8					8
Address TxDOT Comments; Provide clarificatoin		16	40					56
H. Conflict List		4	24					28
TASK SS2 - SUE TOTALS (HOURS)		**44**	**104**			**8**	**12**	**168**
RATE	**$ 260.00**	**$ 250.00**	**$ 140.00**	**$ 111.00**	**$ 179.00**	**$ 78.00**	**$ 98.00**	
TASK SS2 - SUE (COST)	**$ -**	**$ 11,000.00**	**$ 14,560.00**	**$ -**	**$ -**	**$ 624.00**	**$ 1,176.00**	**$ 27,360.00**
Direct and Unit Costs								
Task Description	**Per Item Rate**	**Number of Items**	**Unit**					
2-Man Designating Crew	$ 175.00	8	HR					$ 1,400.00
Direct and Unit Cost Totals								**$ 1,400.00**
Project Totals SS2 - SUE (BGE)								**$28,760.00**

EXHIBIT "C" - FEE SCHEDULE (AMENDMENT 4 - PHASE 2)
LAMB-STAR ENGINEERING, LLC
Corridor Analysis/Public Involvement/Schematic Design/Environmental/Geotech/SUE_Utilities/ROW Mapping/Traffic Projections

From: Airport Drive in McKinney, TX To: County Road 393 in Lowry Crossing, TX	Principal-In-Charge	Senior Design Engineer	Project Engineer	Design Engineer	Engineer-In-Training	Sr. CAD Operator	Admin/ Clerical	TOTAL HRS PER TASK	TOTAL PER TASK
RATE	**$287.00**	**$269.75**	**$211.25**	**$172.25**	**$135.85**	**$156.00**	**$110.00**		
BASIC SERVICES (SPECIFIED RATE)									
TASK BS3. CORRIDOR ALTERNATIVES ANALYSIS									
Unused Fee								0	$ (28,990.00)
TASK BS3 TOTALS (HOURS)	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**$ (28,990.00)**
TASK BS3 TOTALS (COST)	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**		
TASK BS4 - SCHEMATIC DEVELOPMENT									
A. GENERAL									
7 Retaining Wall Layouts - Unused Fee								0	$ (30,040.00)
C. PROJECT DELIVERY								0	$ -
3 Pre-Final (95%)								0	$ -
Draft TCP Narrative and Construction Sequence								0	$ -
Address TxDOT comments		4	16		24			44	$ 7,719.40
4 Final (100%)								0	$ -
TCP Narrative and Construction Sequence								0	$ -
Address TxDOT comments		4	16		24			44	$ 7,719.40
TASK BS4 TOTALS (HOURS)	**0**	**8**	**32**	**0**	**48**	**0**	**0**	**88**	**$ (14,601.20)**
TASK BS4 TOTALS (COST)	**$ -**	**$ 2,158.00**	**$ 6,760.00**	**$ -**	**$ 6,520.80**	**$ -**	**$ -**		

EXHIBIT "C" - FEE SCHEDULE (AMENDMENT 4 - PHASE 2)
LAMB-STAR ENGINEERING, LLC
Corridor Analysis/Public Involvement/Schematic Design/Environmental/Geotech/SUE_Utilities/ROW Mapping/Traffic Projections

From: Airport Drive in McKinney, TX To: County Road 393 in Lowry Crossing, TX	Principal-In-Charge	Senior Design Engineer	Project Engineer	Design Engineer	Engineer-In-Training	Sr. CAD Operator	Admin/ Clerical	TOTAL HRS PER TASK	TOTAL PER TASK
RATE	**$287.00**	**$269.75**	**$211.25**	**$172.25**	**$135.85**	**$156.00**	**$110.00**		
TASK BS5 - HYDROLOGIC AND HYDRAULIC INVESTIGATION									
A. MINOR CROSS DRAINAGE (Estimate 9 Crossings)									
3 Size Cross Drainage Structures (HY-8)								0	$ -
Update culvert geometry, skew angles, x-sections, and HY8		3	96		42			141	$ 26,794.95
Address TxDOT Comments		4	20		30			54	$ 9,379.50
4 Determine ROW and easement needs								0	$ -
Channel design, driveway culverts		12			40			52	$ 8,671.00
Provide information for Drainage Design Technical Summary Report								0	$ -
OPCC								0	$ -
C. CLOSED STORM SEWER SYSTEM								0	$ -
Develop approximate trunk size and inlet spacing (Approx 2.5 miles)								0	$ -
Develop profile exhibit for Evans property storm sewer trunkline		4	24		28			56	$ 9,952.80
Determine ROW and easement needs for outfall								0	$ -
Update exhibits for Drainage Design Technical Summary Report		6	10		24			40	$ 6,991.40
OPCC								0	$ -
D. DRAINAGE DESIGN TECHNICAL SUMMARY REPORT								0	$ -
Prepare Drainage Design Technical Summary Report (Included in tasks above)								0	$ -
TASK BS5 TOTALS (HOURS)	**0**	**29**	**150**	**0**	**164**	**0**	**0**	**343**	**$ 61,789.65**
TASK BS5 TOTALS (COST)	**$ -**	**$ 7,822.75**	**$ 31,687.50**	**$ -**	**$ 22,279.40**	**$ -**	**$ -**		
TASK BS7 - PUBLIC/STAKEHOLDER INVOLVEMENT									
D. ADDITIONAL PROPERTY OWNER/STAKEHOLDER COORDINATION									
1 Public Meetings - Unused Fee								0	$ (10,720.00)
TASK BS8 TOTALS (HOURS)	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**$ (10,720.00)**
TASK BS8 TOTALS (COST)	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**		
TASK BS8 - PROJECT MANAGEMENT									
A. SCHEDULE, PROGRESS REPORTS, AND INVOICES									
Progress Reports and Invoices (assume 9)		18					18	36	$ 6,835.50
								0	$ -
TASK BS8 TOTALS (HOURS)	**0**	**18**	**0**	**0**	**0**	**0**	**18**	**36**	**$ 6,835.50**
TASK BS8 TOTALS (COST)	**$ -**	**$ 4,855.50**	**$ -**	**$ -**	**$ -**	**$ -**	**$ 1,980.00**		

DIRECT COSTS					
Task Description	**Unit**	**Unit Cost**	**Quantity**	**Unit**	
Mileage	Mile	$ 0.655		EA	$ -
DIRECT COSTS TOTALS					**$ -**

TOTAL BASIC SERVICES (LAMB-STAR ENGINEERING, LLC)	**$ 14,313.95**

EXHIBIT "C" - FEE SCHEDULE (AMENDMENT 4 - PHASE 2)
LAMB-STAR ENGINEERING, LLC
SUE and ROW Mapping

SPECIAL SERVICES (SPECIFIED RATE)														
TASK SS2 - UTILITY INVESTIGATION (SUE)														
Unused Labor													0	$ (6,630.00)
TASK BS4 TOTALS (HOURS)	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**		**0**	
TASK BS4 TOTALS (COST)	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**			**$ (6,630.00)**
DIRECT COSTS														
Task Description	**Unit Cost**	**Quantity**	**Unit**											
Unused Costs	$ (22,000.00)	1	EA											$ (22,000.00)
DIRECT COSTS TOTALS														**$ (22,000.00)**
TOTAL SPECIAL SERVICES (LAMB-STAR ENGINEERING, LLC)													**$**	**(28,630.00)**
TOTAL FEE (LAMB-STAR ENGINEERING, LLC)													**$**	**(14,316.05)**

EXHIBIT "C" - FEE SCHEDULE
Terracon Consultants, Inc.
Geotechnical Engineering Services

From: Airport Drive in McKinney, TX *To: County Road 393 in Lowry Crossing, TX*	PROJECT MANAGER	SENIOR ENGINEER	PROJECT ENGINEER	DESIGN ENGINEER	ENGINEER IN TRAINING	ADMIN / CLERICAL	TOTAL LABOR HRS. & COSTS
SS4. Geotechnical Investigation							
UNUSED LABOR							-$129,599.87
SUBTOTAL - LABOR							**($129,599.87)**

EXHIBIT "C" - FEE SCHEDULE
Terracon Consultants, Inc.
Geotechnical Engineering Services

Direct Expenses	UNIT	RATE	SS4			
UNUSED DIRECT EXPENSES						($105,429.75)
SUBTOTAL Direct Expenses			$ -	$ -	$ -	**($105,429.75)**

SUBTOTAL - LABOR ($129,599.87)
SUBTOTAL Direct Expenses ($105,429.75)

Total Terracon Consultants, Inc. Fee **($235,029.62)**

EXHIBIT "C" - FEE SCHEDULE (AMENDMENT 4 - PHASE 2)
RDV Systems, Inc.
3D Visualization Services

		Sr. Modeling Engineer	Modeling Engineer(s)	Delivery Manager	Modeling Project Manager	TOTAL	
Consultant Positions =>							
Task No.	**Task Descriptions**	***Hours***	***Hours***	***Hours***	***Hours***	***Hours***	***Cost***
	Task B Total					**0**	**$0.00**
C	**Modeling of Preferred Alternative (Design Schematic)**						
3-1	Update of existing conditions					0	$0.00
3-2	Detailed 3-D representation of selected roadway	16	24			40	$4,298.72
3-3	Detailed 3-D representation of causeway and bridge structures	8	8			16	$1,844.32
3-4	Simplified vehicle motion	1	4			5	$459.32
	Task C Total					**61**	**$6,602.36**
D	**Other/Miscellaneous (Feasibility study and Design Schematic)**						
4-4	Project Management / Delivery Management - Phase 2			4	2	6	$975.38
4-5	Predefined views, animations, view states, virtual tour - Phase 2	1	4	2		7	$777.26
4-6	Video Development - Phase 2			12		12	$1,907.64
4-7	Training and utilization planning			2		2	$317.94
	Task D Total					**27**	**$3,978.22**
	TOTAL HOURS	**26**	**40**	**20**	**2**	**88**	
	FULLY LOADED BILLABLE HOURLY RATE	$154.28	$76.26	$158.97	$169.75		
	DIRECT LABOR TOTAL	**$4,011.28**	**$3,050.40**	**$3,179.40**	**$339.50**		**$10,580.58**

Software / Subscriptions / Direct Costs	Months	Rate	Cost
123BIM.com Platinum Level subscription (2nd Year)	1	$1,100.00	$1,100.00
Total Software / Subscriptions			$1,100.00

TOTAL SOFTWARE / SUBSCRIPTIONS / DIRECT COSTS	$1,100.00
TOTAL MODEL DEVELOPMENT	$10,580.58
TOTAL PROPOSAL COST	**$11,680.58**

EXHIBIT "C" - FEE SCHEDULE (AMENDMENT 4 - PHASE 2)
Public Information Associates
Public Involvement

From: Airport Drive in McKinney, TX *To: County Road 393 in Lowry Crossing, TX*	PI Specialist (Partner)	PI Coordinator	PI Admin Support	Totals
Rate	**$155.00**	**$109.00**	**$54.00**	
BASIC SERVICES				
TASK BS7 - PUBLIC/STAKEHOLDER INVOLVEMENT				
Stakeholder Involvement	24			24
TASK BS5 TOTALS (HOURS)	**24**	**0**	**0**	**24**
TASK BS5 TOTALS (COST)	**$3,720.00**	**$0.00**	**$0.00**	**$3,720.00**
Reimbursable Direct Expenses	**Unit**	**Quantity**	**Rate**	**Total**
Total Reimbursable Direct Expenses				**$0.00**
Total Public Information Associates Fee				**$3,720.00**

EXHIBIT "C" - FEE SCHEDULE (AMENDMENT 4 - PHASE 2)
Kimley-Horn and Associates, Inc.
Traffic Projections

TASK DESCRIPTION	Traffic Project Manager	Quality Manager	Project Engineer	Engineer-In-Training	Traffic Modeler (Senior)	Project Controller	TOTAL HRS.	AMENDMENT # 4 TOTAL
	$350.00	$335.00	$250.00	$170.00	$335.00	$145.00		
PROJECT MANAGEMENT AND ADMINISTRATION								
Project Management and Coordination	10		2				12	$ 4,000.00
Progress Reports and Invoices (assuming 6 invoices)	6					6	12	$ 2,970.00
Meetings (assuming 12 meetings)	16		2	4			22	$ 6,780.00
DIVERSION ANALYSIS								
Diversion analysis using Travel Demand Model	1		5	2	65		73	$ 23,715.00
Diversion traffic volumes	3	5	10	45	5		68	$ 14,550.00
TRAFFIC ANALYSIS								
Vissim Traffic Analysis for opening year and design year, up to three (3) build alternatives, AM and PM peak hours	2	20	82	155	19		278	$ 60,615.00
One Vissim animation for each build alternative, up to three (3) build alternatives for design year and one peak hour	2	1	15	40	6		64	$ 13,595.00
Traffic memo and up to two (2) rounds of comments	2	5	43	70	3		123	$ 26,030.00
HOURS SUB-TOTALS	42	31	159	316	98	6	652	
TOTAL LABOR COSTS	$14,700.00	$10,385.00	$39,750.00	$53,720.00	$32,830.00	$870.00		**$ 152,255.00**

EXHIBIT "C" - FEE SCHEDULE (AMENDMENT 4 - PHASE 2)
AmaTerra Environmental, Inc.
Corridor Analysis/Public Involvement/Schematic Design/Environmental/Geotech/SUE_Utilities/ROW Mapping/Traffic Projections

Position	Rate	TASK BS6.3 - Archeology & Historic Resources																				Total	
		Archeological Constraints & Background Study		Permit, Prefield & Archeology Fieldwork		Draft Archeological Survey Report		Final Archeological Survey Report & Curation		Historic PCR and Constraints		Historic Resources Research Design		Historic Fieldwork		Draft Historic Resources Survey Report		Final Historic Resources Report		Administration		TOTAL	
		Hours	Cost	Hours	Cost	Hours	Cost	Hours	Cost	Hours	Cost	Hours	Cost	Hours	Cost	Hours	Cost	Hours	Cost	Hours	Cost	Hours	Cost
Principal	$ 232.00		$ -		$ -		$ -		$ -		$ -		$ -		$ -		$ -		$ -		$ -	-	$ -
Program Director	$ 164.00	1	$ 164.00		$ -	1	$ 164.00		$ -	1	$ 164.00	1	$ 164.00		$ -	1	$ 164.00	1	$ 164.00	4	$ 656.00	10	$ 1,640.00
Project Manager	$ 142.00	1	$ 142.00		$ -	1	$ 142.00		$ -		$ -		$ -		$ -		$ -		$ -		$ -	2	$ 284.00
Archeologist VI/Sr. Principal Investigator	$ 136.00	2	$ 272.00		$ -	4	$ 544.00		$ -		$ -		$ -		$ -		$ -		$ -		$ -	6	$ 816.00
Archeologist IV/Project Archeologist/Lab Director	$ 91.00	4	$ 364.00		$ -	18	$ 1,638.00		$ -		$ -		$ -		$ -		$ -		$ -		$ -	22	$ 2,002.00
Archeologist II/Crew Chief	$ 77.00		$ -		$ -	6	$ 462.00		$ -		$ -		$ -		$ -		$ -		$ -		$ -	6	$ 462.00
Archeologist I/Technician	$ 67.00		$ -		$ -	4	$ 268.00		$ -		$ -		$ -		$ -		$ -		$ -		$ -	4	$ 268.00
Sr. Historical Architect	$ 137.00		$ -		$ -		$ -		$ -	2	$ 274.00	3	$ 411.00		$ -	2	$ 274.00	2	$ 274.00		$ -	9	$ 1,233.00
Architectural Historian III	$ 118.00		$ -		$ -		$ -		$ -	2	$ 236.00	2	$ 236.00		$ -	16	$ 1,888.00	4	$ 472.00		$ -	24	$ 2,832.00
Architectural Historian II	$ 89.00		$ -		$ -		$ -		$ -	4	$ 356.00	4	$ 356.00		$ -	10	$ 890.00	4	$ 356.00		$ -	22	$ 1,958.00
GIS Technian	$ 70.00	4	$ 280.00		$ -	4	$ 280.00		$ -	2	$ 140.00	1	$ 70.00		$ -	4	$ 280.00	2	$ 140.00		$ -	17	$ 1,190.00
Admin	$ 88.00		$ -		$ -		$ -		$ -		$ -		$ -		$ -		$ -		$ -	6	$ 528.00	6	$ 528.00
Editor	$ 74.00		$ -		$ -	4	$ 296.00		$ -		$ -		$ -		$ -		$ -		$ -	4	$ 296.00	8	$ 592.00
Clerical	$ 61.00		$ -		$ -		$ -		$ -		$ -		$ -		$ -		$ -		$ -		$ -	-	$ -
SUB TOTAL		12	1,222	0	-	42	3,794	-	-	11	1,170	11	1,237	-	-	33	3,496	13	1,406	14	1,480	136	$ 13,805.00

Miscellaneous Rates - Supplies	Rate																					Total	
		Units	Cost	Units	Cost	Units	Cost	Units	Cost	Units	Cost	Units	Cost	Units	Cost	Units	Cost	Units	Cost	Units	Cost	Units	Cost
8.5“ x 14” B&W photocopy, archivally stable paper	$ 0.10		$ -		$ -		$ -		$ -		$ -		$ -		$ -		$ -		$ -		$ -	-	$ -
8.5 “ x 11” Color photocopy, archivally stable paper	$ 0.50		$ -		$ -		$ -		$ -		$ -		$ -		$ -		$ -		$ -		$ -	-	$ -
Backhoe Rental	$ 1,500.00		$ -		$ -		$ -		$ -		$ -		$ -		$ -		$ -		$ -		$ -	-	$ -
TARL Site Form Fee	$ 96.00		$ -		$ -		$ -		$ -		$ -		$ -		$ -		$ -		$ -		$ -	-	$ -
Curation CAS	$ 262.20		$ -		$ -		$ -		$ -		$ -		$ -		$ -		$ -		$ -		$ -	-	$ -
SUB TOTAL		-	$ -	0	$ -	-	$ -	-	$ -	-	$ -	-	$ -	-	$ -	-	$ -	-	$ -	-	$ -	-	$ -

Miscellaneous Rates - Travel	Rate																					Total	
		Units	Cost	Units	Cost	Units	Cost	Units	Cost	Units	Cost	Units	Cost	Units	Cost	Units	Cost	Units	Cost	Units	Cost	Units	Cost
Lodging (for overnight travel, NTE State rates)	$ 96.00		$ -		$ -		$ -		$ -		$ -		$ -		$ -		$ -		$ -		$ -	-	$ -
Hotel Taxes (State, City, & Local) (13%)	$ 12.48		$ -		$ -		$ -		$ -		$ -		$ -		$ -		$ -		$ -		$ -	-	$ -
Meals (without overnight stay)	$ 41.25		$ -		$ -		$ -		$ -		$ -		$ -		$ -		$ -		$ -		$ -	-	$ -
Meals (with overnight stay)	$ 51.00		$ -		$ -		$ -		$ -		$ -		$ -		$ -		$ -		$ -		$ -	-	$ -
Vehicle Mileage (NTE State reimbursement rate)	$ 0.575		$ -		$ -		$ -		$ -		$ -		$ -		$ -		$ -		$ -		$ -	-	$ -
SUB TOTALS			$ -		$ -		$ -		$ -		$ -		$ -		$ -		$ -		$ -		$ -		$ -

TOTAL			$ 1,222.00		$ -		$ 3,794.00		$ -		$ 1,170.00		$ 1,237.00		$ -		$ 3,496.00		$ 1,406.00		$ 1,480.00		**$ 13,805.00**